Site Inspection Report
Titan Terminal & Transport
South Gate, Los Angeles County, California

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List of Acronyms

amsl	above mean sea level
AOC	analyte of concern
APN	Assessor's Parcel Number
AST	aboveground storage tank
bgs	below ground surface
Brenntag	Brenntag Pacific, Inc.
CA MCL	California Maximum Contaminant Level
CA 2nd MCL	California Secondary Maximum Contaminant Level
CA NL	California Notification Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CLPAS	Contract Laboratory Program Analytical Services
CPT	Cone Penetration Testing
DCA	dichloroethane
DCB	dichlorobenzene
DCE	dichloroethylene
DCP	dichloropropane
DP	direct push
DTSC	Department of Toxic Substances Control
ELA	East Los Angeles
EPA	United States Environmental Protection Agency
Fed MCL	Federal Maximum Contaminant Level
Fed 2nd MCL	Federal Secondary Maximum Contaminant Level
ft	foot
ft^2	square foot
GENIL	General Inspection Laboratories
GSWC	Golden State Water Company
HHMD	LA County Fire Department, Health Hazardous Materials Division
HRS	Hazard Ranking System
LADPW	Los Angeles County Department of Public Works
MCL	Maximum Contaminant Level
MDL	method detection limit
mg/kg	milligrams per kilogram
MTBE	Methyl tert-Butyl Ether
MWC	Mutual Water Company
NDT	non-destructive testing
NE710	North East 710 Study Area
NPL	National Priorities List
PA	Preliminary Assessment
PCE	tetrachloroethylene
PWC	Park Water Company
QC	Quality Control

List of Acronyms (Continued)

RCRIS	Resource Conservation and Recovery Information System
RSL	Regional Screening Level
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SCDM	Superfund Chemical Data Matrix
SEMS	Superfund Enterprise Management System
SEP	soil exposure pathway
SI	Site Inspection
SQL	sample quantitation limit
SSL	soil screening level
Stauffer	Stauffer Chemical Company
SVE	soil vapor extraction
Titan	Titan Terminal & Transport
TCE	trichloroethylene
TDL	target distance limit
TOC	Top of Casing
TRI	Toxics Release Inventory
TSP	trisodium phosphate
UST	underground storage tank
VOC	volatile organic compound
WESTON®	Weston Solutions, Inc.
WPA	wellhead protection area
µg/L	microgram per liter

EXECUTIVE SUMMARY

The Titan Terminal & Transport (Titan) site is officially located at 4570 Ardine St., South Gate, Los Angeles County, California. Additional addresses are also associated with the site. The 7-acre site was formerly known as Stauffer Chemical Company and is located in a primarily urban industrial area. The site is located less than one-quarter mile from residential properties.

For the purposes of this Site Inspection (SI), the site was divided into two distinct operational areas, the Titan Parcels and the Solvay Parcel. The Titan Parcels comprise most of the site, including the central and western 6.6 acres. The Solvay Parcel comprises the remaining 0.4 acre at the southeastern corner of the site.

From approximately 1924 through 1993, the entirety of the facility was owned and operated by Solvay (formerly Rhone-Poulenc, Stauffer Chemical, A.R. Maas, etc.). In approximately 1993, Solvay sold the Titan Parcels portion of the site and, since 1994, Titan has been operating on the site as a hazardous and non-hazardous materials distribution and bulk storage facility. Current operations do not include manufacturing, treatment, or disposal of hazardous materials. No operations are currently conducted on the Solvay Parcel, which is paved and enclosed behind a masonry wall and chain-link fence.

Solvay's historical operations include the manufacturing of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid. The phosphoric acid plant, which operated through approximately 1981, generated an arsenic-containing sludge waste. Between 1940 and 1960, an estimated 200 tons of sludge waste was disposed of to an unlined surface impoundment on the Solvay Parcel. The impoundment was approximately 25 feet (ft) deep and extended off site to the south and east. The impoundment was reportedly retired and resurfaced with asphalt in the mid-1960s with no excavation of the waste materials it contained.

Prior to the 2015 Preliminary Assessment (PA), the U.S. Environmental Protection Agency (EPA) completed a PA in 1984, an SI in 1986, and a Site Reassessment in 2014. Additionally, EPA completed an SI Prioritization and various Site Screenings.

Between 1979 and 1982, in part under the oversight of the California Department of Toxic Substances Control (DTSC), subsurface investigations were conducted on, and adjacent to, the on-site surface impoundment. Since the early 1980s, and with the exception of a leaking petroleum underground storage tank case in the early 1990s, no state or local agency has been actively involved with the site.

In November 2015, Weston Solutions, Inc. (WESTON), on behalf of EPA, conducted the SI sampling event at the site. During the event, WESTON collected soil matrix samples at depths up to 20 ft below ground surface (bgs) from eight on-site borings, which included three locations on the Solvay Parcel; collected groundwater release samples at depths up to 134 ft bgs from eight on-site borings, which included one location on the Solvay Parcel; and collected secondary objective groundwater samples from two off-site borings.

On-site soil/waste samples collected from the Solvay Parcel during the SI investigation exhibited concentrations of metals that exceeded action levels. Most notably, arsenic was identified at concentrations up to 617 milligrams per kilogram (mg/kg); the assigned site-specific action level for arsenic is 7.8 mg/kg. Metals were also identified at elevated concentrations in a perched aquifer groundwater release sample collected from the Solvay Parcel. Most notably, arsenic was identified at a concentration 15,700 micrograms per liter (µg/L); the federal Maximum Contaminant Level (MCL) for arsenic is 10 µg/L.

On-site soil samples collected from the Titan Parcels during the investigation also exhibited concentrations of metals, most notably lead, that exceeded action levels. Lead was also identified at elevated concentrations in Gaspur aquifer groundwater samples collected from the Titan Parcels.

The results of this SI, which were generally consistent with the results of previous investigations, have identified hazardous substance source areas on site. Metals, most notably arsenic, were identified at elevated concentrations in samples collected from the surface impoundment area at the southeastern portion of the site and are likely the result of historical waste disposal practices. In addition, metals, most notably lead, were identified at elevated concentrations in subsurface soils beneath the central portion of the site and are likely the result of historical chemical manufacturing activities. The distribution of contaminants in the aquifers underlying the site suggests that arsenic and lead originating from the site have impacted shallow groundwater and have the potential to migrate into the deeper drinking water aquifers. Furthermore, this distribution also suggests that one or more additional lead source areas exist on site. The site is located within the North East 710 Study Area, which is an area where drinking water wells have historically been impacted by elevated levels of metals and VOCs. The City of South Gate's Well 7, which was located approximately one-quarter mile southeast of the site, was closed in 2002 due to elevated concentrations of contaminants, including arsenic.

1.0 INTRODUCTION

1.1 Regulatory Background

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Weston Solutions, Inc. (WESTON®) has been tasked to conduct a Site Inspection (SI) of the Titan Terminal & Transport (Titan) site in South Gate, Los Angeles County, California.

The Titan site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Public Access Database on February 29, 1984 (CAD008353211). CERCLIS has since been retired and its data transitioned into the Superfund Enterprise Management System (SEMS). The site is listed in SEMS as "Stauffer Chemical (Former)." A Preliminary Assessment (PA) was completed for the U.S. Environmental Protection Agency (EPA) by WESTON on April 29, 2015. The purpose of a PA is to review existing information on a site with potential releases of a hazardous substance and its environs to assess the threats, if any, posed to public health, welfare, or the environment and to determine if further investigation under CERCLA is warranted. Prior to the 2015 WESTON PA, a PA was completed in February 1984, an SI was completed in August 1986, and a Site Reassessment was completed in September 2014. Additionally, EPA completed an SI Prioritization for the site in 1994 and Site Screenings in 1997, 1999, and 2014 (BEI, 1994; DHS, 1985; DTSC, 2014; E&E, 1984; EPA, 2017a; Weston, 2015).

After reviewing the 2015 PA, EPA decided that further investigation of the Titan site would be necessary to more completely evaluate the site using the EPA Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances at the site. The HRS has been adopted by EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which EPA may conduct remedial response actions. This report summarizes the results of the SI for the Titan site (EPA, 2015).

More information about the Superfund program is available on the EPA website at http://www.epa.gov/superfund.

1.2 Apparent Problem

EPA determined that a Site Inspection (SI) was needed at the Titan site because of the following apparent problems:

- The site was used for the manufacturing of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid from approximately 1924 to 1993. The waste generated from the phosphoric acid plant reportedly contained approximately 2.8 percent arsenic trisulfide and 2 to 3 percent phosphoric acid (BEI, 1994; Sitton, 2001; Weston, 2015).

- From approximately 1940 to 1960, an estimated 200 tons of arsenic-containing sludge waste was disposed of to an on-site surface impoundment. The surface impoundment was unlined, suggesting a potential for contaminants to migrate into underlying groundwater (DHS, 1985; E&E, 1984; Stauffer, 1984).

- Between 1979 and 1982, subsurface soil investigations conducted on, and adjacent to, the on-site surface impoundment identified elevated concentrations of metals including, but not limited to, 1,659 milligrams per kilogram (mg/kg) of arsenic, 17 mg/kg of cadmium, and 253 mg/kg of chromium (Stauffer, 1984).

- The site is located within the North East 710 Study Area (NE710). Drinking water wells in the NE710 have historically been impacted by elevated levels of metals and volatile organic compounds (VOCs). The area is under investigation in order to identify the primary sources of this contamination and facilitate further investigation and remediation at those sources under the auspices of either EPA or the State of California. The site is located between one-quarter and one-half mile northwest of the City of South Gate's Well 7, which was destroyed in 2011 but had historically exhibited elevated concentrations of analytes of concern (AOCs), including trichloroethylene (TCE), arsenic, and chromium (Google, 2017; RWQCB, 2015; Weston, 2016).

2.0 SITE DESCRIPTION

2.1 Location *(See Figure 1)*

The Titan site is located at 4570 Ardine St., South Gate, California. Additional addresses associated with the site include 4610 Ardine St. The geographic coordinates for the site are 33° 57' 23.2" North latitude and 118° 11' 13.3" West longitude (Appendix A). The location of the site is shown in Figure 1.

2.2 Site Description *(See Figures 2 through 4)*

The Titan site occupies approximately 7.0 acres in an urban industrial and commercial area. The site is bordered to the north across Ardine Street by the Brenntag Pacific, Inc. (Brenntag) chemical storage and distribution facility (EPA ID No. CAD008287732). The site is bordered to the east, across the Union Pacific Railway line and Salt Lake Avenue, by the Mistras NDT (non-destructive testing) facility [General Inspection Laboratories (GENIL) site; EPA ID No. CAD027897164], the Axel's Meat Co / Quality Meat Co Inc. food distribution facility, and the Roche Commercial Fueling Enterprise tractor-trailer fueling facility. The site is bordered to the south, across the Southern Pacific Railway line, by a large retail shopping center. The site is bordered to the west by the former United States Gypsum Company wallboard manufacturing facility (Google, 2017; Weston, 2017a; Weston, 2017b; Appendix B).

The site can be generally separated into two distinct operational areas, henceforth referred to as the Titan Parcels and the Solvay Parcel. The larger portion of the site includes the Titan Parcels, which occupy approximately 6.6 acres and comprise two Los Angeles County Assessor parcels identified by Assessor Parcel Numbers (APNs) 6215-002-017 and 6215-002-018. The remaining portion of the site includes the Solvay Parcel, which occupies approximately 0.4 acre and comprises a single parcel identified by APN 6215-002-019. The parcel layout is shown in Figure 2 (Google, 2017; LACA, 2017).

As of October 2016, the primary structures on the Titan Parcels included: an approximately 6,000 square foot (ft^2) administration building on the northwest portion of the parcels, an approximately 11,000 ft^2 storage building on the southwestern portion of the parcels, an approximately 11,000 ft^2 warehouse building on the southeastern portion of the parcels, and approximately 42 aboveground storage tanks (ASTs) on the central and southern portions of the parcels. In addition, railroad spurs with operating railcars were located on the central and southern portions of the site. The southern rail spur interconnected with the south-adjacent Southern Pacific Railway line and the central spur interconnected with the east-adjacent Union Pacific Railway line. The only significant structure on the Solvay Parcel was the former phosphoric acid tank area at the southeastern portion of the parcel, which was enclosed behind masonry walls. The phosphoric tanks were dismantled in approximately 1994; however, the tank support structures were still present within the enclosure. The surface of the site was entirely covered in asphalt and/or concrete and the site was enclosed behind a chain-link fence. The Titan Parcels and the Solvay Parcel were separated by a chain-link fence and locked gate. Primary vehicle access to the Titan Parcels was

from Ardine Street; there was no vehicle access to the Solvay Parcel. The site layout is shown in Figure 3 (BEI, 1994; Google, 2017; Appendix B).

The site was first developed for industrial use in approximately 1924. Historically, additional significant structures existing at the site included, but were not limited to: a machine shop at the south-central portion, a chemical manufacturing plant at the north-central portion, a research laboratory at the southwestern portion, a phosphoric acid plant at the southeastern portion, and approximately 15 storage and warehouse buildings located across the site. Two underground storage tanks (USTs), which were reportedly used to store gasoline, were formerly located at the central portion of the site adjacent to the machine shop and at least five sumps were located across the site. With the exception of the phosphoric acid plant, which extended onto the Solvay Parcel, these historical structures were generally located on the Titan Parcels. Most of these former structures were demolished in approximately late 1994. An unlined surface impoundment was located on the Solvay Parcel at the southeastern portion of the site and extended off site to the south and east. The impoundment measured approximately 180 feet (ft) by 130 ft, and extended to approximately 25 ft below ground surface (bgs). The historical site layout is shown in Figure 4 (BEI, 1994; DPW, 1995; DTSC, 2014; E&E, 1984; Google, 2017; Sitton, 2001; Stauffer, 1984).

2.3 Operational History *(See Table 1)*

The Titan site is owned by two separate entities. The Los Angeles County Office of the Assessor records indicate that the Titan Parcels (APNs 6215-002-017 and 6215-002-018) are owned by Kronos Properties, Inc., which has owned these properties since approximately 1993. The records indicate that the Solvay Parcel (APN 6215-002-019) is owned by Rhone-Poulenc, Inc. In approximately 1997, the chemical manufacturing division of Rhone-Poulenc was divested and rebranded as the Rhodia Company. In 2011, Rhodia was acquired by the Solvay Company (Solvay). Prior to 1993, Solvay, through its preceding acquisitions (i.e., A. R. Maas Chemical Company; Victor Chemical Company; Stauffer Chemical Company; Chesebrough-Pond's Manufacturing Company; Imperial Chemical Industries; Rhone-Poulenc Basic Chemicals Company; and Rhodia) had owned the entirety of the site since approximately 1924 (BEI, 1994; Sitton, 2001; Weston, 2015; Appendix C-1).

Historical operations at the site include the manufacturing of TSP, sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993. No manufacturing operations or generation of hazardous waste is currently conducted at the site. A site operator chronology is presented in Table 1 (BEI, 1994; Sitton, 2001; Weston, 2015; Appendix B; Appendix C-1)

Operations at the site were initiated in approximately 1924 by the A. R. Maas Chemical Company and remained relatively unchanged through 1981. These operations primarily included the manufacturing of products for the photochemical industry, specifically: TSP, sodium sulfide, and phosphoric acid. Phosphoric acid manufacturing reportedly ceased in approximately 1981, although the facility continued to manufacture TSP and sodium sulfide. The raw materials used to manufacture the products included, but were not limited to, soda ash, phosphorus, sulfuric acid, and sodium hydroxide. In approximately 1949, the on-site business operations and assets of

A.R. Maas were acquired by the Victor Chemical Company, which was in turn acquired by the Stauffer Chemical Company (Stauffer) in approximately 1960. In approximately 1985, the on-site assets of Stauffer were acquired by the Chesebrough-Pond's Manufacturing Company, which divested these assets to Imperial Chemical Industries in early 1987. Imperial Chemical sold the site assets later that year to the Rhone-Poulenc Basic Chemicals Company, which maintained on-site operations until the facility was shut down in approximately 1993 (BEI, 1994; Sitton, 2001; Weston, 2015).

Waste generated from TSP manufacturing activities at the site consisted of filtered solids, which were stored on site and subsequently removed by an outside waste hauler. In the sodium sulfide process, a sulfur-burning unit and scrubber were used to separate out the impurities. Wastes generated during sodium sulfide manufacturing activities were also stored on site and removed by an outside hauler. The phosphoric acid plant, which operated from approximately 1924 through 1981, generated an arsenic-containing sludge waste. The waste reportedly contained approximately 2.8 percent arsenic trisulfide, which was derived from impurities in the raw manufacturing materials, and 2 to 3 percent phosphoric acid. From at least 1940 to 1960, arsenic-containing sludge waste was disposed of by placing it at the unlined surface impoundment on the Solvay Parcel at the southeastern portion of the site. EPA estimated that between 1950 and 1960 approximately 100 to 200 tons of waste sludge was disposed of by placing it at the impoundment. The impoundment was reportedly resurfaced with asphalt in the mid-1960s with no excavation of the stored waste materials. Between approximately 1960 and 1981, the arsenic-containing waste was stored in an on-site storage tank and subsequently disposed of off site by an outside waste hauler (BEI, 1994; E&E, 1984; Sitton, 2001; Stauffer, 1984).

Since 1994, Titan Terminal & Transport has been operating at the site as a hazardous and non-hazardous materials distribution and bulk storage facility. Bulk materials, which include but are not limited to: acids, bases, agricultural feed, and food grain products, are typically stored on site for no more than 30 days. Dilution and/or blending of bulk liquids within on-site ASTs also takes place at the site. Stored materials are occasionally repackaged and loaded into drums for transfer to various facilities. Operations do not include manufacturing, treatment, or disposal of hazardous materials (Weston, 2015; Appendix B).

2.4 Regulatory Involvement

2.4.1 U. S. Environmental Protection Agency

The Titan site is listed in the Resource Conservation and Recovery Information System (RCRIS) database as *Rhone Poulenc Basic Chemicals Co* (Handler ID: CAD008353211), a Small Quantity Generator with an address of 4570 Ardine St. (EPA, 2017b).

The site is listed in the Toxics Release Inventory (TRI) database as of April 2017. The site is listed as *Rhone-Poulenc Basic Chemicals, Co* (TRI ID: 90280STFFR4570A), with an address of 4570 Ardine St. The most recently released information provided in the TRI database is from 1993. Listed chemical categories include phosphoric acid, sulfuric acid, and sodium hydroxide solution (EPA, 2017c).

2.4.2 California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

The site is listed in the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) EnviroStor database as *Titan Terminal & Transport* (Envirostor ID: 19280830), with an address of 4570 Ardine St. The site is listed as an *Evaluation* site that was *Active* as of September 2015 (DTSC, 2017).

The site was included in the DTSC Abandoned Sites Project (formerly the California Department of Health Services, Toxic Substances Control Program) after being identified during the 1979 Eckhardt Survey. In 1981, DTSC directed Stauffer to sample soils and materials from the Solvay Parcel, specifically in and around the on-site surface impoundment. Additional information regarding this investigation is provided in section 3.1.2 (BEI, 1994; E&E, 1984).

2.4.3 California Environmental Protection Agency, Regional Water Quality Control Board (RWQCB)

The site is listed in the Regional Water Quality Control Board's (RWQCB) GeoTracker database as *Rhone-Poulenc Chemicals Co* (GeoTracker ID: T0603702717; Case No.: I-00524), with an address of 4570 Ardine St. The site is listed as a *LUST Cleanup Site with* a cleanup status as *Completed – Case Closed as of 8/26/1996*. The potential contaminant of concern is listed as *gasoline* and the potential medium affected is *soil*. Although RWQCB appears to have maintained some oversight of the case, the primary local agency managing the leaking UST case was the Los Angeles County Department of Public Works (LADPW). The leaking UST case and associated investigations appear to be solely related to an unauthorized release of petroleum hydrocarbons to subsurface soils. Additional information on LADPW involvement with the site is provided in section 2.4.5 (DPW, 1995; RWQCB, 2017).

Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA.

RWQCB also reportedly issued a stormwater discharge permit to the site operator; however, no additional information regarding this permit is known. RWQCB has had no known additional involvement with the site (Weston, 2015).

2.4.4 Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD)

The Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD) reportedly conducted oversight of the management of hazardous substances and waste at the site. No additional information is known regarding specific HHMD activities related to the site or any notices of violation potentially issued to the facility by HHMD (Weston, 2015).

2.4.5 Los Angeles County Department of Public Works (LADPW)

Between at least 1989 and 1995, LADPW conducted direction and oversight of a leaking UST case at the site. The former on-site USTs included a 200-gallon tank and a 1,000-gallon tank; both of which were reportedly only utilized for gasoline storage. The tanks were located adjacent to the former machine shop on the Titan Parcels and were removed in 1989. Confirmation soil samples collected adjacent to the 1,000-gallon UST identified a release of petroleum hydrocarbons to the subsurface soils. Actions related to the leaking UST included soil matrix sampling, operation of a soil vapor extraction (SVE) system, and the maintenance and sampling of a limited groundwater monitoring well network. Presumably, the SVE system and monitoring well network were destroyed subsequent to the case closure in August 1996. The leaking UST case and associated investigations appear to be solely related to an unauthorized release of petroleum hydrocarbons to subsurface soils (DPW, 1995; RWQCB, 2017; Weston, 2015).

3.0 INVESTIGATIVE EFFORTS

3.1 Previous Sampling

3.1.1 Titan Parcels

In 1989, Stauffer excavated and removed two gasoline USTs from the Titan site. A 1,000-gallon tank was removed from northeast-adjacent to the former machine shop and a 280-gallon tank was removed from west-adjacent to a pipe fitting area located immediately west of the former machine shop. During excavation activities, Stauffer noted that the 1,000-gallon tank was corroded with small holes perforating portions of the tank. Under the oversight and direction of LADPW, Stauffer collected soil matrix samples from beneath the tanks and associated fuel dispenser, which exhibited elevated concentrations of petroleum hydrocarbons. Subsequent investigations of the leaking UST included the installation of an SVE system and a limited groundwater monitoring well network. The case was reported as closed by RWQCB in August 1996. Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA (DPW, 1995; RWQCB, 2017; Weston, 2015).

In 2007, DTSC implemented a groundwater monitoring program on the north-adjacent Brenntag site (EPA ID No. CAD008287732). This program included the installation of numerous groundwater monitoring wells over the course of several project phases, including off-site and downgradient wells. In March 2012, Brenntag installed a nested well-pair on the northwestern portion of the Titan site, south-adjacent to the administration building. Brenntag typically collects water samples from these wells on a semiannual basis. Groundwater samples collected from these wells in October 2016 exhibited elevated concentrations of AOCs including, but not limited to 19 micrograms per liter (µg/L) of TCE and 11 µg/L of arsenic (ARCADIS, 2017).

Prior to the 2015 SI investigation, no known additional soil matrix, soil vapor, or groundwater sampling had been conducted on the Titan Parcels portion of the site.

3.1.2 Solvay Parcel *(See Figure 5; Table 2)*

In August 1979, Stauffer advanced three borings in the northwestern portion of the surface impoundment area, east-adjacent to the former phosphoric acid plant. The borings were reportedly advanced to evaluate soil stability and extended to maximum depths that ranged from 28 ft bgs to 43.5 ft bgs. Soil matrix samples were collected from the borings at approximately 5-ft intervals; however, the complete analytical program and results are not known. The only known analytical results from the event are from depths of 23 ft bgs, 28 ft bgs, and 33 ft bgs at Boring B-3. The arsenic concentrations exhibited in these samples ranged from 1.3 mg/kg to 3.7 mg/kg. A summary of selected 1979 through 1982 Stauffer analytical data is provided in Table 2 and sample locations are presented in Figure 5 (E&E, 1984; Stauffer, 1984).

In July 1981, on the advice of DTSC, Stauffer collected additional soil matrix and waste material samples from the surface impoundment area. The samples were collected to determine the extent

of metal contamination associated with former site-related waste disposal practices as well as to determine the extent of the impoundment. Stauffer advanced at least eight soil borings to total depths up to 55 ft bgs. The borings were located both on site and south-adjacent to the site within the existing Southern Pacific rail spur. Sample analytical results were reported for metals, including arsenic, cadmium, chromium, lead, mercury, and selenium. The results identified elevated concentrations of arsenic, cadmium, and chromium with the following respective maximum concentrations: 1,659 mg/kg, 17 mg/kg, and 253 mg/kg. In general, the samples identified as having the most elevated concentrations were collected from the area south-adjacent to the Solvay Parcel and from depths between 15 ft bgs and 30 ft bgs. During the event, Stauffer converted three of the borings into piezometers, which were set between approximately 15 ft bgs and 25 ft bgs. Water samples were successfully collected from two of the piezometers, identified as SG-4 and SG-9, and submitted for metal analysis; the piezometer at SG-12 was reportedly dry. Stauffer did not release the water analytical results to DTSC stating that they were not representative of area groundwater and may have been contaminated by drilling activities during the installation of the borings. SG-4 was located on the Solvay Parcel west-adjacent to the former phosphoric tanks and SG-9 was located southeast of the parcel on the eastern terminal of the existing Southern Pacific rail spur. The Regional Screening Levels (RSLs) for arsenic and cadmium in resident soils are 0.68 mg/kg and 71 mg/kg, respectively. A residential RSL has not been established for total chromium in soil. The assigned site-specific SI action levels for arsenic, cadmium, and chromium at the site are 7.8 mg/kg, 0.27 mg/kg, and 63 mg/kg, respectively (see section 3.2.1) (E&E, 1984; Stauffer, 1984).

In July 1982, Stauffer advanced six additional borings (SG-13 through SG-18) near the surface impoundment. All six of the borings were located off site on either the Southern Pacific rail spur to the south or within the Union Pacific Railroad right-of-way to the southeast. Soil matrix and/or waste samples were typically collected at 5-ft intervals in each boring, which ranged in total depth from 25 ft bgs to 55 ft bgs. Samples were submitted for arsenic analysis only and exhibited concentrations up to 127 mg/kg. A piezometer was installed at Boring SB-13 from 13 to 18 ft bgs; however, it is not known if a water sample was successfully collected from this location (E&E, 1984; Stauffer, 1984).

Prior to the 2015 SI sampling event, no known additional soil matrix, soil vapor, or groundwater sampling had been conducted on the Solvay Parcel.

3.2 Site Investigation (SI) Sampling *(See Figures 6 through 9; Tables 3 through 8)*

In November 2015, WESTON, on behalf of EPA, conducted the SI sampling event at the Titan site. The event included solid matrix source sampling (i.e., soil and surface impoundment materials), groundwater release sampling, and secondary objective groundwater sampling. The primary objective of the investigation was to document information to be used in the HRS characterization process, including additional source areas and levels of contamination in site soils and groundwater. The secondary objective of the investigation was to identify subsurface lithology and levels of contamination within various water-bearing zones, both on, and near, the site. This information will be utilized in the development of a more comprehensive understanding of the

hydrogeologic conditions that exist within the greater NE710 Study Area as well as the greater subbasin.

Sampling methodology, locations, analyses, and analytical results are summarized below. The Sampling and Analysis Plan (SAP), which was approved by EPA in September 2015, is provided in Appendix F.

Based on the historical use of the site, the elevated concentrations of contaminants in nearby municipal drinking water wells, and the previous sampling events described in section 3.1, specific AOCs at the site were identified as: metals, specifically arsenic, cadmium, and chromium; and VOCs, specifically TCE, tetrachloroethylene (PCE), and related transformation products [e.g., cis-1,2-dichloroethylene (DCE); trans-1,2-DCE; vinyl chloride. In addition, based on the analytical results of the SI investigation, additional AOCs were identified including, but not limited to: lead, antimony, and vanadium.

All samples were submitted under the EPA Contract Laboratory Program to KAP Technologies, Inc. for VOC analysis by EPA Contract Laboratory Program Analytical Services (CLPAS) SOM02.3 or Shealy Environmental Services, Inc. for metal analysis by EPA CLPAS ISM02.3. The data were validated by the EPA Region 9 Quality Assurance Office. The complete validated analytical results are presented in Appendix H. The sample locations are shown in Figure 6.

3.2.1 Action Levels

In accordance with the HRS, the action levels to establish an observed release to groundwater and to establish an on-site source of contaminated soil, are “significantly above background” concentrations. “Significantly above background” is defined as three times the background concentration for all media. When a background concentration is not detected at or above the method detection limit (MDL), the assigned background concentration is the sample quantitation limit (SQL); “significantly above background” for this scenario is defined as a concentration at or above the SQL.

Soil matrix samples collected from Boring TTT-DP-9, which is located at the south-central portion of the site, are designated as background soil samples for HRS purposes. The assigned background concentration for each analyte was determined by amalgamating the concentration data from each of the four discrete-depth soil samples. For any analyte with a reported MDL exceedance in the dataset, the background concentration was conservatively assigned as the arithmetic mean plus three times the standard deviation. For any analyte without an MDL exceedance, the background concentration was conservatively assigned as the maximum SQL value within the dataset.

Although the selected background location is situated within current and historical operational areas of the site, the exhibited concentrations were deemed to be generally consistent with published background levels for native soils in the region and appear unlikely to have been significantly impacted by hazardous substances associated with the site. VOCs were not reported at concentrations above their respective MDLs in any of the four discrete-depth background soil samples. Select metal analytical results from the discrete-depth background samples are provided

in Table 4; the complete analytical results are provided in Appendix H. The selected background location is shown in Figure 6.

As a result of local variations and uncertainties in the groundwater flow direction within the Gaspur aquifer underlying the site, a Gaspur aquifer background (i.e., upgradient) sample location was not assigned. A perched aquifer background sample was not assigned due to the tendency of perched water near the site to be laterally discontinuous over relatively short distances. Furthermore, since upper Exposition aquifer groundwater samples collected during the investigation did not exhibit notably elevated concentrations of the AOCs identified in on-site source areas (as compared to documented federal and state regulatory benchmarks), it was deemed unnecessary for HRS purposes to assign an Exposition background sample location. See section 4.2.1 for a description of the shallow aquifers underlying the site.

3.2.2 Source Sampling *(See Figures 6 through 8; Tables 3 & 4)*

To establish hazardous substance source areas at the site, WESTON collected subsurface soil matrix samples using direct push (DP) technology from eight selectively-biased on-site boring locations, designated as TTT-DP-1 through TTT-DP-8. Three of the locations were situated on the Solvay Parcel, whereas the remaining five were situated on the Titan Parcels. Source sample locations are presented in Figure 6.

3.2.2.1 Solvay Parcel

Source samples were collected from three borings on the Solvay Parcel, designated as TTT-DP-2, TTT-DP-4, and TTT-DP-5. A limited-access drill rig was required to access the parcel due to the enclosing chain-link fence. All three of the locations were situated on the southern portion of the parcel since historical information and analytical data indicated an increased likelihood of identifying elevated concentrations of AOCs in this area. At each location, subsurface lithology was logged to the total depth of the boring at 21 ft bgs and soil matrix samples were collected from depths of 5, 10, 15, and 20 ft bgs. The soil lithologies from each boring were relatively consistent with soils composed primarily of light brown to dark gray silty sands and sandy silts. The upper approximately 9 ft of each boring appeared to be composed of fill material as evidenced by broken concrete and cemented slurry materials. Soils became darker gray with depth, which may be indicative of solidified waste materials that were historically deposited within the surface impoundment. Zones of saturated soils were observed within the borings and an aqueous sample was collected from TTT-DP-2 using a temporary well (see section 3.2.3.1).

Metal Results: *(See Figure 7; Table 3)*

Metals identified at concentrations at or above their corresponding action level in soil matrix samples collected from the Solvay Parcel include antimony, arsenic, cadmium, chromium, copper, vanadium, and zinc. The most elevated metal concentrations were generally identified in the samples collected from between 10 and 20 ft bgs at borings TTT-DP-4 and TTT-DP-5. The maximum arsenic concentration was identified in the 15 ft bgs sample collected from Boring

TTT-DP-4, which was located at the southeastern portion of the parcel. Action levels were assigned per the methodology described in section 3.2.1.

The assigned antimony action level of 1.0 mg/kg was exceeded by 7 of the 12 samples with a maximum concentration of 14 mg/kg. The assigned arsenic action level of 7.8 mg/kg was exceeded by 10 of the 12 samples with a maximum concentration of 617 mg/kg. The assigned cadmium action level of 0.27 mg/kg was exceeded by 6 of the 12 samples with a maximum concentration of 9.8 mg/kg (qualified as estimated). The assigned chromium action level of 63 mg/kg was exceeded by 4 of the 12 samples with a maximum concentration of 402 mg/kg (qualified as estimated). The assigned copper action level of 56 mg/kg was exceeded by 3 of the 12 samples with a maximum concentration of 241 mg/kg (qualified as estimated). The assigned vanadium action level of 137 mg/kg was exceeded by 3 of the 12 samples with a maximum concentration of 163 mg/kg (qualified as estimated). The assigned zinc action level of 225 mg/kg was exceeded by 3 of the 12 samples with a maximum concentration of 436 mg/kg (qualified as estimated). Select analytical results and assigned action levels are presented in Figure 7 and Table 3.

Volatile Organic Compound (VOC) Results:

No VOCs were identified at concentrations at or above their corresponding SQL in soil matrix samples collected from the Solvay Parcel. VOC analytes identified at concentrations below their SQL but above their MDL include methylene chloride and toluene; however, both of these analytes are common laboratory contaminants and the reported detections may not be indicative of actual conditions in the sampled medium. Since no VOC analytes were identified in the background soil matrix samples at concentrations exceeding their corresponding MDLs, the reported SQLs of the background samples were assigned as the VOC action levels (see section 3.2.1).

3.2.2.2 Titan Parcels

Source samples were collected from five borings on the Titan Parcels, designated as TTT-DP-6 through TTT-DP-10. The specific boring locations were selected based on their proximity to historical Stauffer chemical operations areas including: the former acid plant (TTT-DP-6), the former liquid phosphate storage sump (TTT-DP-7), the former UST area (TTT-DP-8), the former maintenance shop (TTT-DP-9), and the former elemental sulfur sump (TTT-DP-10). At each location, subsurface lithology was logged to 15 ft bgs and soil matrix samples were collected from depths of 2, 5, 10, and 15 ft bgs. The soil lithologies from each boring were relatively consistent with soils composed primarily of yellowish brown to brown silty sands with minor lenses of silts and sandy silts. Soils were noted as moist but not saturated and the upper approximately 2 feet of each boring was generally composed of aggregate fill materials. The most notable variation was at Boring TTT-DP-6, where soils between 13 and 15 ft bgs were gray in color.

Metal Results: *(See Figure 8; Table 4)*

Metals identified at concentrations at or above their corresponding action level in soil matrix samples collected from the Titan Parcels include lead and silver. The most elevated concentrations were identified in the 2 ft bgs sample collected from Boring TTT-DP-10, which was located at the

north-central portion of the parcel. Action levels were assigned per the methodology described in section 3.2.1.

The assigned lead action level of 25 mg/kg was exceeded by 1 of the 16 samples with a maximum concentration of 29 mg/kg. The assigned silver action level of 0.51 mg/kg was exceeded by 3 of the 16 samples with a maximum concentration of 2.0 mg/kg. Select analytical results and assigned action levels are presented in Figure 8 and Table 4.

Volatile Organic Compound (VOC) Results:

The only VOC identified at a concentration at or above its corresponding SQL in soil matrix samples collected from the Titan Parcels was toluene. The only additional VOC analyte identified at a concentration below its SQL but above its MDL was methylene chloride. However, both of these analytes are common laboratory contaminants and the reported detections may not be indicative of actual conditions in the sampled medium. Since no VOC analytes were identified in the background soil matrix samples at concentrations exceeding their corresponding MDLs, the reported SQLs of the background samples were assigned as the VOC action levels (see section 3.2.1).

3.2.3 Release Sampling *(See Figures 6 through 8; Tables 5 & 7)*

To establish a release of one or more hazardous substances from on-site source areas to groundwater beneath the site, WESTON collected discrete-depth groundwater samples from the perched, Gaspur, and Exposition aquifers. See section 4.2.1 for a description of the shallow aquifers underlying the site. As part of the investigation, groundwater samples were collected from eight selectively-biased on-site locations using direct push technology, including the use of Cone Penetration Testing (CPT) equipment. One of the locations was situated on the Solvay Parcel and the remaining seven were situated on the Titan Parcels. For HRS purposes, no action levels are assigned for contaminants identified within the aquifers beneath the site (see section 3.2.1). For reporting purposes, analyte concentrations are referenced against documented federal and state regulatory benchmarks. Release sample locations are presented in Figure 6.

3.2.3.1 Solvay Parcel

One release sample was collected from the Solvay Parcel. This sample was collected from approximately 18.5 ft bgs (perched aquifer) at Boring TTT-DP-2. The decision to install a temporary well and attempt to collect a release sample was made at the time of the event due to sufficiently saturated conditions having been encountered while advancing the boring.

Metal Results: *(See Figure 7; Table 5)*

Metals identified at concentrations at or above their corresponding SQL in the groundwater sample collected from the Solvay Parcel include arsenic, cadmium, cobalt, copper, manganese, nickel, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include antimony, barium, chromium, lead, and vanadium. Metals identified in the samples with

exceedances of documented federal and state regulatory benchmarks include arsenic, cadmium, manganese, and nickel.

The arsenic federal Maximum Contaminant Level (MCL) of 10 µg/L was exceeded by the sample with a concentration of 15,700 µg/L. The cadmium federal MCL (Fed MCL) of 5.0 µg/L was exceeded by the sample with a concentration of 13 µg/L. The manganese California Secondary MCL (CA 2nd MCL) of 50 µg/L was exceeded by the sample with a concentration of 11,500 µg/L. The nickel California MCL (CA MCL) of 100 µg/L was exceeded by the sample with a concentration of 836 µg/L (qualified as estimated). Select analytical results and benchmarks are presented in Figure 7 and Table 5.

Volatile Organic Compound (VOC) Results:

The only VOC identified at a concentration at or above its corresponding SQL in the groundwater sample collected from the Solvay Parcel was acetone. The only additional VOC analyte identified at a concentration below its SQL but above its MDL was carbon disulfide. However, both of these analytes are common laboratory contaminants and the reported detections may not be indicative of actual conditions in the sampled medium.

3.2.3.2 Titan Parcels

Thirteen release samples were collected from the Titan Parcels. Four of the 13 samples were collected from on-site direct push borings that were advanced during the SI investigation and included borings TTT-DP-6 through TTT-DP-9. All four of these samples were collected from depths consistent with the Gaspur aquifer.

Nine of the 13 samples were collected from thee on-site CPT borings located along the southern boundary of the parcel. Boring TTT-CPT-1 was advanced at the southeastern corner of the parcel, immediately adjacent to the Solvay Parcel. Boring TTT-CPT-2 was advanced at the south-central portion of the parcel and Boring TTT-CPT-3 was advanced at the southwestern corner of the parcel. During the advancement of each CPT boring, groundwater samples were collected from three distinct depths, which generally corresponded to the Gaspur aquifer and two zones within the Exposition aquifer. The specific sampling depths were determined in the field by targeting coarser-grained sediments as interpreted in the location-specific CPT lithological profile report (Appendix E).

Metal Results: *(See Figure 8; Table 5)*

Metals identified at concentrations at or above their corresponding SQL in groundwater samples collected from the Titan Parcels include arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include antimony, beryllium, and silver.

Metals identified in the samples with exceedances of documented federal and state regulatory benchmarks include arsenic, lead, manganese, nickel, and vanadium. The most elevated metal

concentrations were generally identified in the Gaspur aquifer samples collected from the central portions of the parcel.

The arsenic Fed MCL of 10 µg/L was exceeded by 4 of the 13 samples with a maximum concentration of 18 µg/L. The lead Fed MCL of 15 µg/L was exceeded by 3 of the 13 samples with a maximum concentration of 150 µg/L (qualified as estimated – biased low). The manganese CA 2nd MCL of 50 µg/L was exceeded by all 13 of the samples with a maximum concentration of 20,300 µg/L. The nickel CA MCL of 100 µg/L was exceeded by 5 of the 13 samples with a maximum concentration of 991 µg/L (qualified as estimated). The vanadium California Notification Level (CA NL) of 50 µg/L was exceeded by 2 of the 13 samples with a maximum concentration of 120 µg/L. Select analytical results and benchmarks are presented in Figure 8 and Table 5.

Volatile Organic Compound (VOC) Results: *(See Figure 8; Table 7)*

VOCs identified at concentrations at or above their corresponding SQL in groundwater samples collected from the Titan Parcels include 1,2-dichlorobenzene (DCB); 1,2-dichloroethane (DCA); acetone; cis-1,2-DCE; m,p-xylene; methyl tert-butyl ether; trans-1,2-DCE; and TCE. Additional VOC analytes identified at concentrations below their SQL but above their MDL include ethylbenzene and o-xylene.

VOCs identified in the samples with exceedances of documented federal and state regulatory benchmarks include 1,2-DCA and TCE. The 1,2-DCA Fed MCL of 5.0 µg/L was exceeded by 2 of the 13 samples with a maximum concentration of 5.4 µg/L. The TCE Fed MCL of 5.0 µg/L was exceeded by 1 of the 13 samples with a concentration of 11 µg/L. Select analytical results and benchmarks are presented in Figure 8 and Table 7.

3.2.4 Secondary Objective Groundwater Sampling and Lithological Profiling
(See Figures 6 & 9; Tables 6 & 8)

In accordance with the SI's secondary objective (see section 3.2), WESTON collected lithological profiling data and discrete-depth groundwater samples from two off-site locations that were advanced using DP/CPT technology. Boring TTT-CPT-4 was located approximately 260 ft west of the southwest corner of the site and Boring TTT-CPT-5 was located approximately 450 ft west of TTT-CPT-4. At each location, samples were collected from three distinct depths, which generally corresponded to the Gaspur aquifer and two zones within the Exposition aquifer. See section 4.2.1 for a description of the shallow aquifers underlying the site. The specific sampling depths were determined in the field by targeting coarser-grained sediments as interpreted in the location-specific CPT lithological profile report (Appendix E). Since HRS action levels are not applicable to the secondary objective samples, analyte concentrations were compared to documented federal and state regulatory benchmarks for reporting purposes. Secondary objective sample locations are presented in Figure 6.

As part of adjacent and concurrently-conducted SI investigations, additional samples were collected from on, and adjacent to, the Titan site. As part of the Brenntag (EPA ID No.

CAD008287732) SI investigation, two discrete-depth groundwater samples were collected from existing monitoring well BPI-MW-15; which is located at the northwestern portion of the Titan site, south-adjacent to the Administration Building. As part of the GENIL (EPA ID No. CAD027897164) SI investigation, nine discrete-depth groundwater samples were collected from CPT borings GIL-CPT-4, GIL-CPT-5, and GIL-CPT-6; which were all located along the Salt Lake Avenue corridor, immediately northeast of the Titan site. Select analytical results from the samples collected during adjacent investigations are provided in Table 6 and Table 8; however, the results are not included in the metal and VOC result summaries below. The complete analytical results are available in the corresponding SI report.

Metal Results: *(See Figure 9; Table 6)*

Metals identified at concentrations at or above their corresponding SQL in secondary objective groundwater samples collected during the Titan SI investigation include arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include antimony, beryllium, cadmium, selenium, and silver. Metals identified in the samples with exceedances of documented federal and state regulatory benchmarks include arsenic, manganese, and vanadium.

The arsenic Fed MCL of 10 µg/L was exceeded by 1 of the 6 samples with a maximum concentration of 17 µg/L. The manganese CA 2nd MCL of 50 µg/L was exceeded by all 6 of the samples with a maximum concentration of 1,160 µg/L. The vanadium CA NL of 50 µg/L was exceeded by 1 of the 6 samples with a concentration of 86 µg/L. Select analytical results and benchmarks are presented in Figure 9 and Table 6.

Volatile Organic Compound (VOC) Results: *(See Figure 9; Table 8)*

VOCs identified at concentrations at or above corresponding SQLs in secondary objective groundwater samples collected during the Titan SI investigation include 1,1-DCA; 1,1-DCE; 1,2-DCA; 1,2-dichloropropane (DCP); cis-1,2-DCE; trans-1,2-DCE; and TCE. The only additional VOC analyte identified at a concentration below its SQL but above its MDL was carbon acetone.

VOCs identified in the samples with exceedances of documented federal and state regulatory benchmarks include 1,2-DCA; cis-1,2-DCE; and TCE. The most elevated VOC concentrations were identified in the 86 ft bgs (Expositions aquifer) sample collected from Boring TTT-CPT-5.

The 1,2-DCA Fed MCL of 5.0 µg/L was exceeded by 1 of the 6 samples with a concentration of 7.6 µg/L. The cis-1,2-DCE Fed MCL of 70 µg/L was exceeded by 2 of the 6 samples with a concentration of 170 µg/L. The TCE Fed MCL of 5.0 µg/L was exceeded by 1 of the 6 samples with a concentration of 40 µg/L. Select analytical results and benchmarks are presented in Figure 9 and Table 8.

3.2.5 Deviations from the SAP

Deviations from the September 2015 Titan SAP (Appendix F) occurred during the field work. The significant deviations approved in the field by the EPA Site Assessment Manager include:

- Only three of the proposed five direct push borings at the Solvay Parcel were completed. Proposed borings TTT-DP-1 and TTT-DP-3 were not advanced due to logistical and technical issues that arose during the advancement of the borings.

- Only five of the proposed six CPT borings were advanced. Proposed Boring TTT-CPT-6 was not advanced due to scheduling constraints.

- Groundwater release samples from the perched aquifer were not collected at direct push borings: TTT-DP-6 through TTT-DP-8 and TTT-DP-10 because a water-bearing unit had not been identified within the proposed sampling interval.

- During the advancement of Boring TTT-DP-2 on the Solvay Parcel, saturated subsurface conditions were encountered between approximately 17 ft bgs and 18 ft bgs. A temporary well was installed at this location and an aqueous sample was collected for the purposes of evaluating the level of contamination within this perched water as well as to potentially evaluate the leaching potential of the impoundment materials. This sample was submitted under the same analytical program as the groundwater samples collected from the Titan Parcels.

- Direct push Boring TTT-DP-10 was advanced to a total depth of 15 ft bgs and a groundwater release sample was not collected due to scheduling constraints.

- Direct push Boring TTT-DP-9 was advanced to a total depth of 66 ft bgs and a groundwater release sample was collected from 64 ft bgs because no sample from this interval had been collected at Boring TTT-DP-10.

- "Special Designation" samples (e.g., Laboratory Quality Control [QC], duplicates, blanks) were reassigned in the field based on actual number and location of collected samples. Final designations are presented in the Sample Nos. – CLP Nos. Correlation Tables (Appendix G).

4.0 HAZARD RANKING SYSTEM FACTORS

4.1 Sources of Contamination *(See Figures 7 & 8; Tables 3 & 4)*

For HRS purposes, a source is defined as an area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance.

Potential hazardous substance sources associated with the Titan site include, but may not be limited to:

- Contaminated soils and surface impoundment materials in the southern portion of the Solvay Parcel that are the result of historical on-site phosphoric acid manufacturing operations. Metals, including antimony, arsenic, cadmium, chromium, copper, vanadium, and zinc, were present in site soils and surface impound materials at concentrations significantly above background. Historical information indicated that the unlined surface impoundment, which extended off site to the south and east, measured approximately 180 ft by 130 ft, and extended to approximately 25 ft bgs. EPA estimated that between 1950 and 1960 approximately 100 to 200 tons of waste sludge was disposed of at the impoundment (E&E, 1984; Stauffer, 1984).

- Contaminated soils on the north-central portion of the Titan Parcels, which are likely a result of historical on-site operations; however, the specific operations responsible for the impacted soils are not known. Metals, including lead and silver, were present in site soils at concentrations significantly above background.

4.2 Groundwater Pathway

In determining a score for the groundwater migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to groundwater; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on the number of people who regularly obtain their drinking water from wells that are located within 4 miles of the site. The HRS emphasizes drinking water usage over other uses of groundwater (e.g., food crop irrigation and livestock watering), because, as a screening tool, it is designed to give the greatest weight to the most direct and extensively studied exposure routes.

4.2.1 Hydrogeological Setting *(See Table 9)*

The site lies within the Central Subbasin in the Coastal Plain of the Los Angeles Groundwater Basin. The Central Subbasin is generally bound to the north by the folded, uplifted, and eroded Tertiary basement rocks of the La Brea High surface divide; to the northeast and east by the less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; to the southeast by the Coyote Creek flood control channel (approximate Los Angeles County/Orange County

boundary); and to the southwest by the Newport Inglewood Uplift, a regional anticline associated with the Newport Inglewood fault system. Geologic units typically found beneath the subbasin include Holocene-age alluvium, the upper Pleistocene Lakewood Formation, and the lower Pleistocene San Pedro Formation. The Los Angeles and San Gabriel rivers pass across the surface of the subbasin, primarily by way of engineered concrete channels, on their way to the Pacific Ocean. The average net annual precipitation in the subbasin is approximately 12 inches (DWR, 1961; DWR, 2004).

The Central Subbasin has historically been divided into four areas: the Los Angeles Forebay at the northwest, the Montebello Forebay at the north, the Whittier Area at the northeast, and the Central Basin Pressure Area at the central and southwest. However, these areal distinctions are appropriate for geographical purposes only and do not accurately represent hydrogeologic conditions within the areas. The hydrogeologic forebays, which are generally characterized by unconfined and relatively interconnected aquifer systems, are limited to small regions within the greater Forebay areas. The Montebello Forebay, as well as the Los Angeles Forebay to a lesser degree, serve as the primary groundwater recharge areas for both shallow and deep aquifers across the entirety of the subbasin. The Central Basin Pressure Area is generally characterized by confined aquifer systems separated by relatively impermeable clay layers, although semipermeable zones within these layers allow aquifers to be interconnected in some areas. These semipermeable zones gradually decrease in frequency and magnitude with increasing distance from the forebays (DWR, 1961; DWR, 2004).

The site is located within the northern portion of the Central Basin Pressure Area geographical area, with the Los Angeles Forebay to the northwest and the Montebello Forebay to the northeast. Groundwater beneath the site is typically found within the coarser-grained sediments of the Holocene alluvium (Gaspur aquifer), the upper Pleistocene Lakewood Formation (Exposition and Gage aquifers), and the lower Pleistocene San Pedro Formation (Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside aquifers). The estimated elevations and depths of the aquifers underlying the site are presented in Table 9. Irregular patches of a perched, or semi-perched, aquifer are also present within the Holocene alluvium throughout much of the subbasin. Although significant amounts of water can be found within these perched water-bearing zones, they are often discontinuous over relatively short distances and have historically had only minimal economic benefit. Thus, the perched aquifer does not meet the criteria of an “aquifer” for HRS purposes. These perched zones are typically found between approximately 25 ft bgs and 45 ft bgs (DWR, 1961; DWR, 2004).

For the purposes of this SI, the Gaspur aquifer beneath the site is defined as being between 55 and 77 ft bgs. Water-bearing units identified at shallower depths are defined as being associated with one or more perched (or semiperched) aquifers. The Exposition aquifer is defined as being between 77 and 217 ft bgs; however, the base of this aquifer is considered approximate because no information was found regarding site-specific lithology below approximately 160 ft bgs. These designations were assigned primarily based on CPT lithological profile reports that were developed both during and prior to the completion of the SI investigation. A more comprehensive study of the lithological sediments in the 75 to 100 ft bgs zone beneath the site would be required to ascertain whether the water-bearing zones in this range are most appropriately associated with

the hydrogeologic conditions of the Gaspur or Exposition aquifers. The CPT Lithological Profile Reports developed during the Titan SI investigation are presented in Appendix E.

Throughout much of the subbasin, the Pleistocene-age aquifers are under confined conditions due to the presence of fine-grained, low-permeability interbedded sediments. Although these fine-grained sediments, or aquicludes, generally restrict the downward migration of groundwater from overlying aquifers, semipermeable zones within the aquicludes allow aquifers to be interconnected in some areas. In addition, hydrogeologic modeling of multi-aquifer systems similar to those found in the Central Basin Pressure Area, indicates that groundwater wells screened across multiple aquifers (or wells with improperly constructed annular seals that cross multiple aquifers) can act as a direct pathway for the migration of significant volumes of shallow groundwater into deep confined aquifers when vertical hydraulic head variations create a downward hydraulic gradient. The process of this downward migration is increased in areas where the deeper aquifers have periods of high-volume pumping such as seasonal demand. Furthermore, additional studies have shown that liquids that are denser than water (i.e., dense non-aqueous phase liquids such as TCE and PCE) can migrate downward through a multi-aquifer well even when vertical hydraulic head variations create an upward hydraulic gradient. As of the end of the 2012-2013 fiscal year, there were 537 known extraction wells (306 active and 231 inactive) within the subbasin (AwwaRF, 2006; DWR, 1961; DWR, 2013; Johnson et al., 2011).

The State of California, Department of Water Resources' Bulletin No. 104 (*Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County*) – Appendix A presents "idealized" geologic cross-sections transecting the Central Subbasin. These cross-sections indicate apparent areas of merged aquifers near the site, including approximately one-quarter mile west (Gaspur-Exposition), approximately 500 feet east (Exposition-Gage), and approximately 0.9 mile east (Lynwood-Silverado). Aquifer interconnection within 2 miles of the site has been documented between the Gaspur through Gage and between the Lynwood through Silverado. Aquifer interconnections within 2 miles of the site have been established neither between the Gage through Jefferson, the Jefferson and Lynwood, nor the Silverado and Sunnyside (DWR, 1961).

The regional groundwater flow direction within the subbasin, which was calculated using data from wells screened within the upper San Pedro Formation (Lynwood and Silverado aquifers), is generally to the southwest with local and temporal variations from approximately west-southwest to southeast. Based upon data collected between 2007 and 2016, flow within these deeper aquifers near the site trended towards the west-southwest with temporal variations from west to south-southwest (WRD, 2017).

The groundwater flow direction within the perched aquifer at the site is not known. Because of the highly irregular and discontinuous nature of these perched water-bearing zones, the flow direction is estimated to be highly variable and the calculation of a meaningful flow direction would likely require a separate and specialized investigation.

The groundwater flow direction within the Gaspur aquifer at the site is also not known. Monitoring well networks screened within the Gaspur aquifer on the north-adjacent Brenntag site (EPA ID No. CAD008287732) and the east-adjacent GENIL site (EPA ID No. CAD027897164) were

measured during concurrently-conducted SI investigations. Calculations based on these measurements were generally inconsistent and often resulted in conflicting flow directions. Based on this information, the flow directions within the Gaspur aquifer at the Titan site are expected to be similarly variable and flow directions calculated on adjacent properties should not be extrapolated to the site (Weston, 2017a; Weston, 2017b).

The groundwater flow direction within the Exposition aquifer at the site is estimated to be towards the southwest. This estimated flow direction is based on monitoring well depth-to-water measurements collected from wells screened within this aquifer zone during the concurrently-conducted Brenntag SI investigation, as well as from groundwater data collected by Brenntag during semiannual monitoring events between 2010 and 2016 (ARCADIS, 2017; Weston, 2017a).

During the SI investigation, the subsurface geology at the Titan Parcels portion of the site was logged to a depth of 15 ft bgs, the base of continuous coring. Subsurface materials primarily consisted of yellowish brown, fine- to medium-grained silty sands with increasing bands of light brown to brown silty sands with depth. The lithological identifications are described in the sample log book (Appendix I). Additionally, during the SI investigation, CPT technology was used to estimate the subsurface lithology to a total depth of approximately 136 ft bgs. The interpreted Soil Behavior Type generated from the CPT generally indicated sand units from 2 to 20 ft bgs, 33 to 37 ft bgs, 72 to 80 ft bgs, 84 to 90 ft bgs, 101 to 105 ft bgs, and 130 to 136 (total depth) ft bgs. Between these sand units, the soils were generally composed of silts and clays with thin (i.e., less than 2 ft) interbedded lens of coarser-grained materials. The CPT Lithological Profile Reports are presented in Appendix E.

4.2.2 Groundwater Targets *(See Table 10)*

The nearest HRS-eligible drinking water well to the site is Well 03. This well is operated by the Tract 349 Mutual Water Company (MWC) and is located approximately 0.2 mile to the north of the site. Routine water quality sampling of this well has not reported elevated concentrations of AOCs including: TCE, PCE, arsenic, or chromium. Well 03 is a multi-aquifer well with six distinct screening intervals that correlate to the estimated depths of the Silverado and Sunnyside aquifers (BBD, 1948; DWR, 1961; RWQCB, 2015; Weston, 2016).

The City of South Gate's Well 7 was a public supply well located approximately 0.27 mile southeast of the site, which was removed from service in approximately 2002 and destroyed in approximately 2011 due primarily to elevated concentrations of arsenic, chromium (including hexavalent chromium), and TCE. The maximum reported arsenic concentration of 15.1 µg/L was identified in December 1997. The maximum reported chromium concentration (primarily of the hexavalent species) of 86 µg/L was identified in August 2000. This well had exhibited elevated PCE and TCE concentrations since at least 1985. The maximum reported PCE concentration of 3.8 µg/L and TCE concentration of 14 µg/L were both identified during the most recent recorded sampling in October 2001. Well 7 was a single-aquifer well with a sole screening interval that correlated to the estimated depths of the Lynwood aquifer (DWR, 1948b; DWR, 1961; RWQCB, 2015; Weston, 2016; Appendix C-2).

The City of Huntington Park's Well 12 is an active public supply well located approximately 0.44 mile northwest of the site. During routine water quality sampling, this well has exhibited non-detectable concentrations of TCE since May 2009. The maximum TCE concentration reported in this well was 1.6 µg/L, which was identified in 2003. Elevated TCE concentrations were also reported in 2007 and 2008. This well has not exhibited detectable concentrations of arsenic, chromium, or PCE. Well 12 is a multi-aquifer well with a sole screening interval that correlates to the estimated depths of the Lynwood through Sunnyside aquifers (DWR, 1948a; DWR, 1961; RWQCB, 2015; Weston, 2016).

The Golden State Water Company (GSWC) - Bell/Bell Gardens system's Hoffman Well 02 was a public supply well located approximately 0.47 mile east-northeast of the site, which was removed from service in approximately 2000 and subsequently destroyed in approximately 2007 due primarily to elevated concentrations of chromium. The maximum reported chromium concentration of 333 µg/L was identified in November 2000. This well had consistently exhibited detectable, but relatively low, concentrations of PCE since at least 1985 and had exhibited elevated TCE concentrations since at least 1985. PCE concentrations gradually began increasing in approximately 1990. The maximum reported PCE concentration of 5.7 µg/L was identified in November 2000. The maximum reported TCE concentration of 15.3 µg/L was identified in November 1996. Hoffman Well 02 was a single-aquifer well with three distinct screening intervals (437 to 444, 454 to 476, and 477 to 494 ft bgs) that correlated to the estimated depths of the Lynwood aquifer (DWR, 1961; RWQCB, 2015; Weston, 2016; Appendix C-3).

The Fed MCL for arsenic is 10 µg/L, for chromium is 100 µg/L, for PCE is 5.0 µg/L, and for TCE is 5.0 µg/L.

There are 83 known active drinking water wells, 4 known maintained-standby wells, and 33 known inactive (i.e., inactive, destroyed, abandoned) wells located within the target distance limit (TDL) (i.e., 4 miles of established on-site sources). Water purveyors known to operate wells within the TDL include Tract 349 MWC, City of Huntington Park, City of South Gate, Tract 180 MWC, GSWC - Bell, Bell Gardens, Maywood MWC No. 3, Rancho Los Amigos Hospital, Maywood MWC No. 1, City of Downey, City of Lynwood, City of Bell Gardens, Maywood MWC No. 2, Walnut Park MWC, GSWC – Hollydale, City of Vernon, GSWC – Florence/Graham, City of Compton, City of Commerce, Lynwood Park MWC, CalWater Service – East Los Angeles (ELA), GSWC – Willowbrook, Park Water Company (Liberty) – Compton/Willowbrook, and Sativa Los Angeles County Water District. Additional service information for these purveyors is presented in Table 10 (Weston, 2016).

4.2.3 Groundwater Pathway Conclusion *(See Figures 7 through 9; Tables 5 through 10)*

A release of hazardous substances from the site to groundwater has not been established. For HRS purposes, a release to groundwater is established when a hazardous substance is detected in a hydraulically downgradient well at a concentration significantly above background levels, and some portion of the release is attributable to the site. A hazardous substance is considered to be present at a concentration significantly above background levels when one of the following two criteria is met: (1) the hazardous substance is detected in the contaminated (i.e., release) sample,

when not detected in the background samples or (2) the hazardous substance is detected in the release sample at a concentration equal to or greater than three times the maximum background level, when detected in the background samples.

Release samples collected during the Titan SI sampling event from within the perched aquifer at the Solvay portion of the site exhibited concentrations of arsenic, cadmium, manganese, and nickel that exceeded their corresponding federal and/or state regulatory benchmark. However, since the hydraulic gradient of the perched aquifer beneath the site has not been adequately defined, and since the perched aquifer does not meet the criteria of an "aquifer" for HRS purposes, appropriate background concentrations for these analytes could not be assigned and a release to the perched aquifer cannot be established.

Release samples collected during the Titan SI sampling event from within the Gaspur aquifer at the Titan Parcels portion of the site exhibited concentrations of lead that significantly exceeded the federal MCL. However, since the hydraulic gradient of the Gaspur aquifer beneath the site has not been adequately defined, appropriate background concentrations for these analytes could not be assigned and a release to the Gaspur aquifer cannot be established.

Release samples collected during the Titan SI sampling event from the Exposition aquifer exhibited concentrations of lead that exceeded its corresponding SQL but did not exceed federal MCLs. However, since it was deemed unnecessary for HRS purposes to assign an Exposition aquifer background sample location (see section 3.2.1), a release to the Exposition aquifer cannot be established. Due to logistical restrictions during the investigation, no Exposition release samples were collected from either within, or immediately downgradient, of the Solvay Parcel.

Although a release of arsenic from the site to groundwater cannot be established for HRS purposes, the relatively high arsenic concentrations identified in perched aquifer samples collected from the Solvay Parcel suggests that at least some portion of the arsenic source material is water-soluble and mobilizing into shallow groundwater.

Although a release of lead from the site to groundwater cannot be established for HRS purposes, the relatively high lead concentrations identified in Gaspur aquifer samples collected from the Titan Parcels, in combination with the relatively low lead concentrations identified in on-site source samples, indicate that one or more additional lead source areas may exist on site. Furthermore, the data suggests that at least some portion of the lead source material is water-soluble and mobilizing into shallow groundwater.

The geologic materials between the ground surface at the site and the top of the deepest identified aquifer, the Sunnyside, are generally characterized by confined aquifer systems, which are composed of relatively permeable sands through gravels and are separated by relatively impermeable clay through silt layers; although semipermeable zones within these layers allow one or more aquifers to be interconnected in some areas. The estimated elevations and depths of the aquifers underlying the site are presented in Table 9. There are 83 known active drinking water wells within 4 miles of the site. These wells, which are operated by 23 distinct water purveyors, serve an apportioned population of approximately 563,000 (CTE, 2011; CWS, 2016; DWR, 1961;

KJC, 2016a; KJC, 2016b; MWM, 2016; RMP, 2011; SAA, 2011; SEI, 2012; SWRCB, 2017; Weston, 2016).

4.3 Surface Water Pathway

To determine the score for the surface water pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to surface water (e.g., streams, rivers, lakes, and oceans); 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, persistence, bioaccumulation potential, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on drinking water intakes, fisheries, and sensitive environments associated with surface water bodies within 15 miles downstream of the site.

Surface water runoff from the Titan site is expected to flow from the paved surfaces at the site via engineered concrete troughs into adjacent municipal stormwater drains. The nearest surface water body to the site is the Los Angeles River, which is located approximately 0.7 mile east. The Los Angeles River is highly modified, having been lined with concrete along most of its length by the U.S. Army Corps of Engineers in the 1950s. Flows in the river are dominated by urban runoff and tertiary-treated effluent from several municipal wastewater treatment plants. The river empties into the Pacific Ocean at San Pedro Bay approximately 13.5 miles downstream of the site. There are no surface water intakes, fisheries, or sensitive environments associated with the Los Angeles River downstream of the site; however, there is a potential for fisheries and/or recreational areas to exist within San Pedro Bay (Google, 2017; RWQCB, 1994; Appendix B).

4.4 Soil Exposure and Air Migration Pathways

In determining the score for the soil exposure pathway, the HRS evaluates: 1) the likelihood that there is surficial contamination associated with the site (e.g., contaminated soil that is not covered by pavement or at least 2 feet of clean soil); 2) the characteristics of the hazardous substances in the surficial contamination (i.e., toxicity and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, exposed to the contamination. For the targets component of the evaluation, the HRS focuses on populations that are regularly and currently present on or within 200 feet of surficial contamination. The four populations that receive the most weight are residents, students, daycare attendees, and terrestrial sensitive environments.

In determining the score for the air migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to ambient outdoor air; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on regularly occupied residences, schools, and workplaces within 4 miles of the site. Transient populations, such as customers and travelers passing through the area, are not counted.

There are no known residences, schools, daycare facilities, or sensitive environments on site. In addition, the site is fenced and, with the exception of a small area at the northwestern corner of the site, its surface is entirely covered with pavement or buildings. The nearest identified residential property to the site was located approximately 550 feet north-northeast. There are regularly occupied workplaces on site; however, the total number of employees is not known (Google, 2017; Appendix B).

4.5 Hazard Ranking System Summary *(See Figures 7 through 9; Tables 5 through 10)*

On-site soil-matrix samples collected during the 2015 SI investigation exhibited concentrations of metals that exceeded assigned site-specific action levels. Specific metal analytes include, but are not limited to, antimony, arsenic, cadmium, chromium, copper, lead, silver, vanadium, and zinc.

Groundwater release samples collected during the investigation also exhibited concentrations of metals that exceeded documented federal and/or state regulatory benchmarks. Specific metal analytes include, but are not limited to, arsenic, lead, manganese, nickel, and vanadium. Manganese was the only metal analyte that exceeded its regulatory benchmark in the samples collected from the Exposition aquifer. Groundwater action levels were not assigned for HRS purposes (see section 3.2.1).

The following primary HRS factors are associated with the site:

- Hazardous substance sources at the site have been documented, consisting of a buried/backfilled surface impoundment plus those soils contaminated through migration and soils contaminated during historical chemical manufacturing activities. Metals, including lead, silver, antimony, arsenic, cadmium, chromium, copper, vanadium, and zinc, were present in site soils and/or waste materials at concentrations significantly above background.

- A release of hazardous substances from on-site sources to groundwater cannot be established based on the results of the SI sampling effort since background groundwater concentrations were not assigned.

- Aquifer interconnection within 2 miles of the site has not been adequately documented between the Exposition through Silverado aquifers.

- The geologic materials between the site surface and the top of the Silverado aquifer are generally characterized by approximately 600 feet of relatively permeable sands and gravels and approximately 550 feet of less permeable clays and silts.

- The nearest drinking water well is located less than one-quarter mile from the site.

- Drinking water wells within 4 miles of the site serve an apportioned population of approximately 563,000.

The following secondary HRS factors are associated with the site:

- No drinking water intakes are associated with surface water within 15 miles downstream of the site. However, there is the potential for fisheries and/or sensitive environments associated with the Pacific Ocean to exist within this target distance limit.

- There are no known residences, schools, daycare centers, or sensitive environments on site. The nearest identified residential property to the site is located approximately 550 feet north-northeast.

- There are regularly occupied workplaces on site; however, the total number of employees is not known.

- The site is fenced and generally inaccessible to the public.

- With the exception of minor landscaped areas, the surface of the site is covered with pavement or buildings.

5.0 REMOVAL EVALUATION CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415 (b) (2)] authorizes EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reasons, a referral to Region 9's Emergency Response Office does not appear to be necessary (Google, 2017; Appendix B):

- The site is fenced and generally inaccessible to the public.

- With the exception of minor landscaped areas on the Titan Parcels, the surface of the site is covered with pavement or buildings.

- The Solvay Parcel is additionally separated from Titan’s operational areas by a chain-link fence.

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Tables

Table 1: Site Operator Chronology

Site Parcels	Operator	Primary Operations	Approximate Date Range
All	A.R. Maas Chemical Company	Manufacture of TSP, NA_2S, and H_3PO_4	1924 - 1949
	Victor Chemical Company [1]	Manufacture of TSP, NA_2S, and H_3PO_4	1949 - 1960
	Stauffer Chemical Company [1]	Manufacture of TSP, NA_2S, and H_3PO_4	1960 – 1985 [2]
	Chesebrough-Pond's Manufacturing Co. [1]	Manufacture of TSP and NA_2S	1985 - 1987
	Imperial Chemical Industries [1]	Manufacture of TSP and NA_2S	1987
	Rhone-Poulenc Basic Chemicals Co. [1]	Manufacture of TSP and NA_2S	1987 - 1993
Titan Parcels	Titan Terminal & Transport	Hazardous and non-hazardous materials distribution and bulk storage	1994 - Present
Solvay Parcel	Rhone-Poulenc Basic Chemicals Co. [1]	None	1994 - 1997
Solvay Parcel	Rhodia [1]	None	1998 - 2011
Solvay Parcel	Solvay [1]	None	2011 - Present

H_3PO_4= phosphoric acid
NA_2S= sodium sulfide
TSP= trisodium phosphate

Footnotes:
1 = Includes the business operations and assets of previous operator
2 = On-site manufacturing of phosphoric acid reportedly ceased in approximately 1981

References: BEI, 1994; E&E, 1984; Sitton, 2001; Stauffer, 1984; Weston, 2015; Appendix B

Table 2: Solvay Parcel – Stauffer Solid-Matrix Sample Summary Results (1979-1982)

Boring ID [1]	Total Depth (ft bgs)	Sample Depth (ft bgs)	Analytical Results [2]		
			Arsenic	**Cadmium**	**Chromium**
		Residential RSL	0.68	71	--
		MCL-based SSL	0.29	--	180,000
		HRS SEP Benchmark	0.77	30	200
		Action Level	**7.8**	**0.27**	**63**
B-3	43.5	23	1.3	--	--
		28	3.7	--	--
		33	2.1	--	--
SG-2	21.5	10	**14**	--	14
		15	3.9	--	**253**
		20	**18**	--	19
SG-3	26.5	10	**24**	--	57
		20	8.3	--	12
		25	1.8	--	21
SG-4 [3]	21	10	**25**	--	14
		15	**260 / 384**	--	**92**
		20	**35**	--	18
SG-5 [4]	30.5	5	4.9 / 3.7	--	14
		10	**94**	--	**78**
		20	**21**	--	18
		30	**502 / 304**	**8.0**	33
SG-9 [3]	27	10	11	--	25
		15	**22**	--	**73**
		25	3.8	--	10
SG-10	26.5	10	1.2	--	13
		15	**739 / 1659**	--	**127**
		20	**12**	--	21
		25	**22**	--	24
SG-11	16.5	10	**14**	--	13
		15	**187 / 225**	**17**	**188**
SG-12	14	5	3.3	--	7.0
		10	**17**	--	16
SG-13	36	15	**127**	--	--
		20	**32**	--	--
		25	**50**	--	--
		30	**12**	--	--
		35	**9.6**	--	--
SG-14	36	10	**10**	--	--
		15	**19**	--	--
		20	**15**	--	--
		25	1.2	--	--
		30	3.0	--	--
		35	0.53	--	--
SG-15	56	10	0.77	--	--
		15	4.3	--	--
		20	**14**	--	--
		25	4.1	--	--
		30	1.6	--	--
		35	1.3	--	--
		45	1.2	--	--
		55	0.53	--	--
SG-16	31	10	**11**	--	--
		15	3.1	--	--
		20	**17**	--	--
		25	**14**	--	--
		30	4.6	--	--
SG-17	31	10	3.6	--	--
		15	1.2	--	--
		20	7.2	--	--
		25	6.1	--	--
		30	**12**	--	--
SG-18	26	10	6.5	--	--
		15	**28**	--	--
		20	5.9	--	--
		25	3.5	--	--

Notes:
Values in **Bold** exceed the assigned SI Action Level (see Section 3.2.1)
All results reported in milligrams per kilogram (mg/kg)
1 = Only samples with known analytical results are included in table
2 = Analytical results presented as *value* / *value* indicate a duplicate sample pair.
3 = A piezometer was installed at this location and a water sample collected; however, Stauffer did not release results.
4 = The samples from 5 ft bgs and 30 ft bgs may have been switched at this location.

Definitions:
ft bgs = feet below ground surface
HRS = Hazard Ranking System
MCL = Maximum Contaminant Level
RSL = Regional Screening Level
SEP = Soil Exposure Pathway
SSL = Soil Screening Level
-- = not known or not sampled

References:
E&E, 1984; Stauffer, 1984

Table 3: Solvay Parcel – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Silver	Vanadium	Zinc
Benchmarks and Action Levels										
Residential RSL:		31	0.68	71	--	3,100	400	390	390	23,000
MCL-based SSL:		0.27	0.29	--	180,000	46	14	--	--	--
HRS SEP Benchmark:		30	0.77	30	200	3,000	--	300	394	20,000
Action Level (1):		**1.0**	**7.8**	**0.27**	**63**	**56**	**25**	**0.51**	**137**	**225**
Background Samples										
TTT-DP-9	2	0.93 UJ	1.7 J	0.46 U	7.8	9.9 J-	4.7	0.46 U	14	33
	5	0.89 UJ	1.1 J-	0.09 J	15	9.9 J	4.2 J+	0.44 U	33	56
	10	0.91 UJ	0.64 J	0.46 U	5.9	2.7 J-	1.4	0.46 U	18	27
	15	1.0 UJ	0.53 J	0.51 U	9.0	2.9 J-	1.5	0.51 U	22	36
Source Samples										
TTT-DP-2	5	0.82 J-	1.2	0.36 U	1.4 J	1.5 J	4.4	0.05 J	2.5 J	6.6 J
	10	0.97 UJ	7.2	0.48 U	42 J	7.3 J	1.6	0.05 J	63 J	32 J
	15	**5.6** J-	**71**	**4.3**	38 J	4.0 J	2.1	0.28 J	26 J	36 J
	20	1.0 UJ	**19**	0.52 U	21 J	23 J	5.7	0.05 J	**163** J	68 J
TTT-DP-4	5	**6.9** J-	**38**	**1.0**	**170** J	14 J	10	0.03 J	33 J	57 J
	10	**4.6** J-	**13** J	0.39 U	13	9.6 J-	2.2	0.39 U	46	35
	15	**5.7** J-	**617**	**0.98**	**137** J	21 J	1.7	0.02 J	71 J	**341** J
	20	1.0 UJ	**44**	0.50 U	26 J	17 J	5.2	0.03 J	43 J	68 J
TTT-DP-5	5 (2)	**3.8** J-	**12**	**6.7** J	**83** J	**144** J	9.3	0.18 J	**143** J	**276** J
	10	**1.8** J-	**15**	**9.8** J	38 J	**241** J	12	0.27 J	**144** J	**436** J
	15	1.0 UJ	**15**	0.53 U	50 J	26 J	1.8	0.53 U	35 J	44 J
	20	**14** J-	**57**	**4.1** J	**402** J	**231** J	2.0	0.49 U	75 J	33 J

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 4: Titan Parcels – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Silver	Vanadium	Zinc
Residential RSL:		31	0.68	71	--	3,100	400	390	390	23,000
MCL-based SSL:		0.27	0.29	--	180,000	46	14	--	--	--
HRS SEP Benchmark:		30	0.77	30	200	3,000	--	300	394	20,000
Action Level (1):		**1.0**	**7.8**	**0.27**	**63**	**56**	**25**	**0.51**	**137**	**225**
Background Samples										
TTT-DP-9	2	0.93 UJ	1.7 J	0.46 U	7.8	9.9 J-	4.7	0.46 U	14	33
	5	0.89 UJ	1.1 J-	0.09 J	15	9.9 J	4.2 J+	0.44 U	33	56
	10	0.91 UJ	0.64 J	0.46 U	5.9	2.7 J-	1.4	0.46 U	18	27
	15	1.0 UJ	0.53 J	0.51 U	9.0	2.9 J-	1.5	0.51 U	22	36
Source Samples										
TTT-DP-6	2	0.87 UJ	0.51	0.43 U	9.3 J	12 J	18	0.43 U	23 J	46 J
	5 (2)	0.87 UJ	1.6	0.43 U	9.6 J	7.2 J	2.6	0.43 U	25 J	38 J
	10	1.0 UJ	1.2	0.52 U	7.2 J	4.7 J	1.6	0.52 U	21 J	28 J
	15	0.88 UJ	2.6	0.44 U	6.8 J	3.2 J	1.3	0.44 U	55 J	27 J
TTT-DP-7	2	1.1 UJ	1.4 J	0.54 U	14	15 J-	4.2	0.54 U	34	59
	5	1.1 UJ	1.2 J	0.55 U	13	8.9 J-	3.6	0.55 U	31	51
	10	1.1 UJ	0.65 J	0.52 U	6.0	2.9 J-	1.4	0.52 U	19	25
	15	1.1 J-	3.5 J	0.54 U	8.1	4.4 J-	1.8	0.54 U	31	33
TTT-DP-8	2	1.1 UJ	1.8	0.52 U	13 J	19 J	11	0.39 J	25 J	64 J
	5	0.86 UJ	1.4	0.10 J	14 J	9.1 J	3.2	**0.60**	33 J	45 J
	10	0.97 UJ	1.1	0.48 U	7.5 J	4.4 J	1.9	0.50	23 J	32 J
	15	0.90 UJ	2.3	0.45 U	5.8 J	4.9 J	1.4	0.45 U	25 J	26 J
TTT-DP-10	2	1.1 UJ	3.3 J	0.53 U	19	20 J-	**29**	**2.0**	26	115
	5	0.92 UJ	1.1 J	0.46 U	18	8.3 J-	8.8	**0.98**	28	98
	10	0.89 UJ	0.60 J	0.44 U	6.5	3.7 J-	1.4	0.44 U	20	27
	15	1.1 UJ	2.9 J	0.54 U	14	7.4 J-	3.1	0.54 U	35	55

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
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U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 5: Titan Parcels & Solvay Parcel – Release Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Lead (Pb)	Manganese (Mn)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Vanadium (V)	Zinc (Zn)
Benchmark:		**10**	**2,000**	**5.0**	**100**	**--**	**1,300**	**15**	**50** (2)	**100**	**50**	**100**	**50**	**5,000**
Benchmark Source:		Fed MCL	Fed MCL	Fed MCL	Fed MCL	None	Fed MCL	Fed MCL	CA 2nd MCL	CA MCL	Fed MCL	Fed 2nd MCL	CA NL	CA 2nd MCL
Solvay Parcel														
TTT-DP-2	18.5	**15,700**	0.74 J-	**13**	1.8 J	154	10	0.10 J-	**11,500**	**836** J	10 U	1.0 U	2.4 J	501 J-
Titan Parcels														
TTT-DP-6	66 (1)	3.0 J+	83 J-	0.14 J	5.2	41	9.7 J+	7.9 J	**5190**	**991** J	5.1	0.03 J	9.5	42 J
TTT-DP-7	66	**11** J+	42 J-	0.07 J	3.8	1.6	6.0 J+	1.8 J	**725**	32 J	5.9	1.0 U	8.7	11 J
TTT-DP-8	64 (1)	**13**	55 J-	1.9	6.5	89	19 J-	**108**	**13,400**	**365** J	3.6 J	1.0 U	**90**	150 J-
TTT-DP-9	64	**17**	77 J-	3.6	16	129	31	**150** J-	**20,300**	**323** J	2.9 J	0.03 J	**120**	163 J-
TTT-CPT-1	61	**18**	31 J-	0.39 J	0.33 J	20	6.3	8.7 J-	**2,550**	**293** J	3.0 J	1.0 U	4.4 J	22 J-
	88	4.7	207 J-	0.23 J	19	6.0	17	4.3 J-	**517**	15 J	1.6 J	0.05 J	28	42 J-
	129	4.8	193 J-	0.14 J	11	2.9	7.0	1.8 J-	**1,070**	18 J	4.4 J	0.02 J	10	19 J-
TTT-CPT-2	64 (1)	5.5	64 J-	0.89 J	4.3	69	20	**25** J-	**4,560**	**483** J	5.0	0.02 J	22	56 J-
	88	1.2	86 J-	0.09 J	2.0 U	1.3	2.8	0.19 J-	**1,380**	53 J	2.3 J	1.0 U	5.9	15 J-
	134	3.6	31 J-	0.52 J	1.9 J	2.8	10	0.88 J-	246	36 J	2.4 J	1.0 U	4.7 J	29 J-
TTT-CPT-3	64	6.9 J+	59 J-	0.09 J	2.0 U	2.4	2.0 U	R	380	11 J+	0.79 J	1.0 U	5.3	12 J
	85	1.4 J+	62 J-	0.08 J	2.0 U	0.97 J	6.7 J+	R	**2,910**	85 J	3.6 J	1.0 U	13	35 J
	127	1.8 J+	111 J-	1.0 U	2.0 U	1.2	7.3 J+	R	485	22 J+	2.3 J	1.0 U	1.9 J	27 J

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in November, 2015
1 = Duplicate Sample collected; greater result is presented
2 = Manganese exceedances (i.e., bold/shade) are presented as 10 times benchmark

Definitions:
CA MCL = California Maximum Contaminant Level
CA 2nd MCL = California Secondary Maximum Contaminant Level
CA NL = California Notification Level
Fed MCL = Federal Maximum Contaminant Level
Fed 2nd MCL = Federal Secondary Maximum Contaminant Level
ft bgs = feet below ground surface

Data Qualifier Definitions:
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R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 6: Secondary Objective and Adjacent Site Inspection Groundwater Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Lead (Pb)	Manganese (Mn)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Vanadium (V)	Zinc (Zn)
Benchmark:		**10**	**2,000**	**5.0**	**100**	**--**	**1,300**	**15**	**50 (2)**	**100**	**50**	**100**	**50**	**5,000**
Benchmark Source:		Fed MCL	Fed MCL	Fed MCL	Fed MCL	None	Fed MCL	Fed MCL	CA 2nd MCL	CA MCL	Fed MCL	Fed 2nd MCL	CA NL	CA 2nd MCL
Titan Terminal & Transport SI – Secondary Objective Samples														
TTT-CPT-4	63	2.8	74 J-	1.0 U	2.1	1.3	3.0	0.84 J-	409	8.9 J	0.88 J	1.0 U	7.8	10 J-
	88	2.2	59 J-	1.0 U	2.9	1.1	3.1	0.73 J-	**506**	17 J	3.7 J	1.0 U	3.4 J	9.7 J-
	131	6.9	301	0.13 J	39	7.8 J	20 J-	6.3	**1,140**	28	3.7 J	0.04 J	**86**	44
TTT-CPT-5	66	6.6	58	1.0 U	0.14 J	23 J	1.8 J-	0.18 J	**1,160**	14	3.7 J	1.0 U	3.9 J	3.1
	86	1.0	65	1.0 U	0.14 J	0.69 J	1.4 J-	0.14 J	329	18	2.9 J	1.0 U	1.6 J	3.2
	130	**17**	185	1.0 U	9.0	3.3 J	6.0 J-	2.1	**847**	16	4.5 J	1.0 U	21	18
Brenntag Pacific, Inc. SI *(EPA ID No. CAD008287732)*														
BPI-MW-15A	66	**18**	44 J-	1.0 U	2.0 U	0.30 J	0.37 J	1.0 U	**881**	6.5	1.6 J	1.0 U	1.0 J	3.1
BPI-MW-15B	86	6.2	34 J-	1.0 U	2.0 U	0.51 J	0.46 J	1.0 U	**703**	15	1.3 J	1.0 U	0.79 J	2.9
General Inspection Laboratory SI *(EPA ID No. CAD027897164)*														
GIL-CPT-4	68	2.6	112	1.0 U	2.0 U	1.0 U	2.0	1.0 U	450	24	3.0 J	1.0 U	3.5 J	5.3
	88	0.92 J	106	1.0 U	2.0 U	1.0 U	0.92 J	1.0 U	361	6.2	1.7 J	1.0 U	1.8 J	3.1
	134	1.0	112	1.5	2.0 U	5.4	12	14	438	28	2.1 J	1.0 U	1.8 J	12
GIL-CPT-5	68 (1)	4.0	90 J-	1.0 U	0.15 J	0.87 J	5.6 J	1.0 UJ	**1,080**	17	4.7 J	1.0 U	1.0 J	6.1
	88	2.0	181 J-	1.0 U	2.0 U	0.17 J	2.0 UJ	1.0 UJ	364	2.8	1.8 J	1.0 U	4.1 J	3.9
	132	5.1	138 J-	0.12 J	2.0 U	0.59 J	2.0 J	0.11 J-	378	9.8	2.3 J	1.0 U	1.1 J	5.5
GIL-CPT-6	68 (1)	2.6	70	1.0 U	2.0 U	0.23 J	2.4	1.0 U	436	4.9	1.2 J	1.0 U	2.4 J	3.1
	88	2.6	199	1.0 U	2.0 U	1.0 U	2.7	1.0 U	**566**	4.3	1.2 J	1.0 U	8.7	5.5
	132	3.5	363	1.0 U	3.0	1.3	4.2	1.0 U	317	10	1.5 J	1.0 U	3.9 J	8.6

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
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1 = Duplicate Sample collected; greater result is presented
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Definitions:
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References: WESTON, 2017a; WESTON, 2017b

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UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 7: Titan Parcels & Solvay Parcel – Release Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloroethane	1,1-Dichloroethylene	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	cis-1,2-Dichloroethylene	Methyl tert-Butyl Ether	Tetrachloro-ethylene	trans-1,2-Dichloroethylene	Trichloro-ethylene
		1,1-DCA	1,1-DCE	1,2-DCB	1,2-DCA	1,2-DCP	c-1,2-DCE	MTBE	PCE	t-1,2-DCE	TCE
Benchmark:		**5.0**	**7.0**	**600**	**5.0**	**5.0**	**70**	**13**	**5.0**	**100**	**5.0**
Benchmark Source:		CA MCL	Fed MCL	CA MCL	Fed MCL	Fed MCL	Fed MCL	CA MCL	Fed MCL	Fed MCL	Fed MCL
Solvay Parcel											
TTT-DP-2	18.5	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Titan Parcels											
TTT-DP-6	66 (1)	0.50 U	0.50 U	0.45 J	**5.4**	0.50 U	0.55	3.2	0.50 U	0.50 U	0.75
TTT-DP-7	66	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.80	0.50 U	0.50 U	0.50 U	0.70
TTT-DP-8	64 (1)	0.50 U	0.50 U	0.43 J	**5.0**	0.50 U	0.55	3.0	0.50 U	0.50 U	0.70
TTT-DP-9	64	0.50 U	0.50 U	0.86	1.1	0.50 U	0.39 J	0.50 U	0.50 U	0.50 U	0.42 J
TTT-CPT-1	61	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U	0.50 U	0.32 J
	88	0.50 U	0.50 U	0.50 U	0.80	0.50 U	0.20 J	0.50 U	0.50 U	0.50 U	0.50 U
	129	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
TTT-CPT-2	64 (1)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	88	0.50 U	0.50 U	0.50 U	0.28 J	0.50 U	7.4	0.50 U	0.50 U	0.80	**11**
	134	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.30 J	0.50 U	0.50 U	0.50 U	0.50 U
TTT-CPT-3	64	0.50 U	0.50 U	0.41 J	0.50 U	0.50 U	0.46 J	0.50 U	0.50 U	0.50 U	0.94
	85	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.65	0.50 U	0.50 U	0.50 U	0.51
	127	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in November, 2015
1 = Duplicate Sample collected; greater result is presented

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Complete analytical results are presented in Appendix H

Table 8: Secondary Objective and Adjacent Site Inspection Groundwater Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloroethane	1,1-Dichloroethylene	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	cis-1,2-Dichloroethylene	Methyl tert-Butyl Ether	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene
		1,1-DCA	1,1-DCE	1,2-DCB	1,2-DCA	1,2-DCP	c-1,2-DCE	MTBE	PCE	t-1,2-DCE	TCE
Benchmark:		**5.0**	**7.0**	**600**	**5.0**	**5.0**	**70**	**13**	**5.0**	**100**	**5.0**
Benchmark Source:		CA MCL	Fed MCL	CA MCL	Fed MCL	Fed MCL	Fed MCL	CA MCL	Fed MCL	Fed MCL	Fed MCL
Titan Terminal & Transport SI Secondary Objective Samples											
TTT-CPT-4	63	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.80	0.50 U	0.50 U	0.50 U	0.32 J
	88	0.50 U	0.98	0.50 U	1.2	0.72	**120**	0.50 U	0.50 U	7.5	2.5
	131	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U
TTT-CPT-5	66	2.9	0.50 U	0.50 U	0.50 U	0.50 U	2.7	0.50 U	0.50 U	0.50 U	0.26 J
	86	0.93 J	1.5	1.0 U	**7.6**	3.5	**170**	1.0 U	1.0 U	14	**40**
	130	0.50 U	0.50 U	0.50 U	0.72	0.50 U	6.0	0.50 U	0.50 U	0.47 J	0.67
Brenntag Pacific, Inc. SI *(EPA ID No. CAD008287732)*											
BPI-MW-15A	66	0.19 J	0.82	2.8	0.50 U	0.50 U	29	0.50 U	0.50 U	2.0	**5.7**
BPI-MW-15B	86	0.22 J	0.50 U	0.50 U	2.5	0.50 U	40	0.50 U	0.50 U	13	**11**
General Inspection Laboratory SI *(EPA ID No. CAD027897164)*											
GIL-CPT-4	68	2.0	3.1	0.50 U	**14**	0.50 U	62	0.50 U	0.50 U	6.3	**21**
	88	0.50 U	0.50 U	0.50 U	0.98	0.50 U	0.35 J	0.50 U	0.50 U	0.50 U	1.9
	134	0.50 U	0.50 U	0.50 U	0.22 J	0.50 U	1.0	0.50 U	0.50 U	0.50 U	0.53
GIL-CPT-5	68 (1)	**15**	**20** J+	0.50 U	0.50 U	0.50 U	**450**	0.50 U	0.50 U	42 J	**670**
	88	0.50 U	0.50 U	0.50 U	1.3	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	132	0.50 U	0.50 U	0.50 U	0.20 J	0.50 U	0.29 J	0.50 U	0.50 U	0.50 U	0.33 J
GIL-CPT-6	68 (1)	0.50 U	0.50 U	0.50 U	0.23 J	0.50 U	0.16 J	0.50 U	0.50 U	0.50 U	0.25 J
	88	0.10 J	0.50 U	0.50 U	0.20 J	0.50 U	2.8	0.50 U	0.50 U	0.21 J	**14**
	132	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in November, 2015
1 = Duplicate Sample collected; greater result is presented

Definitions:
CA MCL = California Maximum Contaminant Level
Fed MCL = Federal Maximum Contaminant Level
ft bgs = feet below ground surface

References:
WESTON, 2017a; WESTON, 2017b

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 9: Bulletin 104 Aquifer Elevations near Site

Aquifer	Estimated Elevation (ft amsl)		Estimated Depth (ft bgs)	
	Top	Base	Top	Base
Gaspur	55	25	62	92
Exposition	15	-100	102	217
Gage	-120	-180	237	297
Hollydale	-230	-245	347	362
Jefferson	-305	-370	422	487
Lynwood	-390	-480	507	597
Silverado	-515	-750	632	867
Sunnyside	-1030	-1285	1147	1402

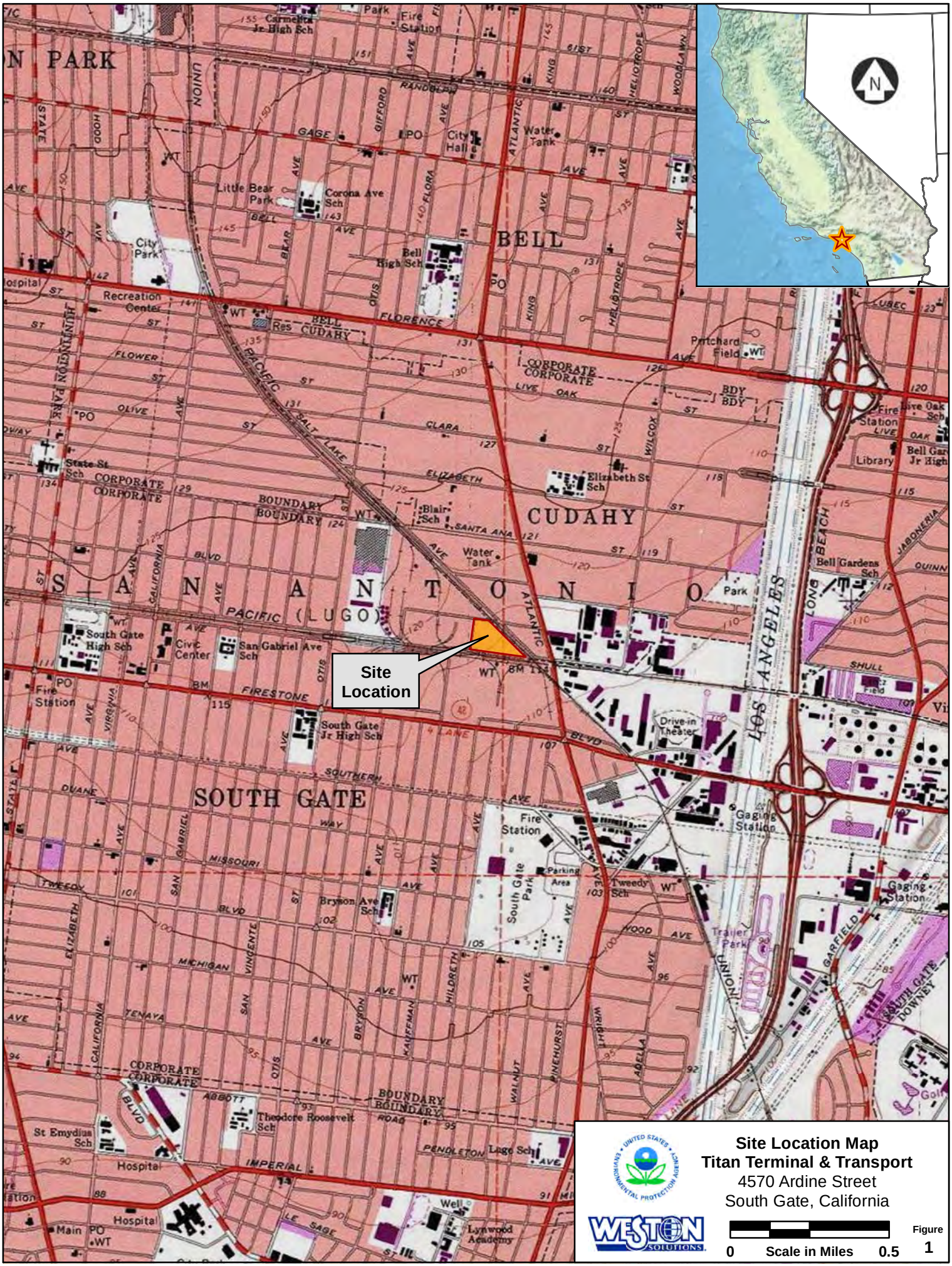
Definitions:
amsl = above mean sea level
bgs = below ground surface
ft = feet
References:
DWR, 1961

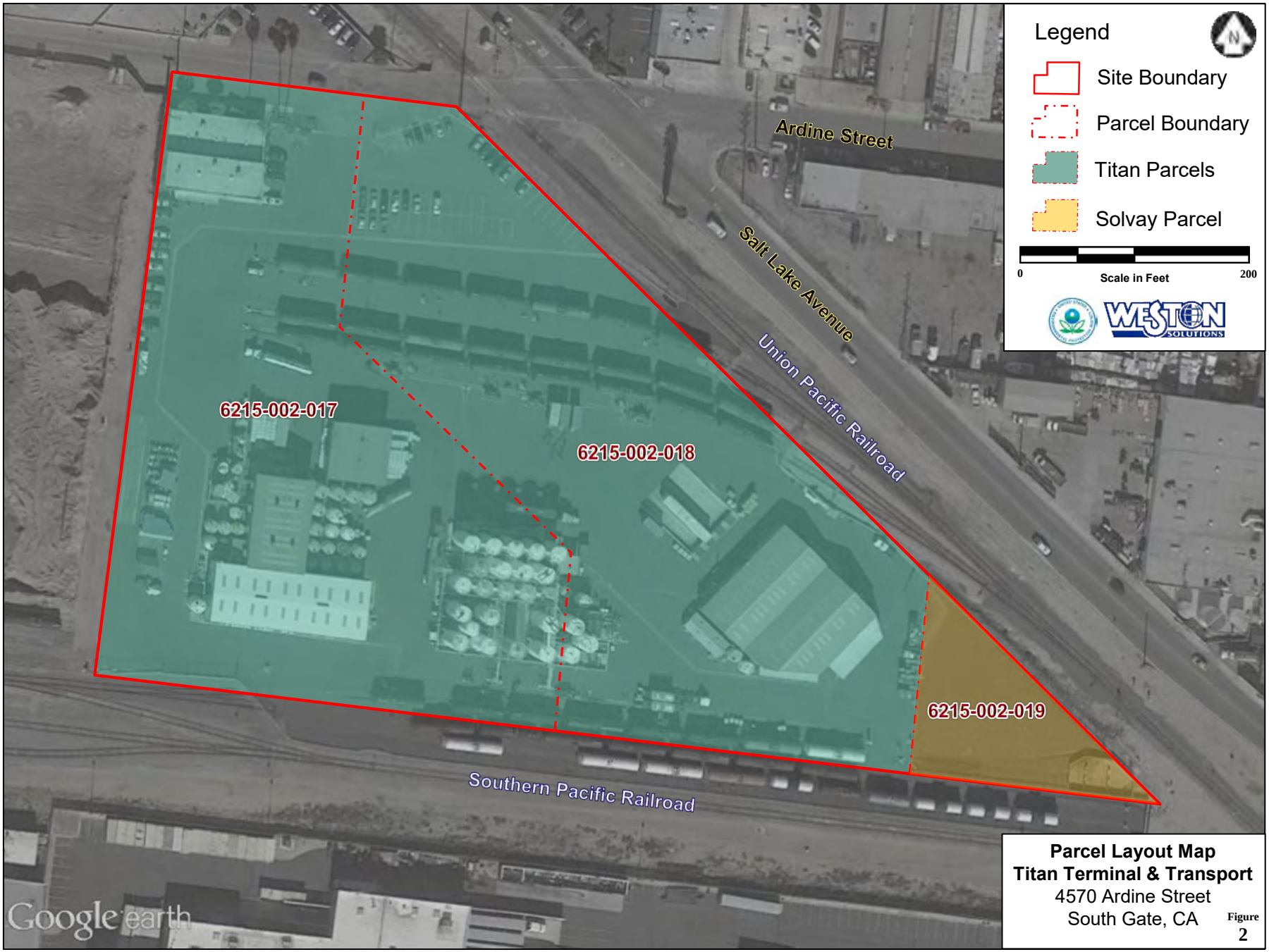
Table 10: Water Purveyors Operating Active Wells Within the Target Distance Limit

Water Company Name	No. of Wells in System[1]	Total Population Served	Percent Groundwater	No. of Wells Within 4 Miles[1]	Direction from site (approx.)
Tract 349 MWC	2	7,500	99%	2	N-NW
City of Huntington Park	5	17,246	72%	5	NW
City of South Gate	7	96,057	99%	7	W-SW-S-SE
Tract 180 MWC	2	14,000	100%	2	N
GSWC - Bell, Bell Gardens	5	58,048	97%	5	NW-N-NE
Maywood MWC #3	2	9,500	92%	2	N
Rancho Los Amigos Hospital	3	8,800	100%	3	SE
Maywood MWC #1	2	3,619	95%	2	NNW
City of Downey	20	112,585	100%	14	E-ESE
City of Lynwood	5	65,965	98%	5	S-SSW
City of Bell Gardens	1	11,879	100%	1	ENE
Maywood MWC #2	2	6,700	80%	2	N-NNW
Walnut Park MWC	3	16,180	73%	3	WNW
GSWC – Hollydale	2	7,666	100%	2	SSE
City of Vernon	7	45,000	84%	5	NNW
GSWC – Florence/Graham	7	65,182	82%	6	WNW
City of Compton	7	81,965	71%	3	SSW
City of Commerce	2	3,828	100%	2	NE
Lynwood Park MWC	3	2,300	100%	3	SW
CalWater Service – ELA	9	150,729	63%	5	NNE-NE
GSWC – Willowbrook	2	10,682	> 60%	2	SW
PWC – Compton/Willowbrook	1	24,698	64	1	SW
Sativa LA CWD	3	6,837	100%	1	SW

Footnotes:
1 = Does not include standby wells
References:
CTE, 2011; CWS, 2016; KJC, 2016a; KJC, 2016b; MWM, 2016; RMP, 2011; SAA, 2011; SEI, 2012; SWRCB, 2017; Weston, 2016

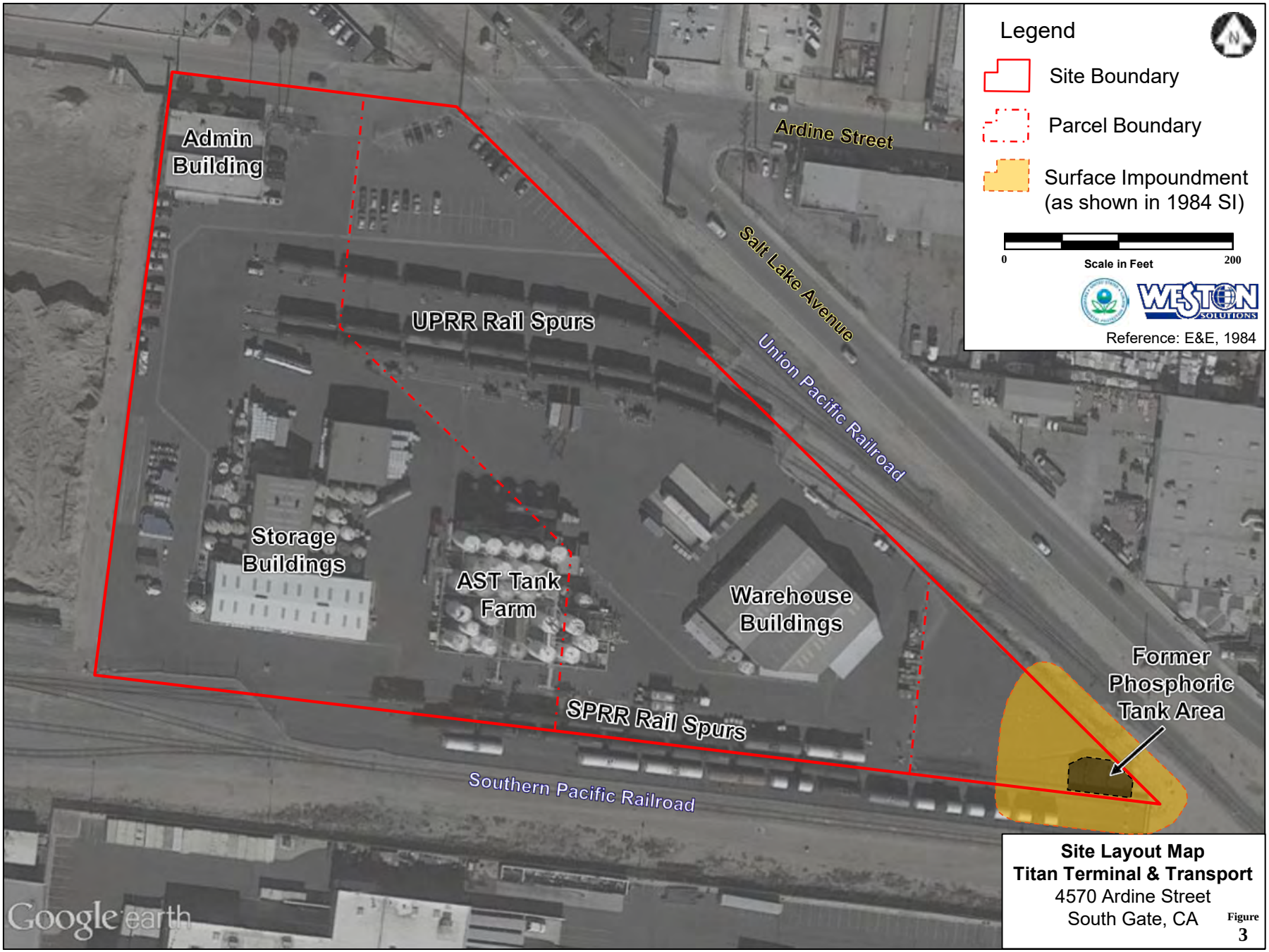
Figures


Site Location
BELL
CUDAHY
SOUTH GATE
LOS ANGELES
Site Location Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California
Figure 1
0
Scale in Miles
0.5



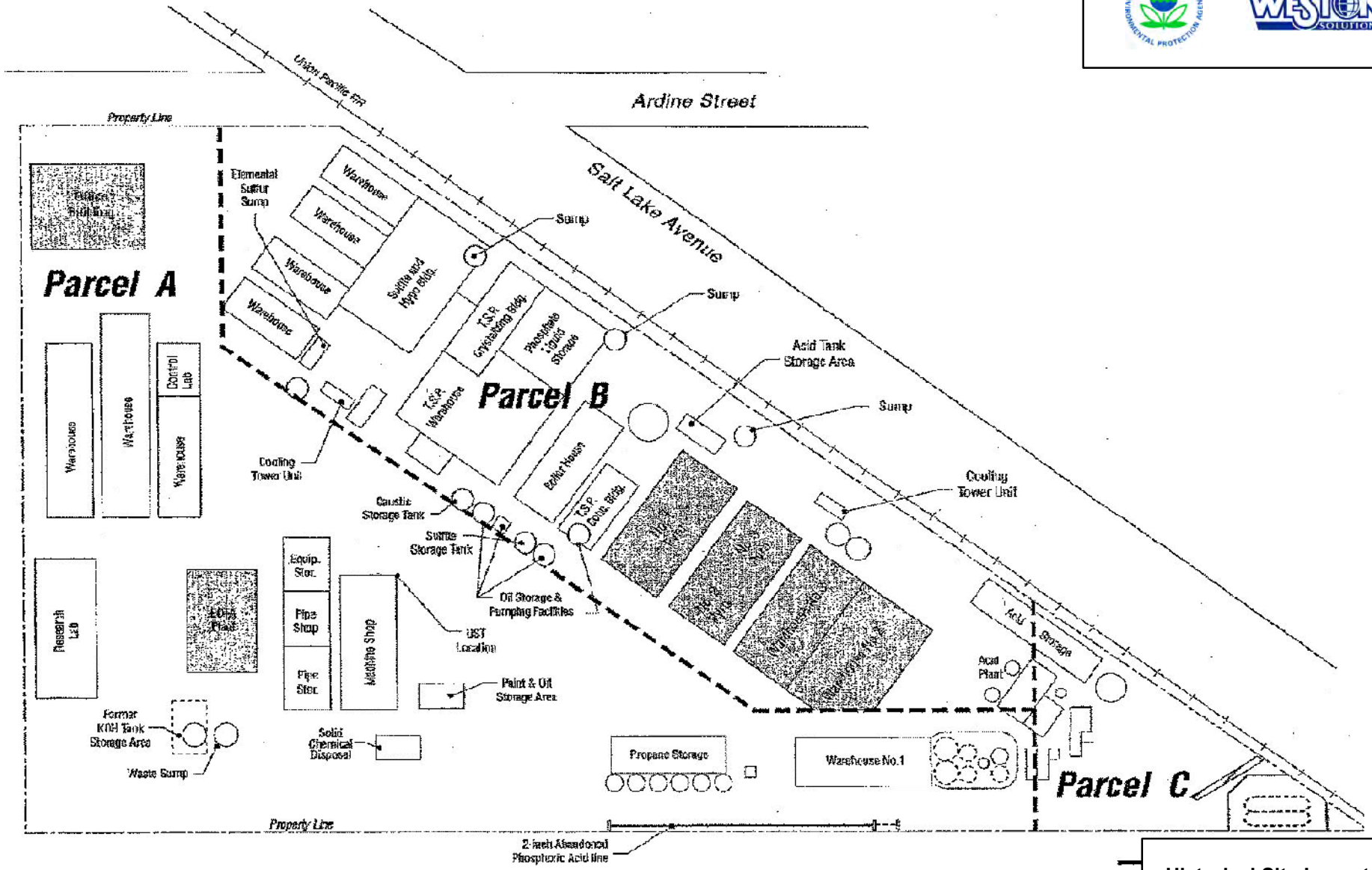
Parcel Layout Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, CA

Figure
2



Site Layout Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, CA

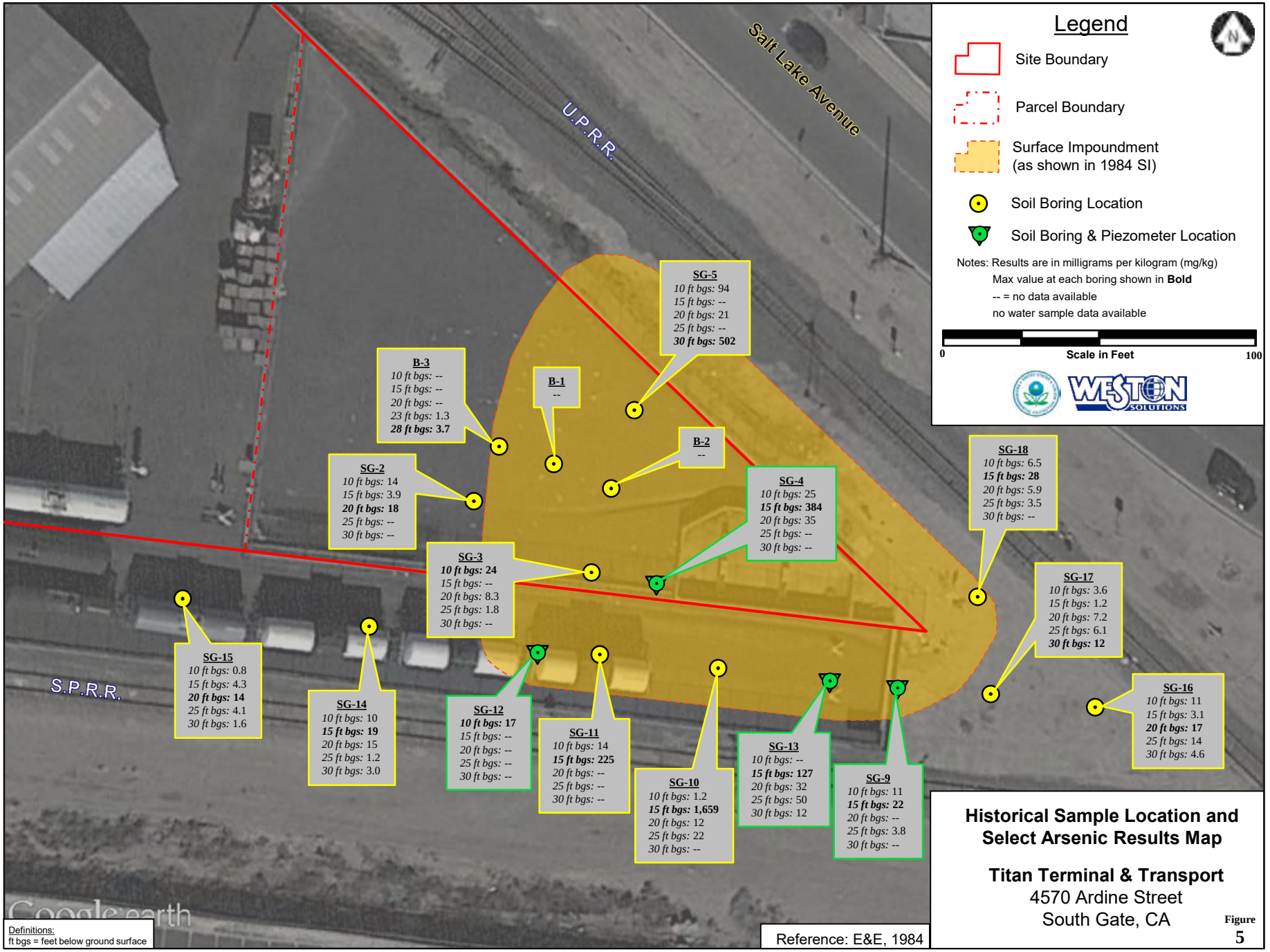
Figure
3



0 Scale in Feet 200

Historical Site Layout Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California

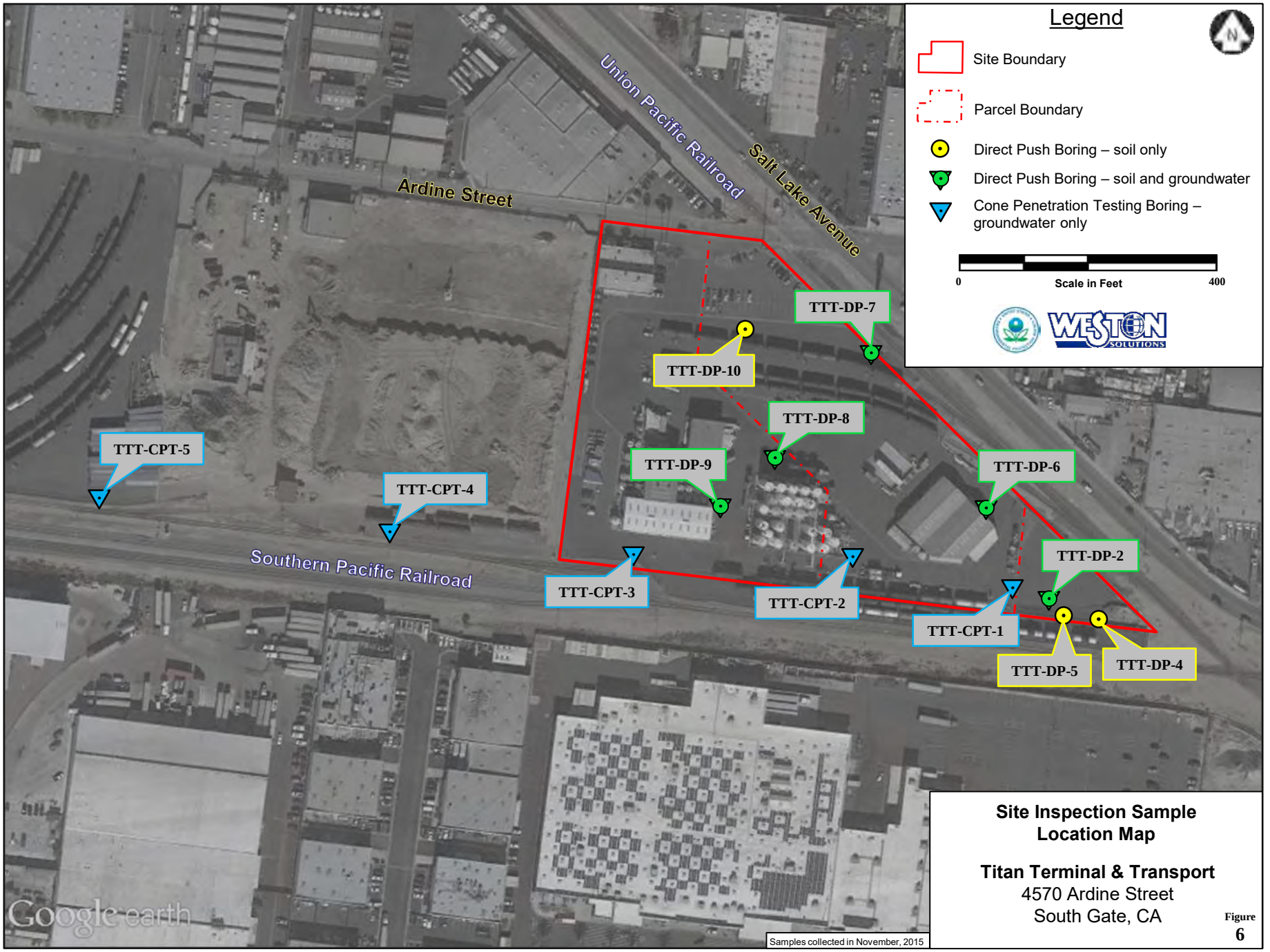
Figure
4



Historical Sample Location and Select Arsenic Results Map

Titan Terminal & Transport
4570 Ardine Street
South Gate, CA

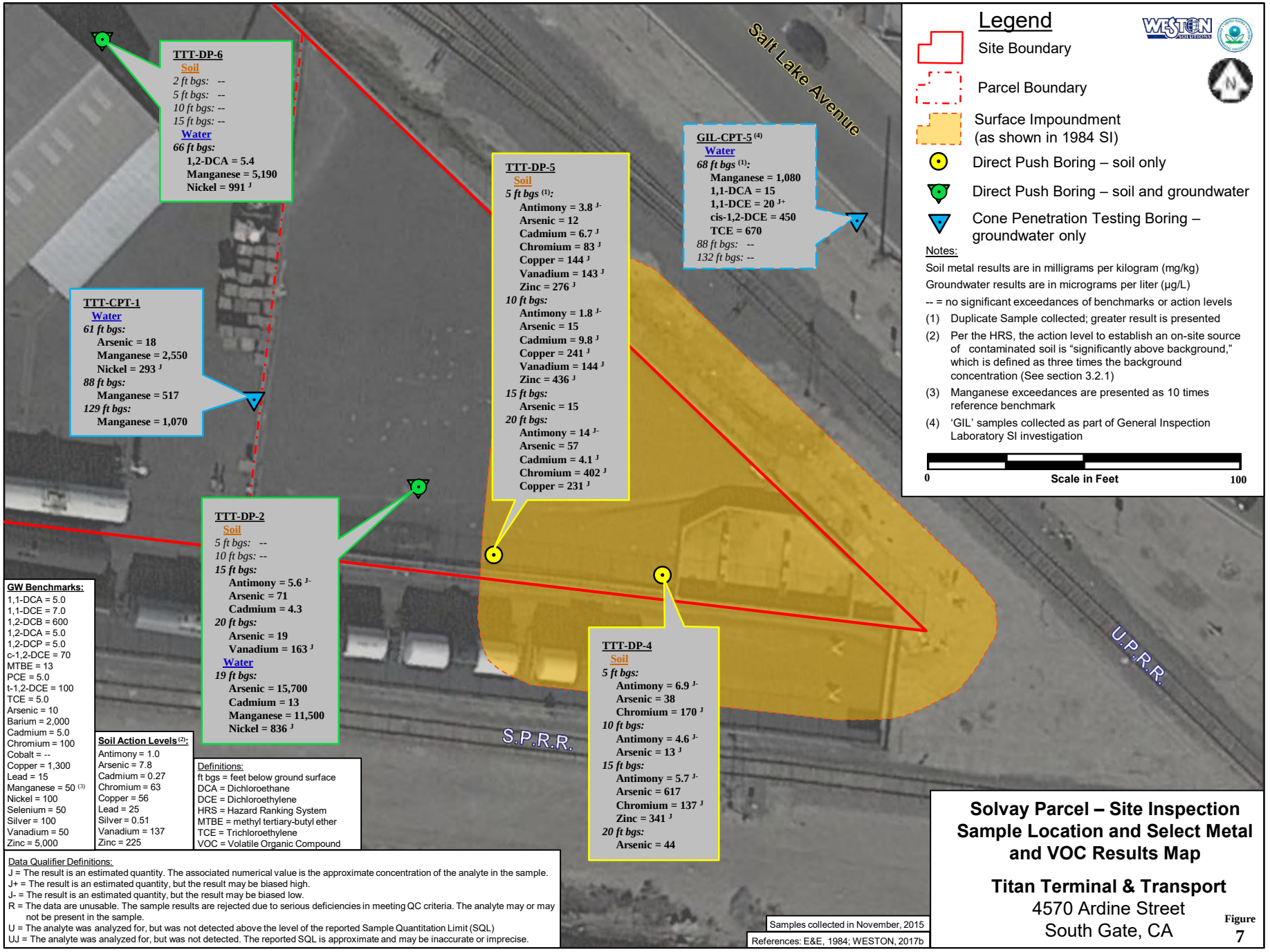
Figure
5

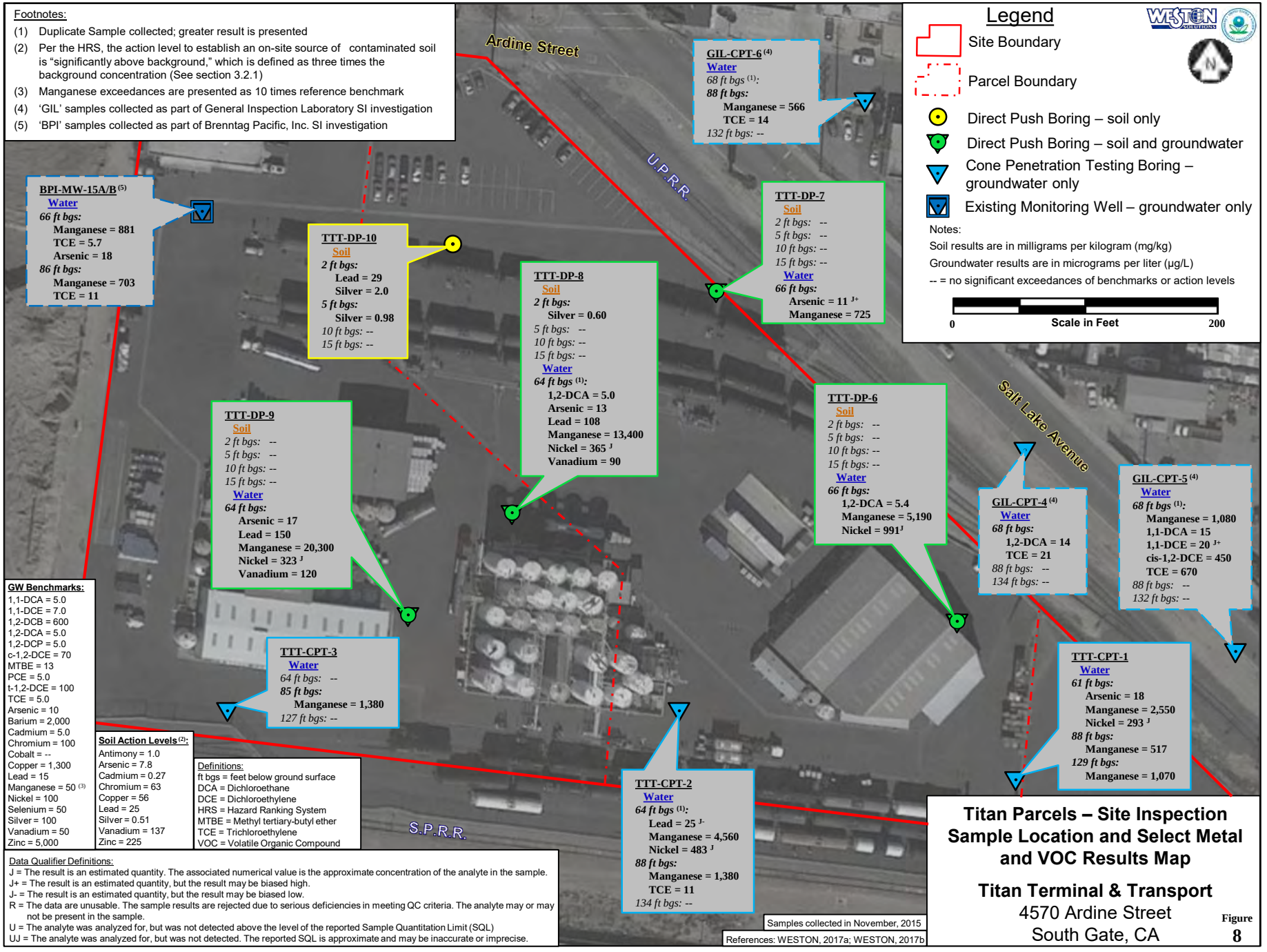


Site Inspection Sample Location Map

Titan Terminal & Transport
4570 Ardine Street
South Gate, CA

Figure **6**


Salt Lake Avenue
S.P.R.R.
U.P.R.R.
TTT-DP-6
Soil
2 ft bgs: --
5 ft bgs: --
10 ft bgs: --
15 ft bgs: --
Water
66 ft bgs:
1,2-DCA = 5.4
Manganese = 5,190
Nickel = 991 J
TTT-CPT-1
Water
61 ft bgs:
Arsenic = 18
Manganese = 2,550
Nickel = 293 J
88 ft bgs:
Manganese = 517
129 ft bgs:
Manganese = 1,070
TTT-DP-5
Soil
5 ft bgs (1):
Antimony = 3.8 J-
Arsenic = 12
Cadmium = 6.7 J
Chromium = 83 J
Copper = 144 J
Vanadium = 143 J
Zinc = 276 J
10 ft bgs:
Antimony = 1.8 J-
Arsenic = 15
Cadmium = 9.8 J
Copper = 241 J
Vanadium = 144 J
Zinc = 436 J
15 ft bgs:
Arsenic = 15
20 ft bgs:
Antimony = 14 J-
Arsenic = 57
Cadmium = 4.1 J
Chromium = 402 J
Copper = 231 J
GIL-CPT-5 (4)
Water
68 ft bgs (1):
Manganese = 1,080
1,1-DCA = 15
1,1-DCE = 20 J+
cis-1,2-DCE = 450
TCE = 670
88 ft bgs: --
132 ft bgs: --
TTT-DP-2
Soil
5 ft bgs: --
10 ft bgs: --
15 ft bgs:
Antimony = 5.6 J-
Arsenic = 71
Cadmium = 4.3
20 ft bgs:
Arsenic = 19
Vanadium = 163 J
Water
19 ft bgs:
Arsenic = 15,700
Cadmium = 13
Manganese = 11,500
Nickel = 836 J
TTT-DP-4
Soil
5 ft bgs:
Antimony = 6.9 J-
Arsenic = 38
Chromium = 170 J
10 ft bgs:
Antimony = 4.6 J-
Arsenic = 13 J
15 ft bgs:
Antimony = 5.7 J-
Arsenic = 617
Chromium = 137 J
Zinc = 341 J
20 ft bgs:
Arsenic = 44
Legend
Site Boundary
Parcel Boundary
Surface Impoundment (as shown in 1984 SI)
Direct Push Boring – soil only
Direct Push Boring – soil and groundwater
Cone Penetration Testing Boring – groundwater only
Notes:
Soil metal results are in milligrams per kilogram (mg/kg)
Groundwater results are in micrograms per liter (µg/L)
-- = no significant exceedances of benchmarks or action levels
(1) Duplicate Sample collected; greater result is presented
(2) Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
(3) Manganese exceedances are presented as 10 times reference benchmark
(4) 'GIL' samples collected as part of General Inspection Laboratory SI investigation
0
Scale in Feet
100
GW Benchmarks:
1,1-DCA = 5.0
1,1-DCE = 7.0
1,2-DCB = 600
1,2-DCA = 5.0
1,2-DCP = 5.0
c-1,2-DCE = 70
MTBE = 13
PCE = 5.0
t-1,2-DCE = 100
TCE = 5.0
Arsenic = 10
Barium = 2,000
Cadmium = 5.0
Chromium = 100
Cobalt = --
Copper = 1,300
Lead = 15
Manganese = 50 (3)
Nickel = 100
Selenium = 50
Silver = 100
Vanadium = 50
Zinc = 5,000
Soil Action Levels (2):
Antimony = 1.0
Arsenic = 7.8
Cadmium = 0.27
Chromium = 63
Copper = 56
Lead = 25
Silver = 0.51
Vanadium = 137
Zinc = 225
Definitions:
ft bgs = feet below ground surface
DCA = Dichloroethane
DCE = Dichloroethylene
HRS = Hazard Ranking System
MTBE = methyl tertiary-butyl ether
TCE = Trichloroethylene
VOC = Volatile Organic Compound
Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL)
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.
Samples collected in November, 2015
References: E&E, 1984; WESTON, 2017b
Solvay Parcel – Site Inspection
Sample Location and Select Metal and VOC Results Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, CA
Figure
7



Footnotes:

(1) Duplicate Sample collected; greater result is presented

(2) Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)

(3) Manganese exceedances are presented as 10 times reference benchmark

(4) 'GIL' samples collected as part of General Inspection Laboratory SI investigation

(5) 'BPI' samples collected as part of Brenntag Pacific, Inc. SI investigation

GW Benchmarks:

1,1-DCA = 5.0
1,1-DCE = 7.0
1,2-DCB = 600
1,2-DCA = 5.0
1,2-DCP = 5.0
c-1,2-DCE = 70
MTBE = 13
PCE = 5.0
t-1,2-DCE = 100
TCE = 5.0
Arsenic = 10
Barium = 2,000
Cadmium = 5.0
Chromium = 100
Cobalt = --
Copper = 1,300
Lead = 15
Manganese = 50 (3)
Nickel = 100
Selenium = 50
Silver = 100
Vanadium = 50
Zinc = 5,000

Soil Action Levels (2):

Antimony = 1.0
Arsenic = 7.8
Cadmium = 0.27
Chromium = 63
Copper = 56
Lead = 25
Silver = 0.51
Vanadium = 137
Zinc = 225

Definitions:
ft bgs = feet below ground surface
DCA = Dichloroethane
DCE = Dichloroethylene
HRS = Hazard Ranking System
MTBE = Methyl tertiary-butyl ether
TCE = Trichloroethylene
VOC = Volatile Organic Compound

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL)
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Samples collected in November, 2015

References: WESTON, 2017a; WESTON, 2017b

Titan Parcels – Site Inspection Sample Location and Select Metal and VOC Results Map

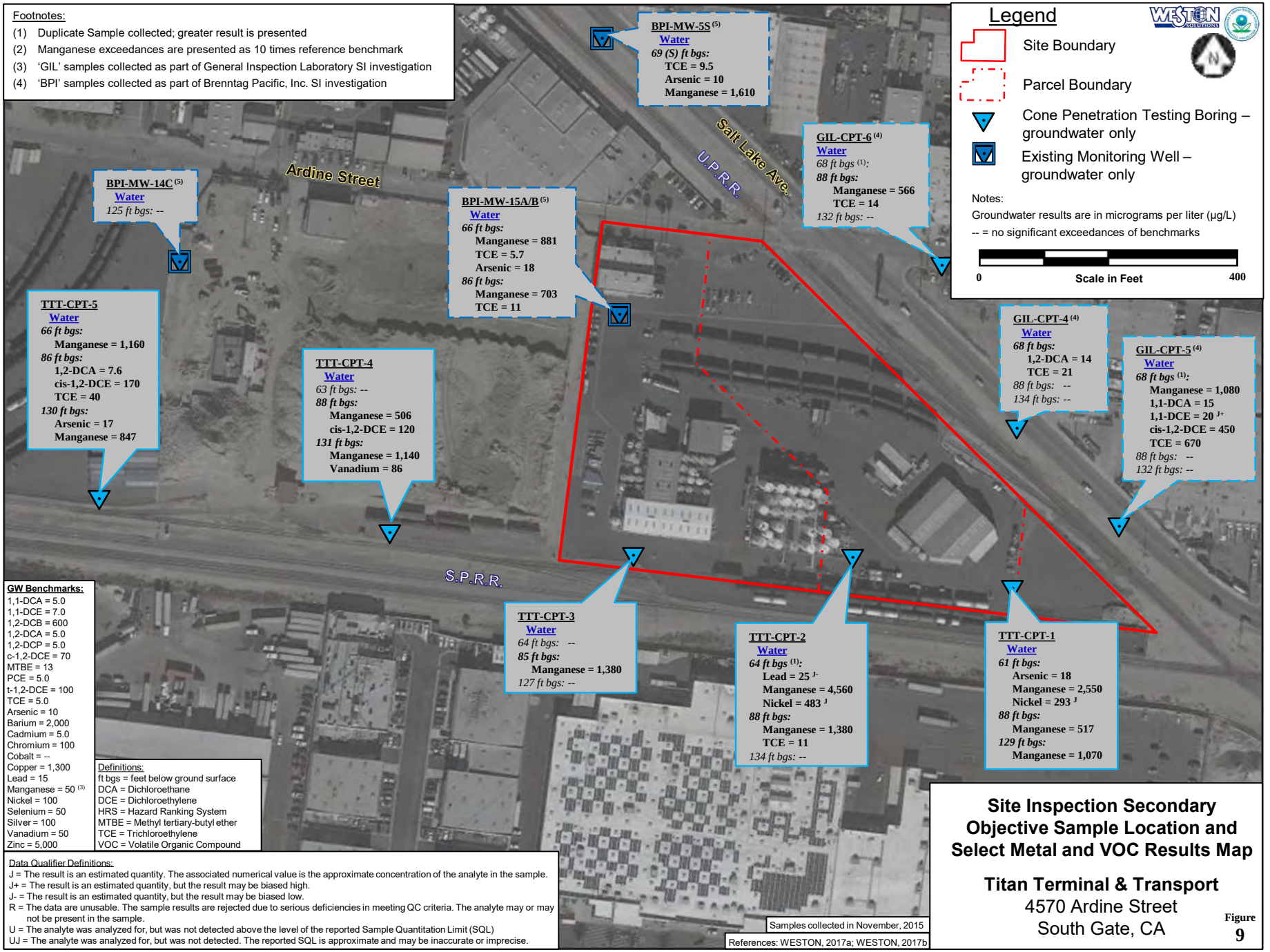
Titan Terminal & Transport

4570 Ardine Street
South Gate, CA

Figure 8

Footnotes:

(1) Duplicate Sample collected; greater result is presented
(2) Manganese exceedances are presented as 10 times reference benchmark
(3) 'GIL' samples collected as part of General Inspection Laboratory SI investigation
(4) 'BPI' samples collected as part of Brenntag Pacific, Inc. SI investigation



Legend

- Site Boundary
- Parcel Boundary
- Cone Penetration Testing Boring – groundwater only
- Existing Monitoring Well – groundwater only

Notes:
Groundwater results are in micrograms per liter (µg/L)
-- = no significant exceedances of benchmarks

0 Scale in Feet 400

GW Benchmarks:

1,1-DCA	5.0
1,1-DCE	7.0
1,2-DCB	600
1,2-DCA	5.0
1,2-DCP	5.0
c-1,2-DCE	70
MTBE	13
PCE	5.0
t-1,2-DCE	100
TCE	5.0
Arsenic	10
Barium	2,000
Cadmium	5.0
Chromium	100
Cobalt	--
Copper	1,300
Lead	15
Manganese	50 (3)
Nickel	100
Selenium	50
Silver	100
Vanadium	50
Zinc	5,000

Definitions:
ft bgs = feet below ground surface
DCA = Dichloroethane
DCE = Dichloroethylene
HRS = Hazard Ranking System
MTBE = Methyl tertiary-butyl ether
TCE = Trichloroethylene
VOC = Volatile Organic Compound

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL)
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Samples collected in November, 2015

References: WESTON, 2017a; WESTON, 2017b

Site Inspection Secondary Objective Sample Location and Select Metal and VOC Results Map

Titan Terminal & Transport

4570 Ardine Street
South Gate, CA

Figure 9

Appendices
(attached under separate cover)

Site Inspection Report
Titan Terminal & Transport
South Gate, Los Angeles County, California

EPA ID No.: CAD008353211
USACE Contract Number: W912P7-16-D-0001
Document Control Number: 20074.063.101.1009

Appendices

Appendix A: Latitude and Longitude Calculations Worksheet

Latitude and Longitude Calculation Worksheet (7.5' quads)
Using an Engineer's Scale (1/50)

Site Name Titan Terminal & Transport **CERCLIS #** CAD083532111

AKA

Address 4570 and 4610 Ardine Street

City South Gate **State** CA **ZIP** 90280

Site Reference Point Aerial – geometric center of site

USGS Quad Name **Scale**

Township **Range** **Section** 3 3 3

Map Datum ☐ 1927 ☐ 1983 **(Check one)** **Meridian**

Map coordinates at southeast corner of 7.5' quadrangle (attach photocopy)

Latitude E > **AN** **Longitude** E > **AW**

Map coordinates at southeast corner of 2.5' grid cell

Latitude E > **AN** **Longitude** E > **AW**

Calculations

LATITUDE(x)

A) Number of ruler graduations between 2.5' (150") grid lines **(a)**

B) Number of ruler graduations between south grid line and the site reference point **(b)**

C) Therefore, a/150 = b/x, where **x= Latitude in decimal seconds, north of the south grid line**

Expressed as minutes and seconds (1' = 60") = E > AN

Add to grid cell latitude = E > AN + E > AN

Site latitude = 33 ° 57 ' 23 " N

LONGITUDE(y)

A) Number of ruler graduations between 2.5' (150") grid lines **(a)**

B) Number of ruler graduations between south grid line and the site reference point **(b)**

C) Therefore, a/150 = b/x, where **x= Longitude in decimal seconds, west of the east grid line**

Expressed as minutes and seconds (1" = 60") = E > AW

Add to grid cell longitude = E > AN + E > AN

Site longitude = 118 ° 11 ' 13 " W

Appendix B:
Site Reconnaissance Interview and Observation Report/ Photographic Documentation

SITE RECONNAISSANCE INTERVIEW AND OBSERVATIONS REPORT/PHOTOGRAPHIC DOCUMENTATION

DATES: August 5, 2015; October 14, 2015; and November 16-20, 2015

OBSERVATIONS MADE BY: Brian P. Reilly, Weston Solutions, Inc. (WESTON)

SITE: Titan Terminal & Transport

EPA ID: CAD008353211

The following information was obtained during the initial Site Inspection (SI) walkthrough (August 2015), the underground utility survey (October 2015), and the SI Sampling event (November 2015):

The site was located in a primarily urban industrial area in the city of South Gate, directly adjacent from the city of Cudahy. The site was signed with the address 4570 Ardine St. Vehicular access to the site was on Ardine Street via a chain-link gate on the north side of the facility. The site was bordered to the north (across Ardine Street) by the Brenntag Pacific chemical manufacturing facility; to the west by the former US Gypsum facility, which was in the process of being demolished; to the south (across railroad main lines) by a retail center that included a Walmart, In-n-Out, Chipotle, and others; to the east (across Salt Lake Avenue and a railroad main line) by an apparent meat-packing and distribution facility, the Mistras non-destructive testing laboratory, and a tractor trailer fueling station.

The site was occupied by the Titan Terminal & Transport (Titan) offices at the northwest corner, a warehouse/storage complex at the southwest corner, an aboveground storage tank (AST) farm at the south-central portion, and a warehouse/storage complex at the southeastern portion. The southeasternmost corner of the property was separately enclosed behind an approximately 1.5 foot high masonry wall topped with a chain-link fence. A gate was located on the southern side of the boundary between this area and the Titan operational area. The only notable structure within the enclosure was a masonry wall at the southeastern corner that appeared to have once contained one-or-more large ASTs. A rail spur transected the northern portion of the site from west-to-east and connected with the east-adjacent railroad main. A second rail spur was situated along the southern boundary of the site and connected to the south-adjacent railroad main.

There were no residences, schools, or daycare facilities located on the site. In addition, no residences, schools, or daycare facilities were observed in the immediate vicinity of the site. No sensitive environments were located on the site and with the exception of the small grassy unpaved area located north of the Titan offices, the surface of the site appeared to be entirely covered with pavement and buildings. In addition, the entirety of the site, with the exception of the small yard north of the office building, was enclosed behind an approximately 6-foot high chain-link fence topped with barb-wire. The site appeared to be secured and generally inaccessible to the public as all visitors were required to check in at the office. Concrete-lined troughs were located throughout the facility that appeared to be designed to divert stormwater into an off-site drainage system.

Photographic Documentation
Titan Terminal & Transport (EPA ID: CAD008353211)

Photo 1 – View looking southwest across central portion of site at large AST farm and warehouse/storage buildings beyond (includes TTT-DP-8 location)

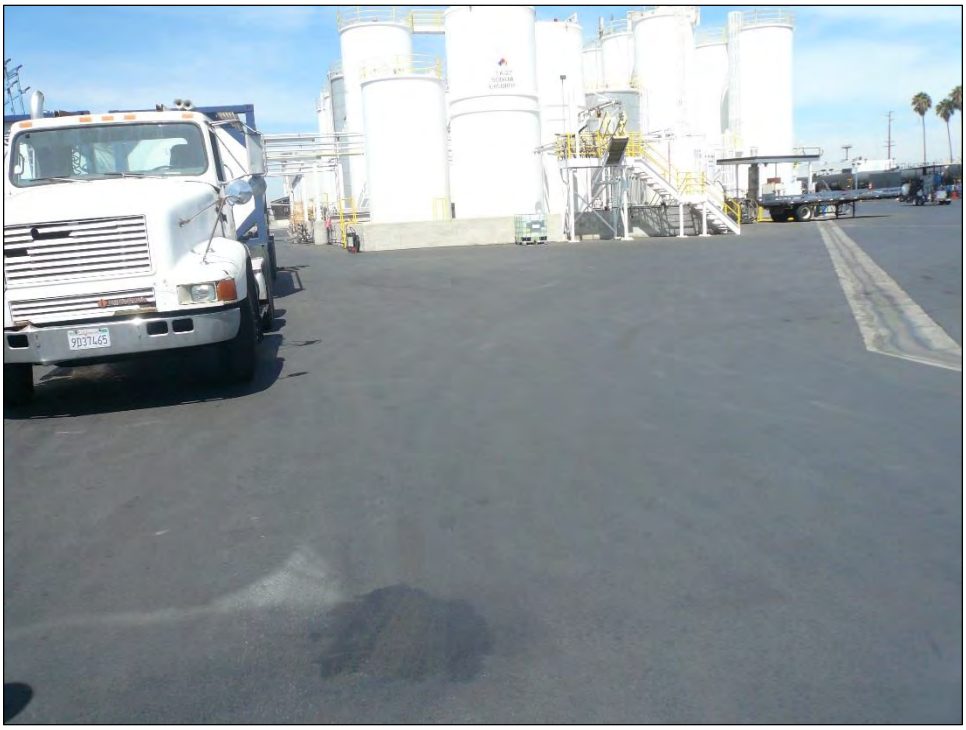


Photo 2 - View looking west across south-central portion of site at large AST farm (includes TTT-CPT-2 location)

Photographic Documentation
Titan Terminal & Transport (EPA ID: CAD008353211)

Photo 3 - View looking west at southwestern corner of site, SPRR rail spur connection, and former US Gypsum facility beyond (includes TTT-CPT-3 location)

Photo 4 - View looking east at northern portion of site and UPRR rail spur connection (includes TTT-DP-7 and TTT-DP-7 locations)

Photo 5 - View looking south-southeast at stormwater trough and monument for monitoring well MW-15 (associated with Brenntag Pacific SI sampling event)

Photo 6 - View looking northeast at northern portion of Solvay Parcel (within fenced area) and Mistras facility (General Inspections Labs site) beyond

Photographic Documentation
Titan Terminal & Transport (EPA ID: CAD008353211)

Photo 7 - View looking east-southeast at southern portion of Solvay Parcel. Note LAR drill rig at TTT-DP-4 with TTT-DP-2 temporary well in foreground

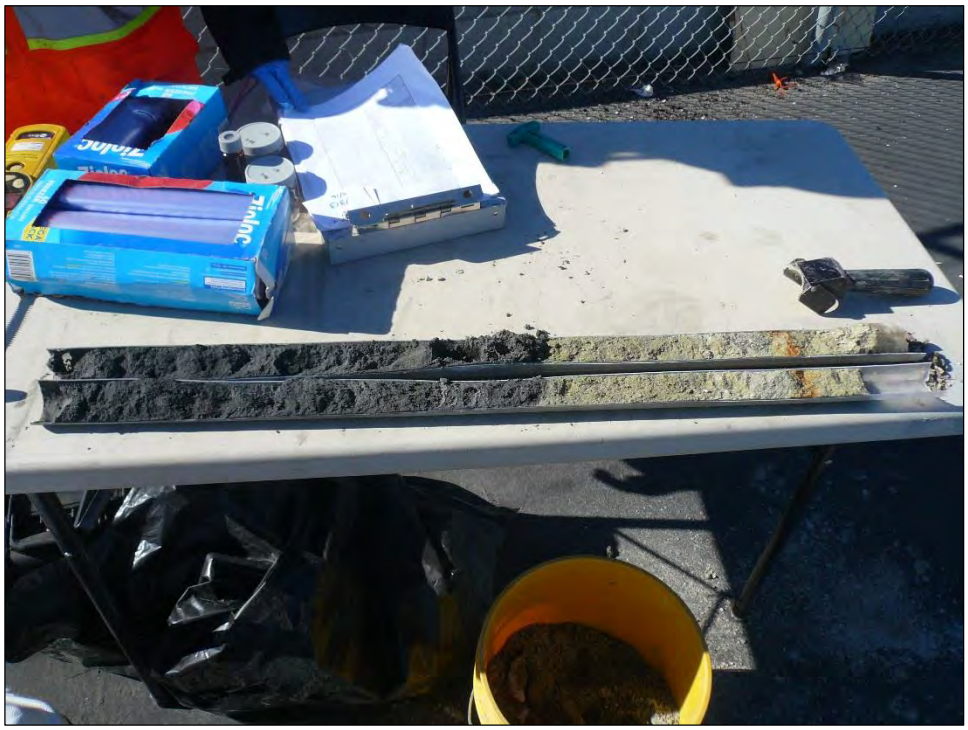


Photo 8 - View looking at 13 (right) through 17 (left) ft-bgs core from TTT-DP-4 within Solvay Parcel.

Photographic Documentation
Titan Terminal & Transport (EPA ID: CAD008353211)

Photo 9 - View looking southeast at CPT rig during the advancement of boring TTT-CPT-1 at the southeastern corner of site, adjacent to Solvay Parcel

Photo 10 - View looking southeast at DP rig during the advancement of boring TTT-DP-8 at the central portion of the site.

Appendix C:
Contact Log
and
Contact Reports

CONTACT LOG

SITE: Titan Terminal & Transport
EPA ID: CAD008353211

NAME	AFFILIATION	PHONE	DATE	INFORMATION
Robert Collar	Golden State Water Company, Central District	(714) 535-7711 ext. 355	03/31/2015	See Contact Report 3
Ron Hernandez	City of South Gate, Public Works	(323) 563-5796	03/31/2015	See Contact Report 2
Susan	Los Angeles County, Office of the Assessor	(562) 256-1701	04/18/2017	See Contact Report 1

CONTACT REPORT 1

AGENCY/AFFILIATION: County of Los Angeles		
DEPARTMENT: Office of the Assessor, South District Office		
ADDRESS/CITY: 1401 E. Willow Street, Signal Hill		
COUNTY/STATE/ZIP: Los Angeles, California, 90755		
CONTACT(S)	TITLE	PHONE
Susan	Assessment Clerk	(562) 256-1701
PERSON MAKING CONTACT: Brian P. Reilly		DATE: 18 April 2017
SUBJECT: Parcel Ownership Information		
SITE NAME: Titan Terminal & Transport		EPA ID#: CAD008353211

The current owner and recorded owner address of the three parcels associated with the Titan Terminal & Transport site as indicated by the Assessor's Office are:

6215-002-017: KRONOS PROPERTIES INC
4570 ARDINE ST, SOUTH GATE, CA 90280

6215-002-018: KRONOS PROPERTIES INC
4610 ARDINE ST, SOUTH GATE, CA 90280

6215-002-019: POULENC INC.
CN 7500 CRANBURY NJ 08512

CONTACT REPORT 2

AGENCY/AFFILIATION: City of South Gate		
DEPARTMENT: Public Works		
ADDRESS/CITY: 4244 Santa Ana Street, South Gate		
COUNTY/STATE/ZIP: Los Angeles, California, 90280		
CONTACT(S)	TITLE	PHONE
Ron Hernandez	Water Operations Foreman	(323) 563-5796
PERSON MAKING CONTACT: Anitra B. Rice		DATE: 04 January 2011
PERSON MAKING CONTACT: Amanda K.C. Reilly		DATE: 22 June 2011
PERSON MAKING CONTACT: Brian P. Reilly		DATE: 31 March 2015
SUBJECT: Public Water Distribution System Information		
SITE NAME: Titan Terminal & Transport		EPA ID#: CAD008353211

Mr. Hernandez indicated that the City of South Gate operates a drinking water supply system that serves approximately 95,115 customers. The blended system consists of six active drinking water wells (Wells 14, 18, 19, 24, 26, and 28), four stand-by wells (Wells 13, 23, 25, and 27), one inactive well (Well 22-B), and seven destroyed wells (Wells 7, 8, 9, 12, 20, and 22-A). The six active groundwater wells provide 100 percent of the drinking water. No single well provides more than 40 percent of the total demand at any given time. The City of South Gate does not sell or purchase water to other water systems and/or water users.

Wells 13, 14, 18, and 19 are treated at the wellhead due to elevated concentrations of tetrachloroethylene (PCE). Well 25 was put into standby status due to high manganese concentrations.

Well 25 partially collapsed in June 2009 during the El Centro earthquake. The well was relined to a Total Depth of 395 feet in May 2010. The collapse was at about 415 feet below ground surface (ft-bgs). From that interval to about 385 ft-bgs, gravel was placed as a filtering media in the existing 16-inch casing. The liner that was placed to a depth of 395 ft-bgs is telescopic with the new wire wrap screen and casing.

Well 27 partially collapsed during rehabilitation work and was relined to a depth of 920’ with a stainless steel wired wrapped liner in August 2001.

Well 7 was destroyed by cementing via tremmie pipe and shooting the well with explosive charges with ball bearings in January 2011 due to the well age and multiple contaminants, specifically trichloroethylene (TCE) and hexavalent chromium.

Well 12 was destroyed in September 1984 by cementing in the well. The well was destroyed due to: the well having been 60 years old at that point; small rocks and casing materials had to be

bailed out and the casing was determined to have failed at 30 ft-bgs and 40 ft-bgs; the pump was operating at only 48% efficiency; perforations were found to have been enlarged at 540'; compression breaks were identified at 164 ft-bgs and 304' ft-bgs; well was out of round, egg-shaped, at 396, 416, 530 and 536 ft-bgs; sand covering one foot of the bottom perforations, so 18 feet of 19 feet of total perforations were deemed usable.

Mr. Hernandez also confirmed the accuracy of the information in the following table:

WELL NAME	WELL STATUS	YEAR DESTROYED	WELL DEPTH (feet)	SCREENING INTERVAL(S) (ft-bgs)
Well 7	Destroyed	2011	830	500 - 600
Well 8	Destroyed	?	?	?
Well 9	Destroyed	?	813	?
Well 12	Destroyed	1984	617	535-554
Well 13	Standby	--	810	600-628; 640-684; 706-762;
Well 14	Active	--	813	615-745; 767-775;
Well 18	Active	--	790	620-630; 640-690; 706-762;
Well 19	Active	--	794	610-620; 626-666; 678-746;
Well 20	Destroyed	?	?	?
Well 22-A	Destroyed	?	?	?
Well 22B	Inactive	--	578	495-545
Well 23	Standby	--	856	530-624; 662-692; 772-798;
Well 24	Active	--	1290	650-710; 730-860; 880-920; 930-940; 950-966; 980-1040; 1050-1110; 1126-1174; 1184-1210; 1220-1246
Well 25	Standby	--	1331	565-620; 640-660; 670-700; 720-850; 860-900; 915-1026; 1040-1160; 1120-1230; 1250-1280; 1290-1310
Well 26	Active	--	1350	634-638; 641-644; 660-689; 700-710; 734-744; 1150-1154; 1188-1192; 1204-1206
Well 27	Standby	--	1200	500-520; 674-701; 716-725; 840-1180
Well 28	Active	--	1277	610-650; 660-690; 730-750; 770-785; 825-890; 930-960; 1030-1075;

CONTACT REPORT 3

AGENCY/AFFILIATION: Golden State Water Company		
DEPARTMENT: Central District		
ADDRESS/CITY: 12035 Burke Street, Suite 1, Santa Fe Springs		
COUNTY/STATE/ZIP: Los Angeles, California, 91773		
CONTACT(S)	TITLE	PHONE
Ana Chavez Robert Collar	Sr. Water Resources Analyst Sr. Hydrogeologist	(714) 535-7711 ext. 219 (714) 535-7711 ext. 355
PERSON MAKING CONTACT: Brian P. Reilly		DATE: 31 March 2015
SUBJECT: Public Water Distribution System Information		
SITE NAME: Titan Terminal & Transport		EPA ID#: CAD008353211

Bell/Bell Gardens System

According to Mr. Robert Collar, as of December 2014, the Bell/Bell Gardens System operates 7,481 service connections. The system consists of five active wells (Bissell #3, Clara #2, Gage #2, Otis #3, and Watson #1), one active/offline well (Bissell #2), two standby/inactive wells (Gage 1 and Priory 2); which supply 99 percent of the water in the system. In addition, the system formerly included four now-destroyed wells (Otis #1, Otis #2, Chanslor #1, and Hoffman #2). Bissell #2 has been offline since June 2012 due to sand issues. Gage 1 and Priory 2 are both standby/inactive, since July 2003 and March 2008, respectively, also due to sand issues. The remaining one percent of the water within the system is provided by the Central Basin Municipal Water District (CBMWD), who obtains its imported water from the Metropolitan Water District of Southern California (MWD). No individual well supplies more than 40 percent of the total supply. Watson #1 water is being treated to remove TCE and PCE.

Otis #1 and #2 were old wells and past their useful life, so they were destroyed and replaced by Otis #3 in 2007.

Chanslor #1 was destroyed in 2007 primarily due to its condition and mechanical problems. Note that VOCs had been detected in groundwater produced from this well, but it's not clear at this point what role, if any, VOCs played in the decision to destroy the well.

Hoffman #2 was destroyed because the need to treat groundwater from this well to remove hexavalent chromium made continued operation of this well uneconomical. Note that VOCs had also been detected in groundwater produced from this well, but it's not clear at this point what role, if any, VOCs played in the decision to destroy the well.

Mr. Collar also confirmed the accuracy of the information in the following table (next page) and verified that all information provided in this contact report is permissible to be presented in a publically-available document.

GSWC – Bell/Bell Gardens System				
Well Name	**Well Address (CONFIDENTIAL)**	**Screen Depths (feet below ground surface)**	**Percent Contribute to Drinking Water [1]**	**Avg. Gallons Per Minute [2]**
Bissell #2		575-1,275	0%	0
Bissell #3		595-615, 680-690, 705-730, 805-820, 900-925, 955-970, 1,005-1,025, 1,050-1,110	100%	1,695
Otis #3		520-530, 570-590, 900-940, 1,220-1,270, 1,400-1,570,	100%	665
Watson #1		243-249, 330-348, 420-427, 442-456	100%	845
Gage #1		282-301, 312-320, 428-434, 488-514	0%	0
Gage #2		290-320, 434-436, 499-502, 555-564, 569-573	100%	640
Priory #2		368-376, 380-400, 422-426, 561-581, 593-613	0%	0
Clara #2		330-350, 360-410, 420-470, 520-560, 610-640, 770-830, 960-970	100%	945
Chanslor #1		415-425	(Destroyed 2007)	N/A
Hoffman #2		437-444, 454-476, 477-494	(Destroyed 2007)	N/A
Otis #1		556-568, 578-596, 910-970, 1,280-1,330	(Destroyed 2004)	N/A
Otis #2		204-272, 285-341, 364-577, 586-906	(Destroyed 2004)	N/A

[1]Zero percent (0%) indicates that this well did not contribute drinking water to the system in 2014, whereas 100% indicates that this well did supply drinking water. Because of the way the system is operated, a fixed percentage of drinking water contributed to the system be each well cannot be defined. In other words, each well may contribute anywhere from 0 to 100% of the water in the system at any time throughout the year.

[2]Pumping rate of each well is an average for calendar year 2014, based on daily average pumping rates.

Appendix D:
Transmittal List

TRANSMITTAL LIST

Date: **August 2017**
Site Name: **Titan Terminal & Transport**
EPA ID No.: **CAD008353211**

****

A copy of the Site Inspection (SI) report for the above-referenced site should be sent to the following recipients:

Jeff Miller
Site Owner & Operator Representative
Titan Terminal & Transport
Kronos Properties, Inc.
830-13 A1A North #120
Ponte Vedra Beach, FL 32082

Jeffrey S. Lang, Esq.
Site Owner Representative
Solvay USA
8 Cedar Brook Drive
Cranbury, NJ 08512

Paul Nemanic
Site Owner Representative
Solvay USA
504 Carnegie Center
Princeton, NJ 08540

Javier Hinojosa
CA Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, CA 91311-6505

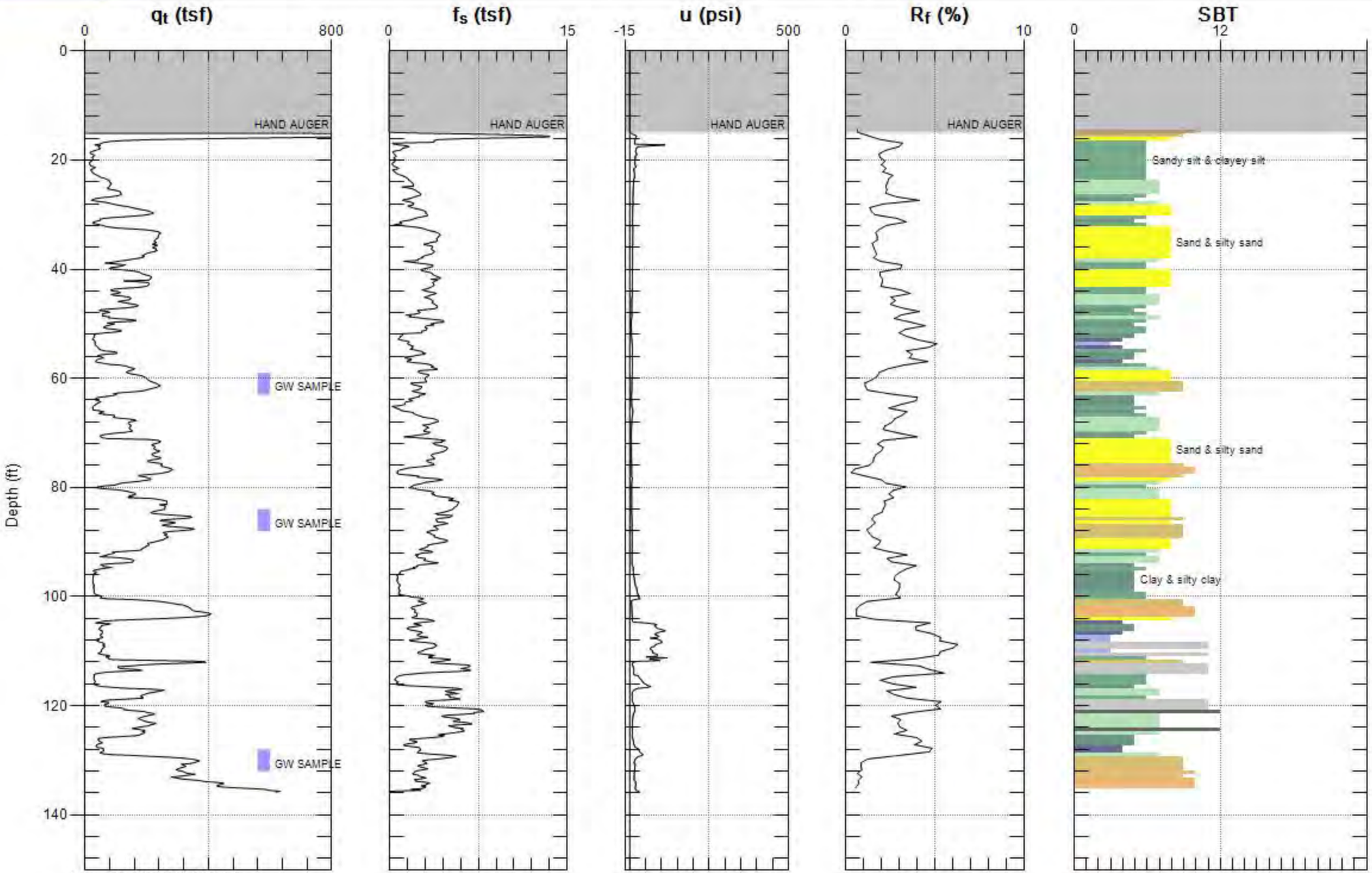
U.S. Environmental Protection Agency, Superfund Records Center
c/o Matt Mitguard
USEPA - Superfund Division
75 Hawthorne Street, SFD-6-1
San Francisco, CA 94105

Appendix E:
Cone Penetration Testing (CPT) Lithological Profile Reports

WESTON SOLUTIONS

Site: US EPA
Sounding: TTT-CPT-01

Engineer: B.REILLY
Date: 11/18/2015 08:27

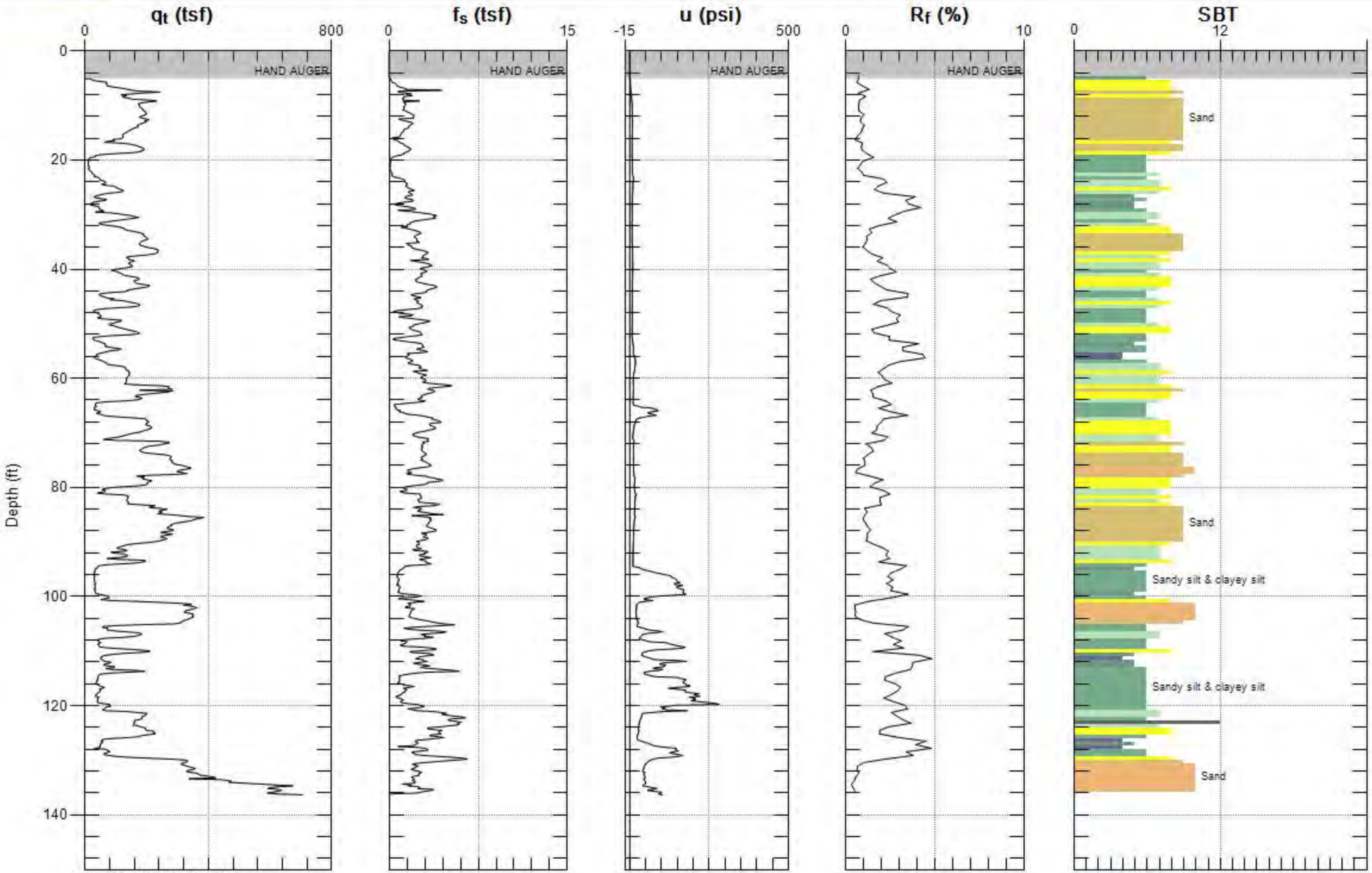


Max. Depth: 135.827 (ft)
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

WESTON SOLUTIONS

Site: US EPA
Sounding: TTT-CPT-02
Engineer: B.REILLY
Date: 11/16/2015 01:07

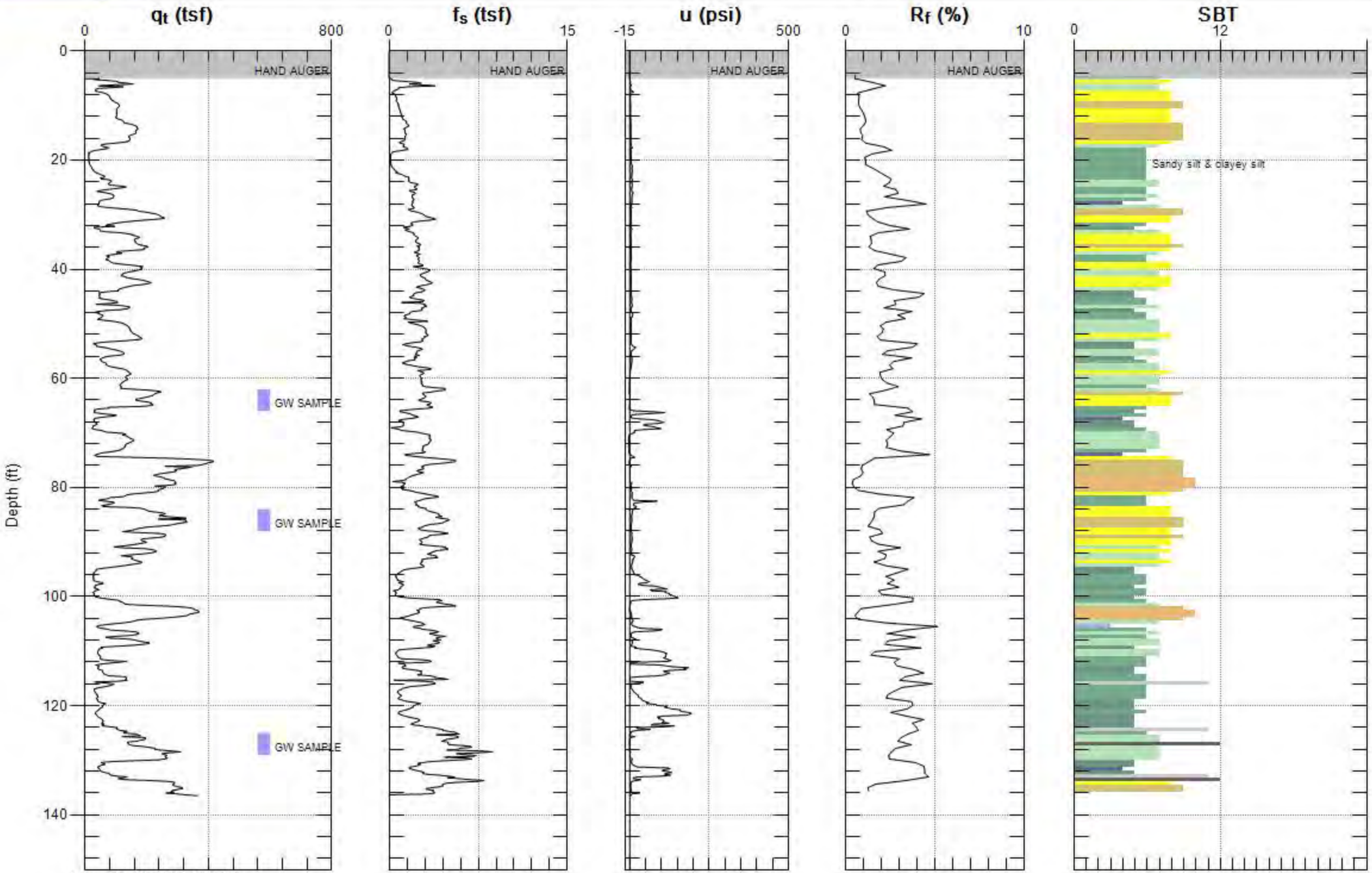


Max. Depth: 136.319 (ft)
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

WESTON SOLUTIONS

Site: US EPA
Sounding: TTT-CPT-03
Engineer: B.REILLY
Date: 11/17/2015 08:32

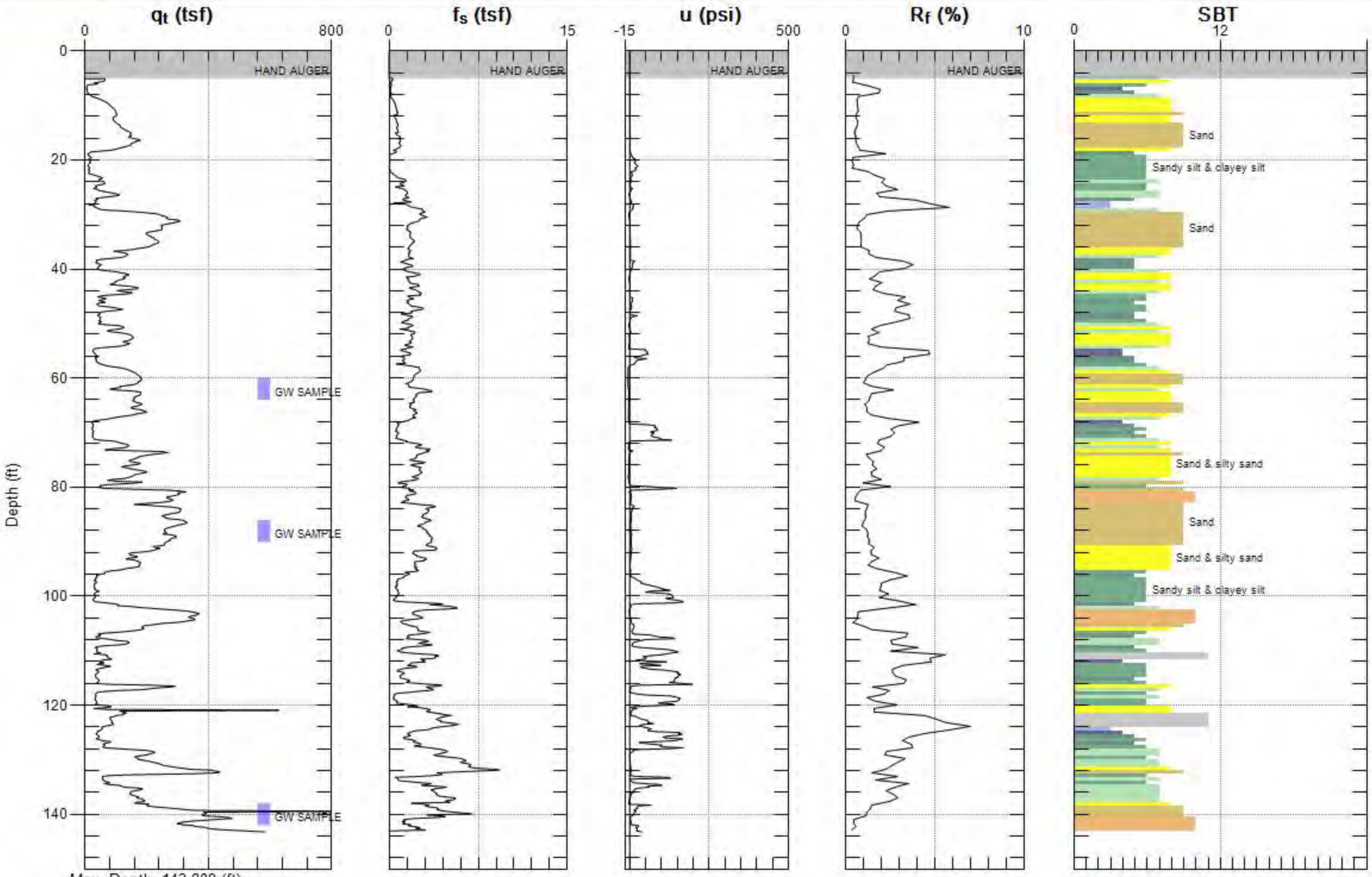


Max. Depth: 136.483 (ft)
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

WESTON SOLUTIONS

Site: US EPA
Sounding: TTT-CPT-04
Engineer: B.REILLY
Date: 11/17/2015 02:05



Max. Depth: 143.209 (ft)
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

Appendix F:
Sampling and Analysis Plan
(SAP)

Site Inspection
Sampling and Analysis Plan

Titan Terminal & Transport
4570 Ardine Street
South Gate, Los Angeles County, California

EPA ID No.: CAD008353211
USACE Contract Number: W91238-11-D-0001
Interagency Agreement No.: 95777001-0
Document Control Number: 20074.063.101.1009

September 2015

Prepared for:
U.S. Environmental Protection Agency
Region 9

Prepared by:
Weston Solutions, Inc.
1340 Treat Blvd., Suite 210

Site Inspection
Sampling and Analysis Plan

Titan Terminal & Transport
4570 Ardine Street
South Gate, Los Angeles County, California

EPA ID No.: CAD008353211
USACE Contract Number: W91238-11-D-0001
Interagency Agreement No.: 95777001-0
Document Control Number: 20074.063.101.1009

Approved by: _____

Brian P. Reilly, Project Manager
WESTON Solutions, Inc.

Approved by: _____ 9/21/15

Matt Mitguard, Site Assessment Manager
U.S. Environmental Protection Agency, Region 9

Approved by: _____

Eugenia E. McNaughton, Ph.D., Quality Assurance Manager
U.S. Environmental Protection Agency, Region 9

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List of Acronyms

AOC	Analyte of Concern
AST	aboveground storage tank
bgs	below ground surface
Brenntag	Brenntag Pacific, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CPT	Cone Penetration Testing
CLP	Contract Laboratory Program
CRQL	Contract Required Quantitation Limit
DCE	dichloroethylene
DTSC	Department of Toxic Substances Control
DQO	Data Quality Objective
EPA	United States Environmental Protection Agency
ft^2	square-feet
GENIL	General Inspection Laboratories
GSWC	Golden State Water Company
HCl	hydrochloric acid
HDPE	High-Density Polyethylene
HHMD	LA County Fire Department, Health Hazardous Materials Division
HNO_3	nitric acid
HRS	Hazard Ranking System
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
IDW	investigation-derived wastes
LADPW	Los Angeles County Department of Public Works
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
mL	milliliters
MQO	Measurement Quality Objective
MRL	Method Reporting Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NPL	National Priorities List
PA	Preliminary Assessment
PCE	tetrachloroethylene
PM	Project Manager
PPE	personal protective equipment
QA	Quality Assurance
QC	Quality Control
RCRIS	Resource Conservation and Recovery Information System
RPD	Relative Percent Difference
RSCC	Regional Sample Control Coordinator
RSL	Regional Screening Level
RWQCB	Regional Water Quality Control Board

SAP	Sampling and Analysis Plan
SAM	Site Assessment Manager
SEMS	Superfund Enterprise Management System
SSA	Site Screening Assessment
SI	Site Inspection
SOP	Standard Operating Procedure
Stauffer	Stauffer Chemical Company
SVE	soil vapor extraction
TCE	trichloroethylene
Titan	Titan Terminal & Transport (site)
TRI	Toxics Release Inventory
TSP	trisodium phosphate
UST	underground storage tank
VOC	volatile organic compound
WESTON	Weston Solutions, Inc.
µg/L	microgram per liter

1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), Weston Solutions, Inc. (WESTON®) has been tasked to conduct a Hazard Ranking System (HRS) Site Inspection (SI) of the Titan Terminal & Transport (Titan) site in South Gate, Los Angeles County, California. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances to the environment, and has been adopted by the United States Environmental Protection Agency (EPA) to assist in setting priorities for further site evaluation and potential remedial action. The HRS is the primary method for determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites where the EPA may conduct remedial actions.

This Sampling and Analysis Plan (SAP) describes the project and data use objectives, data collection rationale, quality assurance goals, and requirements for sampling and analysis activities. The SAP also defines the sampling and data collection methods that will be used for this project. The SAP is intended to accurately reflect the planned data-gathering activities for this site investigation; however, site conditions and additional EPA direction may warrant modifications. All significant changes will be documented in the final report.

WESTON has been tasked to gather and review existing, available information regarding site conditions, identify and fill data gaps, and prepare HRS scoresheets and rationale for the site.

The specific field sampling and chemical analysis information pertaining to the site is addressed in this SAP, in accordance with the EPA documents EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (QA/R-5), March 2001; Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4), February 2006; and Data Quality Objective Process for Superfund (EPA 540/G-93/71), August 1993.

1.1 Project Organization

The following is a list of project personnel and their responsibilities (see Table 1):

Table 1: Organizational Chart

Title/Responsibility	Name	Phone Number
EPA Site Assessment Manager	Matt Mitguard	(415) 972-3096
EPA Quality Assurance Manager	Eugenia E. McNaughton	(415) 972-3411
WESTON Program Manager and Quality Assurance	Christina Marquis	(818) 350-7308
WESTON Project Manager	Brian Reilly	(541) 593-3800
EPA Region 9 Sample Control Coordinator	Susan Sturges	(510) 412-2389

EPA Site Assessment Manager (SAM) - The EPA SAM is Matt Mitguard. Mr. Mitguard is the primary decision maker for this investigation and is the primary contact for the WESTON Project Manager.

EPA Quality Assurance (QA) Manager - The EPA QA Manager is Eugenia E. McNaughton, Ph.D. Ms. McNaughton will be responsible for reviewing the SAP, and arranging for data validation once sampling is completed.

WESTON Program Manager and QA Coordinator - The WESTON Program Manager and QA Coordinator is Christina Marquis. Ms. Marquis is responsible for the overall performance of all tasks assigned to WESTON by the EPA. Ms. Marquis is authorized to approve Sampling Analysis Plans for Southern California sites conducted by WESTON to ensure project quality assurance goals are met.

WESTON Project Manager (PM) - The WESTON PM is Brian Reilly. Mr. Reilly is responsible for preparing the SAP, working with the laboratories, implementing the sampling design, collecting, handling, documenting, and transporting samples, generating field documentation of sampling activities, and working with the WESTON QA Coordinator to ensure project quality assurance goals are met.

EPA Region 9 Sample Control Coordinator (RSCC) – The EPA RSCC is Susan Sturges. Ms. Sturges will determine which laboratories will perform the analyses for the project. If the Contract Laboratory Program (CLP) program will be used, the RSCC will assign CLP numbers. The RSCC will be responsible for delivering the raw data to the EPA SAM.

Analytical Laboratory - The EPA RSCC will arrange for laboratory services for metals by ISM02.2 [using Inductively Coupled Plasma Mass Spectrometry (ICP-MS)] or equivalent, and for volatile organic compounds (VOCs) by SOM02.2 or equivalent.

Data Validation – The EPA QA Office will arrange data validation for this investigation.

1.2 Distribution List

Copies of the final SAP will be distributed to the following persons and organizations:

- Matt Mitguard, EPA Region 9
- Eugenia E. McNaughton, Ph.D., EPA QA Manager
- Weston Solutions, Inc. files
- Site Owners and/or Operators, per their request.

1.3 Statement of the Specific Problem

The apparent problems at the Titan site, which contributed to EPA's determination that a SI was necessary, are as follows:

- The site has been used for the manufacturing of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993 (BEI, 1994; DTSC, 2014b; Weston, 2015).

- From approximately 1924 to 1960, an estimated 200 tons of arsenic-containing sludge waste was disposed of into an on-site unlined surface impoundment (BEI, 1994; DTSC, 2014b).

- Subsurface investigations conducted at the site in the early 1980s identified elevated concentrations of metals in on-site soil, groundwater, and/or surface impoundment materials including, but not limited to: arsenic, cadmium, and chromium (BEI, 1994; DTSC, 2014b).

- The site is situated upgradient with respect to the regional groundwater flow from several municipal supply wells that have been identified with elevated concentrations of volatile organic compounds (VOCs) and/or metals. The site is located approximately 0.26 mile northwest of the City of South Gate's Well 7, which was removed from service in approximately 2002 and destroyed in January 2011 due primarily to elevated concentrations of contaminants, including trichloroethylene (TCE), arsenic, and chromium. The site is also located approximately 0.47 mile west-southwest of the Golden State Water Company (GSWC) - Bell/Bell Gardens system's Hoffman Well 02, which was removed from service in approximately late 2000 and destroyed in approximately October 2007 due primarily to elevated concentrations of chromium (DTSC, 2014a; RWQCB, 2015; Weston, 2015).

2.0 SITE DESCRIPTION

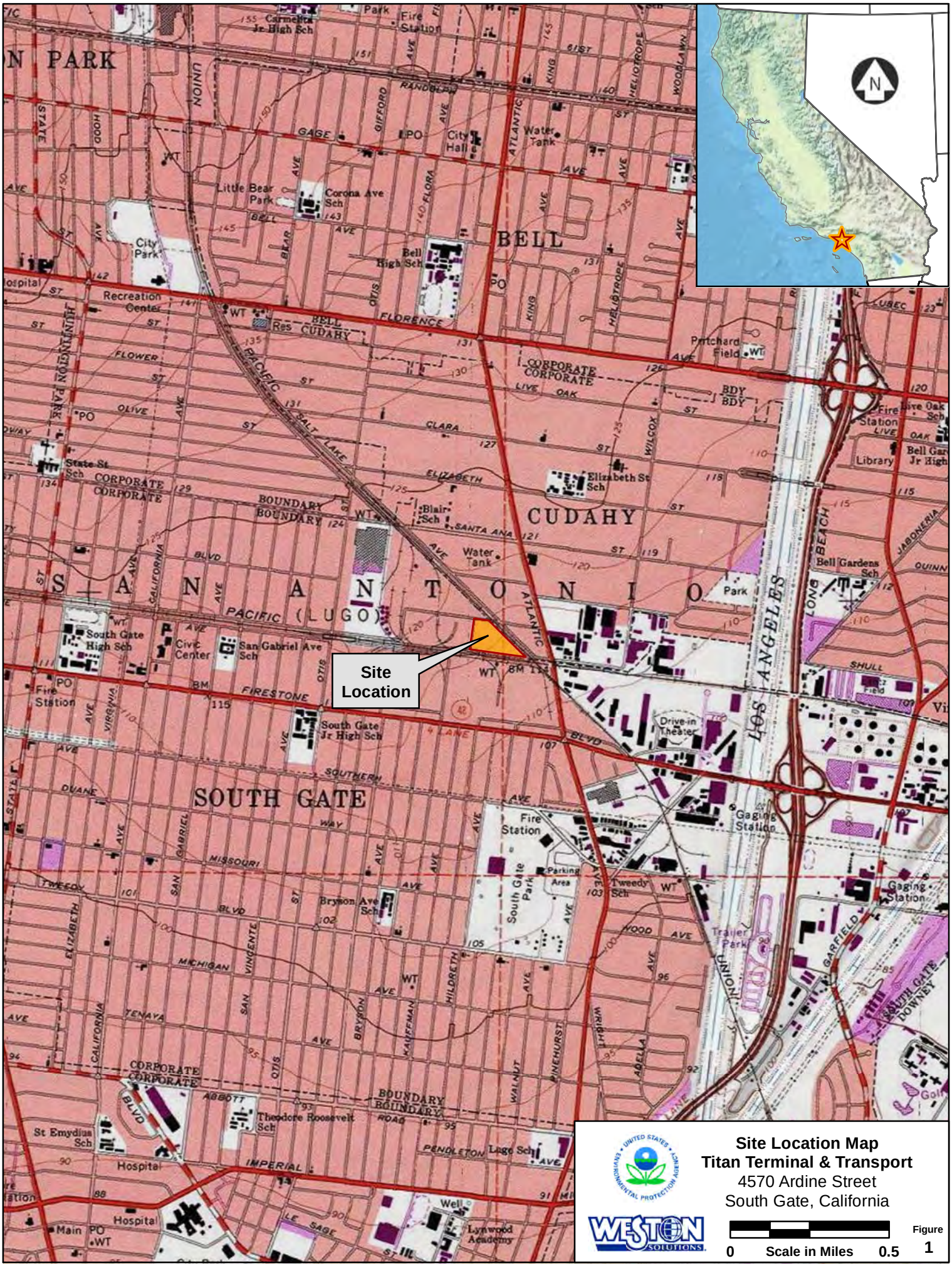
2.1 Location and Description

The Titan site is located at 4570 Ardine Street in South Gate, California. Additional addresses associated with the site property include 4610 Ardine Street. The geographic coordinates for the site are 33° 57' 23.16" North latitude and 118° 11' 13.34" West longitude. The location of the site is shown in Figure 1.

The Titan site occupies approximately 6.4 acres in an industrial and commercial area. The site is bordered to the north across Ardine Street by the Brenntag Pacific, Inc. (Brenntag) chemical storage and distribution facility (EPA ID No.: CAD008287732). The site is bordered to the east, across the Union Pacific railroad tracks and Salt Lake Avenue, by the Mistras NDT non-destructive testing facility [General Inspection Laboratories (GENIL) site; EPA ID No.: CAD027897164], the Axel's Meat Co / Quality Meat Co Inc. food distribution facility, and the Roche Commercial Fueling Enterprise tractor-trailer fueling facility. The site is bordered to the south, across the Southern Pacific railroad tracks, by a large retail shopping center. The site is bordered to the west by the former United States Gypsum Company wallboard manufacturing facility (EPA ID No.: CAD008323073) (DTSC, 2014b; Weston, 2015).

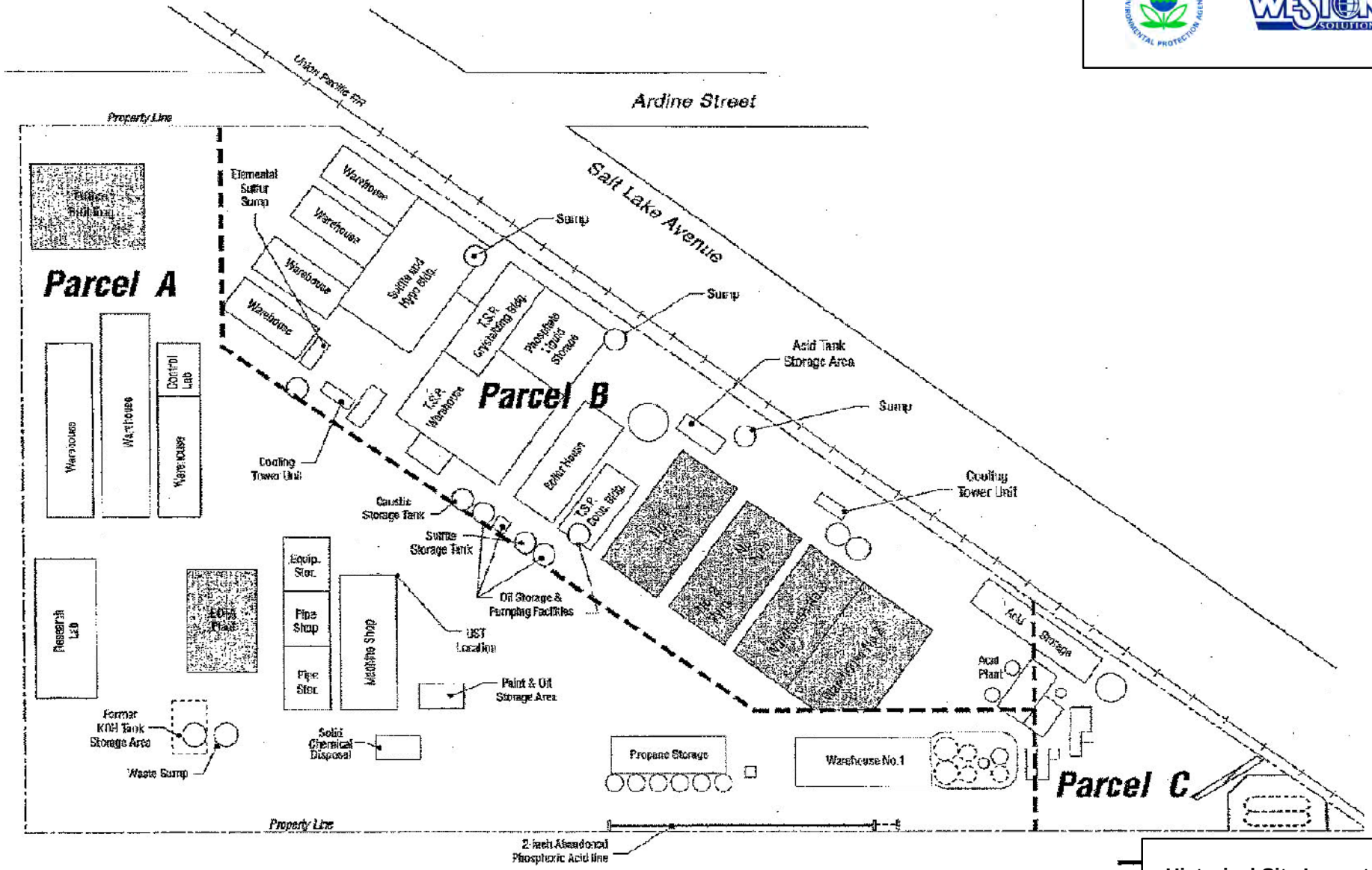
The Titan site is composed of three Los Angeles County Assessor parcels, which are identified as 6215-002-017, -018, and -019. As of August 2015, the site was occupied by a 6,600 square-foot (ft^2) office building located at the northwest portion, a 2,750 ft^2 storage building and a 11,220 ft^2 storage building located at the southwestern portion, and a 10,080 ft^2 warehouse building located at the southeastern portion. Railroad spurs with operating railcars were located at the central and southern portions of the site. At least 40 aboveground storage tanks (ASTs) were located on the site, primarily in the south-central and southwestern portions. The surface of the site appeared to be entirely covered in asphalt and/or concrete and the site appeared to be entirely enclosed behind a chain-link fence. Primary vehicle access to the facility was from Ardine Street. The current site layout is shown in Figure 2 (DTSC, 2014b; Weston, 2015).

Historically, at least 15 storage and warehouse buildings, a Machine Shop, a chemical manufacturing plant, and a research lab occupied the site. At least five sumps were also located throughout the site and two underground storage tanks (USTs) were located adjacent to the former Machine Shop in the central portion of the site. The majority of these historical structures, which were associated with former chemical manufacturing operations, were demolished in approximately late 1994. An unlined surface impoundment was located in the southeast corner of the site on parcel 6215-002-019. The impoundment measured approximately 180 feet by 130 feet, and extended to a depth of approximately 25 feet. The historical site layout is shown in Figure 3 (BEI, 1994; DTSC, 2014b; Weston, 2015).


Site Location
BELL
CUDAHY
SOUTH GATE
LOS ANGELES
Site Location Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California
Figure 1
0
Scale in Miles
0.5

Current Site Layout Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California

Figure
2



0 Scale in Feet 200

Historical Site Layout Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California

Figure
3

2.2 Operational History

The Titan site is currently owned by two separate entities. Parcels 6215-002-017 and 6215-002-018 are currently owned by Kronos Properties, Inc., which has owned these properties since approximately 1993. Parcel 6215-002-019, which includes the historical surface impoundment, is owned by Poulenc, Inc. Prior to 1993, Poulenc, Inc., through its preceding acquired entities (i.e., A. R. Maas Chemical Company, Victor Chemical Company, Stauffer Chemical Company, Chesebrough-Pond's Manufacturing Company, Imperial Chemical Industries, and Rhone-Poulenc Basic Chemicals Company), owned the entirety of the site since it was first developed in approximately 1924 (BEI, 1994; Weston, 2015).

Historical operations at the Titan site include the manufacturing of TSP, sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993. No manufacturing operations or generation of hazardous waste are currently conducted at the site (BEI, 1994; DTSC, 2014b; Weston, 2015).

Operations at the site were initiated in approximately 1924 by the A. R. Maas Chemical Company and remained relatively unchanged through 1981. These operations primarily included the manufacturing of three products: TSP, sodium sulfide, and phosphoric acid. Phosphoric acid manufacturing reportedly ceased in approximately 1981, although the facility continued to manufacture TSP and sodium sulfide. The raw materials used to manufacture the products included, but were not limited to: soda ash, phosphorus, sulfuric acid, and sodium hydroxide. The on-site business operations and assets of A.R. Mass were acquired by the Victor Chemical Company in approximately 1949, which was in turn acquired by the Stauffer Chemical Company (Stauffer) in approximately 1960. In approximately 1985, the on-site assets of Stauffer were acquired by the Chesebrough-Pond's Manufacturing Company, which divested these assets to Imperial Chemical Industries in early 1987. Imperial Chemical sold the site assets later that year to the Rhone-Poulenc Basic Chemicals Company, which maintained on-site operations until the facility was shut down in approximately 1993 (BEI, 1994; DTSC, 2014b; Weston, 2015).

Waste generated from TSP manufacturing activities at the site consisted of filtered solids, which were stored on site and subsequently removed by an outside waste hauler. In the sodium sulfide process, a sulfur-burning unit and scrubber were used to separate out the impurities. Wastes generated during sodium sulfide manufacturing activities were also stored on site and removed by an outside hauler. The phosphoric acid plant, which operated from approximately 1924 through 1981, generated an arsenic-containing sludge waste. This waste reportedly contained approximately 2.8 percent arsenic trisulfide and 2-3 percent phosphoric acid. From approximately 1924 to 1960, an estimated 200 tons of arsenic-containing sludge was disposed of into an unlined surface impoundment at the southeastern portion of the property. The surface impoundment was reportedly resurfaced with asphalt in approximately 1960, prior to the acquisition of the facility by Stauffer. Between approximately 1960 and 1981, the arsenic-containing waste was stored in an on-site storage tank and subsequently disposed off-site by an outside waste hauler (BEI, 1994; DTSC, 2014b; Weston, 2015).

Since 1994, Titan Terminal & Transport has been operating at the site as a hazardous and non-hazardous materials distribution and bulk storage facility. Bulk materials; which include but are

not limited to: acids, bases, agricultural feed, and food grain products; are typically stored on site for no more than 30 days. Dilution and/or blending of bulk liquids within on-site ASTs is also conducted at the site. Stored materials are occasionally repackaged and loaded into drums for transfer to various facilities. Operations do not include manufacturing, treatment, or disposal of hazardous materials (DTSC, 2014b; Weston, 2015).

Table 2: Current and Historic On-site Operators

Location	Operator	Primary Operation(s)	Date
Entirety of Site (APNs: 6215-002-017; 6215-002-018; 6215-002-019)	A.R. Mass Chemical Company	Manufacture of TSP, NA_2S, and H_3PO_4	1924 - 1949
	Victor Chemical Company [1]	Manufacture of TSP, NA_2S, and H_3PO_4	1949 - 1960
	Stauffer Chemical Company [1]	Manufacture of TSP, NA_2S, and H_3PO_4	1960 – 1985 [2]
	Chesebrough-Pond's Manufacturing Co. [1]	Manufacture of TSP and NA_2S	1985 - 1987
	Imperial Chemical Industries [1]	Manufacture of TSP and NA_2S	1987
	Rhone-Poulenc Basic Chemicals Co. [1]	Manufacture of TSP and NA_2S	1987 - 1993
Northern Site Parcels (APNs: 6215-002-017; 6215-002-018)	Titan Terminal & Transport	Hazardous and non-hazardous materials distribution and bulk storage	1994 - Present
Southeast Site Parcel (APN: 6215-002-019)	Rhone-Poulenc Basic Chemicals Co. [1]	None	1994 - Present

APN = Assessor Parcel Number (Los Angeles County)
H_3PO_4 = phosphoric acid
NA_2S = sodium sulfide
TSP = trisodium phosphate

Footnotes:
1 = Includes the business operations and assets of previous operator
2 = On-site manufacturing of phosphoric acid reportedly ceased in approximately 1981

References: ACS, 2014; BEI, 1994; DTSC, 2014b; OCI, 2014; Sitton, 2001; TMS, 1950; TTT, 2014.

2.3 Regulatory Involvement

2.3.1 U. S. Environmental Protection Agency

The Titan site is listed in the Resource Conservation and Recovery Information System (RCRIS) database as 'Rhone-Poulenc Basic Chemicals Co.' (Handler ID: CAD008353211); a Small Quantity Generator addressed at 4570 Ardine Street (Weston, 2015).

The site is listed in the Toxics Release Inventory (TRI) database as 'Rhone-Poulenc Basic Chemicals Co.' (TRI ID: 90280STFFR4570A), addressed at 4570 Ardine Street. The most recent release information provided in the TRI database is from 1993 (Weston, 2015).

2.3.2 California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

The Titan site is listed in California Department of Toxic Substances Control's (DTSC) EnviroStor database as Titan Terminal & Transport (Envirostor ID: 19280830), addressed at 4570 Ardine Street. The site is listed as an 'Evaluation' site that was referred to EPA as of June 6, 1995. DTSC completed a Site Screening Assessment (SSA) for the Titan site in June 2014. The SSA was prepared for EPA and has a final sign-off date of August 20, 2014 (DTSC, 2014b; Weston, 2015).

In 1981, DTSC (formerly the California Department of Health Services, Toxic Substances Control Program) directed Stauffer to sample soils and materials in and around the on-site surface impoundment. Additional information regarding this investigation is provided in Section 3.0 (BEI, 1994).

2.3.3 California Environmental Protection Agency, Regional Water Quality Control Board (RWQCB)

The Titan site is listed in the Regional Water Quality Control Board's (RWQCB) GeoTracker database as Rhone-Poulenc Chemicals Company (GeoTracker ID: T0603702717; Case No.: I-00524), addressed at 4570 Ardine Street. The site is listed as a 'LUST Cleanup Site' with a cleanup status as 'Completed – Case Closed as of 8/26/1996.' The potential contaminant of concern is listed as 'gasoline' and the potential media affected is 'soil' (Weston, 2015).

2.3.4 Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD)

Reportedly, the Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD) has conducted oversight over the management of hazardous substances and waste at the Titan site. No additional information is known regarding specific HHMD activities related to the site or any notices of violation potentially issued to the facility by HHMD (DTSC, 2014b).

2.3.5 Los Angeles County Department of Public Works (LADPW)

Between at least 1989 and 1995, the Los Angeles County Department of Public Works (LADPW) conducted direction and oversight over a leaking UST case at the Titan site; which included soil

matrix sampling, operation of a soil vapor extraction (SVE) system, and the maintenance and sampling of a limited groundwater monitoring well network. Presumably, the SVE system and monitoring well network were destroyed subsequent to the case closure in August 1996. The leaking USTs and associated investigations appear to be solely related to an unauthorized release of petroleum hydrocarbons to subsurface soils. Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA (Weston, 2015).

2.4 Geology/Hydrogeology

The Titan site lies within the Central Subbasin in the Coastal Plain of the Los Angeles Groundwater Basin. The Central Subbasin is generally bound to the north by the folded, uplifted and eroded Tertiary basement rocks of the La Brea High surface divide; to the northeast and east by the less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; to the southeast by the Coyote Creek flood control channel (approximate Los Angeles County/Orange County boundary); and to the southwest by the Newport Inglewood Uplift, a regional anticline associated with the Newport Inglewood fault system. The subbasin has historically been further divided into four areas; the Los Angeles Forebay at the northwest, the Montebello Forebay at the north, the Whittier Area at the northeast, and the Pressure Area at the central and southwest. The forebays are characterized by generally unconfined and relatively interconnected aquifer systems. The Montebello Forebay, as well as the Los Angeles Forebay to a lesser degree, serves as the primary groundwater recharge area for both shallow and deep aquifers across the entirety of the subbasin. The Central Basin Pressure Area is characterized by generally confined aquifer systems separated by relatively impermeable clay layers, although semipermeable zones within these layers allow aquifers to be interconnected in some areas. The Los Angeles and San Gabriel rivers pass across the surface of the Central Basin, primarily by way of engineered concrete channels, on their way to the Pacific Ocean. The average net annual precipitation in the subbasin is approximately 12 inches (DWR, 1961; DWR, 2004).

The Titan site is located within the northern portion of the Central Basin Pressure Area with the Los Angeles Forebay to the northwest and the Montebello Forebay to the northeast. Throughout the Pressure Area, groundwater occurs in Holocene alluvium, the upper Pleistocene Lakewood Formation, and the lower Pleistocene San Pedro Formation. The aquifers underlying the site are, in descending order: the Gaspur, Exposition, Gage/Gardena, Jefferson, Lynwood, Silverado, and Sunnyside. Underlying the Recent alluvium, which includes the Gaspur aquifer, sediments of the upper Pleistocene Lakewood Formation, which includes the Exposition and Gage/Gardena aquifers, are present to a depth of approximately 300 to 400 feet bgs. Sediments of the lower Pleistocene San Pedro Formation, which includes the Lynwood through Sunnyside aquifers, unconformably underlie the Lakewood Formation and extend to a depth of approximately 1,300 feet bgs. The regional groundwater flow direction within the subbasin, which was calculated using data from wells screened within the upper San Pedro Formation (Lynwood through Silverado aquifers), is generally to the southwest with local and temporal variations from approximately west-southwest to southeast. Based upon data collected between 2007 and 2013, flow within these deeper aquifers in the vicinity of the site trended towards the southwest with temporal variations from west to south-southwest (DWR, 1961; DWR, 2004; WRD, 2014).

Throughout much of the subbasin, the Pleistocene-age aquifers are under confined conditions due to the presence of fine-grained, low-permeability interbedded sediments. Although these fine-grained sediments, or aquicludes, generally restrict the downward migration of groundwater from overlying aquifers, semipermeable zones within the aquicludes allow aquifers to be interconnected in some areas. In addition, hydrogeologic modeling of multi-aquifer systems similar to that found in the Central Basin Pressure Area, have concluded that groundwater wells screened across multiple aquifers (or wells with improperly constructed annular seals that cross multiple aquifers) can act as a direct pathway for the migration of significant volumes of shallow groundwater into deep confined aquifers when vertical hydraulic head variations create a downward hydraulic gradient. The process of this downward migration is increased in areas where the deeper aquifers have periods of high-volume pumping such as seasonal demand. Furthermore, additional studies have shown that liquids that are denser than water [i.e., dense non-aqueous phase liquids (DNAPLs), such as TCE and tetrachloroethylene (PCE)], can migrate downward through a multi-aquifer well even when vertical hydraulic head variations create an upward hydraulic gradient. As of the end of the 2012-2013 fiscal year, there were 537 known extraction wells (306 active and 231 inactive) within the subbasin (AwwaRF, 2006; DWR, 1961; DWR, 2013; Johnson et al., 2011).

Aquifer interconnection within two miles of the site has been documented between the Gaspur through Gage/Gardena and between the Jefferson through Silverado. Aquifer interconnection between the Gage/Gardena and Jefferson, and between the Silverado and Sunnyside, has not been documented within two miles of the site. However, due to the relatively large number of older and poorly documented groundwater wells within the subbasin, including numerous wells that are screened across multiple aquifers and may be acting as conduits between these aquifers, interconnection between the Gage/Gardena and Jefferson, and between the Silverado and Sunnyside, is projected for HRS purposes (DWR, 1961; DWR, 2004; DWR, 2013).

The shallow groundwater flow direction in the vicinity of the Titan site is not known. During groundwater investigations conducted on the adjacent north Brenntag site (EPA ID No.: CAD008287732), the shallow groundwater flow direction has generally been calculated towards the southwest; however, during the sampling event conducted in November 2012, the flow direction was calculated towards the northwest. During the Brenntag groundwater investigations, the depth to first groundwater has been generally reported between approximately 55 and 60 feet bgs. In addition, the geologic materials encountered during these investigations were reported to be primarily composed of fine to medium sand to approximately 18 feet bgs; underlain by sand with interbedded layers of silty sand, sandy silt, silty clay, and clayey silt to approximately 50 feet bgs; underlain by predominately silt and clay with interbedded sand layers (ARCADIS, 2007; ARCADIS, 2013).

2.5 Previous Sampling

In 1981, at the direction of the DTSC, soil matrix samples were collected on the Titan site to determine the extent of metals contamination. Soil borings were drilled in seven on-site locations at depths up to approximately 55 feet below ground surface (bgs). All seven of the borings were advanced in the southeastern portion of the site within and adjacent to the on-site surface impoundment. Sample analytical results identified elevated concentrations of metals including, but not limited to: arsenic [739 milligrams per kilogram (mg/kg)], cadmium (17 mg/kg), and chromium (253 mg/kg). In addition, samples collected from the materials within the on-site surface impoundment exhibited arsenic concentrations of up to 1,659 mg/kg. The Residential Regional Screening Levels (RSLs) for arsenic and cadmium are 0.67 mg/kg and 70 mg/kg, respectively. RSLs have not been established for total chromium in soils (BEI, 1994).

In 1982, at the direction of the DTSC, six additional soil matrix samples were collected in the vicinity of the on-site surface impoundment area and submitted for arsenic analysis. Samples exhibited concentrations of arsenic up to 127 mg/kg. A concurrently collected background sample exhibited an arsenic concentration of 3.7 mg/kg. Two groundwater samples were also reportedly collected during this investigation from a perched groundwater zone situated within the on-site surface impoundment. Elevated concentrations of arsenic were reportedly identified in the groundwater samples; however, the specific concentrations were not reported (BEI, 1994).

In approximately 1989, two gasoline USTs were excavated and removed from the Titan site. A 1,000-gallon tank was removed from a location adjacent to the northeast corner of the Machine Shop and a 280-gallon tank was removed from a location adjacent west to a pipe fitting area immediately west of the Machine Shop. During excavation activities, it was noted that the 1,000-gallon tank was corroded with small holes perforating portions of the tank. Soil matrix samples collected under the oversight and direction of the LADPW from beneath the tanks and associated fuel dispenser exhibited elevated concentrations of petroleum hydrocarbons. Subsequent investigations of the leaking USTs included the installation of an SVE system and a limited groundwater monitoring well network. The case was reported as closed by the RWQCB in August 1996. Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA (DTSC, 2014b; Weston, 2015).

In 2007, DTSC implemented a groundwater monitoring program on the adjacent north Brenntag site (EPA ID No.: CAD008287732), which included the installation of numerous groundwater monitoring wells over the course of several project phases. In March 2012, two of the wells associated with the monitoring program were installed on the northwestern portion of the Titan site. Samples collected from these wells in June 2012 exhibited elevated concentrations of VOCs including, but not limited to: TCE [10.6 micrograms per liter (µg/L)]; 1,1-dichloroethene (DCE) (1.1 µg/L); cis-1,2-DCE (60.1 µg/L); and trans-1,2-DCE (3.6 µg/L) (ARCADIS, 2013).

Table 3: Summary of Selected On-Site Soil and Groundwater Investigations

Site Location	Investigation	Maximum Results	
		Soil	Groundwater
On-site Surface Impoundment	1981 Impoundment Survey	arsenic = 739 mg/kg [1] cadmium = 17 mg/kg chromium = 253 mg/kg	--
	1982 Impoundment Survey	arsenic = 127 mg/kg	arsenic = 'elevated'
Northwest Portion of Site	2012 Quarterly Monitoring - Brenntag	--	TCE = 10.6 µg/L cis-1,2-DCE = 60.1 µg/L trans-1,2-DCE = 3.6 µg/L 1,1-DCE = 1.1 µg/L

DCE = dichloroethylene
mg/kg = milligrams per kilogram
TCE = trichloroethylene
µg/L = micrograms per liter
-- = media not sampled
'elevated' = specific results unavailable

Footnotes:
1 = a sample of the impound material exhibited an arsenic concentration of 1,659 mg/kg

References: BEI, 1994; ARCADIS, 2013

2.6 Waste Characteristics

Potential hazardous substance sources associated with the Titan site include, but may not be limited to: an on-site surface impoundment that was historically used to dispose of arsenic-containing arsenic sludge waste and potentially additional hazardous substances, and on-site soils contaminated with VOCs and/or metals including, but not limited to: arsenic, cadmium, and chromium (BEI, 1994; WESTON, 2015).

2.7 HRS Pathways

Based on the analytical data presented in Section 3.0 of this report, there is evidence to indicate that a release of hazardous substances has occurred from one or more sources at the Titan site to shallow groundwater. The depth to shallow groundwater at the site is estimated to be approximately 55-60 feet bgs. The shallow groundwater flow direction at the site has not been adequately determined. Based upon recently collected data, flow within the deeper regional aquifers in the vicinity of the site trended towards the southwest with temporal variations from west to south-southwest. The geologic materials in the unsaturated zone between ground surface and the top of the aquifer are estimated to be predominantly composed of sands interbedded with silts and clays. At least 10 distinct water purveyors operate up to 167 municipal drinking water wells within 4 miles of the site. The nearest of these wells, Well 03, is an active well maintained by the Tract 349 Mutual Water Company and is located approximately 0.2 mile north of the site. The City of South Gate's Well 7 was located approximately 0.26 mile southeast of the site and was removed from service in approximately 2002 due to elevated concentrations of TCE, arsenic, and chromium. In addition, GSWC - Bell/Bell Gardens system's Hoffman Well 02 was located approximately 0.47 mile east-northeast of the site and was removed from service in approximately

2000 due to elevated concentrations of chromium (BEI, 1994; ARCADIS, 2007; DTSC, 2014a; RWQCB, 2015; WRD, 2014; Weston, 2015).

Surface water runoff from the Titan site is expected to flow from the paved surfaces at the site into adjacent railroad easements and/or into curbside municipal stormwater drains along adjacent public roadways (i.e., Ardine St. and/or Salt Lake Ave.). The nearest surface water body to the site is the Los Angeles River, which is located approximately 0.7 mile east. The Los Angeles River is highly modified, having been lined with concrete along a majority of its length by the U.S. Army Corps of Engineers in the 1950s. Flows in the river are dominated by urban runoff and tertiary-treated effluent from several municipal wastewater treatment plants. The river empties into the Pacific Ocean at San Pedro Bay approximately 13.5 miles downstream of the site. There are no surface water intakes, fisheries, or sensitive environments associated with the Los Angeles River downstream of the site; however, there is a potential for fisheries and/or recreational areas to exist within San Pedro Bay (RWQCB, 1994; Weston, 2015).

As of August 2015, there were no residences, schools, or daycare facilities located on the Titan site. The nearest residential property to the site was located approximately 0.2 mile north. No sensitive environments were located on the site and the surface of the site appeared to be entirely covered with pavement or buildings. The site was entirely fenced and generally inaccessible to the public. The total number of employees working at the site is not known (DTSC, 2014b; Weston, 2015).

3.0 PROJECT OBJECTIVES

3.1 Project Task and Problem Definition

WESTON has been tasked to conduct sampling at the Titan site in order to characterize soils and groundwater to further the HRS process. To document an on-site hazardous substance source, soil matrix samples will be collected in the vicinity of the areas of the site that are known to have used and/or stored Analytes of Concern (AOCs). Soil matrix samples will be submitted for laboratory analysis for VOCs and metals. To establish an observed release to groundwater, groundwater samples will be collected and submitted for laboratory analysis of VOCs and metals. It is not necessary to analyze soil or groundwater samples for chromium(VI) since EPA currently assumes, for conservative HRS scoring purposes, that all chromium in groundwater is of the chromium(VI) species.

3.2 Data Use Objectives

Data collected during this site investigation will be used to:

- Determine the concentrations of VOCs and metals in on-site soils to document the presence of one or more hazardous substances sources.

- Determine the concentrations of VOCs and metals in groundwater beneath the site and directly adjacent to the site to document if an observed release from the site to groundwater has occurred.

- Evaluate whether further HRS characterization of the site is necessary. If additional characterization of the site is indicated, an addendum will be made to this SAP that documents these findings and provides a design and procedures for additional site characterization. The SAP Addendum will be submitted to the EPA QA Manager for approval.

If on-site soils are found to be contaminated by VOCs and/or metals, then the presence of hazardous substances in the source will be documented. If groundwater samples are also found to be contaminated with corresponding VOCs and/or metals above the corresponding action levels, an observed release will be documented and integrated into the site's HRS score.

3.3 Action Levels

In accordance with the HRS, the action levels to establish an observed release to groundwater, as well as to establish and on-site source of contaminated soil, are significantly above background concentrations. "Significantly above background" is defined as three times the background concentration for all media. If the background concentration is below the analytical quantitation limit, then the default background level is the background sample quantitation limit; "significantly above background" for this scenario is defined as a detect in the media where the analyte was not detected in the background media. Groundwater samples will be collected in the upgradient direction of the site with respect to the estimated groundwater flow direction to determine these

background levels. One or more soil background samples will be collected from location(s) deemed to have a lower potential for elevated concentrations of AOCs

Based on the regulatory and operational history of the site as discussed in Section 2.2, and information collected during previous investigations conducted at the site as discussed in Section 2.3; VOCs and metals are the constituents deemed most likely to be elevated above background levels. The HRS will evaluate groundwater data as compared to federal Maximum Contaminant Levels (MCLs) for drinking water. The data will also be compared to State of California MCLs for drinking water. Soil data collected from the sites can be compared to EPA Region 9 residential and industrial Regional Screening Levels (RSLs).

3.4 Decision Rules

Decisions will be based primarily on data generated from this SAP. The decision rule is:

- If analytical results indicate that soil samples collected from the site exhibit concentrations of VOCs and/or metals above the corresponding action levels, the presence of a hazardous substance source will be documented and integrated into the site's HRS score.

- If a source of VOCs and/or metals is documented at the site, and if analytical results indicate that groundwater samples collected from the site exhibit concentrations of these substances above the corresponding action levels, an observed release will be documented and integrated into the site's HRS score.

3.5 Data Quality Objectives

3.5.1 Data Quality Objective Process

The DQO process, as set forth in the EPA document, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, was followed to establish the data quality objectives for this project. An outline of the process and the outputs for this project are included in Appendix A.

3.5.2 DQO Data Categories

This investigation will involve the generation of definitive data for soil and groundwater (see Section 3.1). The specific requirements for this data category are detailed in Section 9. The data generated under this project will comply with the requirements for that data category as defined in *Data Quality Objective Process for Superfund, EPA 540/G-93/71, September 1993*. All definitive analytical methods employed for this project will be methods approved by the EPA.

3.5.3 Measurement Quality Objectives (MQOs)

Measurement Quality Objective goals (MQOs) for this project were developed following guidelines in *EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5 Final.* All sampling will be guided by procedures detailed in Section 6.2 and standard operating procedures (SOPs) to ensure representativeness of sample results. Table 4 and Table 5 document the MQOs

for this project. As presented in this table, the published reporting limits for the Method Reporting Limit (MRL) (including the EPA CLP Contract Required Quantitation Limits, or CRQLs) were determined to be appropriate for this project. The acceptable ranges for Accuracy [percent recovery for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis] will fall between 75 and 125 percent for water samples and 65 and 135 percent for soil samples. The threshold of precision [Relative Percent Difference (RPD) for MS/MSD and duplicate sample analysis] will be less than or equal to 35 percent for water samples, and 50 percent for soil samples. The analytical MRLs for each analyte of concern are lower than the RSLs for soils, and lower than corresponding MCLs for water, as shown in Table 4 and Table 5. These action levels are only used as risk-based benchmarks for the purposes of validating the appropriateness of the MRLs. The Industrial RSL is likely the most applicable action level for the site; the Residential RSL is presented for reference purposes only.

Table 4: Data Quality Indicator Goals - Organic Analyses

Analyte:	Method Reporting Limits				Action Levels			
	Water		Soil		Water		Soil	
	Trace Water	Low Water	Low Soil	Med Soil	MCL	CRSC	RSLr	RSLi
	(mg/L)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/L)	(mg/kg)	(mg/kg)
1,1,1-Trichloroethane	0.0005	0.005	0.005	0.25	0.2	--	8100	36000
1,1,2,2-Tetrachloroethane	0.0005	0.005	0.005	0.25	--	0.00034	0.6	2.7
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0005	0.005	0.005	0.25	--	--	40000	175000
1,1,2-Trichloroethane	0.0005	0.005	0.005	0.25	0.005	0.0011	1.1	5
1,1-Dichloroethane	0.0005	0.005	0.005	0.25	--	0.011	3.6	16
1,1-Dichloroethene	0.0005	0.005	0.005	0.25	0.007	--	230	1000
1,2,3-Trichlorobenzene	0.0005	0.005	0.005	0.25	--	--	63	930
1,2,4-Trichlorobenzene	0.0005	0.005	0.005	0.25	0.07	0.0023	24	110
1,2-Dibromo-3-chloropropane	0.0005	0.005	0.005	0.25	0.0002	0.00002	0.0053	0.064
1,2-Dibromoethane	0.0005	0.005	0.005	0.25	0.005	0.00003	0.036	0.16
1,2-Dichlorobenzene	0.0005	0.005	0.005	0.25	--	--	1800	9300
1,2-Dichloroethane	0.0005	0.005	0.005	0.25	0.005	0.00073	0.46	2
1,2-Dichloropropane	0.0005	0.005	0.005	0.25	0.005	0.0018	1	4.4
1,3-Dichlorobenzene	0.0005	0.005	0.005	0.25	--	--	--	--
1,4-Dichlorobenzene	0.0005	0.005	0.005	0.25	0.075	0.012	2.6	11
2-Butanone (Methyl Ethyl Ketone)	0.005	0.01	0.01	0.5	--	--	27000	190000
2-Hexanone	0.005	0.01	0.01	0.5	--	--	200	1300
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	0.005	0.01	0.01	0.5	--	--	5300	56000
Acetone	0.005	0.01	0.01	0.5	--	--	61000	670000
Benzene	0.0005	0.005	0.005	0.25	0.005	0.0012	1.2	5.1
Bromochloromethane	0.0005	0.005	0.005	0.25	--	--	150	630
Bromodichloromethane	0.0005	0.005	0.005	0.25	--	0.001	0.29	1.3
Bromoform	0.0005	0.005	0.005	0.25	--	--	19	86
Bromomethane (Methyl Bromide)	0.0005	0.005	0.005	0.25	--	--	6.8	30
Carbon disulfide	0.0005	0.005	0.005	0.25	--	--	770	3500
Carbon tetrachloride	0.0005	0.005	0.005	0.25	0.005	0.0009	0.65	2.9
Chlorobenzene	0.0005	0.005	0.005	0.25	0.1	--	280	1300
Chloroethane (Ethyl Chloride)	0.0005	0.005	0.005	0.25	--	--	14000	57000
Chloroform	0.0005	0.005	0.005	0.25	--	0.0021	0.32	1.4
Chloromethane (Freon 40)	0.0005	0.005	0.005	0.25	--	--	110	460
cis-1,2-Dichloroethene	0.0005	0.005	0.005	0.25	0.07	--	160	2300
cis-1,3-Dichloropropene	0.0005	0.005	0.005	0.25	--	--	--	--
Cyclohexane	0.0005	0.005	0.005	0.25	--	--	6500	27000
Dibromochloromethane	0.0005	0.005	0.005	0.25	--	--	0.75	3.3
Dichlorodifluoromethane (Freon 12)	0.0005	0.005	0.005	0.25	--	--	87	370
Ethylbenzene	0.0005	0.005	0.005	0.25	0.7	0.0061	5.8	25
Isopropylbenzene (Cumene)	0.0005	0.005	0.005	0.25	--	--	1900	9900
m,p-Xylene	0.0005	0.005	0.005	0.25	--	--	550-m/560-p	2400-m/2400-p
Methyl acetate	0.0005	0.005	0.005	0.25	--	--	78000	120000
Methyl tert-butyl ether (MTBE)	0.0005	0.005	0.005	0.25	--	0.037	47	210
Methylcyclohexane	0.0005	0.005	0.005	0.25	--	--	--	--
Methylene chloride (dichloromethane)	0.0005	0.005	0.005	0.25	0.005	0.01	57	1000
o-Xylene	0.0005	0.005	0.005	0.25	--	--	650	2800
Styrene	0.0005	0.005	0.005	0.25	0.1	--	6000	35000
Tetrachloroethene (PCE)	0.0005	0.005	0.005	0.25	0.005	0.032	24	100
Toluene	0.0005	0.005	0.005	0.25	1	--	4900	47000
trans-1,2-Dichloroethene	0.0005	0.005	0.005	0.25	0.1	--	1600	23000
trans-1,3-Dichloropropene	0.0005	0.005	0.005	0.25	--	--	--	--
Trichloroethene (TCE)	0.0005	0.005	0.005	0.25	0.005	0.001	0.94	6
Trichlorofluoromethane	0.0005	0.005	0.005	0.25	--	--	730	3100
Vinyl chloride	0.0005	0.005	0.005	0.25	0.002	0.000017	0.059	1.7

Notes:

Method Reporting Limits are based on the standard Contract Laboratory Program Contract-Required Detection Limit or EPA Method, statement of work.

Percent Complete for the project must be >/= 90%.

Precision (RPD for MS/MSD and duplicates) should be </= 35% for water samples, and </=50% for soil samples.

Accuracy for each analyte (Percent Recovery for MS/MSD) should fall between 75 and 125 % for water samples, and 65% and 135% for soil samples.

-- = No Applicable Value
CRSC = Cancer Risk Screening Concentration
MCL = Maximum Contaminant Level
mg/L = milligrams per liter.
mg/kg = milligrams per kilogram
RSLi = Regional Screening Level for Industrial Soils
RSLr = Regional Screening Level for Residential Soils

Table 5: Data Quality Indicator Goals - Inorganic Analyses

Analyte:	Method Reporting Limits		Action Levels			
			Water		Soil	
	Water	Soil	MCL	CRSC	RSLr	RSLi
	(mg/L)	(mg/kg)	(mg/L)	(mg/L)	(mg/kg)	(mg/kg)
Metals by ICP-MS:						
Aluminum	0.02	--	--	--	77000	1100000
Antimony	0.002	1	0.006	--	31	470
Arsenic	0.001	0.5	0.01	0.004	0.68	3
Barium	0.01	5	2	--	15000	220000
Beryllium	0.001	0.5	0.004	--	160	2300
Cadmium	0.001	0.5	0.005	--	71	980
Calcium	0.5	--	--	--	--	--
Chromium	0.002	1	0.1	0.00004	0.3	6.3
Cobalt	0.001	0.5	--	--	23	350
Copper	0.002	1	1.3	--	3100	47000
Iron	0.2	--	--	--	55000	820000
Lead	0.001	0.5	0.015	--	400	800
Magnesium	0.5	--	--	--	--	--
Manganese	0.001	0.5	--	--	1800	26000
Nickel (Soluble Salts)	0.001	0.5	--	--	1500	22000
Potassium	0.5	--	--	--	--	--
Selenium	0.005	2.5	0.05	--	390	5800
Silver	0.001	0.5	--	--	390	5800
Sodium	0.5	--	--	--	--	--
Thallium	0.001	0.5	0.002	--	0.78	12
Vanadium	0.005	2.5	--	--	390	5800
Zinc	0.002	1	--	--	23000	350000

Notes:

Method Reporting Limits are based on the standard Contract Laboratory Program Contract-Required Detection Limit or EPA Method, statement of work.

Percent Complete for the project must be >/= 90%.

Precision (RPD for MS/MSD and duplicates) should be </= 35% for water samples, and </=50% for soil samples.

Accuracy for each analyte (Percent Recovery for MS/MSD) should fall between 75 and 125 % for water samples, and 65% and 135% for soil samples.

Chromium action levels are for Chromium(VI) (See Section 3.1 for explanation).

-- = No Applicable Value	mg/L = milligrams per liter.
CRSC = Cancer Risk Screening Concentration	mg/kg = milligrams per kilogram
ICP-MS = Inductively coupled plasma mass spectrometry	RSLi = Regional Screening Level for Industrial Soils, THQ=1.0
MCL = Maximum Contaminant Level	RSLr = Regional Screening Level for Residential Soils, THQ=1.0

3.6 Sample and Data Management

Samples will be collected and logged on a chain-of-custody form as discussed in Section 8.5. Samples will be kept secure in the custody of the sampler at all times, who will assure that all preservation parameters are being followed. Samples will be transferred to the laboratory via a certified carrier in a properly custody-sealed container with chain-of-custody documentation. The SCRIBE data management system will be used to create chain-of-custody documents. The laboratory should note any evidence of tampering upon receipt.

The completed laboratory data report will be submitted to the EPA QA Manager, who will contract the data validation. The EPA QA Manager, will provide the data validation reports to the EPA SAM. The EPA SAM will then provide the data reports to the WESTON PM. The data validation reports and laboratory data summary sheets will be included in the final report to be submitted to the EPA SAM. Before submittal, the final report will undergo a technical review to ensure that all data have been reported and discussed correctly.

3.7 Schedule of Sampling Activities

The field sampling work is expected to take three days to perform. The work is tentatively scheduled to be conducted in November 2015. Access to the property will be necessary two weeks prior in order to mark the boring locations; locate private underground utilities; contact Underground Service Alert, as required by law; to identify buried utilities in public areas.

3.8 Special Training Requirements/Certifications

There are no special training or certification requirements specific to this project. Training requirements relevant to WESTON's health and safety program comply with 29 CFR 1910.120. The site-specific Health and Safety Plan is presented in Appendix B.

4.0 SAMPLING RATIONALE

4.1 Sampling Locations and Rationale

Based on the available regulatory, operational, and investigative history at the Titan site, WESTON selected a sampling strategy to evaluate the levels of contamination of site AOCs in the subsurface soil and shallow groundwater beneath the site as well as in off-site locations. The proposed sampling event will include the advancement of 16 borings using direct push technology. Sample locations were selected primarily based on their proximity to areas where site AOCs have been identified to have been historically used and/or stored as well as the estimated groundwater flow direction. In addition, some locations were selected to provide a more comprehensive profile of the subsurface characteristics within the more generalized region in the vicinity of the site. Soil matrix samples will be collected from nine on-site locations and one off-site location. Groundwater samples will be collected from seven on-site and three off-site locations. The sampling locations may be slightly modified from the proposed locations based upon actual site conditions (e.g., accessibility, underground utilities, etc.). Proposed sample locations are presented in Figure 4.

4.1.1 Soil Matrix Sampling

Soil matrix samples will be collected at each of the ten proposed on-site direct push boring locations (TTT-DP-1 through TTT-DP-10). Four of these locations; TTT-DP-6 through TTT-DP-8, and TTT-DP-10; are collocated with on-site groundwater sample locations. All ten of these locations were selected due to their proximity to areas that are suspected to have used and/or stored AOCs and include: at the approximate location of the former on-site arsenic pond (TTT-DP-1 through TTT-DP-5), adjacent northwest of the former acid plant (TTT-DP-6), adjacent to a former sump associated with the TSP storage area (TTT-DP-7), adjacent northeast of the former on-site UST location (TTT-DP-8), at the approximate location of the southern portion of the former maintenance shop (TTT-DP-9), and adjacent northeast of the former sulfur sump (TTT-DP-10). At the five locations associated with the former arsenic pond (TTT-DP-1 through TTT-DP-5), soil matrix samples will be collected from 5 feet, 10 feet, 15 feet, and 20 feet bgs; which generally correlates to the reported depths of the former pond. At the remaining five locations, soil matrix samples will be collected from 2 feet, 5 feet, 10 feet, and 15 bgs. To establish a background concentration of AOCs, soil samples will also be collected as part of a separate SI Investigation from similar depths at an off-site groundwater sample location, GIL-CPT-6, which is located approximately 150 feet northeast of the northeastern portion of the site. All soil matrix samples will be analyzed for VOCs and metals.

4.1.2 Groundwater Sampling

A groundwater sample will be collected from two discrete depths at four of the ten proposed on-site direct push boring locations; TTT-DP-6 through TTT-DP-8, and TTT-DP-10; and will be collected from three discrete depths at all six of the proposed on-site and off-site CPT boring locations, TTT-CPT-1 through TTT-CPT-6. The collection of samples from multiple discrete depths within the shallow aquifers of the area (i.e., Gaspur and Exposition) will assist in the evaluation of potential impacts from AOCs on different water-bearing zones within these aquifers.

At the four on-site direct push locations, the samples will be collected from approximately 35 feet bgs (if sufficient groundwater is present) and 60 feet bgs. At the six on-site and off-site CPT locations, the samples will be collected from approximately 60 feet bgs, 90 feet bgs, and 130 feet bgs. These depths were selected based upon a March 2013 CPT sounding, which was collected from a boring that was located approximately 150 feet northeast of the site, that indicated these depths corresponded to zones of coarser-grained materials and are likely to contain sufficient groundwater for sampling. The actual sample depths will be determined in the field based upon adjacent CPT lithological logs and/or areas where saturated subsurface soils conditions are encountered. Samples will be collected from multiple depths to evaluate potential impacts on different zones within the shallow aquifers of the area (i.e., Gaspur and Exposition).

The four on-site direct push locations were selected due to their proximity to areas that are known to have used and/or stored AOCs and include: adjacent northwest of the former acid plant (TTT-DP-6), adjacent to a former sump associated with the TSP storage area (TTT-DP-7), adjacent northeast of the former on-site UST location (TTT-DP-8), and adjacent northeast of the former sulfur sump (TTT-DP-10). The six on- and off-site CPT locations were selected based upon their relative directions from the site with respect to the groundwater flow direction within the Exposition aquifer, which is estimated to be towards the southwest, as well as their ability to provide a more comprehensive profile of the subsurface characteristics within the more generalized region in the vicinity of the site. It is anticipated that one of the CPT borings (TTT-CPT-6) will be located approximately upgradient of the on-site sample locations to determine background concentrations, one will be located adjacent to the former arsenic pond (TTT-CPT-1), two will be located on the downgradient portion of the site (TTT-CPT-2 and TTT-CPT-3), and two will be located west of the site (TTT-CPT-4 and TTT-CPT-5) so as to provide a more comprehensive profile of the subsurface characteristics within the more generalized region in the vicinity of the site. It is anticipated that all of these locations will be located either on the site or on an adjacent private property. In addition, upgradient groundwater samples will be collected as part of a separate SI Investigation from three CPT borings located immediately northeast of the Titan site along Salt Lake Avenue (GIL-CPT-4 through GIL-CPT-6), which will also be used to establish background groundwater concentrations of AOCs. All groundwater samples will be analyzed for VOCs and metals.

4.2 Analytes of Concern

Based on the historic use of the site and the previous sampling events described in Section 2.5, specific AOCs at the site are:

- VOCs;
- Metals, primarily arsenic, cadmium, and chromium.

Subsequent to the SI sampling event, if any analytes in addition to the aforementioned are identified at concentrations significantly above background, they will be evaluated as AOCs for the purposes of the SI. Although chromium(VI) is considered to be an AOC for the site, it is not necessary to analyze soil or groundwater samples for chromium(VI) since EPA currently assumes, for conservative HRS scoring purposes, that all chromium in groundwater is of the chromium(VI) species.

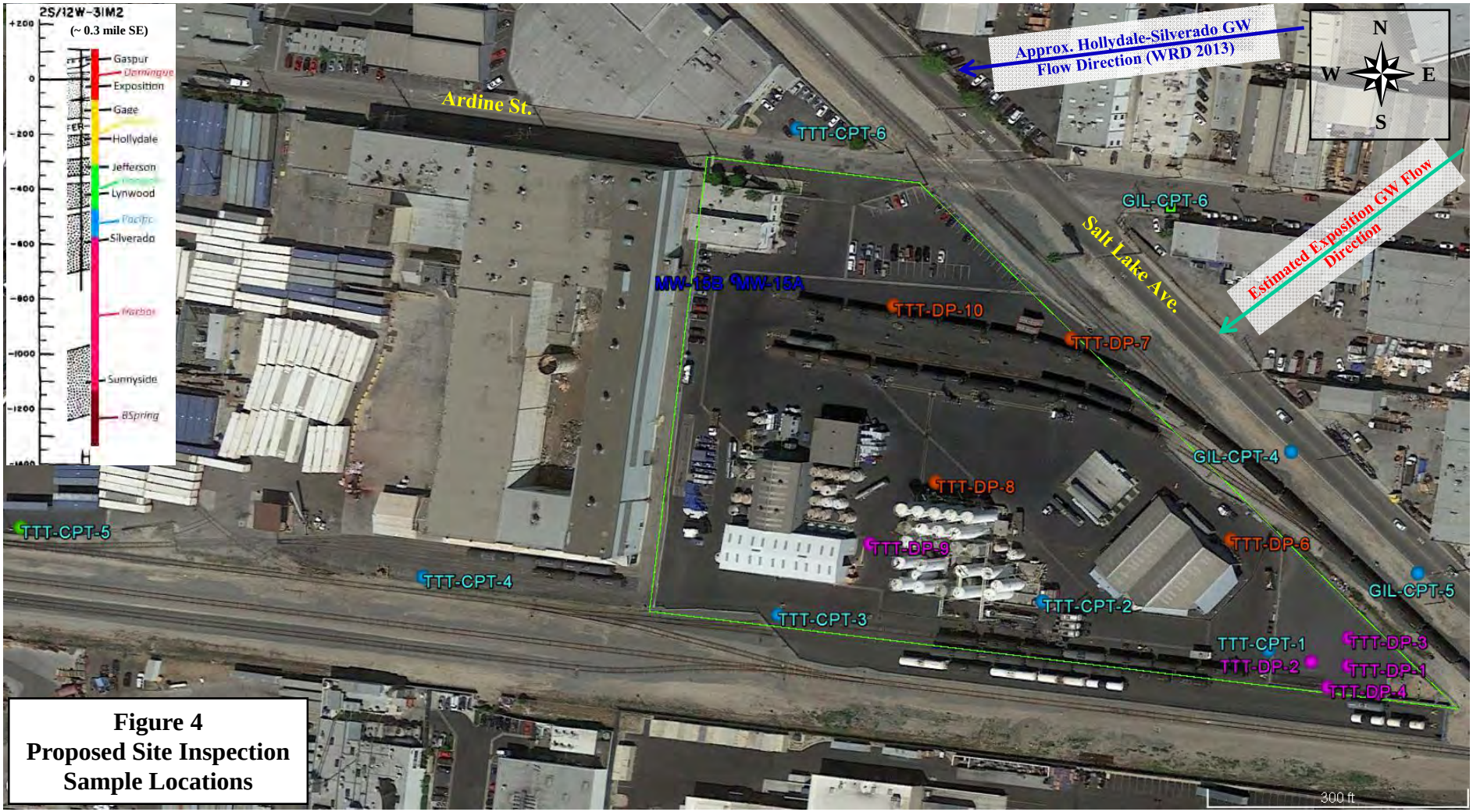


Figure 4
Proposed Site Inspection Sample Locations

- **Proposed Combined Direct Push Soil/Groundwater Grab Sample Location**
  [Two discrete-depth Groundwater (~ 35 & 60 ft-bgs) and Soil Matrix (2, 5, 10, & 15 ft-bgs)]
  (4 Locations = TTT-DP-6 through TTT-DP-8. & TTT-DP-10)
- **Proposed Direct Push Soil Sample Location [Soil Matrix only (5, 10, 15, & 20 ft-bgs)]**
  (6 Locations = TTT-DP-1 through TTT-DP-5, & TTT-DP-9; 20 ft-bgs sample replaced with 2 ft-bgs sample @ TTT-DP-8)
- **Proposed Groundwater Grab Sample Location (~ 60, 90, & 130 ft-bgs)**
  (5 Locations = TTT-CPT-1 through TTT-CPT-4, TTT-CPT-6)
- **Proposed Groundwater Grab Sample Location (~ 60, 90, & 130 ft-bgs) [no CPT logging required]**
  (1 Location = TTT-CPT-5)

Titan Terminal & Transport
4570 Ardine Street
South Gate, CA

All Soil and GW Samples to be analyzed for VOCs and Metals

Total Samples (not including QC): **26** groundwater samples
40 soil matrix samples

Note: Proposed Existing Monitoring Well Groundwater Sample Locations MW-15A and MW-15B, and proposed CPT locations GIL-CPT-4 through GIL-CPT-6 are logistically associated with an adjacent site and are not included with the sample totals.

Draft Revision Date: ***September 15th, 2015****. Disregard all undated and previous dated draft versions.*

5.0 REQUEST FOR ANALYSES

Laboratory services for soil matrix and groundwater samples will be scheduled and arranged for by the EPA Region 9 RSCC for VOC and metals analyses. Samples will be analyzed through EPA's CLP. Sample containers, preservatives, holding times, and estimated number of field and Quality Control (QC) samples are summarized in Table 6 and Table 7.

As enumerated in Table 6, soil matrix field samples will be collected from four distinct depths at 10 separate locations. In addition, four duplicate samples will be collected resulting in a total of 44 soil matrix samples. Additional sample volumes will be collected at three locations for use as laboratory QC samples. Each soil matrix sample will be analyzed for VOCs via EPA CLPAS SOM02.2 or equivalent and for metals via EPA CLPAS ISM02.2 (using ICP-MS) or equivalent.

As enumerated in Table 7, groundwater field samples will be collected from 10 distinct locations; which includes four on-site direct push locations, and six on- and off-site CPT locations. In addition, three duplicate samples will be collected resulting in a total of 29 aqueous samples. Up to six equipment blank and four field blank samples will be collected for QC purposes. An additional sample volume will be collected at two locations for use as a laboratory QC sample. Each groundwater sample will be analyzed for VOCs via EPA CLPAS SOM02.2 or equivalent and for metals via EPA CLPAS ISM02.2 (using ICP-MS) or equivalent.

To provide analytical quality control for the analytical program, the following measures will be utilized:

- All VOC and metals sample analysis will be conducted by a laboratory selected by the EPA Region 9 RSCC.

- Additional volume of sample will be collected for at least one sample per media per each analytical method, to be utilized for MS/MSD analysis.

- A CLP-type data package will be required from the laboratory for all resultant data.

- Holding times will be strictly observed for each analyte type and medium; holding times for each analysis are presented in Table 6 and Table 7.

Table 6: Request for Analytical Services, Matrix - Soil

ANALYSES REQUESTED				Organic	Inorganic
ANALYTICAL METHOD				CLPAS SOM02.2	CLPAS ISM02.2 (using ICP-MS)
ANALYTE(S)				VOCs	Metals
PRESERVATIVES				Chill to 4±2°C	Chill to 4±2°C
ANALYTICAL HOLDING TIME(S)				48 hours	180 days
CONTRACT HOLDING TIME(S)				48 hours	Analyze within 35 days
CONTAINER VOLUME				5 grams	4 ounce
SAMPLE CONTAINER				Plastic	Glass
NUMBER OF CONTAINERS				3	1
SAMPLE VOLUME				15 grams	4 ounce
Sample Number	Sample Location	Estimated Sample Depth (feet)	Special Designation	**VOCs** (Sample Volumes)	**Metals** (Sample Volumes)
TTT-SM-D01-0050	TTT-DP-1	5		1	1
TTT-SM-D01-0100	TTT-DP-1	10		1	1
TTT-SM-D01-0150	TTT-DP-1	15		1	1
TTT-SM-D01-0200	TTT-DP-1	20		1	1
TTT-SM-D02-0050	TTT-DP-2	5		1	1
TTT-SM-D02-0100	TTT-DP-2	10	Lab QC	2	2
TTT-SM-D02-0150	TTT-DP-2	15		1	1
TTT-SM-D02-0200	TTT-DP-2	20		1	1
TTT-SM-D03-0050	TTT-DP-3	5		1	1
TTT-SM-D03-0100	TTT-DP-3	10		1	1
TTT-SM-D03-0150	TTT-DP-3	15		1	1
TTT-SM-D03-0200	TTT-DP-3	20		1	1
TTT-SM-D04-0050	TTT-DP-4	5		1	1
TTT-SM-D04-0100	TTT-DP-4	10	Lab QC	2	2
TTT-SM-D04-0150	TTT-DP-4	15		1	1
TTT-SM-D04-0200	TTT-DP-4	20		1	1
TTT-SM-D05-0050	TTT-DP-5	5		1	1
TTT-SM-D05-0100	TTT-DP-5	10		1	1
TTT-SM-D05-0150	TTT-DP-5	15		1	1
TTT-SM-D05-0200	TTT-DP-5	20		1	1
TTT-SM-D06-0020	TTT-DP-6	2		1	1
TTT-SM-D06-0050	TTT-DP-6	5		1	1
TTT-SM-D06-0100	TTT-DP-6	10		1	1
TTT-SM-D06-0150	TTT-DP-6	15		1	1
TTT-SM-D07-0020	TTT-DP-7	2		1	1
TTT-SM-D07-0050	TTT-DP-7	5		1	1
TTT-SM-D07-0100	TTT-DP-7	10		1	1
TTT-SM-D07-0150	TTT-DP-7	15		1	1
TTT-SM-D08-0020	TTT-DP-8	2		1	1
TTT-SM-D08-0050	TTT-DP-8	5		1	1
TTT-SM-D08-0100	TTT-DP-8	10		1	1
TTT-SM-D08-0150	TTT-DP-8	15		1	1
TTT-SM-D09-0020	TTT-DP-9	2		1	1
TTT-SM-D09-0050	TTT-DP-9	5	Lab QC	2	2
TTT-SM-D09-0100	TTT-DP-9	10		1	1
TTT-SM-D09-0150	TTT-DP-9	15		1	1
TTT-SM-D10-0020	TTT-DP-10	2		1	1
TTT-SM-D10-0050	TTT-DP-10	5		1	1
TTT-SM-D10-0100	TTT-DP-10	10		1	1
TTT-SM-D10-0150	TTT-DP-10	15		1	1
GIL-SM-C06-0020	GIL-CPT-6	2	Background	*Soil background samples to be collected as part of a separate SI Investigation and are in included in the sample totals for that project.*	
GIL-SM-C06-0050	GIL-CPT-6	5	Background		
GIL-SM-C06-0100	GIL-CPT-6	10	Background		
GIL-SM-C06-0150	GIL-CPT-6	15	Background		
TTT-SM-D11-0100	TTT-DP-1	10	Duplicate	1	1
TTT-SM-D12-0050	TTT-DP-3	10	Duplicate	1	1
TTT-SM-D13-0050	TTT-DP-5	5	Duplicate	1	1
TTT-SM-D14-0050	TTT-DP-6	5	Duplicate	1	1
Total Number of Soil Matrix Field Samples				40	40
Total Number of Duplicate Samples				4	4
Total Number of Soil Matrix Samples				**44**	**44**
Total Number of QC Volumes				3	3
Total Number of Sample Volumes				47	47
Total Number of Sample Containers				141	47

Notes:

Stated values for sample holding times, preservatives, volumes, and containers are preliminary and will be verified with the EPA RSCC prior to sampling.

CLPAS = Contract Laboratory Program Analytical Services

ICP-MS = Inductively coupled plasma mass spectrometry

QC = Quality Control

VOCs = Volatile Organic Compounds

Table 7: Request for Analytical Services, Matrix - Water

ANALYSES REQUESTED	Organic	Inorganic
ANALYTICAL METHOD	CLPAS SOM02.2	CLPAS ISM02.2 (using ICP-MS)
ANALYTE(S)	VOCs	Metals
PRESERVATIVES	Add 1:1 HCL to pH <2; no pres. for low conc.; Cool to 4°C ±2°C	Field filter; Add HNO3 to pH <2; Chill to 4±2°C
ANALYTICAL HOLDING TIME(S)	14 days; 7 days for low conc.	180 days
CONTRACT HOLDING TIME(S)	Analyze within 10 days; 5 days for low conc.	Analyze within 35 days
CONTAINER VOLUME	40 mL	500 mL
SAMPLE CONTAINER	Glass VOA Vial	HDPE
NUMBER OF CONTAINERS	3	1
SAMPLE VOLUME	120 mL	500 mL

Sample Number	Sample Location	Estimated Sample Depth (feet)	Special Designation	**VOCs** (Sample Volumes)	**Metals** (Sample Volumes)
TTT-GW-D06-0350	TTT-DP-6	35		1	1
TTT-GW-D06-0600	TTT-DP-6	60		1	1
TTT-GW-D07-0350	TTT-DP-7	35	Lab QC	2	2
TTT-GW-D07-0600	TTT-DP-7	60		1	1
TTT-GW-D08-0350	TTT-DP-8	35		1	1
TTT-GW-D08-0600	TTT-DP-8	60		1	1
TTT-GW-D10-0350	TTT-DP-10	35	Lab QC	2	2
TTT-GW-D10-0600	TTT-DP-10	60		1	1
TTT-GW-C01-0600	TTT-CPT-1	60		1	1
TTT-GW-C01-0900	TTT-CPT-1	90		1	1
TTT-GW-C01-1300	TTT-CPT-1	130		1	1
TTT-GW-C02-0600	TTT-CPT-2	60		1	1
TTT-GW-C02-0900	TTT-CPT-2	90		1	1
TTT-GW-C02-1300	TTT-CPT-2	130		1	1
TTT-GW-C03-0600	TTT-CPT-3	60		1	1
TTT-GW-C03-0900	TTT-CPT-3	90		1	1
TTT-GW-C03-1300	TTT-CPT-3	130		1	1
TTT-GW-C04-0600	TTT-CPT-4	60		1	1
TTT-GW-C04-0900	TTT-CPT-4	90		1	1
TTT-GW-C04-1300	TTT-CPT-4	130		1	1
TTT-GW-C05-0600	TTT-CPT-5	60		1	1
TTT-GW-C05-0900	TTT-CPT-5	90		1	1
TTT-GW-C05-1300	TTT-CPT-5	130		1	1
TTT-GW-C06-0600	TTT-CPT-6	60	Background	1	1
TTT-GW-C06-0900	TTT-CPT-6	90	Background	1	1
TTT-GW-C06-1300	TTT-CPT-6	130	Background	1	1
TTT-GW-C07-0600	TTT-CPT-1	60	Duplicate	1	1
TTT-GW-D11-0350	TTT-DP-6	35	Duplicate	1	1
TTT-GW-D12-0350	TTT-DP-8	35	Duplicate	1	1
TTT-FB01-[insertdate]	Field Blank	NA	Field Blank	1	1
TTT-FB02-[insertdate]	Field Blank	NA	Field Blank	1	1
TTT-FB03-[insertdate]	Field Blank	NA	Field Blank	1	1
TTT-FB04-[insertdate]	Field Blank	NA	Field Blank	1	1
TTT-EB01-[insertdate]	EQ Blank	NA	EQ Blank	1	1
TTT-EB02-[insertdate]	EQ Blank	NA	EQ Blank	1	1
TTT-EB03-[insertdate]	EQ Blank	NA	EQ Blank	1	1
TTT-EB04-[insertdate]	EQ Blank	NA	EQ Blank	1	1
TTT-EB05-[insertdate]	EQ Blank	NA	EQ Blank	1	1
TTT-EB06-[insertdate]	EQ Blank	NA	EQ Blank	1	1
			Total Number of Aqueous Field Samples	26	26
			Total Number of Duplicate Samples	3	3
			Total Number of Aqueous Samples	**29**	**29**
			Total Number of QC Volumes	2	2
			Total Number of Field and EQ Blank Volumes	10	10
			Total Number of Sample Volumes	41	41
			Total Number of Sample Containers	123	41

Notes:

Stated values for sample holding times, preservatives, volumes, and containers are preliminary and will be verified with the EPA RSCC prior to sampling.

CLPAS = Contract Laboratory Program Analytical Services	HNO3 = nitric acid
conc. = concentration	ICP-MS = Inductively coupled plasma mass spectrometry
EQ = equipment	mL = milliliter
HCL = hydrochloric acid	QC = Quality Control
HDPE = high-density polyethylene	VOCs = Volatile Organic Compounds

6.0 METHODS AND PROCEDURES

6.1 Field Equipment

6.1.1 Sampling Equipment

The following equipment will be used to obtain environmental samples:

Equipment	Matrix	Fabrication	Dedicated
40-micron Filter	Groundwater	Plastic	Yes
Tubing	Groundwater	Plastic	Yes
Trowel	Soil	Plastic	Yes
Hand Auger	Soil	Metal	No
Slide Hammer Sleeve	Soil	Brass	No
Sampler Sleeves	Soil	Acetate	Yes
Direct-Push Casing	All Matrices	Steel	No
Gloves	All Matrices	Nitrile	Yes
Ziploc®-style bags	All Matrices	Plastic	Yes

A subcontractor will operate the direct push and sampling devices. Equipment maintenance will be the responsibility of the subcontracted companies using standard industry practices. All non-dedicated sampling equipment will be decontaminated between samples by washing with a low phosphate detergent solution, followed by two rinses with potable water.

6.1.2 Inspection/Acceptance Requirements for Supplies and Consumables

There are no project-specific inspection/acceptance criteria for supplies and consumables. It is standard operating procedure that: personnel will not use broken or defective materials, items will not be used past their expiration date, supplies and consumables will be checked against order and packing slips to verify the correct items were received, and the supplier will be notified of any missing or damaged items.

6.2 Sampling Procedures

6.2.1 Underground Utilities Clearance

All underground utilities will be located and identified by a geophysical survey team. If any subsurface utilities are suspected beneath proposed borings, the borings will be relocated in order to avoid the utilities. Underground Services Alert will be notified at least 72 hours before drilling commences. All boring locations will be advanced using a hand auger, air knife, or similar method to at least five feet bgs.

6.2.2 Soil Sampling

Soil matrix samples will be collected from a total of 10 on-site locations (TTT-DP-1 through TTT-DP-10). The proposed soil sample locations are presented in Figure 4. At each location the asphalt or concrete surface will be cored until the underlying soils are encountered. The borings will then be advanced by hand-auger to a total depth of 5 feet bgs. The soil lithology will be logged in the field and soil samples will be collected from five of the ten borings (TTT-DP-6 through TTT-DP-10) at 2 feet bgs. The borings will then be further advanced using direct push technology in accordance with EPA ERT SOP #2050 (Appendix E) to a sufficient depth for all proposed soil matrix samples to be collected. During the direct push advancement, soil lithology will be logged to at least the depth of the deepest soil matrix sample. At five of the locations (TTT-DP-6 through TTT-DP-10) soil samples will be collected from each boring at 5 feet bgs, 10 feet bgs, and 15 feet bgs. At the remaining five locations (TTT-DP-1 through TTT-DP-5) soil samples will be collected from each boring at 5 feet bgs, 10 feet bgs, 15 feet bgs, and 20 feet bgs. At four locations (TTT-DP-6 through TTT-DP-8 and TTT-DP-10) the borings will be further advanced to depths sufficient to collect groundwater samples as described in Section 6.2.3. It will be determined in the field based upon the actual site conditions and sampling schedule if soil lithology will be logged to the total depth of the direct push borings. The borings will be backfilled in a manner consistent with the requirements of the Los Angeles County Department of Health, which is generally a combination of granular bentonite, hydrated bentonite chips, and grout.

Subsurface soil matrix samples obtained from the upper 5 feet of relevant borings will be collected directly using a slide hammer and brass sleeve, which will be dedicated or appropriately decontaminated between each boring. Samples collected at 5 feet bgs and below will be collected directly from the direct push acetate liners. The sample portion to be used for VOC analysis will be collected first by use of a 5-gram En Core®-type sampling device. The 5-gram containers will be immediately sealed, labeled, and chilled to 4ºC. Subsequent to the collection of the VOC portion of the sample, the metals portion of the sample will be collected and placed in to a Ziploc®-style bag. The samples will be homogenized in the bag and then transferred with a dedicated plastic trowel from the bag to 4-ounce wide-mouth glass jars. Sample containers will be filled to the top, taking care to prevent soil from remaining in the lid threads prior to being closed to prevent potential contaminant migration to or from the sample. Sample containers will be closed as soon as they are filled, immediately chilled to 4ºC, and processed for shipment to the laboratory.

All soil matrix samples will be analyzed for VOCs and metals.

6.2.3 Groundwater Sampling

Groundwater samples will be collected from four on-site proposed direct push boring locations (TTT-DP-6 through TTT-DP-8, and TTT-DP-10), three on-site proposed CPT locations (TTT-CPT-1 and TTT-CPT-3), and three off-site proposed CPT locations (TTT-CPT-4 through TTT-CPT-6). At each of the four direct push locations, the borings will be advanced to groundwater as described in Section 6.2.3. Two discrete-depth groundwater samples will be collected from each location at estimated depths of 35 ft-bgs and 60 ft-bgs; however, the actual sample depths will be determined in the field based upon the depths at which sufficient groundwater is encountered and/or adjacent CPT logging information.

At five of the six on- and off-site CPT locations (TTT-CPT-1 through TTT-CPT-4, and TTT-CPT-6), the borings will be initially advanced to a total depth of approximately 150 feet bgs using the CPT drilling rig. As the borehole is advanced, the CPT drill rig will collect subsurface lithological data (i.e., relative density, static and dynamic pore pressure, hydraulic conductivity) that will be immediately provided to the WESTON field personnel. Based upon this data, WESTON personnel will determine the specific depths to collect the discrete-depth groundwater samples, which are proposed to be at approximately 60 ft-bgs, 90 ft-bgs, and 130 ft-bgs. The CPT drill rig will then advance a second boring to collect each of the groundwater grab samples. At the remaining off-site CPT location (TTT-CPT-5), the initial subsurface data collection boring will not be advanced since CPT logging information is already available near that location.

Once the proper depth has been attained at all direct push and CPT groundwater sample locations, an in-situ groundwater sample will be collected using a Hydropunch™ water sampling device, or equivalent. The Hydropunch™ is inserted into undisturbed soils at the base of the borehole. The outer portion of the Hydropunch™ is then retracted to expose a PVC screen in the water-bearing zone. A mini-bailer is lowered into the screen for collection of an in-situ groundwater sample. Because groundwater samples collected with a Hydropunch™ are representative of in-situ groundwater conditions, samples may be collected immediately without purging or measurement of water quality parameters. The Hydropunch™ is a sealed unit so water from the upper sample location will not migrate to lower sample locations.

Groundwater samples to be analyzed for VOCs will be collected by pouring the sample directly from the bailer into 40-milliliter (mL) vials preserved in the field with hydrochloric acid (HCl), to a final pH of less than 2. The vials will be immediately capped and inverted to check for air bubbles to ensure zero head space. If a bubble appears, the vial will be discarded and a new sample will be collected.

Groundwater samples to be analyzed for metals will be collected by filtering the sample directly from the bailer into a 500-mL High-Density Polyethylene (HDPE) container, which will be preserved in the field with nitric acid (HNO_3) to a final pH of less than 2. In the event that it is not feasible to filter the sample directly from the original sampling device, the sample will be transferred to a dedicated HDPE container and then filtered into the final sample container. The filtering will be conducted either via a 40-micron filter that will connect directly to the bailer or by use of a peristaltic pump to pump the sample through a 40-micron in-line filter.

Subsequent to the collection of each sample in the appropriate container, the sample will be immediately chilled on ice and processed for shipment to the assigned laboratory. When transferring samples, care will be taken not to touch the bailer to the sample container. For duplicate samples, bottles with the two different sample designations will be filled in an alternating sequence. All groundwater samples will be analyzed for VOCs and metals.

6.3 Decontamination Procedures

The decontamination procedures that will be followed are in accordance with approved procedures. Decontamination of sampling equipment must be conducted consistently to assure the quality of samples collected. All non-dedicated equipment that comes into contact with potentially contaminated soil or water will be decontaminated. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. Decontamination will occur prior to and after each use of a piece of non-dedicated equipment. All non-dedicated sampling devices will be steam-cleaned or decontaminated according to EPA Region 9 recommended procedures.

The following, to be carried out in sequence, is an EPA Region 9 recommended procedure for the decontamination of sampling equipment:

- Non-phosphate detergent and tap-water wash, using a brush if necessary
- Tap-water rinse
- Deionized/distilled water rinse (twice)

Equipment will be decontaminated in a pre-designated area on pallets or plastic sheeting, and clean bulky equipment will be stored on plastic sheeting in uncontaminated areas. Cleaned small equipment will be stored in plastic bags. Materials to be stored more than a few hours will also be covered.

7.0 DISPOSAL OF INVESTIGATION - DERIVED WASTE

In the process of collecting environmental samples at this site, several different types of potentially contaminated investigation-derived wastes (IDW) will be generated, including the following:

- Used personal protective equipment (PPE)
- Disposable sampling equipment
- Decontamination fluids
- Excess soil, including cuttings from soil borings.

The EPA's National Contingency Plan requires that management of IDW generated during site investigations comply with all relevant or appropriate requirements to the extent practicable. This sampling plan will follow the *Office of Emergency and Remedial Response (OERR) Directive 9345.3-02 (May 1991)* which provides the guidance for management of IDW during site investigations. Listed below are the procedures that will be followed for handling IDW. The procedures are flexible enough to allow the site investigation team to use its professional judgment on the proper method for the disposal of each type of IDW generated at each sampling location.

- Used PPE and disposable sampling equipment will be double-bagged in plastic trash bags and disposed of in a municipal refuse dumpster. These wastes are not considered hazardous and can be sent to a municipal landfill. Any PPE or dedicated equipment that is to be disposed of that can still be reused will be rendered inoperable before disposal.

- Decontamination fluids that will be generated in the sampling event will consist of deionized water, residual contaminants, and water with non-phosphate detergent. Decontamination fluids will be drummed and staged on site pending laboratory analysis for VOCs and metals. Subsequent to the analysis, the fluids will be disposed in an appropriate manner.

- Soil cuttings generated during the subsurface sampling will be drummed and staged on site pending laboratory analysis for VOCs and metals. Subsequent to the analysis, the cuttings will be disposed in an appropriate manner.

8.0 SAMPLE IDENTIFICATION, DOCUMENTATION AND SHIPMENT

8.1 Field Notes

8.1.1 Field Logbooks

Field logbooks will document where, when, how, and from whom any vital project information was obtained. Logbook entries will be completed and accurate enough to permit reconstruction of field activities. The logbook is bound with consecutively numbered pages. Each page will be dated and the time of entry noted in military time. All entries will be legible, written in ink, and signed by the individual making the entries. Language will be factual, objective, and free of personal opinions. At a minimum, the following information will be recorded, if applicable, during the collection of each sample.

- Sampler's name(s)
- Date and time of sample collection
- Type of sample (e.g., groundwater)
- Type of sampling equipment used
- Field instrument readings and calibration readings for any equipment used, and
- equipment model(s) and serial number(s)
- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, colors, etc.)
- Sample preservation
- Lot numbers of the sample containers, sample identification numbers and any
- explanatory codes, and chain-of-custody form numbers
- Shipping arrangements (overnight air bill number)
- Name(s) of recipient laboratory(ies)

In addition to sampling information, the following specifics may also be recorded in the field logbook for each day of sampling:

- Team members and their responsibilities
- Time of arrival on site and time of site departure
- Other personnel on site
- Summary of any meetings or discussions with any potentially responsible parties, or representatives of any federal, state, or other regulatory agency
- Deviations from sampling plans or site safety plan procedures
- Changes in personnel and responsibilities, as well as reasons for the change
- Levels of safety protection
- Record of photographs

8.1.2 Photographs

Photographs will be taken at representative sampling locations and at other areas of interest on site. They will verify information entered in the field logbook. When a photograph is taken, the

following information will be written on the logbook or will be recorded in the field photography log:

- Date, location
- Description of the subject photographed
- Name of person taking the photograph

8.2 Sample Nomenclature

A unique, identifiable name will be assigned to each sample. The prefix “TTT” will be used to identify the Titan site. The qualifiers “SM” (soil matrix) and “GW” (ground water) will be used to identify the sample medium. The boring location and sample depth (to the tenth of a foot) will be identified and follow the medium qualifier. The boring location will be qualified with either a “D” to indicate a direct push location or a “C” to identify a CPT location. The identified depth for groundwater samples will be the center of the sample screen. A unique number will be assigned to each sample location. For example, if a soil matrix sample is collected from 5.5 feet bgs at TTT-DP-3, the sample number will be “TTT -SM-D03-0055." If a groundwater sample is collected at TTT -CPT-3 with the screen set from 62 to 66 feet bgs, the sample number will be “TTT -GW-C03-0640.” Duplicate samples will be assigned fictitious names. For equipment blanks and field blanks, the qualifiers “EB” and “FB” will be used respectively in place of the location/depth identification. The EPA RSCC may assign additional sample numbers. See Section 4, Table 6, and Table 7 for specific nomenclature and location assignments.

8.3 Container, Preservation, and Holding Time Requirements

All sample containers used will have been delivered to WESTON in a pre-cleaned condition. Container, preservation, and holding time requirements are summarized in in Table 6 and Table 7.

8.4 Sample Labeling, Packaging and Shipping

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. Soil- and water-matrix sample labels will be created using the SCRIBE data management system. Soil- and water-matrix sample labels will be affixed to the sample containers and secured with clear tape. Samples will have preassigned, identifiable and unique numbers in accordance with Section 8.2. The soil sample labels will contain the following information where appropriate:

- Sample number
- Sample location
- Date and time of collection
- Site name
- Analytical parameter and method of preservation
- CLP Case Number (if applicable)

Sample coolers will be retained in the custody of site personnel at all times or secured so as to deny access to anyone else. The procedures for shipping samples are as follows:

- The bottom of the cooler will be lined with bubble wrap to prevent breakage during shipment.
- Screw caps will be checked for tightness.
- Containers will have custody seals affixed so as to prevent opening of the container without breaking the seal.
- All glass sample containers will be wrapped in bubble wrap.
- All containers will be sealed in Ziploc®-style bags.

All samples will be placed in coolers with the appropriate chain-of-custody forms. The SCRIBE data management system will be used to create all chain-of-custody forms. All forms will be enclosed in plastic bags and affixed to the underside of the cooler lid. Empty space in the cooler will be filled with bubble wrap or styrofoam peanuts to prevent movement and breakage during shipment. Each ice chest will be securely taped shut with strapping tape, and custody seals will be affixed to the front, right, and back of each cooler.

Samples will be shipped for immediate delivery to the contracted laboratory. The EPA Region 9 Regional Sample Control Coordinator ((510) 412-2389) will be notified daily of the sample shipment schedule and will be provided with the following information:

- Sampling contractor's name
- The name of the site
- Case number
- Shipment date and expected delivery date
- Total number of samples by matrix, and relative level of contamination (i.e., low, medium, or high)
- Carrier, air bill number(s), and method of shipment (e.g., priority)
- Irregularities or anticipated problems associated with the samples
- Whether additional samples will be sent, if this is the last shipment]

8.5 Chain of Custody Forms and QA/QC Summary Forms

A chain of custody form will be maintained for all samples to be submitted for analysis, from the time the sample is collected until its final deposition. All chain of custody forms for the samples will be maintained by WESTON.

Every transfer of custody must be noted and signed for; a copy of this record is kept by each individual who has signed. Corrections on sample paperwork will be made by drawing a single line through the mistake and initialing and dating the change. The correct information will be entered above, below, or after the mistake. When samples are not under the direct control of the individual responsible for them, they must be stored in a locked container sealed with a custody seal. The chain of custody must include the following:

- Sample identification numbers
- Site name
- Sample date
- Number and volume of sample containers
- Required analyses
- Signature and name of samplers
- Signature(s) of any individual(s) with control over samples
- Airbill number
- Note(s) indicating special holding times and/or detection limits

Traffic reports will be used to document sample collection and shipment to the laboratory for analysis. The SCRIBE data management system will be used to generate all traffic reports and chains of custody. One copy will be completed and sent with the samples for each laboratory and each shipment. If multiple coolers are sent to a single laboratory on a single day, only one form will be completed. If all sample information cannot be entered in one form, then multiple forms will be used. One copy of the form will be sent to the EPA RSCC, another copy will be sent to Contract Laboratory Analytical Services Support, and one copy will accompany the samples to the laboratory. A photocopy of the original will be made for WESTON's master file. The document titled "*Contract Laboratory Program Guidance for Field Samplers*," EPA Superfund document 540-R-07-06, will be taken to the field as a reference. This document is included in Appendix F.

A QA/QC summary form will be completed for each laboratory and each matrix of the sampling event. The sample number for all blanks, reference samples, laboratory QC samples (MS/MSDs) and duplicates will be documented on this form. This form is not sent to the laboratory. The original form will be sent to the EPA; a photocopy of the original will be made for WESTON's master file.

9.0 QUALITY ASSURANCE AND CONTROL (QA/QC)

9.1 Field Quality Control Samples

The QA/QC samples described in the following subsections, which are also listed in Table 6 and 7, will be collected during this investigation.

9.1.1 Assessment of Field Contamination (Blanks)

9.1.1.1 Equipment Blanks

Equipment rinsate blanks will be collected to evaluate field sampling and decontamination procedures by pouring either store-bought distilled water or laboratory-certified 'clean' water over the decontaminated sampling equipment. One equipment rinsate blank will be collected per day for each piece of sampling equipment that is decontaminated in the field. Equipment rinsate blanks will be obtained by passing water through or over the decontaminated sampling devices used that day. Equipment blanks will be analyzed for VOCs and metals (see Table 7).

The equipment blanks will be preserved, packaged, and sealed in the manner described for the groundwater samples in Section 6.2. A separate sample number will be assigned to each sample as described in Section 8.2.

If any compound is detected in field blanks or equipment blanks, then sample data will be considered acceptable without qualification only if the results are above five times the amount detected in the blank(s) for each respective analyte. If the analyte detected in the blank is a common laboratory contaminate, then the sample results for those analytes would be qualified unless the results are above ten times the amount detected in the blank(s). Sample results that are below five times (ten times for common laboratory contaminants) the amount detected in the blanks, additional evaluation will be require during data validation.

9.1.1.2 Field Blanks

A field blank will be collected from each container of distilled water used to collect the equipment rinsate blanks described in Section 9.1.1.1. In the event that only laboratory-certified 'clean' water is used in the collection of equipment blanks, no field blanks will be collected. The field blank sample will consist of filling the appropriate sample container directly from the store-bought distilled water container. The field blanks will be preserved, packaged, and sealed in the manner described for the groundwater samples in Section 6.2. A separate sample number will be assigned to each sample as described in Section 8.2. Field blanks will be analyzed for VOCs and metals. If any compound is detected in the field blanks, this information will be considered when evaluating equipment blank samples as described in Section 9.1.1.1.

9.1.1.3 Temperature Blanks

For each cooler that is shipped or transported to an analytical laboratory, a 40-mL vial of store-bought distilled water will be included that is marked "temperature blank." This blank will be used by the sample custodian to check the temperature of samples upon receipt.

9.1.2 Assessment of Sample Variability (Field Duplicate or Co-located Samples)

Duplicate soil matrix and groundwater samples will be collected at the sample locations indicated in Table 6 and Table 7. Locations for duplicate samples were chosen based on the potential of the sample containing AOCs. At a minimum, one sample per 10 samples, per matrix, will be designated as a duplicate sample. The acceptance criteria for duplicate samples are presented in Section 3.5.3.

When collecting duplicate water samples, bottles with the two different sample identification numbers will be alternated in the filling sequence.

When collecting duplicate soil matrix samples to be analyzed for metals, the samples will be homogenized in a sample-dedicated Ziploc®-style bag. Homogenized materials will then be transferred to the appropriate sample container. When collecting duplicate soil matrix samples to be analyzed for VOCs, the samples will not be homogenized to reduce the potential for volatilization. These equivalent (co-located) samples will be collected from the sample sleeve, alternating with collection of the original samples.

Duplicate samples will be preserved, packaged, and sealed in the same manner described for the groundwater samples in Section 6.2. A separate sample number will be assigned to each duplicate as described in Section 8.2 and presented in Table 6 and Table 7. All duplicate samples will be submitted blind to the laboratory.

9.2 Background Samples

Background groundwater samples will be collected in the estimated upgradient direction of the site to differentiate between on-site and off-site contributions to contamination. Background soil matrix samples will be collected from a location deemed to have a lower potential for elevated concentrations of AOCs. Background samples will be submitted blind to the laboratory and analyzed by the methods indicated in Table 6 and Table 7.

9.3 Laboratory Quality Control (QC) Samples

A laboratory QC sample is not an extra sample; rather, it is a sample that requires additional QC analyses.

For water samples, double volumes of sample will be provided to the laboratory for its use for QC purposes. Two sets of water sample containers will be filled and all containers labeled with a single sample number.

For soil matrix samples, double volumes of sample will be provided to the laboratory for its use for QC purposes. When collecting double-volume QC soil matrix samples to be analyzed for metals, the samples will be homogenized in a sample-dedicated Ziploc®-style bag. Homogenized materials will then be transferred to the appropriate sample container. When collecting double-volume QC soil matrix samples to be analyzed for VOCs, the samples will not be homogenized to reduce the potential for volatilization. These equivalent (co-located) samples will be collected from the sample sleeve, alternating with collection of the original samples.

For this sampling event, the samples collected at the locations indicated in Table 6 and Table 7 will be the designated laboratory QC samples. These locations were chosen because they are suspected to contain detectable levels of AOCs. The sample labels and chain-of-custody records for these samples will identify them as a laboratory QC samples. At a minimum, one sample per 20 samples, per matrix, will be designated as a laboratory QC sample.

9.4 Analytical and Data Package Requirements

It is required that all samples be analyzed in accordance with the methods listed in Table 6 and Table 7. The laboratory is required to supply documentation to demonstrate that their data meet the requirements specified in the contract.

The data validation package shall include all original documentation generated in support of this project. In addition, the laboratory will provide original documentation to support that all requirements of the methods have been met. This includes, but is not limited to, sample tags, custody records, shipping information, sample preparation/extraction records, and instrument printouts such as mass spectra. Copies of information and documentation required in this document are acceptable. CLP methods will follow the contract required data package requirement.]

9.5 Data Validation

Validation of analytical data generated by the CLP and contract laboratories for this investigation will be contracted by the EPA in accordance with the *EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540-R-99\008, 10/99), the EPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review* (*EPA540-R-00-006, 06/01), and/or the EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 540-R-04\001, 10/04).* Tier 3 validation for 100% of the data will be required.

To meet requirements for categorization as definitive data, the following criteria will be evaluated:

- Holding times
- Sampling design approach
- Blank contamination
- Initial and continuing calibration
- Detection limits
- Analyte identification and quantitation

- Matrix spike recoveries
- Performance evaluation samples when specified
- Analytical and total error determination
- Laboratory Control Samples.

Upon completion of validation, data will be classified as one of the following: acceptable for use without qualifications, acceptable for use with qualifications, or unacceptable for use.

9.6 Field Variances

As conditions in the field may vary, it may become necessary to implement minor modifications to this plan. When appropriate, the EPA will be notified of the modifications and a verbal approval obtained before implementing the modifications. Modifications to the original plan will be documented in the final report.

9.7 Assessment of Project Activities

9.7.1 WESTON Assessment Activities

The following assessment activities will be performed by WESTON:

- All project deliverables (SAP, Data Summaries, Data Validation Reports, Site Inspection Report) will be peer-reviewed prior to release to the EPA. In time-critical situations, the peer review may be concurrent with the release of a draft document. Errors discovered in the peer review process will be reported by the reviewer to the originator of the document, who will be responsible for corrective action.

- The WESTON QA Officer will review project documentation (logbooks, chain of custody forms, etc.) to ensure the SAP was followed and that sampling activities were adequately documented. The WESTON QA Officer will document deficiencies and the WESTON Project Manager will be responsible for corrective actions. The WESTON QA Officer is also responsible for review and assessment of the data for data quality issues for the project.

- The WESTON Project Manager is responsible for the review of data, and ensuring that sampling design approach and total error determination meet the DQOs for this project.

9.7.2 EPA Assessment Activities

EPA assessment activities, which can include surveillance, management system reviews, readiness reviews, technical system audits, performance evaluation, and audits and assessments of data quality, have not been formally identified to WESTON by the EPA at the time of completion of the SAP.

9.7.3 Project Status Reports to Management

It is standard procedure for the WESTON PM to report to the EPA SAM any issues, as they occur, that arise during the course of the project that could affect data quality, data use objectives, the project objectives, or project schedules.

9.7.4 Reconciliation of Data with DQOs

Assessment of data quality is an ongoing activity throughout all phases of a project. The following outlines the methods to be used by WESTON for evaluating the results obtained from the project.

- Review of the DQO outputs and the sampling design will be conducted by the WESTON QA Officer and the EPA prior to sampling activities. The reviewer will submit comments to the WESTON PM for action, comment, or clarification. This process will be iterative.

- A preliminary data review will be conducted by WESTON. The purpose of this review is to look for problems or anomalies in the implementation of the sample collection and analysis procedures and to examine QC data for information to verify assumptions underlying the DQOs and the SAP. Anomalies may include changes in the MRLs as a result of dilution, sampling, and/or matrix factors across the sample suite; such anomalies will be reported in writing to the SAM when they are confirmed.

- Data review will also include a comparison of analytical results, MRLs, and background concentrations in an effort to determine whether each result can be identified as "significantly above," or "significantly below" background, as defined in Section 3.3.

10.0 REFERENCES

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Appendix G:
Sample Nos. – CLP Nos. Correlation Tables

CLP No. to Sample No. Correlation Table - Sorted by Sample No.

Sample #	CLP Sample #	Location	SampleType	Remarks
TTT-EB01-111615	MYA1W6	EQ Blank	Equipment Blank	
TTT-EB01-111615	YA1W6	EQ Blank	Equipment Blank	
TTT-EB02-111715	MYA1W7	EQ Blank	Equipment Blank	
TTT-EB02-111715	YA1W7	EQ Blank	Equipment Blank	
TTT-GW-C01-0610	MYA1S1	TTT-CPT-1	Field Sample	
TTT-GW-C01-0610	YA1S1	TTT-CPT-1	Field Sample	
TTT-GW-C01-0880	MYA1S2	TTT-CPT-1	Field Sample	
TTT-GW-C01-0880	YA1S2	TTT-CPT-1	Field Sample	
TTT-GW-C01-1290	MYA1S3	TTT-CPT-1	Field Sample	
TTT-GW-C01-1290	YA1S3	TTT-CPT-1	Field Sample	
TTT-GW-C02-0640	MYA1S4	TTT-CPT-2	Field Sample	
TTT-GW-C02-0640	YA1S4	TTT-CPT-2	Field Sample	
TTT-GW-C02-0880	MYA1S5	TTT-CPT-2	Field Sample	
TTT-GW-C02-0880	YA1S5	TTT-CPT-2	Field Sample	
TTT-GW-C02-1340	MYA1S6	TTT-CPT-2	Field Sample	
TTT-GW-C02-1340	YA1S6	TTT-CPT-2	Field Sample	
TTT-GW-C03-0640	MYA1S7	TTT-CPT-3	Field Sample	
TTT-GW-C03-0640	YA1S7	TTT-CPT-3	Field Sample	
TTT-GW-C03-0850	MYA1S8	TTT-CPT-3	Field Sample	
TTT-GW-C03-0850	YA1S8	TTT-CPT-3	Field Sample	
TTT-GW-C03-1270	MYA1S9	TTT-CPT-3	Field Sample	
TTT-GW-C03-1270	YA1S9	TTT-CPT-3	Field Sample	
TTT-GW-C04-0630	MYA1T0	TTT-CPT-4	Field Sample	
TTT-GW-C04-0630	YA1T0	TTT-CPT-4	Field Sample	
TTT-GW-C04-0880	MYA1T1	TTT-CPT-4	Field Sample	
TTT-GW-C04-0880	YA1T1	TTT-CPT-4	Field Sample	
TTT-GW-C04-1310	MYA1T2	TTT-CPT-4	Field Sample	MS/MSD
TTT-GW-C04-1310	MYA1T2D	TTT-CPT-4	Lab QC	
TTT-GW-C04-1310	MYA1T2S	TTT-CPT-4	Lab QC	
TTT-GW-C04-1310	YA1T2	TTT-CPT-4	Field Sample	
TTT-GW-C05-0660	MYA1T3	TTT-CPT-5	Field Sample	
TTT-GW-C05-0660	YA1T3	TTT-CPT-5	Field Sample	
TTT-GW-C05-0860	MYA1T4	TTT-CPT-5	Field Sample	
TTT-GW-C05-0860	YA1T4	TTT-CPT-5	Field Sample	
TTT-GW-C05-1300	MYA1T5	TTT-CPT-5	Field Sample	
TTT-GW-C05-1300	YA1T5	TTT-CPT-5	Field Sample	
TTT-GW-C07-0640	MYA1T9	TTT-CPT-2	Duplicate	DUP OF TTT-GW-C02-0640
TTT-GW-C07-0640	YA1T9	TTT-CPT-2	Duplicate	DUP OF TTT-GW-C02-0640
TTT-GW-D02-0185	MYA1X2	TTT-DP-2	Field Sample	
TTT-GW-D02-0185	YA1X2	TTT-DP-2	Field Sample	
TTT-GW-D06-0660	MYA1R4	TTT-DP-6	Field Sample	
TTT-GW-D06-0660	YA1R4	TTT-DP-6	Field Sample	
TTT-GW-D07-0660	MYA1R6	TTT-DP-7	Field Sample	MS/MSD
TTT-GW-D07-0660	MYA1R6D	TTT-DP-7	Lab QC	
TTT-GW-D07-0660	MYA1R6S	TTT-DP-7	Lab QC	

TTT-GW-D07-0660	YA1R6	TTT-DP-7	Field Sample	MS/MSD
TTT-GW-D07-0660	YA1R6MS	TTT-DP-7	Lab QC	
TTT-GW-D07-0660	YA1R6MSD	TTT-DP-7	Lab QC	
TTT-GW-D08-0640	MYA1R8	TTT-DP-8	Field Sample	
TTT-GW-D08-0640	YA1R8	TTT-DP-8	Field Sample	
TTT-GW-D09-0640	MYA1R7	TTT-DP-9	Field Sample	
TTT-GW-D09-0640	YA1R7	TTT-DP-9	Field Sample	
TTT-GW-D11-0660	MYA1W0	TTT-DP-6	Duplicate	DUP OF TTT-GW-D06-0660
TTT-GW-D11-0660	YA1W0	TTT-DP-6	Duplicate	DUP OF TTT-GW-D06-0660
TTT-GW-D12-0640	MYA1W1	TTT-DP-8	Duplicate	DUP OF TTT-GW-D08-0640
TTT-GW-D12-0640	YA1W1	TTT-DP-8	Duplicate	DUP OF TTT-GW-D08-0640
TTT-SM-D02-0050	MYA1M3	TTT-DP-2	Field Sample	
TTT-SM-D02-0050	YA1M3	TTT-DP-2	Field Sample	
TTT-SM-D02-0100	MYA1M4	TTT-DP-2	Field Sample	MS/MSD
TTT-SM-D02-0100	MYA1M4D	TTT-DP-2	Lab QC	
TTT-SM-D02-0100	MYA1M4S	TTT-DP-2	Lab QC	
TTT-SM-D02-0100	YA1M4	TTT-DP-2	Field Sample	MS/MSD
TTT-SM-D02-0100	YA1M4MS	TTT-DP-2	Lab QC	
TTT-SM-D02-0100	YA1M4MSD	TTT-DP-2	Lab QC	
TTT-SM-D02-0150	MYA1M5	TTT-DP-2	Field Sample	
TTT-SM-D02-0150	YA1M5	TTT-DP-2	Field Sample	
TTT-SM-D02-0200	MYA1M6	TTT-DP-2	Field Sample	
TTT-SM-D02-0200	YA1M6	TTT-DP-2	Field Sample	
TTT-SM-D04-0050	MYA1N1	TTT-DP-4	Field Sample	
TTT-SM-D04-0050	YA1N1	TTT-DP-4	Field Sample	
TTT-SM-D04-0100	MYA1N2	TTT-DP-4	Field Sample	MS/MSD
TTT-SM-D04-0100	MYA1N2D	TTT-DP-4	Lab QC	
TTT-SM-D04-0100	MYA1N2S	TTT-DP-4	Lab QC	
TTT-SM-D04-0100	YA1N2	TTT-DP-4	Field Sample	Lab QC
TTT-SM-D04-0150	MYA1N3	TTT-DP-4	Field Sample	
TTT-SM-D04-0150	YA1N3	TTT-DP-4	Field Sample	
TTT-SM-D04-0200	MYA1N4	TTT-DP-4	Field Sample	
TTT-SM-D04-0200	YA1N4	TTT-DP-4	Field Sample	
TTT-SM-D05-0050	MYA1N5	TTT-DP-5	Field Sample	
TTT-SM-D05-0050	YA1N5	TTT-DP-5	Field Sample	
TTT-SM-D05-0100	MYA1N6	TTT-DP-5	Field Sample	
TTT-SM-D05-0100	YA1N6	TTT-DP-5	Field Sample	
TTT-SM-D05-0150	MYA1N7	TTT-DP-5	Field Sample	
TTT-SM-D05-0150	YA1N7	TTT-DP-5	Field Sample	
TTT-SM-D05-0200	MYA1N8	TTT-DP-5	Field Sample	
TTT-SM-D05-0200	YA1N8	TTT-DP-5	Field Sample	
TTT-SM-D06-0020	MYA1N9	TTT-DP-6	Field Sample	
TTT-SM-D06-0020	YA1N9	TTT-DP-6	Field Sample	
TTT-SM-D06-0050	MYA1P0	TTT-DP-6	Field Sample	
TTT-SM-D06-0050	YA1P0	TTT-DP-6	Field Sample	
TTT-SM-D06-0100	MYA1P1	TTT-DP-6	Field Sample	
TTT-SM-D06-0100	YA1P1	TTT-DP-6	Field Sample	

TTT-SM-D06-0150	MYA1P2	TTT-DP-6	Field Sample	
TTT-SM-D06-0150	YA1P2	TTT-DP-6	Field Sample	
TTT-SM-D07-0020	MYA1P3	TTT-DP-7	Field Sample	
TTT-SM-D07-0020	YA1P3	TTT-DP-7	Field Sample	
TTT-SM-D07-0050	MYA1P4	TTT-DP-7	Field Sample	
TTT-SM-D07-0050	YA1P4	TTT-DP-7	Field Sample	
TTT-SM-D07-0100	MYA1P5	TTT-DP-7	Field Sample	
TTT-SM-D07-0100	YA1P5	TTT-DP-7	Field Sample	
TTT-SM-D07-0150	MYA1P6	TTT-DP-7	Field Sample	
TTT-SM-D07-0150	YA1P6	TTT-DP-7	Field Sample	
TTT-SM-D08-0020	MYA1P7	TTT-DP-8	Field Sample	
TTT-SM-D08-0020	YA1P7	TTT-DP-8	Field Sample	
TTT-SM-D08-0050	MYA1P8	TTT-DP-8	Field Sample	
TTT-SM-D08-0050	YA1P8	TTT-DP-8	Field Sample	
TTT-SM-D08-0100	MYA1P9	TTT-DP-8	Field Sample	
TTT-SM-D08-0100	YA1P9	TTT-DP-8	Field Sample	
TTT-SM-D08-0150	MYA1Q0	TTT-DP-8	Field Sample	
TTT-SM-D08-0150	YA1Q0	TTT-DP-8	Field Sample	
TTT-SM-D09-0020	MYA1Q1	TTT-DP-9	Field Sample	
TTT-SM-D09-0020	YA1Q1	TTT-DP-9	Field Sample	
TTT-SM-D09-0050	MYA1Q2	TTT-DP-9	Field Sample	MS/MSD
TTT-SM-D09-0050	MYA1Q2D	TTT-DP-9	Lab QC	
TTT-SM-D09-0050	MYA1Q2S	TTT-DP-9	Lab QC	
TTT-SM-D09-0050	YA1Q2	TTT-DP-9	Field Sample	MS/MSD
TTT-SM-D09-0050	YA1Q2MS	TTT-DP-9	Lab QC	
TTT-SM-D09-0050	YA1Q2MSD	TTT-DP-9	Lab QC	
TTT-SM-D09-0100	MYA1Q3	TTT-DP-9	Field Sample	
TTT-SM-D09-0100	YA1Q3	TTT-DP-9	Field Sample	
TTT-SM-D09-0150	MYA1Q4	TTT-DP-9	Field Sample	
TTT-SM-D09-0150	YA1Q4	TTT-DP-9	Field Sample	
TTT-SM-D10-0020	MYA1Q5	TTT-DP-10	Field Sample	
TTT-SM-D10-0020	YA1Q5	TTT-DP-10	Field Sample	
TTT-SM-D10-0050	MYA1Q6	TTT-DP-10	Field Sample	
TTT-SM-D10-0050	YA1Q6	TTT-DP-10	Field Sample	
TTT-SM-D10-0100	MYA1Q7	TTT-DP-10	Field Sample	
TTT-SM-D10-0100	YA1Q7	TTT-DP-10	Field Sample	
TTT-SM-D10-0150	MYA1Q8	TTT-DP-10	Field Sample	
TTT-SM-D10-0150	YA1Q8	TTT-DP-10	Field Sample	
TTT-SM-D13-0050	MYA1R1	TTT-DP-5	Duplicate	DUP OF TTT-SM-D05-0050
TTT-SM-D13-0050	YA1R1	TTT-DP-5	Duplicate	DUP OF TTT-SM-D05-0050
TTT-SM-D14-0050	MYA1R2	TTT-DP-6	Duplicate	DUP OF TTT-SM-D06-0050
TTT-SM-D14-0050	YA1R2	TTT-DP-6	Duplicate	DUP OF TTT-SM-D06-0050

CLP No. to Sample No. Correlation Table - Sorted by CLP No.

Sample #	CLP Sample #	Location	SampleType	Remarks
TTT-SM-D02-0050	MYA1M3	TTT-DP-2	Field Sample	
TTT-SM-D02-0100	MYA1M4	TTT-DP-2	Field Sample	MS/MSD
TTT-SM-D02-0100	MYA1M4D	TTT-DP-2	Lab QC	
TTT-SM-D02-0100	MYA1M4S	TTT-DP-2	Lab QC	
TTT-SM-D02-0150	MYA1M5	TTT-DP-2	Field Sample	
TTT-SM-D02-0200	MYA1M6	TTT-DP-2	Field Sample	
TTT-SM-D04-0050	MYA1N1	TTT-DP-4	Field Sample	
TTT-SM-D04-0100	MYA1N2	TTT-DP-4	Field Sample	MS/MSD
TTT-SM-D04-0100	MYA1N2D	TTT-DP-4	Lab QC	
TTT-SM-D04-0100	MYA1N2S	TTT-DP-4	Lab QC	
TTT-SM-D04-0150	MYA1N3	TTT-DP-4	Field Sample	
TTT-SM-D04-0200	MYA1N4	TTT-DP-4	Field Sample	
TTT-SM-D05-0050	MYA1N5	TTT-DP-5	Field Sample	
TTT-SM-D05-0100	MYA1N6	TTT-DP-5	Field Sample	
TTT-SM-D05-0150	MYA1N7	TTT-DP-5	Field Sample	
TTT-SM-D05-0200	MYA1N8	TTT-DP-5	Field Sample	
TTT-SM-D06-0020	MYA1N9	TTT-DP-6	Field Sample	
TTT-SM-D06-0050	MYA1P0	TTT-DP-6	Field Sample	
TTT-SM-D06-0100	MYA1P1	TTT-DP-6	Field Sample	
TTT-SM-D06-0150	MYA1P2	TTT-DP-6	Field Sample	
TTT-SM-D07-0020	MYA1P3	TTT-DP-7	Field Sample	
TTT-SM-D07-0050	MYA1P4	TTT-DP-7	Field Sample	
TTT-SM-D07-0100	MYA1P5	TTT-DP-7	Field Sample	
TTT-SM-D07-0150	MYA1P6	TTT-DP-7	Field Sample	
TTT-SM-D08-0020	MYA1P7	TTT-DP-8	Field Sample	
TTT-SM-D08-0050	MYA1P8	TTT-DP-8	Field Sample	
TTT-SM-D08-0100	MYA1P9	TTT-DP-8	Field Sample	
TTT-SM-D08-0150	MYA1Q0	TTT-DP-8	Field Sample	
TTT-SM-D09-0020	MYA1Q1	TTT-DP-9	Field Sample	
TTT-SM-D09-0050	MYA1Q2	TTT-DP-9	Field Sample	MS/MSD
TTT-SM-D09-0050	MYA1Q2D	TTT-DP-9	Lab QC	
TTT-SM-D09-0050	MYA1Q2S	TTT-DP-9	Lab QC	
TTT-SM-D09-0100	MYA1Q3	TTT-DP-9	Field Sample	
TTT-SM-D09-0150	MYA1Q4	TTT-DP-9	Field Sample	
TTT-SM-D10-0020	MYA1Q5	TTT-DP-10	Field Sample	
TTT-SM-D10-0050	MYA1Q6	TTT-DP-10	Field Sample	
TTT-SM-D10-0100	MYA1Q7	TTT-DP-10	Field Sample	
TTT-SM-D10-0150	MYA1Q8	TTT-DP-10	Field Sample	
TTT-SM-D13-0050	MYA1R1	TTT-DP-5	Duplicate	DUP OF TTT-SM-D05-0050
TTT-SM-D14-0050	MYA1R2	TTT-DP-6	Duplicate	DUP OF TTT-SM-D06-0050
TTT-GW-D06-0660	MYA1R4	TTT-DP-6	Field Sample	
TTT-GW-D07-0660	MYA1R6	TTT-DP-7	Field Sample	MS/MSD
TTT-GW-D07-0660	MYA1R6D	TTT-DP-7	Lab QC	
TTT-GW-D07-0660	MYA1R6S	TTT-DP-7	Lab QC	
TTT-GW-D09-0640	MYA1R7	TTT-DP-9	Field Sample	

TTT-GW-D08-0640	MYA1R8	TTT-DP-8	Field Sample	
TTT-GW-C01-0610	MYA1S1	TTT-CPT-1	Field Sample	
TTT-GW-C01-0880	MYA1S2	TTT-CPT-1	Field Sample	
TTT-GW-C01-1290	MYA1S3	TTT-CPT-1	Field Sample	
TTT-GW-C02-0640	MYA1S4	TTT-CPT-2	Field Sample	
TTT-GW-C02-0880	MYA1S5	TTT-CPT-2	Field Sample	
TTT-GW-C02-1340	MYA1S6	TTT-CPT-2	Field Sample	
TTT-GW-C03-0640	MYA1S7	TTT-CPT-3	Field Sample	
TTT-GW-C03-0850	MYA1S8	TTT-CPT-3	Field Sample	
TTT-GW-C03-1270	MYA1S9	TTT-CPT-3	Field Sample	
TTT-GW-C04-0630	MYA1T0	TTT-CPT-4	Field Sample	
TTT-GW-C04-0880	MYA1T1	TTT-CPT-4	Field Sample	
TTT-GW-C04-1310	MYA1T2	TTT-CPT-4	Field Sample	MS/MSD
TTT-GW-C04-1310	MYA1T2D	TTT-CPT-4	Lab QC	
TTT-GW-C04-1310	MYA1T2S	TTT-CPT-4	Lab QC	
TTT-GW-C05-0660	MYA1T3	TTT-CPT-5	Field Sample	
TTT-GW-C05-0860	MYA1T4	TTT-CPT-5	Field Sample	
TTT-GW-C05-1300	MYA1T5	TTT-CPT-5	Field Sample	
TTT-GW-C07-0640	MYA1T9	TTT-CPT-2	Duplicate	DUP OF TTT-GW-C02-0640
TTT-GW-D11-0660	MYA1W0	TTT-DP-6	Duplicate	DUP OF TTT-GW-D06-0660
TTT-GW-D12-0640	MYA1W1	TTT-DP-8	Duplicate	DUP OF TTT-GW-D08-0640
TTT-EB01-111615	MYA1W6	EQ Blank	Equipment Blank	
TTT-EB02-111715	MYA1W7	EQ Blank	Equipment Blank	
TTT-GW-D02-0185	MYA1X2	TTT-DP-2	Field Sample	
TTT-SM-D02-0050	YA1M3	TTT-DP-2	Field Sample	
TTT-SM-D02-0100	YA1M4	TTT-DP-2	Field Sample	MS/MSD
TTT-SM-D02-0100	YA1M4MS	TTT-DP-2	Lab QC	
TTT-SM-D02-0100	YA1M4MSD	TTT-DP-2	Lab QC	
TTT-SM-D02-0150	YA1M5	TTT-DP-2	Field Sample	
TTT-SM-D02-0200	YA1M6	TTT-DP-2	Field Sample	
TTT-SM-D04-0050	YA1N1	TTT-DP-4	Field Sample	
TTT-SM-D04-0100	YA1N2	TTT-DP-4	Field Sample	Lab QC
TTT-SM-D04-0150	YA1N3	TTT-DP-4	Field Sample	
TTT-SM-D04-0200	YA1N4	TTT-DP-4	Field Sample	
TTT-SM-D05-0050	YA1N5	TTT-DP-5	Field Sample	
TTT-SM-D05-0100	YA1N6	TTT-DP-5	Field Sample	
TTT-SM-D05-0150	YA1N7	TTT-DP-5	Field Sample	
TTT-SM-D05-0200	YA1N8	TTT-DP-5	Field Sample	
TTT-SM-D06-0020	YA1N9	TTT-DP-6	Field Sample	
TTT-SM-D06-0050	YA1P0	TTT-DP-6	Field Sample	
TTT-SM-D06-0100	YA1P1	TTT-DP-6	Field Sample	
TTT-SM-D06-0150	YA1P2	TTT-DP-6	Field Sample	
TTT-SM-D07-0020	YA1P3	TTT-DP-7	Field Sample	
TTT-SM-D07-0050	YA1P4	TTT-DP-7	Field Sample	
TTT-SM-D07-0100	YA1P5	TTT-DP-7	Field Sample	
TTT-SM-D07-0150	YA1P6	TTT-DP-7	Field Sample	
TTT-SM-D08-0020	YA1P7	TTT-DP-8	Field Sample	

TTT-SM-D08-0050	YA1P8	TTT-DP-8	Field Sample	
TTT-SM-D08-0100	YA1P9	TTT-DP-8	Field Sample	
TTT-SM-D08-0150	YA1Q0	TTT-DP-8	Field Sample	
TTT-SM-D09-0020	YA1Q1	TTT-DP-9	Field Sample	
TTT-SM-D09-0050	YA1Q2	TTT-DP-9	Field Sample	MS/MSD
TTT-SM-D09-0050	YA1Q2MS	TTT-DP-9	Lab QC	
TTT-SM-D09-0050	YA1Q2MSD	TTT-DP-9	Lab QC	
TTT-SM-D09-0100	YA1Q3	TTT-DP-9	Field Sample	
TTT-SM-D09-0150	YA1Q4	TTT-DP-9	Field Sample	
TTT-SM-D10-0020	YA1Q5	TTT-DP-10	Field Sample	
TTT-SM-D10-0050	YA1Q6	TTT-DP-10	Field Sample	
TTT-SM-D10-0100	YA1Q7	TTT-DP-10	Field Sample	
TTT-SM-D10-0150	YA1Q8	TTT-DP-10	Field Sample	
TTT-SM-D13-0050	YA1R1	TTT-DP-5	Duplicate	DUP OF TTT-SM-D05-0050
TTT-SM-D14-0050	YA1R2	TTT-DP-6	Duplicate	DUP OF TTT-SM-D06-0050
TTT-GW-D06-0660	YA1R4	TTT-DP-6	Field Sample	
TTT-GW-D07-0660	YA1R6	TTT-DP-7	Field Sample	MS/MSD
TTT-GW-D07-0660	YA1R6MS	TTT-DP-7	Lab QC	
TTT-GW-D07-0660	YA1R6MSD	TTT-DP-7	Lab QC	
TTT-GW-D09-0640	YA1R7	TTT-DP-9	Field Sample	
TTT-GW-D08-0640	YA1R8	TTT-DP-8	Field Sample	
TTT-GW-C01-0610	YA1S1	TTT-CPT-1	Field Sample	
TTT-GW-C01-0880	YA1S2	TTT-CPT-1	Field Sample	
TTT-GW-C01-1290	YA1S3	TTT-CPT-1	Field Sample	
TTT-GW-C02-0640	YA1S4	TTT-CPT-2	Field Sample	
TTT-GW-C02-0880	YA1S5	TTT-CPT-2	Field Sample	
TTT-GW-C02-1340	YA1S6	TTT-CPT-2	Field Sample	
TTT-GW-C03-0640	YA1S7	TTT-CPT-3	Field Sample	
TTT-GW-C03-0850	YA1S8	TTT-CPT-3	Field Sample	
TTT-GW-C03-1270	YA1S9	TTT-CPT-3	Field Sample	
TTT-GW-C04-0630	YA1T0	TTT-CPT-4	Field Sample	
TTT-GW-C04-0880	YA1T1	TTT-CPT-4	Field Sample	
TTT-GW-C04-1310	YA1T2	TTT-CPT-4	Field Sample	
TTT-GW-C05-0660	YA1T3	TTT-CPT-5	Field Sample	
TTT-GW-C05-0860	YA1T4	TTT-CPT-5	Field Sample	
TTT-GW-C05-1300	YA1T5	TTT-CPT-5	Field Sample	
TTT-GW-C07-0640	YA1T9	TTT-CPT-2	Duplicate	DUP OF TTT-GW-C02-0640
TTT-GW-D11-0660	YA1W0	TTT-DP-6	Duplicate	DUP OF TTT-GW-D06-0660
TTT-GW-D12-0640	YA1W1	TTT-DP-8	Duplicate	DUP OF TTT-GW-D08-0640
TTT-EB01-111615	YA1W6	EQ Blank	Equipment Blank	
TTT-EB02-111715	YA1W7	EQ Blank	Equipment Blank	
TTT-GW-D02-0185	YA1X2	TTT-DP-2	Field Sample	

Appendix H:
Laboratory Reports

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 26, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	MYA1R4
Laboratory:	Shealy Environmental Services, Inc. (EQI)
Analysis:	CLP Metals by ICP-MS
Samples:	20 Groundwater Samples
Collection Date:	November 16, 17, and 18, 2015
Reviewer:	Anna Pajarillo, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM: the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Howard Pham, CLP PO USEPA Region 5
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [X] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report – **Tier 3**

Case No.: 45742
SDG No.: MYA1R4
Site: Titan Terminal & Transport
Laboratory: Shealy Environmental Services, Inc. (EQI)
Analysis: CLP Metals by ICP-MS
Reviewer: Anna Pajarillo, ESAT
Date: May 26, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Inorganic Analytical Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	MYA1W6 and MYA1W7.
Background Samples (BG):	None.
Field Duplicates (D1):	MYA1R4, MYA1S4
(D2):	MYA1W0, MYA1R4
(D3):	MYA1R8, MYA1W1 (in SDG MYA1T2)

CLP PO Action

Nondetected results for lead in samples MYA1S7 through MYA1S9 are qualified as rejected (R) due to a matrix spike recovery below 30% (see Comment A).

The matrix spike recoveries for barium, lead, and zinc were below the 75-125% recovery criteria. The laboratory analyzed the post digestion spike with added concentrations greater than two times the sample concentration. See CLP SOW ISM02.3 (09/2015) Exhibit D ICP-MS Page D-64 Section 12.3.3.3.

Sampling Issues

1. The cooler received by the laboratory on 11/19/15 had a temperature of 6.7ºC which is above the less than or equal to 6ºC sample preservation criterion (see Additional Comments).
2. Contamination above the contract required quantitation limit (CRQL) was found for arsenic, lead, manganese, nickel, and zinc in equipment blank MYA1W6 and for copper, lead, nickel, and zinc in equipment blank MYA1W7 (see Comment D).
3. Samples MYA1R4, MYA1R6, MYA1R7, and MYA1R8 were received with pH greater than two. No impact on sample results is anticipated since the laboratory adjusted the pH to less than two upon sample receipt.
4. The equipment blanks were not submitted "blind" to the laboratory since the matrix was stated as "Blank" and the location was stated as "EQ Blank" on chain of custody records (COCs).

Additional Comments

The samples were analyzed for the following Contract Laboratory Program (CLP) metals by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS): antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc.

Samples MYA1R4, MYA1R6, MYA1S4 through MYA1S9, MYA1T9, MYA1W0, and MYA1X2 and equipment blanks MYA1W6 and MYA1W7 were received by the laboratory with a cooler temperature of 6.7ºC, which is above the $\leq$ 6ºC sample preservation criterion. No adverse effect is expected for ICP-MS metal results based on the recommended preservation criteria for

metals provided in Table 3-2 of EPA publication SW-846, revision 4 (recommended preservation criteria for metals does not require chilling).

On Form 15 (Initial Calibration), the analyte true values for run batch MS2011216A were reported as "0.0000" and the percent difference (%D) columns were blank for all calibration levels. The laboratory provided the revised Form 15 pages upon request, on 3/10/16.

The preparation logs for some solutions were missing from the data package. The laboratory provided the missing pages upon request, on 3/10/16. All standards and spiking solutions were analyzed before the expiration date.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Statement of Work (SOW), except as noted, have been met.

This report was prepared in accordance with the following documents:

- *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)* ISM02.2, August 2014; and
- *USEPA National Functional Guidelines for Inorganic Superfund Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), EPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration,* ISM02.2, August 2014.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Preservation and Holding Times	Yes	
3.	ICP-MS Tune Analysis	Yes	
4.	Calibration	Yes	
	a. Initial	Yes	
	b. Initial and Continuing Calibration Verification	Yes	
5.	Blanks	No	C, D
6.	ICP Interference Check Sample (ICS)	Yes	
7.	Laboratory Control Sample (LCS)	Yes	
8.	Duplicate Sample Analysis	Yes	
9.	Spike Sample Analysis	No	A, E
10.	ICP Serial Dilution	No	F
11.	ICP-MS Internal Standards	No	G, H
12.	Field Duplicate Sample Analysis	No	J
13.	Sample Quantitation	Yes	B, I
14.	Overall Assessment	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. The following nondetected results are rejected and detected results are estimated low and flagged "R" and "J-", respectively, due to matrix spike recoveries below 30%.

- Barium and lead in all field samples.

Matrix spike recoveries are less than 30% for barium and lead in QC sample MYA1R6S as presented below.

Analyte	% Recovery
Barium	1
Lead	26

Nondetected results for these analytes are unusable. Detected results are considered quantitatively uncertain and may be biased low.

A valid post-digestion spike is not available for barium and lead (see CLP PO Action).

B. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

C. The following results are qualified as nondetected (U) due to low level initial calibration blank (CCB) and equipment blank (EB) contamination.

- Chromium in samples MYA1S7 through MYA1S9.
- Thallium in samples MYA1R4, MYA1R6, MYA1R7, MYA1S2 through MYA1S4, MYA1T9, and MYA1W0.

Analyte amounts greater than the MDL but less than or equal to the CRQL were reported in the following blanks at the concentrations presented below.

Analyte	Blank	Concentration, µg/L
Chromium	MYA1W6	1.4
Thallium	ICB034/ICB038	0.059/0.12

Sample results that are greater than or equal to the MDL but less than or equal to the CRQL are reported as nondetected (U) at the respective CRQL.

D. The following results are qualified as estimated and flagged "J+" or "U" due to equipment blank (EB) contamination.

- Arsenic and copper in samples MYA1R4, MYA1R6, MYA1R8, MYA1S7 through MYA1S9, and MYA1W0.
- Lead and zinc in samples MYA1R4, MYA1R6, MYA1S7 through MYA1S9, and MYA1W0.
- Nickel in samples MYA1S7 and MYA1S9.

Analyte amounts greater than the CRQL were reported in the following equipment blanks at the concentrations presented below.

Analyte	Blank	Concentration, µg/L
Arsenic	MYA1W6	1.2
Copper	MYA1W7	3.9
Lead	MYA1W6 and MYA1W7	3.0 and 1.0
Nickel	MYA1W6 and MYA1W7	1.4 and 2.9
Zinc	MYA1W6 and MYA1W7	5.0 and 4.9

Detected results for the analytes listed above are considered quantitatively uncertain and may be biased high.

E. The following results are estimated and flagged "J-" or "UJ" because a matrix spike recovery is outside method QC limit.

- Zinc in all field samples.

The matrix spike recovery for zinc in QC sample MYA1R6S does not meet the 75-125% criterion for accuracy as presented below.

Analyte	% Recovery
Zinc	66

Detected results for zinc are considered quantitatively uncertain and may be biased low.

A valid post-digestion spike is not available for zinc (see CLP PO Action).

F. The following results are estimated and flagged "J" because a serial dilution result is outside method QC limit.

- Nickel in all field samples.

The percent difference for serial dilution analysis of MYA0R9L does not meet the 15% difference criterion for the analyte presented below.

Analyte	% Difference
Nickel	18

Results for nickel are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. Since results for the diluted sample are higher than the original, the reported results may be biased low.

G. The following result is qualified as estimated and flagged "UJ" because an internal standard relative intensity (RI) is outside method QC limit.

{Lithium-6}
- Beryllium in sample MYA1X2.

Since the RI for original analysis is outside the 60-125% QC limit, sample MYA1X2 was re-analyzed at a two-fold dilution as specified in the SOW. The RI of the original analysis and two-fold dilution re-analysis are presented below.

Sample	Internal Standard	% Relative Intensity from Undiluted	% Relative Intensity from 2-Fold Dilution
MYA1X2	Lithium-6	208	179

Because the RI for 2-fold dilution re-analysis is outside the 60-125% QC limit, the beryllium result for sample MYA1X2 is reported from the original undiluted analysis and flagged as specified in the NFG. The reported result is considered quantitatively uncertain.

H. The samples listed in the table below were analyzed at two-fold dilution due to internal standard exceeding QC criteria. Results for the associated elements listed below are reported from the diluted analyses and the CRQLs adjusted accordingly.

Sample	Internal Standard	Associated Elements
MYA1R8 and MYA1S8	Bismuth-209	Lead
MYA1R6, MYA1R8, MYA1S8, and MYA1W0	Lithium-6	Beryllium
MYA1R8, MYA1S8, and MYA1X2	Scandium-45	Arsenic, Beryllium, Chromium, Cobalt, Copper, Nickel, Selenium, Vanadium, Zinc
MYA1R7	Yttrium-89	Cadmium, Chromium, Manganese, Nickel, Vanadium

I. The samples listed in the table below required dilution to obtain results within the calibration range for the indicated elements. Results for these elements are reported from the indicated dilutions and the CRQL adjusted accordingly.

Sample	Dilution Factor	Associated Element
MYA1R6, MYA1S3, and MYA1S5	2	Manganese
MYA1S1, MYA1S4, MYA1S8, and MYA1T9	5	Manganese
MYA1R4 and MYA1W0	10	Manganese
MYA1R8	20	Manganese
MYA1X2	20	Arsenic, Manganese
MYA1R7	50	Manganese

J. Results for the following field duplicate pair do not meet the relative percent difference (RPD) criterion for precision as presented below.

Analyte	MYA1W1, (D3) (in SDG MYA1T2) µg/L	MYA1R8 (D3) µg/L	RPD	QC Limit
Nickel	261	365	33.2	20
Zinc	82.4	150	58.2	20

This uncertainty should be evaluated in the context of project data quality objectives to determine data usability.

Sample Summary Report

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	LCS050	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	4.4		ug/L	4.4		1	Yes	S3VEM
Arsenic	Target	2.2		ug/L	2.2		1	Yes	S3VEM
Barium	Target	19.6		ug/L	19.6		1	Yes	S3VEM
Beryllium	Target	2.3		ug/L	2.3		1	Yes	S3VEM
Cadmium	Target	2.2		ug/L	2.2		1	Yes	S3VEM
Chromium	Target	4.0		ug/L	4.0		1	Yes	S3VEM
Cobalt	Target	2.1		ug/L	2.1		1	Yes	S3VEM
Copper	Target	4.7		ug/L	4.7		1	Yes	S3VEM
Lead	Target	2.0		ug/L	2.0		1	Yes	S3VEM
Manganese	Target	2.2		ug/L	2.2		1	Yes	S3VEM
Nickel	Target	2.1		ug/L	2.1		1	Yes	S3VEM
Selenium	Target	11.7		ug/L	11.7		1	Yes	S3VEM
Silver	Target	2.2		ug/L	2.2		1	Yes	S3VEM
Thallium	Target	1.9		ug/L	1.9		1	Yes	S3VEM
Vanadium	Target	10.0		ug/L	10.0		1	Yes	S3VEM
Zinc	Target	5.2		ug/L	5.2		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1R4	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-DP-6	pH:		Sample Date:	11/17/2015	Sample Time:	13:53:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.46	J	ug/L	0.46	J	1	Yes	S3VEM
Arsenic	Target	2.8	J+	ug/L	2.8		1	Yes	S3VEM
Barium	Target	83.3	J-	ug/L	83.3	*	1	Yes	S3VEM
Beryllium	Target	0.15	J	ug/L	0.15	J	1	Yes	S3VEM
Cadmium	Target	0.13	J	ug/L	0.13	J	1	Yes	S3VEM
Chromium	Target	5.2		ug/L	5.2		1	Yes	S3VEM
Cobalt	Target	41.1		ug/L	41.1		1	Yes	S3VEM
Copper	Target	9.7	J+	ug/L	9.7		1	Yes	S3VEM
Lead	Target	7.9	J	ug/L	7.9	*	1	Yes	S3VEM
Manganese	Target	5020		ug/L	5020	D	10	Yes	S3VEM
Nickel	Target	913	J	ug/L	913	*	1	Yes	S3VEM
Selenium	Target	5.0		ug/L	5.0		1	Yes	S3VEM
Silver	Target	0.031	J	ug/L	0.031	J	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.037	J	1	Yes	S3VEM
Vanadium	Target	9.5		ug/L	9.5		1	Yes	S3VEM
Zinc	Target	42.1	J	ug/L	42.1	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1R6	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-DP-7	pH:		Sample Date:	11/17/2015	Sample Time:	15:49:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.56	J	ug/L	0.56	J	1	Yes	S3VEM
Arsenic	Target	11.0	J+	ug/L	11.0		1	Yes	S3VEM
Barium	Target	41.9	J-	ug/L	41.9	*	1	Yes	S3VEM
Beryllium	Target	2.0	U	ug/L	2.0	UD	2	Yes	S3VEM
Cadmium	Target	0.073	J	ug/L	0.073	J	1	Yes	S3VEM
Chromium	Target	3.8		ug/L	3.8		1	Yes	S3VEM
Cobalt	Target	1.6		ug/L	1.6		1	Yes	S3VEM
Copper	Target	6.0	J+	ug/L	6.0		1	Yes	S3VEM
Lead	Target	1.8	J	ug/L	1.8	*	1	Yes	S3VEM
Manganese	Target	725		ug/L	725	D	2	Yes	S3VEM
Nickel	Target	32.3	J	ug/L	32.3	*	1	Yes	S3VEM
Selenium	Target	5.9		ug/L	5.9		1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.036	J	1	Yes	S3VEM
Vanadium	Target	8.7		ug/L	8.7		1	Yes	S3VEM
Zinc	Target	11.2	J	ug/L	11.2	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1R6A	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/17/2015	Sample Time:	15:49:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Barium	Spike	3480		ug/L	3480		1	Yes	S3VEM
Lead	Spike	37.7		ug/L	37.7		1	Yes	S3VEM
Zinc	Spike	790		ug/L	790		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1R6D	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/17/2015	Sample Time:	15:49:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.54	J	ug/L	0.54	J	1	Yes	S3VEM
Arsenic	Target	11.1		ug/L	11.1		1	Yes	S3VEM
Barium	Target	41.5		ug/L	41.5		1	Yes	S3VEM
Beryllium	Target	2.0	U	ug/L	2.0	UD	2	Yes	S3VEM
Cadmium	Target	0.11	J	ug/L	0.11	J	1	Yes	S3VEM
Chromium	Target	3.7		ug/L	3.7		1	Yes	S3VEM
Cobalt	Target	1.6		ug/L	1.6		1	Yes	S3VEM
Copper	Target	6.2		ug/L	6.2		1	Yes	S3VEM
Lead	Target	1.6		ug/L	1.6		1	Yes	S3VEM
Manganese	Target	718		ug/L	718	D	2	Yes	S3VEM
Nickel	Target	32.6		ug/L	32.6		1	Yes	S3VEM
Selenium	Target	5.8		ug/L	5.8		1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	0.029	J	ug/L	0.029	J	1	Yes	S3VEM
Vanadium	Target	8.6		ug/L	8.6		1	Yes	S3VEM
Zinc	Target	11.3		ug/L	11.3		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1R4	Lab Code: EQI
Sample Number: MYA1R6L	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.66	J	ug/L	0.66	J	5	Yes	S3VEM
Arsenic	Target	13.0		ug/L	13.0		5	Yes	S3VEM
Barium	Target	41.6	J	ug/L	41.6	J	5	Yes	S3VEM
Beryllium	Target	10.0	U	ug/L	10.0	U	10	Yes	S3VEM
Cadmium	Target	5.0	U	ug/L	5.0	U	5	Yes	S3VEM
Chromium	Target	4.0	J	ug/L	4.0	J	5	Yes	S3VEM
Cobalt	Target	1.9	J	ug/L	1.9	J	5	Yes	S3VEM
Copper	Target	9.6	J	ug/L	9.6	J	5	Yes	S3VEM
Lead	Target	1.7	J	ug/L	1.7	J	5	Yes	S3VEM
Manganese	Target	740		ug/L	740		10	Yes	S3VEM
Nickel	Target	38.1		ug/L	38.1	*	5	Yes	S3VEM
Selenium	Target	6.2	J	ug/L	6.2	J	5	Yes	S3VEM
Silver	Target	5.0	U	ug/L	5.0	U	5	Yes	S3VEM
Thallium	Target	5.0	U	ug/L	5.0	U	5	Yes	S3VEM
Vanadium	Target	8.4	J	ug/L	8.4	J	5	Yes	S3VEM
Zinc	Target	18.6		ug/L	18.6		5	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1R6S	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/17/2015	Sample Time:	15:49:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	87.8		ug/L	87.8		1	Yes	S3VEM
Arsenic	Spike	45.7		ug/L	45.7		1	Yes	S3VEM
Barium	Spike	56.8		ug/L	56.8	*	1	Yes	S3VEM
Beryllium	Spike	40.1		ug/L	40.1	D	2	Yes	S3VEM
Cadmium	Spike	41.0		ug/L	41.0		1	Yes	S3VEM
Chromium	Spike	175		ug/L	175		1	Yes	S3VEM
Cobalt	Spike	420		ug/L	420		1	Yes	S3VEM
Copper	Spike	205		ug/L	205		1	Yes	S3VEM
Lead	Spike	7.0		ug/L	7.0	*	1	Yes	S3VEM
Manganese	Spike	1220		ug/L	1220	D	2	Yes	S3VEM
Nickel	Spike	431		ug/L	431		1	Yes	S3VEM
Selenium	Spike	106		ug/L	106		1	Yes	S3VEM
Silver	Spike	42.9		ug/L	42.9		1	Yes	S3VEM
Thallium	Spike	52.7		ug/L	52.7		1	Yes	S3VEM
Vanadium	Spike	493		ug/L	493		1	Yes	S3VEM
Zinc	Spike	340		ug/L	340	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1R7	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-DP-9	pH:		Sample Date:	11/18/2015	Sample Time:	10:26:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.40	J	ug/L	0.40	J	1	Yes	S3VEM
Arsenic	Target	16.9		ug/L	16.9		1	Yes	S3VEM
Barium	Target	76.9	J-	ug/L	76.9	*	1	Yes	S3VEM
Beryllium	Target	0.17	J	ug/L	0.17	J	1	Yes	S3VEM
Cadmium	Target	3.6		ug/L	3.6	D	2	Yes	S3VEM
Chromium	Target	15.9		ug/L	15.9	D	2	Yes	S3VEM
Cobalt	Target	129		ug/L	129		1	Yes	S3VEM
Copper	Target	30.9		ug/L	30.9		1	Yes	S3VEM
Lead	Target	150	J-	ug/L	150	*	1	Yes	S3VEM
Manganese	Target	20300		ug/L	20300	D	50	Yes	S3VEM
Nickel	Target	323	J	ug/L	323	*D	2	Yes	S3VEM
Selenium	Target	2.9	J	ug/L	2.9	J	1	Yes	S3VEM
Silver	Target	0.029	J	ug/L	0.029	J	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.062	J	1	Yes	S3VEM
Vanadium	Target	120		ug/L	120	D	2	Yes	S3VEM
Zinc	Target	163	J-	ug/L	163	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1R8	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-DP-8	pH:		Sample Date:	11/17/2015	Sample Time:	10:24:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.49	J	ug/L	0.49	J	1	Yes	S3VEM
Arsenic	Target	11.6	J+	ug/L	11.6	D	2	Yes	S3VEM
Barium	Target	54.5	J-	ug/L	54.5	*	1	Yes	S3VEM
Beryllium	Target	2.0	U	ug/L	2.0	UD	2	Yes	S3VEM
Cadmium	Target	1.9		ug/L	1.9		1	Yes	S3VEM
Chromium	Target	5.7		ug/L	5.7	D	2	Yes	S3VEM
Cobalt	Target	88.8		ug/L	88.8	D	2	Yes	S3VEM
Copper	Target	16.3	J+	ug/L	16.3	D	2	Yes	S3VEM
Lead	Target	97.2	J-	ug/L	97.2	*D	2	Yes	S3VEM
Manganese	Target	13400		ug/L	13400	D	20	Yes	S3VEM
Nickel	Target	365	J	ug/L	365	*D	2	Yes	S3VEM
Selenium	Target	10.0	U	ug/L	10.0	UD	2	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	83.3		ug/L	83.3	D	2	Yes	S3VEM
Zinc	Target	150	J-	ug/L	150	*D	2	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S1	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-1	pH:		Sample Date:	11/18/2015	Sample Time:	10:25:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.58	J	ug/L	0.58	J	1	Yes	S3VEM
Arsenic	Target	18.1		ug/L	18.1		1	Yes	S3VEM
Barium	Target	31.3	J-	ug/L	31.3	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	0.39	J	ug/L	0.39	J	1	Yes	S3VEM
Chromium	Target	0.33	J	ug/L	0.33	J	1	Yes	S3VEM
Cobalt	Target	20.3		ug/L	20.3		1	Yes	S3VEM
Copper	Target	6.3		ug/L	6.3		1	Yes	S3VEM
Lead	Target	8.7	J-	ug/L	8.7	*	1	Yes	S3VEM
Manganese	Target	2550		ug/L	2550	D	5	Yes	S3VEM
Nickel	Target	293	J	ug/L	293	*	1	Yes	S3VEM
Selenium	Target	3.0	J	ug/L	3.0	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	4.4	J	ug/L	4.4	J	1	Yes	S3VEM
Zinc	Target	21.7	J-	ug/L	21.7	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S2	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-1	pH:		Sample Date:	11/18/2015	Sample Time:	11:05:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.32	J	ug/L	0.32	J	1	Yes	S3VEM
Arsenic	Target	4.7		ug/L	4.7		1	Yes	S3VEM
Barium	Target	207	J-	ug/L	207	*	1	Yes	S3VEM
Beryllium	Target	0.41	J	ug/L	0.41	J	1	Yes	S3VEM
Cadmium	Target	0.23	J	ug/L	0.23	J	1	Yes	S3VEM
Chromium	Target	18.9		ug/L	18.9		1	Yes	S3VEM
Cobalt	Target	6.0		ug/L	6.0		1	Yes	S3VEM
Copper	Target	17.0		ug/L	17.0		1	Yes	S3VEM
Lead	Target	4.3	J-	ug/L	4.3	*	1	Yes	S3VEM
Manganese	Target	517		ug/L	517		1	Yes	S3VEM
Nickel	Target	14.8	J	ug/L	14.8	*	1	Yes	S3VEM
Selenium	Target	1.6	J	ug/L	1.6	J	1	Yes	S3VEM
Silver	Target	0.047	J	ug/L	0.047	J	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.084	J	1	Yes	S3VEM
Vanadium	Target	28.4		ug/L	28.4		1	Yes	S3VEM
Zinc	Target	41.9	J-	ug/L	41.9	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S3	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-1	pH:		Sample Date:	11/18/2015	Sample Time:	11:43:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.81	J	ug/L	0.81	J	1	Yes	S3VEM
Arsenic	Target	4.8		ug/L	4.8		1	Yes	S3VEM
Barium	Target	193	J-	ug/L	193	*	1	Yes	S3VEM
Beryllium	Target	0.12	J	ug/L	0.12	J	1	Yes	S3VEM
Cadmium	Target	0.14	J	ug/L	0.14	J	1	Yes	S3VEM
Chromium	Target	10.5		ug/L	10.5		1	Yes	S3VEM
Cobalt	Target	2.9		ug/L	2.9		1	Yes	S3VEM
Copper	Target	7.0		ug/L	7.0		1	Yes	S3VEM
Lead	Target	1.8	J-	ug/L	1.8	*	1	Yes	S3VEM
Manganese	Target	1070		ug/L	1070	D	2	Yes	S3VEM
Nickel	Target	18.3	J	ug/L	18.3	*	1	Yes	S3VEM
Selenium	Target	4.4	J	ug/L	4.4	J	1	Yes	S3VEM
Silver	Target	0.024	J	ug/L	0.024	J	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.040	J	1	Yes	S3VEM
Vanadium	Target	10.3		ug/L	10.3		1	Yes	S3VEM
Zinc	Target	19.0	J-	ug/L	19.0	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S4	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-2	pH:		Sample Date:	11/16/2015	Sample Time:	15:00:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.66	J	ug/L	0.66	J	1	Yes	S3VEM
Arsenic	Target	5.0		ug/L	5.0		1	Yes	S3VEM
Barium	Target	63.6	J-	ug/L	63.6	*	1	Yes	S3VEM
Beryllium	Target	0.090	J	ug/L	0.090	J	1	Yes	S3VEM
Cadmium	Target	0.89	J	ug/L	0.89	J	1	Yes	S3VEM
Chromium	Target	4.3		ug/L	4.3		1	Yes	S3VEM
Cobalt	Target	68.8		ug/L	68.8		1	Yes	S3VEM
Copper	Target	19.3		ug/L	19.3		1	Yes	S3VEM
Lead	Target	23.7	J-	ug/L	23.7	*	1	Yes	S3VEM
Manganese	Target	4460		ug/L	4460	D	5	Yes	S3VEM
Nickel	Target	483	J	ug/L	483	*	1	Yes	S3VEM
Selenium	Target	5.0		ug/L	5.0		1	Yes	S3VEM
Silver	Target	0.023	J	ug/L	0.023	J	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.041	J	1	Yes	S3VEM
Vanadium	Target	20.7		ug/L	20.7		1	Yes	S3VEM
Zinc	Target	53.0	J-	ug/L	53.0	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S5	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-2	pH:		Sample Date:	11/16/2015	Sample Time:	15:45:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.24	J	ug/L	0.24	J	1	Yes	S3VEM
Arsenic	Target	1.2		ug/L	1.2		1	Yes	S3VEM
Barium	Target	85.9	J-	ug/L	85.9	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	0.086	J	ug/L	0.086	J	1	Yes	S3VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Cobalt	Target	1.3		ug/L	1.3		1	Yes	S3VEM
Copper	Target	2.8		ug/L	2.8		1	Yes	S3VEM
Lead	Target	0.19	J-	ug/L	0.19	J*	1	Yes	S3VEM
Manganese	Target	1380		ug/L	1380	D	2	Yes	S3VEM
Nickel	Target	53.3	J	ug/L	53.3	*	1	Yes	S3VEM
Selenium	Target	2.3	J	ug/L	2.3	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	5.9		ug/L	5.9		1	Yes	S3VEM
Zinc	Target	14.5	J-	ug/L	14.5	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S6	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-2	pH:		Sample Date:	11/16/2015	Sample Time:	16:25:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.6	J	ug/L	1.6	J	1	Yes	S3VEM
Arsenic	Target	3.6		ug/L	3.6		1	Yes	S3VEM
Barium	Target	31.3	J-	ug/L	31.3	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	0.52	J	ug/L	0.52	J	1	Yes	S3VEM
Chromium	Target	1.9	J	ug/L	1.9	J	1	Yes	S3VEM
Cobalt	Target	2.8		ug/L	2.8		1	Yes	S3VEM
Copper	Target	10.1		ug/L	10.1		1	Yes	S3VEM
Lead	Target	0.88	J-	ug/L	0.88	J*	1	Yes	S3VEM
Manganese	Target	246		ug/L	246		1	Yes	S3VEM
Nickel	Target	35.7	J	ug/L	35.7	*	1	Yes	S3VEM
Selenium	Target	2.4	J	ug/L	2.4	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	4.7	J	ug/L	4.7	J	1	Yes	S3VEM
Zinc	Target	28.9	J-	ug/L	28.9	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S7	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-3	pH:		Sample Date:	11/17/2015	Sample Time:	10:25:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.54	J	ug/L	0.54	J	1	Yes	S3VEM
Arsenic	Target	6.9	J+	ug/L	6.9		1	Yes	S3VEM
Barium	Target	58.5	J-	ug/L	58.5	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	0.092	J	ug/L	0.092	J	1	Yes	S3VEM
Chromium	Target	2.0	U	ug/L	0.92	J	1	Yes	S3VEM
Cobalt	Target	2.4		ug/L	2.4		1	Yes	S3VEM
Copper	Target	2.0	U	ug/L	1.9	J	1	Yes	S3VEM
Lead	Target	1.0	R	ug/L	0.46	J*	1	Yes	S3VEM
Manganese	Target	380		ug/L	380		1	Yes	S3VEM
Nickel	Target	10.6	J+	ug/L	10.6	*	1	Yes	S3VEM
Selenium	Target	0.79	J	ug/L	0.79	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	5.3		ug/L	5.3		1	Yes	S3VEM
Zinc	Target	12.2	J	ug/L	12.2	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S8	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-3	pH:		Sample Date:	11/17/2015	Sample Time:	11:05:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.22	J	ug/L	0.22	J	1	Yes	S3VEM
Arsenic	Target	1.4	J+	ug/L	1.4	JD	2	Yes	S3VEM
Barium	Target	61.5	J-	ug/L	61.5	*	1	Yes	S3VEM
Beryllium	Target	2.0	U	ug/L	2.0	UD	2	Yes	S3VEM
Cadmium	Target	0.076	J	ug/L	0.076	J	1	Yes	S3VEM
Chromium	Target	2.0	U	ug/L	1.3	JD	2	Yes	S3VEM
Cobalt	Target	0.97	J	ug/L	0.97	JD	2	Yes	S3VEM
Copper	Target	6.7	J+	ug/L	6.7	D	2	Yes	S3VEM
Lead	Target	1.0	R	ug/L	0.26	J*D	2	Yes	S3VEM
Manganese	Target	2910		ug/L	2910	D	5	Yes	S3VEM
Nickel	Target	84.9	J	ug/L	84.9	*D	2	Yes	S3VEM
Selenium	Target	3.6	J	ug/L	3.6	JD	2	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	13.3		ug/L	13.3	D	2	Yes	S3VEM
Zinc	Target	35.2	J	ug/L	35.2	*D	2	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1S9	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-3	pH:		Sample Date:	11/17/2015	Sample Time:	11:43:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.55	J	ug/L	0.55	J	1	Yes	S3VEM
Arsenic	Target	1.8	J+	ug/L	1.8		1	Yes	S3VEM
Barium	Target	111	J-	ug/L	111	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	2.0	U	ug/L	0.16	J	1	Yes	S3VEM
Cobalt	Target	1.2		ug/L	1.2		1	Yes	S3VEM
Copper	Target	7.3	J+	ug/L	7.3		1	Yes	S3VEM
Lead	Target	1.0	R	ug/L	0.10	J*	1	Yes	S3VEM
Manganese	Target	485		ug/L	485		1	Yes	S3VEM
Nickel	Target	21.9	J+	ug/L	21.9	*	1	Yes	S3VEM
Selenium	Target	2.3	J	ug/L	2.3	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	1.9	J	ug/L	1.9	J	1	Yes	S3VEM
Zinc	Target	27.4	J	ug/L	27.4	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1T0	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-4	pH:		Sample Date:	11/18/2015	Sample Time:	13:35:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.40	J	ug/L	0.40	J	1	Yes	S3VEM
Arsenic	Target	2.8		ug/L	2.8		1	Yes	S3VEM
Barium	Target	73.9	J-	ug/L	73.9	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	2.1		ug/L	2.1		1	Yes	S3VEM
Cobalt	Target	1.3		ug/L	1.3		1	Yes	S3VEM
Copper	Target	3.0		ug/L	3.0		1	Yes	S3VEM
Lead	Target	0.84	J-	ug/L	0.84	J*	1	Yes	S3VEM
Manganese	Target	409		ug/L	409		1	Yes	S3VEM
Nickel	Target	8.9	J	ug/L	8.9	*	1	Yes	S3VEM
Selenium	Target	0.88	J	ug/L	0.88	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	7.8		ug/L	7.8		1	Yes	S3VEM
Zinc	Target	10.0	J-	ug/L	10.0	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1T1	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-4	pH:		Sample Date:	11/18/2015	Sample Time:	14:15:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.23	J	ug/L	0.23	J	1	Yes	S3VEM
Arsenic	Target	2.2		ug/L	2.2		1	Yes	S3VEM
Barium	Target	58.9	J-	ug/L	58.9	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	2.9		ug/L	2.9		1	Yes	S3VEM
Cobalt	Target	1.1		ug/L	1.1		1	Yes	S3VEM
Copper	Target	3.1		ug/L	3.1		1	Yes	S3VEM
Lead	Target	0.73	J-	ug/L	0.73	J*	1	Yes	S3VEM
Manganese	Target	506		ug/L	506		1	Yes	S3VEM
Nickel	Target	16.5	J	ug/L	16.5	*	1	Yes	S3VEM
Selenium	Target	3.7	J	ug/L	3.7	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	3.4	J	ug/L	3.4	J	1	Yes	S3VEM
Zinc	Target	9.7	J-	ug/L	9.7	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1T9	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-2	pH:		Sample Date:	11/16/2015	Sample Time:	15:05:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.45	J	ug/L	0.45	J	1	Yes	S3VEM
Arsenic	Target	5.5		ug/L	5.5		1	Yes	S3VEM
Barium	Target	58.0	J-	ug/L	58.0	*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	0.86	J	ug/L	0.86	J	1	Yes	S3VEM
Chromium	Target	4.2		ug/L	4.2		1	Yes	S3VEM
Cobalt	Target	67.9		ug/L	67.9		1	Yes	S3VEM
Copper	Target	19.9		ug/L	19.9		1	Yes	S3VEM
Lead	Target	24.6	J-	ug/L	24.6	*	1	Yes	S3VEM
Manganese	Target	4560		ug/L	4560	D	5	Yes	S3VEM
Nickel	Target	478	J	ug/L	478	*	1	Yes	S3VEM
Selenium	Target	4.6	J	ug/L	4.6	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.033	J	1	Yes	S3VEM
Vanadium	Target	21.5		ug/L	21.5		1	Yes	S3VEM
Zinc	Target	56.2	J-	ug/L	56.2	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1W0	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-DP-6	pH:		Sample Date:	11/17/2015	Sample Time:	13:58:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.55	J	ug/L	0.55	J	1	Yes	S3VEM
Arsenic	Target	3.0	J+	ug/L	3.0		1	Yes	S3VEM
Barium	Target	79.1	J-	ug/L	79.1	*	1	Yes	S3VEM
Beryllium	Target	2.0	U	ug/L	2.0	UD	2	Yes	S3VEM
Cadmium	Target	0.14	J	ug/L	0.14	J	1	Yes	S3VEM
Chromium	Target	4.7		ug/L	4.7		1	Yes	S3VEM
Cobalt	Target	41.1		ug/L	41.1		1	Yes	S3VEM
Copper	Target	9.4	J+	ug/L	9.4		1	Yes	S3VEM
Lead	Target	6.9	J	ug/L	6.9	*	1	Yes	S3VEM
Manganese	Target	5190		ug/L	5190	D	10	Yes	S3VEM
Nickel	Target	991	J	ug/L	991	*	1	Yes	S3VEM
Selenium	Target	5.1		ug/L	5.1		1	Yes	S3VEM
Silver	Target	0.025	J	ug/L	0.025	J	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.033	J	1	Yes	S3VEM
Vanadium	Target	9.0		ug/L	9.0		1	Yes	S3VEM
Zinc	Target	41.4	J	ug/L	41.4	*	1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1R4	Lab Code: EQI

Sample Number: MYA1W6	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: EQ Blank	pH:	Sample Date: 11/17/2015	Sample Time: 09:20:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Arsenic	Target	1.2		ug/L	1.2		1	Yes	S3VEM
Barium	Target	2.7	J	ug/L	2.7	J*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	1.4	J	ug/L	1.4	J	1	Yes	S3VEM
Cobalt	Target	0.070	J	ug/L	0.070	J	1	Yes	S3VEM
Copper	Target	1.2	J	ug/L	1.2	J	1	Yes	S3VEM
Lead	Target	3.0		ug/L	3.0	*	1	Yes	S3VEM
Manganese	Target	4.0		ug/L	4.0		1	Yes	S3VEM
Nickel	Target	1.4		ug/L	1.4	*	1	Yes	S3VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Zinc	Target	5.0		ug/L	5.0	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1W7	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	EQ Blank	pH:		Sample Date:	11/17/2015	Sample Time:	16:02:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Arsenic	Target	0.67	J	ug/L	0.67	J	1	Yes	S3VEM
Barium	Target	10.0	U	ug/L	10.0	U*	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Copper	Target	3.9		ug/L	3.9		1	Yes	S3VEM
Lead	Target	1.0		ug/L	1.0	*	1	Yes	S3VEM
Manganese	Target	0.65	J	ug/L	0.65	J	1	Yes	S3VEM
Nickel	Target	2.9		ug/L	2.9	*	1	Yes	S3VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Zinc	Target	4.9		ug/L	4.9	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1R4	Lab Code:	EQI
Sample Number:	MYA1X2	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-DP-2	pH:		Sample Date:	11/16/2015	Sample Time:	14:13:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	J	ug/L	1.1	J	1	Yes	S3VEM
Arsenic	Target	15700		ug/L	15700	D	20	Yes	S3VEM
Barium	Target	0.74	J-	ug/L	0.74	J*	1	Yes	S3VEM
Beryllium	Target	1.0	UJ	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	12.5		ug/L	12.5		1	Yes	S3VEM
Chromium	Target	1.8	J	ug/L	1.8	JD	2	Yes	S3VEM
Cobalt	Target	154		ug/L	154	D	2	Yes	S3VEM
Copper	Target	10.4		ug/L	10.4	D	2	Yes	S3VEM
Lead	Target	0.096	J-	ug/L	0.096	J*	1	Yes	S3VEM
Manganese	Target	11500		ug/L	11500	D	20	Yes	S3VEM
Nickel	Target	836	J	ug/L	836	*D	2	Yes	S3VEM
Selenium	Target	10.0	U	ug/L	10.0	UD	2	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	2.4	J	ug/L	2.4	JD	2	Yes	S3VEM
Zinc	Target	501	J-	ug/L	501	*D	2	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1R4	Lab Code: EQI
Sample Number: PBW050	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Manganese	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Zinc	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 26, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	MYA1M3
Laboratory:	Shealy Environmental Services, Inc. (EQI)
Analysis:	CLP Metals by ICP-MS
Samples:	20 Soil Samples
Collection Date:	November 16 and 17, 2015
Reviewer:	Anna Pajarillo, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM: the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Howard Pham, CLP PO USEPA Region 5
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [X] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report – **Tier 3**

Case No.: 45742
SDG No.: MYA1M3
Site: Titan Terminal & Transport
Laboratory: Shealy Environmental Services, Inc. (EQI)
Analysis: CLP Metals by ICP-MS
Reviewer: Anna Pajarillo, ESAT
Date: May 26, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Inorganic Analytical Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	None.
Background Samples (BG):	None.
Field Duplicates (D1):	MYA1R1, MYA1N5
(D2):	MYA1P0, MYA1R2 (in SDG MYA1N2)

CLP PO Action

The matrix spike recovery for antimony is below the 75-125% recovery criteria. The laboratory analyzed the post digestion spike with an added concentration less than two times the contract required quantitation limit (CRQL). See CLP SOW ISM02.3 (09/2015) Exhibit D ICP-MS Page D-64 Section 12.3.3.3.

Sampling Issues

1. The cooler received by the laboratory on 11/19/15 had a temperature of 7.8ºC which is above the less than or equal to (≤) 6ºC sample preservation criterion (see Additional Comments).
2. Signature and Date blocks for "Relinquished by" were not completed on the chain of custody (COC) for samples MYA1M3 through MYA1M6; the COC was not received with the sample shipment as indicated on Form DC-1 Sample Log-In Sheet.

Additional Comments

The samples were analyzed for the following Contract Laboratory Program (CLP) metals by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS): antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc.

Samples MYA1N1, MYA1N3 through MYA1N9, MYA1P0 through MYA1P2, MYA1P7 through MYA1Q0, and MYA1R1 were received by the laboratory with a cooler temperature of 7.8ºC, which is above the ≤ 6ºC sample preservation criterion. No adverse effect is expected for ICP-MS metal results based on the recommended preservation criteria for metals provided in Table 3-2 of EPA publication SW-846, revision 4 (recommended preservation criteria for metals does not require chilling).

On Form 15 (Initial Calibration), the analyte true values for run batch MS2011216A were reported as "0.0000" and the percent difference (%D) columns were blank for all calibration levels. The laboratory provided the revised Form 15 pages upon request, on 3/23/16.

The concentrations and units for the post digestion spike (MYA1M4A) and the serial dilution (MYA1M4L) were reported as water; MYA1M4 is a soil sample. The laboratory provided the corrected Forms 5B and 8 on 03/10/16.

The preparation logs for some solutions were missing from the data package. The laboratory provided the missing pages upon request, on 03/10/16. All standards and spiking solutions were analyzed before the expiration date

All method requirements specified in the EPA Contract Laboratory Program (CLP) Statement of Work (SOW), except as noted, have been met.

This report was prepared in accordance with the following documents:

- *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)* ISM02.2, August 2014; and
- *USEPA National Functional Guidelines for Inorganic Superfund Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), EPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration,* ISM02.2, August 2014.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Preservation and Holding Times	Yes	
3.	ICP-MS Tune Analysis	Yes	
4.	Calibration	Yes	
	a. Initial	Yes	
	b. Initial and Continuing Calibration Verification	Yes	
5.	Blanks	Yes	B
6.	ICP Interference Check Sample (ICS)	Yes	
7.	Laboratory Control Sample (LCS)	Yes	
8.	Duplicate Sample Analysis	Yes	
9.	Spike Sample Analysis	No	C
10.	ICP Serial Dilution	No	D
11.	ICP-MS Internal Standards	No	E, F
12.	Field Duplicate Sample Analysis	No	H
13.	Sample Quantitation	Yes	A, G
14.	Overall Assessment	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. The following results are qualified as nondetected (U) due to low level initial calibration blank (ICB) and continuing calibration blank (CCB) contamination.

- Antimony in samples MYA1M4, MYA1M6, MYA1N4, MYA1N7, MYA1N9, MYA1P1, MYA1P2, and MYA1P7.
- Cadmium in samples MYA1M6, MYA1N4, MYA1N7, MYA1N9, MYA1P0, and MYA1P7.
- Thallium in all field samples.

Analyte amounts greater than the MDL but less than or equal to the CRQL were reported in the following blanks at the concentrations presented below.

Analyte	Blank	Concentration, µg/L
Antimony	ICB038/CCB346	0.16/0.14
Cadmium	CCB344/CCB345/CCB346	0.078/0.070/0.095
Thallium	ICB038/CCB343/CCB344/ CCB345/CCB346	0.12/0.034/0.034/ 0.037/0.047

Sample results that are greater than or equal to the MDL but less than or equal to the CRQL are reported as nondetected (U) at the respective CRQL.

C. The following results are estimated and flagged "J-" or "UJ" because a matrix spike recovery is outside method QC limit.

- Antimony in all field samples.

The matrix spike recovery in QC sample MYA1M4S does not meet the 75-125% criterion for accuracy as presented below.

Analyte	% Recovery
Antimony	59

Detected results for antimony in the samples listed above are considered quantitatively uncertain and may be biased low.

A valid post-digestion spike is not available for antimony (see CLP PO Action).

D. The following results are estimated and flagged "J" or "UJ" because serial dilution results are outside method QC limit.

- Barium, chromium, cobalt, copper, manganese, nickel, vanadium, and zinc in all field samples.

Percent differences for serial dilution analysis of MYA1M4L do not meet the 15% difference criterion for the analytes presented below.

Analyte	% Difference
Barium	18
Chromium	28
Cobalt	25
Copper	36
Manganese	24
Nickel	29
Vanadium	26
Zinc	37

Results for the analytes listed above are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. Since results for the diluted sample are higher than the original, the reported results may be biased low.

E. The following results are qualified as estimated and flagged "J" because an internal standard relative intensity (RI) is outside method QC limit.

{Yttrium-89}
- Cadmium, chromium, manganese, nickel and vanadium in samples MYA1N6, MYA1N8, and MYA1R1.

Since the RIs for original analysis are outside the 60-125% QC limit, the samples listed above were re-analyzed at two-fold dilutions as specified in the SOW. The RIs of the original analysis and two-fold dilution re-analysis are presented below.

Sample	Internal Standard	% Relative Intensity from Undiluted	% Relative Intensity from 2-Fold Dilution
MYA1N6	Yttrium-89	153	134
MYA1N8	Yttrium-89	215	171
MYA1R1	Yttrium-89	181	150

Because the RIs for the 2-fold dilution re-analysis are outside the 60-125% QC limit, the cadmium, chromium, manganese, nickel, and vanadium results for samples MYA1N6, MYA1N8, and MYA1R1 are reported from the original undiluted analysis and flagged as specified in the NFG. The reported results are considered quantitatively uncertain.

F. The samples listed in the table below were analyzed at two-fold dilutions due to an internal standard exceeding QC criteria. Results for the associated elements listed below are reported from the diluted analyses and the CRQLs adjusted accordingly.

Sample	Internal Standard	Associated Element
MYA1N5 and MYA1P8	Yttrium-89	Cadmium, Chromium, Manganese, Nickel, Vanadium

G. Sample MYA1N3 required a dilution to obtain the arsenic result within the calibration range. The result for arsenic is reported from the two-fold dilution and the CRQL adjusted accordingly.

H. Results for the following field duplicate pair do not meet the relative percent difference (RPD) or the absolute difference criteria for precision as presented below.

Analyte	MYA1R1 (D1), mg/kg	MYA1N5 (D1) mg/kg	RPD	QC Limit
Barium	84.3	52.9	45.8	35
Chromium	42.7	83.2	64.3	35
Copper	144	45.7	103.6	35
Manganese	164	59.4	93.6	35
Vanadium	143	55.1	88.7	35
Zinc	276	29.2	161.7	35

Analyte	MYA1R1 (D1), mg/kg	MYA1N5 (D1) mg/kg	Difference, mg/kg	Limit, mg/kg
Cadmium	6.7	0.76	5.9	1.0
Cobalt	3.3	1.2	2.1	1.0
Lead	9.3	2.3	7.0	1.0
Nickel	10.3	2.0	8.3	1.0

This uncertainty should be evaluated in the context of project data quality objectives to determine data usability.

Sample Summary Report

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	LCS057	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.9		mg/kg	1.9		1	Yes	S3VEM
Arsenic	Target	1.1		mg/kg	1.1		1	Yes	S3VEM
Barium	Target	8.7		mg/kg	8.7		1	Yes	S3VEM
Beryllium	Target	0.96		mg/kg	0.96		1	Yes	S3VEM
Cadmium	Target	0.94		mg/kg	0.94		1	Yes	S3VEM
Chromium	Target	1.8		mg/kg	1.8		1	Yes	S3VEM
Cobalt	Target	0.96		mg/kg	0.96		1	Yes	S3VEM
Copper	Target	1.8		mg/kg	1.8		1	Yes	S3VEM
Lead	Target	0.82		mg/kg	0.82		1	Yes	S3VEM
Manganese	Target	0.86		mg/kg	0.86		1	Yes	S3VEM
Nickel	Target	0.82		mg/kg	0.82		1	Yes	S3VEM
Selenium	Target	5.5		mg/kg	5.5		1	Yes	S3VEM
Silver	Target	0.91		mg/kg	0.91		1	Yes	S3VEM
Thallium	Target	0.80		mg/kg	0.80		1	Yes	S3VEM
Vanadium	Target	4.4		mg/kg	4.4		1	Yes	S3VEM
Zinc	Target	1.7		mg/kg	1.7		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1M3	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-2	pH:		Sample Date:	11/16/2015	Sample Time:	09:16:00
% Moisture :				% Solids :	92.1877		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.82	J-	mg/kg	0.82	*	1	Yes	S3VEM
Arsenic	Target	1.2		mg/kg	1.2	*	1	Yes	S3VEM
Barium	Target	81.9	J	mg/kg	81.9	*	1	Yes	S3VEM
Beryllium	Target	0.36	U	mg/kg	0.36	U	1	Yes	S3VEM
Cadmium	Target	0.36	U	mg/kg	0.36	U	1	Yes	S3VEM
Chromium	Target	1.4	J	mg/kg	1.4	*	1	Yes	S3VEM
Cobalt	Target	0.40	J	mg/kg	0.40	*	1	Yes	S3VEM
Copper	Target	1.5	J	mg/kg	1.5	*	1	Yes	S3VEM
Lead	Target	4.4		mg/kg	4.4	*	1	Yes	S3VEM
Manganese	Target	15.2	J	mg/kg	15.2	*	1	Yes	S3VEM
Nickel	Target	0.76	J	mg/kg	0.76	*	1	Yes	S3VEM
Selenium	Target	1.8	U	mg/kg	1.8	U	1	Yes	S3VEM
Silver	Target	0.054	J	mg/kg	0.054	J	1	Yes	S3VEM
Thallium	Target	0.36	U	mg/kg	0.016	J	1	Yes	S3VEM
Vanadium	Target	2.5	J	mg/kg	2.5	*	1	Yes	S3VEM
Zinc	Target	6.6	J	mg/kg	6.6	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1M4	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-2	pH:		Sample Date:	11/16/2015	Sample Time:	09:27:00
% Moisture :				% Solids :	90.7977		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.97	UJ	mg/kg	0.067	J*	1	Yes	S3VEM
Arsenic	Target	7.2		mg/kg	7.2	*	1	Yes	S3VEM
Barium	Target	72.3	J	mg/kg	72.3	*	1	Yes	S3VEM
Beryllium	Target	0.15	J	mg/kg	0.15	J	1	Yes	S3VEM
Cadmium	Target	0.48	U	mg/kg	0.48	U	1	Yes	S3VEM
Chromium	Target	41.8	J	mg/kg	41.8	*	1	Yes	S3VEM
Cobalt	Target	5.2	J	mg/kg	5.2	*	1	Yes	S3VEM
Copper	Target	7.3	J	mg/kg	7.3	*	1	Yes	S3VEM
Lead	Target	1.6		mg/kg	1.6	*	1	Yes	S3VEM
Manganese	Target	296	J	mg/kg	296	*	1	Yes	S3VEM
Nickel	Target	6.3	J	mg/kg	6.3	*	1	Yes	S3VEM
Selenium	Target	2.4	U	mg/kg	2.4	U	1	Yes	S3VEM
Silver	Target	0.045	J	mg/kg	0.045	J	1	Yes	S3VEM
Thallium	Target	0.48	U	mg/kg	0.085	J	1	Yes	S3VEM
Vanadium	Target	63.3	J	mg/kg	63.3	*	1	Yes	S3VEM
Zinc	Target	31.9	J	mg/kg	31.9	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1M4A	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/16/2015	Sample Time:	09:27:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	0.95	J	mg/kg	2.0	J	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1M4D	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:	11/16/2015	Sample Time:	09:27:00
% Moisture :				% Solids :	90.7977		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.072	J	mg/kg	0.072	J	1	Yes	S3VEM
Arsenic	Target	7.0		mg/kg	7.0		1	Yes	S3VEM
Barium	Target	68.0		mg/kg	68.0		1	Yes	S3VEM
Beryllium	Target	0.15	J	mg/kg	0.15	J	1	Yes	S3VEM
Cadmium	Target	0.46	U	mg/kg	0.46	U	1	Yes	S3VEM
Chromium	Target	40.8		mg/kg	40.8		1	Yes	S3VEM
Cobalt	Target	5.0		mg/kg	5.0		1	Yes	S3VEM
Copper	Target	7.0		mg/kg	7.0		1	Yes	S3VEM
Lead	Target	1.6		mg/kg	1.6		1	Yes	S3VEM
Manganese	Target	283		mg/kg	283		1	Yes	S3VEM
Nickel	Target	6.2		mg/kg	6.2		1	Yes	S3VEM
Selenium	Target	2.3	U	mg/kg	2.3	U	1	Yes	S3VEM
Silver	Target	0.040	J	mg/kg	0.040	J	1	Yes	S3VEM
Thallium	Target	0.088	J	mg/kg	0.088	J	1	Yes	S3VEM
Vanadium	Target	65.4		mg/kg	65.4		1	Yes	S3VEM
Zinc	Target	31.9		mg/kg	31.9		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1M3	Lab Code: EQI
Sample Number: MYA1M4L	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	4.8	U	mg/kg	5.0	U	5	Yes	S3VEM
Arsenic	Target	10.1		mg/kg	20.9	*	5	Yes	S3VEM
Barium	Target	85.4		mg/kg	176	*	5	Yes	S3VEM
Beryllium	Target	2.4	U	mg/kg	0.38	J	5	Yes	S3VEM
Cadmium	Target	2.4	U	mg/kg	2.5	U	5	Yes	S3VEM
Chromium	Target	53.6		mg/kg	111	*	5	Yes	S3VEM
Cobalt	Target	6.5		mg/kg	13.5	*	5	Yes	S3VEM
Copper	Target	9.9		mg/kg	20.4	*	5	Yes	S3VEM
Lead	Target	1.8	J	mg/kg	3.8	*	5	Yes	S3VEM
Manganese	Target	368		mg/kg	760	*	5	Yes	S3VEM
Nickel	Target	8.1		mg/kg	16.7	*	5	Yes	S3VEM
Selenium	Target	12.1	U	mg/kg	12.5	U	5	Yes	S3VEM
Silver	Target	2.4	U	mg/kg	2.5	U	5	Yes	S3VEM
Thallium	Target	0.056	J	mg/kg	0.12	J	5	Yes	S3VEM
Vanadium	Target	80.0		mg/kg	165	*	5	Yes	S3VEM
Zinc	Target	43.8		mg/kg	90.5	*	5	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1M4S	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:	11/16/2015	Sample Time:	09:27:00
% Moisture :				% Solids :	90.7977		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	6.4		mg/kg	6.4	*	1	Yes	S3VEM
Arsenic	Spike	12.0		mg/kg	12.0		1	Yes	S3VEM
Barium	Spike	279		mg/kg	279		1	Yes	S3VEM
Beryllium	Spike	5.1		mg/kg	5.1		1	Yes	S3VEM
Cadmium	Spike	5.5		mg/kg	5.5		1	Yes	S3VEM
Chromium	Spike	64.7		mg/kg	64.7		1	Yes	S3VEM
Cobalt	Spike	55.7		mg/kg	55.7		1	Yes	S3VEM
Copper	Spike	28.6		mg/kg	28.6		1	Yes	S3VEM
Lead	Spike	3.7		mg/kg	3.7		1	Yes	S3VEM
Manganese	Spike	328		mg/kg	328		1	Yes	S3VEM
Nickel	Spike	50.5		mg/kg	50.5		1	Yes	S3VEM
Selenium	Spike	11.9		mg/kg	11.9		1	Yes	S3VEM
Silver	Spike	4.9		mg/kg	4.9		1	Yes	S3VEM
Thallium	Spike	5.0		mg/kg	5.0		1	Yes	S3VEM
Vanadium	Spike	112		mg/kg	112		1	Yes	S3VEM
Zinc	Spike	78.5		mg/kg	78.5		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1M5	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-2	pH:		Sample Date:	11/16/2015	Sample Time:	10:00:00
% Moisture :				% Solids :	81.2278		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	5.6	J-	mg/kg	5.6	*	1	Yes	S3VEM
Arsenic	Target	70.3		mg/kg	70.3	*	1	Yes	S3VEM
Barium	Target	93.3	J	mg/kg	93.3	*	1	Yes	S3VEM
Beryllium	Target	0.11	J	mg/kg	0.11	J	1	Yes	S3VEM
Cadmium	Target	4.3		mg/kg	4.3		1	Yes	S3VEM
Chromium	Target	37.8	J	mg/kg	37.8	*	1	Yes	S3VEM
Cobalt	Target	4.2	J	mg/kg	4.2	*	1	Yes	S3VEM
Copper	Target	4.0	J	mg/kg	4.0	*	1	Yes	S3VEM
Lead	Target	2.1		mg/kg	2.1	*	1	Yes	S3VEM
Manganese	Target	30.4	J	mg/kg	30.4	*	1	Yes	S3VEM
Nickel	Target	9.4	J	mg/kg	9.4	*	1	Yes	S3VEM
Selenium	Target	2.8	U	mg/kg	2.8	U	1	Yes	S3VEM
Silver	Target	0.28	J	mg/kg	0.28	J	1	Yes	S3VEM
Thallium	Target	0.56	U	mg/kg	0.070	J	1	Yes	S3VEM
Vanadium	Target	25.9	J	mg/kg	25.9	*	1	Yes	S3VEM
Zinc	Target	36.1	J	mg/kg	36.1	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1M6	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-2	pH:		Sample Date:	11/16/2015	Sample Time:	10:28:00
% Moisture :				% Solids :	77.7926		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	UJ	mg/kg	0.079	J*	1	Yes	S3VEM
Arsenic	Target	19.4		mg/kg	19.4	*	1	Yes	S3VEM
Barium	Target	176	J	mg/kg	176	*	1	Yes	S3VEM
Beryllium	Target	0.46	J	mg/kg	0.46	J	1	Yes	S3VEM
Cadmium	Target	0.52	U	mg/kg	0.23	J	1	Yes	S3VEM
Chromium	Target	20.7	J	mg/kg	20.7	*	1	Yes	S3VEM
Cobalt	Target	12.2	J	mg/kg	12.2	*	1	Yes	S3VEM
Copper	Target	23.0	J	mg/kg	23.0	*	1	Yes	S3VEM
Lead	Target	5.7		mg/kg	5.7	*	1	Yes	S3VEM
Manganese	Target	471	J	mg/kg	471	*	1	Yes	S3VEM
Nickel	Target	16.4	J	mg/kg	16.4	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.051	J	mg/kg	0.051	J	1	Yes	S3VEM
Thallium	Target	0.52	U	mg/kg	0.20	J	1	Yes	S3VEM
Vanadium	Target	163	J	mg/kg	163	*	1	Yes	S3VEM
Zinc	Target	68.2	J	mg/kg	68.2	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N1	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-4	pH:		Sample Date:	11/16/2015	Sample Time:	12:57:00
% Moisture :				% Solids :	91.7487		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	6.9	J-	mg/kg	6.9	*	1	Yes	S3VEM
Arsenic	Target	38.3		mg/kg	38.3	*	1	Yes	S3VEM
Barium	Target	77.4	J	mg/kg	77.4	*	1	Yes	S3VEM
Beryllium	Target	0.19	J	mg/kg	0.19	J	1	Yes	S3VEM
Cadmium	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Chromium	Target	170	J	mg/kg	170	*	1	Yes	S3VEM
Cobalt	Target	4.2	J	mg/kg	4.2	*	1	Yes	S3VEM
Copper	Target	14.0	J	mg/kg	14.0	*	1	Yes	S3VEM
Lead	Target	10.3		mg/kg	10.3	*	1	Yes	S3VEM
Manganese	Target	175	J	mg/kg	175	*	1	Yes	S3VEM
Nickel	Target	6.2	J	mg/kg	6.2	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.031	J	mg/kg	0.031	J	1	Yes	S3VEM
Thallium	Target	0.52	U	mg/kg	0.071	J	1	Yes	S3VEM
Vanadium	Target	32.9	J	mg/kg	32.9	*	1	Yes	S3VEM
Zinc	Target	56.8	J	mg/kg	56.8	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N3	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-4	pH:		Sample Date:	11/16/2015	Sample Time:	13:13:00
% Moisture :				% Solids :	85.4185		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	5.7	J-	mg/kg	5.7	*	1	Yes	S3VEM
Arsenic	Target	617		mg/kg	617	*D	2	Yes	S3VEM
Barium	Target	55.6	J	mg/kg	55.6	*	1	Yes	S3VEM
Beryllium	Target	0.25	J	mg/kg	0.25	J	1	Yes	S3VEM
Cadmium	Target	0.98		mg/kg	0.98		1	Yes	S3VEM
Chromium	Target	137	J	mg/kg	137	*	1	Yes	S3VEM
Cobalt	Target	9.5	J	mg/kg	9.5	*	1	Yes	S3VEM
Copper	Target	20.6	J	mg/kg	20.6	*	1	Yes	S3VEM
Lead	Target	1.7		mg/kg	1.7	*	1	Yes	S3VEM
Manganese	Target	272	J	mg/kg	272	*	1	Yes	S3VEM
Nickel	Target	29.0	J	mg/kg	29.0	*	1	Yes	S3VEM
Selenium	Target	2.4	U	mg/kg	2.4	U	1	Yes	S3VEM
Silver	Target	0.020	J	mg/kg	0.020	J	1	Yes	S3VEM
Thallium	Target	0.48	U	mg/kg	0.079	J	1	Yes	S3VEM
Vanadium	Target	71.1	J	mg/kg	71.1	*	1	Yes	S3VEM
Zinc	Target	341	J	mg/kg	341	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N4	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-4	pH:		Sample Date:	11/16/2015	Sample Time:	13:19:00
% Moisture :				% Solids :	78.9342		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	UJ	mg/kg	0.23	J*	1	Yes	S3VEM
Arsenic	Target	43.5		mg/kg	43.5	*	1	Yes	S3VEM
Barium	Target	168	J	mg/kg	168	*	1	Yes	S3VEM
Beryllium	Target	0.47	J	mg/kg	0.47	J	1	Yes	S3VEM
Cadmium	Target	0.50	U	mg/kg	0.12	J	1	Yes	S3VEM
Chromium	Target	26.0	J	mg/kg	26.0	*	1	Yes	S3VEM
Cobalt	Target	11.3	J	mg/kg	11.3	*	1	Yes	S3VEM
Copper	Target	16.5	J	mg/kg	16.5	*	1	Yes	S3VEM
Lead	Target	5.2		mg/kg	5.2	*	1	Yes	S3VEM
Manganese	Target	455	J	mg/kg	455	*	1	Yes	S3VEM
Nickel	Target	14.0	J	mg/kg	14.0	*	1	Yes	S3VEM
Selenium	Target	2.5	U	mg/kg	2.5	U	1	Yes	S3VEM
Silver	Target	0.025	J	mg/kg	0.025	J	1	Yes	S3VEM
Thallium	Target	0.50	U	mg/kg	0.19	J	1	Yes	S3VEM
Vanadium	Target	42.8	J	mg/kg	42.8	*	1	Yes	S3VEM
Zinc	Target	67.9	J	mg/kg	67.9	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N5	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-5	pH:		Sample Date:	11/16/2015	Sample Time:	13:33:00
% Moisture :				% Solids :	94.4826		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	3.8	J-	mg/kg	3.8	*	1	Yes	S3VEM
Arsenic	Target	9.8		mg/kg	9.8	*	1	Yes	S3VEM
Barium	Target	52.9	J	mg/kg	52.9	*	1	Yes	S3VEM
Beryllium	Target	0.26	J	mg/kg	0.26	J	1	Yes	S3VEM
Cadmium	Target	0.76	J	mg/kg	0.76	JD	2	Yes	S3VEM
Chromium	Target	83.2	J	mg/kg	83.2	*D	2	Yes	S3VEM
Cobalt	Target	1.2	J	mg/kg	1.2	*	1	Yes	S3VEM
Copper	Target	45.7	J	mg/kg	45.7	*	1	Yes	S3VEM
Lead	Target	2.3		mg/kg	2.3	*	1	Yes	S3VEM
Manganese	Target	59.4	J	mg/kg	59.4	*D	2	Yes	S3VEM
Nickel	Target	2.0	J	mg/kg	2.0	*D	2	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.18	J	mg/kg	0.18	J	1	Yes	S3VEM
Thallium	Target	0.53	U	mg/kg	0.097	J	1	Yes	S3VEM
Vanadium	Target	55.1	J	mg/kg	55.1	*D	2	Yes	S3VEM
Zinc	Target	29.2	J	mg/kg	29.2	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N6	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-5	pH:		Sample Date:	11/16/2015	Sample Time:	13:41:00
% Moisture :				% Solids :	88.5837		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.8	J-	mg/kg	1.8	*	1	Yes	S3VEM
Arsenic	Target	15.2		mg/kg	15.2	*	1	Yes	S3VEM
Barium	Target	86.3	J	mg/kg	86.3	*	1	Yes	S3VEM
Beryllium	Target	0.71		mg/kg	0.71		1	Yes	S3VEM
Cadmium	Target	9.8	J	mg/kg	9.8		1	Yes	S3VEM
Chromium	Target	37.9	J	mg/kg	37.9	*	1	Yes	S3VEM
Cobalt	Target	5.0	J	mg/kg	5.0	*	1	Yes	S3VEM
Copper	Target	241	J	mg/kg	241	*	1	Yes	S3VEM
Lead	Target	12.4		mg/kg	12.4	*	1	Yes	S3VEM
Manganese	Target	243	J	mg/kg	243	*	1	Yes	S3VEM
Nickel	Target	15.6	J	mg/kg	15.6	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.27	J	mg/kg	0.27	J	1	Yes	S3VEM
Thallium	Target	0.53	U	mg/kg	0.14	J	1	Yes	S3VEM
Vanadium	Target	144	J	mg/kg	144	*	1	Yes	S3VEM
Zinc	Target	436	J	mg/kg	436	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N7	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-5	pH:		Sample Date:	11/16/2015	Sample Time:	15:25:00
% Moisture :				% Solids :	88.5887		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	UJ	mg/kg	0.38	J*	1	Yes	S3VEM
Arsenic	Target	15.2		mg/kg	15.2	*	1	Yes	S3VEM
Barium	Target	67.5	J	mg/kg	67.5	*	1	Yes	S3VEM
Beryllium	Target	0.17	J	mg/kg	0.17	J	1	Yes	S3VEM
Cadmium	Target	0.53	U	mg/kg	0.31	J	1	Yes	S3VEM
Chromium	Target	50.1	J	mg/kg	50.1	*	1	Yes	S3VEM
Cobalt	Target	6.0	J	mg/kg	6.0	*	1	Yes	S3VEM
Copper	Target	25.7	J	mg/kg	25.7	*	1	Yes	S3VEM
Lead	Target	1.8		mg/kg	1.8	*	1	Yes	S3VEM
Manganese	Target	286	J	mg/kg	286	*	1	Yes	S3VEM
Nickel	Target	20.1	J	mg/kg	20.1	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.53	U	mg/kg	0.53	U	1	Yes	S3VEM
Thallium	Target	0.53	U	mg/kg	0.080	J	1	Yes	S3VEM
Vanadium	Target	34.9	J	mg/kg	34.9	*	1	Yes	S3VEM
Zinc	Target	44.1	J	mg/kg	44.1	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N8	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-5	pH:		Sample Date:	11/16/2015	Sample Time:	15:31:00
% Moisture :				% Solids :	78.5376		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	14.3	J-	mg/kg	14.3	*	1	Yes	S3VEM
Arsenic	Target	56.5		mg/kg	56.5	*	1	Yes	S3VEM
Barium	Target	74.7	J	mg/kg	74.7	*	1	Yes	S3VEM
Beryllium	Target	0.38	J	mg/kg	0.38	J	1	Yes	S3VEM
Cadmium	Target	4.1	J	mg/kg	4.1		1	Yes	S3VEM
Chromium	Target	402	J	mg/kg	402	*	1	Yes	S3VEM
Cobalt	Target	2.2	J	mg/kg	2.2	*	1	Yes	S3VEM
Copper	Target	231	J	mg/kg	231	*	1	Yes	S3VEM
Lead	Target	2.0		mg/kg	2.0	*	1	Yes	S3VEM
Manganese	Target	15.7	J	mg/kg	15.7	*	1	Yes	S3VEM
Nickel	Target	6.1	J	mg/kg	6.1	*	1	Yes	S3VEM
Selenium	Target	2.4	U	mg/kg	2.4	U	1	Yes	S3VEM
Silver	Target	0.49	U	mg/kg	0.49	U	1	Yes	S3VEM
Thallium	Target	0.49	U	mg/kg	0.063	J	1	Yes	S3VEM
Vanadium	Target	75.1	J	mg/kg	75.1	*	1	Yes	S3VEM
Zinc	Target	33.1	J	mg/kg	33.1	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1N9	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-6	pH:		Sample Date:	11/17/2015	Sample Time:	11:26:00
% Moisture :				% Solids :	93.7574		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.87	UJ	mg/kg	0.069	J*	1	Yes	S3VEM
Arsenic	Target	0.51		mg/kg	0.51	*	1	Yes	S3VEM
Barium	Target	72.2	J	mg/kg	72.2	*	1	Yes	S3VEM
Beryllium	Target	0.18	J	mg/kg	0.18	J	1	Yes	S3VEM
Cadmium	Target	0.43	U	mg/kg	0.030	J	1	Yes	S3VEM
Chromium	Target	9.3	J	mg/kg	9.3	*	1	Yes	S3VEM
Cobalt	Target	5.0	J	mg/kg	5.0	*	1	Yes	S3VEM
Copper	Target	12.1	J	mg/kg	12.1	*	1	Yes	S3VEM
Lead	Target	17.7		mg/kg	17.7	*	1	Yes	S3VEM
Manganese	Target	198	J	mg/kg	198	*	1	Yes	S3VEM
Nickel	Target	6.7	J	mg/kg	6.7	*	1	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.43	U	mg/kg	0.43	U	1	Yes	S3VEM
Thallium	Target	0.43	U	mg/kg	0.072	J	1	Yes	S3VEM
Vanadium	Target	22.5	J	mg/kg	22.5	*	1	Yes	S3VEM
Zinc	Target	45.5	J	mg/kg	45.5	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1P0	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-6	pH:		Sample Date:	11/17/2015	Sample Time:	11:33:00
% Moisture :				% Solids :	92.127		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.87	UJ	mg/kg	0.87	U*	1	Yes	S3VEM
Arsenic	Target	1.6		mg/kg	1.6	*	1	Yes	S3VEM
Barium	Target	82.4	J	mg/kg	82.4	*	1	Yes	S3VEM
Beryllium	Target	0.24	J	mg/kg	0.24	J	1	Yes	S3VEM
Cadmium	Target	0.43	U	mg/kg	0.051	J	1	Yes	S3VEM
Chromium	Target	9.6	J	mg/kg	9.6	*	1	Yes	S3VEM
Cobalt	Target	6.1	J	mg/kg	6.1	*	1	Yes	S3VEM
Copper	Target	7.2	J	mg/kg	7.2	*	1	Yes	S3VEM
Lead	Target	2.6		mg/kg	2.6	*	1	Yes	S3VEM
Manganese	Target	218	J	mg/kg	218	*	1	Yes	S3VEM
Nickel	Target	7.9	J	mg/kg	7.9	*	1	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.43	U	mg/kg	0.43	U	1	Yes	S3VEM
Thallium	Target	0.43	U	mg/kg	0.10	J	1	Yes	S3VEM
Vanadium	Target	25.4	J	mg/kg	25.4	*	1	Yes	S3VEM
Zinc	Target	38.2	J	mg/kg	38.2	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1P1	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-6	pH:		Sample Date:	11/17/2015	Sample Time:	11:42:00
% Moisture :				% Solids :	93.2485		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	UJ	mg/kg	0.073	J*	1	Yes	S3VEM
Arsenic	Target	1.2		mg/kg	1.2	*	1	Yes	S3VEM
Barium	Target	52.3	J	mg/kg	52.3	*	1	Yes	S3VEM
Beryllium	Target	0.15	J	mg/kg	0.15	J	1	Yes	S3VEM
Cadmium	Target	0.52	U	mg/kg	0.52	U	1	Yes	S3VEM
Chromium	Target	7.2	J	mg/kg	7.2	*	1	Yes	S3VEM
Cobalt	Target	4.2	J	mg/kg	4.2	*	1	Yes	S3VEM
Copper	Target	4.7	J	mg/kg	4.7	*	1	Yes	S3VEM
Lead	Target	1.6		mg/kg	1.6	*	1	Yes	S3VEM
Manganese	Target	160	J	mg/kg	160	*	1	Yes	S3VEM
Nickel	Target	4.9	J	mg/kg	4.9	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.52	U	mg/kg	0.52	U	1	Yes	S3VEM
Thallium	Target	0.52	U	mg/kg	0.056	J	1	Yes	S3VEM
Vanadium	Target	20.6	J	mg/kg	20.6	*	1	Yes	S3VEM
Zinc	Target	28.0	J	mg/kg	28.0	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1P2	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-6	pH:		Sample Date:	11/17/2015	Sample Time:	11:47:00
% Moisture :				% Solids :	83.6437		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.88	UJ	mg/kg	0.13	J*	1	Yes	S3VEM
Arsenic	Target	2.6		mg/kg	2.6	*	1	Yes	S3VEM
Barium	Target	55.3	J	mg/kg	55.3	*	1	Yes	S3VEM
Beryllium	Target	0.15	J	mg/kg	0.15	J	1	Yes	S3VEM
Cadmium	Target	0.44	U	mg/kg	0.44	U	1	Yes	S3VEM
Chromium	Target	6.8	J	mg/kg	6.8	*	1	Yes	S3VEM
Cobalt	Target	4.2	J	mg/kg	4.2	*	1	Yes	S3VEM
Copper	Target	3.2	J	mg/kg	3.2	*	1	Yes	S3VEM
Lead	Target	1.3		mg/kg	1.3	*	1	Yes	S3VEM
Manganese	Target	176	J	mg/kg	176	*	1	Yes	S3VEM
Nickel	Target	4.9	J	mg/kg	4.9	*	1	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.44	U	mg/kg	0.44	U	1	Yes	S3VEM
Thallium	Target	0.44	U	mg/kg	0.061	J	1	Yes	S3VEM
Vanadium	Target	54.6	J	mg/kg	54.6	*	1	Yes	S3VEM
Zinc	Target	26.9	J	mg/kg	26.9	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1P7	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-8	pH:		Sample Date:	11/17/2015	Sample Time:	08:26:00
% Moisture :				% Solids :	90.2868		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	UJ	mg/kg	0.15	J*	1	Yes	S3VEM
Arsenic	Target	1.8		mg/kg	1.8	*	1	Yes	S3VEM
Barium	Target	93.1	J	mg/kg	93.1	*	1	Yes	S3VEM
Beryllium	Target	0.21	J	mg/kg	0.21	J	1	Yes	S3VEM
Cadmium	Target	0.52	U	mg/kg	0.29	J	1	Yes	S3VEM
Chromium	Target	13.1	J	mg/kg	13.1	*	1	Yes	S3VEM
Cobalt	Target	6.1	J	mg/kg	6.1	*	1	Yes	S3VEM
Copper	Target	18.6	J	mg/kg	18.6	*	1	Yes	S3VEM
Lead	Target	11.2		mg/kg	11.2	*	1	Yes	S3VEM
Manganese	Target	226	J	mg/kg	226	*	1	Yes	S3VEM
Nickel	Target	20.4	J	mg/kg	20.4	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.39	J	mg/kg	0.39	J	1	Yes	S3VEM
Thallium	Target	0.52	U	mg/kg	0.095	J	1	Yes	S3VEM
Vanadium	Target	25.2	J	mg/kg	25.2	*	1	Yes	S3VEM
Zinc	Target	63.9	J	mg/kg	63.9	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1P8	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-8	pH:		Sample Date:	11/17/2015	Sample Time:	09:30:00
% Moisture :				% Solids :	87.3742		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.86	UJ	mg/kg	0.86	U*	1	Yes	S3VEM
Arsenic	Target	1.4		mg/kg	1.4	*	1	Yes	S3VEM
Barium	Target	101	J	mg/kg	101	*	1	Yes	S3VEM
Beryllium	Target	0.30	J	mg/kg	0.30	J	1	Yes	S3VEM
Cadmium	Target	0.10	J	mg/kg	0.10	JD	2	Yes	S3VEM
Chromium	Target	13.5	J	mg/kg	13.5	*D	2	Yes	S3VEM
Cobalt	Target	7.1	J	mg/kg	7.1	*	1	Yes	S3VEM
Copper	Target	9.1	J	mg/kg	9.1	*	1	Yes	S3VEM
Lead	Target	3.2		mg/kg	3.2	*	1	Yes	S3VEM
Manganese	Target	312	J	mg/kg	312	*D	2	Yes	S3VEM
Nickel	Target	10.2	J	mg/kg	10.2	*D	2	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.60		mg/kg	0.60		1	Yes	S3VEM
Thallium	Target	0.43	U	mg/kg	0.12	J	1	Yes	S3VEM
Vanadium	Target	32.7	J	mg/kg	32.7	*D	2	Yes	S3VEM
Zinc	Target	45.1	J	mg/kg	45.1	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1P9	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-8	pH:		Sample Date:	11/17/2015	Sample Time:	09:37:00
% Moisture :				% Solids :	93.6405		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.97	UJ	mg/kg	0.97	U*	1	Yes	S3VEM
Arsenic	Target	1.1		mg/kg	1.1	*	1	Yes	S3VEM
Barium	Target	57.8	J	mg/kg	57.8	*	1	Yes	S3VEM
Beryllium	Target	0.17	J	mg/kg	0.17	J	1	Yes	S3VEM
Cadmium	Target	0.48	U	mg/kg	0.48	U	1	Yes	S3VEM
Chromium	Target	7.5	J	mg/kg	7.5	*	1	Yes	S3VEM
Cobalt	Target	4.6	J	mg/kg	4.6	*	1	Yes	S3VEM
Copper	Target	4.4	J	mg/kg	4.4	*	1	Yes	S3VEM
Lead	Target	1.9		mg/kg	1.9	*	1	Yes	S3VEM
Manganese	Target	174	J	mg/kg	174	*	1	Yes	S3VEM
Nickel	Target	6.0	J	mg/kg	6.0	*	1	Yes	S3VEM
Selenium	Target	2.4	U	mg/kg	2.4	U	1	Yes	S3VEM
Silver	Target	0.50		mg/kg	0.50		1	Yes	S3VEM
Thallium	Target	0.48	U	mg/kg	0.073	J	1	Yes	S3VEM
Vanadium	Target	22.7	J	mg/kg	22.7	*	1	Yes	S3VEM
Zinc	Target	32.0	J	mg/kg	32.0	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1Q0	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-8	pH:		Sample Date:	11/17/2015	Sample Time:	09:42:00
% Moisture :				% Solids :	85.3136		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.90	UJ	mg/kg	0.90	U*	1	Yes	S3VEM
Arsenic	Target	2.3		mg/kg	2.3	*	1	Yes	S3VEM
Barium	Target	48.6	J	mg/kg	48.6	*	1	Yes	S3VEM
Beryllium	Target	0.14	J	mg/kg	0.14	J	1	Yes	S3VEM
Cadmium	Target	0.45	U	mg/kg	0.45	U	1	Yes	S3VEM
Chromium	Target	5.8	J	mg/kg	5.8	*	1	Yes	S3VEM
Cobalt	Target	4.0	J	mg/kg	4.0	*	1	Yes	S3VEM
Copper	Target	4.9	J	mg/kg	4.9	*	1	Yes	S3VEM
Lead	Target	1.4		mg/kg	1.4	*	1	Yes	S3VEM
Manganese	Target	145	J	mg/kg	145	*	1	Yes	S3VEM
Nickel	Target	3.9	J	mg/kg	3.9	*	1	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.45	U	mg/kg	0.45	U	1	Yes	S3VEM
Thallium	Target	0.45	U	mg/kg	0.050	J	1	Yes	S3VEM
Vanadium	Target	24.7	J	mg/kg	24.7	*	1	Yes	S3VEM
Zinc	Target	25.5	J	mg/kg	25.5	*	1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1M3	Lab Code:	EQI
Sample Number:	MYA1R1	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-5	pH:		Sample Date:	11/16/2015	Sample Time:	13:46:00
% Moisture :				% Solids :	89.0133		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.8	J-	mg/kg	1.8	*	1	Yes	S3VEM
Arsenic	Target	11.6		mg/kg	11.6	*	1	Yes	S3VEM
Barium	Target	84.3	J	mg/kg	84.3	*	1	Yes	S3VEM
Beryllium	Target	0.83		mg/kg	0.83		1	Yes	S3VEM
Cadmium	Target	6.7	J	mg/kg	6.7		1	Yes	S3VEM
Chromium	Target	42.7	J	mg/kg	42.7	*	1	Yes	S3VEM
Cobalt	Target	3.3	J	mg/kg	3.3	*	1	Yes	S3VEM
Copper	Target	144	J	mg/kg	144	*	1	Yes	S3VEM
Lead	Target	9.3		mg/kg	9.3	*	1	Yes	S3VEM
Manganese	Target	164	J	mg/kg	164	*	1	Yes	S3VEM
Nickel	Target	10.3	J	mg/kg	10.3	*	1	Yes	S3VEM
Selenium	Target	2.3	U	mg/kg	2.3	U	1	Yes	S3VEM
Silver	Target	0.17	J	mg/kg	0.17	J	1	Yes	S3VEM
Thallium	Target	0.45	U	mg/kg	0.11	J	1	Yes	S3VEM
Vanadium	Target	143	J	mg/kg	143	*	1	Yes	S3VEM
Zinc	Target	276	J	mg/kg	276	*	1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1M3	Lab Code: EQI
Sample Number: PBS057	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Arsenic	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Barium	Target	5.0	U	mg/kg	5.0	U	1	Yes	S3VEM
Beryllium	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Cadmium	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Chromium	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Cobalt	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Copper	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Lead	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Manganese	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Nickel	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Selenium	Target	2.5	U	mg/kg	2.5	U	1	Yes	S3VEM
Silver	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Thallium	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Vanadium	Target	2.5	U	mg/kg	2.5	U	1	Yes	S3VEM
Zinc	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: April 6, 2016

SUBJECT: Review of Analytical Data, **Tier 3**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	MYA1Q2
Laboratory:	Shealy Environmental Services, Inc. (EQI)
Analysis:	CLP Metals by ICP-MS
Samples:	1 Soil Sample
Collection Date:	November 18, 2015
Reviewer:	Anna Pajarillo, ESAT

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM: the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Howard Pham, CLP PO USEPA Region 5
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [X] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report – **Tier 3**

Case No.: 45742
SDG No.: MYA1Q2
Site: Titan Terminal & Transport
Laboratory: Shealy Environmental Services, Inc. (EQI)
Analysis: CLP Metals by ICP-MS
Reviewer: Anna Pajarillo, ESAT
Date: April 6, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Inorganic Analytical Sequence.*

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	None.
Background Samples (BG):	None.
Field Duplicates (D1):	Not Provided.

CLP PO Action

The matrix spike recoveries for antimony, arsenic, and copper do not meet the 75-125% recovery criteria. The laboratory analyzed the post digestion spike with added concentrations greater than two times the contract required quantitation limit (CRQL) or two times the sample concentration. See CLP SOW ISM02.3 (09/2015) Exhibit D ICP-MS Page D-64 Section 12.3.3.3.

Sampling Issues

The cooler received by the laboratory had a temperature of 6.7°C which is above the less than or equal to (≤) 6°C sample preservation criterion (see Additional Comments).

Additional Comments

The samples were analyzed for the following Contract Laboratory Program (CLP) metals by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS): antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc.

Sample MYA1Q2 was received by the laboratory with a cooler temperature of 6.7°C, which is above the ≤ 6°C sample preservation criterion. No adverse effect is expected for ICP-MS metal results based on the recommended preservation criteria for metals provided in Table 3-2 of EPA publication SW-846, revision 4 (recommended preservation criteria for metals does not require chilling).

The concentrations and units for the post digestion spike (MYA1Q2A) and the serial dilution (MYA1Q2L) were reported as water; MYA1Q2 is a soil sample. The laboratory provided the corrected Form 8 on 03/10/16 and Form 5B on 3/25/16.

The preparation logs for some solutions were missing from the data package. The laboratory provided the missing pages upon request, on 03/10/16. All standards and spiking solutions were analyzed before the expiration date.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Statement of Work (SOW), except as noted, have been met.

This report was prepared in accordance with the following documents:

- *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)* ISM02.2, August 2014; and
- *USEPA National Functional Guidelines for Inorganic Superfund Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), EPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration,* ISM02.2, August 2014.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Preservation and Holding Times	Yes	
3.	ICP-MS Tune Analysis	Yes	
4.	Calibration	Yes	
	a. Initial	Yes	
	b. Initial and Continuing Calibration Verification	Yes	
5.	Blanks	Yes	B
6.	ICP Interference Check Sample (ICS)	Yes	
7.	Laboratory Control Sample (LCS)	Yes	
8.	Duplicate Sample Analysis	Yes	
9.	Spike Sample Analysis	No	C
10.	ICP Serial Dilution	No	D
11.	ICP-MS Internal Standards	No	E
12.	Field Duplicate Sample Analysis	N/A	
13.	Sample Quantitation	Yes	A
14.	Overall Assessment	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. The following results are qualified as nondetected (U) due to low level initial calibration blank (ICB) and continuing calibration blank (CCB) contamination.

- Antimony and silver in sample MYA1Q2.
- Thallium in sample MYA1Q2 and preparation blank PBS056.

Analyte amounts greater than the MDL but less than or equal to the CRQL were reported in the following blanks at the concentrations presented below.

Analyte	Blank	Concentration, µg/L
Antimony	ICB037/CCB326	0.20/0.14
Silver	ICB037	0.027
Thallium	ICB037/CCB324/CCB325/CCB326	0.14/0.032/0.033/0.055

Sample results that are greater than or equal to the MDL but less than or equal to the CRQL are reported as nondetected (U) at the respective CRQL.

C. The following results are estimated and flagged "J-", "J+", or "UJ" because matrix spike recoveries are outside method QC limits.

- Antimony, arsenic, and lead in sample MYA1Q2.

The matrix spike recoveries in QC sample MYA1Q2S do not meet the 75-125% criterion for accuracy as presented below.

Analyte	% Recovery
Antimony	36
Arsenic	72
Lead	133

Detected results in sample MYA1Q2 are considered quantitatively uncertain and may be biased low for arsenic and biased high for lead. The unacceptable pre-digestion spike recoveries may indicate poor laboratory technique or matrix effects which may interfere with the analysis.

A valid post-digestion spike is not available (see CLP PO Action).

D. The following result is estimated and flagged "J" because a serial dilution result is outside method QC limit.

- Copper in sample MYA1Q2.

The percent difference of copper (39%) for serial dilution analysis of MYA1Q2L does not meet the 15% difference criterion.

The result for copper is considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. Since the copper result for the diluted sample is higher than the original, the reported copper result may be biased low.

E. Sample MYA1Q2 was analyzed at a two-fold dilution due to an internal standard exceeding QC criteria. Results for the associated elements listed below are reported from the diluted analysis and the CRQLs adjusted accordingly.

Sample	Internal Standard	Associated Element
MYA1Q2	Yttrium-89	Cadmium, Chromium, Manganese, Nickel, Vanadium

Sample Summary Report

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1Q2	Lab Code:	EQI
Sample Number:	LCS056	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0		mg/kg	2.0		1	Yes	S3VEM
Arsenic	Target	1.2		mg/kg	1.2		1	Yes	S3VEM
Barium	Target	9.3		mg/kg	9.3		1	Yes	S3VEM
Beryllium	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Cadmium	Target	1.1		mg/kg	1.1		1	Yes	S3VEM
Chromium	Target	2.0		mg/kg	2.0		1	Yes	S3VEM
Cobalt	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Copper	Target	2.0		mg/kg	2.0		1	Yes	S3VEM
Lead	Target	0.90		mg/kg	0.90		1	Yes	S3VEM
Manganese	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Nickel	Target	1.1		mg/kg	1.1		1	Yes	S3VEM
Selenium	Target	5.1		mg/kg	5.1		1	Yes	S3VEM
Silver	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Thallium	Target	0.87		mg/kg	0.87		1	Yes	S3VEM
Vanadium	Target	4.6		mg/kg	4.6		1	Yes	S3VEM
Zinc	Target	1.9		mg/kg	1.9		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1Q2	Lab Code:	EQI
Sample Number:	MYA1Q2	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-9	pH:		Sample Date:	11/18/2015	Sample Time:	09:36:00
% Moisture :				% Solids :	86.6676		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.89	UJ	mg/kg	0.082	J*	1	Yes	S3VEM
Arsenic	Target	1.1	J-	mg/kg	1.1	*	1	Yes	S3VEM
Barium	Target	120		mg/kg	120		1	Yes	S3VEM
Beryllium	Target	0.33	J	mg/kg	0.33	J	1	Yes	S3VEM
Cadmium	Target	0.091	J	mg/kg	0.091	JD	2	Yes	S3VEM
Chromium	Target	14.9		mg/kg	14.9	D	2	Yes	S3VEM
Cobalt	Target	8.5		mg/kg	8.5		1	Yes	S3VEM
Copper	Target	9.9	J	mg/kg	9.9	*	1	Yes	S3VEM
Lead	Target	4.2	J+	mg/kg	4.2	*	1	Yes	S3VEM
Manganese	Target	386		mg/kg	386	D	2	Yes	S3VEM
Nickel	Target	14.0		mg/kg	14.0	D	2	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.44	U	mg/kg	0.044	J	1	Yes	S3VEM
Thallium	Target	0.44	UJ	mg/kg	0.15	J	1	Yes	S3VEM
Vanadium	Target	32.9		mg/kg	32.9	D	2	Yes	S3VEM
Zinc	Target	55.6		mg/kg	55.6		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1Q2	Lab Code:	EQI
Sample Number:	MYA1Q2A	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/18/2015	Sample Time:	09:36:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	89.1		mg/kg	201		1	Yes	S3VEM
Arsenic	Spike	27.5		mg/kg	61.9		1	Yes	S3VEM
Lead	Spike	20.3		mg/kg	45.7		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1Q2	Lab Code:	EQI
Sample Number:	MYA1Q2D	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:	11/18/2015	Sample Time:	09:36:00
% Moisture :				% Solids :	86.6676		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.088	J	mg/kg	0.088	J	1	Yes	S3VEM
Arsenic	Target	1.2		mg/kg	1.2		1	Yes	S3VEM
Barium	Target	120		mg/kg	120		1	Yes	S3VEM
Beryllium	Target	0.37	J	mg/kg	0.37	J	1	Yes	S3VEM
Cadmium	Target	0.092	J	mg/kg	0.092	JD	2	Yes	S3VEM
Chromium	Target	14.7		mg/kg	14.7	D	2	Yes	S3VEM
Cobalt	Target	8.5		mg/kg	8.5		1	Yes	S3VEM
Copper	Target	10.3		mg/kg	10.3		1	Yes	S3VEM
Lead	Target	4.3		mg/kg	4.3		1	Yes	S3VEM
Manganese	Target	361		mg/kg	361	D	2	Yes	S3VEM
Nickel	Target	13.4		mg/kg	13.4	D	2	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.043	J	mg/kg	0.043	J	1	Yes	S3VEM
Thallium	Target	0.16	J	mg/kg	0.16	J	1	Yes	S3VEM
Vanadium	Target	32.5		mg/kg	32.5	D	2	Yes	S3VEM
Zinc	Target	56.5		mg/kg	56.5		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1Q2	Lab Code: EQI
Sample Number: MYA1Q2L	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	4.4	U	mg/kg	5.0	U	5	Yes	S3VEM
Arsenic	Target	1.5	J	mg/kg	3.4		5	Yes	S3VEM
Barium	Target	119		mg/kg	268		5	Yes	S3VEM
Beryllium	Target	0.41	J	mg/kg	0.92	J	5	Yes	S3VEM
Cadmium	Target	4.4	U	mg/kg	5.0	U	10	Yes	S3VEM
Chromium	Target	15.1		mg/kg	33.9		10	Yes	S3VEM
Cobalt	Target	9.3		mg/kg	20.9		5	Yes	S3VEM
Copper	Target	13.8		mg/kg	31.0	*	5	Yes	S3VEM
Lead	Target	4.1		mg/kg	9.1		5	Yes	S3VEM
Manganese	Target	379		mg/kg	853		10	Yes	S3VEM
Nickel	Target	14.7		mg/kg	33.1		10	Yes	S3VEM
Selenium	Target	11.1	U	mg/kg	12.5	U	5	Yes	S3VEM
Silver	Target	2.2	U	mg/kg	0.10	J	5	Yes	S3VEM
Thallium	Target	0.22	J	mg/kg	0.51	J	5	Yes	S3VEM
Vanadium	Target	32.8		mg/kg	73.8		10	Yes	S3VEM
Zinc	Target	59.8		mg/kg	135		5	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1Q2	Lab Code:	EQI
Sample Number:	MYA1Q2S	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:	11/18/2015	Sample Time:	09:36:00
% Moisture :				% Solids :	86.6676		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	3.3		mg/kg	3.3	*	1	Yes	S3VEM
Arsenic	Spike	3.7		mg/kg	3.7	*	1	Yes	S3VEM
Barium	Spike	297		mg/kg	297		1	Yes	S3VEM
Beryllium	Spike	4.3		mg/kg	4.3		1	Yes	S3VEM
Cadmium	Spike	4.4		mg/kg	4.4	D	2	Yes	S3VEM
Chromium	Spike	30.1		mg/kg	30.1	D	2	Yes	S3VEM
Cobalt	Spike	48.2		mg/kg	48.2		1	Yes	S3VEM
Copper	Spike	27.9		mg/kg	27.9		1	Yes	S3VEM
Lead	Spike	6.6		mg/kg	6.6	*	1	Yes	S3VEM
Manganese	Spike	403		mg/kg	403	D	2	Yes	S3VEM
Nickel	Spike	58.9		mg/kg	58.9	D	2	Yes	S3VEM
Selenium	Spike	8.6		mg/kg	8.6		1	Yes	S3VEM
Silver	Spike	4.6		mg/kg	4.6		1	Yes	S3VEM
Thallium	Spike	4.1		mg/kg	4.1		1	Yes	S3VEM
Vanadium	Spike	70.9		mg/kg	70.9	D	2	Yes	S3VEM
Zinc	Spike	103		mg/kg	103		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1Q2	Lab Code: EQI
Sample Number: PBS056	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Arsenic	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Barium	Target	5.0	U	mg/kg	5.0	U	1	Yes	S3VEM
Beryllium	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Cadmium	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Chromium	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Cobalt	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Copper	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Lead	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Manganese	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Nickel	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Selenium	Target	2.5	U	mg/kg	2.5	U	1	Yes	S3VEM
Silver	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Thallium	Target	0.50	U	mg/kg	0.0085	J	1	Yes	S3VEM
Vanadium	Target	2.5	U	mg/kg	2.5	U	1	Yes	S3VEM
Zinc	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
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MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 26, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	MYA1T2
Laboratory:	Shealy Environmental Services, Inc. (EQI)
Analysis:	CLP Metals by ICP-MS
Samples:	5 Groundwater Samples
Collection Date:	November 17, 18, and 20, 2015
Reviewer:	Anna Pajarillo, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM: the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Howard Pham, CLP PO USEPA Region 5
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [X] Action

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report – **Tier 3**

Case No.: 45742
SDG No.: MYA1T2
Site: Titan Terminal & Transport
Laboratory: Shealy Environmental Services, Inc. (EQI)
Analysis: CLP Metals by ICP-MS
Reviewer: Anna Pajarillo, ESAT
Date: May 26, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Inorganic Analytical Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	None.
Background Samples (BG):	None.
Field Duplicates (D3):	MYA1W1, MYA1R8 (in SDG MYA1R4)

CLP PO Action

The matrix spike recovery for copper was below the 75-125% recovery criteria. The laboratory analyzed the post digestion spike with an added concentration greater than two times the sample concentration. See CLP SOW ISM02.3 (09/2015) Exhibit D ICP-MS Page D-64 Section 12.3.3.3.

Sampling Issues

None.

Additional Comments

The samples were analyzed for the following Contract Laboratory Program (CLP) metals by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS): antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc.

Samples MYA1T2 through MYA1T5 and MYA1W1 were received at the laboratory 2-4 days after sample collection. The reviewer presumed that the samples were stored properly from the time of collection to the time of shipping. The laboratory documentation indicates that the samples were received on ice and at a temperature of 4.2°C.

The preparation logs for some solutions were missing from the data package. The laboratory provided the missing pages upon request, on 3/10/16. All standards and spiking solutions were analyzed before the expiration date.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Statement of Work (SOW), except as noted, have been met.

This report was prepared in accordance with the following documents:
- *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)* ISM02.2, August 2014; and
- *USEPA National Functional Guidelines for Inorganic Superfund Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), EPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration*, ISM02.2, August 2014.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Preservation and Holding Times	Yes	
3.	ICP-MS Tune Analysis	Yes	
4.	Calibration	Yes	
	a. Initial	Yes	
	b. Initial and Continuing Calibration Verification	Yes	
5.	Blanks	Yes	B
6.	ICP Interference Check Sample (ICS)	Yes	
7.	Laboratory Control Sample (LCS)	Yes	
8.	Duplicate Sample Analysis	Yes	
9.	Spike Sample Analysis	No	C
10.	ICP Serial Dilution	No	D
11.	ICP-MS Internal Standards	Yes	E
12.	Field Duplicate Sample Analysis	No	G
13.	Sample Quantitation	Yes	A, F
14.	Overall Assessment	Yes	

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. The following results are qualified as nondetected (U) due to low level initial calibration blank (ICB) and continuing calibration blank (CCB) contamination.

- Thallium in sample MYA1T2.

Analyte amounts greater than the MDL but less than or equal to the CRQL were reported in the following blanks at the concentrations presented below.

Analyte	Blank	Concentration, µg/L
Thallium	ICB031/CCB251	0.071/0.026

Sample results that are greater than or equal to the MDL but less than or equal to the CRQL are reported as nondetected (U) at the respective CRQL.

C. The following results are estimated and flagged "J-" because a matrix spike recovery is outside method QC limit.

- Copper in all field samples.

The matrix spike recovery for copper in QC sample MYA1T2S does not meet the 75-125% criterion for accuracy as presented below.

Analyte	% Recovery
Copper	67

Detected results for copper are considered quantitatively uncertain and may be biased low.

A valid post-digestion spike is not available for copper (see CLP PO Action).

D. The following results are estimated and flagged "J" because a serial dilution result is outside method QC limit.

- Cobalt in all field samples.

The percent difference for serial dilution analysis of MYA0T2L does not meet the 15% difference criterion for the analytes presented below.

Analyte	% Difference
Cobalt	12

Results for the cobalt are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. Since results for the diluted sample are higher than the original, the reported results may be biased low.

E. The internal standard (IS) lithium-6 relative intensity (RI) for sample MYA1W1 (51%) is below the QC limit of 60-125%. The sample was re-analyzed at a 2-fold dilution as required by the statement of work (SOW) and the RI (78%) is within QC limit. Therefore, the beryllium result is reported from the 2-fold dilution.

F. The samples listed in the table below required dilution to obtain results within the calibration range for the indicated elements. Results for these elements are reported from the indicated dilutions and the CRQL adjusted accordingly.

Sample	Dilution Factor	Associated Element
MYA1T2 and MYA1T3	2	Manganese
MYA1W1	20	Manganese

G. Results for the following field duplicate pair do not meet the relative percent difference (RPD) criterion for precision as presented below.

Analyte	MYA1W1, (D3) µg/L	MYA1R8 (D3) (in SDG MYA1R4) µg/L	RPD	QC Limit
Nickel	261	365	33.2	20
Zinc	82.4	150	58.2	20

This uncertainty should be evaluated in the context of project data quality objectives to determine data usability.

Sample Summary Report

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	LCS039	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	4.1		ug/L	4.1		1	Yes	S3VEM
Arsenic	Target	1.8		ug/L	1.8		1	Yes	S3VEM
Barium	Target	19.6		ug/L	19.6		1	Yes	S3VEM
Beryllium	Target	2.1		ug/L	2.1		1	Yes	S3VEM
Cadmium	Target	2.1		ug/L	2.1		1	Yes	S3VEM
Chromium	Target	4.6		ug/L	4.6		1	Yes	S3VEM
Lead	Target	2.0		ug/L	2.0		1	Yes	S3VEM
Manganese	Target	2.2		ug/L	2.2		1	Yes	S3VEM
Nickel	Target	2.4		ug/L	2.4		1	Yes	S3VEM
Selenium	Target	11.4		ug/L	11.4		1	Yes	S3VEM
Silver	Target	2.2		ug/L	2.2		1	Yes	S3VEM
Thallium	Target	1.9		ug/L	1.9		1	Yes	S3VEM
Vanadium	Target	10.0		ug/L	10.0		1	Yes	S3VEM
Zinc	Target	4.6		ug/L	4.6		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1T2	Lab Code: EQI

Sample Number: LCS051	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cobalt	Target	1.8		ug/L	1.8		1	Yes	S3VEM
Copper	Target	4.2		ug/L	4.2		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1T2	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-4	pH:		Sample Date:	11/18/2015	Sample Time:	14:55:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	J	ug/L	1.1	J	1	Yes	S3VEM
Arsenic	Target	6.9		ug/L	6.9		1	Yes	S3VEM
Barium	Target	301		ug/L	301		1	Yes	S3VEM
Beryllium	Target	0.27	J	ug/L	0.27	J	1	Yes	S3VEM
Cadmium	Target	0.13	J	ug/L	0.13	J	1	Yes	S3VEM
Chromium	Target	38.6		ug/L	38.6		1	Yes	S3VEM
Cobalt	Target	7.8	J	ug/L	7.8	*	1	Yes	S3VEM
Copper	Target	20.0	J-	ug/L	20.0	*	1	Yes	S3VEM
Lead	Target	6.3		ug/L	6.3		1	Yes	S3VEM
Manganese	Target	1140		ug/L	1140	D	2	Yes	S3VEM
Nickel	Target	27.8		ug/L	27.8		1	Yes	S3VEM
Selenium	Target	3.7	J	ug/L	3.7	J	1	Yes	S3VEM
Silver	Target	0.038	J	ug/L	0.038	J	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	0.079	J	1	Yes	S3VEM
Vanadium	Target	86.1		ug/L	86.1		1	Yes	S3VEM
Zinc	Target	43.8		ug/L	43.8		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1T2A	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/18/2015	Sample Time:	14:55:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Copper	Spike	346		ug/L	346		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1T2D	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/18/2015	Sample Time:	14:55:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.3	J	ug/L	1.3	J	1	Yes	S3VEM
Arsenic	Target	7.1		ug/L	7.1		1	Yes	S3VEM
Barium	Target	311		ug/L	311		1	Yes	S3VEM
Beryllium	Target	0.28	J	ug/L	0.28	J	1	Yes	S3VEM
Cadmium	Target	0.14	J	ug/L	0.14	J	1	Yes	S3VEM
Chromium	Target	40.9		ug/L	40.9		1	Yes	S3VEM
Cobalt	Target	7.8		ug/L	7.8		1	Yes	S3VEM
Copper	Target	20.0		ug/L	20.0		1	Yes	S3VEM
Lead	Target	6.5		ug/L	6.5		1	Yes	S3VEM
Manganese	Target	1180		ug/L	1180	D	2	Yes	S3VEM
Nickel	Target	28.1		ug/L	28.1		1	Yes	S3VEM
Selenium	Target	3.1	J	ug/L	3.1	J	1	Yes	S3VEM
Silver	Target	0.047	J	ug/L	0.047	J	1	Yes	S3VEM
Thallium	Target	0.14	J	ug/L	0.14	J	1	Yes	S3VEM
Vanadium	Target	89.6		ug/L	89.6		1	Yes	S3VEM
Zinc	Target	44.1		ug/L	44.1		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1T2	Lab Code: EQI
Sample Number: MYA1T2L	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.92	J	ug/L	0.92	J	5	Yes	S3VEM
Arsenic	Target	7.5		ug/L	7.5		5	Yes	S3VEM
Barium	Target	295		ug/L	295		5	Yes	S3VEM
Beryllium	Target	5.0	U	ug/L	5.0	U	5	Yes	S3VEM
Cadmium	Target	5.0	U	ug/L	5.0	U	5	Yes	S3VEM
Chromium	Target	41.5		ug/L	41.5		5	Yes	S3VEM
Cobalt	Target	8.7		ug/L	8.7	*	5	Yes	S3VEM
Copper	Target	25.1		ug/L	25.1		5	Yes	S3VEM
Lead	Target	6.0		ug/L	6.0		5	Yes	S3VEM
Manganese	Target	1130		ug/L	1130		10	Yes	S3VEM
Nickel	Target	30.4		ug/L	30.4		5	Yes	S3VEM
Selenium	Target	3.4	J	ug/L	3.4	J	5	Yes	S3VEM
Silver	Target	5.0	U	ug/L	5.0	U	5	Yes	S3VEM
Thallium	Target	5.0	U	ug/L	5.0	U	5	Yes	S3VEM
Vanadium	Target	89.4		ug/L	89.4		5	Yes	S3VEM
Zinc	Target	55.0		ug/L	55.0		5	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1T2S	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/18/2015	Sample Time:	14:55:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	77.8		ug/L	77.8		1	Yes	S3VEM
Arsenic	Spike	41.8		ug/L	41.8		1	Yes	S3VEM
Barium	Spike	2300		ug/L	2300		1	Yes	S3VEM
Beryllium	Spike	40.5		ug/L	40.5		1	Yes	S3VEM
Cadmium	Spike	46.7		ug/L	46.7		1	Yes	S3VEM
Chromium	Spike	230		ug/L	230		1	Yes	S3VEM
Cobalt	Spike	424		ug/L	424		1	Yes	S3VEM
Copper	Spike	187		ug/L	187	*	1	Yes	S3VEM
Lead	Spike	26.7		ug/L	26.7		1	Yes	S3VEM
Manganese	Spike	1620		ug/L	1620	D	2	Yes	S3VEM
Nickel	Spike	469		ug/L	469		1	Yes	S3VEM
Selenium	Spike	84.8		ug/L	84.8		1	Yes	S3VEM
Silver	Spike	46.7		ug/L	46.7		1	Yes	S3VEM
Thallium	Spike	49.6		ug/L	49.6		1	Yes	S3VEM
Vanadium	Spike	564		ug/L	564		1	Yes	S3VEM
Zinc	Spike	442		ug/L	442		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1T3	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-5	pH:		Sample Date:	11/20/2015	Sample Time:	13:41:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.36	J	ug/L	0.36	J	1	Yes	S3VEM
Arsenic	Target	6.6		ug/L	6.6		1	Yes	S3VEM
Barium	Target	58.1		ug/L	58.1		1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	0.14	J	ug/L	0.14	J	1	Yes	S3VEM
Cobalt	Target	23.0	J	ug/L	23.0	*	1	Yes	S3VEM
Copper	Target	1.8	J-	ug/L	1.8	J*	1	Yes	S3VEM
Lead	Target	0.18	J	ug/L	0.18	J	1	Yes	S3VEM
Manganese	Target	1160		ug/L	1160	D	2	Yes	S3VEM
Nickel	Target	13.6		ug/L	13.6		1	Yes	S3VEM
Selenium	Target	3.7	J	ug/L	3.7	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	3.9	J	ug/L	3.9	J	1	Yes	S3VEM
Zinc	Target	3.1		ug/L	3.1		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1T4	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-5	pH:		Sample Date:	11/20/2015	Sample Time:	14:13:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.31	J	ug/L	0.31	J	1	Yes	S3VEM
Arsenic	Target	1.0		ug/L	1.0		1	Yes	S3VEM
Barium	Target	64.6		ug/L	64.6		1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	0.14	J	ug/L	0.14	J	1	Yes	S3VEM
Cobalt	Target	0.69	J	ug/L	0.69	J*	1	Yes	S3VEM
Copper	Target	1.4	J-	ug/L	1.4	J*	1	Yes	S3VEM
Lead	Target	0.14	J	ug/L	0.14	J	1	Yes	S3VEM
Manganese	Target	329		ug/L	329		1	Yes	S3VEM
Nickel	Target	17.7		ug/L	17.7		1	Yes	S3VEM
Selenium	Target	2.9	J	ug/L	2.9	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	1.6	J	ug/L	1.6	J	1	Yes	S3VEM
Zinc	Target	3.2		ug/L	3.2		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1T5	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-CPT-5	pH:		Sample Date:	11/20/2015	Sample Time:	14:57:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.4	J	ug/L	1.4	J	1	Yes	S3VEM
Arsenic	Target	17.4		ug/L	17.4		1	Yes	S3VEM
Barium	Target	185		ug/L	185		1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	9.0		ug/L	9.0		1	Yes	S3VEM
Cobalt	Target	3.3	J	ug/L	3.3	*	1	Yes	S3VEM
Copper	Target	6.0	J-	ug/L	6.0	*	1	Yes	S3VEM
Lead	Target	2.1		ug/L	2.1		1	Yes	S3VEM
Manganese	Target	847		ug/L	847		1	Yes	S3VEM
Nickel	Target	16.0		ug/L	16.0		1	Yes	S3VEM
Selenium	Target	4.5	J	ug/L	4.5	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	20.9		ug/L	20.9		1	Yes	S3VEM
Zinc	Target	17.5		ug/L	17.5		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1T2	Lab Code:	EQI
Sample Number:	MYA1W1	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:	TTT-DP-8	pH:		Sample Date:	11/17/2015	Sample Time:	10:31:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.89	J	ug/L	0.89	J	1	Yes	S3VEM
Arsenic	Target	13.1		ug/L	13.1		1	Yes	S3VEM
Barium	Target	48.5		ug/L	48.5		1	Yes	S3VEM
Beryllium	Target	2.0	U	ug/L	2.0	UD	2	Yes	S3VEM
Cadmium	Target	1.9		ug/L	1.9		1	Yes	S3VEM
Chromium	Target	6.5		ug/L	6.5		1	Yes	S3VEM
Cobalt	Target	78.2	J	ug/L	78.2	*	1	Yes	S3VEM
Copper	Target	19.2	J-	ug/L	19.2	*	1	Yes	S3VEM
Lead	Target	108		ug/L	108		1	Yes	S3VEM
Manganese	Target	12900		ug/L	12900	D	20	Yes	S3VEM
Nickel	Target	261		ug/L	261		1	Yes	S3VEM
Selenium	Target	3.6	J	ug/L	3.6	J	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	90.2		ug/L	90.2		1	Yes	S3VEM
Zinc	Target	82.4		ug/L	82.4		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1T2	Lab Code: EQI
Sample Number: PBW039	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	Yes	S3VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Manganese	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Nickel	Target	0.44	J	ug/L	0.44	J	1	Yes	S3VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	Yes	S3VEM
Zinc	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1T2	Lab Code: EQI

Sample Number: PBW051	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cobalt	Target	1.0	U	ug/L	1.0	U	1	Yes	S3VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	Yes	S3VEM

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 26, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	MYA1N2
Laboratory:	Shealy Environmental Services, Inc. (EQI)
Analysis:	CLP Metals by ICP-MS
Samples:	13 Soil Samples
Collection Date:	November 16, 17, and 18, 2015
Reviewer:	Anna Pajarillo, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM: the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Howard Pham, CLP PO USEPA Region 5
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [X] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report – **Tier 3**

Case No.: 45742
SDG No.: MYA1N2
Site: Titan Terminal & Transport
Laboratory: Shealy Environmental Services, Inc. (EQI)
Analysis: CLP Metals by ICP-MS
Reviewer: Anna Pajarillo, ESAT
Date: May 26. 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Inorganic Analytical Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	None.
Background Samples (BG):	None.
Field Duplicates (D2):	MYA1R2, MYA1P0 (in SDG MYA1M3)

CLP PO Action

The matrix spike recoveries for antimony, copper, and nickel are below the 75-125% recovery criteria. The laboratory analyzed the post digestion spike with an added concentration greater than two times the sample concentration. See CLP SOW ISM02.3 (09/2015) Exhibit D ICP-MS Page D-64 Section 12.3.3.3.

Sampling Issues

The coolers received by the laboratory had temperatures of 6.7°C and 7.8°C which are above the less than or equal to 6°C sample preservation criterion (see Additional Comments).

Additional Comments

The samples were analyzed for the following Contract Laboratory Program (CLP) metals by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS): antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc.

All samples were received by the laboratory with cooler temperatures of 6.7°C and 7.8°C, which are above the ≤ 6°C sample preservation criterion. No adverse effect is expected for ICP-MS metal results based on the recommended preservation criteria for metals provided in Table 3-2 of EPA publication SW-846, revision 4 (recommended preservation criteria for metals does not require chilling).

The preparation logs for some solutions were missing from the data package. The laboratory provided the missing pages upon request, on 03/10/16. All standards and spiking solutions were analyzed before the expiration date.

The concentrations and units for the post digestion spike (MYA1N2A) and the serial dilution (MYA1N2L) were reported as water; MYA1N2 is a soil sample. The laboratory provided the corrected Forms 5B and 8 on 03/10/16.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Statement of Work (SOW), except as noted, have been met.

This report was prepared in accordance with the following documents:

- *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)* ISM02.2, August 2014; and
- *USEPA National Functional Guidelines for Inorganic Superfund Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), EPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration*, ISM02.2, August 2014.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Preservation and Holding Times	Yes	
3.	ICP-MS Tune Analysis	Yes	
4.	Calibration	Yes	
	a. Initial	Yes	
	b. Initial and Continuing Calibration Verification	Yes	
5.	Blanks	Yes	B
6.	ICP Interference Check Sample (ICS)	Yes	
7.	Laboratory Control Sample (LCS)	Yes	
8.	Duplicate Sample Analysis	Yes	
9.	Spike Sample Analysis	No	C
10.	ICP Serial Dilution	No	D
11.	ICP-MS Internal Standards	Yes	
12.	Field Duplicate Sample Analysis	Yes	
13.	Sample Quantitation	Yes	A
14.	Overall Assessment	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. The following results are qualified as nondetected (U) due to low level initial calibration blank (ICB) and continuing calibration blank (CCB) contamination.

- Antimony in samples MYA1P3 through MYA1P5, MYA1Q1, MYA1Q3, MYA1Q5, MYA1Q6, MYA1Q8, and MYA1R2.
- Cadmium in samples MYA1N2, MYA1P3 through MYA1P6, MYA1Q1, MYA1Q3, MYA1Q4, MYA1Q6 through MYA1Q8, and MYA1R2.
- Silver in samples MYA1P3 through MYA1P6, MYA1Q1, MYA1Q4, MYA1Q7, MYA1Q8, and MYA1R2.
- Thallium in all field samples and preparation blank PBS056.

Analyte amounts greater than the MDL but less than or equal to the CRQL were reported in the following blanks at the concentrations presented below.

Analyte	Blank	Concentration, µg/L
Antimony	ICB037/CCB326	0.20/0.14
Cadmium	ICB037/CCB326	0.095/0.081
Silver	ICB037	0.027
Thallium	ICB037/CCB324/CCB325/CCB326	0.14/0.032/0.033/0.055

Sample results that are greater than or equal to the MDL but less than or equal to the CRQL are reported as nondetected (U) at the respective CRQL.

C. The following results are estimated and flagged "J-" or "UJ" because matrix spike recoveries are outside method QC limit.

- Antimony, copper, and nickel in all field samples.

Matrix spike recoveries in QC sample MYA1N2S do not meet the 75-125% criterion for accuracy as presented below.

Analyte	% Recovery
Antimony	33
Copper	67
Nickel	73

Detected results for these analytes in the samples listed above are considered quantitatively uncertain and may be biased low.

A valid post-digestion spike is not available for antimony, copper, and nickel (see CLP PO Action).

D. The following results are estimated and flagged "J" because serial dilution results are outside method QC limit.

- Arsenic, copper, and nickel in all samples.

Percent differences for serial dilution analysis of MYA1N2L do not meet the 15% difference criterion for the analytes presented below.

Analyte	% Difference
Arsenic	23
Copper	22
Nickel	24

Results for the analytes listed above are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. Since results for the diluted sample are higher than the original, the reported results may be biased low.

Sample Summary Report

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	LCS056	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0		mg/kg	2.0		1	Yes	S3VEM
Arsenic	Target	1.2		mg/kg	1.2		1	Yes	S3VEM
Barium	Target	9.3		mg/kg	9.3		1	Yes	S3VEM
Beryllium	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Cadmium	Target	1.1		mg/kg	1.1		1	Yes	S3VEM
Chromium	Target	2.0		mg/kg	2.0		1	Yes	S3VEM
Cobalt	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Copper	Target	2.0		mg/kg	2.0		1	Yes	S3VEM
Lead	Target	0.90		mg/kg	0.90		1	Yes	S3VEM
Manganese	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Nickel	Target	1.1		mg/kg	1.1		1	Yes	S3VEM
Selenium	Target	5.1		mg/kg	5.1		1	Yes	S3VEM
Silver	Target	1.0		mg/kg	1.0		1	Yes	S3VEM
Thallium	Target	0.87		mg/kg	0.87		1	Yes	S3VEM
Vanadium	Target	4.6		mg/kg	4.6		1	Yes	S3VEM
Zinc	Target	1.9		mg/kg	1.9		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1N2	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-4	pH:		Sample Date:	11/16/2015	Sample Time:	13:00:00
% Moisture :				% Solids :	91.3973		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	4.6	J-	mg/kg	4.6	*	1	Yes	S3VEM
Arsenic	Target	12.8	J	mg/kg	12.8	*	1	Yes	S3VEM
Barium	Target	67.4		mg/kg	67.4		1	Yes	S3VEM
Beryllium	Target	0.21	J	mg/kg	0.21	J	1	Yes	S3VEM
Cadmium	Target	0.39	U	mg/kg	0.30	J	1	Yes	S3VEM
Chromium	Target	13.4		mg/kg	13.4	*	1	Yes	S3VEM
Cobalt	Target	6.0		mg/kg	6.0		1	Yes	S3VEM
Copper	Target	9.6	J-	mg/kg	9.6	*	1	Yes	S3VEM
Lead	Target	2.2		mg/kg	2.2		1	Yes	S3VEM
Manganese	Target	176		mg/kg	176		1	Yes	S3VEM
Nickel	Target	8.4	J-	mg/kg	8.4	*	1	Yes	S3VEM
Selenium	Target	1.9	U	mg/kg	1.9	U	1	Yes	S3VEM
Silver	Target	0.39	U	mg/kg	0.39	U	1	Yes	S3VEM
Thallium	Target	0.39	U	mg/kg	0.11	J	1	Yes	S3VEM
Vanadium	Target	45.9		mg/kg	45.9		1	Yes	S3VEM
Zinc	Target	35.2		mg/kg	35.2		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1N2A	Method:	Metals by ICP-MS	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:	11/16/2015	Sample Time:	13:00:00
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	79.7		mg/kg	207		1	Yes	S3VEM
Copper	Spike	146		mg/kg	379		1	Yes	S3VEM
Nickel	Spike	287		mg/kg	745		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1N2D	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:	11/16/2015	Sample Time:	13:00:00
% Moisture :				% Solids :	91.3973		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	3.1		mg/kg	3.1	*	1	Yes	S3VEM
Arsenic	Target	11.3		mg/kg	11.3		1	Yes	S3VEM
Barium	Target	66.1		mg/kg	66.1		1	Yes	S3VEM
Beryllium	Target	0.20	J	mg/kg	0.20	J	1	Yes	S3VEM
Cadmium	Target	0.37	J	mg/kg	0.20	J	1	Yes	S3VEM
Chromium	Target	9.8		mg/kg	9.8	*	1	Yes	S3VEM
Cobalt	Target	5.3		mg/kg	5.3		1	Yes	S3VEM
Copper	Target	8.8		mg/kg	8.8		1	Yes	S3VEM
Lead	Target	2.1		mg/kg	2.1		1	Yes	S3VEM
Manganese	Target	166		mg/kg	166		1	Yes	S3VEM
Nickel	Target	7.4		mg/kg	7.4		1	Yes	S3VEM
Selenium	Target	1.9	U	mg/kg	1.9	U	1	Yes	S3VEM
Silver	Target	0.37	U	mg/kg	0.37	U	1	Yes	S3VEM
Thallium	Target	0.37	J	mg/kg	0.11	J	1	Yes	S3VEM
Vanadium	Target	45.8		mg/kg	45.8		1	Yes	S3VEM
Zinc	Target	34.3		mg/kg	34.3		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1N2	Lab Code: EQI
Sample Number: MYA1N2L	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	4.6		mg/kg	12.0		5	Yes	S3VEM
Arsenic	Target	15.7		mg/kg	40.9	*	5	Yes	S3VEM
Barium	Target	66.3		mg/kg	172		5	Yes	S3VEM
Beryllium	Target	1.9	U	mg/kg	0.56	J	5	Yes	S3VEM
Cadmium	Target	0.31	J	mg/kg	0.81	J	5	Yes	S3VEM
Chromium	Target	13.8		mg/kg	35.9		5	Yes	S3VEM
Cobalt	Target	6.6		mg/kg	17.1		5	Yes	S3VEM
Copper	Target	11.7		mg/kg	30.5	*	5	Yes	S3VEM
Lead	Target	2.2		mg/kg	5.6		5	Yes	S3VEM
Manganese	Target	174		mg/kg	453		5	Yes	S3VEM
Nickel	Target	10.4		mg/kg	27.1	*	5	Yes	S3VEM
Selenium	Target	9.6	U	mg/kg	12.5	U	5	Yes	S3VEM
Silver	Target	1.9	U	mg/kg	2.5	U	5	Yes	S3VEM
Thallium	Target	0.17	J	mg/kg	0.43	J	5	Yes	S3VEM
Vanadium	Target	46.0		mg/kg	119		5	Yes	S3VEM
Zinc	Target	37.9		mg/kg	98.4		5	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1N2S	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:	11/16/2015	Sample Time:	13:00:00
% Moisture :				% Solids :	91.3973		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	7.0		mg/kg	7.0	*	1	Yes	S3VEM
Arsenic	Spike	14.7		mg/kg	14.7		1	Yes	S3VEM
Barium	Spike	204		mg/kg	204		1	Yes	S3VEM
Beryllium	Spike	3.3		mg/kg	3.3		1	Yes	S3VEM
Cadmium	Spike	3.9		mg/kg	3.9		1	Yes	S3VEM
Chromium	Spike	24.9		mg/kg	24.9		1	Yes	S3VEM
Cobalt	Spike	39.8		mg/kg	39.8		1	Yes	S3VEM
Copper	Spike	21.8		mg/kg	21.8	*	1	Yes	S3VEM
Lead	Spike	3.5		mg/kg	3.5		1	Yes	S3VEM
Manganese	Spike	208		mg/kg	208		1	Yes	S3VEM
Nickel	Spike	35.0		mg/kg	35.0	*	1	Yes	S3VEM
Selenium	Spike	6.7		mg/kg	6.7		1	Yes	S3VEM
Silver	Spike	3.6		mg/kg	3.6		1	Yes	S3VEM
Thallium	Spike	3.4		mg/kg	3.4		1	Yes	S3VEM
Vanadium	Spike	82.5		mg/kg	82.5		1	Yes	S3VEM
Zinc	Spike	67.8		mg/kg	67.8		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1P3	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-7	pH:		Sample Date:	11/17/2015	Sample Time:	14:48:00
% Moisture :				% Solids :	87.7091		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	UJ	mg/kg	0.096	J*	1	Yes	S3VEM
Arsenic	Target	1.4	J	mg/kg	1.4	*	1	Yes	S3VEM
Barium	Target	124		mg/kg	124		1	Yes	S3VEM
Beryllium	Target	0.34	J	mg/kg	0.34	J	1	Yes	S3VEM
Cadmium	Target	0.54	U	mg/kg	0.17	J	1	Yes	S3VEM
Chromium	Target	14.4		mg/kg	14.4	*	1	Yes	S3VEM
Cobalt	Target	8.4		mg/kg	8.4		1	Yes	S3VEM
Copper	Target	15.2	J-	mg/kg	15.2	*	1	Yes	S3VEM
Lead	Target	4.2		mg/kg	4.2		1	Yes	S3VEM
Manganese	Target	407		mg/kg	407		1	Yes	S3VEM
Nickel	Target	9.6	J-	mg/kg	9.6	*	1	Yes	S3VEM
Selenium	Target	2.7	U	mg/kg	2.7	U	1	Yes	S3VEM
Silver	Target	0.54	U	mg/kg	0.059	J	1	Yes	S3VEM
Thallium	Target	0.54	U	mg/kg	0.15	J	1	Yes	S3VEM
Vanadium	Target	33.7		mg/kg	33.7		1	Yes	S3VEM
Zinc	Target	58.7		mg/kg	58.7		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1P4	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-7	pH:		Sample Date:	11/17/2015	Sample Time:	14:55:00
% Moisture :				% Solids :	88.3379		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	UJ	mg/kg	0.076	J*	1	Yes	S3VEM
Arsenic	Target	1.2	J	mg/kg	1.2	*	1	Yes	S3VEM
Barium	Target	102		mg/kg	102		1	Yes	S3VEM
Beryllium	Target	0.31	J	mg/kg	0.31	J	1	Yes	S3VEM
Cadmium	Target	0.55	U	mg/kg	0.12	J	1	Yes	S3VEM
Chromium	Target	13.4		mg/kg	13.4	*	1	Yes	S3VEM
Cobalt	Target	7.8		mg/kg	7.8		1	Yes	S3VEM
Copper	Target	8.9	J-	mg/kg	8.9	*	1	Yes	S3VEM
Lead	Target	3.6		mg/kg	3.6		1	Yes	S3VEM
Manganese	Target	293		mg/kg	293		1	Yes	S3VEM
Nickel	Target	8.1	J-	mg/kg	8.1	*	1	Yes	S3VEM
Selenium	Target	2.8	U	mg/kg	2.8	U	1	Yes	S3VEM
Silver	Target	0.55	U	mg/kg	0.032	J	1	Yes	S3VEM
Thallium	Target	0.55	U	mg/kg	0.15	J	1	Yes	S3VEM
Vanadium	Target	31.1		mg/kg	31.1		1	Yes	S3VEM
Zinc	Target	50.7		mg/kg	50.7		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1P5	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-7	pH:		Sample Date:	11/17/2015	Sample Time:	15:03:00
% Moisture :				% Solids :	94.2255		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	UJ	mg/kg	0.064	J*	1	Yes	S3VEM
Arsenic	Target	0.65	J	mg/kg	0.65	*	1	Yes	S3VEM
Barium	Target	44.8		mg/kg	44.8		1	Yes	S3VEM
Beryllium	Target	0.14	J	mg/kg	0.14	J	1	Yes	S3VEM
Cadmium	Target	0.52	U	mg/kg	0.038	J	1	Yes	S3VEM
Chromium	Target	6.0		mg/kg	6.0	*	1	Yes	S3VEM
Cobalt	Target	3.1		mg/kg	3.1		1	Yes	S3VEM
Copper	Target	2.9	J-	mg/kg	2.9	*	1	Yes	S3VEM
Lead	Target	1.4		mg/kg	1.4		1	Yes	S3VEM
Manganese	Target	115		mg/kg	115		1	Yes	S3VEM
Nickel	Target	3.5	J-	mg/kg	3.5	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.52	U	mg/kg	0.028	J	1	Yes	S3VEM
Thallium	Target	0.52	U	mg/kg	0.076	J	1	Yes	S3VEM
Vanadium	Target	18.5		mg/kg	18.5		1	Yes	S3VEM
Zinc	Target	24.8		mg/kg	24.8		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1P6	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-7	pH:		Sample Date:	11/17/2015	Sample Time:	15:09:00
% Moisture :				% Solids :	83.4628		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	J-	mg/kg	1.1	*	1	Yes	S3VEM
Arsenic	Target	3.5	J	mg/kg	3.5	*	1	Yes	S3VEM
Barium	Target	68.2		mg/kg	68.2		1	Yes	S3VEM
Beryllium	Target	0.18	J	mg/kg	0.18	J	1	Yes	S3VEM
Cadmium	Target	0.54	U	mg/kg	0.052	J	1	Yes	S3VEM
Chromium	Target	8.1		mg/kg	8.1	*	1	Yes	S3VEM
Cobalt	Target	5.0		mg/kg	5.0		1	Yes	S3VEM
Copper	Target	4.4	J-	mg/kg	4.4	*	1	Yes	S3VEM
Lead	Target	1.8		mg/kg	1.8		1	Yes	S3VEM
Manganese	Target	217		mg/kg	217		1	Yes	S3VEM
Nickel	Target	5.1	J-	mg/kg	5.1	*	1	Yes	S3VEM
Selenium	Target	2.7	U	mg/kg	2.7	U	1	Yes	S3VEM
Silver	Target	0.54	U	mg/kg	0.26	J	1	Yes	S3VEM
Thallium	Target	0.54	U	mg/kg	0.11	J	1	Yes	S3VEM
Vanadium	Target	30.9		mg/kg	30.9		1	Yes	S3VEM
Zinc	Target	33.2		mg/kg	33.2		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1Q1	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-9	pH:		Sample Date:	11/18/2015	Sample Time:	09:28:00
% Moisture :				% Solids :	94.231		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.93	UJ	mg/kg	0.11	J*	1	Yes	S3VEM
Arsenic	Target	1.7	J	mg/kg	1.7	*	1	Yes	S3VEM
Barium	Target	46.3		mg/kg	46.3		1	Yes	S3VEM
Beryllium	Target	0.11	J	mg/kg	0.11	J	1	Yes	S3VEM
Cadmium	Target	0.46	U	mg/kg	0.11	J	1	Yes	S3VEM
Chromium	Target	7.8		mg/kg	7.8	*	1	Yes	S3VEM
Cobalt	Target	3.7		mg/kg	3.7		1	Yes	S3VEM
Copper	Target	9.9	J-	mg/kg	9.9	*	1	Yes	S3VEM
Lead	Target	4.7		mg/kg	4.7		1	Yes	S3VEM
Manganese	Target	138		mg/kg	138		1	Yes	S3VEM
Nickel	Target	9.1	J-	mg/kg	9.1	*	1	Yes	S3VEM
Selenium	Target	2.3	U	mg/kg	2.3	U	1	Yes	S3VEM
Silver	Target	0.46	U	mg/kg	0.13	J	1	Yes	S3VEM
Thallium	Target	0.46	U	mg/kg	0.058	J	1	Yes	S3VEM
Vanadium	Target	14.3		mg/kg	14.3		1	Yes	S3VEM
Zinc	Target	33.2		mg/kg	33.2		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1Q3	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-9	pH:		Sample Date:	11/18/2015	Sample Time:	09:39:00
% Moisture :				% Solids :	95.4191		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.91	UJ	mg/kg	0.053	J*	1	Yes	S3VEM
Arsenic	Target	0.64	J	mg/kg	0.64	*	1	Yes	S3VEM
Barium	Target	51.3		mg/kg	51.3		1	Yes	S3VEM
Beryllium	Target	0.15	J	mg/kg	0.15	J	1	Yes	S3VEM
Cadmium	Target	0.46	U	mg/kg	0.040	J	1	Yes	S3VEM
Chromium	Target	5.9		mg/kg	5.9	*	1	Yes	S3VEM
Cobalt	Target	4.0		mg/kg	4.0		1	Yes	S3VEM
Copper	Target	2.7	J-	mg/kg	2.7	*	1	Yes	S3VEM
Lead	Target	1.4		mg/kg	1.4		1	Yes	S3VEM
Manganese	Target	167		mg/kg	167		1	Yes	S3VEM
Nickel	Target	4.0	J-	mg/kg	4.0	*	1	Yes	S3VEM
Selenium	Target	2.3	U	mg/kg	2.3	U	1	Yes	S3VEM
Silver	Target	0.46	U	mg/kg	0.46	U	1	Yes	S3VEM
Thallium	Target	0.46	U	mg/kg	0.082	J	1	Yes	S3VEM
Vanadium	Target	18.0		mg/kg	18.0		1	Yes	S3VEM
Zinc	Target	27.1		mg/kg	27.1		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1Q4	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-9	pH:		Sample Date:	11/18/2015	Sample Time:	09:43:00
% Moisture :				% Solids :	85.5645		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	UJ	mg/kg	1.0	U*	1	Yes	S3VEM
Arsenic	Target	0.53	J	mg/kg	0.53	*	1	Yes	S3VEM
Barium	Target	71.9		mg/kg	71.9		1	Yes	S3VEM
Beryllium	Target	0.23	J	mg/kg	0.23	J	1	Yes	S3VEM
Cadmium	Target	0.51	U	mg/kg	0.041	J	1	Yes	S3VEM
Chromium	Target	9.0		mg/kg	9.0	*	1	Yes	S3VEM
Cobalt	Target	4.8		mg/kg	4.8		1	Yes	S3VEM
Copper	Target	2.9	J-	mg/kg	2.9	*	1	Yes	S3VEM
Lead	Target	1.5		mg/kg	1.5		1	Yes	S3VEM
Manganese	Target	182		mg/kg	182		1	Yes	S3VEM
Nickel	Target	5.6	J-	mg/kg	5.6	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	0.51	U	mg/kg	0.018	J	1	Yes	S3VEM
Thallium	Target	0.51	U	mg/kg	0.11	J	1	Yes	S3VEM
Vanadium	Target	21.5		mg/kg	21.5		1	Yes	S3VEM
Zinc	Target	35.6		mg/kg	35.6		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1Q5	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-10	pH:		Sample Date:	11/18/2015	Sample Time:	07:46:00
% Moisture :				% Solids :	90.3919		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	UJ	mg/kg	0.39	J*	1	Yes	S3VEM
Arsenic	Target	3.3	J	mg/kg	3.3	*	1	Yes	S3VEM
Barium	Target	97.4		mg/kg	97.4		1	Yes	S3VEM
Beryllium	Target	0.22	J	mg/kg	0.22	J	1	Yes	S3VEM
Cadmium	Target	0.53	U	mg/kg	0.53		1	Yes	S3VEM
Chromium	Target	19.2		mg/kg	19.2	*	1	Yes	S3VEM
Cobalt	Target	5.8		mg/kg	5.8		1	Yes	S3VEM
Copper	Target	20.1	J-	mg/kg	20.1	*	1	Yes	S3VEM
Lead	Target	29.0		mg/kg	29.0		1	Yes	S3VEM
Manganese	Target	239		mg/kg	239		1	Yes	S3VEM
Nickel	Target	20.2	J-	mg/kg	20.2	*	1	Yes	S3VEM
Selenium	Target	2.6	U	mg/kg	2.6	U	1	Yes	S3VEM
Silver	Target	2.0		mg/kg	2.0		1	Yes	S3VEM
Thallium	Target	0.53	U	mg/kg	0.12	J	1	Yes	S3VEM
Vanadium	Target	26.1		mg/kg	26.1		1	Yes	S3VEM
Zinc	Target	115		mg/kg	115		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1Q6	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-10	pH:		Sample Date:	11/18/2015	Sample Time:	07:52:00
% Moisture :				% Solids :	85.5719		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.92	UJ	mg/kg	0.058	J*	1	Yes	S3VEM
Arsenic	Target	1.1	J	mg/kg	1.1	*	1	Yes	S3VEM
Barium	Target	139		mg/kg	139		1	Yes	S3VEM
Beryllium	Target	0.29	J	mg/kg	0.29	J	1	Yes	S3VEM
Cadmium	Target	0.46	U	mg/kg	0.12	J	1	Yes	S3VEM
Chromium	Target	17.7		mg/kg	17.7	*	1	Yes	S3VEM
Cobalt	Target	7.3		mg/kg	7.3		1	Yes	S3VEM
Copper	Target	8.3	J-	mg/kg	8.3	*	1	Yes	S3VEM
Lead	Target	8.8		mg/kg	8.8		1	Yes	S3VEM
Manganese	Target	226		mg/kg	226		1	Yes	S3VEM
Nickel	Target	8.7	J-	mg/kg	8.7	*	1	Yes	S3VEM
Selenium	Target	2.3	U	mg/kg	2.3	U	1	Yes	S3VEM
Silver	Target	0.98		mg/kg	0.98		1	Yes	S3VEM
Thallium	Target	0.46	U	mg/kg	0.17	J	1	Yes	S3VEM
Vanadium	Target	28.1		mg/kg	28.1		1	Yes	S3VEM
Zinc	Target	97.8		mg/kg	97.8		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1Q7	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-10	pH:		Sample Date:	11/18/2015	Sample Time:	08:00:00
% Moisture :				% Solids :	91.7585		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.89	UJ	mg/kg	0.89	U*	1	Yes	S3VEM
Arsenic	Target	0.60	J	mg/kg	0.60	*	1	Yes	S3VEM
Barium	Target	57.9		mg/kg	57.9		1	Yes	S3VEM
Beryllium	Target	0.15	J	mg/kg	0.15	J	1	Yes	S3VEM
Cadmium	Target	0.44	U	mg/kg	0.052	J	1	Yes	S3VEM
Chromium	Target	6.5		mg/kg	6.5	*	1	Yes	S3VEM
Cobalt	Target	4.4		mg/kg	4.4		1	Yes	S3VEM
Copper	Target	3.7	J-	mg/kg	3.7	*	1	Yes	S3VEM
Lead	Target	1.4		mg/kg	1.4		1	Yes	S3VEM
Manganese	Target	167		mg/kg	167		1	Yes	S3VEM
Nickel	Target	4.4	J-	mg/kg	4.4	*	1	Yes	S3VEM
Selenium	Target	2.2	U	mg/kg	2.2	U	1	Yes	S3VEM
Silver	Target	0.44	U	mg/kg	0.050	J	1	Yes	S3VEM
Thallium	Target	0.44	U	mg/kg	0.083	J	1	Yes	S3VEM
Vanadium	Target	20.4		mg/kg	20.4		1	Yes	S3VEM
Zinc	Target	27.2		mg/kg	27.2		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1Q8	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-10	pH:		Sample Date:	11/18/2015	Sample Time:	08:06:00
% Moisture :				% Solids :	85.885		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	UJ	mg/kg	0.13	J*	1	Yes	S3VEM
Arsenic	Target	2.9	J	mg/kg	2.9	*	1	Yes	S3VEM
Barium	Target	113		mg/kg	113		1	Yes	S3VEM
Beryllium	Target	0.29	J	mg/kg	0.29	J	1	Yes	S3VEM
Cadmium	Target	0.54	U	mg/kg	0.12	J	1	Yes	S3VEM
Chromium	Target	14.4		mg/kg	14.4	*	1	Yes	S3VEM
Cobalt	Target	7.6		mg/kg	7.6		1	Yes	S3VEM
Copper	Target	7.4	J-	mg/kg	7.4	*	1	Yes	S3VEM
Lead	Target	3.1		mg/kg	3.1		1	Yes	S3VEM
Manganese	Target	255		mg/kg	255		1	Yes	S3VEM
Nickel	Target	9.3	J-	mg/kg	9.3	*	1	Yes	S3VEM
Selenium	Target	2.7	U	mg/kg	2.7	U	1	Yes	S3VEM
Silver	Target	0.54	U	mg/kg	0.032	J	1	Yes	S3VEM
Thallium	Target	0.54	U	mg/kg	0.17	J	1	Yes	S3VEM
Vanadium	Target	34.6		mg/kg	34.6		1	Yes	S3VEM
Zinc	Target	54.7		mg/kg	54.7		1	Yes	S3VEM

Case No:	45742	Contract:	EPW14035	SDG No:	MYA1N2	Lab Code:	EQI
Sample Number:	MYA1R2	Method:	Metals by ICP-MS	Matrix:	Soil	MA Number:	
Sample Location:	TTT-DP-6	pH:		Sample Date:	11/17/2015	Sample Time:	11:38:00
% Moisture :				% Solids :	91.7465		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.78	UJ	mg/kg	0.065	J*	1	Yes	S3VEM
Arsenic	Target	1.3	J	mg/kg	1.3	*	1	Yes	S3VEM
Barium	Target	74.7		mg/kg	74.7		1	Yes	S3VEM
Beryllium	Target	0.23	J	mg/kg	0.23	J	1	Yes	S3VEM
Cadmium	Target	0.39	U	mg/kg	0.085	J	1	Yes	S3VEM
Chromium	Target	9.0		mg/kg	9.0	*	1	Yes	S3VEM
Cobalt	Target	5.8		mg/kg	5.8		1	Yes	S3VEM
Copper	Target	5.9	J-	mg/kg	5.9	*	1	Yes	S3VEM
Lead	Target	2.3		mg/kg	2.3		1	Yes	S3VEM
Manganese	Target	218		mg/kg	218		1	Yes	S3VEM
Nickel	Target	5.9	J-	mg/kg	5.9	*	1	Yes	S3VEM
Selenium	Target	1.9	U	mg/kg	1.9	U	1	Yes	S3VEM
Silver	Target	0.39	U	mg/kg	0.023	J	1	Yes	S3VEM
Thallium	Target	0.39	U	mg/kg	0.11	J	1	Yes	S3VEM
Vanadium	Target	23.2		mg/kg	23.2		1	Yes	S3VEM
Zinc	Target	37.1		mg/kg	37.1		1	Yes	S3VEM

Case No: 45742	Contract: EPW14035	SDG No: MYA1N2	Lab Code: EQI
Sample Number: PBS056	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Arsenic	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Barium	Target	5.0	U	mg/kg	5.0	U	1	Yes	S3VEM
Beryllium	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Cadmium	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Chromium	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Cobalt	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Copper	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM
Lead	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Manganese	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Nickel	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Selenium	Target	2.5	U	mg/kg	2.5	U	1	Yes	S3VEM
Silver	Target	0.50	U	mg/kg	0.50	U	1	Yes	S3VEM
Thallium	Target	0.50	U	mg/kg	0.0085	J	1	Yes	S3VEM
Vanadium	Target	2.5	U	mg/kg	2.5	U	1	Yes	S3VEM
Zinc	Target	1.0	U	mg/kg	1.0	U	1	Yes	S3VEM

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300; Fax: (510) 412-2304.

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 27, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	YA1M3
Laboratory:	KAP Technologies, Inc. (KAP)
Analysis:	CLP Low-Level Volatiles
Samples:	20 Soil Samples
Collection Date:	November 16 and 17, 2015
Reviewer:	Estrellita Manuel, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM; the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Raymond Flores, CLP PO USEPA Region 6
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report - **Tier 3**

Case No.: 45742
SDG No.: YA1M3
Site: Titan Terminal & Transport
Laboratory: KAP Technologies, Inc. (KAP)
Analysis: CLP Low-Level Volatiles
Reviewer: Estrellita Manuel, ESAT
Date: May 27, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Organic Analytic Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	None.
Trip Blanks (TB):	None.
Background Samples (BG):	None.
Field Duplicates (D1):	YA1N5, YA1R1 (in SDG YA1N2)
(D2):	YA1R2, YA1P0

CLP PO Action

None.

Sampling Issues

None.

Additional Comments

All standards and spiking solutions were analyzed before the expiration date.

Other than laboratory artifacts (retention times of 2.8-3.6, 4.7, 6.8, 7.9, 9.4, 9.8, 10.7, 11.0, 11.6, 14.3, 16.6, 17.2, 18.6, and 20.2 minutes), tentatively identified compounds (TICs) were not found in the samples.

The percent relative standard deviation (%RSD) of 22.3% reported for 1,2-dichlorobenzene in the 11/19/15 initial calibration exceeds the 20.0% validation criterion. Examination of the RRFs indicates that the sensitivity at the CRQL is good; CRQL standard RRF of 3.1635 is above the average RRF of 2.5673. Therefore, in the reviewer's technical judgment, qualification of non-detected results is not necessary. Associated sample results for 1,2-dichlorobenzene are not qualified because they are non-detects.

The laboratory performed manual peak integration for some standard, sample, and blank chromatograms. Manual integrations were reviewed and found to be in compliance with CLP Statement of Work (SOW) requirements.

This report was prepared in accordance with the following documents:
- *USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015; and
- *USEPA National Functional Guidelines for Superfund Organic Methods Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1	Data Completeness	Yes	
2	Holding Time/Preservation	Yes	
3	GC/MS Tune/GC Performance	Yes	
4	Initial Calibration	Yes	
5	Continuing Calibration Verification (CCV)	No	B
6	Laboratory Blanks	Yes	
7	Field/Equipment/Trip Blanks	N/A	
8	Deuterated Monitoring Compounds (DMCs)	No	C
9	Matrix Spike/Matrix Spike Duplicates (MS/MSDs)	Yes	
10	Internal Standards	Yes	
11	Compound Identification	Yes	
12	Compound Quantitation and Reported CRQLs	Yes	A
13	System Performance	Yes	
14	Field Duplicate Sample Analysis	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. Result for the following analyte is qualified as estimated due to a large percent difference (%D) in CCV and is flagged "UJ".

- 1,2-Dichloroethane in method blank VBLK05.

The following value exceeds the ±25.0% validation criterion for closing CCVs.

Analyte	Calibration Date and Time	%D
1,2-Dichloroethane	11/21/15 21:52	+28.4

C. Results for the following analytes are qualified as estimated due to a low deuterated monitoring compound (DMC) recovery and are flagged "UJ".

{1,1-Dichloroethene-d2}
- 1,1-Dichloroethene, cis-1,2-dichloroethene, and trans-1,2-dichloroethene in sample YA1N5.

DMC recovery for the qualification listed above is shown below.

Sample	DMC	% Recovery	QC Limit
YA1N5	1,1-Dichloroethene-d2	39	45-110

Since qualified results are nondetected, false negatives may exist. Sample YA1N5 was not reanalyzed.

The recovery for DMC 1,1,2,2-tetrachloroethane-d2 in sample YA1R2 (127%) exceeds the QC limit of 45-120%, indicating potential high bias in detected results; qualification is not necessary because the associated target analytes are not detected.

Sample Summary Report

Case No:	45742	Contract:	EPW14031	SDG No:	YA1M3	Lab Code:	KAP
Sample Number:	VBLK01	Method:	Volatile Organics	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100.00		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	4.1	J	ug/kg	4.1	J	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	2.1	J	ug/kg	2.1	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclotetrasiloxane, octamethyl-	TIC	9.5	NJ	ug/kg	9.5	NJ	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	86	NJ	ug/kg	86	NJ	1.0	Yes	NV
Unknown-01	TIC	11	J	ug/kg	11	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP
Sample Number: VBLK03	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	3.9	J	ug/kg	3.9	J	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.9	J	ug/kg	4.9	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.1	J	ug/kg	4.1	J	1.0	Yes	S3VEM
Unknown-06	TIC	1.0	J	ug/kg	1.0	J	1.0	Yes	NV
Unknown-11	TIC	0.96	J	ug/kg	0.96	J	1.0	Yes	NV
Unknown-03	TIC	0.79	J	ug/kg	0.79	J	1.0	Yes	NV
Unknown-05	TIC	0.62	J	ug/kg	0.62	J	1.0	Yes	NV
Unknown-10	TIC	0.95	J	ug/kg	0.95	J	1.0	Yes	NV
Unknown-01	TIC	2.0	J	ug/kg	2.0	J	1.0	Yes	NV
Unknown-08	TIC	0.97	J	ug/kg	0.97	J	1.0	Yes	NV
Unknown-02	TIC	1.3	J	ug/kg	1.3	J	1.0	Yes	NV
Unknown-09	TIC	7.1	J	ug/kg	7.1	J	1.0	Yes	NV
Unknown-12	TIC	2.8	J	ug/kg	2.8	J	1.0	Yes	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.9	NJ	ug/kg	1.9	NJ	1.0	Yes	NV
Unknown-04	TIC	1.0	J	ug/kg	1.0	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	89	NJ	ug/kg	89	NJ	1.0	Yes	NV
Unknown-07	TIC	0.88	J	ug/kg	0.88	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP
Sample Number: VBLK05	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	UJ	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	3.9	J	ug/kg	3.9	J	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.8	J	ug/kg	4.8	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.5	J	ug/kg	4.5	J	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	92	NJ	ug/kg	92	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP
Sample Number: VBLK09	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	7.0		ug/kg	7.0		1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.0	J	ug/kg	4.0	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.0	J	ug/kg	4.0	J	1.0	Yes	S3VEM
Cyclotrisiloxane, hexamethyl-	TIC	3.1	NJ	ug/kg	3.1	NJ	1.0	Yes	NV
Unknown-08	TIC	0.86	J	ug/kg	0.86	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	90	NJ	ug/kg	90	NJ	1.0	Yes	NV
Unknown-04	TIC	2.8	J	ug/kg	2.8	J	1.0	Yes	NV
Unknown-12	TIC	2.9	J	ug/kg	2.9	J	1.0	Yes	NV
Unknown-03	TIC	1.3	J	ug/kg	1.3	J	1.0	Yes	NV
Unknown-07	TIC	1.3	J	ug/kg	1.3	J	1.0	Yes	NV
Unknown-10	TIC	1.1	J	ug/kg	1.1	J	1.0	Yes	NV
Unknown-09	TIC	0.52	J	ug/kg	0.52	J	1.0	Yes	NV
Cyclotetrasiloxane, octamethyl-	TIC	3.2	NJ	ug/kg	3.2	NJ	1.0	Yes	NV
Unknown-05	TIC	0.54	J	ug/kg	0.54	J	1.0	Yes	NV
Unknown-02	TIC	0.96	J	ug/kg	0.96	J	1.0	Yes	NV
Unknown-11	TIC	1.0	J	ug/kg	1.0	J	1.0	Yes	NV
Unknown-01	TIC	2.1	J	ug/kg	2.1	J	1.0	Yes	NV
Unknown-06	TIC	0.56	J	ug/kg	0.56	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP
Sample Number: VBLK19	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	3.0	J	ug/kg	3.0	J	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	3.6	J	ug/kg	3.6	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	3.0	J	ug/kg	3.0	J	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	63	NJ	ug/kg	63	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP
Sample Number: VHBLK01	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Unknown-05	TIC	0.65	J	ug/kg	0.65	J	1.0	Yes	NV
Unknown-03	TIC	1.9	J	ug/kg	1.9	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	64	NJ	ug/kg	64	NJ	1.0	Yes	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.2	NJ	ug/kg	1.2	NJ	1.0	Yes	NV
Unknown-04	TIC	0.52	J	ug/kg	0.52	J	1.0	Yes	NV
Unknown-06	TIC	0.62	J	ug/kg	0.62	J	1.0	Yes	NV
Unknown-02	TIC	1.6	J	ug/kg	1.6	J	1.0	Yes	NV
Unknown-07	TIC	1.6	J	ug/kg	1.6	J	1.0	Yes	NV
Cyclotetrasiloxane, octamethyl-	TIC	2.3	NJ	ug/kg	2.3	NJ	1.0	Yes	NV
Unknown-08	TIC	2.6	J	ug/kg	2.6	J	1.0	Yes	NV
Unknown-01	TIC	2.1	J	ug/kg	2.1	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1M3	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-2	pH: 7.0	Sample Date: 11/16/2015	Sample Time: 09:16:00
% Moisture :		% Solids : 92.50	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromomethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloroform	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Benzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
o-Xylene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Styrene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromoform	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Unknown-14	TIC	0.73	J	ug/kg	0.73	J	1.0	No	NV
Unknown-12	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-05	TIC	0.89	J	ug/kg	0.89	J	1.0	No	NV
Unknown-06	TIC	3.6	J	ug/kg	3.6	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	98	NJ	ug/kg	98	NJ	1.0	No	NV
Unknown-07	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-01	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-19	TIC	7.2	J	ug/kg	7.2	J	1.0	No	NV
Unknown-15	TIC	4.0	J	ug/kg	4.0	J	1.0	No	NV
Unknown-08	TIC	0.82	J	ug/kg	0.82	J	1.0	No	NV
Unknown-02	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-03	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-16	TIC	8.0	J	ug/kg	8.0	J	1.0	No	NV
Unknown-17	TIC	0.67	J	ug/kg	0.67	J	1.0	No	NV
Unknown-10	TIC	0.73	J	ug/kg	0.73	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-09	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-13	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-04	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-11	TIC	0.65	J	ug/kg	0.65	J	1.0	No	NV
Unknown-18	TIC	22	J	ug/kg	22	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1M4	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-2	pH: 6.8	Sample Date: 11/16/2015	Sample Time: 09:27:00
% Moisture :		% Solids : 91.10	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromomethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloroform	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Benzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
o-Xylene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Styrene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromoform	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Unknown-15	TIC	5.8	J	ug/kg	5.8	J	1.0	No	NV
Unknown-03	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-12	TIC	10	J	ug/kg	10	J	1.0	No	NV
Unknown-02	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV
Unknown-01	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-08	TIC	0.63	J	ug/kg	0.63	J	1.0	No	NV
Unknown-14	TIC	19	J	ug/kg	19	J	1.0	No	NV
Unknown-04	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV
Unknown-07	TIC	0.72	J	ug/kg	0.72	J	1.0	No	NV
Unknown-05	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.0	NJ	ug/kg	2.0	NJ	1.0	No	NV
Unknown-06	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-11	TIC	4.6	J	ug/kg	4.6	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	110	NJ	ug/kg	110	NJ	1.0	No	NV
Unknown-13	TIC	0.93	J	ug/kg	0.93	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-09	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-10	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1M4MS	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH: 6.8	Sample Date: 11/16/2015	Sample Time: 09:27:00
% Moisture :		% Solids : 91.10	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Spike	57		ug/kg	57		1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Spike	52		ug/kg	52		1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Spike	61		ug/kg	61		1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Spike	45		ug/kg	45	B	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Spike	56		ug/kg	56		1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1M4MSD	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH: 6.8	Sample Date: 11/16/2015	Sample Time: 09:27:00
% Moisture :		% Solids : 91.10	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromomethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Spike	52		ug/kg	52		1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Acetone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylene chloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Butanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Benzene	Spike	52		ug/kg	52		1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichloroethene	Spike	63		ug/kg	63		1.0	Yes	S3VEM
Methylcyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Toluene	Spike	37		ug/kg	37		1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chlorobenzene	Spike	55		ug/kg	55		1.0	Yes	S3VEM
Ethylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
o-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Styrene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromoform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1M5	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-2	pH: 6.4	Sample Date: 11/16/2015	Sample Time: 10:00:00
% Moisture :		% Solids : 80.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Chloromethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Bromomethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Chloroethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Acetone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.6	J	ug/kg	1.6	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
2-Butanone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Chloroform	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Benzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Toluene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
2-Hexanone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
o-Xylene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Styrene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Bromoform	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.9	U	ug/kg	5.9	U	1.0	Yes	S3VEM
Unknown-10	TIC	5.0	J	ug/kg	5.0	J	1.0	No	NV
Unknown-06	TIC	0.87	J	ug/kg	0.87	J	1.0	No	NV
Unknown-05	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	110	NJ	ug/kg	110	NJ	1.0	No	NV
Unknown-08	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-02	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-03	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-14	TIC	8.8	J	ug/kg	8.8	J	1.0	No	NV
Unknown-01	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-12	TIC	0.84	J	ug/kg	0.84	J	1.0	No	NV
Unknown-09	TIC	0.92	J	ug/kg	0.92	J	1.0	No	NV
Unknown-07	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-13	TIC	30	J	ug/kg	30	J	1.0	No	NV
Unknown-04	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-11	TIC	14	J	ug/kg	14	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyclotrisiloxane, hexamethyl-	TIC	2.0	NJ	ug/kg	2.0	NJ	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1M6	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-2	pH: 7.9	Sample Date: 11/16/2015	Sample Time: 10:28:00
% Moisture :		% Solids : 78.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Chloromethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Bromomethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Chloroethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Acetone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
2-Butanone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Chloroform	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Benzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Toluene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
2-Hexanone	Target	12	U	ug/kg	12	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
o-Xylene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Styrene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Bromoform	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.8	U	ug/kg	5.8	U	1.0	Yes	S3VEM
Unknown-12	TIC	0.82	J	ug/kg	0.82	J	1.0	No	NV
Unknown-09	TIC	0.69	J	ug/kg	0.69	J	1.0	No	NV
Unknown-10	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-02	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-05	TIC	0.86	J	ug/kg	0.86	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	0.80	NJ	ug/kg	0.80	NJ	1.0	No	NV
Unknown-13	TIC	12	J	ug/kg	12	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	110	NJ	ug/kg	110	NJ	1.0	No	NV
Unknown-14	TIC	7.4	J	ug/kg	7.4	J	1.0	No	NV
Unknown-11	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-07	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-03	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	5.6	NJ	ug/kg	5.6	NJ	1.0	No	NV
Unknown-01	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-08	TIC	0.72	J	ug/kg	0.72	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-15	TIC	6.0	J	ug/kg	6.0	J	1.0	No	NV
Unknown-04	TIC	2.4	J	ug/kg	2.4	J	1.0	No	NV
Unknown-06	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.8	NJ	ug/kg	1.8	NJ	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1N1	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-4	pH: 9.7	Sample Date: 11/16/2015	Sample Time: 12:57:00
% Moisture :		% Solids : 93.30	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromomethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloroform	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Benzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
o-Xylene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Styrene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromoform	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	96	NJ	ug/kg	96	NJ	1.0	No	NV
Unknown-14	TIC	0.91	J	ug/kg	0.91	J	1.0	No	NV
Unknown-09	TIC	0.54	J	ug/kg	0.54	J	1.0	No	NV
Unknown-03	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-10	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-06	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-15	TIC	4.8	J	ug/kg	4.8	J	1.0	No	NV
Unknown-13	TIC	11	J	ug/kg	11	J	1.0	No	NV
Unknown-07	TIC	0.71	J	ug/kg	0.71	J	1.0	No	NV
Unknown-12	TIC	6.0	J	ug/kg	6.0	J	1.0	No	NV
Unknown-04	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.0	NJ	ug/kg	2.0	NJ	1.0	No	NV
Unknown-02	TIC	2.6	J	ug/kg	2.6	J	1.0	No	NV
Unknown-05	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-11	TIC	0.94	J	ug/kg	0.94	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-01	TIC	2.4	J	ug/kg	2.4	J	1.0	No	NV
Unknown-08	TIC	0.57	J	ug/kg	0.57	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1N3	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-4	pH: 9.3	Sample Date: 11/16/2015	Sample Time: 13:13:00
% Moisture :		% Solids : 86.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.7	J	ug/kg	1.7	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	3.2	J	ug/kg	3.2	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Unknown-08	TIC	0.67	J	ug/kg	0.67	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	86	NJ	ug/kg	86	NJ	1.0	No	NV
Unknown-12	TIC	6.7	J	ug/kg	6.7	J	1.0	No	NV
Unknown-09	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-04	TIC	3.8	J	ug/kg	3.8	J	1.0	No	NV
Unknown-11	TIC	8.2	J	ug/kg	8.2	J	1.0	No	NV
Unknown-05	TIC	0.99	J	ug/kg	0.99	J	1.0	No	NV
Unknown-14	TIC	22	J	ug/kg	22	J	1.0	No	NV
Unknown-02	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-10	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.8	NJ	ug/kg	2.8	NJ	1.0	No	NV
Unknown-06	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-01	TIC	0.97	J	ug/kg	0.97	J	1.0	No	NV
Unknown-15	TIC	4.8	J	ug/kg	4.8	J	1.0	No	NV
Unknown-03	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-07	TIC	0.68	J	ug/kg	0.68	J	1.0	No	NV
Unknown-13	TIC	0.96	J	ug/kg	0.96	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1N4	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-4	pH: 6.9	Sample Date: 11/16/2015	Sample Time: 13:19:00
% Moisture :		% Solids : 80.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromomethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloroform	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Benzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
o-Xylene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Styrene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromoform	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Unknown-08	TIC	0.94	J	ug/kg	0.94	J	1.0	No	NV
Unknown-02	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-11	TIC	5.0	J	ug/kg	5.0	J	1.0	No	NV
Unknown-09	TIC	3.9	J	ug/kg	3.9	J	1.0	No	NV
Unknown-06	TIC	0.66	J	ug/kg	0.66	J	1.0	No	NV
Unknown-10	TIC	9.6	J	ug/kg	9.6	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.0	NJ	ug/kg	3.0	NJ	1.0	No	NV
Unknown-04	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	98	NJ	ug/kg	98	NJ	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	1.4	NJ	ug/kg	1.4	NJ	1.0	No	NV
Unknown-07	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	12	NJ	ug/kg	12	NJ	1.0	No	NV
Unknown-01	TIC	4.2	J	ug/kg	4.2	J	1.0	No	NV
Unknown-05	TIC	0.81	J	ug/kg	0.81	J	1.0	No	NV
Unknown-03	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1N5	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-5	pH: 5.5	Sample Date: 11/16/2015	Sample Time: 13:33:00
% Moisture :		% Solids : 89.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Vinyl chloride	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Bromomethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	6.4	UJ	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Acetone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Carbon disulfide	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Methyl acetate	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.9	J	ug/kg	1.9	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	6.4	UJ	ug/kg	6.4	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	6.4	UJ	ug/kg	6.4	U	1.0	Yes	S3VEM
2-Butanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Bromochloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chloroform	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Cyclohexane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Benzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Trichloroethene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
4-Methyl-2-pentanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Toluene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
2-Hexanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Ethylbenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
o-Xylene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
m,p-Xylene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Styrene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Bromoform	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Cyclotetrasiloxane, octamethyl-	TIC	10	NJ	ug/kg	10	NJ	1.0	No	NV
Unknown-13	TIC	9.4	J	ug/kg	9.4	J	1.0	No	NV
Unknown-04	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-03	TIC	4.0	J	ug/kg	4.0	J	1.0	No	NV
Unknown-08	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Furan, tetrahydro-	TIC	0.74	NJ	ug/kg	0.74	NJ	1.0	No	NV
Unknown-02	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-11	TIC	13	J	ug/kg	13	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	120	NJ	ug/kg	120	NJ	1.0	No	NV
Unknown-07	TIC	0.83	J	ug/kg	0.83	J	1.0	No	NV
Unknown-01	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-06	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-10	TIC	0.68	J	ug/kg	0.68	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-09	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.9	NJ	ug/kg	2.9	NJ	1.0	No	NV
Unknown-05	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-12	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1N6	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-5	pH: 5.9	Sample Date: 11/16/2015	Sample Time: 13:41:00
% Moisture :		% Solids : 90.10	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromomethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.5	J	ug/kg	1.5	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloroform	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Benzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
o-Xylene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Styrene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromoform	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Unknown-05	TIC	0.73	J	ug/kg	0.73	J	1.0	No	NV
Unknown-13	TIC	15	J	ug/kg	15	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.5	NJ	ug/kg	2.5	NJ	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	99	NJ	ug/kg	99	NJ	1.0	No	NV
Unknown-01	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-08	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-06	TIC	0.65	J	ug/kg	0.65	J	1.0	No	NV
Unknown-14	TIC	6.1	J	ug/kg	6.1	J	1.0	No	NV
Unknown-09	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-11	TIC	13	J	ug/kg	13	J	1.0	No	NV
Unknown-10	TIC	0.87	J	ug/kg	0.87	J	1.0	No	NV
Unknown-04	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-12	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-03	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	8.8	NJ	ug/kg	8.8	NJ	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-07	TIC	0.65	J	ug/kg	0.65	J	1.0	No	NV
Unknown-02	TIC	7.7	J	ug/kg	7.7	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1N7	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-5	pH: 6.4	Sample Date: 11/16/2015	Sample Time: 15:25:00
% Moisture :		% Solids : 89.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.6	J	ug/kg	1.6	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	3.8	J	ug/kg	3.8	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Unknown-13	TIC	6.6	J	ug/kg	6.6	J	1.0	No	NV
Unknown-11	TIC	0.54	J	ug/kg	0.54	J	1.0	No	NV
Unknown-12	TIC	12	J	ug/kg	12	J	1.0	No	NV
Unknown-14	TIC	5.7	J	ug/kg	5.7	J	1.0	No	NV
Unknown-06	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-08	TIC	0.61	J	ug/kg	0.61	J	1.0	No	NV
Unknown-02	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-10	TIC	0.94	J	ug/kg	0.94	J	1.0	No	NV
Unknown-09	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-03	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-05	TIC	2.6	J	ug/kg	2.6	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	2.7	NJ	ug/kg	2.7	NJ	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	94	NJ	ug/kg	94	NJ	1.0	No	NV
Unknown-04	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.9	NJ	ug/kg	2.9	NJ	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-01	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-07	TIC	0.64	J	ug/kg	0.64	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP
Sample Number: YA1N8	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-5	pH: 4.4	Sample Date: 11/16/2015	Sample Time: 15:31:00
% Moisture :		% Solids : 79.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Vinyl chloride	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Bromomethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Acetone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Carbon disulfide	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Methyl acetate	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.7	J	ug/kg	1.7	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
2-Butanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Bromochloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chloroform	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Cyclohexane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Benzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Trichloroethene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Toluene	Target	4.2	J	ug/kg	4.2	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
2-Hexanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Chlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Ethylbenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
o-Xylene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
m,p-Xylene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Styrene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Bromoform	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	6.4	U	ug/kg	6.4	U	1.0	Yes	S3VEM
Unknown-15	TIC	7.2	J	ug/kg	7.2	J	1.0	No	NV
Unknown-11	TIC	0.67	J	ug/kg	0.67	J	1.0	No	NV
Unknown-05	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-13	TIC	28	J	ug/kg	28	J	1.0	No	NV
Unknown-03	TIC	4.0	J	ug/kg	4.0	J	1.0	No	NV
Unknown-04	TIC	3.0	J	ug/kg	3.0	J	1.0	No	NV
Unknown-01	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-08	TIC	0.75	J	ug/kg	0.75	J	1.0	No	NV
Unknown-10	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-02	TIC	3.4	J	ug/kg	3.4	J	1.0	No	NV
Unknown-12	TIC	18	J	ug/kg	18	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.5	NJ	ug/kg	3.5	NJ	1.0	No	NV
Unknown-07	TIC	0.70	J	ug/kg	0.70	J	1.0	No	NV
Unknown-09	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	120	NJ	ug/kg	120	NJ	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-06	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-14	TIC	25	J	ug/kg	25	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	2.6	NJ	ug/kg	2.6	NJ	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1N9	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-6	pH: 7.9	Sample Date: 11/17/2015	Sample Time: 11:26:00
% Moisture :		% Solids : 92.70	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromomethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Acetone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylene chloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Butanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Benzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Toluene	Target	2.4	J	ug/kg	2.4	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
o-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Styrene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromoform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Unknown-12	TIC	8.4	J	ug/kg	8.4	J	1.0	No	NV
Unknown-04	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-05	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	2.8	NJ	ug/kg	2.8	NJ	1.0	No	NV
Unknown-11	TIC	0.49	J	ug/kg	0.49	J	1.0	No	NV
Unknown-16	TIC	4.6	J	ug/kg	4.6	J	1.0	No	NV
Unknown-08	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-13	TIC	6.5	J	ug/kg	6.5	J	1.0	No	NV
Unknown-07	TIC	0.63	J	ug/kg	0.63	J	1.0	No	NV
Unknown-09	TIC	0.87	J	ug/kg	0.87	J	1.0	No	NV
Unknown-03	TIC	2.7	J	ug/kg	2.7	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	92	NJ	ug/kg	92	NJ	1.0	No	NV
Unknown-01	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-14	TIC	0.51	J	ug/kg	0.51	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.5	NJ	ug/kg	2.5	NJ	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-06	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-15	TIC	8.6	J	ug/kg	8.6	J	1.0	No	NV
Unknown-02	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-10	TIC	0.68	J	ug/kg	0.68	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP
Sample Number: YA1P0	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-6	pH: 9.2	Sample Date: 11/17/2015	Sample Time: 11:33:00
% Moisture :		% Solids : 91.70	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.6	J	ug/kg	1.6	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.2		ug/kg	5.2	B	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetic acid, 2-ethylhexyl ester	TIC	2.6	NJ	ug/kg	2.6	NJ	1.0	No	NV
Unknown-18	TIC	6.5	J	ug/kg	6.5	J	1.0	No	NV
Unknown-06	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-08	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-02	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-17	TIC	21	J	ug/kg	21	J	1.0	No	NV
Unknown-16	TIC	27	J	ug/kg	27	J	1.0	No	NV
Unknown-09	TIC	0.60	J	ug/kg	0.60	J	1.0	No	NV
Unknown-10	TIC	0.70	J	ug/kg	0.70	J	1.0	No	NV
Unknown-03	TIC	0.94	J	ug/kg	0.94	J	1.0	No	NV
Unknown-04	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-15	TIC	15	J	ug/kg	15	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	99	NJ	ug/kg	99	NJ	1.0	No	NV
Unknown-11	TIC	0.95	J	ug/kg	0.95	J	1.0	No	NV
Unknown-01	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-05	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.2	NJ	ug/kg	3.2	NJ	1.0	No	NV
Unknown-12	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-07	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV
Unknown-13	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-14	TIC	0.64	J	ug/kg	0.64	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1P1	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-6	pH: 9.0	Sample Date: 11/17/2015	Sample Time: 11:42:00
% Moisture :		% Solids : 93.70	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.9	J	ug/kg	1.9	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.7		ug/kg	5.7	B	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Unknown-03	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-06	TIC	3.0	J	ug/kg	3.0	J	1.0	No	NV
Unknown-14	TIC	0.75	J	ug/kg	0.75	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	2.2	NJ	ug/kg	2.2	NJ	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.1	NJ	ug/kg	3.1	NJ	1.0	No	NV
Unknown-09	TIC	0.66	J	ug/kg	0.66	J	1.0	No	NV
Unknown-11	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-16	TIC	24	J	ug/kg	24	J	1.0	No	NV
Unknown-04	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-07	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-12	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-02	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-13	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-17	TIC	0.54	J	ug/kg	0.54	J	1.0	No	NV
Unknown-08	TIC	0.83	J	ug/kg	0.83	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-15	TIC	0.51	J	ug/kg	0.51	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	11	NJ	ug/kg	11	NJ	1.0	No	NV
Unknown-05	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	97	NJ	ug/kg	97	NJ	1.0	No	NV
Unknown-10	TIC	0.66	J	ug/kg	0.66	J	1.0	No	NV
Unknown-18	TIC	6.2	J	ug/kg	6.2	J	1.0	No	NV
Unknown-01	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1P2	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-6	pH: 6.9	Sample Date: 11/17/2015	Sample Time: 11:47:00
% Moisture :		% Solids : 83.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Chloromethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Vinyl chloride	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Bromomethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Chloroethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Acetone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Carbon disulfide	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Methyl acetate	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.8	J	ug/kg	1.8	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
2-Butanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Bromochloromethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Chloroform	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Cyclohexane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Benzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Trichloroethene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Toluene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
2-Hexanone	Target	13	U	ug/kg	13	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Chlorobenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Ethylbenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
o-Xylene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
m,p-Xylene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Styrene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Bromoform	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	6.3	U	ug/kg	6.3	U	1.0	Yes	S3VEM
Unknown-16	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-11	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-07	TIC	2.3	J	ug/kg	2.3	J	1.0	No	NV
Unknown-05	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-17	TIC	19	J	ug/kg	19	J	1.0	No	NV
Unknown-14	TIC	9.8	J	ug/kg	9.8	J	1.0	No	NV
Unknown-13	TIC	0.77	J	ug/kg	0.77	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.0	NJ	ug/kg	3.0	NJ	1.0	No	NV
Unknown-01	TIC	3.2	J	ug/kg	3.2	J	1.0	No	NV
Unknown-09	TIC	0.69	J	ug/kg	0.69	J	1.0	No	NV
Unknown-02	TIC	2.3	J	ug/kg	2.3	J	1.0	No	NV
Unknown-15	TIC	28	J	ug/kg	28	J	1.0	No	NV
Unknown-08	TIC	11	J	ug/kg	11	J	1.0	No	NV
Unknown-06	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-10	TIC	0.89	J	ug/kg	0.89	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-04	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-18	TIC	7.3	J	ug/kg	7.3	J	1.0	No	NV
Unknown-12	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-03	TIC	3.9	J	ug/kg	3.9	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	110	NJ	ug/kg	110	NJ	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1P7	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-8	pH: 9.2	Sample Date: 11/17/2015	Sample Time: 08:26:00
% Moisture :		% Solids : 91.70	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Chloromethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Bromomethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Chloroethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Acetone	Target	9.4	U	ug/kg	9.4	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.4	J	ug/kg	1.4	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
2-Butanone	Target	9.4	U	ug/kg	9.4	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Chloroform	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Benzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.4	U	ug/kg	9.4	U	1.0	Yes	S3VEM
Toluene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.4	U	ug/kg	9.4	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
o-Xylene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Styrene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Bromoform	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.7	U	ug/kg	4.7	U	1.0	Yes	S3VEM
Unknown-14	TIC	5.8	J	ug/kg	5.8	J	1.0	No	NV
Unknown-08	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-03	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-01	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.4	NJ	ug/kg	2.4	NJ	1.0	No	NV
Unknown-05	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	0.82	NJ	ug/kg	0.82	NJ	1.0	No	NV
Unknown-13	TIC	21	J	ug/kg	21	J	1.0	No	NV
Unknown-12	TIC	7.0	J	ug/kg	7.0	J	1.0	No	NV
Unknown-07	TIC	0.51	J	ug/kg	0.51	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	89	NJ	ug/kg	89	NJ	1.0	No	NV
Unknown-10	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-09	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-04	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-06	TIC	0.52	J	ug/kg	0.52	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-11	TIC	0.51	J	ug/kg	0.51	J	1.0	No	NV
Unknown-02	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1P8	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-8	pH: 9.7	Sample Date: 11/17/2015	Sample Time: 09:30:00
% Moisture :		% Solids : 87.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromomethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Acetone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.4	J	ug/kg	1.4	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Butanone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Benzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Toluene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
o-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Styrene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromoform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Unknown-16	TIC	18	J	ug/kg	18	J	1.0	No	NV
Unknown-11	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-17	TIC	5.5	J	ug/kg	5.5	J	1.0	No	NV
Unknown-08	TIC	0.53	J	ug/kg	0.53	J	1.0	No	NV
Unknown-07	TIC	0.60	J	ug/kg	0.60	J	1.0	No	NV
Unknown-06	TIC	0.54	J	ug/kg	0.54	J	1.0	No	NV
Unknown-14	TIC	20	J	ug/kg	20	J	1.0	No	NV
Unknown-01	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-09	TIC	3.3	J	ug/kg	3.3	J	1.0	No	NV
Unknown-02	TIC	2.4	J	ug/kg	2.4	J	1.0	No	NV
Unknown-04	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	9.5	NJ	ug/kg	9.5	NJ	1.0	No	NV
Unknown-05	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-03	TIC	3.0	J	ug/kg	3.0	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	94	NJ	ug/kg	94	NJ	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-12	TIC	0.78	J	ug/kg	0.78	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.6	NJ	ug/kg	2.6	NJ	1.0	No	NV
Unknown-13	TIC	0.58	J	ug/kg	0.58	J	1.0	No	NV
Unknown-15	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-10	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1P9	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-8	pH: 9.7	Sample Date: 11/17/2015	Sample Time: 09:37:00
% Moisture :		% Solids : 93.90	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromomethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.7	J	ug/kg	1.7	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chloroform	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Benzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
o-Xylene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Styrene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Bromoform	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.7	U	ug/kg	5.7	U	1.0	Yes	S3VEM
Unknown-11	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-17	TIC	22	J	ug/kg	22	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	1.9	NJ	ug/kg	1.9	NJ	1.0	No	NV
Unknown-05	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-06	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-08	TIC	0.67	J	ug/kg	0.67	J	1.0	No	NV
Unknown-02	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-14	TIC	0.61	J	ug/kg	0.61	J	1.0	No	NV
Unknown-09	TIC	0.71	J	ug/kg	0.71	J	1.0	No	NV
Unknown-10	TIC	0.68	J	ug/kg	0.68	J	1.0	No	NV
Unknown-07	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-04	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-15	TIC	0.71	J	ug/kg	0.71	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	110	NJ	ug/kg	110	NJ	1.0	No	NV
Unknown-12	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-18	TIC	11	J	ug/kg	11	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.2	NJ	ug/kg	3.2	NJ	1.0	No	NV
Unknown-13	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-19	TIC	4.3	J	ug/kg	4.3	J	1.0	No	NV
Unknown-03	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-16	TIC	13	J	ug/kg	13	J	1.0	No	NV
Unknown-01	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1Q0	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-8	pH: 7.6	Sample Date: 11/17/2015	Sample Time: 09:42:00
% Moisture :		% Solids : 84.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromomethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.5	J	ug/kg	1.5	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloroform	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Benzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
o-Xylene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Styrene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromoform	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Unknown-12	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-05	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-06	TIC	0.95	J	ug/kg	0.95	J	1.0	No	NV
Unknown-09	TIC	0.57	J	ug/kg	0.57	J	1.0	No	NV
Unknown-15	TIC	11	J	ug/kg	11	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.8	NJ	ug/kg	2.8	NJ	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	1.3	NJ	ug/kg	1.3	NJ	1.0	No	NV
Unknown-07	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-02	TIC	0.92	J	ug/kg	0.92	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	95	NJ	ug/kg	95	NJ	1.0	No	NV
Unknown-01	TIC	2.0	JB	ug/kg	2.0	JB	1.0	No	NV
Unknown-03	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-14	TIC	0.55	J	ug/kg	0.55	J	1.0	No	NV
Unknown-04	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-11	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-13	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-16	TIC	24	J	ug/kg	24	J	1.0	No	NV
Unknown-17	TIC	4.9	J	ug/kg	4.9	J	1.0	No	NV
Unknown-08	TIC	0.64	J	ug/kg	0.64	J	1.0	No	NV
Unknown-10	TIC	0.53	J	ug/kg	0.53	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1M3	Lab Code: KAP

Sample Number: YA1R2	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-6	pH: 9.4	Sample Date: 11/17/2015	Sample Time: 11:38:00
% Moisture :		% Solids : 91.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	1.6	J	ug/kg	1.6	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	2.5	J	ug/kg	2.5	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Unknown-12	TIC	0.70	J	ug/kg	0.70	J	1.0	No	NV
Unknown-09	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-03	TIC	3.2	J	ug/kg	3.2	J	1.0	No	NV
Unknown-04	TIC	4.1	J	ug/kg	4.1	J	1.0	No	NV
Unknown-17	TIC	5.4	J	ug/kg	5.4	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	13	NJ	ug/kg	13	NJ	1.0	No	NV
Unknown-13	TIC	30	J	ug/kg	30	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	100	NJ	ug/kg	100	NJ	1.0	No	NV
Unknown-11	TIC	0.70	J	ug/kg	0.70	J	1.0	No	NV
Unknown-02	TIC	2.8	J	ug/kg	2.8	J	1.0	No	NV
Unknown-15	TIC	33	J	ug/kg	33	J	1.0	No	NV
Unknown-01	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-05	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-07	TIC	0.63	J	ug/kg	0.63	J	1.0	No	NV
Unknown-16	TIC	0.56	J	ug/kg	0.56	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyclotrisiloxane, hexamethyl-	TIC	3.4	NJ	ug/kg	3.4	NJ	1.0	No	NV
Unknown-10	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-08	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-14	TIC	2.7	J	ug/kg	2.7	J	1.0	No	NV
Unknown-06	TIC	0.57	J	ug/kg	0.57	J	1.0	No	NV

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300; Fax: (510) 412-2304.

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 27, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	YA1N2
Laboratory:	KAP Technologies, Inc. (KAP)
Analysis:	CLP Low-Level Volatiles
Samples:	14 Soil Samples
Collection Date:	November 16 through 18, 2015
Reviewer:	Estrellita Manuel, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM; the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Raymond Flores, CLP PO USEPA Region 6
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report - **Tier 3**

Case No.: 45742
SDG No.: YA1N2
Site: Titan Terminal & Transport
Laboratory: KAP Technologies, Inc. (KAP)
Analysis: CLP Low-Level Volatiles
Reviewer: Estrellita Manuel, ESAT
Date: May 27, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Organic Analytic Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	None.
Trip Blanks (TB):	None.
Background Samples (BG):	None.
Field Duplicates (D1):	YA1R1, YA1N5 (in SDG YA1M3)

CLP PO Action

None.

Sampling Issues

None.

Additional Comments

All standards and spiking solutions were analyzed before the expiration date.

Other than laboratory artifacts (retention times of 2.8-3.6, 4.7, 6.8, 7.9, 9.4, 9.8, 10.7, 11.0, 11.6, 14.3, 16.6, 17.2, 18.6, and 20.2 minutes), tentatively identified compounds (TICs) were not found in the samples.

The percent relative standard deviation (%RSD) of 22.3% reported for 1,2-dichlorobenzene in the 11/19/15 initial calibration exceeds the 20.0% validation criterion. Examination of the relative response factors (RRFs) indicates that the sensitivity at the contract required quantitation limit (CRQL) is good; CRQL standard RRF of 3.1635 is above the average RRF of 2.5673. Therefore, in the reviewer's technical judgment, qualification of non-detected results is not necessary. Associated sample results for 1,2-dichlorobenzene are not qualified because they are non-detects.

The laboratory performed manual peak integration for some standard and sample chromatograms. Manual integrations were reviewed and found to be in compliance with CLP Statement of Work (SOW) requirements.

This report was prepared in accordance with the following documents:

- *USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015; and
- *USEPA National Functional Guidelines for Superfund Organic Methods Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1	Data Completeness	Yes	
2	Holding Time/Preservation	Yes	
3	GC/MS Tune/GC Performance	Yes	
4	Initial Calibration	Yes	
5	Continuing Calibration Verification (CCV)	No	B
6	Laboratory Blanks	Yes	C
7	Field/Equipment/Trip Blanks	N/A	
8	Deuterated Monitoring Compounds (DMCs)	Yes	
9	Matrix Spike/Matrix Spike Duplicates (MS/MSDs)	Yes	
10	Internal Standards	Yes	
11	Compound Identification	Yes	
12	Compound Quantitation and Reported CRQLs	Yes	A
13	System Performance	Yes	
14	Field Duplicate Sample Analysis	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. Results for the following analyte are qualified as estimated due to large percent differences (%Ds) in CCVs and are flagged "UJ".

- 1,2-Dichloroethane in all samples and method blanks VBLK05 and VBLK07.

The following values exceed the ±25.0% validation criterion for closing CCVs.

Analyte	Calibration Date and Time	%D
1,2-Dichloroethane	11/21/15 21:52	+28.4
1,2-Dichloroethane	11/23/15 22:01	+26.1

C. The following results are qualified as non-detected due to method blank and storage blank contamination and are flagged "U".

- Methylene chloride in samples YA1P3 through YA1P6 and YA1Q1 through YA1Q8.
- 1,2,4-Trichlorobenzene in YA1P5.

Methylene chloride is present in method blank VBLK07 at 4.1 µg/kg and 1,2,4-trichlorobenzene is present in storage blank VHBLK01 at 1.8 µg/kg. Results for these analytes that are less than or equal to the CRQL are qualified as non-detected at the CRQL. Methylene chloride results above the CRQL and less than two times the blank concentration are reported as nondetected at the reported concentration.

Sample Summary Report

Case No:	45742	Contract:	EPW14031	SDG No:	YA1N2	Lab Code:	KAP
Sample Number:	VBLK05	Method:	Volatile Organics	Matrix:	Soil	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100.00		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	UJ	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	3.9	J	ug/kg	3.9	J	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.8	J	ug/kg	4.8	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.5	J	ug/kg	4.5	J	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	92	NJ	ug/kg	92	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP
Sample Number: VBLK07	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	4.1	J	ug/kg	4.1	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	UJ	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	96	NJ	ug/kg	96	NJ	1.0	Yes	NV
Unknown-01	TIC	5.4	J	ug/kg	5.4	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP
Sample Number: VBLK09	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	7.0		ug/kg	7.0		1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.0	J	ug/kg	4.0	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.0	J	ug/kg	4.0	J	1.0	Yes	S3VEM
Unknown-06	TIC	0.56	J	ug/kg	0.56	J	1.0	Yes	NV
Unknown-08	TIC	0.86	J	ug/kg	0.86	J	1.0	Yes	NV
Unknown-12	TIC	2.9	J	ug/kg	2.9	J	1.0	Yes	NV
Unknown-09	TIC	0.52	J	ug/kg	0.52	J	1.0	Yes	NV
Unknown-01	TIC	2.1	J	ug/kg	2.1	J	1.0	Yes	NV
Unknown-07	TIC	1.3	J	ug/kg	1.3	J	1.0	Yes	NV
Unknown-11	TIC	1.0	J	ug/kg	1.0	J	1.0	Yes	NV
Unknown-03	TIC	1.3	J	ug/kg	1.3	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	90	NJ	ug/kg	90	NJ	1.0	Yes	NV
Unknown-04	TIC	2.8	J	ug/kg	2.8	J	1.0	Yes	NV
Unknown-10	TIC	1.1	J	ug/kg	1.1	J	1.0	Yes	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.1	NJ	ug/kg	3.1	NJ	1.0	Yes	NV
Cyclotetrasiloxane, octamethyl-	TIC	3.2	NJ	ug/kg	3.2	NJ	1.0	Yes	NV
Unknown-02	TIC	0.96	J	ug/kg	0.96	J	1.0	Yes	NV
Unknown-05	TIC	0.54	J	ug/kg	0.54	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP
Sample Number: VBLK11	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	3.3	J	ug/kg	3.3	J	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.9	J	ug/kg	4.9	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.0	J	ug/kg	4.0	J	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	69	NJ	ug/kg	69	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP
Sample Number: VHBLK01	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	1.8	J	ug/kg	1.8	JB	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	1.5	J	ug/kg	1.5	JB	1.0	Yes	S3VEM
Unknown-01	TIC	1.1	J	ug/kg	1.1	J	1.0	Yes	NV
Cyclotetrasiloxane, octamethyl-	TIC	4.1	NJ	ug/kg	4.1	NJ	1.0	Yes	NV
Unknown-06	TIC	0.71	J	ug/kg	0.71	J	1.0	Yes	NV
Unknown-04	TIC	0.67	J	ug/kg	0.67	J	1.0	Yes	NV
Unknown-02	TIC	1.6	J	ug/kg	1.6	J	1.0	Yes	NV
Unknown-05	TIC	1.1	J	ug/kg	1.1	J	1.0	Yes	NV
Unknown-07	TIC	2.8	J	ug/kg	2.8	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	70	NJ	ug/kg	70	NJ	1.0	Yes	NV
Unknown-03	TIC	1.4	J	ug/kg	1.4	J	1.0	Yes	NV
Unknown-08	TIC	1.7	J	ug/kg	1.7	J	1.0	Yes	NV
3-Methylheptyl acetate	TIC	0.74	NJ	ug/kg	0.74	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1N2	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-4	pH: 7.2	Sample Date: 11/16/2015	Sample Time: 13:00:00
% Moisture :		% Solids : 91.80	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Bromomethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Acetone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methylene chloride	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
2-Butanone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chloroform	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Benzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.8	UJ	ug/kg	4.8	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Toluene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
o-Xylene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Styrene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Bromoform	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Unknown-08	TIC	13	J	ug/kg	13	J	1.0	No	NV
Unknown-01	TIC	0.99	J	ug/kg	0.99	J	1.0	No	NV
Unknown-09	TIC	5.3	J	ug/kg	5.3	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.3	NJ	ug/kg	2.3	NJ	1.0	No	NV
Unknown-07	TIC	6.6	J	ug/kg	6.6	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	89	NJ	ug/kg	89	NJ	1.0	No	NV
Unknown-03	TIC	2.7	J	ug/kg	2.7	J	1.0	No	NV
Unknown-06	TIC	0.99	J	ug/kg	0.99	J	1.0	No	NV
Unknown-05	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-04	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-02	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1P3	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-7	pH: 9.6	Sample Date: 11/17/2015	Sample Time: 14:48:00
% Moisture :		% Solids : 88.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Chloromethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Bromomethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Chloroethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.6	U	ug/kg	3.6	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Chloroform	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Benzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.6	UJ	ug/kg	5.6	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
o-Xylene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Styrene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Bromoform	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.6	U	ug/kg	5.6	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	110	NJ	ug/kg	110	NJ	1.0	No	NV
Unknown-02	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Hexane	TIC	13	NJ	ug/kg	13	NJ	1.0	No	NV
Unknown-07	TIC	6.1	J	ug/kg	6.1	J	1.0	No	NV
Unknown-09	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-03	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-05	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-06	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-01	TIC	2.9	J	ug/kg	2.9	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.7	NJ	ug/kg	1.7	NJ	1.0	No	NV
Unknown-04	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-08	TIC	3.2	J	ug/kg	3.2	J	1.0	No	NV
Unknown-10	TIC	2.3	J	ug/kg	2.3	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1P4	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-7	pH: 9.8	Sample Date: 11/17/2015	Sample Time: 14:55:00
% Moisture :		% Solids : 89.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromomethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Acetone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.5	U	ug/kg	5.5	B	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Butanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Benzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.9	UJ	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Toluene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.8	U	ug/kg	9.8	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
o-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Styrene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromoform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Cyclotrisiloxane, hexamethyl-	TIC	2.3	NJ	ug/kg	2.3	NJ	1.0	No	NV
Unknown-03	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-06	TIC	2.7	J	ug/kg	2.7	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	89	NJ	ug/kg	89	NJ	1.0	No	NV
Unknown-01	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-04	TIC	7.6	J	ug/kg	7.6	J	1.0	No	NV
Unknown-02	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	1.5	NJ	ug/kg	1.5	NJ	1.0	No	NV
Unknown-05	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1P5	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-7	pH: 8.6	Sample Date: 11/17/2015	Sample Time: 15:03:00
% Moisture :		% Solids : 95.30	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Chloromethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Bromomethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Chloroethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Acetone	Target	9.2	U	ug/kg	9.2	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Methylene chloride	Target	4.6	U	ug/kg	4.1	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
2-Butanone	Target	9.2	U	ug/kg	9.2	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Chloroform	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Benzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.6	UJ	ug/kg	4.6	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.2	U	ug/kg	9.2	U	1.0	Yes	S3VEM
Toluene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.2	U	ug/kg	9.2	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
o-Xylene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Styrene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Bromoform	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.6	U	ug/kg	1.7	J	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.6	U	ug/kg	4.6	U	1.0	Yes	S3VEM
Cyclotrisiloxane, hexamethyl-	TIC	2.7	NJ	ug/kg	2.7	NJ	1.0	No	NV
Unknown-02	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-04	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-05	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-09	TIC	0.90	J	ug/kg	0.90	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	84	NJ	ug/kg	84	NJ	1.0	No	NV
Unknown-11	TIC	28	J	ug/kg	28	J	1.0	No	NV
Unknown-10	TIC	8.6	J	ug/kg	8.6	J	1.0	No	NV
Unknown-08	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-07	TIC	0.52	J	ug/kg	0.52	J	1.0	No	NV
Unknown-06	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-03	TIC	4.3	J	ug/kg	4.3	J	1.0	No	NV
Unknown-12	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-01	TIC	3.0	J	ug/kg	3.0	J	1.0	No	NV
Unknown-13	TIC	4.7	J	ug/kg	4.7	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP
Sample Number: YA1P6	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-7	pH: 8.2	Sample Date: 11/17/2015	Sample Time: 15:09:00
% Moisture :		% Solids : 85.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.1	U	ug/kg	5.1	B	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	UJ	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Unknown-04	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	6.6	NJ	ug/kg	6.6	NJ	1.0	No	NV
Unknown-12	TIC	11	J	ug/kg	11	J	1.0	No	NV
Unknown-11	TIC	0.52	J	ug/kg	0.52	J	1.0	No	NV
Unknown-13	TIC	6.6	J	ug/kg	6.6	J	1.0	No	NV
Unknown-06	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	3.0	NJ	ug/kg	3.0	NJ	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	97	NJ	ug/kg	97	NJ	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	2.4	NJ	ug/kg	2.4	NJ	1.0	No	NV
Unknown-10	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-01	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Unknown-08	TIC	0.80	J	ug/kg	0.80	J	1.0	No	NV
Unknown-09	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-02	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV
Unknown-07	TIC	0.62	J	ug/kg	0.62	J	1.0	No	NV
Unknown-03	TIC	4.4	J	ug/kg	4.4	J	1.0	No	NV
Unknown-05	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q1	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-9	pH: 8.9	Sample Date: 11/18/2015	Sample Time: 09:28:00
% Moisture :		% Solids : 95.30	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.1	U	ug/kg	4.5	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	UJ	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Unknown-07	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-11	TIC	5.2	J	ug/kg	5.2	J	1.0	No	NV
Unknown-08	TIC	25	J	ug/kg	25	J	1.0	No	NV
Unknown-01	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-06	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-04	TIC	3.1	J	ug/kg	3.1	J	1.0	No	NV
Unknown-03	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-02	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV
Unknown-10	TIC	18	J	ug/kg	18	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.9	NJ	ug/kg	2.9	NJ	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	9.4	NJ	ug/kg	9.4	NJ	1.0	No	NV
Unknown-09	TIC	2.7	J	ug/kg	2.7	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	93	NJ	ug/kg	93	NJ	1.0	No	NV
Unknown-05	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q2	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-9	pH: 9.2	Sample Date: 11/18/2015	Sample Time: 09:36:00
% Moisture :		% Solids : 86.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.1	U	ug/kg	5.1	B	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	UJ	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	92	NJ	ug/kg	92	NJ	1.0	No	NV
Unknown-04	TIC	5.0	J	ug/kg	5.0	J	1.0	No	NV
Unknown-01	TIC	3.2	J	ug/kg	3.2	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.9	NJ	ug/kg	1.9	NJ	1.0	No	NV
Unknown-03	TIC	1.0	J	ug/kg	1.0	J	1.0	No	NV
Unknown-07	TIC	2.3	J	ug/kg	2.3	J	1.0	No	NV
Unknown-05	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-02	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-06	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q2MS	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH: 9.2	Sample Date: 11/18/2015	Sample Time: 09:36:00
% Moisture :		% Solids : 86.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Spike	57		ug/kg	57		1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Spike	53		ug/kg	53		1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Spike	62		ug/kg	62		1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Spike	44		ug/kg	44	B	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Spike	54		ug/kg	54		1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q2MSD	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location:	pH: 9.2	Sample Date: 11/18/2015	Sample Time: 09:36:00
% Moisture :		% Solids : 86.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Chloromethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Bromomethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Chloroethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Spike	63		ug/kg	63		1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Chloroform	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Benzene	Spike	60		ug/kg	60		1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Trichloroethene	Spike	72		ug/kg	72		1.0	Yes	S3VEM
Methylcyclohexane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Spike	51		ug/kg	51	B	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Chlorobenzene	Spike	61		ug/kg	61		1.0	Yes	S3VEM
Ethylbenzene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
o-Xylene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Styrene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Bromoform	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.4	U	ug/kg	5.4	U	1.0	Yes	S3VEM

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q3	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-9	pH: 9.2	Sample Date: 11/18/2015	Sample Time: 09:39:00
% Moisture :		% Solids : 95.90	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.1	U	ug/kg	2.5	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	UJ	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclotetrasiloxane, octamethyl-	TIC	2.8	NJ	ug/kg	2.8	NJ	1.0	No	NV
Unknown-04	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.6	NJ	ug/kg	1.6	NJ	1.0	No	NV
3-Methylheptyl acetate	TIC	1.6	NJ	ug/kg	1.6	NJ	1.0	No	NV
Unknown-07	TIC	5.0	J	ug/kg	5.0	J	1.0	No	NV
Unknown-08	TIC	3.2	J	ug/kg	3.2	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	96	NJ	ug/kg	96	NJ	1.0	No	NV
Unknown-01	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-06	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-09	TIC	4.3	J	ug/kg	4.3	J	1.0	No	NV
Unknown-05	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-02	TIC	3.4	J	ug/kg	3.4	J	1.0	No	NV
Unknown-03	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q4	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-9	pH: 8.3	Sample Date: 11/18/2015	Sample Time: 09:43:00
% Moisture :		% Solids : 88.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromomethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.0	U	ug/kg	2.4	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chloroform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Benzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0	UJ	ug/kg	5.0	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
o-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Styrene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Bromoform	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.0	U	ug/kg	5.0	U	1.0	Yes	S3VEM
Unknown-06	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	2.4	NJ	ug/kg	2.4	NJ	1.0	No	NV
Unknown-05	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Hexane	TIC	11	NJ	ug/kg	11	NJ	1.0	No	NV
Unknown-04	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-07	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.9	NJ	ug/kg	1.9	NJ	1.0	No	NV
Unknown-01	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-02	TIC	2.3	J	ug/kg	2.3	J	1.0	No	NV
Unknown-10	TIC	4.5	J	ug/kg	4.5	J	1.0	No	NV
Unknown-03	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	93	NJ	ug/kg	93	NJ	1.0	No	NV
Unknown-09	TIC	3.6	J	ug/kg	3.6	J	1.0	No	NV
Unknown-08	TIC	7.8	J	ug/kg	7.8	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	5.3	NJ	ug/kg	5.3	NJ	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP
Sample Number: YA1Q5	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-10	pH: 9.3	Sample Date: 11/18/2015	Sample Time: 07:46:00
% Moisture :		% Solids : 91.90	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromomethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Acetone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylene chloride	Target	4.9	U	ug/kg	2.4	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Butanone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chloroform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Benzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.9	UJ	ug/kg	4.9	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
4-Methyl-2-pentanone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Toluene	Target	2.9	J	ug/kg	2.9	JB	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.9	U	ug/kg	9.9	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
o-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Styrene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Bromoform	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.9	U	ug/kg	4.9	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	91	NJ	ug/kg	91	NJ	1.0	No	NV
Unknown-10	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-02	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-07	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-08	TIC	7.4	J	ug/kg	7.4	J	1.0	No	NV
Unknown-06	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-01	TIC	2.9	J	ug/kg	2.9	J	1.0	No	NV
Unknown-09	TIC	12	J	ug/kg	12	J	1.0	No	NV
Unknown-04	TIC	6.6	J	ug/kg	6.6	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.8	NJ	ug/kg	1.8	NJ	1.0	No	NV
Unknown-05	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-11	TIC	10	J	ug/kg	10	J	1.0	No	NV
Unknown-03	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-12	TIC	3.6	J	ug/kg	3.6	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q6	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-10	pH: 9.3	Sample Date: 11/18/2015	Sample Time: 07:52:00
% Moisture :		% Solids : 85.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromomethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.2	U	ug/kg	2.4	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chloroform	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Benzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.2	UJ	ug/kg	5.2	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
o-Xylene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Styrene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Bromoform	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.2	U	ug/kg	5.2	U	1.0	Yes	S3VEM
Unknown-01	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.7	NJ	ug/kg	1.7	NJ	1.0	No	NV
Unknown-06	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-11	TIC	7.5	J	ug/kg	7.5	J	1.0	No	NV
Unknown-03	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
Unknown-09	TIC	15	J	ug/kg	15	J	1.0	No	NV
Unknown-07	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Acetic acid, 2-ethylhexyl ester	TIC	2.2	NJ	ug/kg	2.2	NJ	1.0	No	NV
Unknown-08	TIC	5.9	J	ug/kg	5.9	J	1.0	No	NV
Unknown-10	TIC	10	J	ug/kg	10	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	99	NJ	ug/kg	99	NJ	1.0	No	NV
Unknown-04	TIC	4.7	J	ug/kg	4.7	J	1.0	No	NV
Unknown-02	TIC	2.5	J	ug/kg	2.5	J	1.0	No	NV
Unknown-05	TIC	1.8	J	ug/kg	1.8	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q7	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-10	pH: 9.5	Sample Date: 11/18/2015	Sample Time: 08:00:00
% Moisture :		% Solids : 92.10	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromomethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.1	U	ug/kg	2.5	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chloroform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Benzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.1	UJ	ug/kg	5.1	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Toluene	Target	2.6	J	ug/kg	2.6	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/kg	10	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
o-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Styrene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Bromoform	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.1	U	ug/kg	5.1	U	1.0	Yes	S3VEM
Acetic acid, 2-ethylhexyl ester	TIC	1.9	NJ	ug/kg	1.9	NJ	1.0	No	NV
Unknown-03	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Unknown-06	TIC	1.6	J	ug/kg	1.6	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	100	NJ	ug/kg	100	NJ	1.0	No	NV
Unknown-01	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-04	TIC	2.7	J	ug/kg	2.7	J	1.0	No	NV
Unknown-02	TIC	2.8	J	ug/kg	2.8	J	1.0	No	NV
Unknown-10	TIC	5.3	J	ug/kg	5.3	J	1.0	No	NV
Unknown-09	TIC	15	J	ug/kg	15	J	1.0	No	NV
Unknown-07	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-08	TIC	6.8	J	ug/kg	6.8	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	1.9	NJ	ug/kg	1.9	NJ	1.0	No	NV
Unknown-05	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV
Unknown-11	TIC	5.6	J	ug/kg	5.6	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1Q8	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-10	pH: 8.3	Sample Date: 11/18/2015	Sample Time: 08:06:00
% Moisture :		% Solids : 85.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Vinyl chloride	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromomethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Acetone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Carbon disulfide	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methyl acetate	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methylene chloride	Target	5.3	U	ug/kg	2.0	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
2-Butanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Bromochloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chloroform	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Cyclohexane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Benzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.3	UJ	ug/kg	5.3	U	1.0	Yes	S3VEM
Trichloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Toluene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
2-Hexanone	Target	11	U	ug/kg	11	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Chlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Ethylbenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
o-Xylene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
m,p-Xylene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Styrene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Bromoform	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	5.3	U	ug/kg	5.3	U	1.0	Yes	S3VEM
Unknown-08	TIC	7.7	J	ug/kg	7.7	J	1.0	No	NV
Unknown-05	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-02	TIC	2.0	J	ug/kg	2.0	J	1.0	No	NV
Unknown-10	TIC	6.2	J	ug/kg	6.2	J	1.0	No	NV
Unknown-06	TIC	2.2	J	ug/kg	2.2	J	1.0	No	NV
Unknown-09	TIC	2.1	J	ug/kg	2.1	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.2	NJ	ug/kg	2.2	NJ	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	100	NJ	ug/kg	100	NJ	1.0	No	NV
Unknown-04	TIC	1.2	J	ug/kg	1.2	J	1.0	No	NV
Unknown-03	TIC	3.9	J	ug/kg	3.9	J	1.0	No	NV
Unknown-11	TIC	3.3	J	ug/kg	3.3	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	5.9	NJ	ug/kg	5.9	NJ	1.0	No	NV
Unknown-01	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-07	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1N2	Lab Code: KAP

Sample Number: YA1R1	Method: Volatile Organics	Matrix: Soil	MA Number:
Sample Location: TTT-DP-5	pH: 5.8	Sample Date: 11/16/2015	Sample Time: 13:46:00
% Moisture :		% Solids : 89.00	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Vinyl chloride	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Bromomethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Acetone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Carbon disulfide	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methyl acetate	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methylene chloride	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
2-Butanone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Bromochloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chloroform	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Cyclohexane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Benzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	4.8	UJ	ug/kg	4.8	U	1.0	Yes	S3VEM
Trichloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Toluene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
2-Hexanone	Target	9.6	U	ug/kg	9.6	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Chlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Ethylbenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
o-Xylene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
m,p-Xylene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Styrene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Bromoform	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	4.8	U	ug/kg	4.8	U	1.0	Yes	S3VEM
Unknown-10	TIC	16	J	ug/kg	16	J	1.0	No	NV
Unknown-12	TIC	8.3	J	ug/kg	8.3	J	1.0	No	NV
Unknown-03	TIC	2.6	J	ug/kg	2.6	J	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	2.3	NJ	ug/kg	2.3	NJ	1.0	No	NV
Unknown-05	TIC	1.1	J	ug/kg	1.1	J	1.0	No	NV
Unknown-11	TIC	11	J	ug/kg	11	J	1.0	No	NV
Unknown-04	TIC	1.4	J	ug/kg	1.4	J	1.0	No	NV
Unknown-09	TIC	4.9	J	ug/kg	4.9	J	1.0	No	NV
Unknown-02	TIC	1.3	J	ug/kg	1.3	J	1.0	No	NV
Unknown-06	TIC	1.9	J	ug/kg	1.9	J	1.0	No	NV
Unknown-08	TIC	0.98	J	ug/kg	0.98	J	1.0	No	NV
Unknown-01	TIC	1.5	J	ug/kg	1.5	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	93	NJ	ug/kg	93	NJ	1.0	No	NV
Unknown-07	TIC	1.7	J	ug/kg	1.7	J	1.0	No	NV

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300; Fax: (510) 412-2304.

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 27, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	YA1S4
Laboratory:	KAP Technologies, Inc. (KAP)
Analysis:	CLP Trace Volatiles
Samples:	20 Groundwater Samples
Collection Date:	November 16, 17, and 18, 2015
Reviewer:	Estrellita Manuel, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM; the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Raymond Flores, CLP PO USEPA Region 6
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report - **Tier 3**

Case No.: 45742
SDG No.: YA1S4
Site: Titan Terminal & Transport
Laboratory: KAP Technologies, Inc. (KAP)
Analysis: CLP Trace Volatiles
Reviewer: Estrellita Manuel, ESAT
Date: May 27, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Organic Analytic Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	YA1W6 and YA1W7.
Trip Blanks (TB):	None.
Background Samples (BG):	None.
Field Duplicates (D1):	YA1T9, YA1S4
(D2):	YA1R4, YA1W0 (in SDG YA1W0)
(D3):	YA1R8, YA1W1 (in SDG YA1W0)

CLP PO Action

None.

Sampling Issues

1. Contamination above the contract required quantitation limit (CRQL) was found for acetone and 2-butanone in equipment blanks YA1W6 and YA1W7 (see Comment C).
2. Equipment blanks were not submitted "blind" to the laboratory since the matrix was stated as "Blank" and the location was stated as "EQ Blank" on chain of custody records (COCs).

Additional Comments

The percent relative standard deviation (%RSD) of 36.5% reported for trichlorofluoromethane in the 11/15/15 initial calibration exceeds the 30.0% validation criterion. Examination of the relative response factors (RRFs) indicates that the sensitivity at the CRQL is good; CRQL standard RRF of 0.8019 is above the average RRF of 0.5727. Therefore, in the reviewer's technical judgment, qualification of non-detected results is not necessary.

Ethylbenzene was incorrectly identified for the 11/15/15 initial calibration and the 11/19/15 10:05 and 11/19/15 14:01 continuing calibration verifications (CCVs). The laboratory provided revised data (Form 6A, Form 7A, and quantitation report) upon request, on 03/21/16.

All standards and spiking solutions were analyzed before the expiration date.

In addition to laboratory artifacts (retention times of 1.8-3.0, 4.7, 4.8, 6.6, 6.9, 7.1, 10.1, 10.9, 11.2, 13.2, 14.5, 19.8, and 20.4 minutes), tentatively identified compounds (TICs) were found in samples YA1R6, YA1R8, YA1S1, YA1S6, YA1S7, YA1WS9, YA1T9, and YA1X2 (see attached Form 1Bs).

The laboratory performed manual peak integration for standard and sample chromatograms. Manual integrations were reviewed and found to be in compliance with CLP Statement of Work (SOW) requirements.

This report was prepared in accordance with the following documents:

- *USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015; and
- *USEPA National Functional Guidelines for Superfund Organic Methods Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1	Data Completeness	Yes	
2	Holding Time/Preservation	Yes	
3	GC/MS Tune/GC Performance	Yes	
4	Initial Calibration	Yes	
5	Continuing Calibration Verification (CCV)	No	B
6	Laboratory Blanks	Yes	C
7	Field/Equipment/Trip Blanks	No	C
8	Deuterated Monitoring Compounds (DMCs)	Yes	
9	Matrix Spike/Matrix Spike Duplicates (MS/MSDs)	No	D
10	Internal Standards	Yes	
11	Compound Identification	Yes	
12	Compound Quantitation and Reported CRQLs	Yes	A, E
13	System Performance	Yes	
14	Field Duplicate Sample Analysis	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. Results for the following analyte are qualified as estimated due to a large percent difference (%D) in the CCV and are flagged "UJ".

- Carbon disulfide in samples YA1S4, YA1S5, YA1S6, YA1T9, and YA1X2 and method blank VBLKKE.

The following value exceeds the ±25.0% validation criterion for closing CCVs.

Analyte	Calibration Date and Time	%D
Carbon disulfide	11/19/15 14:01	-25.8

C. The following results are qualified as non-detected due to method blanks, storage blank, and equipment blank contamination and are flagged "U" .

- Methylene chloride in samples YA1R4, YA1R6 through YA1R8, YA1S1, YA1S3 through YA1S9, YA1T9, and YA1X2.
- Toluene in samples YA1R6 and YA1R7.
- Acetone in samples YA1R4, YA1R6, YA1R8, YA1S7, and YA1S9.

Methylene chloride is present in method blanks VBLKKE, VBLKKQ, and VBLKKS and storage blank VHBLK01; toluene is present in method blank VBLKKQ. Acetone and 2-butanone are present in equipment blanks YA1W6 and YA1W7. Results for these analytes that are less than or equal to the CRQL are qualified as non-detected at the CRQL. Acetone and methylene chloride results above the CRQL and less than two times the blank concentration are reported as nondetected at the reported concentration.

D. The recoveries for benzene in QC samples YA1R6MS and YA1R6MSD do not meet the criteria for accuracy specified in the SOW, as shown below.

Analyte	YA1R6MS % Recovery	YA1R6MSD % Recovery	QC limit % Recovery
Benzene	130	128	76-127

Results reported may indicate poor laboratory technique or matrix effects which may interfere with analysis. This uncertainty should be evaluated in the context of project data quality objectives to determine data usability.

E. Sample YA1T1 was reanalyzed at a 20-fold dilution due to the concentration of cis-1,2-dichloroethene exceeding the calibration range. The result for cis-1,2-dichloroethene in YA1T1 is reported from the diluted analysis.

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1R6

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1357.01

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34405

% Solids: _____ Date Received: 11/19/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/23/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		Unknown-01	2.60	0.20	J
02		Unknown-02	2.68	0.44	J
03		Unknown-03	2.91	0.55	J
04		Unknown-04	3.03	0.27	J
05		Unknown-05	4.81	0.28	J
06	000463-71-8	cis-1,3-dichloropropene-d4	10.07	10	NJ
07		Unknown-06	10.85	0.47	J
08		Unknown-07	14.56	0.19	J
09		Unknown-08 Octanal	16.20	1.0	J N
10	000124-19-6	Nonanal	17.27	2.9	NJ
11					
12					
13					
14					
15					
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18					
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20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796'	Total Alkanes	N/A		

' EPA-designated Registry Number.

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1R8

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1360.03

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34413

% Solids: _____ Date Received: 11/20/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/23/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.59~~	~~1.7~~	~~J~~
02		Unknown-02	2.68	0.58	J
03		Unknown-03	2.82	0.31	J
04		Unknown-04	~~2.91~~	1.2	J
05		Unknown-05	3.01	0.64	J
06		Unknown-06	3.09	0.33	J
07		Unknown-07	3.25	0.37	J
08		Unknown-08	3.33	0.32	J
09		Unknown-09	4.00	0.22	J
10		Unknown-10	4.12	0.26	J
11		~~Unknown-11~~	~~4.81~~	~~0.56~~	~~J~~
12		~~Unknown-12~~ Methylpropanal	5.12	2.9	J N
13		~~Unknown-13~~ Diisopropyl Ether	5.49	0.88	J N
14	~~000463-71-8~~	~~cis-1,3-dichloropropene-d4~~	~~10.07~~	~~9.5~~	~~NJB~~
15		Unknown-14	10.20	0.23	J
16		Unknown-15	10.84	0.35	J
17		~~Unknown-16~~	11.67	0.37	J
18		~~Unknown-17~~	~~13.24~~	~~0.27~~	~~J~~
19		~~Unknown-18~~ Octanal	16.19	0.63	J N
20		~~Unknown-19~~ Nonanal	17.26	0.59	J N
21					
22		Em 3/17/16			
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1S1

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1360.04

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34414

% Solids: _____ Date Received: 11/20/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/23/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.60~~	~~0.30~~	~~J~~
02		Unknown-02	2.68	0.27	J
03		Unknown-03	2.83	0.28	J
04		Unknown-04	2.89	0.36	J
05		Unknown-05	4.83	0.21	J
06		Unknown-06	9.69	0.22	J
07	000463-71-8	cis-1,3-dichloropropene-d4	10.07	9.7	NJ
08		~~Unknown-07~~	10.20	0.16	J
09		~~Unknown-08~~	10.84	0.39	J
10		Unknown-09	12.41	0.11	J
11		Unknown-10	14.51	0.11	J
12		~~Unknown-11~~	~~14.55~~	~~0.37~~	~~J~~
13		~~Unknown-12~~ Octanal	16.19	0.96	JN
14		~~Unknown-13~~ Nonanal	17.26	0.63	JN
15					
16		EM 3/17/16			
17					
18					
19					
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25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1S6

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1345.03

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34323

% Solids: _____ Date Received: 11/18/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/19/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.20~~	~~0.27~~	~~J~~ B
02		Unknown-02	2.59	~~0.24~~	~~J~~
03		Unknown-03	~~2.91~~	0.73	J
04		Unknown-04	2.93	0.32	J
05		Unknown-05	4.82	0.46	J
06	000463-71-8	cis-1,3-dichloropropene-d4	10.08	8.3	NJ B
07		Unknown-06	10.85	0.29	J B
08		~~Unknown-07~~	~~14.57~~	~~0.23~~	~~J~~
09	000124-13-0	Octanal	16.20	1.9	NJ
10	000124-19-6	Nonanal	17.27	2.5	NJ
11					
12		Em 3/6/16			
13					
14					
15					
16					
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21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

0308

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1S7

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1357.02

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34406

% Solids: _____ Date Received: 11/19/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/23/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.60~~	~~0.24~~	~~J~~
02		Unknown-02	2.84	~~0.29~~	J
03		Unknown-03	~~2.89~~	0.27	J
04		Unknown-04	4.83	0.28	J
05	000463-71-8	cis-1,3-dichloropropene-d4	10.07	9.5	NJ B
06		~~Unknown-05~~	10.85	0.53	J
07		Unknown-06	14.23	0.17	J
08		~~Unknown-07~~	~~14.56~~	~~0.23~~	~~J~~
09		~~Unknown-08~~ Octanal	16.20	0.61	J N
10		~~Unknown-09~~ Nonanal	17.26	0.97	J N
11					
12		Cm 8/17/16			
13					
14					
15					
16					
17					
18					
19					
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21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

0336

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1S9

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1357.04

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34408

% Solids: _____ Date Received: 11/19/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/23/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
~~01~~		~~Unknown-01~~	~~2.59~~	~~0.30~~	~~JB~~
02		Unknown-02	2.84	0.51	J
03		Unknown-03	2.90	0.34	J
04		Unknown-04	4.83	0.32	J
05		Unknown-05	9.68	0.21	J
06	000463-71-8	~~cis-1,3-dichloropropene-d4~~	10.07	9.6	NJB
07		Unknown-06	10.84	0.52	JB
08		~~Unknown-07~~	~~14.56~~	~~0.27~~	~~J~~
09		~~Unknown-08~~ Octanal	16.20	0.80	JN
10		~~Unknown-09~~	~~17.26~~	~~0.43~~	~~J~~
11					
12					
13					
14					
15					
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25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

0388

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1T9

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1345.04

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34324

% Solids: _____ Date Received: 11/18/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/19/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.20~~	~~0.20~~	~~J~~
02		Unknown-02	2.59	~~0.22~~	J
03		Unknown-03	~~2.88~~	0.63	J
04		Unknown-04	2.91	0.37	J
05		Unknown-05	2.95	0.40	J
06		Unknown-06	6.39	0.11	J
07		Unknown-07	9.70	0.18	J
08	000463-71-8	cis-1,3-dichloropropene-d4	10.08	8.6	NJ
09		Unknown-08	10.19	0.13	J
10		~~Unknown-09~~	~~10.85~~	~~0.25~~	~~J~~
11	005794-04-7	~~Bicyclo[2.2.1]heptane, 2,2-di~~ Camphene	14.24	1.0	NJ
12		~~Unknown-10~~	~~14.67~~	~~0.33~~	~~J~~
13	000124-13-0	Octanal	16.20	0.81	NJ
14	000124-19-6	Unknown-11 Nonanal	17.27	1.5	JN
15					
16					
17		CM 3/17/16			
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A	0.44	J

[1] EPA-designated Registry Number.

FORM 1B-OR

ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1X2

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1S4

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1345.05

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34325

% Solids: _____ Date Received: 11/18/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/19/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.20~~	~~0.82~~	~~JP~~
02		Unknown-02	2.38	0.18	J
03		Unknown-03	2.59	~~0.20~~	J
04		Unknown-04	2.88	1.3	J
05		Unknown-05	2.96	0.65	J
06		Unknown-06	4.82	0.52	J
07		Unknown-07	9.73	0.14	J
08	000463-71-8	cis-1,3-dichloropropene-d4	10.08	8.4	NJB
09		Unknown-08	10.19	0.30	J
10		Unknown-09	10.63	0.13	J
11		Unknown-10	10.86	0.33	J
12		Unknown-11	14.52	0.32	J
13		~~Unknown-12~~	~~14.57~~	~~0.13~~	~~J~~
14		~~Unknown-13~~ Octanal	16.20	0.57	J N
15		~~Unknown-14~~ Nonanal	17.27	0.62	J N
16					
17		DM 5/17/16			
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796'	Total Alkanes	N/A		J

' EPA-designated Registry Number.

0601

Sample Summary Report

Case No:	45742	Contract:	EPW14031	SDG No:	YA1S4	Lab Code:	KAP
Sample Number:	VBLKKE	Method:	Trace Volatiles	Matrix:	Water	MA Number:	
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.33	J	ug/L	0.33	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	8.5	NJ	ug/L	8.5	NJ	1.0	Yes	NV
Unknown-02	TIC	0.51	J	ug/L	0.51	J	1.0	Yes	NV
Benzene, butyl-	TIC	0.51	NJ	ug/L	0.51	NJ	1.0	Yes	NV
Azulene	TIC	0.52	NJ	ug/L	0.52	NJ	1.0	Yes	NV
Unknown-01	TIC	0.62	J	ug/L	0.62	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: VBLKKQ	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.19	J	ug/L	0.19	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.26	J	ug/L	0.26	J	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-02	TIC	0.18	J	ug/L	0.18	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	9.8	NJ	ug/L	9.8	NJ	1.0	Yes	NV
Unknown-03	TIC	0.72	J	ug/L	0.72	J	1.0	Yes	NV
Unknown-04	TIC	0.22	J	ug/L	0.22	J	1.0	Yes	NV
Unknown-01	TIC	0.19	J	ug/L	0.19	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: VBLKKS	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.20	J	ug/L	0.20	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-04	TIC	0.38	J	ug/L	0.38	J	1.0	Yes	NV
Unknown-05	TIC	0.10	J	ug/L	0.10	J	1.0	Yes	NV
Unknown-03	TIC	0.16	J	ug/L	0.16	J	1.0	Yes	NV
Unknown-02	TIC	0.13	J	ug/L	0.13	J	1.0	Yes	NV
Unknown-01	TIC	0.41	J	ug/L	0.41	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	10	NJ	ug/L	10	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: VHBLK01	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.17	J	ug/L	0.17	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-01	TIC	0.42	J	ug/L	0.42	J	1.0	Yes	NV
Unknown-07	TIC	0.27	J	ug/L	0.27	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	10	NJ	ug/L	10	NJ	1.0	Yes	NV
Unknown-02	TIC	0.83	J	ug/L	0.83	J	1.0	Yes	NV
Unknown-10	TIC	0.18	J	ug/L	0.18	J	1.0	Yes	NV
Unknown-08	TIC	0.12	J	ug/L	0.12	J	1.0	Yes	NV
Unknown-03	TIC	0.18	J	ug/L	0.18	J	1.0	Yes	NV
Unknown-09	TIC	0.25	J	ug/L	0.25	J	1.0	Yes	NV
Unknown-04	TIC	0.12	J	ug/L	0.12	J	1.0	Yes	NV
Unknown-06	TIC	0.11	J	ug/L	0.11	J	1.0	Yes	NV
Unknown-05	TIC	0.26	J	ug/L	0.26	J	1.0	Yes	NV
Unknown-11	TIC	0.12	J	ug/L	0.12	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1R4	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-DP-6	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 13:53:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	7.6	U	ug/L	7.6		1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.13	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.55		ug/L	0.55		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.75		ug/L	0.75		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	8.8	NJ	ug/L	8.8	NJ	1.0	No	NV
Unknown-04	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
Unknown-09	TIC	0.16	J	ug/L	0.16	J	1.0	No	NV
Unknown-05	TIC	0.16	J	ug/L	0.16	J	1.0	No	NV
Unknown-01	TIC	0.33	J	ug/L	0.33	J	1.0	No	NV
Unknown-10	TIC	0.31	J	ug/L	0.31	J	1.0	No	NV
Unknown-02	TIC	0.38	J	ug/L	0.38	J	1.0	No	NV
Unknown-07	TIC	0.40	J	ug/L	0.40	J	1.0	No	NV
Unknown-11	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-08	TIC	0.49	J	ug/L	0.49	J	1.0	No	NV
Unknown-06	TIC	0.13	J	ug/L	0.13	J	1.0	No	NV
Unknown-03	TIC	0.72	J	ug/L	0.72	J	1.0	No	NV
6-Nitro-8-methoxy-2H-chromene	TIC	0.11	NJ	ug/L	0.11	NJ	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: YA1R6	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-DP-7	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 15:49:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	3.7	J	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.12	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.80		ug/L	0.80		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.70		ug/L	0.70		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.24	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Nonanal	TIC	2.9	NJ	ug/L	2.9	NJ	1.0	Yes	NV
Unknown-03	TIC	0.55	J	ug/L	0.55	J	1.0	No	NV
Unknown-02	TIC	0.44	J	ug/L	0.44	J	1.0	No	NV
Unknown-06	TIC	0.47	J	ug/L	0.47	J	1.0	No	NV
Unknown-07	TIC	0.19	J	ug/L	0.19	J	1.0	No	NV
Unknown-08	TIC	1.0	JN	ug/L	1.0	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	10	NJ	ug/L	10	NJ	1.0	No	NV
Unknown-05	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
Unknown-01	TIC	0.20	J	ug/L	0.20	J	1.0	No	NV
Unknown-04	TIC	0.27	J	ug/L	0.27	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: YA1R6MS	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 15:49:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Spike	5.9		ug/L	5.9		1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.14	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.66		ug/L	0.66		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Spike	6.5		ug/L	6.5		1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Spike	6.3		ug/L	6.3		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Spike	6.0		ug/L	6.0	B	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Spike	5.8		ug/L	5.8		1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1R6MSD	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 15:49:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Spike	5.5		ug/L	5.5		1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.14	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.66		ug/L	0.66		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Spike	6.4		ug/L	6.4		1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Spike	6.2		ug/L	6.2		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Spike	6.0		ug/L	6.0	B	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Spike	6.0		ug/L	6.0		1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1R7	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-DP-9	pH: 2.0	Sample Date: 11/18/2015	Sample Time: 10:26:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.14	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.39	J	ug/L	0.39	J	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	1.1		ug/L	1.1		1.0	Yes	S3VEM
Trichloroethene	Target	0.42	J	ug/L	0.42	J	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.23	JB	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.44	J	ug/L	0.44	J	1.0	Yes	S3VEM
o-Xylene	Target	0.34	J	ug/L	0.34	J	1.0	Yes	S3VEM
m,p-Xylene	Target	0.74		ug/L	0.74		1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.86		ug/L	0.86		1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-05	TIC	0.20	J	ug/L	0.20	J	1.0	No	NV
Unknown-09	TIC	0.24	J	ug/L	0.24	J	1.0	No	NV
Unknown-03	TIC	0.36	J	ug/L	0.36	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.1	NJ	ug/L	9.1	NJ	1.0	No	NV
Unknown-02	TIC	0.34	J	ug/L	0.34	J	1.0	No	NV
Unknown-01	TIC	1.5	J	ug/L	1.5	J	1.0	No	NV
Unknown-07	TIC	0.40	J	ug/L	0.40	J	1.0	No	NV
Unknown-06	TIC	0.12	J	ug/L	0.12	J	1.0	No	NV
Unknown-08	TIC	0.10	J	ug/L	0.10	J	1.0	No	NV
Unknown-04	TIC	0.13	J	ug/L	0.13	J	1.0	No	NV
Benzene, (1-methylethyl)-	TIC	0.10	NJ	ug/L	0.10	NJ	1.0	No	NV
Benzene, 1,2,3-trimethyl-	TIC	0.23	NJ	ug/L	0.23	NJ	1.0	No	NV
Unknown-10	TIC	0.12	J	ug/L	0.12	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1R8	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-DP-8	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 10:24:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	7.1	U	ug/L	7.1		1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.15	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	3.0		ug/L	3.0		1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.0		ug/L	5.0		1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.43	J	ug/L	0.43	J	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-16	TIC	0.37	J	ug/L	0.37	J	1.0	No	NV
Unknown-14	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Unknown-02	TIC	0.58	J	ug/L	0.58	J	1.0	No	NV
Unknown-11	TIC	0.56	J	ug/L	0.56	J	1.0	No	NV
Unknown-18	TIC	0.63	JN	ug/L	0.63	J	1.0	Yes	NV
Unknown-15	TIC	0.35	J	ug/L	0.35	J	1.0	No	NV
Unknown-10	TIC	0.26	J	ug/L	0.26	J	1.0	No	NV
Unknown-19	TIC	0.59	JN	ug/L	0.59	J	1.0	Yes	NV
Unknown-03	TIC	0.31	J	ug/L	0.31	J	1.0	No	NV
Unknown-07	TIC	0.37	J	ug/L	0.37	J	1.0	No	NV
Unknown-13	TIC	0.88	JN	ug/L	0.88	J	1.0	Yes	NV
Unknown-05	TIC	0.64	J	ug/L	0.64	J	1.0	No	NV
Unknown-04	TIC	1.2	J	ug/L	1.2	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.5	NJ	ug/L	9.5	NJ	1.0	No	NV
Unknown-08	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Unknown-06	TIC	0.33	J	ug/L	0.33	J	1.0	No	NV
Unknown-17	TIC	0.27	J	ug/L	0.27	J	1.0	No	NV
Unknown-12	TIC	2.9	JN	ug/L	2.9	J	1.0	Yes	NV
Unknown-09	TIC	0.22	J	ug/L	0.22	J	1.0	No	NV
Unknown-01	TIC	1.7	J	ug/L	1.7	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S1	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-1	pH: 2.0	Sample Date: 11/18/2015	Sample Time: 10:25:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	4.1	J	ug/L	4.1	J	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.14	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.13	J	ug/L	0.13	J	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.32	J	ug/L	0.32	J	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-12	TIC	0.96	JN	ug/L	0.96	J	1.0	Yes	NV
Unknown-09	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-06	TIC	0.22	J	ug/L	0.22	J	1.0	No	NV
Unknown-08	TIC	0.39	J	ug/L	0.39	J	1.0	No	NV
Unknown-05	TIC	0.21	J	ug/L	0.21	J	1.0	No	NV
Unknown-11	TIC	0.37	J	ug/L	0.37	J	1.0	No	NV
Unknown-01	TIC	0.30	J	ug/L	0.30	J	1.0	No	NV
Unknown-03	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
Unknown-10	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-02	TIC	0.27	J	ug/L	0.27	J	1.0	No	NV
Unknown-13	TIC	0.63	JN	ug/L	0.63	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	9.7	NJ	ug/L	9.7	NJ	1.0	No	NV
Unknown-04	TIC	0.36	J	ug/L	0.36	J	1.0	No	NV
Unknown-07	TIC	0.16	J	ug/L	0.16	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: YA1S2	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-1	pH: 2.0	Sample Date: 11/18/2015	Sample Time: 11:05:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.20	J	ug/L	0.20	J	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.80		ug/L	0.80		1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-02	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.7	NJ	ug/L	9.7	NJ	1.0	No	NV
Unknown-05	TIC	0.19	J	ug/L	0.19	J	1.0	No	NV
Unknown-01	TIC	0.26	J	ug/L	0.26	J	1.0	No	NV
Unknown-04	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-03	TIC	0.35	J	ug/L	0.35	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S3	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-1	pH: 2.0	Sample Date: 11/18/2015	Sample Time: 11:43:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.41	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-02	TIC	0.48	J	ug/L	0.48	J	1.0	No	NV
Unknown-04	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-08	TIC	0.18	J	ug/L	0.18	J	1.0	No	NV
Unknown-05	TIC	0.18	J	ug/L	0.18	J	1.0	No	NV
Unknown-01	TIC	0.38	J	ug/L	0.38	J	1.0	No	NV
Unknown-09	TIC	0.18	J	ug/L	0.18	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	11	NJ	ug/L	11	NJ	1.0	No	NV
Unknown-03	TIC	0.66	J	ug/L	0.66	J	1.0	No	NV
Unknown-06	TIC	0.21	J	ug/L	0.21	J	1.0	No	NV
Unknown-07	TIC	0.42	J	ug/L	0.42	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S4	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-2	pH: 2.0	Sample Date: 11/16/2015	Sample Time: 15:00:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.28	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Octanal	TIC	0.81	NJ	ug/L	0.81	NJ	1.0	No	NV
Unknown-03	TIC	0.68	J	ug/L	0.68	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	8.6	NJ	ug/L	8.6	NJ	1.0	No	NV
Unknown-01	TIC	0.86	J	ug/L	0.86	J	1.0	No	NV
Unknown-02	TIC	0.67	J	ug/L	0.67	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S5	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-2	pH: 2.0	Sample Date: 11/16/2015	Sample Time: 15:45:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.27	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.80		ug/L	0.80		1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	7.4		ug/L	7.4		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.28	J	ug/L	0.28	J	1.0	Yes	S3VEM
Trichloroethene	Target	11		ug/L	11		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	7.0	NJ	ug/L	7.0	NJ	1.0	No	NV
Unknown-01	TIC	0.57	J	ug/L	0.57	J	1.0	No	NV
Unknown-02	TIC	0.57	J	ug/L	0.57	J	1.0	No	NV
Unknown-04	TIC	0.70	J	ug/L	0.70	J	1.0	No	NV
Unknown-05	TIC	0.70	J	ug/L	0.70	J	1.0	No	NV
Unknown-06	TIC	1.0	J	ug/L	1.0	J	1.0	No	NV
Unknown-03	TIC	0.87	J	ug/L	0.87	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S6	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-2	pH: 2.0	Sample Date: 11/16/2015	Sample Time: 16:25:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	3.8	J	ug/L	3.8	J	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.28	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.30	J	ug/L	0.30	J	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-01	TIC	0.37	J	ug/L	0.37	J	1.0	No	NV
Octanal	TIC	1.9	NJ	ug/L	1.9	NJ	1.0	Yes	NV
Unknown-02	TIC	0.24	J	ug/L	0.24	J	1.0	No	NV
Unknown-03	TIC	0.73	J	ug/L	0.73	J	1.0	No	NV
Unknown-04	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
Unknown-07	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	8.3	NJ	ug/L	8.3	NJ	1.0	No	NV
Unknown-06	TIC	0.29	J	ug/L	0.29	J	1.0	No	NV
Unknown-05	TIC	0.46	J	ug/L	0.46	J	1.0	No	NV
Nonanal	TIC	2.5	NJ	ug/L	2.5	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S7	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-3	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 10:25:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	3.5	J	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.17	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.46	J	ug/L	0.46	J	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.94		ug/L	0.94		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.41	J	ug/L	0.41	J	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-01	TIC	0.24	J	ug/L	0.24	J	1.0	No	NV
Unknown-08	TIC	0.61	JN	ug/L	0.61	J	1.0	Yes	NV
Unknown-02	TIC	0.29	J	ug/L	0.29	J	1.0	No	NV
Unknown-07	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Unknown-04	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
Unknown-05	TIC	0.53	J	ug/L	0.53	J	1.0	No	NV
Unknown-06	TIC	0.17	J	ug/L	0.17	J	1.0	No	NV
Unknown-03	TIC	0.27	J	ug/L	0.27	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.5	NJ	ug/L	9.5	NJ	1.0	No	NV
Unknown-09	TIC	0.97	JN	ug/L	0.97	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S8	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-3	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 11:05:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.15	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.65		ug/L	0.65		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.51		ug/L	0.51		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-08	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-07	TIC	0.21	J	ug/L	0.21	J	1.0	No	NV
Unknown-02	TIC	0.48	J	ug/L	0.48	J	1.0	No	NV
Unknown-01	TIC	0.76	J	ug/L	0.76	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.0	NJ	ug/L	9.0	NJ	1.0	No	NV
Unknown-06	TIC	0.53	J	ug/L	0.53	J	1.0	No	NV
Unknown-04	TIC	0.19	J	ug/L	0.19	J	1.0	No	NV
Unknown-03	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Unknown-05	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1S9	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-3	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 11:43:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	4.4	J	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.16	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-09	TIC	0.43	J	ug/L	0.43	J	1.0	No	NV
Unknown-01	TIC	0.30	J	ug/L	0.30	J	1.0	No	NV
Unknown-08	TIC	0.80	JN	ug/L	0.80	J	1.0	Yes	NV
Unknown-07	TIC	0.27	J	ug/L	0.27	J	1.0	No	NV
Unknown-02	TIC	0.51	J	ug/L	0.51	J	1.0	No	NV
Unknown-04	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
Unknown-03	TIC	0.34	J	ug/L	0.34	J	1.0	No	NV
Unknown-05	TIC	0.21	J	ug/L	0.21	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.6	NJ	ug/L	9.6	NJ	1.0	No	NV
Unknown-06	TIC	0.52	J	ug/L	0.52	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1T0	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-4	pH: 2.0	Sample Date: 11/18/2015	Sample Time: 13:35:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	3.8	J	ug/L	3.8	J	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.80		ug/L	0.80		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.32	J	ug/L	0.32	J	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-03	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-06	TIC	0.15	J	ug/L	0.15	J	1.0	No	NV
Unknown-08	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-10	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-01	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
Unknown-05	TIC	0.19	J	ug/L	0.19	J	1.0	No	NV
Unknown-04	TIC	0.10	J	ug/L	0.10	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.7	NJ	ug/L	9.7	NJ	1.0	No	NV
Unknown-02	TIC	0.36	J	ug/L	0.36	J	1.0	No	NV
Unknown-07	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
Unknown-09	TIC	0.26	J	ug/L	0.26	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: YA1T1	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-4	pH: 2.0	Sample Date: 11/18/2015	Sample Time: 14:15:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.98		ug/L	0.98		1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	7.5		ug/L	7.5		1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	120		ug/L	120	D	20.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	1.2		ug/L	1.2		1.0	Yes	S3VEM
Trichloroethene	Target	2.5		ug/L	2.5		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.72		ug/L	0.72		1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-05	TIC	0.19	J	ug/L	0.19	J	1.0	No	NV
Unknown-12	TIC	0.16	J	ug/L	0.16	J	1.0	No	NV
Unknown-04	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Unknown-01	TIC	0.67	J	ug/L	0.67	J	1.0	No	NV
Unknown-09	TIC	0.46	J	ug/L	0.46	J	1.0	No	NV
Unknown-08	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-07	TIC	0.20	J	ug/L	0.20	J	1.0	No	NV
Unknown-06	TIC	0.31	J	ug/L	0.31	J	1.0	No	NV
Unknown-03	TIC	0.62	J	ug/L	0.62	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	8.1	NJ	ug/L	8.1	NJ	1.0	No	NV
Unknown-02	TIC	0.39	J	ug/L	0.39	J	1.0	No	NV
Unknown-11	TIC	0.17	J	ug/L	0.17	J	1.0	No	NV
Unknown-10	TIC	0.18	J	ug/L	0.18	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1T2	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-4	pH: 2.0	Sample Date: 11/18/2015	Sample Time: 14:55:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-03	TIC	0.35	J	ug/L	0.35	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	10	NJ	ug/L	10	NJ	1.0	No	NV
Unknown-01	TIC	0.51	J	ug/L	0.51	J	1.0	No	NV
Unknown-04	TIC	0.16	J	ug/L	0.16	J	1.0	No	NV
Unknown-02	TIC	0.10	J	ug/L	0.10	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: YA1T9	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-2	pH: 2.0	Sample Date: 11/16/2015	Sample Time: 15:05:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.9		ug/L	5.9		1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.28	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-01	TIC	0.20	J	ug/L	0.20	J	1.0	No	NV
Unknown-05	TIC	0.40	J	ug/L	0.40	J	1.0	No	NV
Unknown-10	TIC	0.33	J	ug/L	0.33	J	1.0	No	NV
Unknown-11	TIC	1.5	JN	ug/L	1.5	J	1.0	Yes	NV
Octanal	TIC	0.81	NJ	ug/L	0.81	NJ	1.0	Yes	NV
Unknown-02	TIC	0.22	J	ug/L	0.22	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	8.6	NJ	ug/L	8.6	NJ	1.0	No	NV
Unknown-03	TIC	0.63	J	ug/L	0.63	J	1.0	No	NV
Unknown-08	TIC	0.13	J	ug/L	0.13	J	1.0	No	NV
Unknown-07	TIC	0.18	J	ug/L	0.18	J	1.0	No	NV
Bicyclo[2.2.1]heptane, 2,2-dimethyl-3-methylene-, (1S)-	TIC	1.0	NJ	ug/L	1.0	NJ	1.0	Yes	NV
Unknown-06	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-04	TIC	0.37	J	ug/L	0.37	J	1.0	No	NV
Unknown-09	TIC	0.25	J	ug/L	0.25	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1W6	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: EQ Blank	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 09:20:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	12		ug/L	12		1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.16	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	16		ug/L	16		1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-03	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Cyclotetrasiloxane, octamethyl-	TIC	0.32	NJ	ug/L	0.32	NJ	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	10	NJ	ug/L	10	NJ	1.0	No	NV
Cyclotrisiloxane, hexamethyl-	TIC	0.55	NJ	ug/L	0.55	NJ	1.0	No	NV
Unknown-02	TIC	0.22	J	ug/L	0.22	J	1.0	No	NV
Unknown-04	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-01	TIC	0.30	J	ug/L	0.30	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP

Sample Number: YA1W7	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: EQ Blank	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 16:02:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	13		ug/L	13		1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.15	JB	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	15		ug/L	15		1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	9.7	NJ	ug/L	9.7	NJ	1.0	No	NV
Unknown-07	TIC	0.56	J	ug/L	0.56	J	1.0	No	NV
Unknown-09	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-05	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-01	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
Unknown-03	TIC	0.15	J	ug/L	0.15	J	1.0	No	NV
Unknown-06	TIC	0.12	J	ug/L	0.12	J	1.0	No	NV
Unknown-04	TIC	0.22	J	ug/L	0.22	J	1.0	No	NV
Unknown-02	TIC	0.19	J	ug/L	0.19	J	1.0	No	NV
Unknown-08	TIC	0.33	J	ug/L	0.33	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1S4	Lab Code: KAP
Sample Number: YA1X2	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-DP-2	pH: 2.0	Sample Date: 11/16/2015	Sample Time: 14:13:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	7.2		ug/L	7.2		1.0	Yes	S3VEM
Carbon disulfide	Target	3.5	J	ug/L	3.5		1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.51	U	ug/L	0.51	B	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-14	TIC	0.62	JN	ug/L	0.62	J	1.0	Yes	NV
Unknown-12	TIC	0.13	J	ug/L	0.13	J	1.0	No	NV
Unknown-05	TIC	0.65	J	ug/L	0.65	J	1.0	No	NV
Unknown-09	TIC	0.13	J	ug/L	0.13	J	1.0	No	NV
Unknown-11	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
Unknown-07	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-02	TIC	0.18	J	ug/L	0.18	J	1.0	No	NV
Unknown-04	TIC	1.3	J	ug/L	1.3	J	1.0	No	NV
Unknown-03	TIC	0.20	J	ug/L	0.20	J	1.0	No	NV
Unknown-08	TIC	0.30	J	ug/L	0.30	J	1.0	No	NV
Unknown-06	TIC	0.52	J	ug/L	0.52	J	1.0	No	NV
Unknown-01	TIC	0.82	J	ug/L	0.82	J	1.0	No	NV
Unknown-13	TIC	0.57	JN	ug/L	0.57	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	8.4	NJ	ug/L	8.4	NJ	1.0	No	NV
Unknown-10	TIC	0.33	J	ug/L	0.33	J	1.0	No	NV

ICF International
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300; Fax: (510) 412-2304.

MEMORANDUM

TO: Matt Mittguard, Site Manager
Brownfields and Site Assessment Section, SFD-6-1
USEPA Region 9

THROUGH: Joe Eidelberg, Chemist
Quality Assurance Section, EMD 3-2
USEPA Region 9

FROM: Kathy O'Brien, Project Manager KO
Environmental Services Assistance Team (ESAT) Region 9
ICF International

ESAT Contract No.: EP-W-13-029
Technical Direction Form No.: 10106115

DATE: May 27, 2016

SUBJECT: Review of Analytical Data, **Tier 3 [UPDATED]**

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Titan Terminal & Transport
Site Account No.:	A9 95 QB 00
Case No.:	45742
SDG No.:	YA1W0
Laboratory:	KAP Technologies, Inc. (KAP)
Analysis:	CLP Trace Volatiles
Samples:	5 Groundwater Samples
Collection Date:	November 17 and 20, 2015
Reviewer:	Estrellita Manuel, ESAT

This report has been updated to include a review of field quality control samples (duplicates).

EXES Data Manager has been updated with the results of this review and the validation label revised to S3VEM; the dynamic deliverables were regenerated and are available on the SMO Portal.

If there are any questions, please contact Joe Eidelberg (QA Program/EPA) at (415) 972-3809.

Attachment

cc: Raymond Flores, CLP PO USEPA Region 6
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report - **Tier 3**

Case No.: 45742
SDG No.: YA1W0
Site: Titan Terminal & Transport
Laboratory: KAP Technologies, Inc. (KAP)
Analysis: CLP Trace Volatiles
Reviewer: Estrellita Manuel, ESAT
Date: May 27, 2016

I. SDG SUMMARY

For Sample Information and Laboratory Quality Control (QC), refer to EXES National Functional Guidelines (NFG) data validation reports *Analytical Sample Listing* and *Organic Analytic Sequence*.

Field QC

Field Blanks (FB):	None.
Equipment Blanks (EB):	None.
Trip Blanks (TB):	None.
Background Samples (BG):	None.
Field Duplicates (D2):	YA1W0, YA1R4 (in SDG YA1S4)
(D3):	YA1W1, YA1R8 (in SDG YA1S4)

CLP PO Action

None.

Sampling Issues

None.

Additional Comments

Recovery for deuterated monitoring compound (DMC) 1,2-dichlorobenzene-d4 in YA1T4DL exceeds the QC limit, indicating potential high bias in detected results; qualification is not necessary because results for associated target analytes were not reported from the diluted analysis.

Sample YA1T4 was analyzed at a 2-fold dilution due to high concentrations of target analytes. The quantitation limits for YA1T4 have been raised to account for the dilution.

Ethylbenzene was incorrectly identified for the 12/10/15 initial calibration and the 12/10/15 21:06 continuing calibration verification (CCV); 1,3-dichlorobenzene was incorrectly identified for the 12/10/15 21:06 CCV. The laboratory provided revised data (Form 6A, Form 7A, and quantitation report) upon request, on 03/16/16.

All standards and spiking solutions were analyzed before the expiration date.

No sample was designated for “laboratory QC” on chain of custody records (COCs). The matrix spike/matrix spike duplicate (MS/MSD) analysis was not performed.

In addition to laboratory artifacts (retention times of 1.8-3.0, 4.7, 4.8, 6.6, 6.9, 7.1, 10.1, 10.9, 11.2, 13.2, 14.5, 16.3, 17.5, 19.8, and 20.4 minutes), tentatively identified compounds (TICs) were found in samples YA1T4, YA1T5, and YA1W0 (see attached Form 1Bs).

The laboratory performed manual peak integration for standard and blank chromatograms. Manual integrations were reviewed and found to be in compliance with CLP Statement of Work (SOW) requirements.

This report was prepared in accordance with the following documents:

- *USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015; and
- *USEPA National Functional Guidelines for Superfund Organic Methods Data Review*, August 2014.

For technical definitions, refer to *Exhibit G (Glossary of Terms), USEPA Contract Laboratory Program Statement of Work for Organics Superfund Methods, Multi-Media, Multi-Concentration*, SOM02.3, September 2015.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1	Data Completeness	Yes	
2	Holding Time/Preservation	Yes	
3	GC/MS Tune/GC Performance	Yes	
4	Initial Calibration	No	B
5	Continuing Calibration Verification (CCV)	No	C
6	Laboratory Blanks	Yes	D
7	Field/Equipment/Trip Blanks	N/A	
8	Deuterated Monitoring Compounds (DMCs)	Yes	
9	Matrix Spike/Matrix Spike Duplicates (MS/MSDs)	N/A	
10	Internal Standards	Yes	
11	Compound Identification	Yes	
12	Compound Quantitation and Reported CRQLs	Yes	A, E
13	System Performance	Yes	
14	Field Duplicate Sample Analysis	Yes	

N/A = Not Applicable.

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are estimated and flagged "J". Results are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in analytical precision near the quantitation limit.

B. Results for the following analyte are qualified as estimated due to a large percent relative standard deviation (%RSD) in the initial calibration and are flagged "UJ".

- cis-1,3-Dichloropropene in sample YA1T4 and method blank VBLKLE.

The following value exceeds the 20.0% validation criterion.

Analyte	Calibration Date	%RSD
cis-1,3-dichloropropene	11/30/15	26.3

In addition, the relative response factor (RRF) of 0.5103 for the 0.5 µg/L CRQL standard is below the average RRF of 0.7689, indicating low sensitivity at the CRQL.

C. Results for the following analytes are qualified as estimated due to large percent differences (%Ds) in the CCV and are flagged "UJ".

- Carbon disulfide and tetrachloroethene in method blank VBLKLU and storage blank VHBLK01.

The following values exceed the ±25.0% validation criterion for closing CCVs.

Analyte	Calibration Date and Time	%D
Carbon disulfide	12/10/15 21:06	-25.3
Tetrachloroethene	12/10/15 21:06	+31.7

D. The following results are qualified as nondetected due to method blank and storage blank contamination and are flagged "U".

- Methylene chloride and chlorobenzene in samples YA1T4.

Methylene chloride is present in method blanks VBLKKS, VBLKLE, and VBLKLU and storage blank VHBLK01; chlorobenzene is present in method blank VBLKLE. Results for these analytes that are less than or equal to the CRQL are qualified as non-detected at the CRQL.

E. Sample YA1T4 was reanalyzed at a 20-fold dilution due to the concentration of cis-1,2-dichloroethene exceeding the calibration range. The result for cis-1,2-dichloroethene in YA1T4 is reported from the diluted analysis.

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1T4

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1WU

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1369.02

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34552

% Solids: _____ Date Received: 11/24/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/30/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 2.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.69~~	~~0.26~~	~~J~~ B
02		~~Unknown-02~~	~~2.90~~	~~1.1~~	~~J~~
03		~~Unknown-03~~	~~3.37~~	~~0.33~~	~~J~~
04		~~Unknown-04~~ Methyl propanol	5.14	2.3	J N
05	000108-20-3	Diisopropyl ether	5.50	4.7	NJ
06	~~000463-71-8~~	~~cis 1,3 dichloropropene d4~~	~~10.00~~	~~9.2~~	~~NJ~~
07		Unknown-05	10.85	0.32	J B
08		Unknown-06	13.16	0.27	J
09		Unknown-07	13.73	0.27	J
10		Unknown-08	15.04	0.24	J
11		~~Unknown-09~~	~~16.56~~	~~0.23~~	~~J~~
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		J

[1] EPA-designated Registry Number.

Cm 3/16/16

FORM 1B-OR

ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1T5

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1W0

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1369.03

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34433

% Solids: _____ Date Received: 11/24/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/24/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.03~~	~~0.66~~	~~JB~~
02		Unknown-02	2.90	0.13	J B
03		Unknown-03	3.38	0.14	J
04		~~Unknown-04~~	4.48	0.11	J
05		~~Unknown-05~~	~~4.83~~	~~0.11~~	~~J~~
06		~~Unknown-06~~ Diisopropyl Ether	(5.44)	3.8	JN
07		~~Unknown-07~~	~~7.05~~	~~0.37~~	~~J~~
08		Unknown-08	9.11	0.32	J B
09	000463-71-8	cis-1,3-dichloropropene-d4	10.08	9.1	NJ B
10		~~Unknown-09~~	10.85	0.32	J
11		~~Unknown-10~~	~~14.51~~	~~0.11~~	~~J~~
12			em	3/16/16	
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		J

[1] EPA-designated Registry Number.

FORM 1B-OR
ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
YA1W0

Lab Name: KAP TECHNOLOGIES, INC. Contract: EPW14031

Lab Code: KAP Case No.: 45742 MA No.: _____ SDG No.: YA1W0

Analytical Method: Trace VOA Level: TRACE

Matrix: WATER Lab Sample ID: S-1361.01

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: G34425

% Solids: _____ Date Received: 11/20/2015

GC Column: RTX-VMS ID: 0.25 (mm) Date Extracted: _____

Extract Concentrated: (Y/N) _____ Date Analyzed: 11/24/2015

Soil Aliquot (VOA): _____ (uL) Extract Volume: _____ (uL)

Heated Purge: (Y/N) N Extraction Type: _____

Purge Volume: 25.0 (mL) Injection Volume: _____ (uL)

Cleanup Types: _____ pH: _____ Dilution Factor: 1.0

Concentration Units (ug/L, ug/kg): ug/L Cleanup Factor: _____

	CAS No.	ANALYTE	RT	EST. CONC.	Q
01		~~Unknown-01~~	~~2.59~~	~~1.9~~	~~JP~~
02		Unknown-02	~~2.68~~	0.47	J
03		Unknown-03	2.86	0.61	J
04		~~Unknown-04~~	2.91	0.36	J
05		~~Unknown-05~~	~~4.13~~	~~0.23~~	~~J~~
06		~~Unknown-06~~ Methyl Propanol	5.13	3.1	JN
07		~~Unknown-07~~ Diisopropyl ether	5.50	0.82	JN
08	~~000463-73-8~~	~~cis-1,3-dichloropropene-d4~~	~~10.00~~	~~5.7~~	~~NJ~~
09		Unknown-08	10.21	0.23	J
10		Unknown-09	10.86	0.24	J
11		~~Unknown-10~~	11.26	0.23	J
12		Unknown-11	11.68	0.21	J
13		~~Unknown-12~~	~~14.56~~	~~0.32~~	~~J~~
14	000124-13-0	Octanal	16.20	0.94	NJ
15		~~Unknown-13~~ Nonanal	~~17.27~~	~~0.71~~	~~JN~~
16			EM	3/16/16	
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	8966796[1]	Total Alkanes	N/A		J

[1] EPA-designated Registry Number.

Sample Summary Report

Case No:	45742	Contract:	EPW14031	SDG No:	YA1W0	Lab Code:	KAP
Sample Number:	VBLKKS	Method:	Trace Volatiles	Matrix:	Water	MA Number:	
Sample Location:		pH:	2	Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.20	J	ug/L	0.20	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-04	TIC	0.38	J	ug/L	0.38	J	1.0	Yes	NV
Unknown-03	TIC	0.16	J	ug/L	0.16	J	1.0	Yes	NV
Unknown-01	TIC	0.41	J	ug/L	0.41	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	10	NJ	ug/L	10	NJ	1.0	Yes	NV
Unknown-05	TIC	0.10	J	ug/L	0.10	J	1.0	Yes	NV
Unknown-02	TIC	0.13	J	ug/L	0.13	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP
Sample Number: VBLKLE	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH: 2	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.20	J	ug/L	0.20	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.10	J	ug/L	0.10	J	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-06	TIC	0.14	J	ug/L	0.14	J	1.0	Yes	NV
Unknown-03	TIC	0.20	J	ug/L	0.20	J	1.0	Yes	NV
Unknown-01	TIC	0.23	J	ug/L	0.23	J	1.0	Yes	NV
Unknown-05	TIC	0.16	J	ug/L	0.16	J	1.0	Yes	NV
Unknown-02	TIC	0.11	J	ug/L	0.11	J	1.0	Yes	NV
Unknown-04	TIC	0.13	J	ug/L	0.13	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	7.8	NJ	ug/L	7.8	NJ	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP
Sample Number: VBLKLU	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH: 2	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.43	J	ug/L	0.43	J	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	5.7	NJ	ug/L	5.7	NJ	1.0	Yes	NV
Unknown-08	TIC	0.37	J	ug/L	0.37	J	1.0	Yes	NV
Unknown-07	TIC	0.43	J	ug/L	0.43	J	1.0	Yes	NV
Unknown-01	TIC	0.17	J	ug/L	0.17	J	1.0	Yes	NV
Unknown-04	TIC	0.31	J	ug/L	0.31	J	1.0	Yes	NV
Azulene	TIC	0.57	NJ	ug/L	0.57	NJ	1.0	Yes	NV
Unknown-03	TIC	0.19	J	ug/L	0.19	J	1.0	Yes	NV
Benzene, 1-methyl-4-(1-methylethyl)-	TIC	0.33	NJ	ug/L	0.33	NJ	1.0	Yes	NV
Unknown-02	TIC	0.27	J	ug/L	0.27	J	1.0	Yes	NV
Unknown-06	TIC	0.32	J	ug/L	0.32	J	1.0	Yes	NV
Benzene, 1,3-dimethyl-	TIC	0.27	NJ	ug/L	0.27	NJ	1.0	Yes	NV
Unknown-05	TIC	0.28	J	ug/L	0.28	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP
Sample Number: VHBLK01	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location:	pH: 2	Sample Date:	Sample Time:
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.62		ug/L	0.62	B	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	UJ	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-01	TIC	0.25	J	ug/L	0.25	J	1.0	Yes	NV
cis-1,3-dichloropropene-d4	TIC	5.3	NJB	ug/L	5.3	NJB	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP

Sample Number: YA1T3	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-5	pH: 2.0	Sample Date: 11/20/2015	Sample Time: 13:41:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	2.9		ug/L	2.9		1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	2.7		ug/L	2.7		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.26	J	ug/L	0.26	J	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-dichloropropene-d4	TIC	9.8	NJ	ug/L	9.8	NJ	1.0	No	NV
Unknown-07	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
Unknown-11	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-02	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-08	TIC	0.12	J	ug/L	0.12	J	1.0	No	NV
Unknown-03	TIC	0.17	J	ug/L	0.17	J	1.0	No	NV
Unknown-10	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
Unknown-06	TIC	0.34	J	ug/L	0.34	J	1.0	No	NV
Unknown-01	TIC	0.19	J	ug/L	0.19	J	1.0	No	NV
Unknown-09	TIC	0.17	J	ug/L	0.17	J	1.0	No	NV
Unknown-05	TIC	0.15	J	ug/L	0.15	J	1.0	No	NV
Unknown-04	TIC	0.12	J	ug/L	0.12	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP

Sample Number: YA1T4	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-5	pH: 2.0	Sample Date: 11/20/2015	Sample Time: 14:13:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Chloromethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Vinyl chloride	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Bromomethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Chloroethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Trichlorofluoromethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,1-Dichloroethene	Target	1.5		ug/L	1.5		2.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Acetone	Target	10	U	ug/L	10	U	2.0	Yes	S3VEM
Carbon disulfide	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Methyl acetate	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Methylene chloride	Target	1.0	U	ug/L	0.27	JB	2.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	14		ug/L	14		2.0	Yes	S3VEM
Methyl tert-butyl ether	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.93	J	ug/L	0.93	J	2.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	170		ug/L	170	D	20.0	Yes	S3VEM
2-Butanone	Target	10	U	ug/L	10	U	2.0	Yes	S3VEM
Bromochloromethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Chloroform	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Cyclohexane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Carbon tetrachloride	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Benzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,2-Dichloroethane	Target	7.6		ug/L	7.6		2.0	Yes	S3VEM
Trichloroethene	Target	40		ug/L	40		2.0	Yes	S3VEM
Methylcyclohexane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,2-Dichloropropane	Target	3.5		ug/L	3.5		2.0	Yes	S3VEM
Bromodichloromethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	1.0	UJ	ug/L	1.0	U	2.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	10	U	ug/L	10	U	2.0	Yes	S3VEM
Toluene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Tetrachloroethene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
2-Hexanone	Target	10	U	ug/L	10	U	2.0	Yes	S3VEM
Dibromochloromethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,2-Dibromoethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Chlorobenzene	Target	1.0	U	ug/L	0.44	JB	2.0	Yes	S3VEM
Ethylbenzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
o-Xylene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
m,p-Xylene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Styrene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Bromoform	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Isopropylbenzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	1.0	U	ug/L	1.0	U	2.0	Yes	S3VEM
Unknown-04	TIC	2.3	JN	ug/L	2.3	J	2.0	Yes	NV
Unknown-05	TIC	0.32	J	ug/L	0.32	J	2.0	No	NV
Unknown-07	TIC	0.27	J	ug/L	0.27	J	2.0	No	NV
Unknown-06	TIC	0.27	J	ug/L	0.27	J	2.0	No	NV
Unknown-08	TIC	0.24	J	ug/L	0.24	J	2.0	No	NV
Unknown-09	TIC	0.23	J	ug/L	0.23	J	2.0	No	NV
Unknown-01	TIC	0.26	J	ug/L	0.26	J	2.0	No	NV
Unknown-03	TIC	0.33	J	ug/L	0.33	J	2.0	No	NV
Unknown-02	TIC	1.1	J	ug/L	1.1	J	2.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.2	NJ	ug/L	9.2	NJ	2.0	No	NV
Diisopropyl ether	TIC	4.7	NJ	ug/L	4.7	NJ	2.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP

Sample Number: YA1T5	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-CPT-5	pH: 2.0	Sample Date: 11/20/2015	Sample Time: 14:57:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.47	J	ug/L	0.47	J	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	6.0		ug/L	6.0		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.72		ug/L	0.72		1.0	Yes	S3VEM
Trichloroethene	Target	0.67		ug/L	0.67		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-06	TIC	3.8	NJ	ug/L	3.8	J	1.0	Yes	NV
Unknown-03	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-01	TIC	0.66	JB	ug/L	0.66	JB	1.0	No	NV
Unknown-02	TIC	0.13	J	ug/L	0.13	J	1.0	No	NV
Unknown-10	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-08	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.1	NJ	ug/L	9.1	NJ	1.0	No	NV
Unknown-04	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-07	TIC	0.27	J	ug/L	0.27	J	1.0	No	NV
Unknown-05	TIC	0.11	J	ug/L	0.11	J	1.0	No	NV
Unknown-09	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP
Sample Number: YA1W0	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-DP-6	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 13:58:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	9.9		ug/L	9.9		1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	3.2		ug/L	3.2		1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	5.4		ug/L	5.4		1.0	Yes	S3VEM
Trichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.45	J	ug/L	0.45	JB	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-04	TIC	0.36	J	ug/L	0.36	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.7	NJ	ug/L	9.7	NJ	1.0	No	NV
Unknown-06	TIC	3.1	JN	ug/L	3.1	J	1.0	Yes	NV
Unknown-03	TIC	0.61	J	ug/L	0.61	J	1.0	No	NV
Octanal	TIC	0.94	NJ	ug/L	0.94	NJ	1.0	Yes	NV
Unknown-07	TIC	0.82	JN	ug/L	0.82	J	1.0	Yes	NV
Unknown-05	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Unknown-09	TIC	0.24	J	ug/L	0.24	J	1.0	No	NV
Unknown-11	TIC	0.21	J	ug/L	0.21	J	1.0	No	NV
Unknown-12	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV
Unknown-10	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Unknown-08	TIC	0.23	J	ug/L	0.23	J	1.0	No	NV
Unknown-01	TIC	1.9	J	ug/L	1.9	J	1.0	No	NV
Unknown-02	TIC	0.47	J	ug/L	0.47	J	1.0	No	NV
Unknown-13	TIC	0.71	JN	ug/L	0.71	J	1.0	Yes	NV

Case No: 45742	Contract: EPW14031	SDG No: YA1W0	Lab Code: KAP
Sample Number: YA1W1	Method: Trace Volatiles	Matrix: Water	MA Number:
Sample Location: TTT-DP-8	pH: 2.0	Sample Date: 11/17/2015	Sample Time: 10:31:00
% Moisture :		% Solids :	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Dichlorodifluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Vinyl chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromomethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichlorofluoromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloro-1,2,2-trifluoroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Acetone	Target	8.3		ug/L	8.3		1.0	Yes	S3VEM
Carbon disulfide	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl acetate	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methylene chloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,2-Dichloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Methyl tert-butyl ether	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,2-Dichloroethene	Target	0.55		ug/L	0.55		1.0	Yes	S3VEM
2-Butanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Bromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chloroform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,1-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Cyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Carbon tetrachloride	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Benzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Trichloroethene	Target	0.70		ug/L	0.70		1.0	Yes	S3VEM
Methylcyclohexane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromodichloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
cis-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
4-Methyl-2-pentanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Toluene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
trans-1,3-Dichloropropene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2-Trichloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Tetrachloroethene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
2-Hexanone	Target	5.0	U	ug/L	5.0	U	1.0	Yes	S3VEM
Dibromochloromethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromoethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Chlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Ethylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
o-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
m,p-Xylene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Styrene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Bromoform	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Isopropylbenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,1,2,2-Tetrachloroethane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,3-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,4-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2-Dibromo-3-chloropropane	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,4-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
1,2,3-Trichlorobenzene	Target	0.50	U	ug/L	0.50	U	1.0	Yes	S3VEM
Unknown-02	TIC	0.33	J	ug/L	0.33	J	1.0	No	NV
Unknown-07	TIC	0.14	J	ug/L	0.14	J	1.0	No	NV
Unknown-06	TIC	0.17	J	ug/L	0.17	J	1.0	No	NV
Unknown-04	TIC	0.65	J	ug/L	0.65	J	1.0	No	NV
Unknown-03	TIC	0.36	J	ug/L	0.36	J	1.0	No	NV
Unknown-05	TIC	0.31	J	ug/L	0.31	J	1.0	No	NV
Unknown-10	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
Unknown-12	TIC	0.21	J	ug/L	0.21	J	1.0	No	NV
Unknown-08	TIC	0.17	J	ug/L	0.17	J	1.0	No	NV
Unknown-09	TIC	0.33	J	ug/L	0.33	J	1.0	No	NV
Unknown-11	TIC	0.28	J	ug/L	0.28	J	1.0	No	NV
cis-1,3-dichloropropene-d4	TIC	9.0	NJ	ug/L	9.0	NJ	1.0	No	NV
Unknown-01	TIC	0.32	J	ug/L	0.32	J	1.0	No	NV

Appendix I:
Field Logbook

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Titan Terminal

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RITE GREEN

Archival

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CONTENTS

PAGE	REFERENCE	DATE

11-16-15 NE-710 SI RV/RPT

0700 Tailgate Health and Safety meeting.

0730 Health and Safety briefing @ Titan Terminal. RPT

0745 Gregg Drilling removing a portion of fence to get limited access rig into the former Arsenic pond. RPT

0840 Limited access rig (LAR) setup over TTT-DP-2. RPT

0850 Gregg Drilling hand augering DP-2. Asphalt ~6" thick 6" to 5' bg Silty Sand: light Brown; fine to medium grained sand; trace gravel, NON plastic fines, Slightly moist. RPT

5' to 6' bgs as above 6' to 7' Silty Sand; very light brown fine grained sand, slightly moist. 7 to 9' sandy Silt; dark gray, fine grained sand; NON-plastic fines, slightly moist.

9' to 13' bg As Above. RPT

13 to 17' bg sandy SILT (ML); gray to dark gray. NON plastic fines; fine grained sand, slightly moist. Lens of moist soil 16' to 16.5' bg.

17 to 21' bgs groundwater encountered between 17+18' bgs sandy Silt as above 18 to 21 Silt (ML) moist (no gw). dark brownish gray, low to medium plasticity fines. RPT

11-16-15 NE-710 SI RV/RPT

0916 collected TTT-DP-2@5'.

0927 collected TTT-DP-2@10' (Lab QC)

1000 collected TTT-DP-2@15'.

1028 collected TTT-DP-2@20'

1030 Gregg Drilling setting temp well screened from 16 to 21 fbg. RPT

1045 Bailer fell down well casing.

1115 TTT-DP-2 Not generating enough water to collect sample Gregg Drilling is going to install a temp well w/ 1" PVC screen to 20' bg.

1130 Gregg Drilling breaking for lunch.

1200 Gregg Drilling moved LAR to TTT-DP-4.

1230 Gregg clearing TTT-DP-4 w/ hand auger to 5' bg. RPT

0 to 6" Asphalt 6" to 3' bg Sand w/ silt; Brown fine to medium grained sand NON plastic fines, slightly moist. 3' to 5' bg sand w/ concrete chunks. RPT

Concrete in soil stopped @ 5.5' bg 6 to 8' Silty Sand (SM) light yellowish brown, fine grained sand, NON-plastic fines, slightly moist. 8 to 9' sandy Silt (ML) grayish Brown. Non plastic fines; fine grained sand, slightly moist. 9 to 9.5 As Above 9.5 to 13. Silty SAND (SM): yellowish brown, fine grained sand, non plastic fines, slightly moist

Rite in the Rain

11-16-15 NE-710-SI RV/RPT

13' to 15' bg As Above. 15' to 17'. silty SAND (SM) dark Gray; fine grained sand, non plastic fines slightly moist to moist. 17' to 18' As Above wet. 18' to 21' Silt (ML); dark Gray. low to medium plasticity fines, slightly moist to moist.

1257 Collected soil sample TTT-DP-4@5'

1300 Collected soil sample TTT-DP-4@10' (LabQC)

1313 Collected soil sample TTT-DP-4@15'

1319 Collected soil sample TTT-DP-4@20'

1320 Gregg Drilling moved to TTT-DP-5.

0 to 6" Asphalt. 6" to 5' bg Sand w/silt (SM) light Brown fine to medium grained, non plastic fines slightly moist. 5' to 6' As Above 6' to 9' silty SAND; (SM) light gray. fine grained sand, non plastic fines, slightly moist. 9' to 10' sand As Above 10' to 11' very hard slurry/cement material, light grey, dry 11' to 13' silty SAND (SM); Brown, fine grained sand, non plastic fines, slightly moist

1333 Collected TTT-DP-5@5' soil sample

1341 Collected TTT-DP@10'

1346 Collected Dup of TTT-DP-5@10'

1413 Collected water sample from TTT-DP-2.

The Direct push Rods are stuck in TTT-DP-5 @ ~17' bg. Gregg drilling getting augers sent to the site to over drill rods free

11-16-15 NE-710-SI RV/RPT

1510 Gregg Drilling onsite w/ Auger to overdrill rods from TTT-DP-5.

1520 Rods are freed collecting 15' sample from TTT-DP-5.

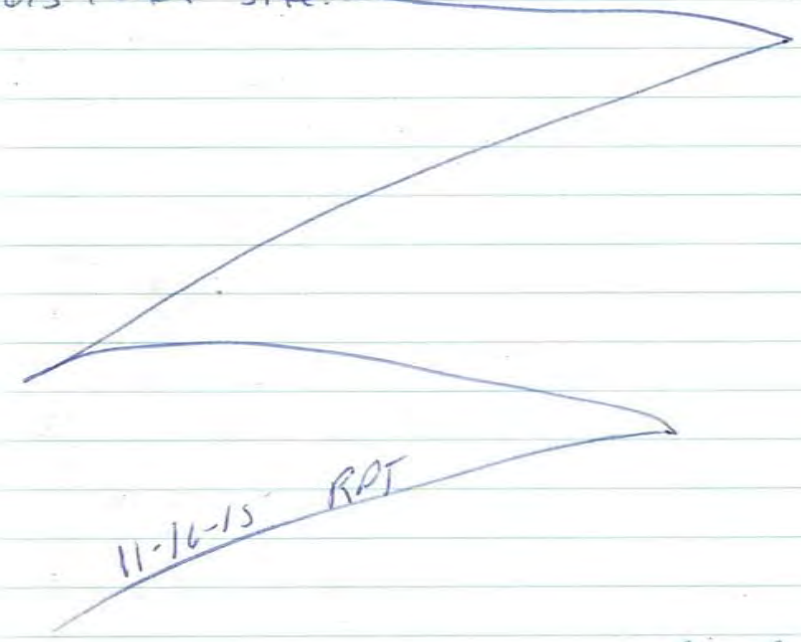
13' to 14' siltySAND; Light Brown, fine grained, non plastic fines, slightly moist. No Recovery from 17 to 19. 19 to 21 sandySilt; dark gray non plastic fines, fine grained, moist.

1525 Collected soil sample TTT-DP-5@15'

1531 Collected soil sample TTT-DP-5@20'

1600 Mobbing back to my dust yard.

1615 left site.



Rite in the Rain

11-17-15 NE-710-SE RV/RPT

0710 Tailgate Health and Safety meeting. Topic: Hearing protection. ——— RPT

0730 Going to Titan Terminal. ——— RPT

0755 Gregg Drilling setting up on TTT-DP-8

0800 Gregg Drilling Clearing TTT-DP-8 w/ Hand Auger. 0 to 4" Asphalt 4" to 2' silty Sand (sm); yellowish Brown; fine to medium grained, non-plastic fines, slightly moist. ———

0826 Collected soil sample TTT-DP-8@2' 3' to 5' bg As Above; Brown. ——— RPT

0840 TTT-DP-8 cleared to 5' bg. Gregg Drilling waiting on replacement rig to show up.

0915 Replacement drill rig onsite. ——— RPT

5' to 9' As Above. ——— RPT

0930 Collected soil sample TTT-DP-8@5'

0937 Collected soil sample TTT-DP-8@10' 9' to 14' As Above. 13' to 15' As Above banding yellowish brown & Gray. ——— RPT

0942 Collected soil sample TTT-DP-8@15'

1005 Pushed Rods to a TD of 66' bg.

1024 Collected water sample TTT-GW-DP8-0640

1031 Collected water sample DUP TTT-GW-D12-0640

1040 Gregg Drilling tripping rods out of DP-8.

1105 Gregg Drilling setup on TTT-DP-6 clearing borehole using hand auger. ——— RPT

11-17-15 NE-710-SE RV/RPT

0 to 4" Asphalt 4" to 2' base material. 2' to 4 silty Sand (sm): yellowish brown, fine and medium grained, non-plastic fines, slightly moist. 4 to 9' As Above Brown.

1126 Collected soil sample TTT-DP-06@2.0'

1133 Collected soil sample TTT-DP-06@5.0'

1139 Collected soil sample (Dup) TTT-DP-0605.0'

9 to 10' As Above. 10' to 13' silty Sand (sm) light brown, fine to medium grained, non plastic fines, slightly moist to moist. 13' to 15' silty Sand (sm) gray, banded, fine to medium grained, non plastic fines, moist. ———

1142 Collected soil sample TTT-DP-06@10'

1147 Collected soil sample TTT-DP-06@15'

1353 Collected water sample TTT-GW-DP06-0660

1358 Collected water sample TTT-GW-D11-0660 Dup

1430 Gregg Drilling setting up on TTT-DP-7

0 to 4" Asphalt. 4" to 1' aggregate base. 1' to 4' silty Sand (sm); dark brown, fine grained non-plastic fines, slightly moist. 4' to 5.5 Silt (ML); dark brown, low to medium plasticity fines moist. 5.5 to 9' silty Sand (sm); yellowish brown very fine to fine grained, non plastic fines slightly moist. ——— RPT

1448 collected soil sample TTT-DP-7@2.0'

Rain in the Rain

11-17-15 NE-I-710-SI RV/RPT

1455 Collected soil sample TTT-DP-9 @ 5' RPT
9.5 to 15' silty SAnd (SM); light Brown, fine to medium grained, non-plastic fines, slightly moist to moist. ——— RPT
1503 Collected soil sample TTT-DP-7 @ 10'
1515 RPT Gregg drilling advancing rods to 68' bgs
1535 Gregg drilling installing 1" PVC temp well.
1549 Collected groundwater Sample TTT-GW-07-0660
1602 Collected Equipmet Blank. ——— RPT
1610 Returned to staging area ——— RPT
1630 Left staging area.

RPT

11-17-15

11-18-15 NE-I710-SI RV/RPT

0630 Arrived onsite. ——— RPT
0700 Tailgate Health and SAfety meeting. Topic: SAfety glassess + eye protection.
0710 Signed in @ Titan Terminal. — RPT
0720 Gregg Drilling setting up on location TTT-DP-10. ——— RPT
0730 Clearing TTT-DP-10 w/ Hand Auger 0 to 4" Asphalt 4" to 2' fill material Sand w/ gravel, Brown. ——— RPT
0746 Collected soil sample TTT-DP-10 @ 2.0' 2' to 4'. Silty SAnd (SM) yellowish brown, fine to medium grained, non-plastic fines, slightly moist 4 to 10' As Above Brown, 10' to 14' As Above, some banding Light yellowish brown 14' to 15' sandy Silt (ML) dark yellowish brown. non-plastic fines, very fine to fine grained slightly moist. ——— RPT
0752 Collected soil sample TTT-DP-10 @ 5'
0800 Collected soil sample TTT-DP-10 @ 10'
0806 Collected soil sAmple TTT-DP-10 @ 15'
0810 TAnker truck unloading over soil sampling location TTT-DP-9 moving to MSM while truck is unloading. ——— RPT
0910 Setting up on TTT-DP-9. ——— RPT
0 to 4" Asphalt. 4" to 1.5' gravelly Sand.

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11-18-15 NE-I710-SI RV/RPT

1.5 to 5 silty SAnd (sm); yellowish Brown, fine to medium grained, NON plastic fines, slightly moist 5 to 8 silt w/SAnd (ML); dark yellowish brown, NON plastic fines, very fine to fine grained, slightly moist. 8 to 13' silty SAnd (sm); yellowish brown, fine to med. grained; NON plastic fines, slightly moist. 13' to 15' As Above w/ banding Pale brown & brown. ——— RPT

0928 Collected soil sample TTT-DP-9 @ 2.0'

0936 Collected soil sample + LAB QC TTT-DP-9 @ 5'

0939 Collected soil sample TTT-DP-9 @ 10'

0943 Collected soil sample TTT-DP-9 @ 15'

0945 Gregg Drilling advancing rods to 66' bg to collect a water sAmple.

1015 Temp well casing & screen set to a TD of 66' bg

1026 Collected groundwAter sample TTT-GW-09-0640. ——— RPT

1035 - Signed out @ Tifton Terminal.

11-18-15 RPT

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PAGE	REFERENCE	DATE
6-	Titan Terminal CPT	11/16/2005-

I-710 Corridor SA Project
11/2/2015 → 11/21/2015
Los Angeles County, CA
3 weeks

0700 Loaded equipment @ Long Beach Office with B. Castellana
0745 Arrived at QWS Site (8332 Wilcox) with supplies and attended safety briefing
0800 Unloaded gear then headed to staging area for setup of sample mgmt area → vacant lot (8420 Atlantic Ave)
0845 Scribe Setup and Printer Setup for COC and Labels
0900 Modified existing Scribe projects to include Percent Solids as another analyses
1030 Received QWS-SM-D01-0020
QWS-SM-D01-0050
QWS-SM-D01-0100
QWS-SM-D01-0150

QWS-DP-1 location

Created labels Assigned to COCs

1140 Received QWS-SM-D08-0020
QWS-SM-D08-0050
QWS-SM-D08-0100
QWS-SM-D08-0150
QWS-SM-D15-0050 (Dup)

QWS-DP-08 location

created labels assigned to COCs

1230 Lunch!
1300 Resumed updating Scribe database(s)

Disregard Data Management Logback Unnecessary to continue

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11/3/2015 QWS Site
0700 Arrived @ Staging Area
0715 Arrived @ project site

Disregard Mgmt Data Logbook. Will not continue

Rite in the Rain

11/16/2015 587

0655 - WESTON Ryan Green arrived at project staging area at 8420 Atlantic Ave in Cudahy, CA; morning safety briefing with Brian Reilly, Rod Tobias, Rivian Villanueva, and Ian Bruce, and same Gregg drilling crews as last week.

0730 - Personnel drove equipment to Titan Terminal site, safety briefing with Titan facility personnel, discussed site vehicle traffic, chemicals, work areas, PPE.

0924 - CPT crew set up at TTT-CPT-1, hand augered to 5 ft bgs. Begin downhole progress with rig.

0932 - Refusal at 7 ft bgs at TTT-CPT-1.

0948 - CPT crew moved rig 3 ft forward to second hand augered hole, downhole progress begin.

0953 - Refusal of CPT rig at 7 ft bgs at TTT-CPT-1, same depth as first refusal.

1035 - CPT crew moved rig off of TTT-CPT-1, Brian checked location of nearby sewer line, no conflict. CPT crew moved support rig onto TTT-CPT-1 and tried to use direct-push to get through obstruction, not successfull. B Reilly asked CPT crew to move SW 10 ft to edge of utility cleared box around TTT-CPT-1 and try again.

1045 - CPT crew began augering with support rig at third spot for TTT-CPT-1. Asphalt to 8 inches bgs, mud

11/16/2015 61°F

brown sand fill with little angular gravel to 1.5 ft bgs.

1103 - CPT crew hand augered to 5 ft bgs at 2 locations 10 ft SW of original location at TTT-CPT-1; transition to orange-brown sand at 3.5 ft bgs, med gr.

1123 - CPT crew set up CPT rig at new TTT-CPT-1 and began pushing down.

1130 - CPT refusal at 7 ft. again. Crew breaks for lunch.

1220 - R Green returned to CPT rig, crew hand augering 2 locations at TTT-CPT-2.

1255 - CPT crew finished augering 2 holes to 5 ft bgs at TTT-CPT-2.

1306 - CPT crew positioned CPT truck on TTT-CPT-2 and began downhole progress.

1350 - CPT logging reached total overall depth of 136.5 ft bgs, refusal.

1412 - CPT crew removed rods from TTT-CPT-2.

1415 - Selected groundwater sampling intervals for TTT-CPT-2 based on CPT logging: 62-66 ft bgs, 86-90 ft bgs, 132-136 ft bgs.

1500 - Collected groundwater sample TTT-GW-C02-0640 from 64 ft bgs at TTT-CPT-2; also collected duplicate groundwater sample TTT-GW-C07-0640 from same interval with time stamp 1505.

Rite in the Rain

11/16/2015 66°F

1545 - Collected groundwater sample TTT-GW-CØ2-ØØ88Ø from 88 ft bgs at TTT-CPT-2; 3 VOA (40-ml) preserved with 12 drops HCl to <2 pH, 1 1-L poly to be filtered and preserved on-site.

1610 - B. Reilly switch out w/ Ryan Green

1625 - Collect gw sample TTT-GW-CØ2-1320 from 130-133' interval. 3 VOA; Silky - preserved w/ 12 drops HCl; time 1625

1645 - collect metals portion ~400 mL; insufficient volume to split.

WESTON SOLUTIONS INC
11/16/2015

11/17/2015 52°F

0700 - WESTON Ryan Green arrived at staging at [redacted] at 8420 Atlantic Ave.

0740 - Morning safety briefing with Brian Reilly, hear protection discussed. Work to continue at the Titan Terminal site with same WESTON and Gregg crews.

0820 - Greg CPT crew cleared 2 spots at location TTT-CPT-3 with hand auger to depths of 5 ft bgs. 6 inches asphalt underlain by organic brown sand, med grained, loose, dry, some angular gravel fill.

0840 - CPT crew began downhole progress and Soil logging at TTT-CPT-3.

0920 - R Green and B Reilly collected rinsate/equipment blank from bailer used yesterday afternoon at TTT-CPT-2, sample name TTT-EBØ1-111715 collected 3 VOA preserved with HCl and 1 500-ml poly preserved with Nitric to <2 pH.

0932 - CPT crew reached total overall depth (refusal) at 136.82 ft bgs at TTT-CPT-3. Begin removing rods from boring.

1025 - Collected groundwater sample TTT-GW-CØ3-ØØ64Ø from 64 ft bgs at boring TTT-CPT-3; 3 VOAs preserved with 12 drops HCl & 1 1-L poly (preservation and filtering on site later).

Rite in the Rain

11/17/2015 66°F

1040 - Darren from Iris Environmental on site to collect split samples.

1105 - Collected groundwater sample TTT-GW-C03-0850 from 85 ft bgs at TTT-CPT-3; 3 VOAs preserved with 12 drops HCl each, 1 1-L poly to be filtered and preserved on site before shipping.

~~1135 - Collected.~~

1143 - Collected groundwater sample TTT-GW-C03-1270 from 127 ft bgs at TTT-CPT-3; 3 VOAs preserved with HCl & 1 1-L poly.

1158 - RGreen depart site for lunch.

1325 - Gregg CPT crew setting up at TTT-CPT-4.

1400 - Gregg CPT crew began downhole progress at TTT-CPT-4 logging soil types.

1450 - Gregg CPT crew reached refusal at 143.20 at TTT-CPT-4.

1520 - RGreen returned to staging area to help pack coolers, Gregg CPT crew returned to staging area to decon 2 sets of rods & equipment.

WESTON SOLUTIONS INC 11/17/2015

11/18/2015 54°F

0650 - WESTON Ryan Green arrived at project staging area at 8420 Atlantic Ave.

0712 - Morning Safety briefing complete, Brian Reilly covered eyewear protection equipment.

0715 - Personnel (WESTON and Gregg crews) drove to the Titan Terminal site and signed in at the front desk.

0805 - CPT crew finished augering 2 spots at location TTT-CPT-1 at first location attempted on 11/16/2015 but had refusal at 7 ft bgs. Auger rig encountered dense concrete-like obstruction at 9-10 ft bgs, augered through without issue.

0820 - CPT crew set up CPT rig at TTT-CPT-1 and began downhole progress and soil logging.

0917 - CPT crew reached refusal at TTT-CPT-1 at 135.82 ft bgs, begin removing rods.

1025 - Collected groundwater sample TTT-GW-C01-0610 from 61 ft at boring TTT-CPT-1. 3 40-ml VOA preserved with 16 drops HCl to <2 pH, also filled approximately 600 ml in a 1-L poly container to be filtered and preserved on site before shipping, Lower quantity due to very slow recharge and high silt in interval at 59-63 ft bgs thin silty sand.

1105 - Collected groundwater sample TTT-GW-C01-0880 from 88 ft bgs at TTT-CPT-1; 3 VOA w/HCl, 1 1-L poly.

Rite in the Rain

11/18/2015 684

1143 - Collected groundwater sample TTT-GW-C01-1290 from 129 ft bgs at TTT-CPT-1. 3 VOA and 1 1-L poly. Significant effervescence with HCl preservative in VOAs.

- Breaks For Lunch, B. Reilly temporary replacing Ryan Gowen on CPT

1330 - CPT Rig MOVED to TTT-CPT-04 for groundwater push.

1335 - Collect gw sample from 62-64'
- Collect 3 VOAs, HCL-12 drops
- TTT-GW-C04-0630; 1335
- Collect 1 L for Metals; moderately silty

1410 - Collect gw sample from 86'-90'
- TTT-GW-C04-0880; 1415
- Collect 3 VOAs - HCL -12 drops
- Collect 1 L for Metals: low silt

1450 - Refusal @ 132.22'. Set screen from 129.22'-132.22'.
- TTT-GW-C04-1310; 1455
- 3 VOAs; HCL → 12 drops; some sed, no fizz; Collect 1L for Metals; moderate silt.

1515: Filter Sample w/ Titan consultant
- Holes patched and rigs return to staging for Decon

1415: CPT Rig Leaves site.

NE-1-710 SI 11/20/2015

1300 R. Villanueva, B. Riley (WESTON), Tim Patterson & Keith Ward (Gregg)
- depart staging area (8420 Atlantic Ave.) to titan Transport & Terminal.
- Sign visitor's log and mobe to TTT-CPT-5.

1315 CPT Crew bore one hole via hand auger to 5 ft bgs at TTT-CPT-5. 6-inches of asphalt underlain by brownish sand, fine-medium sand, dry.

1330 CPT Crew begin pushing to 1st Sample depth.
- selected groundwater sampling depths: 64-68 ft bgs, 84-88 ft bgs, 128-132 ft bgs. selected by B. Riley based on previous Arcadis data logging (2/19/2013).

1341 Collect groundwater sample TTT-GW-C05-0660 from 64-68 ft bgs. Collected 3 VOAs Preserved with HCl (12 drops) < 2 pH, 1, 1-L poly Unpreserved unfiltered. Will be filtered/pre-

Rite in the Rain

NE - 1710 SI 11/20/2015

— served at the end of day.

1413 Collect groundwater sample
— TTT-GW-C05-0860 from
— 84-88 ft bgs. Collected 3
— VOAs preserved with HCl (12
— drops) <2pH, 1;1L Poly
— unpreserved/unfiltered will
— preserve/filter at end of day.

1457 Collect groundwater sample
— TTT-GW-C05-1300 from
— 128-132 ft bgs. Collected
— 3 VOAs preserved with HCl
— (12 drops) < 2 pH., 1-1-L poly
— unpreserved/unfiltered. Will
— preserve/filter at end of day.

1518 Complete groundwater sampling. CPT crew grout bore hole.

1530 Demobe equipment from CPT rig. Sign out of Titan Transport.

1545 Arrive at staging area. Filter/preserve samples collected from CPT-C05 location.

11/20/2015

Rite in the Rain

Appendix J:
References

Reference:
ARCADIS, 2017

Arcadis, U.S., Inc.
445 South Figueroa St
Suite 3650
Los Angeles
California 90071
Tel 213 486 9884
Fax 213 486 9894
www.arcadis.com

ENVIRONMENT

Mr. Manjul Bose
California Environmental Protection Agency
Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, California 91311

Subject:
Second Semi-Annual 2016 Groundwater Monitoring Report
Brenntag – South Gate (Former L.A. Chemical)
4545 Ardine Street
South Gate, California

Date:
January 31, 2017

Contact:
Greg Fiol

Phone:
213.797.5278

Email
greg.fiol@arcadis.com

Our Ref:
CA000677.0018.00002

Dear Mr. Bose:

Arcadis U.S., Inc. (Arcadis) is pleased to submit this progress report on behalf of Brenntag Pacific, Inc. (Brenntag) presenting the results of groundwater monitoring performed during the second semi-annual 2016 groundwater monitoring event at the Brenntag South Gate facility (site) for the July 1 through December 31, 2016 reporting period. Twenty-eight groundwater monitoring wells were gauged for depth to water, and groundwater samples were collected as part of the current monitoring event. A description of groundwater monitoring activities and results is presented in the following sections. The site location is shown on Figure 1, and the current monitoring well locations are shown on Figure 2.

Previous groundwater monitoring events at the site were conducted using submersible pumps and low-flow groundwater sampling methods as outlined in the Department of Toxic Substances Control (DTSC) approved 2007 *Sampling and Analysis Plan*[1] (SAP). Arcadis proposed a switch to passive sampling using HydraSleeve™ samplers, and the DTSC approved the change following a review of the data collected as part of the first semi-annual 2009 monitoring event. The HydraSleeve™ sampling devices are attached to stainless steel harnesses that have been constructed for each individual site monitoring well.

[1] Arcadis. 2007. Sampling and Analysis Plan: Brenntag South Gate Site. March.

GROUNDWATER MONITORING

On October 6, 2016, Arcadis personnel gauged 28 wells (MW-1 through MW-4, MW-5S, MW-5D, MW-6S, MW-6D, MW-7S, MW-7D, MW-8 through MW-12, MW-13A, MW-13B, MW-13C, MW-14A, MW-14B, MW-14C, MW-15A, MW-15B, MW-16, MW-16C, MW-17A, MW-17B, and MW-17C) for depth to static groundwater and well total depth. The water level meter was decontaminated between monitoring wells by washing with a non-phosphate detergent and purified water solution wash followed by two purified water rinses. Results of the gauging activities performed during the reporting period are summarized in Table 2. Field gauging forms are included as Appendix A.

Following well gauging, 1.5-liter or 3-liter HydraSleeve™ samplers were deployed in each of the 28 site wells. The sampler is placed in the center of the screened interval in each monitoring well with a fully submerged screen interval, or it is placed approximately 5 feet from the bottom of the well in wells that have partially submerged screen intervals. The 1.5-liter or 3-liter HydraSleeve™ samplers were placed in each well a minimum of two weeks prior to collection of groundwater samples, to allow each water column to reach equilibrium with groundwater. To ensure that representative groundwater samples are collected, field parameters (i.e., turbidity, dissolved oxygen [DO], oxidation-reduction potential [ORP], conductivity, and temperature) are recorded.

From October 24 to October 26, 2016, Arcadis personnel retrieved the HydraSleeve™ samplers from each well and groundwater samples were collected. The HydraSleeve™ harness systems dedicated to each well were replaced following groundwater sampling. A complete description of site passive sampling methods utilizing HydraSleeve™ samplers was included with the *First Semi-Annual 2009 Groundwater Monitoring and Comparative Groundwater Sampling Report*[2], dated September 1, 2009.

Groundwater Sampling

Field measurement of pH, temperature, specific conductance, DO, ORP, and turbidity was completed immediately after the sampler was retrieved from the well by transferring groundwater from the sampler into a container and collecting the information using a Horiba U-53 water quality meter. With the exception of wells

[2] Arcadis. 2009. First Semi-Annual 2009 Groundwater Monitoring and Comparative Groundwater Sampling Report. September 1.

MW-1, MW-8 through MW-11, MW-13C, MW-14A, MW-15A, and MW-17A, where insufficient water was available in the top portion of the HydraSleeve™ sampler, all other samplers had sufficient water to collect the parameter readings; however, sufficient water for parameter collection was not available in MW-7S and MW-7D due to a field error during retrieval. Upon retrieval of the HydraSleeve™ sampler and collection of water quality parameters, groundwater samples were transferred into method appropriate, laboratory-supplied containers. Each container was labeled, recorded on a chain-of-custody form, placed in an ice-chilled cooler for preservation, and delivered to SGS-Accutest Laboratories (Accutest), a state-certified analytical laboratory located in San Jose, California.

Duplicate groundwater samples were collected from monitoring wells MW-2 and MW-6D. The duplicate samples were collected in a separate set of sample containers immediately following the collection of the primary samples and were analyzed to evaluate the precision of laboratory analytical procedures. The primary and duplicate samples were analyzed for the same parameters, and the duplicate sample results from monitoring wells MW-2 and MW-6D were consistent with their primary sample results for most constituents. Field and quality control samples were collected in accordance with the SAP. Laboratory analytical results are summarized in Tables 3 and 4. Copies of the laboratory reports and chain-of-custody documents are provided in Appendix B.

Trip blanks were provided by Accutest and placed inside each cooler containing groundwater samples to be analyzed for volatile organic compounds (VOCs) by United States Environmental Protection Agency (EPA) Method 8260B. Three trip blanks were submitted for analysis as part of the second semi-annual 2016 groundwater monitoring event. No VOCs were detected in the trip blanks. Primary and duplicate groundwater samples were analyzed for VOCs and total petroleum hydrocarbon gasoline range organics (TPH-g) carbon chain analysis using EPA Method 8260B, Title 22 California Assessment Manual (CAM) metals using EPA Methods 6010/7000, total petroleum hydrocarbon diesel range organics (TPH-d) and total petroleum hydrocarbon motor oil range organics (TPH-o) carbon chain analysis using EPA Method 8260B, and 1,4-dioxane using EPA Method 8270C (M) Isotope Dilution. For wells MW-6D DUP, MW-13A, MW-13B, MW-13C, MW-14A, MW-14B, MW-14C, MW-15A, MW-15B, MW-16, MW-16C, MW-17A, MW-17B, and MW-17C insufficient water was available to collect samples for TPH-d and TPH-o (Tables 3 and 4).

Purge water was not produced during the second semi-annual 2016 groundwater monitoring event.

RESULTS

Groundwater Levels

During the reporting period, all groundwater elevations decreased by an average of 0.74 foot compared to the previous monitoring event. The greatest groundwater level decline of 1.40 feet was observed in well MW-10. Since 2007, groundwater levels have declined over 5 feet at the site. Groundwater levels are shown in Table 2. Figure 3 presents a hydrograph for site monitoring well elevation data from December 2005 to the present.

Data from wells MW-1, MW-2, MW-3, MW-4, MW-5S, MW-6S, MW-7S, MW-12, MW-13A, MW-14A, MW-15A, and MW-17A (screened between approximately 45 to 85 feet below ground surface [bgs]) were used to evaluate groundwater gradient and flow direction in the shallow saturated zone. Elevations of groundwater in the shallow wells indicate a hydraulic gradient of 0.020 foot per foot (ft/ft) to the northeast, but the gradient is slightly variable on site. Shallow groundwater elevation contours are depicted on Figure 4.

Data from wells MW-5D, MW-6D, MW-7D, MW-8, MW-13B, MW-14B, MW-15B, and MW-15B (screened between approximately 80 to 104 feet bgs) were used to evaluate groundwater gradient and flow direction in the deeper Gaspur Aquifer. Data from the deeper wells indicate an average gradient of approximately 0.003 ft/ft consistently to the southwest. The groundwater elevation contours and hydraulic gradient direction map for the Gaspur Aquifer are presented on Figure 5.

Laboratory Analytical Results

VOCs were detected in 27 of the 28 monitoring wells sampled during the current monitoring event. Tetrachloroethene (PCE) was detected in 10 of the 26 primary samples at concentrations ranging from 1.5 J microgram per liter (µg/L) (MW-6D; the "J" flag means a result detected between the laboratory detection and reporting limit and is considered an estimate) to 76.3 µg/L (MW-7D).

Trichloroethene (TCE) was detected in 24 of the 28 primary samples at concentrations ranging from 0.28 J µg/L (MW-13C) to 174 µg/L (MW-7D). Cis-1,2-

dichloroethene was detected in 25 of the 28 primary samples at concentrations ranging from an estimated value of 0.33 J µg/L (MW-13C) to 1,020 µg/L. Vinyl chloride was detected in two of the 28 primary samples at estimated concentrations of 0.86 J µg/L (MW-1) and 0.93 J µg/L (MW-5D). Vinyl chloride was also detected in the duplicate sample for MW-2 (DUP 1) at an estimated concentration of 0.32 J µg/L.

1,4-Dioxane was detected in 22 of the 28 of the primary samples for which it was analyzed at concentrations ranging from 0.16 J µg/L (MW-5D) to 513 µg/L (MW-14A). Table 3 summarizes the results of VOCs and 1,4-Dioxane in groundwater for the current monitoring event, and Figure 6 depicts the distribution of VOCs and 1,4-Dioxane in groundwater during the current monitoring event. Total VOC and 1,4-Dioxane concentrations from the second semi-annual 2016 monitoring event were consistent with results from previous monitoring events.

Metals were detected in 26 of the 28 monitoring wells sampled. In 17 of the sampled wells, arsenic was detected at or above concentrations exceeding 0.010 milligram per liter (mg/L) (the California Code of Regulations, Title 22 Maximum Contaminant Level [MCL] or Regulatory Action Level [RAL] for drinking water, which is used here for comparative purposes only). The detected concentrations ranged from 0.0100 mg/L (MW-15B) to 5.40 mg/L (MW-16). Cadmium was detected in one well (MW-6S), exceeding its MCL of 0.0050 mg/L at a concentration of 0.0117 mg/L. Nickel was detected in 12 of the 28 monitoring wells sampled; in six of the wells nickel concentrations were above its MCL of 0.10 mg/L. Nickel concentrations ranged from 0.0402 mg/L (MW-12) to 0.359 mg/L (MW-1). Lead was detected above its RAL of 0.015 mg/L in four of the 27 sampled wells, and in one duplicate sample collected at concentrations ranging from 0.0052 mg/L (MW-11) to 0.0288 mg/L (MW-6 DUP). Table 4 summarizes the analytical results for metals in groundwater during the current monitoring event. Figure 7 depicts the distribution of metals in groundwater for the current groundwater monitoring event.

TPH-g was detected in 10 of the 28 monitoring wells sampled. Gasoline range hydrocarbons (C_6-C_{10}) ranged from 53.1 J µg/L (MW-2 DUP) to 601 µg/L (MW-4); however, the detection of TPH has been identified in the TPH as gasoline carbon range and may not indicate the presence of gasoline. Of the 15 primary samples collected and analyzed for TPH-d (C_{10}-C_{28}) and TPH-o (C_{28}-C_{40}), TPH-d was detected in all 15 at concentrations ranging from 39.3 J µg/L (MW-5S) to 2,180 µg/L (MW-12), and TPH-o was detected in all 15 samples at concentrations ranging from 22.6 J µg/L (MW-5S) to 747 µg/L (MW-1).

Table 4 summarizes the analytical results for petroleum hydrocarbons in groundwater during the current monitoring event. Figure 8 depicts the distribution of TPH in groundwater for the current groundwater monitoring event.

Appendix C includes a summary of laboratory analytical results for groundwater samples collected at the site to date.

PLANNED ACTIVITIES NEXT QUARTER

Groundwater will continue to be monitored and sampled on a semi-annual basis, with the next groundwater sampling event tentatively scheduled for the first quarter of 2017.

CLOSING

If you have any questions or comments regarding this report, please contact Greg Fiol at 213.797.5278.

Sincerely,

Arcadis U.S., Inc.

Arianne R Terry

Arianne Terry
Staff Geologist

Robert Ruscitto

Robert Ruscitto, P.G. 7038, C.Hg. 943
Principal Geologist

Greg Fiol
Senior Project Manager

Copies:
Shawn Wiram – Brenntag North America, Inc. (CD Only)
Brian Beal – Brenntag Pacific, Inc. (CD Only)
Jeff Miller – Hawks Bay, LLC (CD only)
Project File

Enclosures:

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Appendices

Appendix A	Field Monitoring Forms
Appendix B	Laboratory Analytical Results and Chain-of-Custody Documentation
Appendix C	Summary of Groundwater Analytical Results

TABLES

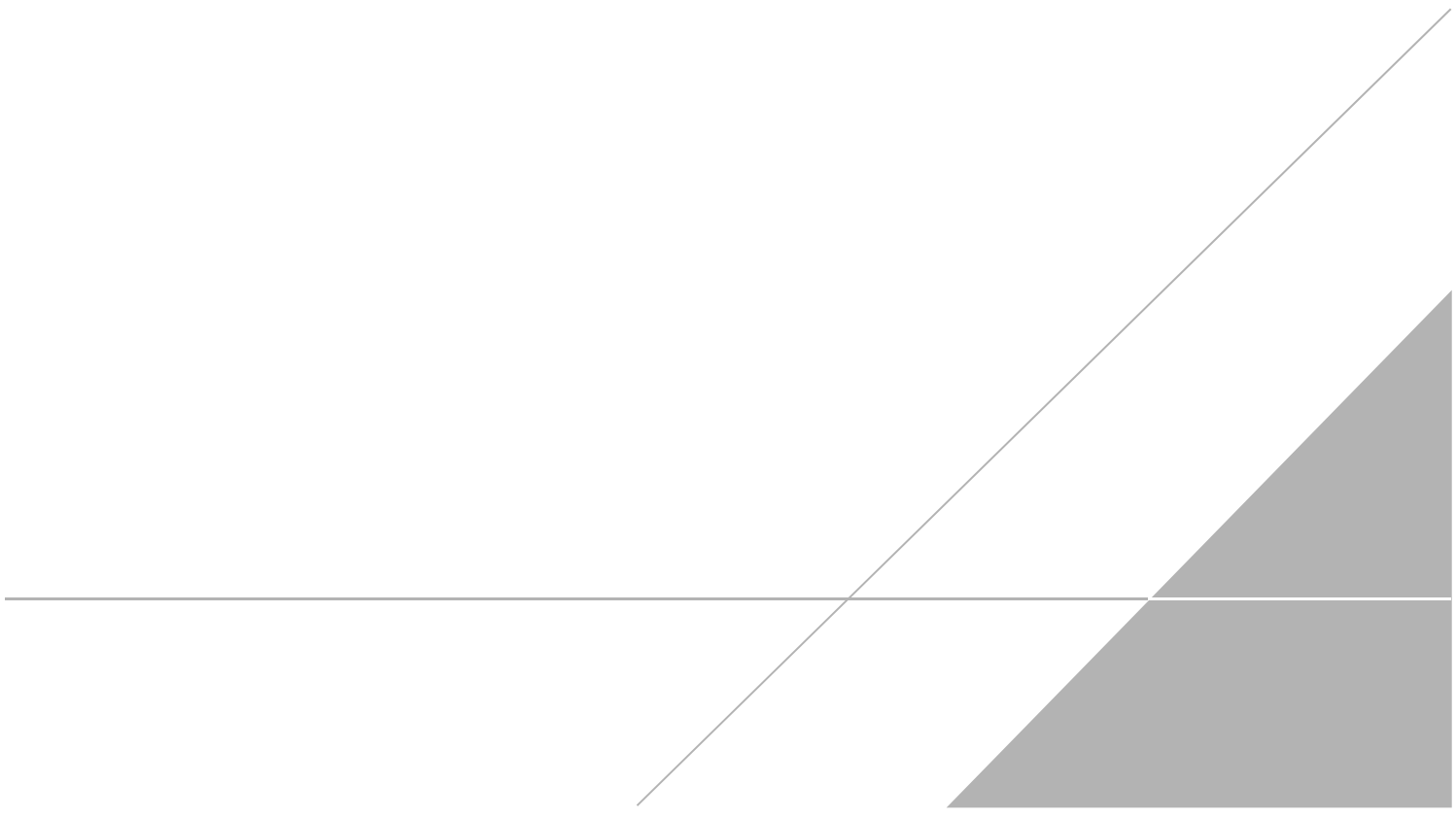

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Table 1. Summary of Well Construction Information
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well ID	Off-Site/ On-Site	Top of Casing Elevation	Installation Date	Total Depth of Boring (feet bgs)	Total Depth of Well (feet bgs)	Screen Interval (feet bgs)	Casing Diameter (inches)	Well Screen Construction	Screen Slot Size (inches)	Sand Pack Material	Depth to Top of Sand Pack (feet bgs)
MW-1	On-Site	121.21	10/18/1985	75.0	75.0	65 to 75	4	PVC	0.02	# 3 washed monterey sand	60
MW-2	On-Site	120.65	2/6/1986	85.0	85.0	50 to 85	4	PVC	NA	Unknown	43.5
MW-3	On-Site	119.97	2/6/1986	85.0	85.0	50 to 85	4	PVC	NA	Unknown	43.5
MW-4	On-Site	121.33	2/21/1986	85.0	85.0	50 to 85	4	PVC	NA	Unknown	46
MW-5S	Off-Site	120.26	9/29/1988	87.5	73.0	53 to 73	4	PVC	Unknown	Unknown	49
MW-5D	Off-Site	120.26	10/5/1988	104.0	93.0	83 to 93	4	PVC	Unknown	Unknown	80
MW-6S	On-Site	121.17	10/11/1988	75.0	71.0	51 to 71	4	PVC	Unknown	Unknown	48
MW-6D	On-Site	121.21	10/10/1988	98.0	91.0	81 to 91	4	PVC	Unknown	Unknown	78
MW-7S	On-Site	122.21	10/12/1988	73.0	73.0	53 to 73	4	PVC	Unknown	Unknown	48
MW-7D	On-Site	122.24	10/12/1988	100.0	96.0	86 to 96	4	PVC	Unknown	Unknown	84
MW-8	On-Site	121.20	10/6/1988	101.5	96.0	86 to 96	4	PVC	Unknown	Unknown	81
MW-9	On-Site	121.49	11/26/1990	100.0	97.0	52 to 97	4	PVC	0.02	# 2/12	48
MW-10	On-Site	121.80	11/28/1990	97.0	97.0	52 to 97	4	PVC	0.02	# 2/12	49
MW-11	On-Site	122.37	11/28/1990	100.0	95.0	50 to 95	4	PVC	Unknown	Unknown	48
MW-12	On-Site	122.53	5/23/2002	75.0	75.0	40 to 75	4	PVC	Unknown	Unknown	38
MW-13A	Off-Site	121.99	4/3/2012	104.0	70.0	55-70	2	PVC	0.01	# 2/12	53
MW-13B	Off-Site	122.02	4/3/2012	104.0	104.0	94-104	2	PVC	0.01	# 2/12	92
MW-13C	Off-Site	121.81	4/2/2012	130.0	130.0	120-130	2	PVC	0.01	# 2/12	118
MW-14A	Off-Site	121.61	4/5/2012	95.0	70.0	55-70	2	PVC	0.01	# 2/12	53
MW-14B	Off-Site	121.48	4/5/2012	95.0	95.0	85-95	2	PVC	0.01	# 2/12	83
MW-14C	Off-Site	121.62	4/4/2012	130.0	129.0	119-129	2	PVC	0.01	# 2/12	117
MW-15A	Off-Site	117.79	3/31/2012	100.0	70.0	55-70	2	PVC	0.01	# 2/12	53
MW-15B	Off-Site	117.88	3/31/2012	100.0	90.0	80-90	2	PVC	0.01	# 2/12	78
MW-16	On-Site	121.84	4/9/2012	142.0	118.0	108-118	2	PVC	0.01	# 2/12	106
MW-16C	On-Site	121.89	4/9/2012	142.0	142.0	132-142	2	PVC	0.01	# 2/12	130
MW-17A	Off-Site	120.84	9/23/2015	71.5	71.0	56-71	4	PVC	0.01	# 2/12	54
MW-17B	Off-Site	120.90	9/22/2015	125.0	90.0	80-90	2	PVC	0.01	# 2/12	78
MW-17C	Off-Site	120.92	9/22/2015	125.0	124.0	114-124	2	PVC	0.01	# 2/12	112

Notes:

bgs	Below ground surface
NA	Not available
PVC	Polyvinyl chloride

Wells MW-1 to MW-12 were surveyed in June 2007. Wells MW-13 to MW-16 were surveyed in April 2012, and well MW-17 was surveyed in September 2015 by Guida Surveying, Inc.

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Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-1	65 to 75	12/18/05	119.12	59.80	59.32
		5/22/06	119.12	55.88	63.24
		12/6/06	119.12	56.49	62.63
		6/2/07	121.21	56.18	65.03
		11/27/07	121.21	56.71	64.50
		7/14/08	121.21	57.30	63.91
		12/1/08	121.21	57.88	63.33
		6/15/09	121.21	58.45	62.76
		12/10/09	121.21	59.20	62.01
		6/16/10	121.21	59.70	61.51
		12/15/10	121.21	60.20	61.01
		6/3/11	121.21	60.45	60.76
		12/2/11	121.21	60.50	60.71
		5/18/12	121.21	60.48	60.73
		11/16/12	121.21	60.82	60.39
		3/19/13	121.21	61.02	60.19
		9/18/13	121.21	61.58	59.63
		4/21/14	121.21	62.38	58.83
		9/24/14	121.21	62.98	58.23
		4/6/15	121.21	63.71	57.50
		10/9/15	121.21	64.44	56.77
		4/4/16	121.21	65.28	55.93
		10/6/16	**121.21**	**66.00**	**55.21**
MW-2	50 to 85	12/18/05	118.50	58.85	59.65
		5/22/06	118.50	55.77	62.73
		12/6/06	118.50	55.65	62.85
		6/2/07	120.65	55.40	65.25
		11/27/07	120.65	55.95	64.70
		7/14/08	120.65	56.57	64.08
		12/1/08	120.65	57.25	63.40
		6/15/09	120.65	57.72	62.93
		12/10/09	120.65	58.50	62.15
		6/16/10	120.65	59.05	61.60
		12/15/10	120.65	62.10	58.55
		6/3/11	120.65	59.85	60.80
		12/2/11	120.65	59.85	60.80
		5/18/12	120.65	59.80	60.85
		11/16/12	120.65	60.26	60.39
		3/19/13	120.65	60.42	60.23
		9/18/13	120.65	60.93	59.72
		4/21/14	120.65	61.68	58.97
		9/24/14	120.65	62.32	58.33
		4/6/15	120.65	62.96	57.69
		10/9/15	120.65	63.84	56.81
		4/4/16	120.65	64.71	55.94
		10/6/16	**120.65**	**65.42**	**55.23**

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-3	50 to 85	12/18/05	117.88	58.28	59.60
		5/22/06	117.88	55.02	62.86
		12/6/06	117.88	NM	NA
		6/2/07	119.97	54.60	65.37
		7/14/08	119.97	56.00	63.97
		12/1/08	119.97	56.36	63.61
		6/15/09	119.97	57.05	62.92
		12/10/09	119.97	57.72	62.25
		6/16/10	119.97	58.30	61.67
		12/15/10	119.97	59.40	60.57
		6/3/11	119.97	59.10	60.87
		12/2/11	119.97	59.10	60.87
		5/18/12	119.97	59.10	60.87
		11/16/12	119.97	59.49	60.48
		3/19/13	119.97	59.86	60.11
		9/18/13	119.97	60.24	59.73
		4/21/14	119.97	61.08	58.89
		9/24/14	119.97	61.58	58.39
		4/6/15	119.97	62.27	57.70
		10/9/15	119.97	63.04	56.93
		4/4/16	119.97	63.89	56.08
		10/6/16	**119.97**	**64.13**	**55.84**
MW-4	50 to 85	12/18/05	119.21	NM	NA
		5/22/06	119.21	55.93	63.28
		12/6/06	119.21	55.70	63.51
		6/2/07	121.33	55.07	66.26
		11/27/07	121.33	55.75	65.58
		7/14/08	121.33	56.72	64.61
		12/1/08	121.33	57.90	63.43
		6/15/09	121.33	58.40	62.93
		12/10/09	121.33	59.17	62.16
		6/16/10	121.33	59.70	61.63
		12/15/10	121.33	61.60	59.73
		6/3/11	121.33	60.60	60.73
		12/2/11	121.33	60.60	60.73
		5/18/12	121.33	60.60	60.73
		11/16/12	121.33	60.96	60.37
		3/19/13	121.33	61.10	60.23
		9/18/13	121.33	61.61	59.72
		4/21/14	121.33	62.41	58.92
		9/24/14	121.33	62.77	58.56
		4/6/15	121.33	63.69	57.64
		10/9/15	121.33	64.47	56.86
		4/4/16	121.33	65.39	55.94
		10/6/16	**121.33**	**66.10**	**55.23**

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-5S	53 to 73	12/18/05	118.54	NM	NA
		5/22/06	118.54	55.19	63.35
		12/6/06	118.54	54.93	63.61
		6/2/07	120.26	54.85	65.41
		11/27/07	120.26	55.37	64.89
		7/14/08	120.26	56.00	64.26
		12/1/08	120.26	56.65	63.61
		6/15/09	120.26	57.19	63.07
		12/10/09	120.26	57.94	62.32
		6/16/10	120.26	58.40	61.86
		12/15/10	120.26	59.25	61.01
		6/3/11	120.26	59.25	61.01
		12/2/11	120.26	59.25	61.01
		5/18/12	120.26	59.20	61.06
		11/16/12	120.26	59.62	60.64
		3/19/13	120.26	59.70	60.56
		9/18/13	120.26	60.34	59.92
		4/21/14	120.26	61.11	59.15
		9/24/14	120.26	61.70	58.56
		4/6/15	120.26	62.42	57.84
		10/9/15	120.26	63.11	57.15
		4/4/16	120.26	64.00	56.26
		10/6/16	**120.26**	**64.69**	**55.57**
MW-5D	83 to 93	12/18/05	118.63	NM	NA
		5/22/06	118.63	55.51	63.12
		12/6/06	118.63	55.50	63.13
		6/2/07	120.26	54.90	65.36
		11/27/07	120.26	55.43	64.83
		7/14/08	120.26	56.04	64.22
		12/1/08	120.26	56.60	63.66
		6/15/09	120.26	57.20	63.06
		12/10/09	120.26	58.00	62.26
		6/16/10	120.26	58.55	61.71
		12/15/10	120.26	60.20	60.06
		6/3/11	120.26	59.75	60.51
		12/2/11	120.26	59.35	60.91
		5/18/12	120.26	59.28	60.98
		11/16/12	120.26	59.74	60.52
		3/19/13	120.26	59.90	60.36
		9/18/13	120.26	60.38	59.88
		4/21/14	120.26	61.26	59.00
		9/24/14	120.26	66.88	53.38
		4/6/15	120.26	62.47	57.79
		10/9/15	120.26	63.20	57.06
		4//4/16	120.26	64.11	56.15
		10/6/16	**120.26**	**64.76**	**55.50**

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Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-6S	51 to 71	12/18/05	119.04	59.40	59.64
		5/22/06	119.04	55.86	63.18
		12/6/06	119.04	56.24	62.80
		6/2/07	121.17	56.17	65.00
		11/27/07	121.17	56.47	64.70
		7/14/08	121.17	57.10	64.07
		12/1/08	121.17	57.80	63.37
		6/15/09	121.17	58.30	62.87
		12/10/09	121.17	59.00	62.17
		6/16/10	121.17	59.55	61.62
		12/15/10	121.17	61.20	59.97
		6/3/11	121.17	60.35	60.82
		12/2/11	121.17	60.35	60.82
		5/18/12	121.17	60.35	60.82
		11/16/12	121.17	60.73	60.44
		3/19/13	121.17	60.86	60.31
		9/18/13	121.17	61.05	60.12
		4/21/14	121.17	61.88	59.29
		9/24/14	121.17	62.44	58.73
		4/6/15	121.17	63.26	57.91
		10/9/15	121.17	63.88	57.29
		4/4/16	121.17	64.84	56.33
		10/6/16	**121.17**	**65.57**	**55.60**
MW-6D	81 to 91	12/18/05	119.09	59.70	59.39
		5/22/06	119.09	56.45	62.64
		12/6/06	119.09	56.43	62.66
		6/2/07	121.21	56.18	65.03
		11/27/07	121.21	56.60	64.61
		7/14/08	121.21	57.30	63.91
		12/1/08	121.21	57.92	63.29
		6/15/09	121.21	58.45	62.76
		12/10/09	121.21	59.20	62.01
		6/16/10	121.21	59.70	61.51
		12/15/10	121.21	60.15	61.06
		6/3/11	121.21	60.45	60.76
		12/2/11	121.21	60.50	60.71
		5/18/12	121.21	60.45	60.76
		11/16/12	121.21	60.88	60.33
		3/19/13	121.21	61.12	60.09
		9/18/13	121.21	61.59	59.62
		4/21/14	121.21	62.44	58.77
		9/24/14	121.21	63.00	58.21
		4/6/15	121.21	63.68	57.53
		10/9/15	121.21	64.34	56.87
		4/4/16	121.21	65.16	56.05
		10/6/16	**121.21**	**66.10**	**55.11**

ARCADIS Design & Consultancy for natural and built assets

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-7S	53 to 73	12/18/05	119.65	60.08	59.57
		5/22/06	119.65	57.04	62.61
		12/6/06	119.65	57.27	62.38
		6/2/07	122.21	57.41	64.80
		11/27/07	122.21	58.00	64.21
		7/14/08	122.21	58.51	63.70
		12/1/08	122.21	59.15	63.06
		6/15/09	122.21	59.65	62.56
		12/10/09	122.21	60.35	61.86
		6/16/10	122.21	60.87	61.34
		12/15/10	122.21	62.05	60.16
		6/3/11	122.21	61.60	60.61
		12/2/11	122.21	61.65	60.56
		5/18/12	122.21	61.70	60.51
		11/16/12	122.21	62.11	60.10
		3/19/13	122.21	62.28	59.93
		9/18/13	122.21	62.73	59.48
		4/21/14	122.21	63.54	58.67
		9/24/14	122.21	64.14	58.07
		4/6/15	122.21	64.82	57.39
		10/9/15	122.21	65.00	57.21
		4/4/16	122.21	66.67	55.54
		10/6/16	**122.21**	**67.35**	**54.86**
MW-7D	86 to 96	12/18/05	119.62	60.66	58.96
		5/22/06	119.62	57.21	62.41
		12/6/06	119.62	57.50	62.12
		6/2/07	122.24	57.72	64.52
		11/27/07	122.24	58.25	63.99
		7/14/08	122.24	58.84	63.40
		12/1/08	122.24	59.47	62.77
		6/15/09	122.24	59.96	62.28
		12/10/09	122.24	60.13	62.11
		6/16/10	122.24	61.25	60.99
		12/15/10	122.24	61.80	60.44
		6/3/11	122.24	62.00	60.24
		12/2/11	122.24	62.00	60.24
		5/18/12	122.24	62.04	60.20
		11/16/12	122.24	62.42	59.82
		3/19/13	122.24	62.62	59.62
		3/19/13	122.24	63.10	59.14
		4/21/14	122.24	63.92	58.32
		9/24/14	122.24	64.58	57.66
		4/6/15	122.24	65.22	57.02
		10/9/15	122.24	65.89	56.35
		4/4/16	122.24	66.83	55.41
		10/6/16	**122.24**	**67.49**	**54.75**

ARCADIS Design & Consultancy for natural and built assets

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-8	86 to 96	12/18/05	119.09	59.85	59.24
		5/22/06	119.09	55.65	63.44
		12/6/06	119.09	56.60	62.49
		6/2/07	121.20	56.31	64.89
		11/27/07	121.20	56.80	64.40
		7/14/08	121.20	57.38	63.82
		12/1/08	121.20	58.10	63.10
		6/15/09	121.20	58.56	62.64
		12/10/09	121.20	59.35	61.85
		6/16/10	121.20	59.85	61.35
		12/15/10	121.20	60.30	60.90
		6/3/11	121.20	60.55	60.65
		12/2/11	121.20	60.60	60.60
		5/18/12	121.20	60.61	60.59
		11/16/12	121.20	61.00	60.20
		3/19/13	121.20	61.20	60.00
		9/18/13	121.20	61.72	59.48
		4/21/14	121.20	62.54	58.66
		9/24/14	121.20	63.14	58.06
		4/6/15	121.20	63.76	57.44
		10/9/15	121.20	65.44	55.76
		4/4/16	121.20	65.44	55.76
		10/6/16	**121.20**	**66.07**	**55.13**
MW-9	52 to 97	12/18/05	119.35	59.90	59.45
		5/22/06	119.35	56.57	62.78
		12/6/06	119.35	56.86	62.49
		6/2/07	121.49	56.55	64.94
		11/27/07	121.49	57.00	64.49
		7/14/08	121.49	57.52	63.97
		12/1/08	121.49	58.18	63.31
		6/15/09	121.49	58.76	62.73
		12/10/09	121.49	59.30	62.19
		6/16/10	121.49	59.88	61.61
		12/15/10	121.49	60.55	60.94
		6/3/11	121.49	60.35	61.14
		12/2/11	121.49	60.25	61.24
		5/18/12	121.49	60.17	61.32
		11/16/12	121.49	60.50	60.99
		3/19/13	121.49	60.75	60.74
		9/18/13	121.49	61.07	60.42
		4/21/14	121.49	61.68	59.81
		9/24/14	121.49	62.08	59.41
		4/6/15	121.49	62.71	58.78
		10/9/15	121.49	63.14	58.35
		4/4/16	121.49	64.00	57.49
		10/6/16	**121.49**	**64.72**	**56.77**

ARCADIS Design & Consultancy for natural and built assets

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-10	52 to 97	12/18/05	119.93	60.66	59.27
		5/22/06	119.93	57.38	62.55
		12/6/06	119.93	57.39	62.54
		6/2/07	121.80	57.09	64.71
		11/27/07	121.80	57.39	64.41
		7/14/08	121.80	57.90	63.90
		12/1/08	121.80	58.40	63.40
		6/15/09	121.80	58.80	63.00
		12/10/09	121.80	59.45	62.35
		6/16/10	121.80	59.78	62.02
		12/15/10	121.80	60.10	61.70
		6/3/11	121.80	60.25	61.55
		12/2/11	121.80	60.20	61.60
		5/18/12	121.80	60.26	61.54
		11/16/12	121.80	60.62	61.18
		3/19/13	121.80	60.65	61.15
		9/18/13	121.80	61.20	60.60
		4/21/14	121.80	61.78	60.02
		9/24/14	121.80	62.24	59.56
		4/6/15	121.80	63.28	58.52
		10/9/15	121.80	64.72	57.08
		4/4/16	121.80	66.30	55.50
		10/6/16	**121.80**	**67.70**	**54.10**
MW-11	50 to 95	12/18/05	120.43	58.75	61.68
		5/22/06	120.43	51.29	69.14
		12/6/06	120.43	51.33	69.10
		6/2/07	122.37	53.38	68.99
		11/27/07	122.37	51.00	71.37
		7/14/08	122.37	54.12	68.25
		12/1/08	122.37	58.26	64.11
		6/15/09	122.37	60.10	62.27
		12/10/09	122.37	61.10	61.27
		6/16/10	122.37	61.60	60.77
		12/15/10	122.37	61.40	60.97
		6/3/11	122.37	62.30	60.07
		12/2/11	122.37	62.35	60.02
		5/18/12	122.37	62.40	59.97
		11/16/12	122.37	62.79	59.58
		3/19/13	122.37	62.92	59.45
		9/18/13	122.37	63.45	58.92
		4/21/14	122.37	64.24	58.13
		9/24/14	122.37	64.84	57.53
		4/6/15	122.37	65.48	56.89
		10/9/15	122.37	66.36	56.01
		4/4/16	122.37	67.12	55.25
		10/6/16	**122.37**	**67.86**	**54.51**

ARCADIS Design & Consultancy for natural and built assets

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-12	40 to 75	12/18/05	NS	61.30	NA
		5/22/06	NS	57.92	NA
		12/6/06	NS	58.13	NA
		6/2/07	122.53	57.85	64.68
		11/27/07	122.53	58.21	64.32
		7/14/08	122.53	58.65	63.88
		12/1/08	122.53	59.32	63.21
		6/15/09	122.53	59.75	62.78
		12/10/09	122.53	60.45	62.08
		6/16/10	122.53	61.20	61.33
		12/15/10	122.53	62.25	60.28
		6/3/11	122.53	61.70	60.83
		12/2/11	122.53	61.50	61.03
		5/18/12	122.53	61.54	60.99
		11/16/12	122.53	61.82	60.71
		3/19/13	122.53	61.98	60.55
		9/18/13	122.53	62.25	60.28
		4/21/14	122.53	63.12	59.41
		9/24/14	122.53	63.68	58.85
		4/6/15	122.53	64.18	58.35
		10/9/15	122.53	64.61	57.92
		4/4/16	122.53	65.48	57.05
		10/6/16	**122.53**	**65.91**	**56.62**
MW-13A	50 to 70	5/17/12	121.99	59.40	62.59
		11/16/12	121.99	59.88	62.11
		3/19/13	121.99	60.00	61.99
		9/18/13	121.99	60.33	61.66
		4/21/14	121.99	59.99	62.00
		9/24/14	121.99	61.48	60.51
		4/6/15	121.99	61.97	60.02
		10/9/15	121.99	62.48	59.51
		4/4/16	121.99	63.30	58.69
		10/6/16	**121.99**	**63.85**	**58.14**
MW-13B	94 to 104	5/17/12	122.02	64.00	58.02
		11/16/12	122.02	64.36	57.66
		3/19/13[1]	122.02	65.04	56.98
		9/18/13	122.02	65.18	56.84
		4/21/14	122.02	65.94	56.08
		9/24/14	122.02	66.74	55.28
		4/6/15	122.02	67.53	54.49
		10/9/15	122.02	68.27	53.75
		4/4/16	122.02	69.14	52.88
		10/6/16	**122.02**	**69.96**	**52.06**

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-13C	120 to 130	5/17/12	121.81	71.35	50.46
		11/16/12	121.81	72.04	49.77
		3/19/13	121.81	72.07	49.74
		9/18/13	121.81	73.00	48.81
		4/21/14	121.81	73.95	47.86
		9/24/14	121.81	75.04	46.77
		4/6/15	121.81	75.82	45.99
		10/9/15	121.81	76.82	44.99
		4/4/16	121.81	77.62	44.19
		10/6/16	**121.81**	**78.58**	**43.23**
MW-14A	55 to 70	5/17/12	121.61	58.24	63.37
		11/16/12	121.61	58.74	62.87
		3/19/13	121.61	58.93	62.68
		9/18/13	121.61	59.26	62.35
		4/21/14	121.61	60.02	61.59
		9/24/14	121.61	60.40	61.21
		4/6/15	121.61	60.88	60.73
		10/9/15	121.61	61.36	60.25
		4/4/16	121.61	61.73	59.88
		10/6/16	**121.61**	**61.92**	**59.69**
MW-14B	85 to 95	5/17/12	121.48	62.25	59.23
		11/16/12	121.48	62.74	58.74
		3/19/13	121.48	62.87	58.61
		9/18/13	121.48	63.42	58.06
		4/21/14	121.48	64.24	57.24
		9/24/14	121.48	64.88	56.60
		4/6/15	121.48	65.54	55.94
		10/9/15	121.48	63.70	57.78
		4/4/16	121.48	67.15	54.33
		10/6/16	**121.48**	**67.81**	**53.67**
MW-14C	119 to 129	5/17/12	121.62	73.15	48.47
		11/16/12	121.62	73.96	47.66
		3/19/13	121.62	74.06	47.56
		9/18/13	121.62	75.22	46.40
		4/21/14	121.62	76.21	45.41
		9/24/14	121.62	77.47	44.15
		4/6/15	121.62	78.16	43.46
		10/9/15	121.62	79.32	42.30
		4/4/16	121.62	80.07	41.55
		10/6/16	**121.62**	**81.12**	**40.50**
MW-15A	55 to 70	5/17/12	117.79	56.34	61.45
		11/16/12	117.79	56.82	60.97
		3/19/13	117.79	56.96	60.83
		9/18/13	117.79	57.47	60.32
		4/21/14	117.79	58.19	59.60
		9/24/14	117.79	58.71	59.08
		4/6/15	117.79	59.52	58.27
		10/9/15	117.79	59.83	57.96
		4/4/16	117.79	60.46	57.33
		10/6/16	**117.79**	**60.94**	**56.85**

Table 2. Summary of Groundwater Gauging Data
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well Identification	Screen Interval (feet)	Date	Top of Casing (ft amsl)	Depth to Groundwater (feet)	Groundwater Elevation (ft amsl)
MW-15B	80 to 90	5/17/12	117.88	57.54	60.34
		11/16/12	117.88	58.00	59.88
		3/19/13	117.88	58.16	59.72
		9/18/13	117.88	58.72	59.16
		4/21/14	117.88	59.54	58.34
		9/24/14	117.88	60.16	57.72
		4/6/15	117.88	60.84	57.04
		10/9/15	117.88	61.52	56.36
		4/4/16	117.88	62.34	55.54
		10/6/16	**117.88**	**63.00**	**54.88**
MW-16	108 to 118	5/17/12	121.84	74.72	47.12
		11/16/12	121.84	75.89	45.95
		3/19/13	121.84	75.76	46.08
		9/18/13	121.84	77.00	44.84
		4/21/14	121.84	78.08	43.76
		9/24/14	121.84	79.44	42.40
		4/6/15	121.84	80.00	41.84
		10/9/15	121.84	79.44	42.40
		4/4/16	121.84	82.03	39.81
		10/6/16	**121.84**	**83.22**	**38.62**
MW-16C	132 to 142	5/17/12	121.89	75.36	46.53
		11/16/12	121.89	75.44	46.45
		3/19/13	121.89	76.48	45.41
		9/18/13	121.89	77.82	44.07
		4/21/14	121.89	78.82	43.07
		9/24/14	121.89	80.22	41.67
		4/6/15	121.89	80.92	40.97
		10/9/15	121.89	82.00	39.89
		4/4/16	121.89	82.84	39.05
		10/6/16	**121.89**	**84.00**	**37.89**
MW-17A	56 to 71	10/9/15	120.84	63.27	57.57
		4/4/16	120.84	64.04	56.80
		10/6/16	**120.84**	**64.65**	**56.19**
MW-17B	80 to 90	10/9/15	120.90	63.35	57.55
		4/4/16	120.90	64.20	56.70
		10/6/16	**120.90**	**64.82**	**56.08**
MW-17C	114 to 124	10/9/15	120.92	82.00	38.92
		4/4/16	120.92	82.93	37.99
		10/6/16	**120.92**	**84.18**	**36.74**

Notes:

ft amsl	Feet above mean sea level
NA	Not applicable
NM	Not measured
NS	Not surveyed

1. Depth to groundwater elevation was revised based on field measurement taken during HydraSleeve™ retrieval; Retrieval DTW was consistent with historical levels and the DTW of 84.60 as previously reported should be considered anomalous

Table 3. Summary of Second Semi-Annual 2016 Groundwater Analytical Results (VOCs and Field Parameters)
Brenntag South Gate
4545 Ardine Street, South Gate, California

Well ID	MW-1	MW-2	MW-2[1] DUP	MW-3	MW-4	MW-5S	MW-5D	MW-6S	MW-6D	MW-6D DUP	MW-7S	MW-7D	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13A[1]	MW-13B[1]	MW-13C[1]	MW-14A	MW-14B	MW-14C	MW-15A[1]	MW-15B	MW-16	MW-16C[1]	MW-17A	MW-17B	MW-17C[2]
	10/25/2016	10/25/2016	10/24/2016	10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/24/2016	10/26/2016	10/26/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/24/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/25/2016	10/25/2016	10/24/2016	10/24/2016	10/24/2016
VOCs by EPA Method 8260 B (µg/L)																														
Acetone	<25	<25	<25	<25	<250	<25	<25	<130	<50	<50	<25	<63	<25	<25	<25	<25	<25	<25	<25	**32.2**	<25	<63	**18.5 J**	<25	<25	<25	<25	<25	<25	<25
Benzene	**1.7**	**0.21 J**	**0.22 J**	<1.0	<10	<1.0	**0.48 J**	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**0.23 J**	**0.66 J**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromobenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0	<25	<10	<10	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**2.7 J**	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
sec-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	**0.44 J**	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	**1.2 J**	<1.0	**5.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.6**	**4.8**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	<1.0	<1.0	<1.0	**1.6**	**5.1 J**	<1.0	<1.0	<5.0	**0.93 J**	**0.92 J**	**5.5**	**8.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	**0.56 J**	<1.0	<1.0	<1.0	<1.0
2-Chlorotoluene (o)	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chlorotoluene (p)	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-Chloropropane	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0	<25	<10	<10	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dibromoethane	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene (o)	**0.33 J**	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	**68.6**	<1.0	**10.2**	<1.0	**0.82 J**	<1.0	<1.0	<1.0	<1.0	**0.91 J**	**447[b]**	<1.0	**2.9**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (m)	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	**0.59 J**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.1 J**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (p)	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	**10.4**	<1.0	**0.96 J**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**58.6**	<1.0	**0.70 J**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	**1.6**	**1.7**	**1.9**	**1.3**	**16.2**	<1.0	<1.0	<5.0	**0.93 J**	**0.82 J**	**5.6**	**3.9**	<1.0	**2.8**	**24.1**	**5.1**	**2.6**	<1.0	**5.1**	**0.68 J**	**11.5**	**2.4 J**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	<1.0	**2.5**	**2.7**	**1.1**	**15.5**	<1.0	<1.0	<5.0	<2.0	<2.0	**1.0**	**9.5**	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0	**0.36 J**	**0.34 J**	**0.32 J**	**7.3**	**0.73 J**	<1.0	**3.2**	<1.0	**4.7**	<1.0	<1.0	<1.0
1,1-Dichloroethylene	**1.5**	**0.83 J**	**0.89 J**	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	**1.3**	**2.1 J**	<1.0	**1.0**	**4.1**	**3.8**	**5.3**	<1.0	**4.9**	<1.0	**1.2**	**4.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
c-1,2-Dichloroethene	**1,020[a]**	**91.2**	**91.6**	**21.3**	**943**	**7.7**	**45.8**	**329**	**277[c]**	**259[c]**	**26.0**	**18.0**	**18.9**	**34.2**	**48.5**	**35.8**	**2.9**	<1.0	**11.0**	**0.33 J**	**27.4**	**186**	<1.0	**24.9**	**48.4**	**1.3**	**22.8**	**5.3**	<1.0	**3.0**
t-1,2-Dichloroethene	**22.5**	**4.9**	**4.8**	<1.0	**12.9**	<1.0	**1.3**	<5.0	**3.4**	**3.3**	**1.3**	<2.5	**0.64[a] J**	**1.5[a]**	**2.4[a]**	**1.8[a]**	<1.0	<1.0	<1.0	<1.0	**1.6**	**5.7**	<1.0	**1.6**	**12.9**	<1.0	**1.5**	<1.0	<1.0	<1.0
1,2-Dichloropropane	**11.3**	<1.0	**0.34 J**	<1.0	**15.8**	<1.0	<1.0	**3.8 J**	**4.0**	**3.7**	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**0.98 J**	<1.0	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0	<1.0
1,3-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloropropene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
c-1,3-Dichloropropene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
t-1,3-Dichloropropene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Hexanone	<10	<10	<10	<10	<100	<10	<10	<50	<20	<20	<10	<25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10	<10
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.1**	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0	<25	<10	<10	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-Pentanone	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0	<25	<10	<10	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0	<25	<10	<10	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0	**5.6**	**4.3**	<1.0	<1.0	<5.0	**1.5 J**	**1.6 J**	**50.8**	**76.3**	**6.7**	**3.6**	<1.0	**5.4**	<1.0	<1.0	<1.0	<1.0	<1.0	**71.3**	<1.0	<1.0	<1.0	**15.1**	<1.0	<1.0	<1.0	<1.0
Toluene	**0.35 J**	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**0.32 J**	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	**9.6**	**0.45 J**	**0.43 J**	**21.1**	**56.9**	**3.4**	<1.0	**21.8**	**32.3**	**33.0**	**94.4**	**174**	**14.7**	**14.9**	**13.6**	**84.4[b]**	**0.60 J**	<1.0	<1.0	**0.28 J**	**14.7**	**161**	**0.90 J**	**6.0**	**19.3**	**7.4**	**0.38 J**	**5.4**	<1.0	**2.0**
Trichlorofluoromethane	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trimethylbenzene	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	<1.0	<2.0	<2.0	<2.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	**0.86 J**	<1.0	**0.32 J**	<1.0	<10	<1.0	**0.93 J**	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes (p/m-Xylene and o-Xylene)	<3.0	<3.0	<3.0	<3.0	<30	<3.0	<3.0	<15	<6.0	<6.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Methyl-t-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<20	<20	<20	<20	<200	<20	<20	<100	<40	<40	<20	<50	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<20	<20	<20	<20	<20	<20	<20	<20
Diisopropyl Ether (DIPE)	**2.5**	**2.0**	**2.0**	**0.33 J**	**4.8 J**	<1.0	**0.31 J**	<5.0	<2.0	<2.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**0.59 J**	**1.9**	<1.0	**0.26 J**	<1.0	**3.4**	<1.0	<1.0	**0.34 J**
Ethyl-t-Butyl Ether (ETBE)	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tert-Amyl-Methyl Ether (TAME)	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<10	<4.0	<4.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Other Parameters																														
1,4 Dioxane by EPA Method 8270C (M)	**0.96**	**1.8**	**1.8**	**0.36**	**0.74**	**0.19 J**	**2.2**	**0.16 J**	<0.29	<0.29	**2.5**	**3.0**	**0.41**	**2.6**	**197**	**14.1**	**16.1**	<0.29	**14.4**	**2.4**	**513**	**4.3**	**2.1**	<0.29	**3.1**	**1.1**	**0.59**	<0.30	<0.28	<0.28
pH (Standard units)	--	7.51	--	6.73	7.10	6.91	6.73	7.68	7.60	--	--	--	--	--	--	--	7.42	8.06	7.16	--	--	8.30	8.66	--	6.97	6.93	7.16	--	6.61	6.85
Specific Conductance (milliSiemens per centimeter)	--	1.8	--	1.01	1.16	1.17	0.317	2.31	0.410	--	--	--	--	--	--	--	2.51	1.56	1.93	--	--	2.79	1.52	--	1.89	--	1.520	--	0.953	1.20
Oxidation Reduction Potential (ORP) (millivolts)	--	13	--	40	-2	-66	42	-119	39	--	--	--	--	--	--	--	-17	38	-31	--	--	9	-18	--	60	90	-44	--	88	-21
Dissolved Oxygen (DO) (mg/L)	--	3.3	--	4.11	8.29	3.7	7.7	1.74	4.00	--	--	--	--	--	--	--	1.80	4.08	8.60	--	--	2.61	2.82	--	3.59	2.50	2.58	--	4.05	3.18
Turbidity (NTUs)	--	0.0	--	8.9	0.0	0.0	0.0	19.7	40.5	--	--	--	--	--	--	--	360	701	93.4	--	--	830	67.5	--	294	66.9	66.8	--	349	65.4
Temperature (Degrees Celsius)	--	24.81	--	26.21	26.45	25.10	24.21	26.73	26.37	--	--	--	--	--	--	--	28.21	26.69	25.81	--	--	22.89	22.59	--	20.95	18.74	19.22	--	19.92	20.84

Notes:

µg/L	Micrograms per liter
<1.0	Not detected at or above indicated laboratory reporting limit
--	Not analyzed
VOCs	Volatile organic compounds
DUP	Duplicate sample
NTU	Nephelometric turbidity unit
MEK	Methyl Ether Ketone
EPA	Environmental Protection Agency
J	Indicates an estimated value
a	Result is from Run# 2
b	Result is from Run# 3
c	Sample re-analyzed beyond hold time
d	Associated CCV outside control limits
1	Methyl Chloride was detected in MW-2 (DUP) at a concentration of 0.82 J,d; in MW-13A at a concentration of 0.93 J,d; in MW-13B at a concentration of 0.75 J,c; in MW-13C at a concentration of 0.72 J,d; in MW-14C at a concentration of 2.4, in MW-15A at a concertation of 0.72 J, and in MW-16C at a concentration of 0.82 J
2	Sample vial(s) contained bubbles greater than 6mm; reported results are considered minimum values

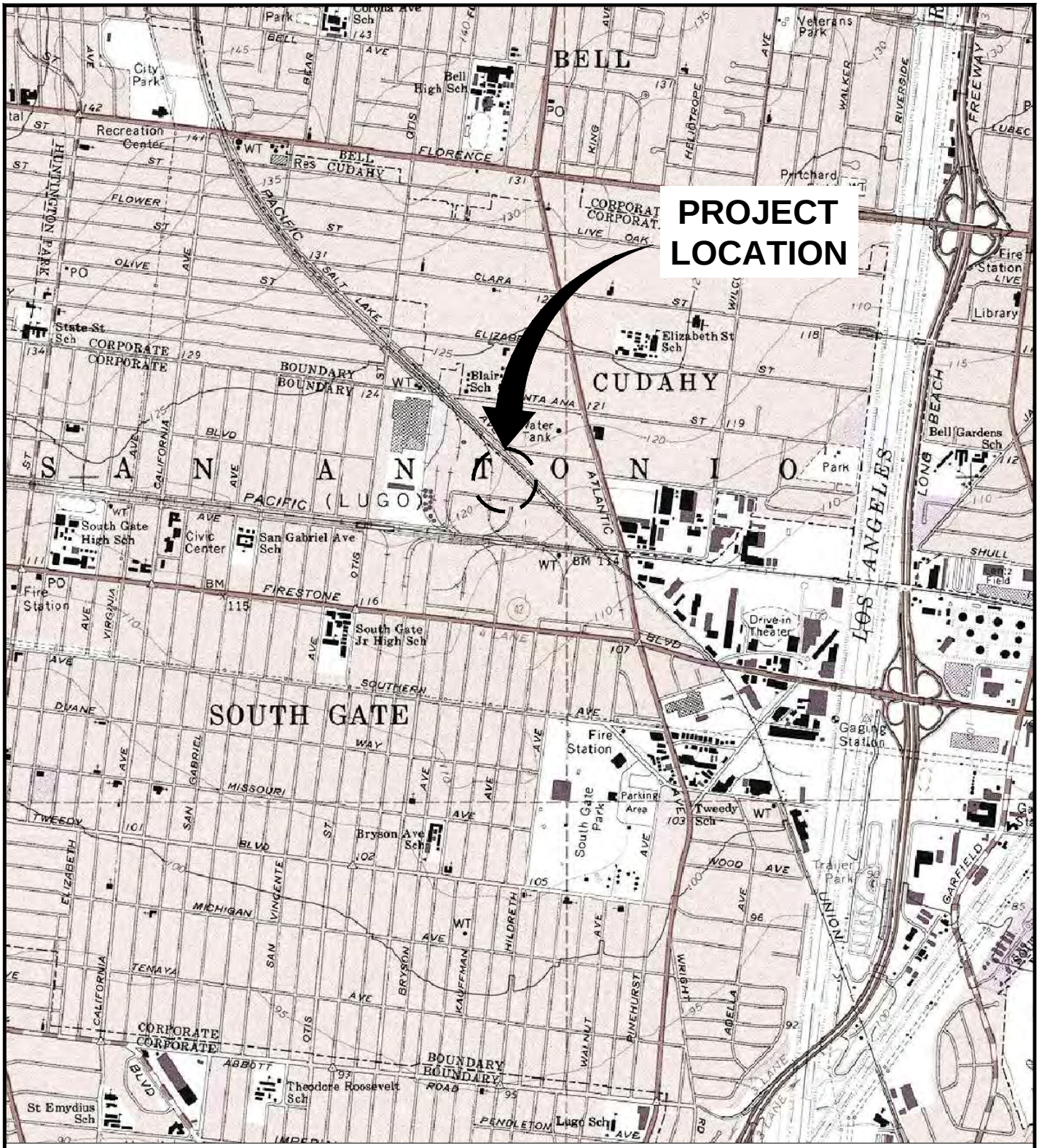
Table 4. Summary of Second Semi-Annual 2016 Groundwater Analytical Results (Metals and TPH)
Brenntag South Gate, South Gate, California
4545 Ardine Street, South Gate, California

Well ID	MW-1	MW-2	MW-2 DUP	MW-3	MW-4	MW-5S	MW-5D	MW-6S	MW-6D	MW-6D DUP	MW-7S	MW-7D	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13A	MW-13B	MW-13C	MW-14A	MW-14B	MW-14C	MW-15A	MW-15B	MW-16	MW-16C	MW-17A	MW-17B	MW-17C
Date Sampled	10/25/2016	10/25/2016	10/24/2016	10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/24/2016	10/26/2016	10/26/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/24/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/25/2016	10/25/2016	10/24/2016	10/24/2016	10/24/2016
Total Metals by EPA 6010/7000 (mg/L)																														
Antimony	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	**0.0070**	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	**0.0069**	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	**0.397**	**0.0291**	**0.0298**	**0.0113**	**0.0640**	**0.0123**	**0.0191**	**0.881**	**0.298**	**0.335**	<0.010	**1.04**	**1.10**	<0.010	<0.010	<0.010	<0.010	**0.0147**	<0.010	**0.0240**	**0.0196**	<0.010	**0.0510**	**0.0110**	**0.0100**	**5.40**	**0.0711**	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.437**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cadmium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.0117**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chromium	**0.0173**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.0136**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.0702**	**0.0206**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.0184**	<0.010
Cobalt	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Copper	**0.183**	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	**0.212**	**0.0657**	**0.104**	**0.0876**	**0.0286**	**0.0667**	<0.025	<0.025	**0.0280**	<0.025	<0.025	<0.025	<0.025	**0.105**	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Lead	**0.0242**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.0227**	**0.0085**	**0.0288**	<0.0050	<0.0050	**0.0110**	<0.0050	<0.0050	**0.0052**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.0151**	**0.0061**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Mercury	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Molybdenum	**0.132**	<0.050	<0.050	<0.050	**0.0810**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.0561**	**0.0606**	**0.0789**	**0.0777**	**0.0624**	**0.0522**	<0.050	<0.050	<0.050	<0.050	<0.050	**0.0591**	**0.0630**	**0.105**	<0.050	**0.110**	<0.050	<0.050
Nickel	**0.359**	**0.0458**	**0.0467**	<0.040	**0.0969**	<0.040	<0.040	**0.0404**	<0.040	**0.0460**	**0.320**	**0.224**	<0.040	<0.040	**0.0819**	**0.304**	**0.0402**	<0.040	<0.040	<0.040	**0.120**	**0.104**	<0.040	<0.040	<0.040	**0.0928**	<0.040	<0.040	<0.040	<0.040
Selenium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.0113**	<0.010	<0.010	**0.0114**	**0.0185**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Thallium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.127**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Zinc	**0.319**	**0.051**	**0.0511**	**0.132**	**0.113**	<0.020	**0.0229**	**0.316**	**0.306**	**0.449**	<0.020	**0.104**	**0.486**	<0.020	<0.020	**0.0425**	<0.020	**0.0226**	<0.020	**0.0509**	**0.310**	**0.0909**	**0.0408**	<0.020	<0.020	**0.0329**	<0.020	**0.0228**	**0.0609**	<0.020
TPH C6-C10 by EPA Method 8260 (µg/L); TPH C10-C40 by EPA Method 8015B (µg/L)																														
C6-C10	**579**	<100	**53.1 J**	<100	**601**	<100	<100	**176**	**202**	**184**	**70.5 J**	**130**	<100	<100	**66.8 J**	**69.5**	<100	<100	<100	<100	**61.8**	**246**	<200	<100	<100	<100	<100	<100	<100	<100
C10-C28	**971**	**217**	**168**	**62.9**	**446**	**39.3 J**	**203**	**1,020**	**515**	--	**420**	**644**	**519**	**491**	**218**	**250**	**2,180**	--	--	--	--	--	--	--	--	--	--	--	**--**	--	--
C28-C40	**747**	**207**	**59.7**	**31.2 J**	**84.0**	**22.6 J**	**92.0**	**501**	**359**	--	**181**	**218**	**186**	**234**	**124**	**123**	**292**	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

µg/L	Micrograms per liter
mg/L	Milligrams per liter
<0.0050	Not detected above indicated laboratory reporting limit
--	Not analyzed
NS	Not sampled
J	Indicates an estimated value
B	Indicates analyte found in associated method blank
Dup	Duplicate sample
EPA	Environmental Protection Agency
TPH	Total petroleum hydrocarbons

FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., SOUTH GATE, CALIFORNIA, 1964, PHOTOREVISED 1981

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.

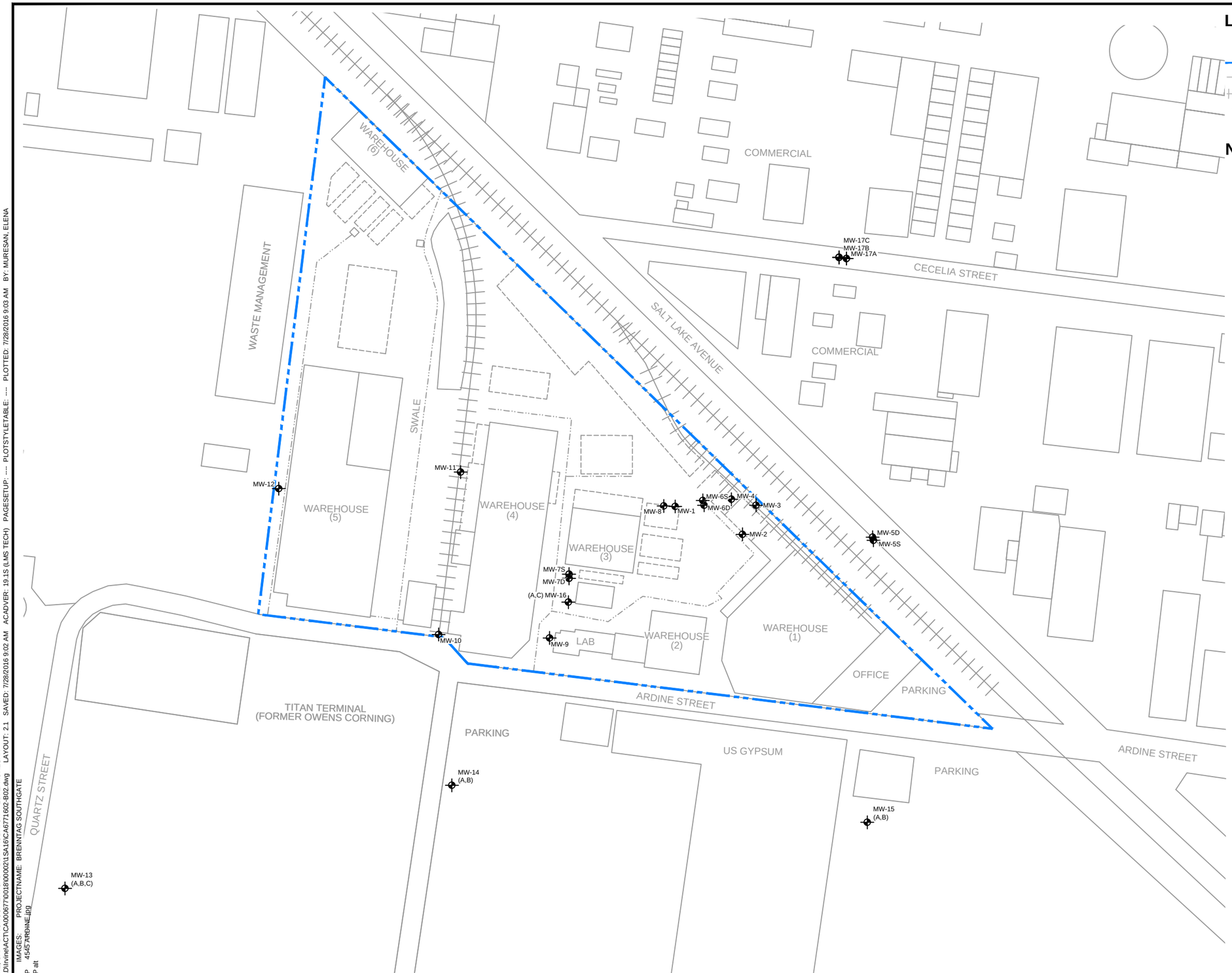
BRENNTAG SOUTH GATE, INC.
4545 ARDINE STREET, SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:LONG BEACH, CA. DIV/GROUP:ENVDAD LD:R. HUBATCH LYR:(Opt)ON=*;OFF=*REF*
C:\ENVCAD.LONG BEACH.ACT\CA0006771\0016\00002\2015 2SA\DWG\CA6771602-B01.dwg LAYOUT: FIG 1 SAVED: 12/2/2015 9:51 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 12/4/2015 9:59 AM BY: HUBATCH, RICK
IMAGES: PROJECTNAME: Brenntah - South Gate
01_sitemap.JPG



LEGEND

- GROUNDWATER MONITORING WELL
- PROPERTY BOUNDARY
- CONCRETE SWALE
- RAILROAD TRACKS
- DRUM STORAGE AREA

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'

GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

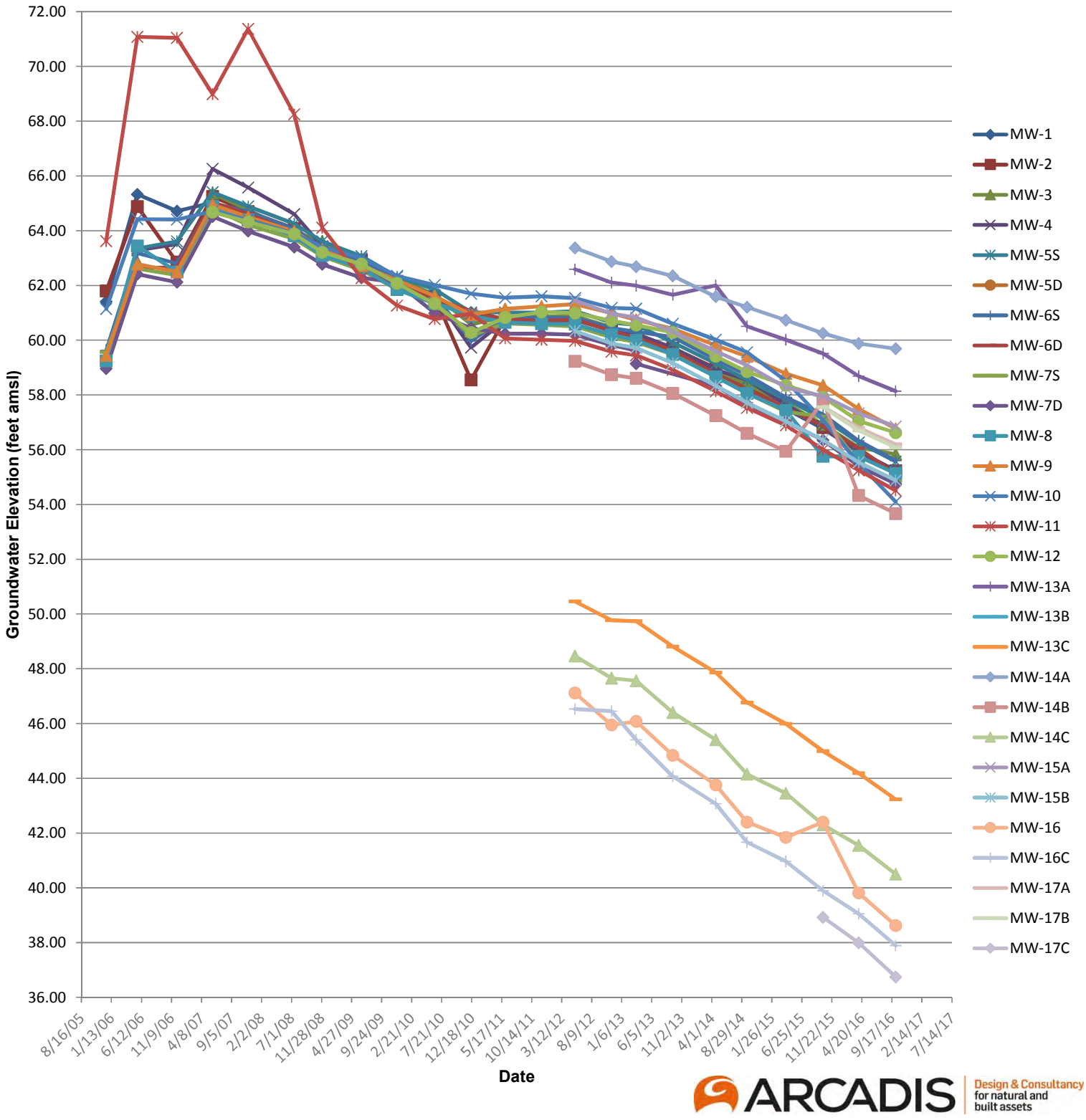
SITE PLAN SHOWING MONITORING WELL LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

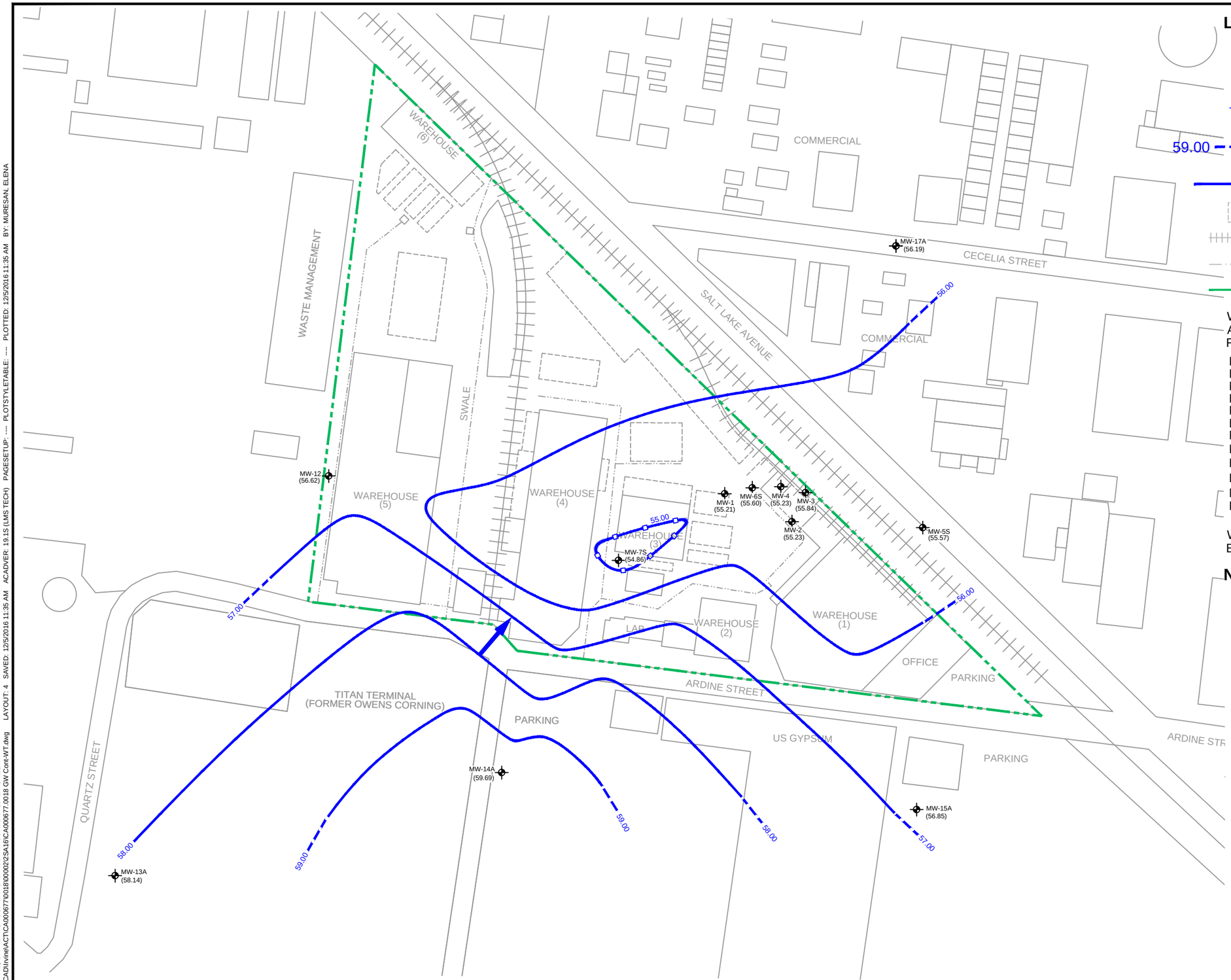
FIGURE
2

CITY:IRVINE, CA DIV/GROUP:ENVCAD DB:R. HUBATCH LD: E. MURESAN
G:\ENVCAD\Irvine\ACT\CA0006771\0018\00002\1SA16\CA6771602-B02.dwg LAYOUT: 2.1 SAVED: 7/28/2016 9:02 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/28/2016 9:03 AM BY: MURESAN, ELENA
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP 4545 ARDINE.jpg
BASEMAP alt

FIGURE 3
MONITORING WELL HYDROGRAPH
DECEMBER 2005 TO PRESENT
BRENNTAG SOUTH GATE
4545 ARDINE STREET, SOUTH GATE, CALIFORNIA



ARCADIS Design & Consultancy for natural and built assets



LEGEND

- GROUNDWATER MONITORING WELL
- (59.69) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 59.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- SEPARATE SYMBOLS INDICATES LOWER ELEVATION
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-1 (65-75)
MW-2 (50-85)
MW-3 (50-85)
MW-4 (50-85)
MW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13A (55-70)
MW-14A (55-70)
MW-15A (55-70)
MW-17A (56-71)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'
GRAPHIC SCALE

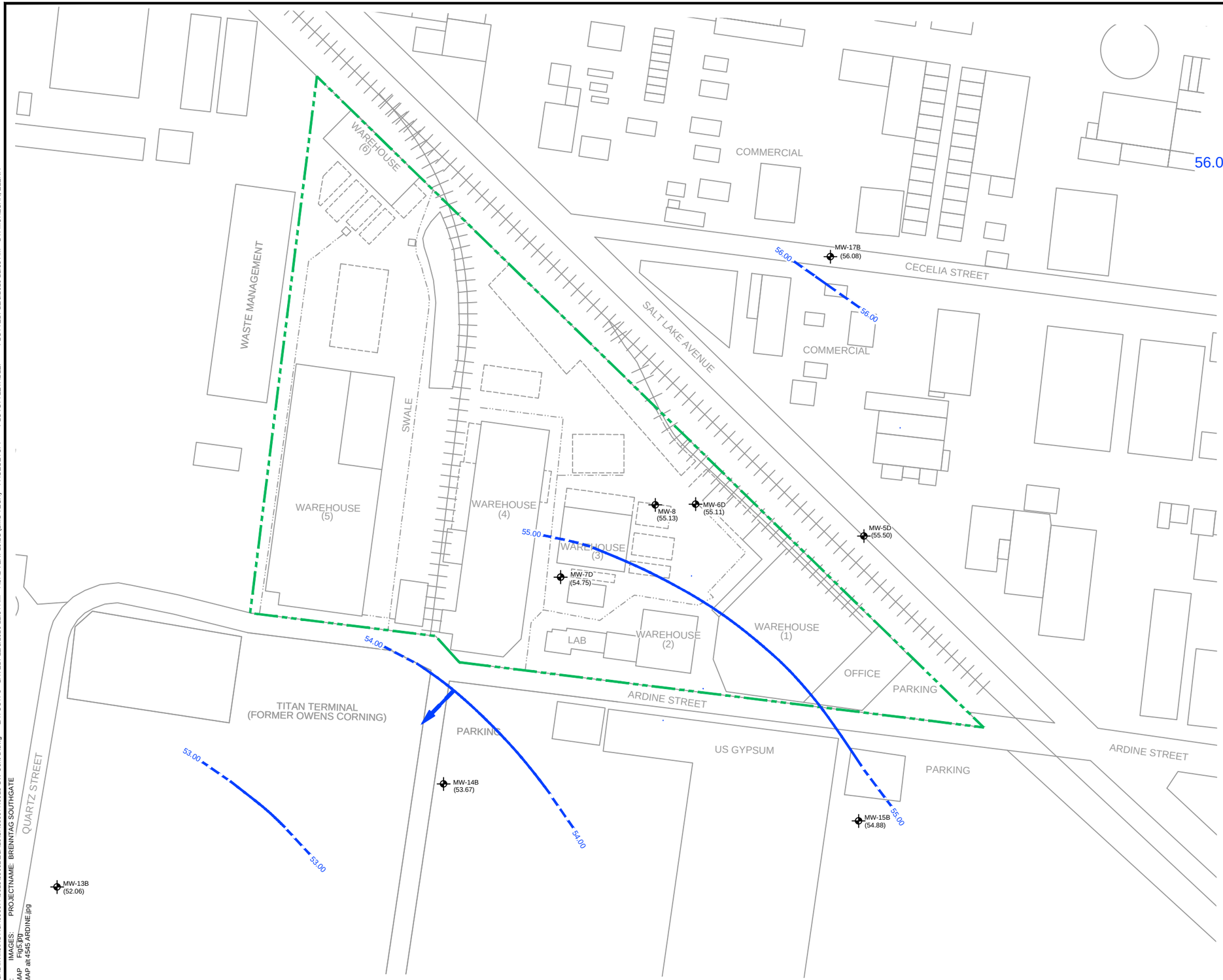
BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
WELLS SCREENED IN THE WATER TABLE
OCTOBER 6, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

CITY:IRVINE, CA DIV/GROUP:ENVCAD DB:R. HUBATCH LD:E.MURESAN
G:\ENVCAD\Irvine\ACT\CA000677\0018\00002\2SA16\CA000677.0018 GW Cont-WT.dwg LAYOUT: 4 SAVED: 12/5/2016 11:35 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/5/2016 11:35 AM BY: MURESAN, ELENA



LEGEND

- GROUNDWATER MONITORING WELL
- (56.08) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 56.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13B (94-104)
MW-14B (85-95)
MW-15B (80-90)
MW-17B (80-90)

WELL WITH SCREENS DEEPER THAN 105 FT BGS WERE NOT USED IN CONTOURING

* NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'
GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP DEEP WELLS OCTOBER 6, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

CITY:IRVINE, CA DIV/GROUP:ENVCAD DB:R. HUBATCH LD:E.MURESAN
G:\ENVCAD\Irvine\ACT\CA000677\0018\00002\2SA16\CA000677.0018 GW Cont-D.dwg LAYOUT: 5 SAVED: 12/5/2016 11:34 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/5/2016 11:35 AM BY: MURESAN, ELENA
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP Fig5.jpg
BASEMAP alt 4545 ARDINE.jpg

	MW-17B	MW-17C	MW-17A
Benzene	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0
Chloroform	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0
1,1-Dichloroethene	<1.0	<1.0	<1.0
c-1,2-Dichloroethene	<1.0	3.0	5.3
t-1,2-Dichloroethene	<1.0	<1.0	<1.0
1,2-Dichloropropane	<1.0	<1.0	<1.0
Tetrachloroethene	<1.0	<1.0	<1.0
Trichloroethene	<1.0	2.0	5.4
Vinyl Chloride	<1.0	<1.0	<1.0
Tert-Butyl Alcohol	<20	<20	<20
Di-isopropyl Ether	<1.0	0.34 J	<1.0
1,4-Dioxane	<0.28	<0.28	<0.30

	MW-10	MW-7D	MW-11	MW-1	MW-6D
Benzene	<1.0	<2.5	<1.0	1.7	<2.0
Chlorobenzene	<1.0	1.2 J	<1.0	0.44 J	<2.0
Chloroform	<1.0	8.2	<1.0	<1.0	0.93 J
1,2-Dichlorobenzene	<1.0	68.6	0.82 J	0.33 J	<2.0
1,4-Dichlorobenzene	<1.0	10.4	<1.0	<1.0	<2.0
1,1-Dichloroethane	24.1	3.9	5.1	1.6	0.93 J
1,2-Dichloroethane	<1.0	9.5	1.1	<1.0	<2.0
1,1-Dichloroethene	4.1	2.1 J	3.8	1.5	<2.0
c-1,2-Dichloroethene	48.5	18.0	35.8	1,020a	277c
t-1,2-Dichloroethene	2.4a	<2.5	1.8a	22.5	3.4
1,2-Dichloropropane	<1.0	<2.5	<1.0	11.3	4.0
Tetrachloroethene	<1.0	76.3	5.4	<1.0	1.5 J
Trichloroethene	13.6	174	84.4b	9.6	32.3
Vinyl Chloride	<1.0	<2.5	<1.0	0.86 J	<2.0
Tert-Butyl Alcohol	<20	<50	<20	<20	<40
Di-isopropyl Ether	<1.0	<2.5	<1.0	2.5	<2.0
1,4-Dioxane	197	3.0	14.1	0.96	<0.29

	MW-12	MW-9	MW-7S	MW-8	MW-6S	MW-6D DUP	MW-3
Benzene	<1.0	<1.0	<1.0	<1.0	<5.0	<2.0	<1.0
Chlorobenzene	<1.0	5.1	<1.0	<1.0	<5.0	<2.0	<1.0
Chloroform	<1.0	<1.0	5.5	<1.0	<5.0	0.92 J	1.6
1,2-Dichlorobenzene	<1.0	10.2	<1.0	<1.0	<5.0	<2.0	<1.0
1,4-Dichlorobenzene	<1.0	0.96 J	<1.0	<1.0	<5.0	<2.0	<1.0
1,1-Dichloroethane	2.6	2.8	5.6	<1.0	<5.0	0.82 J	1.3
1,2-Dichloroethane	<1.0	<1.0	1.0	<1.0	<5.0	<2.0	1.1
1,1-Dichloroethene	5.3	1.0	1.3	<1.0	<5.0	<2.0	<1.0
c-1,2-Dichloroethene	2.9	34.2	26.0	18.9	329	259c	21.3
t-1,2-Dichloroethene	<1.0	1.5a	1.3	0.64a J	<5.0	3.3	<1.0
1,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	3.8 J	3.7	<1.0
Tetrachloroethene	<1.0	3.6	50.8	6.7	<5.0	1.6 J	5.6
Trichloroethene	0.60 J	14.9	94.4	14.7	21.8	33.0	21.1
Vinyl Chloride	<1.0	<1.0	<1.0	<1.0	<5.0	<2.0	<1.0
Tert-Butyl Alcohol	<20	<20	<20	<20	<100	<40	<20
Di-isopropyl Ether	<1.0	<1.0	<1.0	<1.0	<5.0	<2.0	0.33 J
1,4-Dioxane	16.1	2.6	2.5	0.41	0.16 J	<0.29	0.36

	MW-2	MW-2 DUP
Benzene	0.21 J	0.22 J
Chlorobenzene	<1.0	<1.0
Chloroform	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0
1,1-Dichloroethane	1.7	1.9
1,2-Dichloroethane	2.5	2.7
1,1-Dichloroethene	0.83 J	0.89 J
c-1,2-Dichloroethene	91.2	91.6
t-1,2-Dichloroethene	4.9	4.8
1,2-Dichloropropane	<1.0	0.34 J
Tetrachloroethene	<1.0	<1.0
Trichloroethene	0.45 J	0.43 J
Vinyl Chloride	<1.0	0.32 J
Tert-Butyl Alcohol	<20	<20
Di-isopropyl Ether	2.0	2.0
1,4-Dioxane	1.8	1.8

	MW-14A	MW-14B	MW-14C
Benzene	0.23 J	0.66 J	<1.0
Chlorobenzene	2.6	4.8	<1.0
Chloroform	<1.0	<2.5	<1.0
1,2-Dichlorobenzene	0.91 J	447b	<1.0
1,4-Dichlorobenzene	<1.0	58.6	<1.0
1,1-Dichloroethane	11.5	2.4 J	<1.0
1,2-Dichloroethane	0.32 J	7.3	0.73 J
1,1-Dichloroethene	1.2	4.1	<1.0
c-1,2-Dichloroethene	27.4	186	<1.0
t-1,2-Dichloroethene	1.6	5.7	<1.0
1,2-Dichloropropane	<1.0	0.98 J	<1.0
Tetrachloroethene	<1.0	71.3	<1.0
Trichloroethene	14.7	161	0.90 J
Vinyl Chloride	<1.0	<2.5	<1.0
Tert-Butyl Alcohol	<20	<50	<20
Di-isopropyl Ether	<1.0	0.59 J	1.9
1,4-Dioxane	513	4.3	2.1

	MW-5S	MW-5D
Benzene	<1.0	0.48 J
Chlorobenzene	<1.0	<1.0
Chloroform	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0
1,1-Dichloroethene	<1.0	<1.0
c-1,2-Dichloroethene	7.7	45.8
t-1,2-Dichloroethene	<1.0	1.3
1,2-Dichloropropane	<1.0	<1.0
Tetrachloroethene	<1.0	<1.0
Trichloroethene	3.4	<1.0
Vinyl Chloride	<1.0	0.93 J
Tert-Butyl Alcohol	<20	<20
Di-isopropyl Ether	<1.0	0.31 J
1,4-Dioxane	0.19 J	2.2

	MW-13A	MW-13B	MW-13C	MW-16	MW-16C	MW-4
Benzene	<1.0	<1.0	<1.0	<1.0	<1.0	<10
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<10
Chloroform	<1.0	<1.0	<1.0	0.56 J	<1.0	5.1 J
1,2-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<10
1,4-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<10
1,1-Dichloroethane	<1.0	5.1	0.68 J	<1.0	<1.0	16.2
1,2-Dichloroethane	<1.0	0.36 J	0.34 J	<1.0	4.7	15.5
1,1-Dichloroethene	<1.0	4.9	<1.0	<1.0	<1.0	<10
c-1,2-Dichloroethene	<1.0	11.0	0.33 J	1.3	22.8	943
t-1,2-Dichloroethene	<1.0	<1.0	<1.0	<1.0	1.5	12.9
1,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	1.1	15.8
Tetrachloroethene	<1.0	<1.0	<1.0	15.1	<1.0	4.3
Trichloroethene	<1.0	<1.0	0.28 J	7.4	0.38 J	56.9
Vinyl Chloride	<1.0	<1.0	<1.0	<1.0	<1.0	<10
Tert-Butyl Alcohol	<20	<20	<20	<20	<20	<200
Di-isopropyl Ether	<1.0	<1.0	<1.0	<1.0	3.4	4.8 J
1,4-Dioxane	<0.29	14.4	2.4	1.1	0.59	0.74

	MW-15A	MW-15B
Benzene	<1.0	<1.0
Chlorobenzene	<1.0	<1.0
Chloroform	<1.0	<1.0
1,2-Dichlorobenzene	2.9	<1.0
1,4-Dichlorobenzene	0.70 J	<1.0
1,1-Dichloroethane	<1.0	<1.0
1,2-Dichloroethane	<1.0	3.2
1,1-Dichloroethene	<1.0	<1.0
c-1,2-Dichloroethene	24.9	48.4
t-1,2-Dichloroethene	1.6	12.9
1,2-Dichloropropane	<1.0	<1.0
Tetrachloroethene	<1.0	<1.0
Trichloroethene	6.0	19.3
Vinyl Chloride	<1.0	<1.0
Tert-Butyl Alcohol	<20	<20
Di-isopropyl Ether	<1.0	0.26 J
1,4-Dioxane	<0.29	3.1

LEGEND

- GROUNDWATER MONITORING WELL
- PROPERTY BOUNDARY
- CONCRETE SWALE
- RAILROAD TRACKS
- DRUM STORAGE AREA

t-1,2-DICHLOROETHENE	TRANS-1,2-DICHLOROETHENE
c-1,2-DICHLOROETHENE	cis-1,2-DICHLOROETHENE
VOCs	VOLATILE ORGANIC COMPOUNDS
<1.0	COMPOUND NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMIT
A	RESULT IS FRON RUN #2
B	RESULT IS FRON RUN #3
C	SAMPLE RE-ANALYZED BEYOND HOLD TIME
D	ASSOCIATED CCV OUTSIDE CONTROL LIMITS
J	INDICATES AN ESTIMATED VALUE
--	NOT ANALYZED
NS	NOT SAMPLED

NOTES

1. ALL RESULTS EXPRESSED IN MICROGRAMS PER LITER.
2. FOR A FULL LIST OF DETECTIONS PLEASE SEE THE ANALYTICAL REPORT IN APPENDIX B OF THIS REPORT.

0 150' 300'

GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA

SECOND SEMI-ANNUAL 2016 GROUNDWATER MONITORING REPORT

DISTRIBUTION OF SELECT VOCs AND 1,4-DIOXANE IN GROUNDWATER OCTOBER 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6

CITY: IRVINE, CA DIV/GROUP: ENCVAD LD: E. MURESAN
G:\ENVCAD\Irvine\ACT\CA000677\0018\00002\2SA16\CA000677-FIG6.dwg LAYOUT: 6 SAVED: 1/30/2017 10:32 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/30/2017 10:33 AM BY: MURESAN, ELENA
XREFS: BASEMAP BASEMAP alt IMAGES: 4545 ARDINE.jpg PROJECTNAME: BRENNTAG SOUTHGATE

MW-12	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.0624
Nickel	0.0402
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-1	
Antimony	<0.0060
Arsenic	0.397
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	0.0173
Cobalt	<0.050
Copper	0.183
Lead	0.0242
Mercury	<0.00050
Molybdenum	0.132
Nickel	0.359
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.319

MW-6S	
Antimony	<0.0060
Arsenic	0.881
Barium	<0.20
Beryllium	<0.0040
Cadmium	0.0117
Chromium	<0.010
Cobalt	<0.050
Copper	0.212
Lead	0.0227
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.0404
Selenium	0.0113
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.316

MW-6D DUP	
Antimony	< 0.0060
Arsenic	0.322
Barium	< 0.20
Beryllium	< 0.0050
Cadmium	0.0022
Chromium	< 0.010
Cobalt	< 0.0050
Copper	0.0942
Lead	0.0154
Mercury	<0.00020
Molybdenum	<0.020
Nickel	0.0120
Selenium	< 0.010
Silver	< 0.0050
Thallium	< 0.010
Vanadium	0.0149
Zinc	0.223

Vanadium	<0.050
Zinc	0.306

MW-6D DUP	
Antimony	<0.0060
Arsenic	0.335
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	0.0136
Cobalt	<0.050
Copper	0.104
Lead	0.0288
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.046
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.449

MW-17C	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-17B	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	0.0184
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0609

MW-17A	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.11
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0228

MW-9	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.0606
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-11	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	0.028
Lead	0.0052
Mercury	<0.00050
Molybdenum	0.0777
Nickel	0.304
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0425

MW-8	
Antimony	<0.0060
Arsenic	1.1
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	0.0667
Lead	0.011
Mercury	<0.00050
Molybdenum	0.0561
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.486

MW-4	
Antimony	<0.0060
Arsenic	0.064
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.081
Nickel	0.0969
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.113

MW-3	
Antimony	<0.0060
Arsenic	0.0113
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.132

MW-2	
Antimony	<0.0060
Arsenic	0.0291
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.0458
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.051

MW-2 DUP	
Antimony	<0.0060
Arsenic	0.0298
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.0467
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0511

MW-10	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.0789
Nickel	0.0819
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-14A	
Antimony	<0.0060
Arsenic	0.0196
Barium	0.437
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	0.0702
Cobalt	<0.050
Copper	0.105
Lead	0.0151
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.12
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	0.127
Zinc	0.31

MW-14B	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	0.0206
Cobalt	<0.050
Copper	<0.025
Lead	0.0061
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.104
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0909

MW-14C	
Antimony	<0.0060
Arsenic	0.051
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0408

MW-13A	
Antimony	<0.0060
Arsenic	0.0147
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.0522
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0226

MW-13B	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-13C	
Antimony	0.007
Arsenic	0.024
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0509

MW-16	
Antimony	0.0069
Arsenic	5.4
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.105
Nickel	0.0928
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0329

MW-16C	
Antimony	<0.0060
Arsenic	0.0711
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-7D	
Antimony	<0.0060
Arsenic	1.04
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	0.0286
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.224
Selenium	0.0185
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.104

MW-7S	
Antimony	<0.0060
Arsenic	<0.010
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	0.0876
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	0.32
Selenium	0.0114
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-15A	
Antimony	<0.0060
Arsenic	0.011
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.0591
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-15B	
Antimony	<0.0060
Arsenic	0.01
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	0.063
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

MW-5D	
Antimony	<0.0060
Arsenic	0.0191
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	0.0229

MW-5S	
Antimony	<0.0060
Arsenic	0.0123
Barium	<0.20
Beryllium	<0.0040
Cadmium	<0.0050
Chromium	<0.010
Cobalt	<0.050
Copper	<0.025
Lead	<0.0050
Mercury	<0.00050
Molybdenum	<0.050
Nickel	<0.040
Selenium	<0.010
Silver	<0.010
Thallium	<0.010
Vanadium	<0.050
Zinc	<0.020

SALT LAKE AVENUE
CECELIA STREET
ARDINE STREET
QUARTZ STREET
SWALE
WAREHOUSE (5)
WAREHOUSE (4)
WAREHOUSE (3)
WAREHOUSE (2)
WAREHOUSE (1)
LAB
OFFICE
PARKING
US GYPSUM
MW-1
MW-2
MW-3
MW-4
MW-5D
MW-5S
MW-6D
MW-6S
MW-7D
MW-7S
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13 (A,B,C)
MW-14 (A,B,C)
MW-15 (A,B)
MW-16 (A,C)
MW-17A
MW-17B
MW-17C

LEGEND

- GROUNDWATER MONITORING WELL
- PROPERTY BOUNDARY
- CONCRETE SWALE
- RAILROAD TRACKS
- DRUM STORAGE AREA
- <0.050 COMPOUND NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMIT
- -- NOT ANALYZED
- NS NOT SAMPLED

NOTE

1. ALL RESULTS EXPRESSED IN MILLIGRAMS PER LITER.

0 150' 300'

GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA

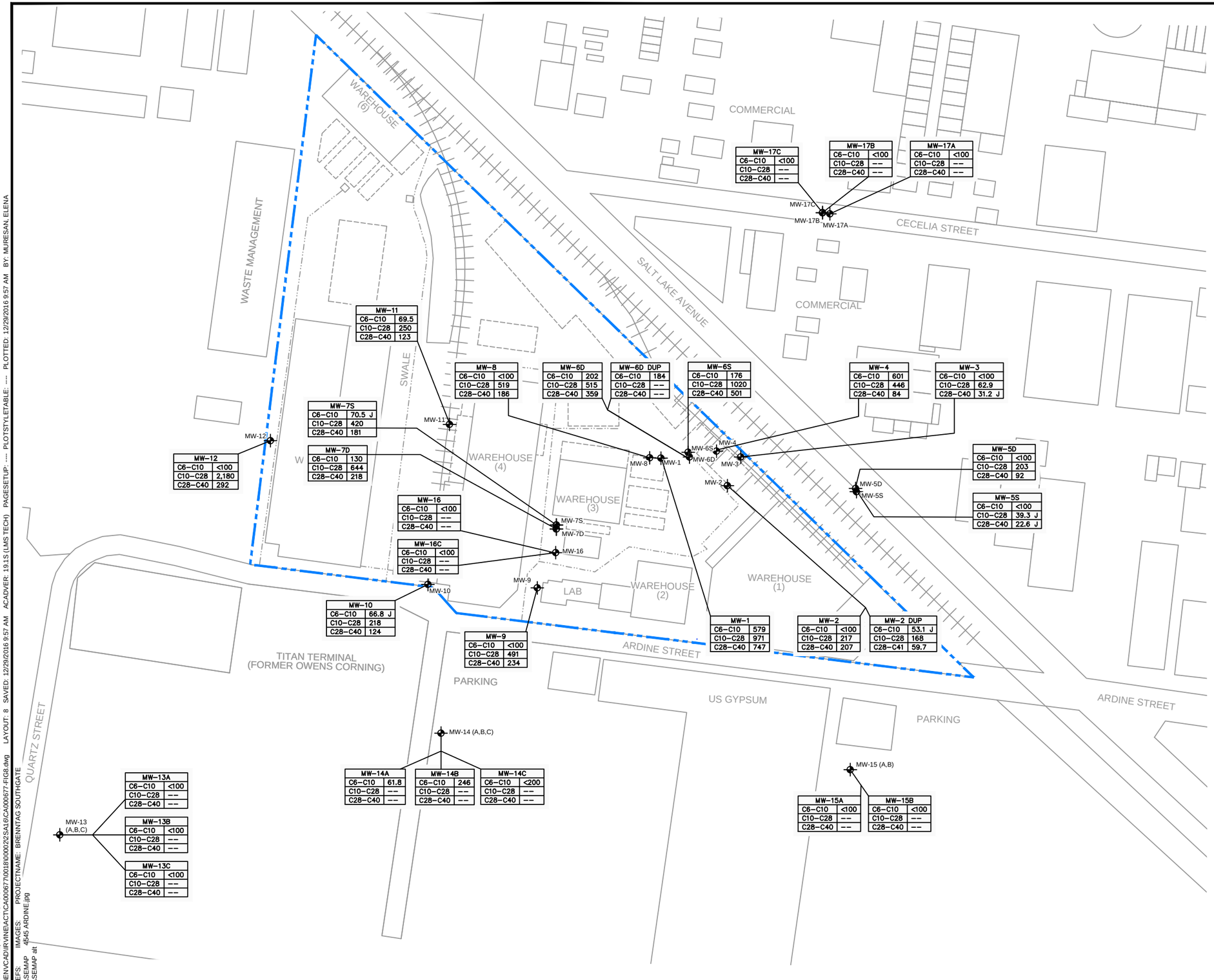
SECOND SEMI-ANNUAL 2016 GROUNDWATER MONITORING REPORT

DISTRIBUTION OF METALS IN GROUNDWATER OCTOBER 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

CITY: IRVINE, CA. DIV/GROUP:ENCVAD LD:E. MURESAN
C:\ENVCAD\IRVINE\ACT\CA000677\001\B000021\25A16\CA000677-FIG7.dwg LAYOUT: 7 SAVED: 12/29/2016 9:48 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP 4545 ARDINE.jpg PLOTSTYLETABLE: --- PLOTTED: 12/29/2016 9:57 AM BY: MURESAN, ELENA
BASEMAP alt



LEGEND

- GROUNDWATER MONITORING WELL
- PROPERTY BOUNDARY
- CONCRETE SWALE
- RAILROAD TRACKS
- DRUM STORAGE AREA
- C6-C10 GASOLINE RANGE HYDROCARBONS
- C10-C28 DIESEL RANGE HYDROCARBONS
- C28-C40 MOTOR OIL RANGE HYDROCARBONS
- <50 COMPOUND NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMIT
- J INDICATES AN ESTIMATED VALUE
- -- NOT ANALYZED
- NS NOT SAMPLED

NOTE

1. ALL RESULTS EXPRESSED IN MICROGRAMS PER LITER.

0 150' 300'

GRAPHIC SCALE

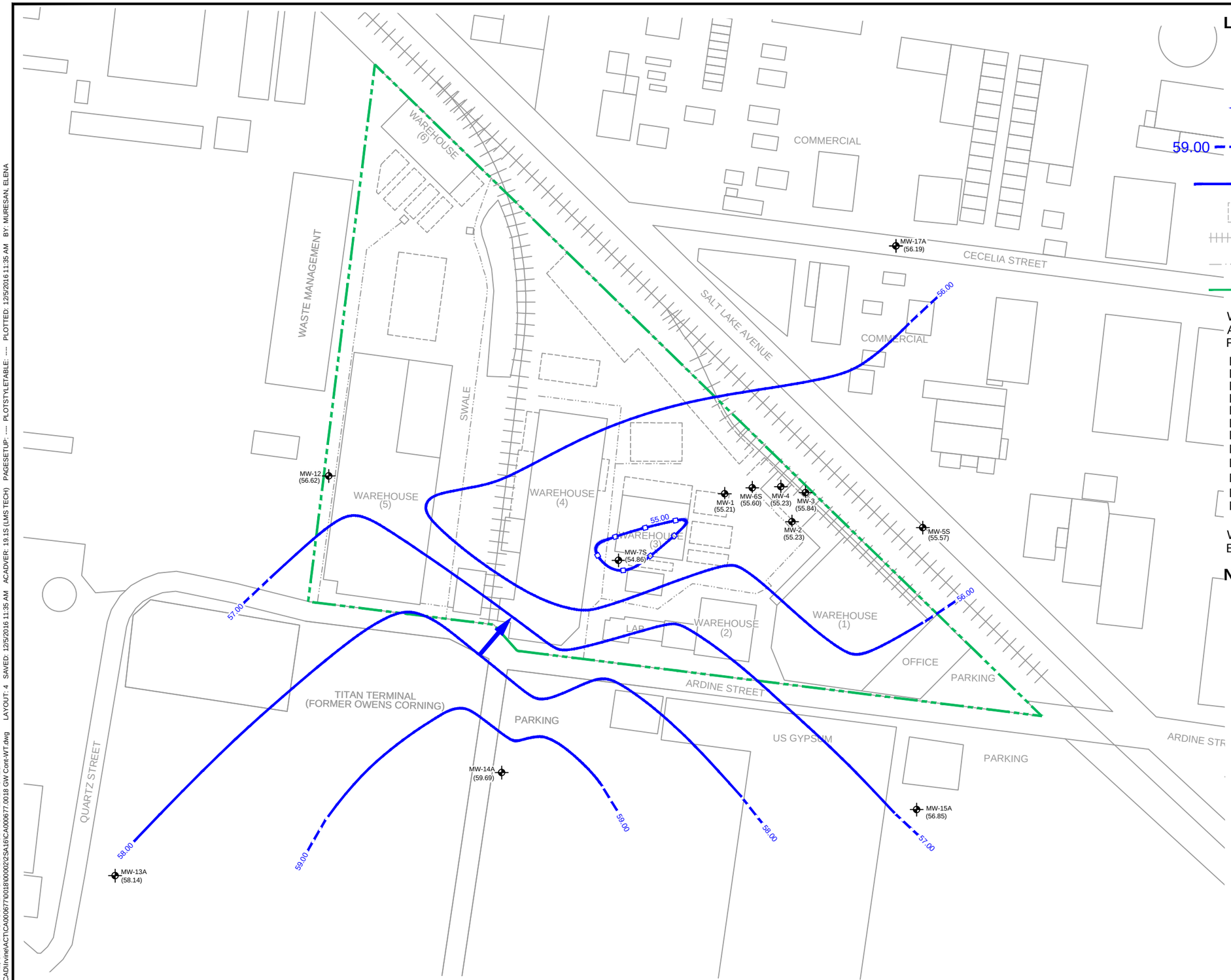
BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2016 GROUNDWATER MONITORING REPORT

DISTRIBUTION OF TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER OCTOBER 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE 8

CITY: IRVINE, CA. DIV/GROUP:ENCVAD LD:E. MURESAN
C:\ENVCAD\IRVINE\ACT\CA000677\0018\00002\2SA16\CA000677-FIG8.dwg LAYOUT: 8 SAVED: 12/29/2016 9:57 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/29/2016 9:57 AM BY: MURESAN, ELENA
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP 4545 ARDINE.jpg
BASEMAP alt



LEGEND

- GROUNDWATER MONITORING WELL
- (59.69) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 59.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- SEPARATE SYMBOLS INDICATES LOWER ELEVATION
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-1 (65-75)
MW-2 (50-85)
MW-3 (50-85)
MW-4 (50-85)
MW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13A (55-70)
MW-14A (55-70)
MW-15A (55-70)
MW-17A (56-71)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'
GRAPHIC SCALE

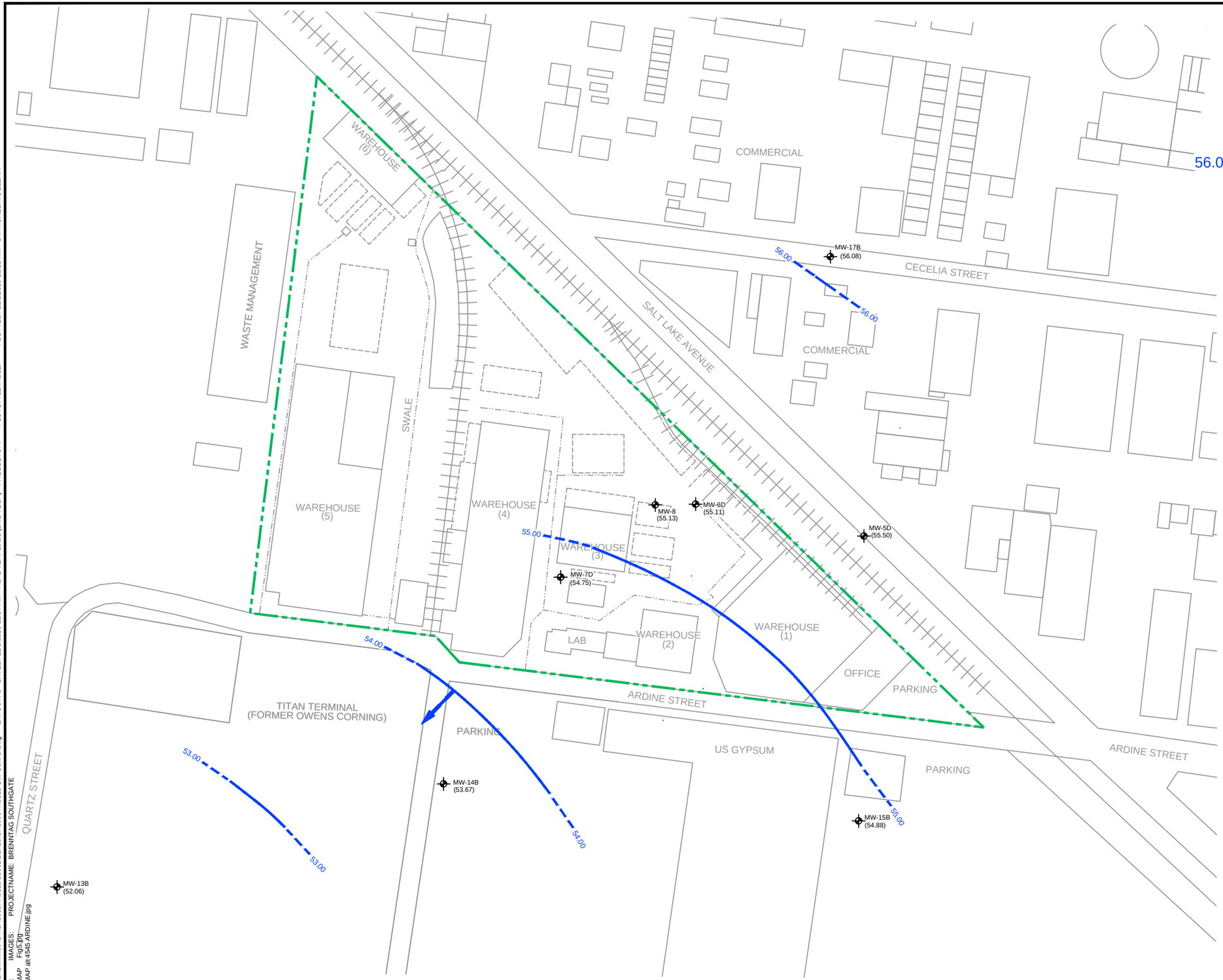
BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
WELLS SCREENED IN THE WATER TABLE
OCTOBER 6, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

CITY:IRVINE, CA DIV/GROUP:ENVCAD DB:R. HUBATCH LD:E.MURESAN
G:\ENVCAD\Irvine\ACT\CA000677\0018\00002\2SA16\CA000677.0018 GW Cont-WT.dwg LAYOUT: 4 SAVED: 12/5/2016 11:35 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/5/2016 11:35 AM BY: MURESAN, ELENA



LEGEND

- GROUNDWATER MONITORING WELL
- (56.08) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 56.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13B (94-104)
MW-14B (85-95)
MW-15B (80-90)
MW-17B (80-90)

WELL WITH SCREENS DEEPER THAN 105 FT BGS WERE NOT USED IN CONTOURING

* NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'
GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

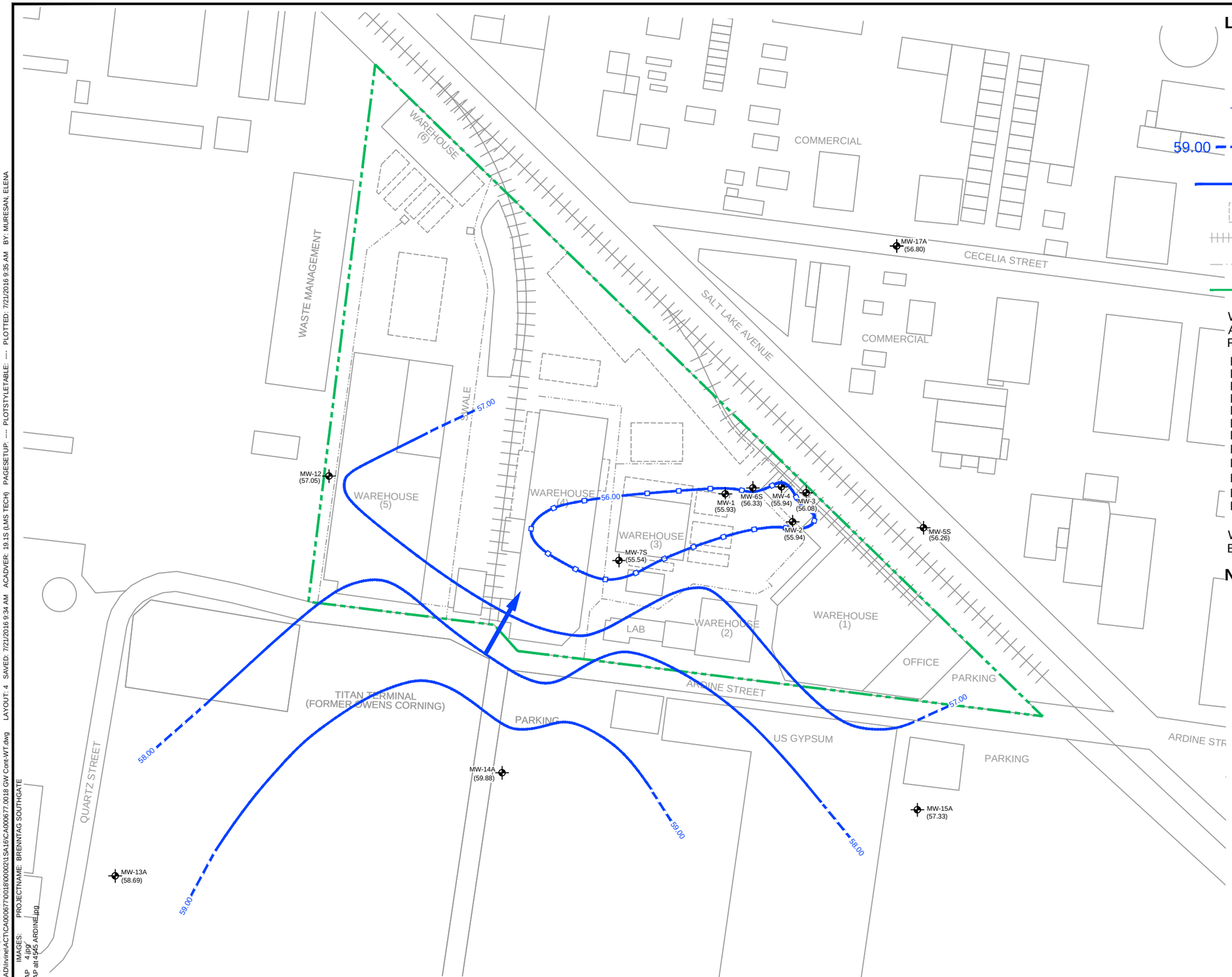
GROUNDWATER CONTOUR MAP DEEP WELLS OCTOBER 6, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

CITY:IRVINE, CA DIV/GROUP:ENVCAD DB:R. HUBATCH LD:E.MURESAN
G:\ENVCAD\Irvine\ACT\CA000677\0018\00002\2SA16\CA000677.0018 GW Cont-D.dwg LAYOUT: 5 SAVED: 12/5/2016 11:34 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/5/2016 11:35 AM BY: MURESAN, ELENA
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP Fig5.jpg
BASEMAP alt 4545 ARDINE.jpg

CITY:LONG BEACH, CA. DIVGROUP:ENRVAD LDR: HUBATCH
G:\ENVCAD\rmeACTICA\00577\0018\00021SA18\CA00577.0018 GW Cont-WT.dwg LAYOUT: 4 SAVED: 7/21/2016 9:34 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/21/2016 9:35 AM BY: MURESAN, ELENA
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP 4.jpg
BASEMAP all 4545 ARDINE.jpg



LEGEND

- GROUNDWATER MONITORING WELL
- (59.88) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 59.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- SEPARATE SYMBOLS INDICATES LOWER ELEVATION
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-1 (65-75)
MW-2 (50-85)
MW-3 (50-85)
MW-4 (50-85)
MW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13A (55-70)
MW-14A (55-70)
MW-15A (55-70)
MW-17A (56-71)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'

GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
FIRST SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP WELLS SCREENED IN THE WATER TABLE APRIL 4, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY:LONG BEACH, CA; DIV/GROUP:ENRV/AD LD/R: HUBATCH
G:\ENV\CA\Irvine\ACTIVE\CA000577\0018\000021\SA16\CA000577.0018 GW Cont-D.dwg LAYOUT: 5 SAVED: 7/21/2016 11:55 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/21/2016 11:56 AM BY: MURESAN, ELENA
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP 5.jpg
BASEMAP alt 4545 ARDINE.jpg

WAREHOUSE (6)
WASTE MANAGEMENT
COMMERCIAL
CECELIA STREET
SALT LAKE AVENUE
COMMERCIAL
SWALE
WAREHOUSE (5)
WAREHOUSE (4)
WAREHOUSE (3)
WAREHOUSE (2)
WAREHOUSE (1)
LAB
OFFICE
PARKING
ARDINE STREET
TITAN TERMINAL (FORMER OWENS CORNING)
PARKING
US GYPSUM
PARKING
ARDINE STREET
QUARTZ STREET

MW-17B (56.70)
MW-8 (55.76)
MW-6D (56.05)
MW-5D (56.15)
MW-7D (55.41)
MW-14B (54.33)
MW-15B (55.54)
MW-13B (52.88)

56.00
55.00
54.00
53.00

LEGEND

- GROUNDWATER MONITORING WELL
- (56.70) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 56.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13B (94-104)
MW-14B (85-95)
MW-15B (80-90)
MW-17B (80-90)

WELL WITH SCREENS DEEPER THAN 105 FT BGS WERE NOT USED IN CONTOURING

* NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'
GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA

FIRST SEMI-ANNUAL 2016
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP DEEP WELLS APRIL 4, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

CITY:LONG BEACH, CA. DIVGROUP:ENRVAD LD/R: HUBATCH
C:\ENVCAD.LONG BEACH ACTIC\400677\00\160\000\2015 2SA\DWG\CA6771602-C01.dwg LAYOUT: 4 SAVED: 1/28/2016 9:28 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/29/2016 7:16 AM BY: HUBATCH, RICK
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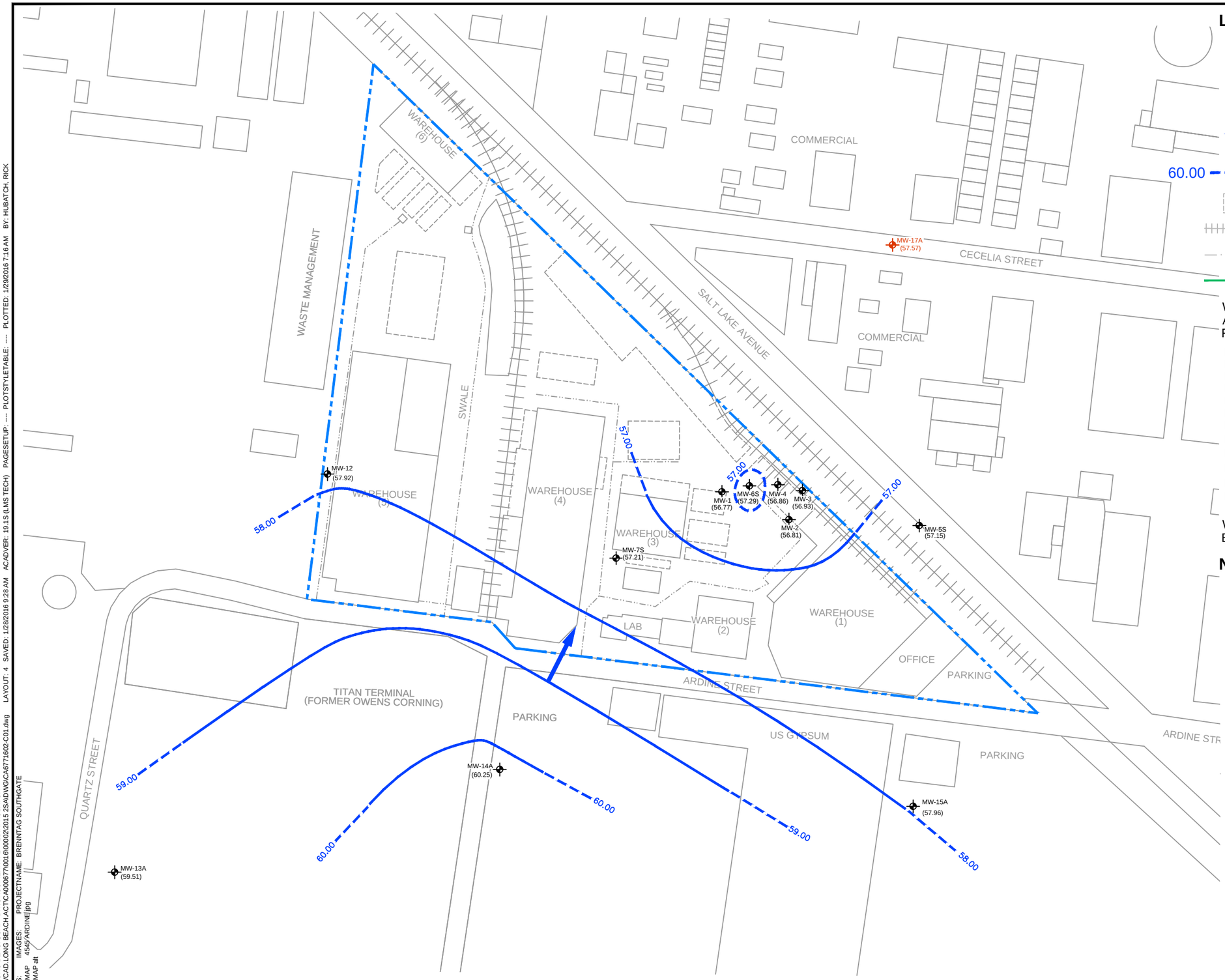
BASEMAP 4545 ARDINE.jpg
BASEMAP alt



LEGEND

- GROUNDWATER MONITORING WELL
- GROUNDWATER MONITORING WELL (INSTALLED SEPTEMBER 2015)
- (60.25) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 60.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-1 (65-75)
MW-2 (50-85)
MW-3 (50-85)
MW-4 (50-85)
MW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13A (55-70)
MW-14A (55-70)
MW-15A (55-70)
MW-17A (56-71)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'

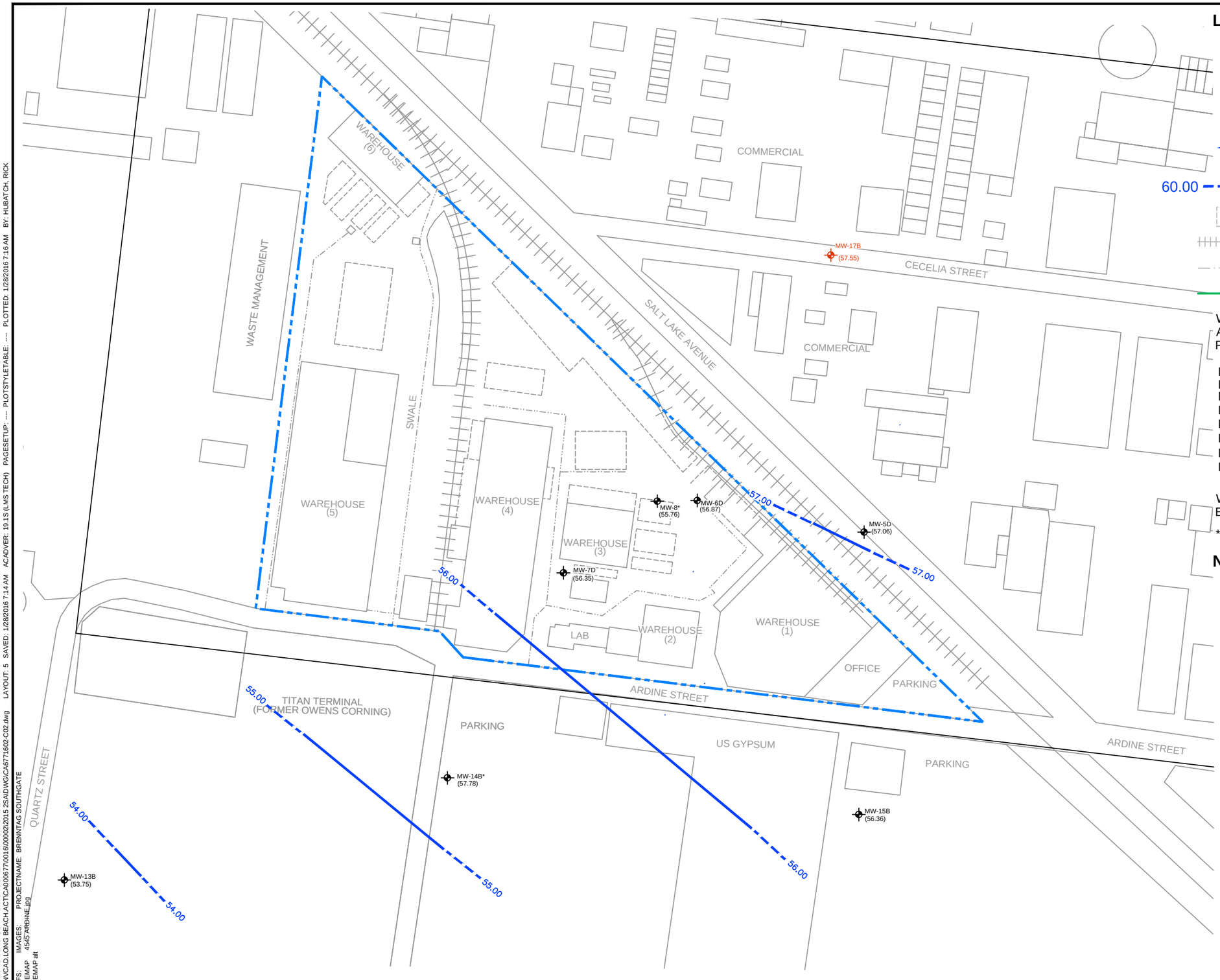
GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2015 GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP WELLS SCREENED IN THE WATER TABLE OCTOBER 9, 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4



LEGEND

- GROUNDWATER MONITORING WELL
- GROUNDWATER MONITORING WELL (INSTALLED SEPTEMBER 2015)
- (57.78) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 60.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13B (94-104)
MW-14B (85-95)
MW-15B (80-90)
MW-17B (80-90)

WELL WITH SCREENS DEEPER THAN 105 FT BGS WERE NOT USED IN CONTOURING

* NOT USED IN CONTOURING

NOTES

1. WELLS MW-1 TO MW-12 WERE SURVEYED IN JUNE 2007, WELLS MW-13 TO MW-16, WERE SURVEYED IN APRIL 2012, AND MW-17 WAS SURVEYED IN SEPTEMBER 2015.
2. REFERENCE SITE MAP DIGITIZED USING GOOGLE EARTH PRO IMAGE-ARCADIS G&M (2006).

0 150' 300'
GRAPHIC SCALE

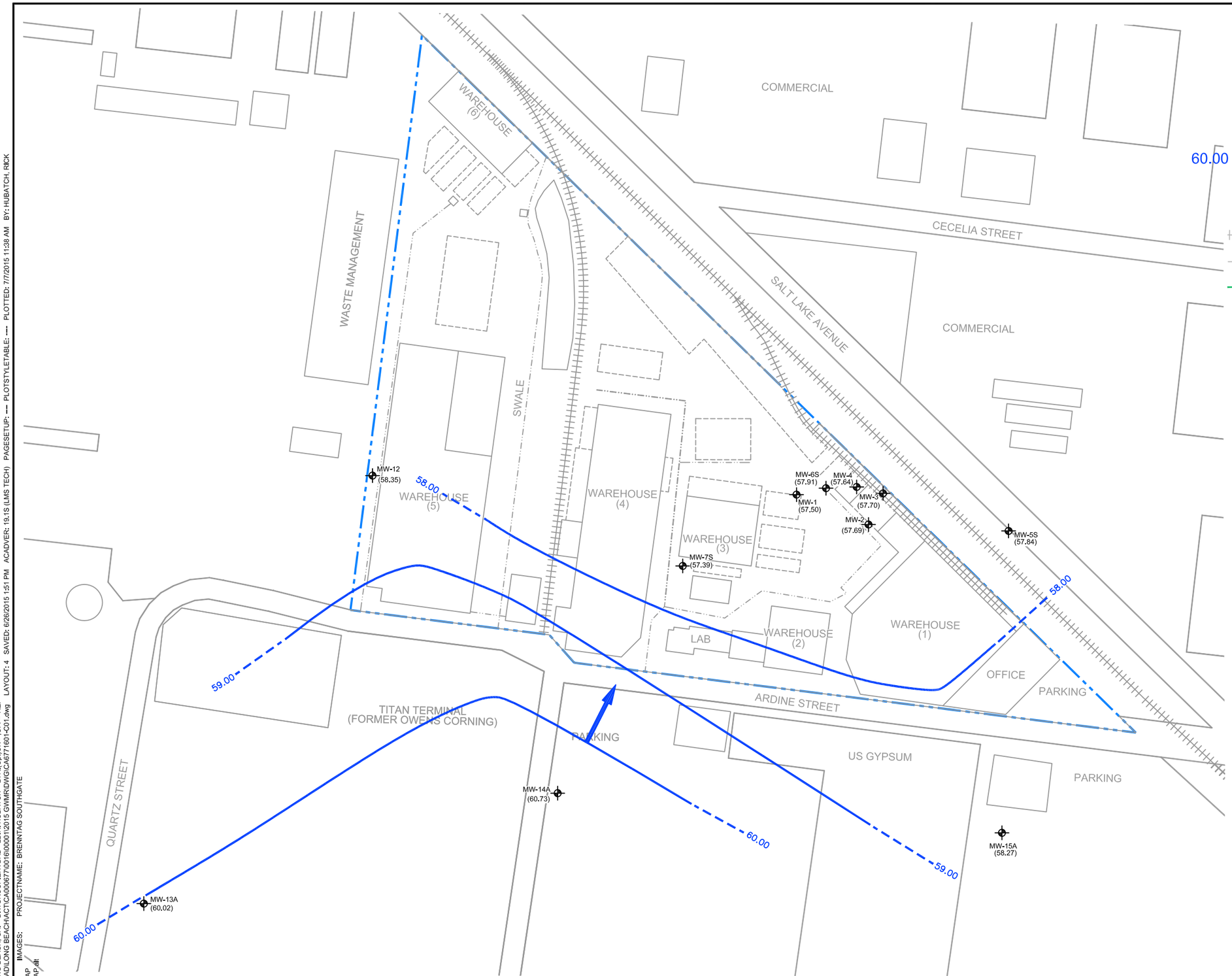
BRENNTAG PACIFIC, INC.
4545 ARDINE STREET
SOUTH GATE, CALIFORNIA
SECOND SEMI-ANNUAL 2015
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
DEEP WELLS
OCTOBER 9, 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

CITY:LONG BEACH, CA. DIV/GROUP:ENRVAD LD:R. HUBATCH
C:\ENVCAD.LONG BEACH.ACT\CA000677\0016\00002\2015 2SA\DWG\CA6771602-C02.dwg LAYOUT: 5 SAVED: 1/28/2016 7:14 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/28/2016 7:16 AM BY: HUBATCH, RICK
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP 4545 ARDINE.jpg
BASEMAP alt



LEGEND

MW-1 GROUNDWATER MONITORING WELL

(60.73) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL

DIRECTION OF GROUNDWATER GRADIENT

60.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)

DRUM STORAGE AREA

RAILROAD TRACKS

DRAINAGE DITCH

PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-1 (65-75)
MW-2 (50-85)
MW-3 (50-85)
MW-4 (50-85)
MW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13A (55-70)
MW-14A (55-70)
MW-15A (55-70)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

0 140' 280'

GRAPHIC SCALE

BRENNTAG SOUTH GATE, INC.
4545 ARDINE STREET, SOUTH GATE, CALIFORNIA
FIRST SEMI-ANNUAL 2015
GROUNDWATER MONITORING REPORT

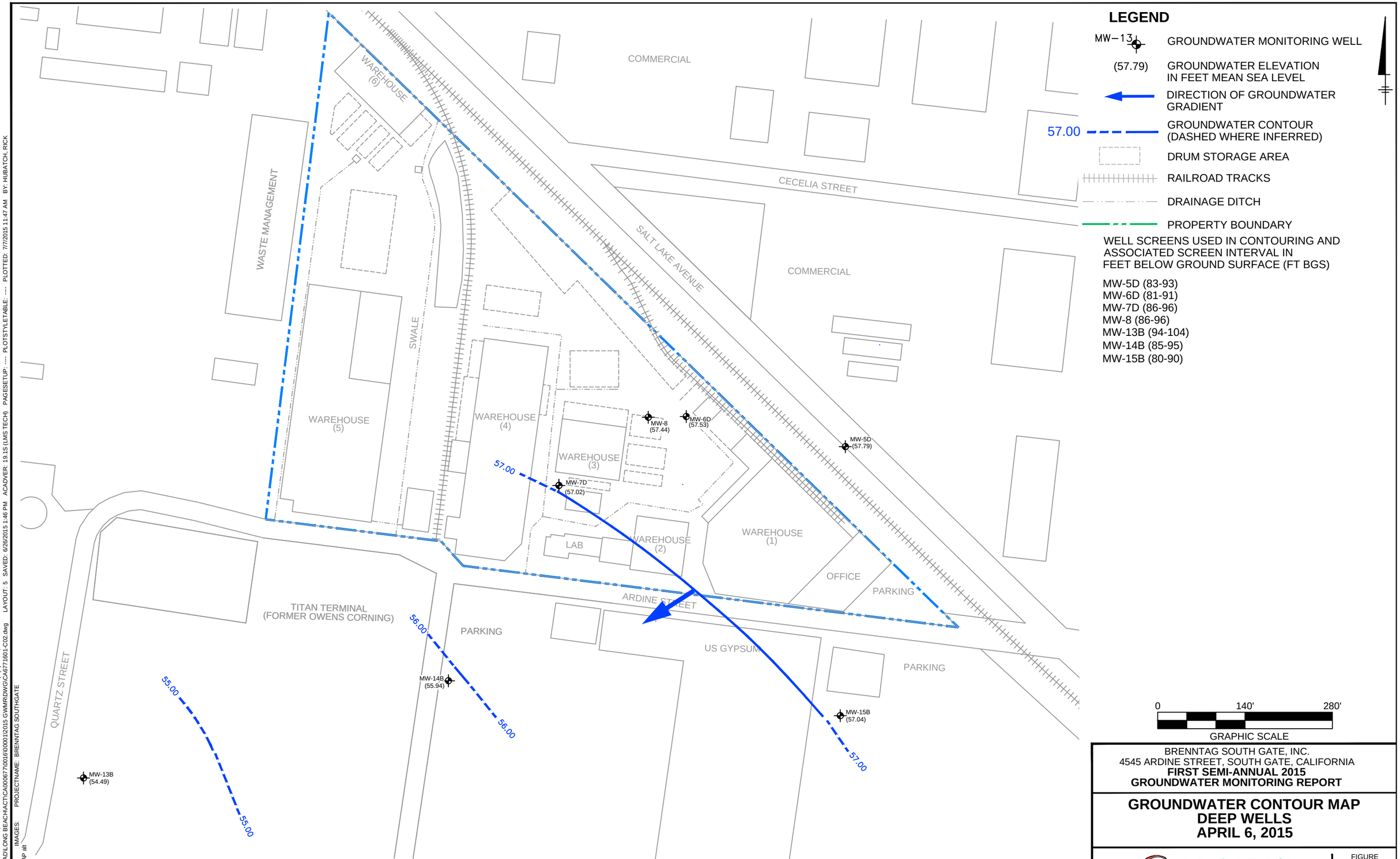
GROUNDWATER CONTOUR MAP
WELLS SCREENED IN THE WATER TABLE
APRIL 6, 2015

ARCADIS

FIGURE
4

CITY:LONG BEACH, CA. DIV/GROUP:ENVDAD LD:R. HUBATCH LYR:(Opt)ON=*;OFF=*REF*
Z:\ENVCAD\LONG BEACH\ACT\CA000677\0016\00001\2015 GWMR\DWG\CA6771601-C01.dwg LAYOUT: 4 SAVED: 6/26/2015 1:51 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/7/2015 11:38 AM BY: HUBATCH, RICK
XREFS: BASEMAP BASEMAP.dlt IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE

CITY:LONG BEACH, CA. DIV/GROUP:ENV/DAD LD:R. HUBATCH LYR:(Opt)ON=*;OFF=*REF*
Z:\ENV\CADL\ONG BEACH\ACTIVITY\CA000677\00160\000012015 GWMRI\DWG\CA677160 1-C02.dwg LAYOUT: 5 SAVED: 6/26/2015 1:46 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/7/2015 11:47 AM BY: HUBATCH, RICK
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP alt



LEGEND

- MW–13 — GROUNDWATER MONITORING WELL
- (57.79) — GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- DIRECTION OF GROUNDWATER GRADIENT
- 57.00 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13B (94-104)
MW-14B (85-95)
MW-15B (80-90)

0 140' 280'

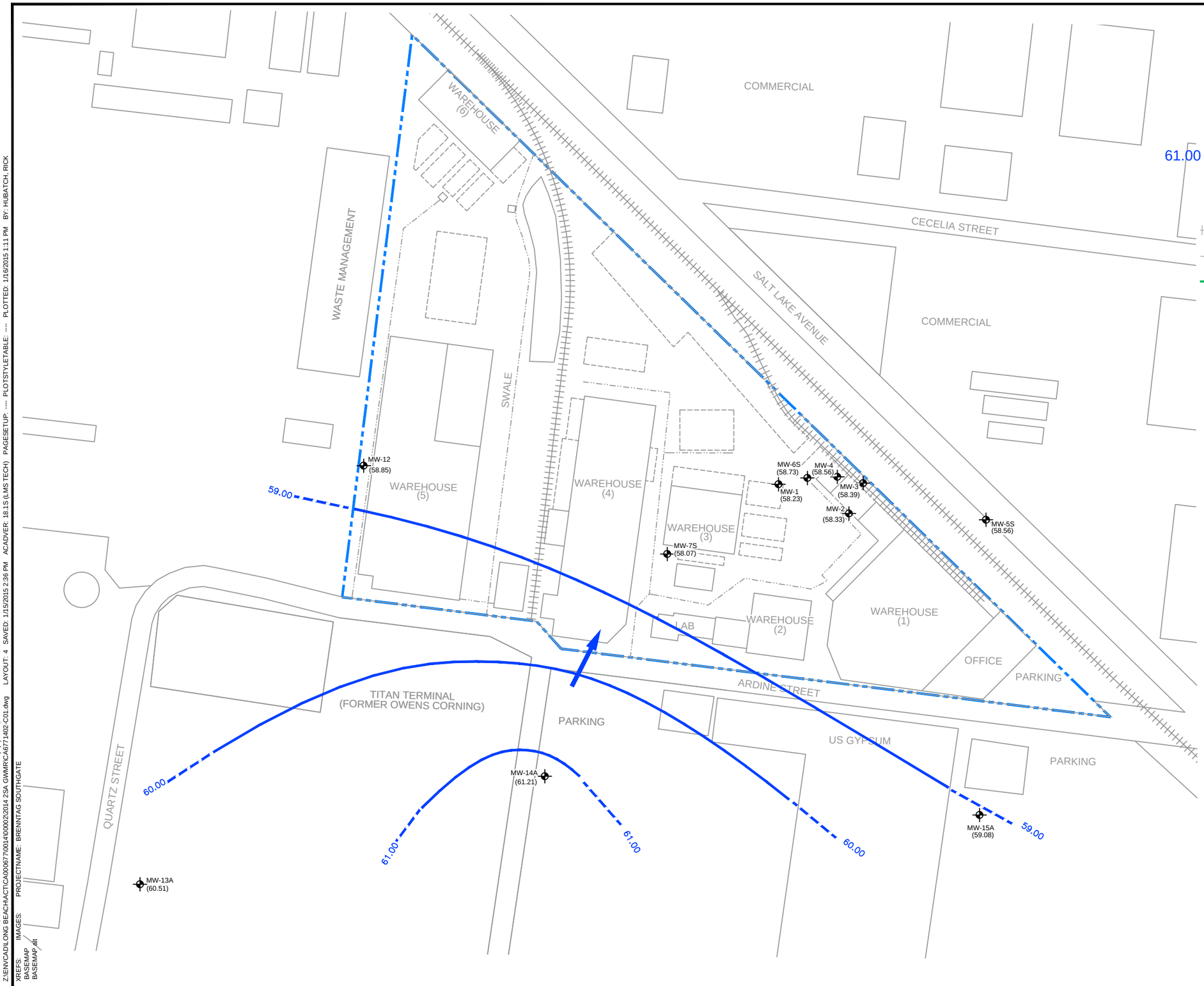
GRAPHIC SCALE

BRENNTAG SOUTH GATE, INC.
4545 ARDINE STREET, SOUTH GATE, CALIFORNIA
FIRST SEMI-ANNUAL 2015
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP DEEP WELLS APRIL 6, 2015

ARCADIS

FIGURE 5



LEGEND

MW-1 GROUNDWATER MONITORING WELL

(60.21) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL

DIRECTION OF GROUNDWATER GRADIENT

61.00 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)

DRUM STORAGE AREA

RAILROAD TRACKS

DRAINAGE DITCH

PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-1 (65-75)
MW-2 (50-85)
MW-3 (50-85)
MW-4 (50-85)
MW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13A (55-70)
MW-14A (55-70)
MW-15A (55-70)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

0 140' 280'

GRAPHIC SCALE

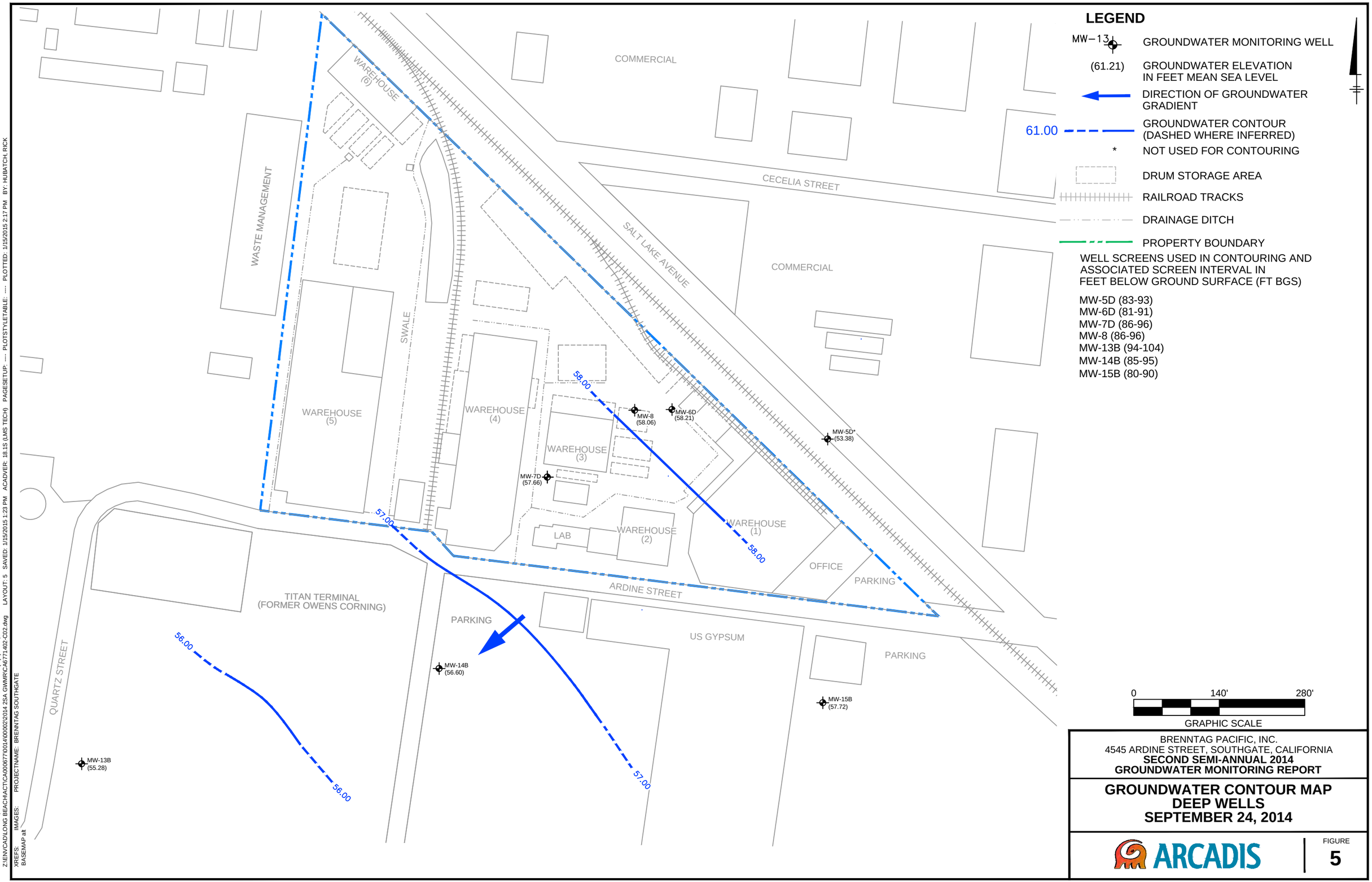
BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
SECOND SEMI-ANNUAL 2014
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
WELLS SCREENED IN THE WATER TABLE
SEPTEMBER 24, 2014

ARCADIS

FIGURE
4

CITY:LONG BEACH, CA. DIV/GROUP:ENVDAD LD:R. HUBATCH LYR:(Opt)ON=*;OFF=*REF*
Z:\ENVCAD\LONG BEACH\ACT\CA000677\0014\00002\2014 2SA GWMR\CA6771402-C01.dwg LAYOUT: 4 SAVED: 1/15/2015 2:36 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/16/2015 1:11 PM BY: HUBATCH, RICK
XREFS: BASEMAP BASEMAP.dlt IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE



BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
SECOND SEMI-ANNUAL 2014
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
DEEP WELLS
SEPTEMBER 24, 2014

ARCADIS

FIGURE
5

CITY:LONG BEACH, CA. DIV/GROUP:ENVDAD LD:R. HUBATCH LYR:(Opt)ON=*;OFF=*REF*
Z:\ENVCAD\LONG BEACH\ACT\CA000677\0014\00002\2014 2SA GWMR\CA6771402-C02.dwg LAYOUT: 5 SAVED: 1/15/2015 1:23 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/15/2015 2:17 PM BY: HUBATCH, RICK
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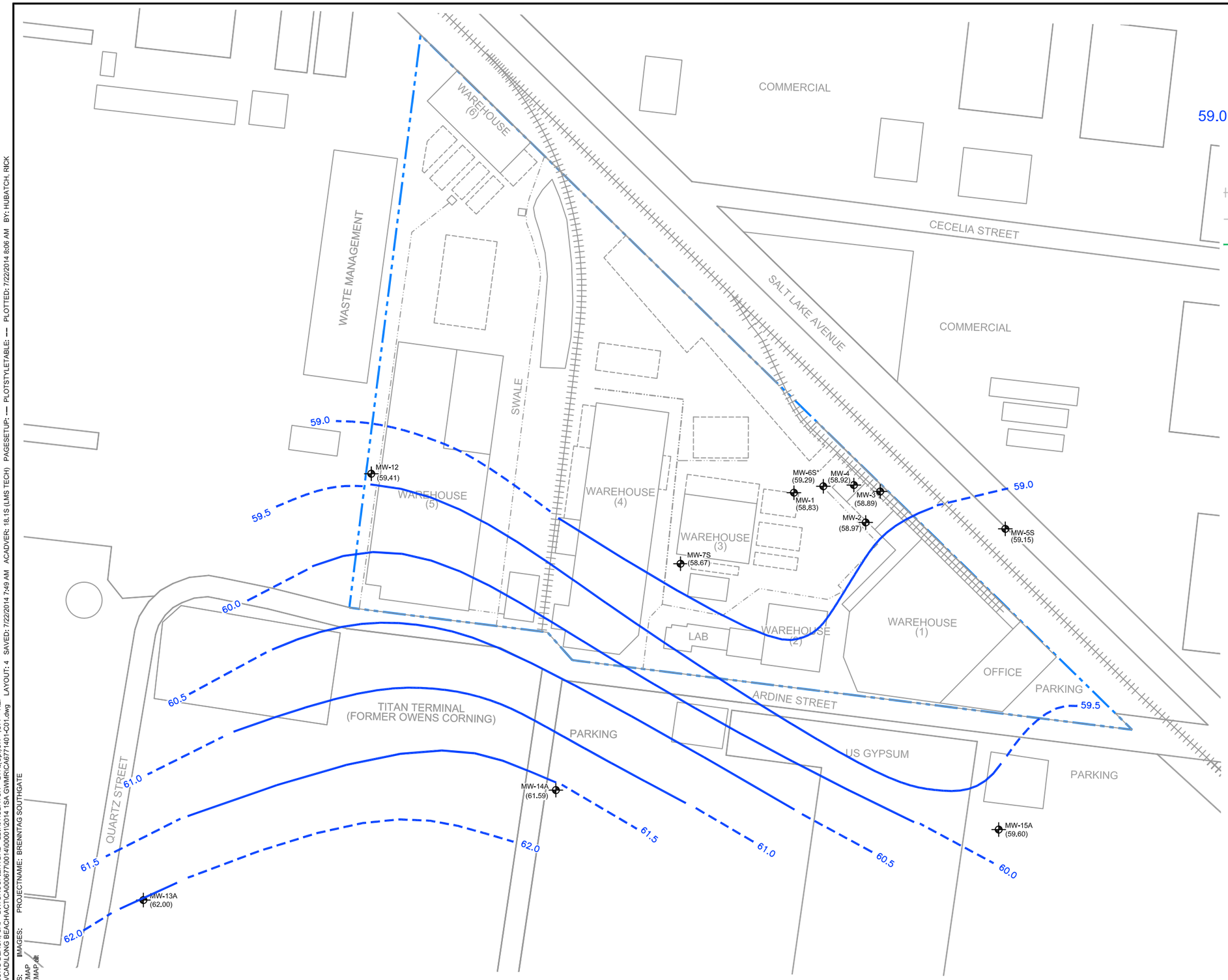
BASEMAP alt



LEGEND

MW-1 GROUNDWATER MONITORING WELL

(59.60) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL

59.0 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)

* NOT USED FOR CONTOURING

DRUM STORAGE AREA

RAILROAD TRACKS

DRAINAGE DITCH

PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-1 (65-75)
MW-2 (50-85)
MW-3 (50-85)
MW-4 (50-85)
MW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13A (55-70)
MW-14A (55-70)
MW-15A (55-70)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

0 140' 280'

GRAPHIC SCALE

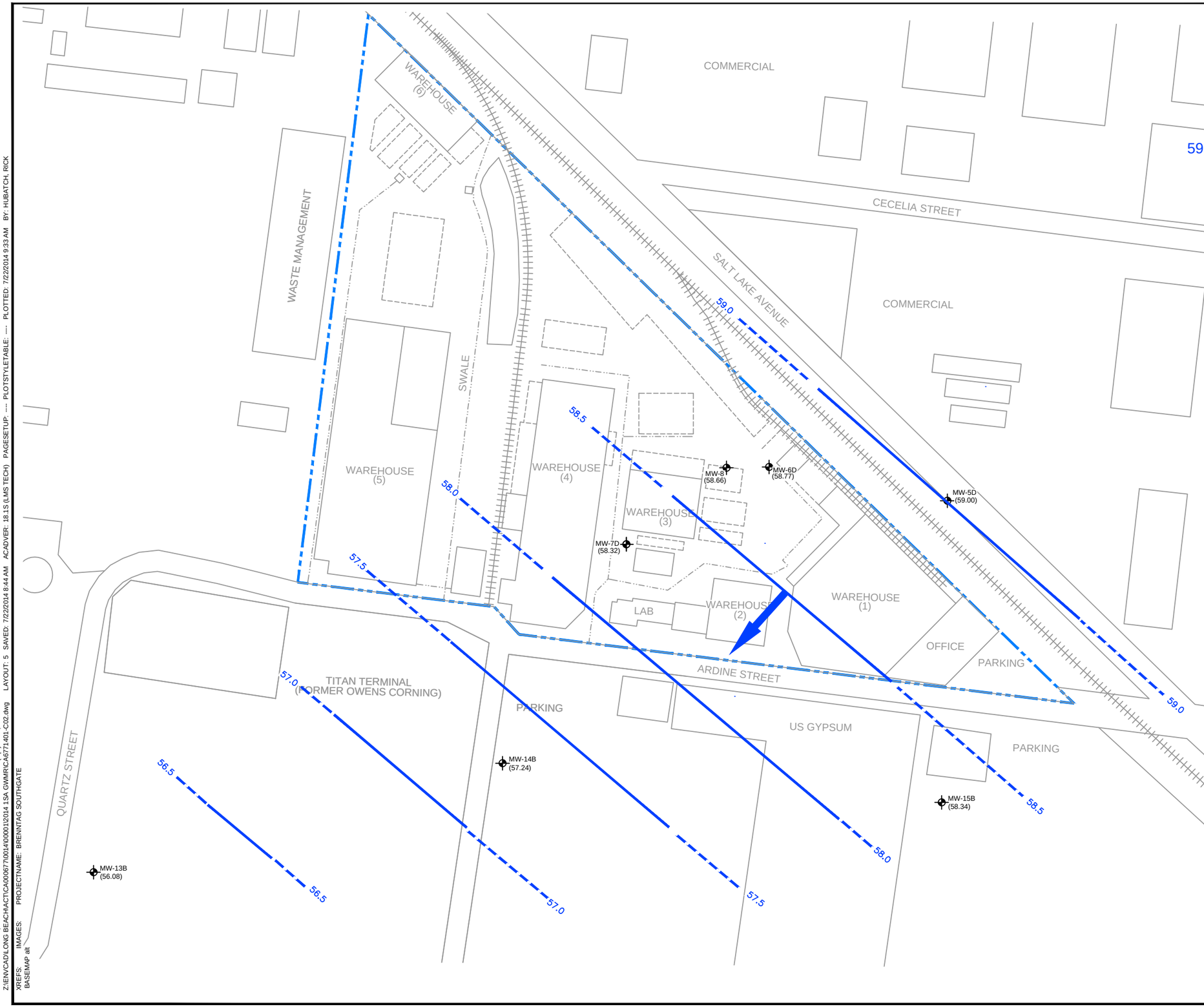
BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
FIRST SEMI-ANNUAL 2014
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
WELLS SCREENED IN THE WATER TABLE
APRIL 21, 2014

ARCADIS

FIGURE
4

CITY:LONG BEACH, CA. DIV/GROUP:ENVDAD LD:R. HUBATCH LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\LONG BEACH\ACT\CA000677\0014\00001\2014 1SA GWMR\CA6771401-C01.dwg LAYOUT: 4 SAVED: 7/22/2014 7:49 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/22/2014 8:06 AM BY: HUBATCH, RICK
XREFS: BASEMAP BASEMAP.dlt IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE



LEGEND

MW-13 GROUNDWATER MONITORING WELL

(59.00) GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL

DIRECTION OF GROUNDWATER GRADIENT

59.0 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)

DRUM STORAGE AREA

RAILROAD TRACKS

DRAINAGE DITCH

PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOCIATED SCREEN INTERVAL IN FEET BELOW GROUND SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13B (94-104)
MW-14B (85-95)
MW-15B (80-90)

0 140' 280'

GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
FIRST SEMI-ANNUAL 2014
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
DEEP WELLS
APRIL 21, 2014

ARCADIS

FIGURE
5

CITY:LONG BEACH, CA. DIV/GROUP:ENVDAD LD:R. HUBATCH LYR:(Opt)ON=*;OFF=*REF*
Z:\ENVCAD\LONG BEACH\ACT\CA000677\0014\00001\2014 1SA GWMR\CA6771401-C02.dwg LAYOUT: 5 SAVED: 7/22/2014 8:44 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/22/2014 9:33 AM BY: HUBATCH, RICK
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP alt

LEGEND

- MW-1 — GROUNDWATER MONITORING WELL
- (60.97) — GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- (NU) — NOT USED FOR CONTOURING
- 60.5 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOSIATED SCREEN INTERVAL IN FEET BELOW GRADE SURFACE (FT BGS)

MW-1 (65-75)
SW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13 (55-70)
MW-14 (55-70)
MW-15 (55-70)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

COMMERCIAL
COMMERCIAL
CECELIA STREET
SALT LAKE AVENUE
WASTE MANAGEMENT
WAREHOUSE (6)
WAREHOUSE (5)
WAREHOUSE (4)
WAREHOUSE (3)
WAREHOUSE (2)
WAREHOUSE (1)
SWALE
LAB
OFFICE
PARKING
ARDINE STREET
TITAN TERMINAL (FORMER OWENS CORNING)
PARKING
US GYPSUM
PARKING
QUARTZ STREET

MW-11
MW-12 (60.71)
MW-6S (60.44)
MW-4 (60.37)
MW-8
MW-1 (60.39)
MW-6D
MW-3 (60.48)
MW-2 (60.39)
MW-5D
MW-5S (60.64)
MW-7S (61.10)
MW-7D
MW-16
MW-10
MW-9
MW-14A (62.87)
MW-15A (60.97)
MW-13A (62.11)

60.50
61.50
62.50

0 140' 280'
GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
SECOND SEMI-ANNUAL 2012
GROUNDWATER MONITORING REPORT

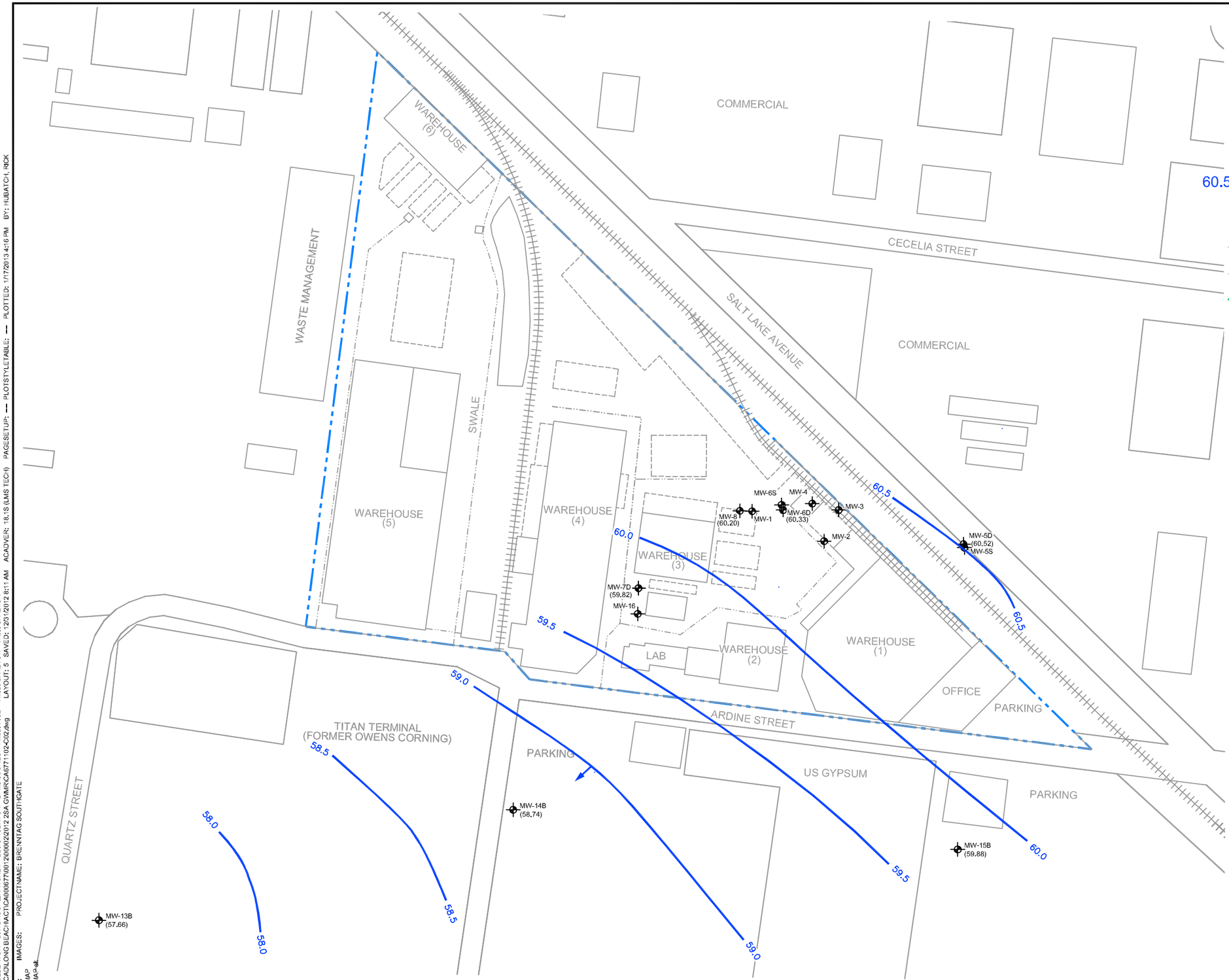
GROUNDWATER CONTOUR MAP
WELLS SCREENED IN THE WATER TABLE
NOVEMBER 2012

ARCADIS

FIGURE
4

CITY:FULLERTON DIV/GROUP:ENR/CAD4 LDR: HUBATCH BPMA: JONES PMS: FIOL
C:\ENVCAD\LONG BEACH\ACTIVE\CAD\60077000\2000\02201\2 SSA GWMR\CA6771102-001.dwg LAYOUT: 4 SAVED: 2/27/2012 2:04 PM TMS: CARLTON TRS: CARLTON
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP
BASEMAP alt
PLOTSTYLETABLE: — PAGESETUP: — PLOTTED: 12/1/2012 8:12 AM BY: HUBATCH, RICK
ACADVER: 18.1S (LMS TECH)

CITY:FULLERTON DIV/GROUP:ENR4CAD4 LD#: HUBATCH BPNM:A.JONES PMS:.FIOL TMS: CARLTON TRG: CARLTON
G:\ENVCAD\LONG BEACH\ACTIVE\60077000\26000\22012 26A GWMR\CAD\77110124-002.dwg LAYOUT: 5 SAVED: 12/5/2012 8:11 AM ACADVER: 18.1S (LMS TECH)
XREFS: PAGESETUP: -- PLOTSTYLETABLE: -- PLOTTED: 1/17/2013 4:16 PM BY: HUBATCH, RICK
IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP
BASEMAP-alt



LEGEND

- MW-13 — GROUNDWATER MONITORING WELL
- (60.52) — GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- (NU) — NOT USED FOR CONTOURING
- DIRECTION OF GROUNDWATER GRADIENT
- 60.5 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOSIATED SCREEN INTERVAL IN FEET BELOW GRADE SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13 (94-104)
MW-14 (85-95)
MW-15 (80-90)

0 140' 280'

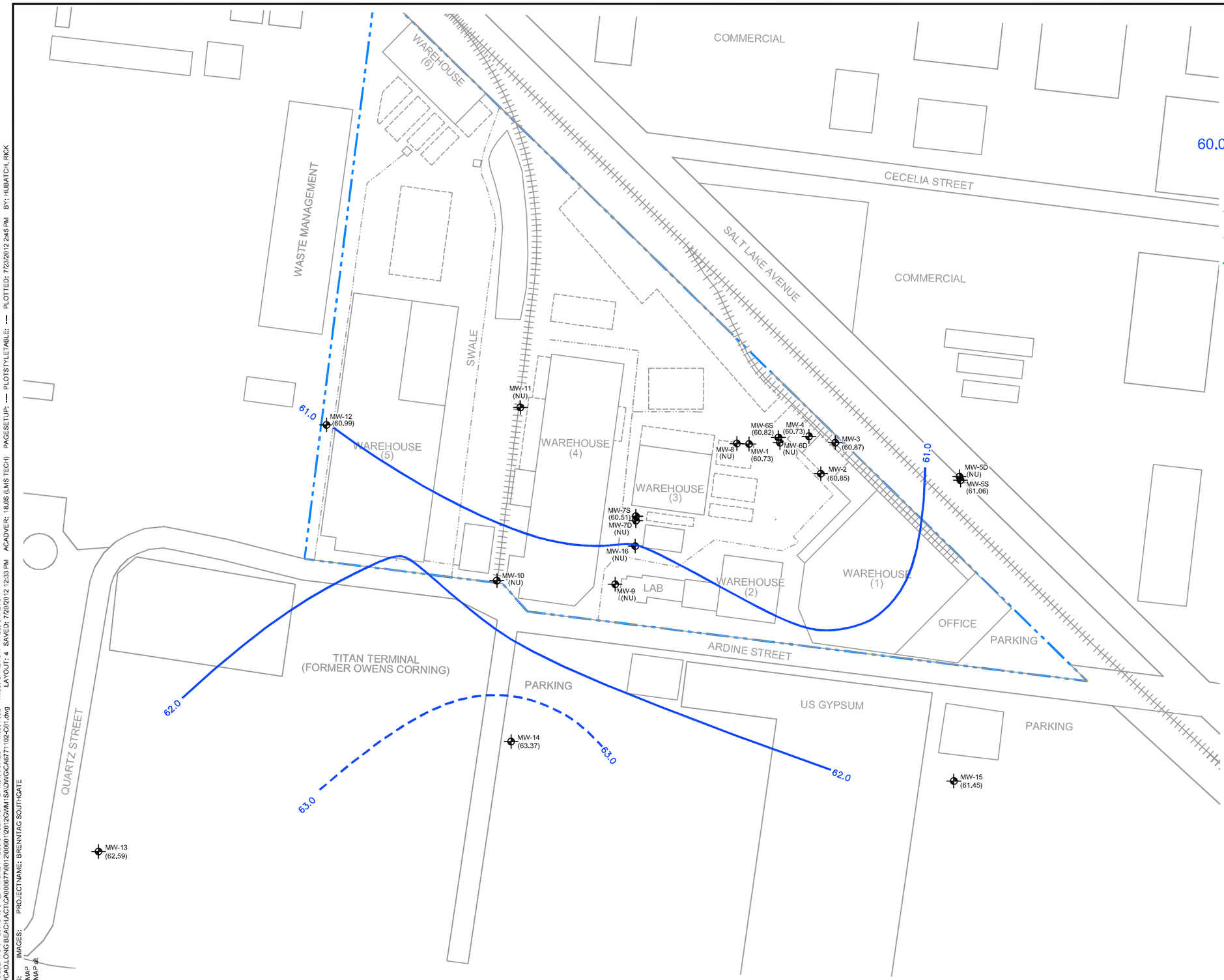
GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
SECOND SEMI-ANNUAL 2012
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP DEEP WELLS, NOVEMBER, 2012

ARCADIS

FIGURE
5



LEGEND

- MW-1 — GROUNDWATER MONITORING WELL
- (61.01) — GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- (NU) — NOT USED FOR CONTOURING
- 60.0 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOSIATED SCREEN INTERVAL IN FEET BELOW GRADE SURFACE (FT BGS)

MW-1 (65-75)
SW-5S (53-73)
MW-6S (51-71)
MW-7S (53-73)
MW-12 (45-75)
MW-13 (55-70)
MW-14 (55-70)
MW-15 (55-70)

WELL WITH SCREENS DEEPER THAN 75 FT BGS WERE NOT USED IN CONTOURING

0 140' 280'

GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
FIRST SEMI-ANNUAL 2012
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP WELLS SCREENED IN THE WATER TABLE JUNE 2012

ARCADIS

FIGURE 4

CITY:FULLERTON DIV/GROUP:ENR/CAD4 LD:R.HUBATCH BPNS:JONES PNS:.FIOL TMS:.CARLTON TRS:.CARLTON
C:\ENVCAD\LONG BEACH\ACTIVE\A0006770\00\120000\120\12GWM\SAD\WOCA6771102-03\1.2dwg LAYOUT:4 SAVED:7/20/2012 12:33 PM ACADVER:18.0S (LMS TECH) PAGESETUP:.- PLOTSTYLETABLE:.- PLOTTED:7/20/2012 2:45 PM BY:.HUBATCH, RICK
XREFS: PROJECTNAME:.BRENNTAG SOUTHGATE
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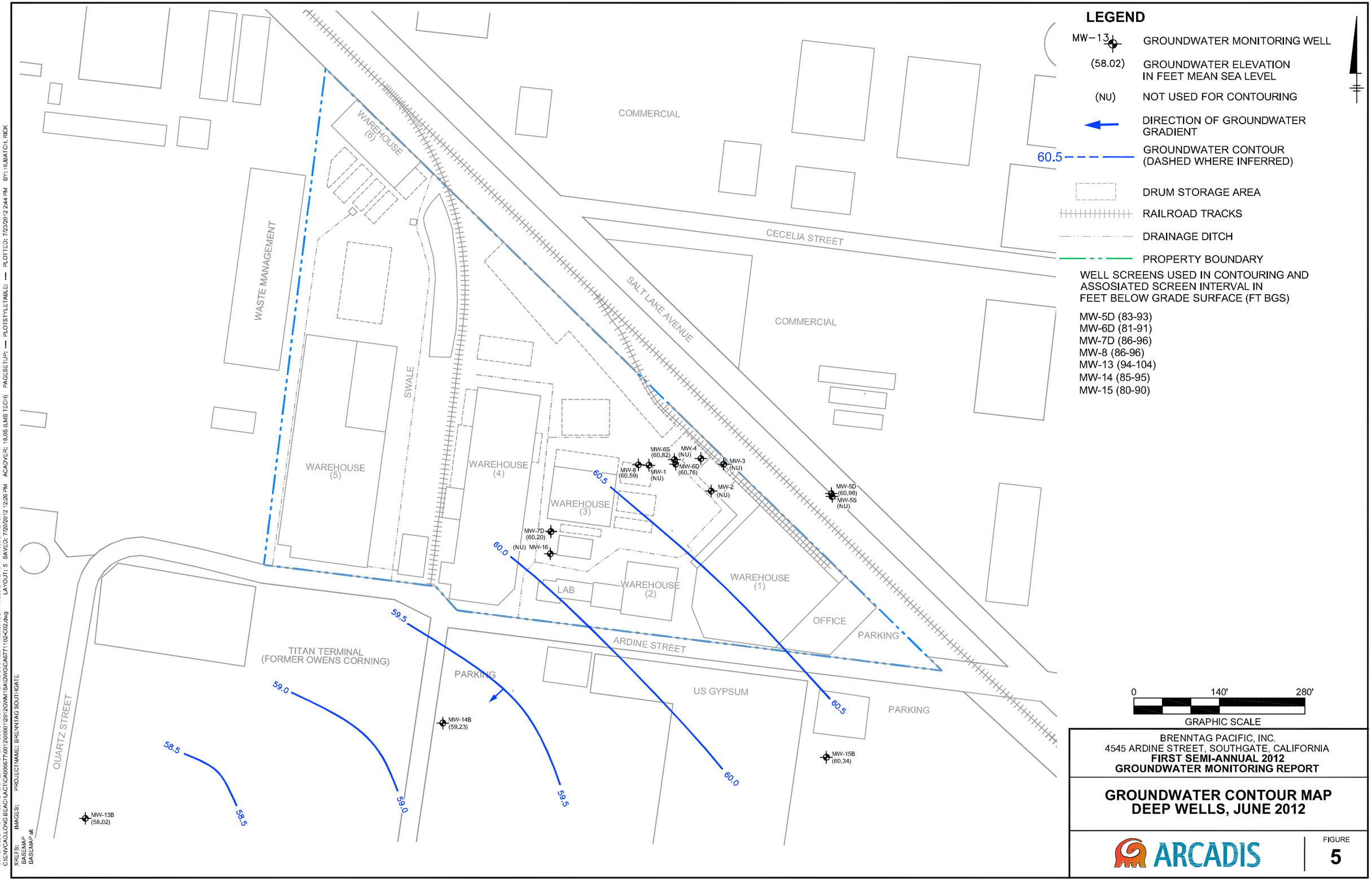
BASEMAP alt



LEGEND

- MW-13 — GROUNDWATER MONITORING WELL
- (58.02) — GROUNDWATER ELEVATION IN FEET MEAN SEA LEVEL
- (NU) — NOT USED FOR CONTOURING
- DIRECTION OF GROUNDWATER GRADIENT
- 60.5 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

WELL SCREENS USED IN CONTOURING AND ASSOSIATED SCREEN INTERVAL IN FEET BELOW GRADE SURFACE (FT BGS)

MW-5D (83-93)
MW-6D (81-91)
MW-7D (86-96)
MW-8 (86-96)
MW-13 (94-104)
MW-14 (85-95)
MW-15 (80-90)

0 140' 280'

GRAPHIC SCALE

BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
FIRST SEMI-ANNUAL 2012
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP DEEP WELLS, JUNE 2012

ARCADIS

FIGURE 5

CITY:FULLERTON DIV/GROUP:ENR4CAE4 LD/R: HUBATCH BP/DA: JONES PM/G: HOL TM/G: CARLTON TR/G: CARLTON
C:\ENVCAD\LONGBEACH\CAD\66770001\200001201\2GWM1SADWG\CA67771102-002.dwg LAYOUT: 5 SAVED: 7/20/2012 12:26 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: — PLOTTED: 7/20/2012 2:44 PM BY: HUBATCH, RICK
XREFS: IMAGES: PROJECTNAME: BRENNTAG SOUTHGATE
BASEMAP
BASEMAP alt

CITY:FULLERTON DIV/GROUP:(Reqd) LD:HUBATCH, R PIC:--- PM:(Reqd) TM:HOGAN, A LYR:(On)ON=*;OFF=*REF*
G:\ENVCAD\Fullerton\ACTIVITY\CA000677\0009\000022011\REPORTS\SEMI ANNUAL\2ndDWG\CA677090Z-C01.dwg LAYOUT: 4 SAVED: 1/25/2011 3:43 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 1/26/2011 9:24 AM BY: HUBATCH, RICK
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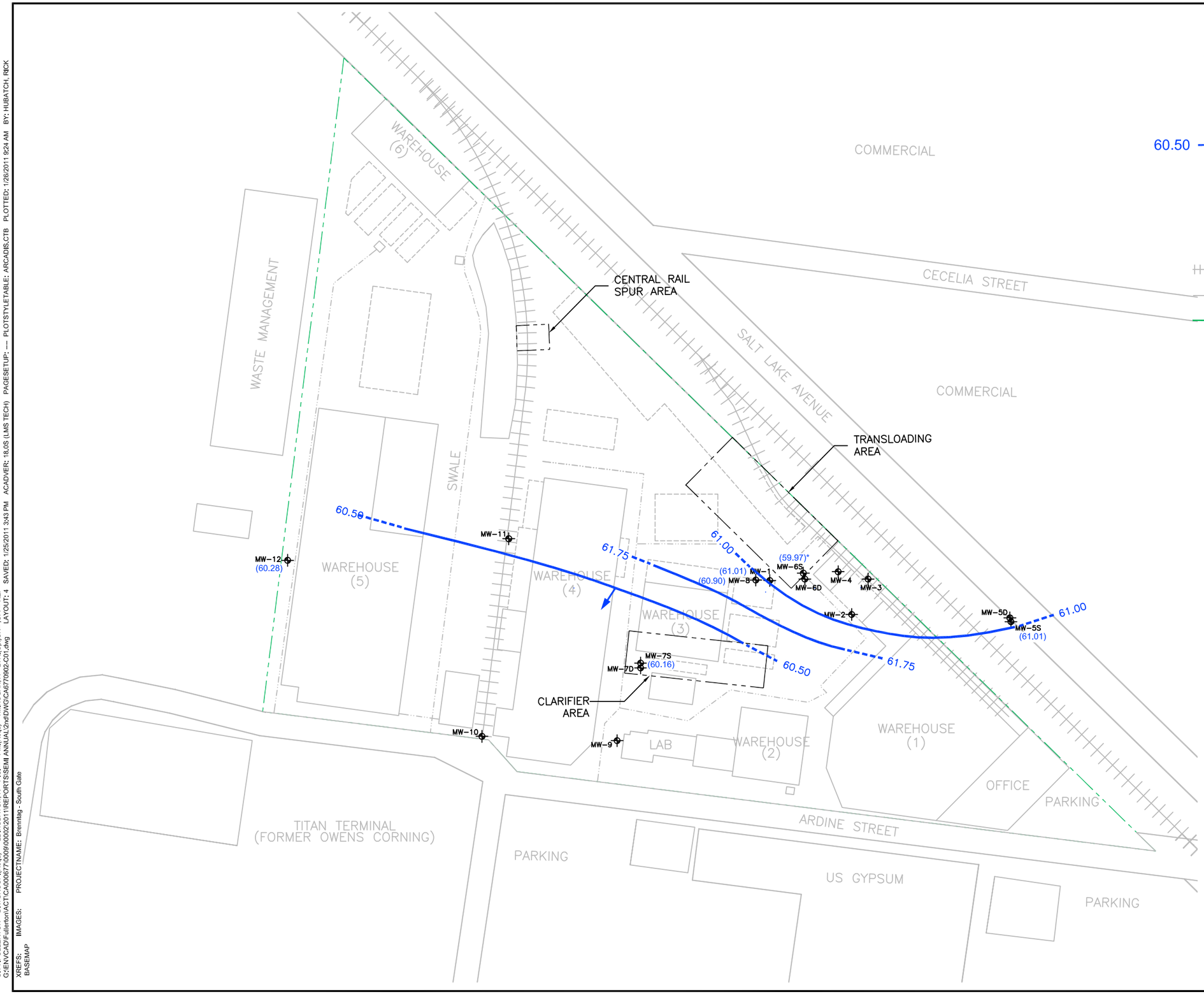
BASEMAP



LEGEND

- MW–12 (60.28) — EXISTING GROUNDWATER MONITORING WELL IDENTIFICATION AND ELEVATION OF POTENTIOMETRIC GROUNDWATER LEVEL IN FEET ABOVE MEAN SEA LEVEL (AMSL)
- 60.50 — APPROXIMATE LINE OF EQUAL ELEVATION IN FEET AMSL; DASHED WHERE INFERRED
- * — DATA NOT USED FOR CONTOURING
- DIRECTION OF GROUNDWATER GRADIENT
- DRUM STORAGE AREA
- RAILROAD TRACKS
- DRAINAGE DITCH
- PROPERTY BOUNDARY

0 120' 240'
GRAPHIC SCALE

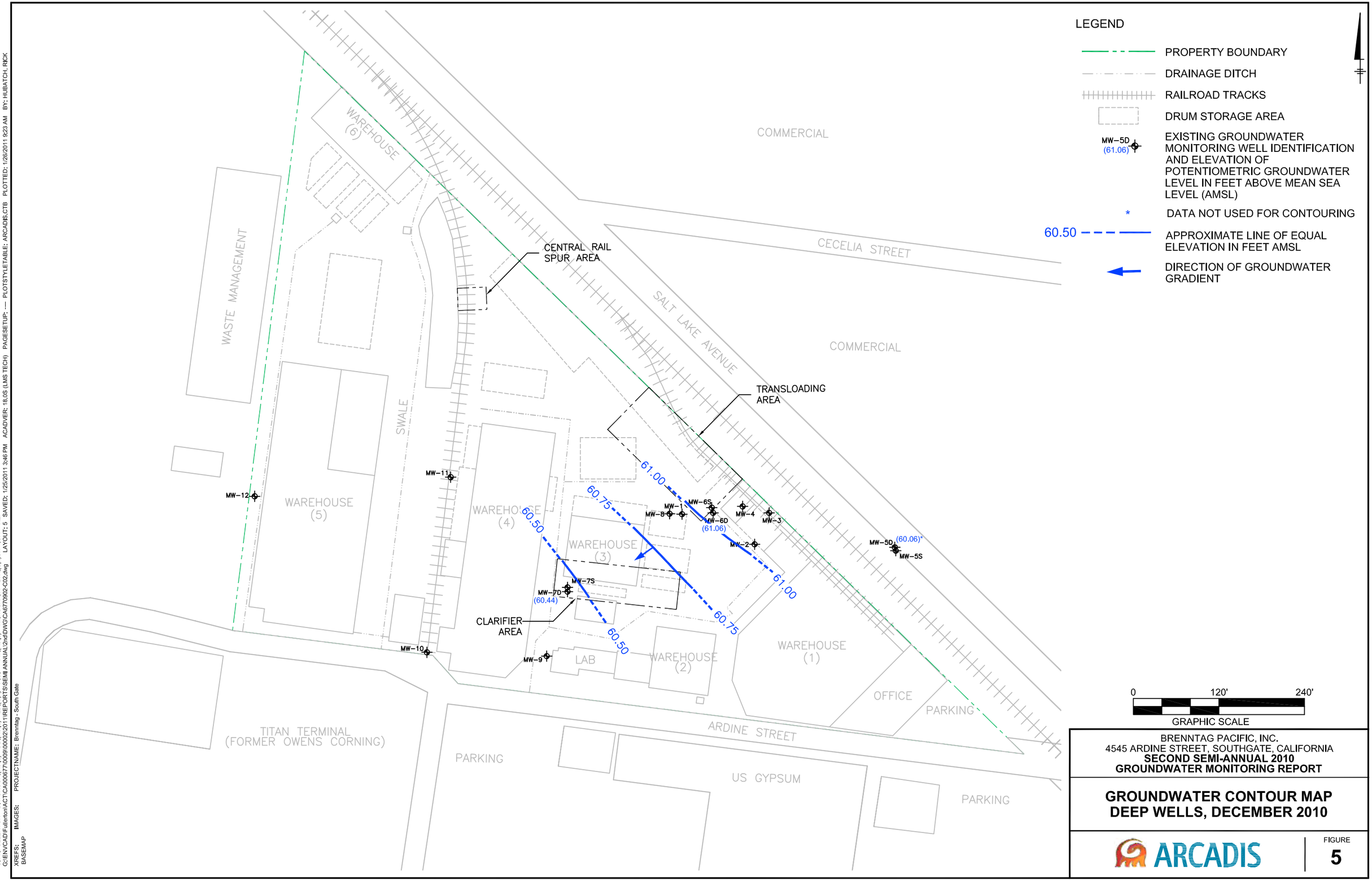
BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
SECOND SEMI-ANNUAL 2010 GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP SHALLOW WELLS, DECEMBER 2010

ARCADIS

FIGURE 4

CITY:FULLERTON DIV/GROUP:(Req'd) DB:(Req'd) LD:(Opt) PIC:— PM:(Req'd) TM:HOGAN, A LYR:(On)ON=*;OFF=*REF*
G:\ENVCAD\Fullerton\ACTIVE\00067700090\0002\2011\REPORTS\SEMI ANNUAL\2nd\DWG\CA677090Z-C02.dwg LAYOUT: 5 SAVED: 1/25/2011 3:46 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 1/26/2011 9:23 AM BY: HUBATCH, RICK
XREFS: IMAGES: PROJECTNAME: Brenntag - South Gate
BASEMAP



BRENNTAG PACIFIC, INC.
4545 ARDINE STREET, SOUTHGATE, CALIFORNIA
SECOND SEMI-ANNUAL 2010
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP DEEP WELLS, DECEMBER 2010

ARCADIS

FIGURE
5

APPENDIX C

Summary of Groundwater Analytical Results

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-1										
Date	05/25/06	12/07/06	06/06/07	11/28/07	07/14/08	12/02/08	12/02/08 Dup	06/17/09	12/30/09	06/30/10	12/16/10
VOCs by EPA Method 8260 (µg/L)											
Acetone	12	<50	<50	<50	<50	<50	<100	<100	<50	<100	<80
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<20	<20	<10	<100	<80
Chloroform	130	3.9	35	6.8	2.9	<1.0	<2.0	<2.0	3.8	<5.0	<4.0
Naphthalene	<10	<10	<10	<10	<10	<10	<20	<20	<10	<25	<20
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<20	<20	<10	<100	<80
Methylene chloride	10	<10	<10	<10	<10	<10	<20	<20	<10	<100	<80
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<20	<20	<10	<100	<80
Benzene	<0.50	1.4	0.51	0.81	0.83	<1.0	<1.0	<1.0	<0.50	<5.0	<4.0
1,2-Dichlorobenzene (1,2-DCB)	1.9	19.0	3.1	13.0	15.0	4.8	5.3	5.3	<1.0	<5.0	<4.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	4.2	<1.0	2.7	3.1	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
1,2,3- Trichlorobenzene	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
1,2,4- Trichlorobenzene	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
Isopropylbenzene	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<25	<20
Total Xylenes (p/m- and o- xylene)	56	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<4.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	<20	NS	NS	NS	<40
Di isopropyl ether (DIPE)	<2.0	2.7	<2.0	<2.0	<2.0	<2.0	<4.0	NS	NS	NS	3.2 J
Tetrachloroethene (PCE)	9.7	48	11	9.7	5.6	5.4	4.8	<2.0	<1.0	<5.0	<4.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
Trichloroethene (TCE)	49	400	130	250	48	18	16	11	11	11	6
1,1-Dichloroethane (1,1-DCA)	1.3	4.5	1.8	2.1	2.1	<1.0	<2.0	<2.0	<1.0	1.6 J	<4.0
1,2-Dichloroethane (1,2-DCA)	1.1	4.2	1.9	2.9	2.2	<0.50	<1.0	1.0	<0.50	<5.0	<4.0
1,1-Dichloroethene (1,1-DCE)	2.3	6.9	3	4.6	5.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	130	210	110	140	330	160	180	250	32	213	244
trans-1,2-Dichloroethene (trans-1,2-DCE)	2.0	4.4	2.8	2.7	6.3	<2.0	3.6	4.2	<1.0	7.0	7.0

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-1										
Date	05/25/06	12/07/06	06/06/07	11/28/07	07/14/08	12/02/08	12/02/08 Dup	06/17/09	12/30/09	06/30/10	12/16/10
Vinyl Chloride	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<5.0	<4.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<5.0	<4.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<5.0	<4.0
1,2-Dichloropropane (1,2-DCP)	<1.0	4	2	3.5	3.9	<2.0	<2.0	<2.0	<1.0	1.8 J	5.7
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	8.4	5.2	4.7	3.8	4.8	<2.0	<2.0	3.4	<2.0	0.95	0.88
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)											
C6-C10	--	--	--	--	--	--	--	--	--	242 J	312
C10-C28	--	--	--	--	--	--	--	--	--	--	1,720
C28-C40	--	--	--	--	--	--	--	--	--	--	4,730
C6	--	--	--	ND	ND	ND	ND	ND	ND	--	--
C7	--	53	38	66	ND	ND	ND	ND	ND	--	--
C8	--	21	5.1	8.9	ND	4.6	7.4	4.6	ND	--	--
C9-C10	--	15	8	43	ND	17	17	17	ND	--	--
C11-C12	--	4.7	20	26	ND	67	60	67	ND	--	--
C13-C14	--	18	55	25	ND	98	93	98	ND	--	--
C15-C16	--	13	79	28	ND	120	120	120	ND	--	--
C17-C18	--	19	120	40	ND	170	160	170	ND	--	--
C19-C20	--	22	110	24	ND	190	200	190	ND	--	--
C21-C22	--	11	100	24	ND	180	180	180	ND	--	--
C23-C24	--	10	120	13	ND	290	260	290	ND	--	--
C25-C28	--	3.7	220.0	3.1	ND	490	450.0	490	690	--	--
C29-C32	--	ND	180	ND	ND	410	350.0	410	710	--	--
C33-C36	--	ND	96	ND	ND	360	280.0	360	580	--	--
C37-C40	--	ND<500	28	ND	ND	370	270.0	370	ND	--	--
C41-C44	--	--	1.9	ND	ND	190	120.0	190	ND	--	--
C6-C44 Total	--	--	1,200	<500	<500	3000	2,500	3,000	3,300	--	--
Metals by EPA Method 6010B/7470A (mg/L)											
Antimony	--	<0.015	0.0162	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030
Arsenic	--	1.7	21.2	3.19	3.73	0.992	1.18	0.992	0.421	0.0697	0.919
Barium	--	0.0440	0.0507	0.0283	0.0297	0.0561	0.0684	0.0561	0.1410	0.0253	0.1410
Beryllium	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050
Cadmium	--	<0.005	0.01	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	0.0071	0.0085
Chromium	--	0.0091	0.0227	<0.00500	0.0055	0.0578	0.0636	0.0578	0.0353	0.0264	0.0245
Cobalt	--	0.0097	0.0245	0.0072	0.0054	0.0289	0.0342	0.0289	<0.0100	<0.0050	0.0070
Copper	--	0.0162	0.1360	0.0165	0.0361	0.0982	0.115	0.0982	0.186	0.235	0.310
Lead	--	0.0214	0.0810	<0.0100	0.0123	0.0185	0.0222	0.0185	0.0515	0.0353	0.0380
Mercury	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-1										
Date	05/25/06	12/07/06	06/06/07	11/28/07	07/14/08	12/02/08	12/02/08 Dup	06/17/09	12/30/09	06/30/10	12/16/10
Molybdenum	--	0.0455	0.0486	0.0491	0.0373	0.0239	0.0281	0.0239	0.0123	0.0134	0.0346
Nickel	--	0.483	0.372	0.493	0.364	0.1400	0.162	0.140	0.0344	0.154	0.282
Selenium	--	0.0229	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030
Silver	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050
Thallium	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030
Vanadium	--	<0.005	0.00739	<0.00500	<0.00500	0.0068	0.00753	0.0068	0.0237	0.0110	0.0105
Zinc	--	0.0747	0.609	0.0581	0.142	0.235	0.258	0.235	1.02	0.540	0.468
Field Measurements											
pH (Standard units)	6.62	7.09	8.22	7.72	6.60	6.75	--	7.29	5.34	7.08	6.79
Specific Conductance (milliSiemens per centimeter)	0.421	0.768	0.642	0.750	0.790	0.170	--	0.653	0.010	3.14	3.790
Oxidation-Reduction Potential (ORP) (millivolts)	-154.0	-91.0	-79.0	-133	-123	-120	--	-144	131	-111	-66
Dissolved Oxygen (DO) (mg/L)	0.72	1.43	5.36	0.00	0.88	1.70	--	5.31	10.26	2.00	7.67
Temperature (degrees Celsius)	27.00	24.10	25.88	24.36	31.00	22.80	--	27.81	13.99	23.70	18.54

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
1. Sampled at a depth of 76 feet
2. Sampled at a depth of 73 feet
3. Sampled at a depth of 63 feet

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-1											
Date	06/20/11	12/19/11	06/08/12	12/04/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/27/15*	04/20/16	10/25/16
VOCs by EPA Method 8260 (µg/L)												
Acetone	<80	5.4 J	5.3 J	<20	<20	<200	<200	<400	<400	<1,000	<1,000	<25
2-Butanone (methyl ethyl ketone)	<80	<10	<10	<10	<10	<100	<100	--	<200	<500	<500	<5.0
Chloroform	<4.0	<1.0	<1.0	0.29 J	0.49 J	<10	<10	<20	<20	<50	<50	<1.0
Naphthalene	<20	<5.0	<5.0	<5.0	<5.0	<50	<50	<100	<100	<100	<100	<5.0
2-Hexanone (methyl butyl ketone)	<80	<10	<10	<10	<10	<100	<100	<200	<200	<500	<500	<10
Methylene chloride	<80	<1.0	<10	<10	<10	<10	<100	<400	<400	<50	<50	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<80	<10	<10	6.2 J	<10	<100	<100	<200	<200	79.6 J	<500	<5.0
Benzene	<4.0	<1.0	0.69 J	<1.0	1.30	<10	<10	<20	5.0 J	<50	<50	1.7
1,2-Dichlorobenzene (1,2-DCB)	<4.0	0.45 J	0.38 J	<1.0	0.29 J	<10	<10	<20	<20	14.8 J	<50	0.33 J
1,3-Dichlorobenzene (1,3-DCB)	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
Chlorobenzene	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	0.44 J
Ethylbenzene	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<1.0
1,2,3- Trichlorobenzene	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<2.0
1,2,4- Trichlorobenzene	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<2.0
n-Butylbenzene	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<1.0
s-Butylbenzene	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<1.0
t-Butylbenzene	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<1.0
Isopropylbenzene	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
n-Propylbenzene	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<1.0
Toluene	<4.0	<4.0	<1.0	<1.0	0.32 J	<10	<10	<20	<20	<50	<50	0.35 J
p-Isopropyltoluene	<20	<2.0	<2.0	<2.0	<2.0	<20	<20	<40	<40	<100	<100	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	<2.0	<4.0	<4.0	<4.0	<20	<20	<40	<40	<100	<100	<3.0
Methyl tert-butyl ether (MTBE)	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
Tert-Butyl Alcohol (TBA)	<40	<10	<10	<10	<10	<100	<100	<200	<200	<500	<500	<20
Di isopropyl ether (DIPE)	<20	<2.0	3.4	<2.0	1.8 J	3.2 J	3.3 J	4.8 J	4.5 J	<100	<100	2.5
Tetrachloroethene (PCE)	<4.0	0.56 J	0.59 J	1.8	3.1	<10	<10	<20	<20	<50	<50	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<4.0	<1.0	<1.0	<1.0	0.44 J	<10	<10	<20	<20	<50	<50	<1.0
Trichloroethene (TCE)	31	4	8	7.8	24	21	8.6 J	10.9 J	12.3 J	<50	27.8 J	9.6
1,1-Dichloroethane (1,1-DCA)	<4.0	<1.0	1.0	<1.0	1.1	<10	<10	<20	<20	<50	<50	1.6
1,2-Dichloroethane (1,2-DCA)	<4.0	<1.0	0.56 J	<1.0	0.48 J	<10	<10	<20	<20	<50	<50	<1.0
1,1-Dichloroethene (1,1-DCE)	<4.0	<1.0	1.4	<1.0	2.1	2.8 J	<10	<20	<20	<50	<50	1.5
cis-1,2-Dichloroethene (cis-1,2-DCE)	185	23	299	19.1	602	974	981	881	2,110	2,910	2,560	1,020a
trans-1,2-Dichloroethene (trans-1,2-DCE)	2.5 J	1.1	8.2	0.41 J	12.5	12.1	14.6	15.8 J	22.8	24.4 J	20.3 J	22.5

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Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-1											
Date	06/20/11	12/19/11	06/08/12	12/04/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/27/15*	04/20/16	10/25/16
Vinyl Chloride	<4.0	<1.0	1.20	<1.0	2.10	3.2 J	<10	<20	<20	<50	<50	0.86 J
Carbon Tetrachloride	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
Styrene	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<1.0
1,2-Dibromomethane	<4.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<20	<20	<50	<50	<2.0
1,2-Dichloropropane (1,2-DCP)	5.1	<1.0	2.2	<1.0	5.5	<10	7.8 J	10.0 J	11.8 J	<50	17.3 J	11.3
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	1.0	<0.95	0.62	<4.7	<4.8	0.96 J	<10	<3.8	<4.7	--	1.1 J	0.96
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)												
C6-C10	190 J	37.8	836	38	844	1,360	2,370	1,450	3,360	5,230	3,080	579
C10-C28	463	421	835	522	2,010	571	1,430	294	1,780	--	1,360	971
C28-C40	1,060	622	3,210	1,260	6,150	1,820	4,150	2,630	6,440	--	2,760	747
C6	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)												
Antimony	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	< 0.0060	< 0.0060	<0.0060	<0.0060	<0.0060
Arsenic	0.508	1.46	1.75	0.523	0.129	0.371	0.564	0.716	1.31	0.754	0.298	0.397
Barium	<0.20	<0.20	0.2860	<0.20	0.2040	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	0.0098	0.0088	0.0046	0.0023	0.0135	0.0050	0.0048	0.0100	0.0077	<0.0020	<0.0050
Chromium	0.0181	0.0256	0.0460	0.0468	0.0111	0.0177	0.0165	0.0268	0.0364	0.0277	<0.010	0.0173
Cobalt	0.0055	<0.0050	0.0074	0.0052	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0077	<0.050
Copper	0.124	0.227	0.533	0.298	0.101	0.176	0.232	0.287	0.474	0.307	0.0839	0.183
Lead	0.0200	0.0477	0.0946	0.0813	0.0144	0.0321	0.0442	0.0530	0.0858	0.0559	0.0117	0.0242
Mercury	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00027	<0.00020	0.00026	<0.00020	<0.00020	<0.00050

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-1											
Date	06/20/11	12/19/11	06/08/12	12/04/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/27/15*	04/20/16	10/25/16
Molybdenum	<0.020	<0.020	0.0322	0.0229	<0.020	0.0456	0.0471	0.0593	0.0721	0.0362	0.0289	0.132
Nickel	0.280	0.0228	0.3130	0.0246	0.3470	0.3610	0.336	0.216	0.287	0.504	0.663	0.359
Selenium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0051	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	0.0112	0.0199	0.0243	<0.010	<0.010	<0.010	0.0124	0.0121	0.0110	<0.010	<0.050
Zinc	0.253	0.582	0.992	1.14	0.274	0.557	0.487	0.613	0.968	0.694	0.192	0.319
Field Measurements												
pH (Standard units)	7.11	7.47	7.12	7.76	7.73	6.45	6.50	6.62	6.72	7.56	6.57	--
Specific Conductance (milliSiemens per centimeter)	1.100	1.280	1.400	0.305	5.440	5.400	5.29	4.140	4.910	5.270	6.170	--
Oxidation-Reduction Potential (ORP) (millivolts)	-33	-103	-27	65	-111	-76	-23	-67	-77	-66	-23	--
Dissolved Oxygen (DO) (mg/L)	0.00	7.03	0.00	6.70	6.84	1.17	9.89	8.19	7.84	8.58	9.91	--
Temperature (degrees Celsius)	22.14	16.11	22.15	26.50	24.18	20.87	31.32	21.52	29.79	23.24	21.99	--

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
1. Sampled at a depth of 76 feet
2. Sampled at a depth of 73 feet
3. Sampled at a depth of 63 feet

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-2																		
Date	5/24/06 [1]	5/24/06 [2]	5/24/06 [3]	12/07/06	06/06/07	11/28/07	07/15/08	07/15/08 Dup	12/02/08	06/16/09	06/16/09 Dup	12/31/09	12/31/09 Dup	06/30/10	06/30/10 Dup	12/15/10	12/15/10 Dup	06/20/11	06/20/11 Dup
VOCs by EPA Method 8260 (µg/L)																			
Acetone	13	13	13	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<100	<100	<20	<20	<20	<20
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<100	<20	<20	<20	<20
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<25	<25	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<100	<20	<20	<20	<20
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<100	<20	<20	<20	<20
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<100	<100	<20	<20	<20	<20
Benzene	1.1	1.1	1.0	1.0	0.7	0.6	0.62	0.62	<1.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	1.4	1.4	1.3	1.8	2.8	3.5	3.5	3.5	2.1	2.2	1.9	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	1.0	1.5	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<25	<25	<5.0	<5.0	<5.0	<5.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<10	<10
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	56	10	12	<10	<10	<10	<10	NS	NS	NS	NS	<50	<50	<10	<10	<10	<10
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	5	NS	NS	NS	NS	<25	<25	<5.0	<5.0	<5.0	0.52 J
Tetrachloroethene (PCE)	4.1	3.9	4.0	3.3	2.5	1.3	1.6	<1.0	1.6	1.7	1.5	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	130	130	120	110	86	8.7	19	20	12	7.0	6.0	1.9	1.3	18.7	16.2	0.77 J	0.71 J	4.5	5.4
1,1-Dichloroethane (1,1-DCA)	4.4	4.6	4.6	3.3	2.7	2.6	3.0	3.0	11.0	6.2	5.0	8.6	8.4	5.2	4.8 J	<1.0	<1.0	1.1	1.3
1,2-Dichloroethane (1,2-DCA)	11	11	12	6.2	6.6	7.3	<0.50	<0.50	20.0	10.0	9.5	18.0	18.0	10.5	9.4	<1.0	<1.0	2.2	2.4
1,1-Dichloroethene (1,1-DCE)	4.0	4.0	3.9	2.9	2.2	2.3	1.9	1.7	5.9	1.2	<1.0	4.1	3.7	2.4 J	2.3 J	<1.0	0.22 J	0.75 J	0.95 J
cis-1,2-Dichloroethene (cis-1,2-DCE)	150	160	150	94	91	170	190	190	500	170	160	370	410	299	280	13.5	12.9	95.5	95.8
trans-1,2-Dichloroethene (trans-1,2-DCE)	4.0	4.3	3.8	3.4	2.2	2.6	<1.0	2.7	8.6	4.6	3.9	11.0	11.0	10.3	9.7	0.55 J	0.56 J	2.9	3.1
Vinyl Chloride	0.67	0.56	0.58	0.082	0.65	0.61	<0.50	<0.50	0.84	53.00	46.00	31.00	32.00	5.30	5.10	<1.0	<1.0	0.60 J	0.73 J
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane (1,2-DCP)	5.3	4.8	4.8	3.4	4.6	5.1	3.6	3.4	4.2	2.5	2.2	<1.0	<1.0	<5.0	2.0 J	<1.0	<1.0	0.48 J	0.63 J
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	61	59	59	120	230	170	48	49	61	25	25	24	23	6.3	7.8	<0.95	<2.0	3.2	3.2
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																			
C6-C10	--	--	--	--	--	--	--	--	--	--	--	--	--	350	318	<50	<50	128	135
C10-C28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	199	303	<94	<94
C28-C40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	214	345	<190	<190
C6	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
C7	--	--	--	ND	38	12	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
C8	--	--	--	ND	5.1	2.3	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
C9-C10	--	--	--	12	47	69	ND	10	13	ND	ND	ND	ND	--	--	--	--	--	--
C11-C12	--	--	--	57	100	70	120	110	29	ND	ND	ND	ND	--	--	--	--	--	--
C13-C14	--	--	--	65	96	59	110	79	37	ND	ND	ND	ND	--	--	--	--	--	--
C15-C16	--	--	--	78	140	100	150	100	49	ND	ND	ND	ND	--	--	--	--	--	--
C17-C18	--	--	--	100	140	75	170	120	73	ND	ND	ND	ND	--	--	--	--	--	--
C19-C20	--	--	--	63	82	60	120	78	51	ND	ND	ND	ND	--	--	--	--	--	--
C21-C22	--	--	--	24	55	23	70	40	16	ND	ND	ND	ND	--	--	--	--	--	--
C23-C24	--	--	--	12	7.8	10	32	13	9	ND	ND	ND	ND	--	--	--	--	--	--
C25-C28	--	--	--	4.1	13	ND	61	16	4	ND	ND	ND	ND	--	--	--	--	--	--
C29-C32	--	--	--	ND	ND	ND	45	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
C33-C36	--	--	--	ND	ND	ND	13	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
C37-C40	--	--	--	ND<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
C41-C44	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	730	<500	890	570	<500	<500	<500	<500	<500	--	--	--	--	--	--

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-2																		
Date	5/24/06 [1]	5/24/06 [2]	5/24/06 [3]	12/07/06	06/06/07	11/28/07	07/15/08	07/15/08 Dup	12/02/08	06/16/09	06/16/09 Dup	12/31/09	12/31/09 Dup	06/30/10	06/30/10 Dup	12/15/10	12/15/10 Dup	06/20/11	06/20/11 Dup
Metals by EPA Method 6010B/7470A (mg/L)																			
Antimony	--	--	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.0100	<0.030	<0.030	<0.0060	<0.0060
Arsenic	--	--	--	0.128	0.0937	0.114	0.117	0.11	0.0728	0.0593	0.0617	0.0476	0.0472	0.0367	0.0412	<0.030	<0.030	0.0245	0.024
Barium	--	--	--	0.0447	0.0369	0.0356	0.0376	0.0365	0.0278	0.0766	0.0773	0.0454	0.0441	0.675	0.0677	<0.10	<0.10	<0.20	<0.20
Beryllium	--	--	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium	--	--	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Chromium	--	--	--	0.009	<0.005	<0.00500	<0.00500	<0.00500	0.00507	<0.00500	<0.00500	<0.0100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.010
Cobalt	--	--	--	<0.005	0.0114	<0.00500	<0.00500	<0.00500	0.0057	<0.00500	<0.00500	<0.0100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Copper	--	--	--	0.0206	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	0.0496	0.0549	0.0127	<0.0100	0.0127	0.0141	0.0098	0.0098	0.0317	0.0195
Lead	--	--	--	0.0225	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	0.0152	0.0154	<0.0100	<0.0100	<0.0050	0.005	<0.010	<0.010	0.0195	0.019
Mercury	--	--	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	--	--	--	0.0231	0.0195	0.0233	0.0140	0.0132	0.0343	0.0138	0.014	0.0374	0.0373	0.0400	0.0383	<0.0050	<0.0050	0.0234	<0.020
Nickel	--	--	--	0.348	0.352	0.381	0.385	0.374	0.197	0.114	0.114	0.200	0.199	0.189	0.179	0.010	0.0099	0.0708	0.0583
Selenium	--	--	--	0.0384	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.0200	<0.030	<0.030	<0.010	<0.010
Silver	--	--	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050
Thallium	--	--	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.0200	<0.030	<0.030	<0.010	<0.010
Vanadium	--	--	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.010
Zinc	--	--	--	0.0146	0.0255	0.0182	0.0197	0.0106	0.0116	0.0555	0.0561	0.0217	0.0187	0.0286	0.0413	0.116	0.111	0.139	0.153
Field Measurements																			
pH (Standard units)	6.87	6.87	6.87	7.06	8.22	7.71	7.00	--	6.61	7.29	--	6.53	--	7.15	--	7.89	--	7.00	--
Specific Conductance (milliSiemens per centimeter)	0.662	0.662	0.661	6210	0.666	0.709	0.760	--	0.460	0.310	--	4.170	--	1.050	--	0.244	--	1.860	--
Oxidation-Reduction Potential (ORP) (millivolts)	-158	-131	-128	-127	-143	-157	-124	--	-19	-150	--	-94	--	99	--	-37	--	-89	--
Dissolved Oxygen (DO) (mg/L)	2.15	1.65	2.02	0.92	0.00	0.00	1.11	--	1.50	4.97	--	2.35	--	2.40	--	9.51	--	1.46	--
Temperature (degrees Celsius)	27.20	27.70	29.31	25.30	22.51	23.44	27.80	--	24.00	28.70	--	17.07	--	24.50	--	18.44	--	26.86	--

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
a - Dilution required due to sample foaming
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
1. Sampled at a depth of 76 feet
2. Sampled at a depth of 73 feet
3. Sampled at a depth of 63 feet

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-2																					
Date	12/20/11	12/20/11 Dup	06/08/12	06/08/12 Dup	12/03/12	12/03/12 Dup	04/08/13	04/08/13 Dup	10/07/13	10/07/13 Dup	05/12/14	05/12/14 Dup	10/20/14	10/20/14 Dup	04/28/15	04/28/15 Dup	10/27/15[a]	10/27/15 Dup	04/20/16	04/20/16 Dup	10/25/16	10/25/16 Dup
VOCs by EPA Method 8260 (µg/L)																						
Acetone	<100	<100	<40	<20	<100	<100	<20	<100	<50	<50	<20	<20	<20	<20	<40	<20	<200	5.1 J	<200	<200	<25	<25
2-Butanone (methyl ethyl ketone)	<50	<50	<10	<10	<10	<10	<10	<10	<25	<25	<10	<10	--	--	<20	<10	<100	<10	<100	<100	<5.0	<5.0
Chloroform	<5.0	<4.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	0.35 J	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
Naphthalene	<25	<25	<10	<5.0	<25	<25	<5.0	<25	<13	<13	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<50	<5.0	<50	<50	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<50	<50	<20	<10	<50	<50	<10	<50	<25	<25	<10	<10	<10	<10	<10	<10	<100	<10	<100	<100	<10	<10
Methylene chloride	<50	<50	<2.0	<10	<50	<5.0	<10	<5.0	<25	<25	<1.0	<1.0	<10	<1.0	<10	<1.0	<10	<1.0	<10	<10	<5.0	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<50	<50	<20	<10	<50	<5.0	<10	<5.0	<25	<25	<10	<10	<10	<10	<20	<10	<100	<10	<100	<100	<5.0	<5.0
Benzene	<5.0	<5.0	<2.0	0.20 J	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	0.22 J	<2.0	<1.0	<10	<1.0	<10	<10	0.21 J	0.22 J
1,2-Dichlorobenzene (1,2-DCB)	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
Chlorobenzene	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
Ethylbenzene	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<10	<10	<4.0	<2.0	<4.0	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<1.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<10	<10	<4.0	<2.0	<4.0	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<2.0	<2.0
1,2,3- Trichlorobenzene	<10	<10	<4.0	<2.0	<10	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<2.0	<2.0
1,2,4- Trichlorobenzene	<10	<10	<4.0	<2.0	<10	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<2.0	<2.0
n-Butylbenzene	<10	<10	<4.0	<2.0	<10	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<1.0	<1.0
s-Butylbenzene	<10	<10	<4.0	<2.0	<10	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<1.0	<1.0
t-Butylbenzene	<10	<10	<4.0	<2.0	<10	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<1.0	<1.0
Isopropylbenzene	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
n-Propylbenzene	<10	<10	<4.0	<2.0	<10	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<1.0	<1.0
Toluene	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
p-Isopropyltoluene	<10	<10	<4.0	<2.0	<10	<10	<2.0	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<1.0	<1.0
Total Xylenes (p/m- and o- xylene)	<10	<10	<8.0	<2.0	<8.0	<2.0	<8.0	<2.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<20	<2.0	<20	<20	<3.0	<3.0
Methyl tert-butyl ether (MTBE)	<5.0	<5.0	<2.0	<1.0	<2.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<50	<50	<20	<10	<20	<50	<10	<50	<25	<25	<10	<10	<10	<10	<20	<10	<100	<10	<100	<100	<20	<20
Di isopropyl ether (DIPE)	2.2 J	2.3 J	0.99 J	1.0 J	1.8 J	1.6 J	0.56 J	2.0 J	3.4 J	3.4 J	0.54 J	0.41 J	1.1 J	1.8 J	1.3 J	1.4 J	<20	0.62 J	<20	<20	2.0	2.0
Tetrachloroethene (PCE)	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	3.7	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<5.0	<5.0	<2.0	<1.0	<10	<10	<1.0	<10	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<20	<1.0	<20	<20	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<5.0	<5.0	<2.0	<1.0	<10	<10	<1.0	<10	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
Trichloroethene (TCE)	14.6	14.3	2.0	2.3	1.0	<5.0	1.9	1.6 J	2.3 J	2.3 J	1.8	56.7	3.9	4.1	1.2 J	1.3	<10	0.39 J	<10	<10	0.45 J	0.43 J
1,1-Dichloroethane (1,1-DCA)	3.6 J	3.6 J	1.4 J	1.6	1.9 J	1.7 J	0.58 J	1.9 J	<2.5	<2.5	0.56 J	0.64 J	1.3	1.9	0.96 J	1.2	<10	0.53 J	<10	<10	1.7	1.9
1,2-Dichloroethane (1,2-DCA)	6.0	6.2	2.7	2.9	4.4 J	4.1 J	1.4	4.1	6.4	6.4	1.4	0.62 J	2.7	3.9	2.2	2.5	<10	0.97 J	<10	<10	2.5	2.7
1,1-Dichloroethene (1,1-DCE)	3.2 J	2.9 J	1.0 J	1.3	1.3 J	1.2 J	0.35 J	1.5 J	2.0 J	2.0 J	0.40 J	<1.0	1.0	1.5	0.64 J	0.81 J	<10	<1.0	<10	<10	0.83 J	0.89 J
cis-1,2-Dichloroethene (cis-1,2-DCE)	379	385	144	131	217	203	53.4	190	248	248	53.3	15.8	157	111	82.6	82.7	31.2	42.7	8.5 J	6.2 J	91.2	91.6
trans-1,2-Dichloroethene (trans-1,2-DCE)	12.5	13.1	5.2	6.1	7.5	7.4	2.3	7.3	10.5	10.5	2.3	1.0	5.1	8.1	3.4	4.0	<10	1.5	<10	<10	4.9	4.8
Vinyl Chloride	<5.0	<5.0	<2.0	0.43 J	<2.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	0.26 J	<2.0	0.39 J	<10	0.24 J	<10	<10	<1.0	0.32 J
Carbon Tetrachloride	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
Styrene	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<10	<10	<1.0	<1.0
1,2-Dibromomethane	<5.0	<5.0	<2.0	<1.0	<5.0	<5.0	<1.0	<5.0	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0	<10	<10	<2.0	<2.0
1,2-Dichloropropane (1,2-DCP)	1.5 J	1.5 J	0.53 J	0.62 J	<5.0	<5.0	<1.0	0.56 J	0.77 J	0.77 J	<1.0	<1.0	0.38 J	0.52 J	<2.0	0.31 J	<10	<1.0	<10	<10	<1.0	0.34 J
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	5.5	5.4	2.0	0.7	2.7	2.2	1.6	2.6	3.4	3.4	1.4	0.25 J	2.9	2.5	0.94	0.90	--	--	0.085 J	0.13	1.8	1.8
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																						
C6-C10	412	426	280	395	300	279	124	389	360	360	124	165	228	333	90.2 J	167	<500	<50	<500	<500	<100	53.1 J
C10-C28	252	322	205	433	316	201	--	--	--	--	--	--	300	284	359	342	--	--	298	290	217	168
C28-C40	<190	<190	156	718	193	161	--	171 J	140 J	140 J	451	87.0	225	181 J	460	305	--	--	305	327	207	59.7
C6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-2																					
Date	12/20/11	12/20/11 Dup	06/08/12	06/08/12 Dup	12/03/12	12/03/12 Dup	04/08/13	04/08/13 Dup	10/07/13	10/07/13 Dup	05/12/14	05/12/14 Dup	10/20/14	10/20/14 Dup	04/28/15	04/28/15 Dup	10/27/15[a]	10/27/15 Dup	04/20/16	04/20/16 Dup	10/25/16	10/25/16 Dup
Metals by EPA Method 6010B/7470A (mg/L)																						
Antimony	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	0.0382	0.0365	0.0249	0.0213	0.0267	0.015	0.0229	0.022	0.0245	0.0245	0.0233	0.0144	0.0247	0.0267	0.0169	0.0175	<0.010	<0.010	0.0149	0.0158	0.0291	0.0298
Barium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040	<0.0040
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050	<0.0050
Chromium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Copper	0.01	<0.010	<0.010	<0.010	0.033	<0.010	0.0125	<0.010	<0.010	<0.010	0.0161	0.0419	<0.010	<0.010	0.0116	0.0126	0.0121	0.014	0.0122	0.0133	<0.025	<0.025
Lead	0.0135	0.0126	<0.010	<0.010	0.0269	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050	<0.0050
Mercury	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050
Molybdenum	0.0584	0.056	0.0353	0.0348	0.06	0.0576	<0.020	0.049	0.0656	0.0656	0.0255	0.0461	0.0571	0.0584	0.0388	0.0426	<0.020	<0.020	<0.020	<0.020	<0.050	<0.050
Nickel	0.237	0.232	0.0695	0.0649	0.130	0.127	0.0193	0.103	0.0887	0.0887	0.0245	0.0686	0.0798	0.0805	0.0273	0.0298	0.0103	0.0104	0.0064	0.0063	0.0458	0.0467
Selenium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.010
Thallium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050
Zinc	0.046	0.0536	0.0301	0.0308	0.173	0.0326	0.106	0.0411	<0.020	<0.020	0.102	0.0689	0.0317	0.0299	0.093	0.0777	0.135	0.145	0.238	0.228	0.0507	0.0511
Field Measurements																						
pH (Standard units)	6.96	--	7.81	--	7.26	--	7.26	--	--	--	--	--	7.18	--	7.19	--	8.24	--	6.84	--	7.51	--
Specific Conductance (milliSiemens per centimeter)	4.050	--	1.750	--	2.510	--	1.980	--	--	--	--	--	2.830	--	1.760	--	0.663	--	0.345	--	1.8	--
Oxidation-Reduction Potential (ORP) (millivolts)	-49	--	-159	--	-82	--	-97	--	--	--	--	--	-66	--	-91	--	-193	--	98	--	13	--
Dissolved Oxygen (DO) (mg/L)	5.93	--	9.91	--	0.28	--	14.07	--	--	--	--	--	0.32	--	9.17	--	8.45	--	9.81	--	3.3	--
Temperature (degrees Celsius)	18.22	--	24.43	--	23.23	--	30.16	--	--	--	--	--	21.30	--	20.55	--	26.53	--	27.75	--	24.81	--

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
a - Dilution required due to sample foaming
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
1. Sampled at a depth of 76 feet
2. Sampled at a depth of 73 feet
3. Sampled at a depth of 63 feet

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-3											
Date	5/24/06 [1]	5/24/06 [2]	5/24/06[3]	12/06/06	06/06/07	11/27/07	07/16/08	12/03/08	06/15/09	01/11/10	06/30/10	12/15/10
VOCs by EPA Method 8260 (µg/L)												
Acetone	<10	<10	34	--	<50	NS	<50	<50	<50	<50	<100	<100
2-Butanone (methyl ethyl ketone)	<10	<10	<10	--	<10	NS	<10	<10	<10	<10	<100	<100
Chloroform	3.1	3.5	8.1	--	1.3	NS	2.3	<1.0	<1.0	1.4	<5.0	<5.0
Naphthalene	<10	<10	<10	--	<10	NS	<10	<10	<10	<10	<25	<25
2-Hexanone (methyl butyl ketone)	<10	<10	<10	--	<10	NS	<10	<10	<10	<10	<100	<100
Methylene chloride	<10	<10	<10	--	<10	NS	<10	<10	<10	<10	<100	<100
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	--	<10	NS	<10	<10	<10	<10	<100	<100
Benzene	2.7	<0.50	<0.50	--	<0.50	NS	<0.50	<0.50	1.0	<0.50	<5.0	<5.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
Chlorobenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
Ethylbenzene	2.3	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
n-Butylbenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
s-Butylbenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
t-Butylbenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
Isopropylbenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
n-Propylbenzene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
Toluene	10	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<25	<25
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	--	<10	NS	<10	<10	NS	NS	<50	<50
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	--	<2.0	NS	<2.0	<2.0	NS	NS	<25	<25
Tetrachloroethene (PCE)	7.0	6.0	6.1	--	6.3	NS	2.1	13	5.8	4.2	9.2	21.5
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
Trichloroethene (TCE)	56	48	54	--	27	NS	27	150	63	13	52.3	271
1,1-Dichloroethane (1,1-DCA)	1.7	1.6	2	--	1.2	NS	1.8	1.0	8.3	1.9	3.7 J	3.2 J
1,2-Dichloroethane (1,2-DCA)	1.1	1.1	1	--	<0.50	NS	<0.50	<0.50	6.6	0.5	3.0 J	2.9 J
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	5.7	<1.0	2.6 J	2.0 J
cis-1,2-Dichloroethene (cis 1,2-DCE)	76	80	91	--	23	NS	55	45	620	68	303	159
trans-1,2-Dichloroethene (trans 1,2-DCE)	2.0	<1.0	<1.0	--	<1.0	NS	1.0	<1.0	6.4	<1.0	6.0	4.2 J
Vinyl Chloride	<0.50	<0.50	<0.50	--	<0.50	NS	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	--	<0.50	NS	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0
Styrene	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	--	<1.0	NS	<1.0	<1.0	3	<1.0	<5.0	<5.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	26	24	23	--	4.8	NS	9.2	<2.0	16	<2.0	2.5	2.3
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)												
C6-C10	--	--	--	--	--	--	--	--	--	--	377	571
C10-C28	--	--	--	--	--	--	--	--	--	--	--	<190
C28-C40	--	--	--	--	--	--	--	--	--	--	--	<380
C6	--	--	--	--	--	NS	ND	8.9	ND	ND	--	--
C7	--	--	--	--	ND	NS	ND	73.0	ND	ND	--	--
C8	--	--	--	--	ND	NS	ND	20.0	ND	ND	--	--

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-3											
Date	5/24/06 [1]	5/24/06 [2]	5/24/06[3]	12/06/06	06/06/07	11/27/07	07/16/08	12/03/08	06/15/09	01/11/10	06/30/10	12/15/10
C9-C10	--	--	--	--	4.0	NS	ND	30.0	ND	ND	--	--
C11-C12	--	--	--	--	ND	NS	ND	2.9	ND	ND	--	--
C13-C14	--	--	--	--	11	NS	ND	ND	ND	ND	--	--
C15-C16	--	--	--	--	15	NS	ND	ND	ND	ND	--	--
C17-C18	--	--	--	--	20	NS	ND	ND	ND	ND	--	--
C19-C20	--	--	--	--	33	NS	ND	ND	ND	ND	--	--
C21-C22	--	--	--	--	28	NS	ND	ND	ND	ND	--	--
C23-C24	--	--	--	--	22	NS	ND	ND	ND	ND	--	--
C25-C28	--	--	--	--	13	NS	ND	ND	ND	ND	--	--
C29-C32	--	--	--	--	33	NS	ND	ND	ND	ND	--	--
C33-C36	--	--	--	--	32	NS	ND	ND	ND	ND	--	--
C37-C40	--	--	--	--	19	NS	ND	ND	ND	ND	--	--
C41-C44	--	--	--	--	3.2	NS	ND	ND	ND	ND	--	--
C6-C44 Total	--	--	--	--	ND	NS	<500	<500	<500	<500	--	--
Metals by EPA Method 6010B/7470A (mg/L)												
Antimony	--	--	--	--	<0.015	NS	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030
Arsenic	--	--	--	--	<0.010	NS	<0.0100	0.0	0.0519	<0.0100	<0.0100	<0.030
Barium	--	--	--	--	0.0633	NS	0.120	0.169	0.170	0.055	0.052	<0.10
Beryllium	--	--	--	--	<0.001	NS	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050
Cadmium	--	--	--	--	<0.005	NS	<0.00500	<0.00500	<0.00500	<0.0100	<0.0020	0.0026
Chromium	--	--	--	--	0.0187	NS	<0.00500	0.0290	0.0103	<0.0100	<0.0050	<0.0050
Cobalt	--	--	--	--	0.0171	NS	<0.00500	<0.00500	0.0186	<0.0100	<0.0050	0.0096
Copper	--	--	--	--	0.0217	NS	0.0257	0.0636	0.114	0.022	0.025	0.045
Lead	--	--	--	--	<0.010	NS	<0.0100	<0.0100	0.0145	<0.0100	<0.0050	<0.010
Mercury	--	--	--	--	<0.0005	NS	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020
Molybdenum	--	--	--	--	0.0118	NS	0.00538	0.00750	0.115	0.0129	0.0879	0.0979
Nickel	--	--	--	--	0.166	NS	0.191	0.0309	0.507	0.0184	0.317	0.382
Selenium	--	--	--	--	<0.015	NS	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030
Silver	--	--	--	--	<0.005	NS	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050
Thallium	--	--	--	--	<0.015	NS	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030
Vanadium	--	--	--	--	<0.005	NS	<0.00500	0.0059	0.00545	<0.0100	<0.0050	0.00720
Zinc	--	--	--	--	0.0574	NS	0.0453	0.1830	0.217	0.069	0.041	0.066
Field Measurements												
pH (Standard units)	7.07	7.08	7.07	--	8.32	NS	7.00	6.94	7.38	7.04	7.07	7.19
Specific Conductance (milliSiemens per centimeter)	0.471	0.473	0.447	--	0.450	NS	0.510	56	0.433	0.814	3.350	2.900
Oxidation-Reduction Potential (ORP) (millivolts)	68	85	98	--	87	NS	43	-65	-103	-113	-43	-63
Dissolved Oxygen (DO) (mg/L)	2.41	4.42	5.69	--	4.93	NS	1.04	2.70	6.54	3.32	1.93	9.39
Temperature (degrees Celsius)	21.82	23.17	23.67	--	22.32	NS	26.50	21.10	23.24	23.26	22.70	17.78

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
1 - sampled at a depth of 76 feet
2 - sampled at a depth of 73 feet
3 - sampled at a depth of 63 feet

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-3											
Date	06/21/11	12/19/11	07/02/12	12/04/12	04/08/13	10/08/13	05/15/14	10/21/14	05/04/15	10/29/15	04/18/16	10/24/16
VOCs by EPA Method 8260 (µg/L)												
Acetone	<20	<200	<80	<20	<20	<20	<20	<20	<20	6.4 J	<20	<25
2-Butanone (methyl ethyl ketone)	<20	<100	<40	<10	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	0.59 J	<10	0.89 J	1.1	0.46 J	0.31 J	0.35 J	0.35 J	1.1	0.77 J	1.3	1.6
Naphthalene	<5.0	<50	<20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<20	<100	<40	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<20	<100	<40	<10	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<20	<100	<40	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3- Trichlorobenzene	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<5.0	<20	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Total Xylenes (p/m- and o- xylene)	<10	<10	<16.0	<16.0	<16.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether (MTBE)	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<100	<40	<10	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	0.93 J	<20	0.92 J	<2.0	0.83 J	0.75 J	0.41 J	6.7	<2.0	<2.0	<2.0	0.33 J
Tetrachloroethene (PCE)	5.4	27.1	23.1	10.8	2.5	12.0	3.7	3.3	5.1	6.1	3.2	5.6
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<10	<4.0	0.40 J	<1.0	<1.0	<1.0	<1.0	0.32 J	0.22 J	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	48.7	396	224	43.9	10.1	144	57	129	19.1	19.0	12.7	21.1
1,1-Dichloroethane (1,1-DCA)	1.1	2.5 J	2.6 J	1.2	0.77 J	<1.0	0.64 J	2.3	0.87 J	1.2	0.67 J	1.3
1,2-Dichloroethane (1,2-DCA)	0.70 J	2.6 J	2.1 J	0.38 J	0.59 J	1.4	0.62 J	4.9	<1.0	<1.0	0.38 J	1.1
1,1-Dichloroethene (1,1-DCE)	0.33 J	<10	1.6 J	<1.0	0.38 J	0.75 J	<1.0	2.2	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (cis 1,2-DCE)	18.7	30	99.8	14.1	25.2	23.2	15.8	150	12.9	14.2	10.2	21.3
trans-1,2-Dichloroethene (trans 1,2-DCE)	0.47 J	<10	3.0 J	0.38 J	0.58 J	1.5	1.0	13.8	0.49 J	0.39 J	0.43 J	<1.0
Vinyl Chloride	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<10	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<10	<4.0	<1.0	<1.0	0.40 J	<1.0	0.53 J	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	<0.97	1.3	1.7	0.14 J	0.19 J	0.83	0.25 J	1.6	<0.47	--	0.31	0.36
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)												
C6-C10	115	627	357	94.5	92.3	331	165	600	62.2	81.5	68.8	<100
C10-C28	<94	1,150	165	96.5	31.9 J	112	57.8	74.4 J	51.8 J	--	63.2 J	62.9
C28-C40	<190	2,130	<0.19	76.2	<47	176	87.0	57.0 J	97.9 J	--	110 J	31.2 J
C6	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--	--	--

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-3											
Date	06/21/11	12/19/11	07/02/12	12/04/12	04/08/13	10/08/13	05/15/14	10/21/14	05/04/15	10/29/15	04/18/16	10/24/16
C9-C10	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)												
Antimony	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	<0.010	<0.010	0.0126	<0.010	<0.010	<0.010	0.0144	<0.010	<0.010	0.0146	0.0122	0.0113
Barium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	<0.0050	<0.0050	0.0052	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	<0.010	0.067	0.0485	<0.010	<0.010	0.024	0.0419	0.0197	0.0209	<0.010	0.0159	<0.025
Lead	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	0.036	0.112	0.0913	<0.020	0.0386	0.0904	0.0461	0.121	<0.020	<0.020	<0.020	<0.050
Nickel	0.0280	0.284	0.249	0.0222	0.0386	0.0904	0.0461	0.1210	<0.020	<0.020	<0.020	<0.050
Selenium	<0.010	<0.010	<0.010	<0.010	0.017	0.158	0.0686	0.102	0.0068	0.0058	<0.0050	<0.040
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	0.116	0.021	0.0479	0.108	0.0311	<0.020	0.069	<0.020	0.0641	0.122	0.165	0.132
Field Measurements												
pH (Standard units)	8.70	7.44	9.80	8.50	7.79	7.45	6.11	7.44	7.31	7.84	8.60	6.73
Specific Conductance (milliSiemens per centimeter)	1.320	3.330	1.190	0.609	0.837	3.140	1.300	2.180	0.726	0.335	0.692	1.01
Oxidation-Reduction Potential (ORP) (millivolts)	24	98	122	-32	129	213	18	113	13	-39	116	40
Dissolved Oxygen (DO) (mg/L)	1.98	6.50	0.00	6.77	7.44	8.53	1.77	6.12	9.47	8.21	9.82	4.11
Temperature (degrees Celsius)	26.08	17.37	24.43	21.97	27.40	23.68	27.11	22.11	20.28	26.03	20.52	26.21

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
1 - sampled at a depth of 76 feet
2 - sampled at a depth of 73 feet
3 - sampled at a depth of 63 feet

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-4														MW-4							
Date	05/24/06	12/07/06	06/06/07	11/28/07	07/16/08	12/03/08	06/15/09	12/31/09	07/01/10	12/15/10	06/21/11	12/20/11	06/07/12	12/04/12	04/08/13	10/09/13	05/13/14	10/21/14	04/28/15	10/27/15[a]	04/19/16	10/24/16
VOCs by EPA Method 8260 (µg/L)																						
Acetone	54	<50	<50	<50	<50	<50	290	<50	<40	<20	<80	54.2 J	66.9 J	<40	<40	<100	<100	41.7 J	<200	<200	<200	<250
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<80	<40	<10	<20	<20	<50	<50	--	<100	<100	<100	<50
Chloroform	2.8	2.8	33	<1.0	<1.0	<1.0	<1.0	2.6	2.4	1.3	<4.0	<4.0	<4.0	<2.0	0.76 J	<5.0	1.8	<10	<10	<10	4.4 J	5.1 J
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0	<20	<20	<20	<10	<10	<25	<25	<50	<50	<50	<50	<50
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<80	<40	<40	<20	<20	<50	<50	<100	<100	<100	<100	<100
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<80	<40	<40	<20	<20	<5.0	<5.0	<10	<10	<10	<10	<50
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<80	<40	<40	<20	<20	<50	<50	<100	<100	<100	<100	<50
Benzene	0.95	1.0	<0.50	0.76	0.60	0.54	<0.50	<0.50	<2.0	<1.0	<4.0	0.99 J	<4.0	0.68 J	0.67 J	1.2 J	<5.0	<10.0	<10	<10	2.2 J	<10
1,2-Dichlorobenzene (1,2-DCB)	3.3	4.2	2.1	3.1	2.1	1.9	1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	0.54 J	0.54 J	<5.0	<5.0	<10	<10	<10	<10	<10
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.38 J	<4.0	<4.0	<4.0	<2.0	<2.0	<5.0	<5.0	<10	<10	<10	<10	<10
1,4-Dichlorobenzene (1,4-DCB)	2.5	3.2	1.5	2.0	1.5	1.7	<1.0	<1.0	<2.0	0.36 J	<4.0	<4.0	<4.0	0.76 J	0.78 J	<5.0	<5.0	<10	<10	<10	<10	<10
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<5.0	<5.0	<10	<10	<10	<10	<10
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	0.49 J	<2.0	<5.0	<5.0	<10	<10	<10	<10	<10
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<8.0	<8.0	<10	<10	<20	<20	<20	<20	<10
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<8.0	<8.0	<10	<10	<20	<20	<20	<20	<10
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<4.0	<4.0	<10	<10	<20	<20	<20	<20	<20
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<4.0	<4.0	<10	<10	<20	<20	<20	<20	<20
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<4.0	<4.0	<10	<10	<20	<20	<20	<20	<10
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<4.0	<4.0	<10	<10	<20	<20	<20	<20	<10
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<4.0	<4.0	<10	<10	<20	<20	<20	<20	<10
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<5.0	<5.0	<10	<10	<10	<10	<10
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<4.0	<4.0	<10	<10	<20	<20	<20	<20	<10
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	4.0 J	<5.0	<10	<10	<10	<10	<10
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<20	<8.0	<8.0	<4.0	<4.0	<10	<10	<20	<20	<20	<20	<10
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<16.0	<16.0	<16.0	<10	<10	<20	<20	<20	<20	<30
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<5.0	<5.0	<10	<10	<10	<10	<10
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	NS	NS	<20	<10	<40	<40	<40	<20	5.3 J	<50	<50	<100	<100	<100	<100	<200
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	NS	<10	3.0 J	3.2 J	3.1 J	2.5 J	2.8 J	3.4 J	3.4 J	2.7 J	3.2 J	3.4 J	3.9 J	3.4 J	4.8 J
Tetrachloroethene (PCE)	6.3	7.8	4.8	1.6	1.8	1.8	2.2	3.5	<2.0	<1.0	<4.0	8.2	10.1	4.5	8.8	8.8	1.7 J	13.2	<10	<10	<10	4.3
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.62 J	0.23 J	<4.0	<4.0	<4.0	<2.0	<2.0	<10	<10	<20	<20	<20	<20	<10
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.82 J	1.1	<4.0	<4.0	1.0 J	0.72 J	0.92 J	<5.0	1.8 J	<10	2.6 J	<20	2.8 J	<10
Trichloroethene (TCE)	97	110	68	11	10	13	37	39	27.1	<1.0	5.7	121	118	79	135	158	13	253	30	7.7 J	12.9	56.9
1,1-Dichloroethane (1,1-DCA)	1.2	1.2	<1.0	<1.0	1.1	1.9	3.2	4.4	6.3	9.8	9.8	10.4	8.7	10.0	10.1	10.0	11.9	15.4	13.0	12.9	16.9	16.2
1,2-Dichloroethane (1,2-DCA)	1.8	1.4	0.7	1.1	1.1	<0.50	2.7	2.6	3.8	6.9	7.7	10.6	8.3	10.2	11.9	11.2	13.1	18.1	16.6	15.9	14.3	15.5
1,1-Dichloroethene (1,1-DCE)	3.4	2.6	1.5	1.9	<1.0	<1.0	1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	0.59 J	1.1 J	<5.0	<10	<10	<10	2.7 J	<10
cis-1,2-Dichloroethene (cis-1,2-DCE)	49	72	41	110	88	110	150	160	137	47	222	274	242	119	199	284	601	585	689	79	888	943
trans-1,2-Dichloroethene (trans-1,2-DCE)	3.7	5.6	2.8	4.1	2.5	2.7	3.0	2.1	3.0	3.9	4.4	3.7 J	3.1 J	3.9	4.1	5.0	5.1	4.2 J	6.0 J	5.8 J	8.6 J	12.9
Vinyl Chloride	<0.50	<0.50	<0.50	1.0	<0.50	4.4	1.4	0.6	37.6	13.9	7.7	0.84 J	2.1 J	3.4	4.3	6.4	9.7	2.6 J	10.1	21.0	7.6 J	<10
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<5.0	<5.0	<10	<10	<10	<10	<10
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<5.0	<5.0	<10	<10	<10	<10	<10
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<5.0	<5.0	<10	<10	<10	<10	<20
1,2-Dichloropropane (1,2-DCP)	2.4	2.0	<1.0	1.1	<1.0	1.6	2.0	<1.0	3.7	5.7	6.3	7.3	6.5	7.4	8.2	7.6	10.6	14.8	12.8	12.1	16.7	15.8
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	20	46	5	61	77	50	19	5.7	4.4	3.9	5.0	3.0	2.9	3.0	2.3	1.7	1.4	1.2	0.79	--	0.87	0.74
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)															**TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)**							
C6-C10	--	--	--	--	--	--	--	--	192	124	359	465	734	286	479	884	1,370	1,400	1,010	<500	1,680	601
C10-C28	--	--	--	--	--	--	--	--	--	461	486	1,290	672	477	943	722	594	1,230	936	--	880	446
C28-C40	--	--	--	--	--	--	--	--	--	174	134 J	259	334	139	522	406	308	103 J	97.2 J	--	351	84.0
C6	--	--	--	ND	ND	21.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	ND	31	ND	ND	46.0	12.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	ND	9.3	4.3	ND	16.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	15	15	59	ND	50	220	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	66	78	100	ND	56	1,900	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	74	66	80	ND	50	750	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	100	110	100	ND	54	350	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	86	120	110	ND	63	1,600	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	77	100	54	ND	30	100	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	23	90	25	ND	11	76	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	14	110	9.3	ND	10.0	32.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	4.4	130	3.3	ND	20.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	ND	100	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	ND	160	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	ND<500	190	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	130	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	1,400	550	<500	<500	5,100	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-4														MW-4							
Date	05/24/06	12/07/06	06/06/07	11/28/07	07/16/08	12/03/08	06/15/09	12/31/09	07/01/10	12/15/10	06/21/11	12/20/11	06/07/12	12/04/12	04/08/13	10/09/13	05/13/14	10/21/14	04/28/15	10/27/15[a]	04/19/16	10/24/16
Metals by EPA Method 6010B/7470A (mg/L)																						
Antimony	--	<0.015	0.0277	<0.0150	<0.0150	<0.0150	0.0234	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	0.0270	0.0335	0.0322	<0.0100	0.04090	0.0971	<0.0100	<0.0100	<0.030	<0.010	<0.010	0.0115	0.0268	<0.010	<0.010	<0.010	0.0168	0.0190	0.0111	0.0375	0.0640
Barium	--	0.0197	0.0284	0.0175	0.0177	0.0275	0.0911	0.0191	0.0302	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	<0.005	0.0128	<0.00500	0.0110	0.00513	<0.00500	<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.00210	<0.0020	<0.0020	0.00500	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	--	0.0135	0.00953	<0.00500	<0.00500	0.0232	0.0133	<0.0100	0.0114	0.0115	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	0.0207	0.0300	0.0148	0.00894	0.00694	<0.00500	<0.0100	0.00730	0.00620	0.00590	<.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	--	0.162	0.154	0.108	0.0302	0.118	0.319	0.0461	0.00990	0.0150	<0.010	0.0105	0.0166	0.0138	0.0254	0.0168	0.0212	0.0451	0.0480	0.0166	0.0888	<0.025
Lead	--	<0.010	<0.010	<0.0100	<0.0100	<0.0100	0.0589	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0137	<0.010	<0.010	<0.0050
Mercury	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	0.000898	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	0.0211	0.0157	0.0204	0.0120	0.0132	0.235	0.0662	0.0135	0.00790	<0.020	0.0214	<0.020	<0.020	0.0261	0.0293	<0.020	0.0316	0.0225	0.0407	0.0505	0.0810
Nickel	--	1.15	0.702	1.03	0.836	0.752	0.292	0.195	0.256	0.280	0.253	0.219	0.166	0.156	0.121	0.0891	0.0839	0.0801	0.0799	0.0776	0.0784	0.0969
Selenium	--	0.0287	<0.0150	<0.0150	<0.0150	<0.0150	0.170	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	0.0087	0.00675	0.00659	0.00679	0.00645	0.00841	<0.0100	0.0129	0.0112	0.0139	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0117	0.0107	<0.010	0.0106	<0.050
Zinc	--	0.0584	0.400	1.48	0.0822	0.504	2.96	0.424	0.159	0.113	0.0451	0.0721	0.146	0.225	0.235	0.191	0.251	0.235	0.554	0.158	0.667	0.113
Field Measurements																						
pH (Standard units)	12.32	6.89	8.80	8.06	7.20	6.76	10.57	8.04	8.93	7.33	8.84	9.24	8.23	9.38	10.00	9.00	6.70	8.88	7.52	7.86	6.94	7.10
Specific Conductance (milliSiemens per centimeter)	1.68	0.924	0.690	0.919	0.870	0.810	0.762	4.620	6.000	3.790	5.370	7.430	6.250	6.540	6.360	5.090	4.420	4.730	6.000	4.230	5.640	1.16
Oxidation-Reduction Potential (ORP) (millivolts)	-147	-62	-61	-127	-105	-165	-311	-167	7	-69	230	-363	-296	-141	-254	-276	-116	-630	-97	-172	17	-2
Dissolved Oxygen (DO) (mg/L)	2.47	0.84	0.97	2.91	0.87	1.70	6.20	1.31	4.45	9.43	1.18	5.68	8.72	5.62	11.85	0.37	10.23	0.87	8.07	8.62	11.27	8.29
Temperature (degrees Celsius)	23.98	23.4	22.17	22.27	26.70	20.90	22.51	28.34	21.20	17.91	28.89	21.39	27.18	23.62	26.32	18.19	24.58	23.10	20.49	25.47	20.90	26.45

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
a - Dilution required due to sample foaming
1. Historical metal results have been corrected to show significant figures.

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-5S																					
Date	05/23/06	12/07/06	06/04/07	11/28/07	07/15/08	12/02/08	06/16/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/09/13	10/08/13	05/13/14	10/20/14	04/29/15	10/26/15*	04/18/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																						
Acetone	<20	<100	<100	<50	<50	<50	<50	<50	<40	<40	<40	<40	<40	<50	<50	<100	<20	<20	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<20	<20	<20	<10	<10	<10	<10	<10	<40	<40	<40	<40	<10	<25	<25	<50	<10	--	<10	<10	<10	<5.0
Chloroform	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<13	<13	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<20	<20	<20	<10	<10	<10	<10	<10	<40	<40	<40	<40	<20	<25	<25	<50	<10	<10	<10	<10	<10	<10
Methylene chloride	<20	<20	<20	<10	<10	<10	<10	<10	<40	<40	<40	<40	<20	<2.5	<2.5	<5.0	<10	<10	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<20	<20	<20	<10	<10	<10	<10	<10	<40	<40	<40	<40	<20	<25	<25	<50	<10	<10	<10	<10	<10	<5.0
Benzene	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<8.0	<8.0	<8.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<20	<20	<20	<10	<10	<10	NS	NS	<20	<20	<20	<20	<20	<25	<25	<50	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	NS	NS	<10	<10	<10	<10	<4.0	<5.0	<5.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	4.2	6.7	5.0	4.3	4.5	4.2	2.4	3.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	200	200	170	150	160	140	140	110	163	177	138	191	175	191	219	120	52.6	38.1	17.5	10.0	5.4	3.4
1,1-Dichloroethane (1,1-DCA)	2	2.2	<2.0	1.6	1.6	1.8	1.8	1.3	1.7 J	1.9 J	1.4 J	1.8 J	1.6 J	1.6 J	1.9 J	<5.0	0.38 J	0.33 J	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	2.4	2.6	3	2.1	1.3	1.8	1.5	<1.0	1.4 J	1.7 J	<2.0	1.5 J	1.1 J	<2.5	0.69 J	<5.0	<1.0	0.48 J	0.37 J	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	15	18	16	13	16	18	19	15	19.9	22.8	17.6	23.5	21.8	20.5	25.1	19.5	14.8	19.6	11.9	10.4	8.9	7.7
trans-1,2-Dichloroethene (trans-1,2-DCE)	<2.0	<2.0	<2.0	1.1	<1.0	<1.0	1.1	<1.0	1.4 J	1.4 J	<2.0	1.3 J	1.4 J	1.4 J	1.6 J	<5.0	0.49 J	0.71 J	0.48 J	<1.0	0.30 J	<1.0
Vinyl Chloride	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	1	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.95	<1.0	<0.97	2.9	0.42 J	0.81 J	0.68	0.71	0.29 J	0.30 J	0.23 J	--	0.22	0.19 J

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-5S																					
Date	05/23/06	12/07/06	06/04/07	11/28/07	07/15/08	12/02/08	06/16/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/09/13	10/08/13	05/13/14	10/20/14	04/29/15	10/26/15*	04/18/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																						
C6-C10	--	--	--	--	--	--	--	--	201	251	125	300	373	349	480	267	134	94.7	<50	33.1 J	43.7 J	<100
C10-C28	--	--	--	--	--	--	--	--	--	<100	<100	63.7 J	90.9	113.0	40.01 J	<95	<94	<94	58.0 JB	--	--	39.3 J
C28-C40	--	--	--	--	--	--	--	--	--	<200	<200	<190	<0.19	147.0	<48	76.2 J	--	<190	84.1 JB	--	--	22.6 J
C6	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	ND	57	40	ND	36	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	ND	2	2.2	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	ND	12	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	ND	39	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	ND	25	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	ND	29	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	ND	28	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	ND	10	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	ND	8	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	ND	6	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	ND	14	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	<500	<500	<500	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																						
Antimony	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	0.0159	<0.010	0.0118	0.0105	0.0185	<0.0100	<0.0100	<0.0100	<0.030	<0.010	<0.010	0.0145	<0.010	0.0108	0.0113	0.011	0.0109	0.0114	0.0114	0.0123	0.0123
Barium	--	0.0205	0.0252	0.0208	0.0358	0.0539	0.0638	0.0375	0.0389	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	--	<0.005	0.0170	0.00663	<0.00500	0.01410	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	<0.005	0.0141	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	--	<0.005	0.0053	0.00522	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	--	0.0106	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	0.0709	0.0671	0.0620	0.0688	0.0493	0.0672	0.0534	0.0650	0.0580	0.0635	0.0533	0.0472	0.0628	0.0835	0.0717	0.0525	0.0589	0.0619	0.0507	0.0513	<0.050
Nickel	--	0.0082	0.0196	0.0109	0.0109	0.0182	0.0101	<0.0100	0.0080	0.0073	0.0059	0.0089	0.0052	0.0217	0.0082	0.0077	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.040
Selenium	--	0.0445	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	0.0095	0.0124	0.00985	0.01100	0.01210	0.00973	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	--	0.0286	0.0397	0.0141	0.0336	0.0217	<0.0100	<0.0100	<0.0100	<0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0488	<0.020
Field Measurements																						
pH (Standard units)	7.04	7.25	8.14	7.83	7.20	6.82	7.33	7.41	7.20	7.61	7.20	7.52	--	7.02	8.11	7.78	--	6.88	7.48	8.21	7.01	6.91
Specific Conductance (milliSiemens per centimeter)	0.105	0.186	0.181	0.186	0.190	0.180	0.182	1.760	1.770	0.617	7.790	1.710	--	1.100	1.580	1.290	--	4.110	0.996	0.783	0.799	1.17
Oxidation-Reduction Potential (ORP) (millivolts)	100	44	70.0	83.0	91.0	39.0	88.0	21.0	85.0	-142.0	-150.0	147.0	--	-55.0	125.0	49.0	--	66.0	34.0	-82.0	173	-66
Dissolved Oxygen (DO) (mg/L)	3.10	3.14	3.89	3.41	7.38	4.10	6.20	3.79	0.00	9.01	0.00	6.92	--	5.83	11.11	3.44	--	6.93	7.48	8.40	8.94	3.7
Temperature (degrees Celsius)	24.67	24.50	24.28	23.11	25.30	20.70	23.37	14.50	24.10	17.15	28.10	16.90	--	20.40	25.32	20.37	--	22.16	28.51	29.97	28.24	25.10

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-5D																					
Date	05/23/06	12/06/06	06/04/07	11/27/07	07/14/08	12/02/08	06/17/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/09/13	10/08/13	05/13/14	10/20/14	04/29/15	10/27/15*	04/18/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																						
Acetone	<10	<10	<10	<50	<50	<50	<50	<50	<40	<40	<20	<20	<20	<20	7.5 J	<20	<20	<20	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<20	<20	<10	<10	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<0.50	0.72	0.54	0.76	0.90	1.10	1.10	1.30	1.1 J	1.4 J	1.10	1.10	0.66 J	0.41 J	0.48 J	0.52 J	0.60 J	0.34 J	0.43 J	0.28 J	0.29 J	0.48 J
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<20	<20	<20	<10	<10	<10	NS	NS	<20	<20	<5.0	<10	4.1 J	<10	<10	<10	<10	2.6 J	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	NS	NS	<10	<10	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	0.27 J	<2.0	<2.0	<2.0	0.58 J	0.31 J
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	9.9	3.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	0.34 J	0.31 J	0.35 J	<1.0	0.56 J	0.35 J	0.31 JB	<1.0	<1.0
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	1.1	0.99	0.70	0.70	0.60	0.71	0.65	0.72	<2.0	<2.0	0.41 J	0.47 J	0.35 J	<1.0	0.24 J	0.21 J	0.23 J	<1.0	0.23 J	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.60 J	0.72 J	<1.0	0.65 J	0.42 J	<1.0	0.20 J	<1.0	<1.0	<1.0	0.32 J	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	1.8	38	39	50	74	82	89	99	78	99	84	91.1	55	34.4	47.9	45.3	55.0	37.2	40.8	32.2	27.4	45.8
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0	<1.0	1.4	1.1	1.5	1.4	1.4 J	1.5 J	1.5	1.6	1.2	0.77 J	1.1	0.99 J	1.3	1.3	1.2	0.76 J	0.80 J	1.30
Vinyl Chloride	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	1	<0.50	0.85 J	0.64 J	0.51 J	1.1	1.1	0.35 J	0.89 J	0.50 J	0.66 J	0.31 J	1.0	0.46 J	0.35 J	0.93 J
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	<2.0	3.7	4.3	7.9	12	14	21	29	18.7	10.7	11.6	4.2	5.5	4.5	3.0	2.4	1.3	1.5	1.1	--	0.39	2.2

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-5D																					
Date	05/23/06	12/06/06	06/04/07	11/27/07	07/14/08	12/02/08	06/17/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/09/13	10/08/13	05/13/14	10/20/14	04/29/15	10/27/15*	04/18/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																						
C6-C10	--	--	--	--	--	--	--	--	87.0 J	123	91.0	131	120	65.5	116	88.9	135	79.6	74.9	79.3	69.7	<100
C10-C28	--	--	--	--	--	--	--	--	--	111	<95	123	187	159	145	130	<96	80.4 J	137	--	73.3 J	203
C28-C40	--	--	--	--	--	--	--	--	--	<190	<190	<190	<0.19	84	<48	185 J	<190	<190	104 JB	--	47.6 J	92.0
C6	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	ND	9.3	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	ND	8.6	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	ND	10	ND	8.9	3.7	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	ND	75	65	55	92	64	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	83	30	17	20	24	16	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	3.5	17.0	ND	7.8	8.3	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	ND	16	1.4	2.0	2.4	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	ND	10	2.7	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	ND	10	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	<500	<500	<500	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																						
Antimony	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	<0.010	<0.010	0.0231	0.0362	0.0247	0.0119	0.0136	0.0123	<0.030	<0.010	0.019	0.0361	0.0268	0.0174	0.0207	0.0106	0.0249	0.0121	0.0168	<0.010	0.0191
Barium	--	0.0843	0.0766	0.0761	0.0835	0.0799	0.0755	0.0796	0.0660	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	--	<0.005	<0.005	<0.00500	<0.00500	0.00690	0.00736	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	<0.005	0.0181	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	--	<0.010	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	0.0705	0.0623	0.0620	0.0539	0.0564	0.0526	0.0520	0.0449	0.0513	0.0452	0.0386	0.0272	0.0327	0.0402	0.0345	0.0378	0.0310	0.0348	0.0324	0.0404	<0.050
Nickel	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.040
Selenium	--	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	--	0.0209	0.0201	0.0163	0.0490	0.0126	<0.0100	<0.0100	0.0218	<0.010	<0.020	<0.020	<0.020	0.0214	<0.020	<0.020	<0.020	0.0325	<0.020	0.0482	0.0630	0.0229
Field Measurements																						
pH (Standard units)	7.11	7.52	8.17	7.76	7.10	6.91	7.62	7.61	6.98	7.58	8.82	7.72	7.82	7.63	8.13	7.53	--	6.95	7.51	9.13	6.66	6.73
Specific Conductance (milliSiemens per centimeter)	0.187	0.104	0.101	0.105	0.120	98.000	0.948	0.595	2.300	0.713	0.963	0.905	0.756	0.701	0.637	0.555	--	0.397	0.892	0.666	0.673	0.317
Oxidation-Reduction Potential (ORP) (millivolts)	127	-162	-134	-169.0	-161.0	-145.0	-190.0	-98.0	22.4	-137.0	-164.0	-173.0	-114.0	-35.0	-73.0	-97.0	--	-33.0	-98.0	-122.0	119.0	42
Dissolved Oxygen (DO) (mg/L)	2.73	6.99	0.00	0.00	1.87	2.60	5.92	6.14	0.00	9.23	1.35	6.56	8.07	6.14	8.90	0.82	--	1.11	7.91	8.52	10.43	7.7
Temperature (degrees Celsius)	21.53	24.70	24.35	22.51	29.10	20.70	24.47	17.07	23.70	16.95	28.91	18.03	23.40	21.90	20.12	21.27	--	22.11	28.50	25.46	28.60	24.21

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-6S															
Date	05/25/06	12/08/06	06/06/07	11/29/07	07/16/08	12/03/08	12/03/08 Dup	06/17/09	06/17/09 Dup	12/31/09	12/31/09 Dup	07/01/10	07/01/10 Dup	12/16/10	12/16/10 Dup
VOCs by EPA Method 8260 (µg/L)															
Acetone	12	<1,000	<1,000	<250	<500	<500	<500	<50	<50	<50	<50	<100	<100	<40	<40
2-Butanone (methyl ethyl ketone)	<10	<200	<200	<50	<100	<100	<100	<10	<10	<10	<10	<100	<100	<40	<40
Chloroform	75	30	22	15	15	<10	<10	3.8	4.1	1.5	1.5	<5.0	<5.0	<2.0	<2.0
Naphthalene	<10	<200	<200	<50	<100	<100	<100	<5.0	<10	<10	<10	<25	<25	<10	<10
2-Hexanone (methyl butyl ketone)	<10	<200	<200	<50	<100	<100	<100	<10	<10	<10	<10	<100	<100	<40	<40
Methylene chloride	<10	<200	<200	<50	<100	<100	<100	<5.0	<10	<10	<10	<100	<100	<40	<40
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<200	<200	<50	<100	<100	<100	<5.0	<10	<10	<10	<100	<100	<40	<40
Benzene	51	17	<10	5.8	<5.0	<5.0	<5.0	1.8	2.1	<0.50	<0.50	<5.0	<5.0	0.61 J	<2.0
1,2-Dichlorobenzene (1,2-DCB)	7.0	<20	<20	6.5	23.0	<10	<10	3.2	3.4	1.3	1.1	<5.0	<5.0	<2.0	<2.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	0.86 J	0.80 J
1,4-Dichlorobenzene (1,4-DCB)	3.6	<20	<20	<5.0	<10	<10	<10	1.7	1.7	1.1	1.1	<5.0	<5.0	<2.0	<2.0
Chlorobenzene	1.4	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
Ethylbenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
1,2,3- Trichlorobenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
1,2,4- Trichlorobenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
n-Butylbenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
s-Butylbenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
t-Butylbenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
Isopropylbenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
n-Propylbenzene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
Toluene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
p-Isopropyltoluene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<25	<25	<10	<10
Total Xylenes (p/m- and o- xylene)	3.2	<20	<20	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10
Methyl tert-butyl ether (MTBE)	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
Tert-Butyl Alcohol (TBA)	<10	<200	<200	<50	<100	<100	<100	NS	NS	NS	NS	<50	<50	<20	<20
Di isopropyl ether (DIPE)	<2.0	<40	<40	<4.0	<20	<20	<20	NS	NS	NS	NS	3.4 J	3.3 J	1.4 J	1.4 J
Tetrachloroethene (PCE)	76	120.0	87.0	100	70	59	65	29	29	16	17	2.7 J	2.6 J	<2.0	<2.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
1,1,2-Trichloroethane (1,1,2-TCA)	6.2	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
Trichloroethene (TCE)	390	460.0	310	290	230	210	230	220	220	38	38	19	19	1.7 J	1.7 J
1,1-Dichloroethane (1,1-DCA)	2.9	<20	<20	<5.0	<10	<10	<10	1.6	1.6	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
1,2-Dichloroethane (1,2-DCA)	<0.50	<10	<10	<2.5	<5.0	<5.0	<5.0	1.1	1.1	<0.50	<0.50	<5.0	<5.0	<2.0	<2.0
1,1-Dichloroethene (1,1-DCE)	9.9	<20	<20	<5.0	<10	<10	<10	3.4	3.4	<1.0	<1.0	<5.0	<5.0	0.73 J	0.67 J
cis-1,2-Dichloroethene (cis-1,2-DCE)	4800	2,300	1,600	990	960	710	730	500	500	100	100	255	249	147	146
trans-1,2-Dichloroethene (trans-1,2-DCE)	7	<20	<20	<5.0	<10	<10	<10	5.7	5.7	1.1	1.1	2.6 J	2.6 J	1.8 J	1.7 J
Vinyl Chloride	<0.50	<10	<10	<2.5	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<2.0	<2.0
Carbon Tetrachloride	<0.50	<10	<10	<5.0	<5.0	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<2.0	<2.0
Styrene	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
1,2-Dibromomethane	<1.0	<20	<20	<5.0	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
1,2-Dichloropropane (1,2-DCP)	20	<20	<20	7.1	<10	<10	<10	5.2	5.2	<1.0	<1.0	2.1 J	2.0 J	1.1 J	1.1 J
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	8.6	14.0	12.0	12	13	10	10	4.2	4.4	<2.0	<2.0	0.55 J	0.48 J	<0.95	<0.96

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-6S														
Date	05/25/06	12/08/06	06/06/07	11/29/07	07/16/08	12/03/08	12/03/08 Dup	06/17/09	06/17/09 Dup	12/31/09	12/31/09 Dup	07/01/10	07/01/10 Dup	12/16/10	12/16/10 Dup
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)															
C6-C10	--	--	--	--	--	--	--	--	--	--	--	324	318	186	177
C10-C28	--	--	--	--	--	--	--	--	--	--	--	--	--	564	391
C28-C40	--	--	--	--	--	--	--	--	--	--	--	--	--	392	297
C6	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
C7	--	ND	ND	72	ND	110	62	27	31	ND	ND	--	--	--	--
C8	--	ND	ND	26	ND	21	45	6.0	6.7	ND	ND	--	--	--	--
C9-C10	--	ND	9.3	77	ND	48	50	ND	ND	ND	ND	--	--	--	--
C11-C12	--	ND	8.6	46	ND	42	7.3	ND	14	ND	ND	--	--	--	--
C13-C14	--	ND	9.5	67	ND	62	32	41	ND	ND	ND	--	--	--	--
C15-C16	--	ND	75	81	ND	65	45	27	41	ND	ND	--	--	--	--
C17-C18	--	83	30	120	ND	90	90	ND	87	ND	ND	--	--	--	--
C19-C20	--	3.5	17	48	ND	50	62	190	95	ND	ND	--	--	--	--
C21-C22	--	ND	16	35	ND	42	34	30	67	ND	ND	--	--	--	--
C23-C24	--	ND	10	13	ND	17	28	21	42	ND	ND	--	--	--	--
C25-C28	--	ND	10	ND	ND	15.0	6.2	19	26	ND	ND	--	--	--	--
C29-C32	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
C33-C36	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
C37-C40	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
C41-C44	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--
C6-C44 Total	--	--	--	590	<500	560	<500	<500	<500	<500	<500	324	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)															
Antimony	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.0100	<0.030	<0.030
Arsenic	--	<0.010	<0.010	2.95	2.34	2.41	2.39	2.47	2.40	0.826	0.848	4.51	4.43	1.07	0.985
Barium	--	0.0843	0.0766	<0.0100	0.0127	0.0198	0.0197	0.152	0.134	0.0331	0.0257	0.129	0.127	<0.10	<0.10
Beryllium	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium	--	<0.005	<0.005	<0.00500	0.00924	0.01200	0.01200	0.00852	0.00909	0.01120	0.01120	0.0393	0.0389	0.0125	0.0134
Chromium	--	<0.005	<0.005	0.159	0.177	0.170	0.166	0.0512	0.0532	0.0108	<0.0100	0.0147	0.0143	0.0053	0.006
Cobalt	--	<0.005	0.0181	0.0306	0.0208	0.0229	0.0224	0.0324	0.0345	<0.0100	<0.0100	0.0144	0.0142	0.0103	0.0099
Copper	--	<0.005	<0.005	0.411	0.313	0.397	0.406	0.351	0.374	0.056	0.044	0.0653	0.0649	0.0261	0.0298
Lead	--	<0.010	<0.010	<0.0100	<0.0100	0.02020	0.02000	0.0316	0.0299	0.0152	0.0139	0.0172	0.0172	<0.010	<0.010
Mercury	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.000200	<0.00020	<0.00020
Molybdenum	--	0.0705	0.0623	0.0268	0.0157	0.0243	0.0243	0.0414	0.0412	<0.0100	<0.0100	0.0216	0.0211	0.0106	0.0095
Nickel	--	<0.005	<0.005	1.75	1.68	1.57	1.59	0.685	0.709	0.029	0.0279	0.235	0.233	0.123	0.111
Selenium	--	<0.015	<0.015	0.02170	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.0200	<0.030	<0.030
Silver	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050
Thallium	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.0200	<0.030	<0.030
Vanadium	--	<0.005	<0.005	0.0433	0.0388	0.0376	0.0374	0.0251	0.0265	<0.0100	<0.0100	0.0055	0.0054	0.0052	0.0055
Zinc	--	0.0209	0.0201	0.173	0.124	0.195	0.194	0.655	0.640	0.364	0.315	0.246	0.240	0.164	0.19
Field Measurements															
pH (Standard units)	7.15	7.10	8.43	7.85	7.20	6.67	6.67	7.13	7.13	6.22	6.22	6.95	--	7.12	--
Specific Conductance (milliSiemens per centimeter)	0.747	1.27	0.912	0.959	0.950	0.870	0.870	0.704	0.704	5.180	5.180	3.78	--	0.581	--
Oxidation-Reduction Potential (ORP) (millivolts)	-15	-45	68	92	114	-16	-16	53	53	-90	-90	-109	--	-10	--
Dissolved Oxygen (DO) (mg/L)	0.59	0.94	0.78	0.00	0.82	1.50	1.50	5.19	5.19	1.99	1.99	3.380	--	7.15	--
Temperature (degrees Celsius)	26.99	27.3	27.03	22.29	26.40	25.80	25.80	28.60	28.60	18.02	18.02	22.00	--	18.10	--

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-6S															
Date	06/21/11	06/21/11 Dup	12/19/11	12/19/11 Dup	06/07/12	06/07/12 Dup	12/04/12	12/04/12 Dup	04/09/13	10/08/13	05/13/14	10/21/14	04/28/15	10/27/15*	04/20/16	10/24/16
VOCs by EPA Method 8260 (µg/L)																
Acetone	<20	<20	9.3 J	9.5 J	<40	5.5 J	<20	<20	4.7 J	<20	<100	<50	<100	<100	<100	<130
2-Butanone (methyl ethyl ketone)	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<50	--	<50	<50	<50	<25
Chloroform	<1.0	<1.0	1.7 J	1.6 J	<2.0	<1.0	0.26 J	0.25 J	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
Naphthalene	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<13	<25	<25	<25	<25
2-Hexanone (methyl butyl ketone)	<20	<20	<20	<20	<20	<10	<10	<10	<10	<10	<50	<25	<50	<50	<50	<50
Methylene chloride	<20	<20	<20	<20	<20	<10	<10	<10	<10	<1.0	<50	<25	<50	<50	<50	<25
4-Methyl-2-pentanone (methyl isobutyl ketone)	<20	<20	<20	<20	<20	<10	<10	<10	<10	<10	<50	<25	<50	<50	<50	<25
Benzene	0.38 J	0.39 J	0.40 J	<2.0	0.76 J	0.81 J	<1.0	<1.0	1.20	1.30	1.9 J	2.4 J	2.4 J	<5.0	<5.0	<5.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<2.0	<2.0	0.50 J	0.55 J	<1.0	<1.0	0.82 J	0.75 J	<5.0	0.76 J	<5.0	<5.0	<5.0	<5.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<2.0	<2.0	<2.0	0.35 J	<1.0	<1.0	0.54 J	0.51 J	<5.0	0.51 J	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<5.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<5.0
1,2,3- Trichlorobenzene	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<10
1,2,4- Trichlorobenzene	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<10
n-Butylbenzene	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<5.0
s-Butylbenzene	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<5.0
t-Butylbenzene	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<5.0
Isopropylbenzene	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
n-Propylbenzene	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<5.0
Toluene	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
p-Isopropyltoluene	<5.0	<5.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<5.0	<10	<10	<10	<5.0
Total Xylenes (p/m- and o- xylene)	<10	<10	<10	<10	<8.0	<4.0	<8.0	<4.0	<8.0	<2.0	<10	<5.0	<10	<10	<10	<15
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
Tert-Butyl Alcohol (TBA)	<10	<10	<20	<20	<20	<10	<10	<10	<10	<10	<50	<25	<50	<50	<50	<100
Di isopropyl ether (DIPE)	1.7 J	1.8 J	1.8 J	1.7 J	3.7 J	4.0	0.33 J	0.32 J	5.9	5.6	11.8	15.8	17.2	3.7 J	2.8 J	<5.0
Tetrachloroethene (PCE)	0.71 J	0.69 J	2	2	<2.0	<1.0	0.41 J	0.41 J	<1.0	0.39 J	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
Trichloroethene (TCE)	13	12	31	29	4.0	4.3	8.4	8.3	5.9	13	4.9 J	6.5	4.2 J	4.8 J	5.3	21.8
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	0.53 J	0.52 J	0.89 J	0.96 J	<1.0	<1.0	0.99 J	1.2	1.3 J	1.7 J	1.6 J	<5.0	<5.0	<5.0
1,2-Dichloroethane (1,2-DCA)	<1.0	<1.0	<2.0	<2.0	<2.0	0.40 J	<2.0	<1.0	0.62 J	0.83 J	1.2 J	1.9 J	1.3 J	<5.0	<5.0	<5.0
1,1-Dichloroethene (1,1-DCE)	0.32 J	0.32 J	0.65 J	0.64 J	0.97 J	1.0	<1.0	<1.0	1.2	1.8	1.5 J	2.5	2.1 J	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	75.8	75.8	150	142	243	246	43.7	43.3	300	359	435	353	553	244	258	329
trans-1,2-Dichloroethene (trans-1,2-DCE)	1.2	1.1	2.7	2.7	4.9	5.3	0.43 J	0.43 J	6.1	4.5	7.3	11.3	13.6	4.3 J	4.5 J	<5.0
Vinyl Chloride	<1.0	<1.0	<2.0	<2.0	7.9	9.1	<1.0	<1.0	8.9	7.9	9.1	5.9	3.0 J	<5.0	4.4 J	<5.0
Carbon Tetrachloride	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
Styrene	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<5.0
1,2-Dibromomethane	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.5	<5.0	<5.0	<5.0	<10
1,2-Dichloropropane (1,2-DCP)	0.69 J	0.69 J	1.4 J	1.4 J	2.2	2.6	0.24 J	0.23 J	2.7	7.1	7.9	11.4	8.9	2.4 J	1.9 J	3.8 J
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	<0.98	<0.96	<0.96	<0.95	0.12 J	0.17 J	<0.94	<4.7	0.32 J	0.78 J	0.74 J	0.80	0.32 J	--	0.25 J	0.16 J

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-6S															
Date	06/21/11	06/21/11 Dup	12/19/11	12/19/11 Dup	06/07/12	06/07/12 Dup	12/04/12	12/04/12 Dup	04/09/13	10/08/13	05/13/14	10/21/14	04/28/15	10/27/15*	04/20/16	10/24/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																
C6-C10	132	130	241	232	516	643	60.1	60.3	601	537	931	998	1,250	406	333	176
C10-C28	452	710	740	914	752	711	867	1,540	696	743	--	818	819	--	791	1,020
C28-C40	826	1,530	793	1,110	790	770	1,740	3,750	894	634	--	763	748	--	1,580	501
C6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																
Antimony	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	0.535	0.52	0.729	0.727	1.18	1.20	0.284	0.488	1.49	1.24	1.36	1.56	1.59	0.81	1.37	0.881
Barium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	0.0032	0.0023	0.0091	0.009	0.0226	0.0232	0.015	0.0257	0.006	0.0401	<0.0020	<0.0020	0.0025	0.0049	0.0095	0.0117
Chromium	<0.010	<0.010	0.0142	0.0138	<0.010	<0.010	0.0155	0.0283	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	0.0067	0.0065	0.0055	0.0055	<0.0050	<0.0050	<0.0050	0.0053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	0.0415	0.0381	0.127	0.125	0.0373	0.0407	0.115	0.239	<0.010	0.0556	0.0166	0.0255	0.0228	<0.010	0.107	0.212
Lead	0.0197	0.0180	0.1310	0.1250	0.0142	0.0170	0.0703	0.146	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0281	0.0227
Mercury	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00032	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.027	0.0472	0.079	0.0608	0.0399	0.0578	<0.050
Nickel	0.057	0.0563	0.0961	0.0952	0.132	0.133	0.0958	0.161	0.231	0.751	0.834	0.515	0.364	0.151	0.168	0.0404
Selenium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0113
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0141	<0.010	<0.010	<0.030	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	0.253	0.25	0.275	0.273	0.0814	0.0897	0.652	0.832	0.0248	0.0451	0.0314	0.0471	0.0346	<0.020	0.358	0.316
Field Measurements																
pH (Standard units)	8.29	--	7.21	--	7.11	--	--	--	8.61	6.81	6.07	6.79	7.07	7.81	6.66	7.68
Specific Conductance (milliSiemens per centimeter)	1.060	--	0.566	--	0.877	--	--	--	2.400	5.590	5.120	5.190	3.630	1.650	2.370	2.31
Oxidation-Reduction Potential (ORP) (millivolts)	-112	--	110	--	-111	--	--	--	-132	-99	-89	-114	24	-72	36	-119
Dissolved Oxygen (DO) (mg/L)	2.72	--	7.99	--	1.12	--	--	--	9.14	1.93	7.00	1.10	8.00	8.35	8.28	1.74
Temperature (degrees Celsius)	25.23	--	18.60	--	26.99	--	--	--	19.95	19.16	22.97	20.12	27.91	24.30	32.31	26.73

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-6D																														
Date	05/25/06	12/07/06	06/06/07	11/28/07	07/15/08	12/02/08	06/15/09	12/30/09	06/30/10	12/16/10	06/21/11	12/19/11	06/07/12	12/04/12	04/09/13	04/08/13 Dup	10/08/13	10/08/13 Dup	05/13/14	05/13/14 Dup	10/21/14	10/21/14 Dup	04/28/15	04/28/15 Dup	10/27/15*	10/27/15 Dup*	04/20/16	04/20/16 Dup	10/26/16	10/26/16 Dup
VOCs by EPA Method 8260 (µg/L)																															
Acetone	<10	<50	<50	<50	<50	<50	<50	<50	<20	<20	<20	<20	8.8 J	<20	5.9 J	7.6 J	<20	<4.0	<20	<20	<20	<20	<20	<20	<20	<20	<20	4.2 J	<50	<50
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	--	--	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.24 J	0.25 J	0.26 J	0.24 J	0.62 J	0.62 J	1.1	1.1	0.93 J	0.92 J
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	4.4 J	<10	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	6.0	3.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	1.3	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
Ethylbenzene	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.0	<4.0	<2.0	<4.0	<2.0	<4.0	<2.0	<4.0	<2.0	<4.0	<2.0	<4.0	<6.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	NS	0.84 J	0.71 J	1.1 J	<5.0	0.59 J	<2.0	<2.0	<2.0	0.25 J	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE)	76	76.0	1.9	2.5	2.5	1.8	<1.0	<1.0	0.33 J	0.23 J	0.39 J	1.1	0.44 J	0.61 J	0.60 J	0.56 J	0.58 J	0.60 J	1.7	1.6	3.2	3.1	3.1	2.8	3.3	3.5	3.4	3.3	1.5 J	1.6 J
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
1,1,2-Trichloroethane (1,1,2-TCA)	6.2	6.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
Trichloroethene (TCE)	3.1	3.3	16	19	10	5.3	<1.0	1.5	8.8	9	5.1	9.7	4.1	4.6	5.1	4.9	6.6	6.8	17	16.5	32.2	30.9	31.8	26.4	37.5	43.2	45.6	45.0	32.3	33.0
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.41 J	0.35 J	0.49 J	<1.0	0.23 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.24 J	0.23 J	0.28 J	0.26 J	0.46 J	0.52 J	0.94 J	0.94 J	0.93 J	0.82 J
1,2-Dichloroethane (1,2-DCA)	0.58	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.64 J	0.46 J	0.65 J	<1.0	0.31 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.21 J	<1.0	0.26 J	0.22 J	<1.0	<1.0	<2.0	<2.0
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.26 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	28	6.4	8.9	11	9.1	7.9	13.0	12.0	37.4	35.4	45.1	15.2	23.5	3.1	3.3	3.6	9.1	9.5	11.2	11.5	17.5	17.7	31.2	27.8	90.7	96.0 b	334	343	277c	259c
trans-1,2-Dichloroethene (trans-1,2-DCE)	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	1.4	2.0	0.85 J	1.3	<1.0	<1.0	<1.0	0.44 J	0.44 J	0.70 J	0.68 J	1.1	1.1	1.1	1.1	1.5	1.7	3.6	3.5	3.4	3.3
Vinyl Chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<4.0	<4.0	<4.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.69 J	0.88 J	0.50 J	0.57 J	0.33 J	<1.0	<1.0	<1.0	1.6	1.7	5.1	5.2	10.7	10.5	8.1	6.6	8.0	9.5	4.2	4.1	4.0	3.7
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.58 J	<0.95	<0.99	<0.96	0.21 J	<0.47	<0.47	0.17 J	0.24 J	0.18 J	0.27 J	0.16 J	0.22 J	0.17 J	0.18 J	0.21 J	--	--	<0.19	0.027 JB	<0.29	<0.29

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-6D																												
Date	05/25/06	12/07/06	06/06/07	11/28/07	07/15/08	12/02/08	06/15/09	12/30/09	06/30/10	12/16/10	06/21/11	12/19/11	06/07/12	12/04/12	04/09/13	04/08/13 Dup	10/08/13	10/08/13 Dup	05/13/14	05/13/14 Dup	10/21/14	10/21/14 Dup	04/28/15	04/28/15 Dup	10/27/15*	10/27/15 Dup*	04/20/16	04/20/16 Dup	10/26/16	10/26/16 Dup
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																													
C6-C10	--	--	--	--	--	--	--	--	61.8	60.8	90.0	45.2	59.0	<50	46.2 J	44.7 J	40.9 J	41.2 J	80.5	74.9	112	108	150	87.7	225	164	428	428	202	184
C10-C28	--	--	--	--	--	--	--	--	--	284	<94	211	187	265	207	90.8 J	197	57.3 J	--	251	130	106	50.6 J	36.4 J	--	--	431	444	515	--
C28-C40	--	--	--	--	--	--	--	--	--	271	140	236	552	299	482	276.0	699	176 J	--	442	244	238	145 J	101 J	--	--	719	699	359	--
C6	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	3.1	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	2.9	ND	ND	6.1	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	26	18	ND	2.8	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	48	35	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	23	26	0.54	13.00	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	35	27	19	13	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	44	33	26	25	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	11	13	5.1	12.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	9.5	18	ND	12.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	6.8	9.4	ND	10.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	10	4.6	ND	3.7	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	ND	<500	<500	<500	<500	<500	62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																													
Antimony	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	< 0.0060	<0.0060	< 0.0060	<0.0060	<0.0060	< 0.0060	<0.0060	<0.0060
Arsenic	--	--	<0.0100	0.0279	0.0185	0.0343	0.0110	<0.0100	0.0339	0.0335	0.0188	0.0880	0.0906	0.0307	0.0236	0.0244	0.0126	0.0127	0.0775	0.0754	0.0776	0.0681	0.0805	0.0466	0.0575	0.0595	0.325	0.322	0.298	0.335
Barium	--	--	0.0721	0.0796	0.0767	0.0913	0.0667	0.0507	0.0227	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.20	<0.20	< 0.20	<0.20	< 0.20	<0.20	< 0.20	<0.20	<0.20
Beryllium	--	--	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	0.07960	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.0040	<0.0040
Cadmium	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	0.00880	0.00820	0.00350	0.00320	0.00260	0.00260	<0.0020	<0.0020	<0.0020	<0.0020	0.00500	0.00390	0.00510	0.00480	0.00300	<0.0020	0.00230	0.00210	0.00280	0.00220	<0.0050	<0.0050
Chromium	--	--	<0.005	0.00653	<0.00500	0.01270	0.00662	<0.0100	<0.0050	0.00540	<0.010	<0.010	<0.010	0.01020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	0.01360
Cobalt	--	--	0.0136	<0.00500	<0.00500	0.00704	<0.00500	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.050	<0.050
Copper	--	--	<0.005	0.01510	<0.00500	0.01400	0.00603	<0.0100	0.00700	0.01310	0.0188	0.0416	0.0369	0.0298	0.0259	0.0272	0.0184	0.0163	0.0599	0.0579	0.0915	0.0761	0.0607	0.0378	0.0296	0.0297	0.0956	0.0942	0.0657	0.104
Lead	--	--	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.010	<0.010	0.0367	0.0158	0.0212	<0.010	<0.010	<0.010	<0.010	0.0178	0.0158	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	0.0141	0.0154	0.0085	0.0288
Mercury	--	--	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	< 0.00020	<0.00020	< 0.00020	<0.00020	< 0.00020	<0.00020	< 0.00020	<0.00050	<0.00050
Molybdenum	--	--	0.0447	0.0486	0.0465	0.0481	0.0434	0.0407	0.0137	0.0150	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0201	0.0268	<0.020	<0.020	<0.020	0.0200	0.0278	0.0338	0.0299	0.0297	<0.020	<0.020	<0.050	<0.050
Nickel	--	--	0.00665	0.00672	<0.00500	0.0112	0.00725	0.0122	0.0434	0.0368	0.0332	0.00900	0.0138	0.0054	0.00530	0.00550	0.0108	0.00890	0.0163	0.0160	0.0212	0.0175	0.0174	0.0110	0.0189	0.0176	0.0123	0.0120	<0.040	0.0460
Selenium	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	<0.010
Silver	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.0050	< 0.0050	<0.010	<0.010
Thallium	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	<0.010
Vanadium	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.010	<0.010	< 0.010	<0.010	< 0.010	0.0154	0.0149	<0.050	<0.050
Zinc	--	--	0.0546	0.106	0.0250	0.0814	0.0340	0.0336	0.0760	0.134	0.166	0.197	0.0696	0.222	0.220	0.218	0.0555	0.0463	0.0163	0.285	0.354	0.310	0.240	0.140	0.184	0.188	0.226	0.223	0.306	0.449
Field Measurements																														
pH (Standard units)	--	--	8.32	7.77	7.20	6.48	7.30	7.42	7.11	6.19	8.64	7.78	7.97	8.18	7.92	--	7.17	--	6.65	--	7.15	--	7.35	--	7.85	--	6.05	--	7.60	--
Specific Conductance (milliSiemens per centimeter)	--	--	0.105	0.117	0.120	0.120	0.109	1.150	1.070	0.415	0.701	0.395	1.190	0.277	0.509	--	0.368	--	0.622	--	0.188	--	0.998	--	0.715	--	0.276	--	0.410	--
Oxidation-Reduction Potential (ORP) (millivolts)	--	--	-109	-117	-65	-109	-94	124	-104	-1	-65	114	-249	67	21	--	-82	--	-37	--	-47	--	18	--	-38	--	234	--	39	--
Dissolved Oxygen (DO) (mg/L)	--	--	1.71	0.11	1.35	2.30	6.08	3.45	6.70	8.17	2.36	8.13	8.79	6.66	8.52	--	0.62	--	7.03	--	0.12	--	9.22	--	8.51	--	7.93	--	4.00	--
Temperature (degrees Celsius)	--	--	21.65	22.92	26.40	25.60	25.81	16.13	23.80	18.24	23.13	18.59	27.75	25.52	20.18	--	19.63	--	24.10	--	21.57	--	27.53	--	23.70	--	31.24	--	26.37	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID																									
Date	05/25/06	5/25/06 Dup	12/08/06	06/06/07	06/06/07 Dup	11/28/07	11/28/07 Dup	07/15/08	12/02/08	06/17/09	12/31/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/29/15	10/26/15*	04/20/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																									
Acetone	13	23	<250	<250	<250	<100	<100	<100	<100	<50	<100	<80	<50	<50	<50	<40	<40	<40	<20	<20	<20	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<50	<50	<50	<20	<20	<20	<20	<10	<20	<80	<50	<50	<50	<10	<10	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	64	49	60	43	43	42	45	25	31	27	31	16.5	17.5	14.5	12.9	10.1	6.3	6.9	1.9	3.0	3.2	1.5	2.5	3.1	5.5
Naphthalene	<10	<10	<50	<50	<50	<20	<20	<20	<20	<10	<20	<20	<13	<13	<13	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<50	<50	<50	<20	<20	<20	<20	<10	<20	<80	<50	<50	<50	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	<10	<50	<50	<50	<20	<20	<20	<20	<10	<20	<80	<50	<50	<50	<20	<20	<20	<10	<10	<10	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<50	<50	<50	<20	<20	<20	<20	<10	<20	<80	<50	<50	<50	<20	<20	<20	<10	<10	<10	<10	<10	<10	<5.0
Benzene	2.0	1.4	<2.5	<2.5	<2.5	1.6	1.7	1.2	1.2	1.0	1.1	<4.0	0.92 J	<2.5	<2.5	<2.0	<2.0	0.25 J	0.22 J	<1.0	0.21 J	<1.0	0.24 J	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	71	58	110	79	81	83	83	62	38	29	22	<4.0	<2.5	<2.5	6.2	10.5	4.3	7.4	22.2	12.8	27.0	23.1	2.2	0.93 J	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	16.5	16.4	8.3	<2.5	<2.0	<2.0	<2.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	7.2	6.0	12	8.2	8.4	9.1	8.4	<2.0	4.7	3.0	<2.0	1.3 J	1.4 J	0.94 J	1.8 J	1.4 J	2.2	2.4	2.4	1.4	2.6	2.6	1.4	0.26 J	<1.0
Chlorobenzene	2.9	2.3	<5.0	<5.0	<5.0	2.5	2.5	<2.0	<2.0	<1.0	<2.0	1.4 J	1.6 J	<2.5	0.80 J	0.70 J	0.76 J	0.66 J	0.74 J	0.41 J	0.77 J	0.66 J	0.51 J	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.5	<2.5	<5.0	<8.0	<8.0	<8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<50	<50	<50	<20	<20	<20	<20	NS	NS	<40	<25	<25	<25	<20	<20	<20	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<10	<10	<10	<10	<10	<4.0	<4.0	NS	NS	<20	<13	<13	<13	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	82	77	140	91	93	85	88	74	54	37	34	45	51	44	53	49.5	40.4	47.9	32.0	27.0	34.4	27.8	34.4	37.9	50.8
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	420	360	490	330	330	330	350	300	260	240	230	187	224	118	160	118	85.8	94.1	68.2	51.6	72.6	56.4	69.2	77.7	94.4
1,1-Dichloroethane (1,1-DCA)	8.5	7	11.0	8.3	8.6	8.0	8.5	6.5	6.6	5.7	6.3	3.6 J	4.9	2.9	5.1	3.8	4.7	5.3	5.0	3.8	5.7	5.1	5.8	5.8	5.6
1,2-Dichloroethane (1,2-DCA)	14	10	15.0	12.0	12.0	13	14	<1.0	6.2	5.2	5.2	3.0 J	3.6	1.6 J	1.8 J	0.94 J	0.64 J	0.65 J	0.31 J	0.20 J	0.27 J	0.23 J	0.42 J	0.68 J	1.0
1,1-Dichloroethene (1,1-DCE)	7.8	5.8	11.0	7.1	7.5	10	10	7.3	8.7	6.7	5.5	3.3 J	4.3	2.0 J	2.7	1.9 J	1.8 J	2.0	2.4	1.4	2.6	2.4	2.6	1.9	1.3
cis-1,2-Dichloroethene (cis-1,2-DCE)	8.4	5.9	9.8	7.1	7.6	9.1	10	28	11	17	13	9.6	12.6	5.7	14.1	10.4	14.1	13.2	11.5	9.5	15.4	14.5	18.1	25.0	26.0
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	0.82 J	<2.5	0.82 J	0.63 J	0.89 J	0.87 J	0.77 J	0.53 J	0.97 J	0.94 J	1.0	1.2	1.3
Vinyl Chloride	<0.50	<0.50	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	0.25 J	<1.0	<1.0	0.27 J	<1.0	<1.0	<1.0
Carbon Tetrachloride	<0.50	<0.50	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<4.0	<2.5	<2.5	<2.5	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	13	11	11	11	10	10	10	7.8	3.1	8.5	4.0	3.6	2.5	2.9	1.8	2.1	1.3	1.3	0.95	1.3	1.1	2.7	--	1.1	2.5

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID																								
Date	05/25/06	5/25/06 Dup	12/08/06	06/06/07	06/06/07 Dup	11/28/07	11/28/07 Dup	07/15/08	12/02/08	06/17/09	12/31/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/29/15	10/26/15*	04/20/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																									
C6-C10	--	--	--	--	--	--	--	--	--	--	--	276	391	190	339	338	209	365	173	183	197	149	214	201	70.5 J
C10-C28	--	--	--	--	--	--	--	--	--	--	--	--	70.6 J	<94	171	305	184	327	143	468	365	421	--	354	420
C28-C40	--	--	--	--	--	--	--	--	--	--	--	--	<190	<190	<200	150	53	129 J	144 J	366	291	302	--	209	181
C6	--	--	--	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	100	110	93	94	ND	62	33	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	43	31	31	30	ND	16	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	67	84	83	83	ND	24	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	38	56	18	21	90	1	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	56	22	22	19	39	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	27	34	24	19	37	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	42	31	14	14	18	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	18	13	4	8.0	16.0	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	9.7	13	5.7	1.1	12.0	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	3.1	5.6	ND	ND	7.9	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	6.8	19	ND	ND	29.0	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	ND	ND	<500	<500	<500	<500	<500	<500	276	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																									
Antimony	--	--	--	0.0176	0.0166	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	--	--	0.0583	0.0182	<0.0100	<0.0100	0.01000	0.02590	<0.0100	<0.0100	<0.0100	<0.030	0.01170	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	--	--	--	0.0140	0.0137	0.0129	0.0133	0.0152	0.0174	0.0168	0.0179	0.0149	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	--	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	--	--	0.0299	0.0298	0.0196	0.0204	0.0221	0.0239	0.0240	0.0187	0.0206	0.0225	0.0089	0.0080	0.0086	0.0031	0.0067	0.0060	0.0109	0.0064	0.0064	0.0059	0.0057	<0.0050
Chromium	--	--	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	0.00748	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	--	--	0.0361	0.0353	0.0245	0.0255	0.0215	0.0248	0.0246	0.0262	0.0198	0.0203	0.0137	0.0117	0.0081	0.0067	0.0060	0.0071	<0.0050	0.0071	0.0072	0.0083	0.0082	<0.050
Copper	--	--	--	0.460	0.453	0.455	0.470	0.438	0.464	0.503	0.538	0.442	0.508	0.247	0.223	0.180	0.124	0.162	0.160	0.154	0.163	0.177	0.188	0.178	0.0876
Lead	--	--	--	<0.010	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	--	--	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	--	--	0.0361	0.0366	0.0371	0.0385	0.0341	0.0431	0.0488	0.0568	0.0494	0.0399	0.0377	0.0438	<0.020	0.0461	0.0455	0.0450	0.0419	0.0415	0.0385	0.0364	0.0378	<0.050
Nickel	--	--	--	0.466	0.463	0.457	0.473	0.437	0.441	0.448	0.468	0.370	0.402	0.270	0.273	0.162	0.177	0.200	0.203	0.198	0.214	0.232	0.258	0.285	0.320
Selenium	--	--	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	0.01560	<0.0150	<0.0200	<0.030	<0.010	<0.010	0.01240	0.01810	<0.010	<0.010	<0.010	0.01000	<0.010	<0.010	<0.010	0.0114
Silver	--	--	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	--	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	--	--	0.0128	0.0129	0.0140	0.0140	0.0129	0.0145	0.0141	0.0135	0.0114	0.0124	0.0131	<0.010	<0.010	<0.010	<0.010	0.0125	<0.010	0.0149	0.0139	0.0158	0.0182	<0.050
Zinc	--	--	--	0.0910	0.0313	0.0206	0.0233	0.0248	0.0221	0.0178	0.0409	<0.0100	0.0124	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0241	<0.020	<0.020	<0.020	<0.020
Field Measurements																									
pH (Standard units)	7.10	7.10	7.40	8.53	8.53	8.06	8.06	7.40	6.83	7.41	7.26	7.21	7.28	7.82	7.43	--	7.11	7.78	7.56	7.27	7.17	--	8.04	6.87	--
Specific Conductance (milliSiemens per centimeter)	0.410	0.410	0.528	0.489	0.489	0.514	0.514	0.510	0.470	0.502	5.730	4.600	3.610	4.420	4.350	--	4.100	3.920	4.150	4.140	4.090	--	4.110	4.890	--
Oxidation-Reduction Potential (ORP) (millivolts)	93	93	13	37	37	-3.0	-3.0	65	-19	106	47	142	129	83	166	--	22	32	60	-135	75	--	124	236	--
Dissolved Oxygen (DO) (mg/L)	0.74	0.74	1.7	0.88	0.88	0.00	0.00	1.35	2.00	5.77	4.78	0.00	9.04	8.36	6.51	--	3.81	8.10	0.82	9.40	7.50	--	7.17	9.90	--
Temperature (degrees Celsius)	23.31	23.31	22.5	25.21	25.21	23.23	23.23	30.20	23.60	23.89	11.48	25.30	18.87	22.29	16.85	--	22.95	22.63	25.08	29.50	22.38	--	32.04	20.31	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; Metals samples were analyzed for dissolved metals

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-7D																						
Date	05/25/06	12/08/06	06/06/07	11/28/07	07/16/08	7/16/08 Dup	12/03/08	06/17/09	12/31/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/29/15	10/26/15*	04/20/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																							
Acetone	<10	<1,000	<1,000	<500	<500	<100	<500	<50	<250	<400	<400	<400	<400	<200	<200	<200	<200	<200	<20	<100	<100	<100	<63
2-Butanone (methyl ethyl ketone)	<10	<200	<200	<100	<100	<20	<100	<10	<50	<400	<400	<400	<400	<10	<10	<10	<100	<100	--	<50	<50	<50	<13
Chloroform	3.0	<20	<20	<10	<10	11.0	<10	<1.0	8.4	9.5 J	<20	<20	<20	6.2 J	21.6	26.1	4.3 J	7.1 J	19.4	1.1 J	4.6 J	6.1	8.2
Naphthalene	<10	<200	<200	<100	<100	<20	<100	<10	<50	<100	<100	<100	<100	<50	<50	<50	<50	<50	<5.0	<25	<25	<25	<13
2-Hexanone (methyl butyl ketone)	<10	<200	<200	<100	<100	<20	<100	<10	<50	<400	<400	<400	<400	<100	<100	<100	<100	<100	<10	<10	<10	<10	<25
Methylene chloride	<10	<200	<200	<100	<100	<20	<100	<10	<50	<400	<400	<400	<400	<100	<100	<100	<100	<100	<10	<50	<50	<50	<13
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<200	<200	<100	<100	<20	<100	<10	<50	<400	<400	<400	<400	<100	<100	<100	<100	<100	<10	<50	<50	<50	<13
Benzene	<0.50	<10	<10	<5.0	<5.0	2.2	<5.0	0.7	<2.5	<20	<20	<20	<20	4.2 J	<10	<10	<10	<10	0.55 J	<5.0	<5.0	<5.0	<2.5
1,2-Dichlorobenzene (1,2-DCB)	270	220	180	180	210	230	130	28	66	<20	<20	<20	507	770	380	367	284	242	195	223	144	106	69
1,3-Dichlorobenzene (1,3-DCB)	1.8	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	173	257	253	<20	4.6 J	2.8 J	2.9 J	2.2 J	<10	1.4	1.2 J	<5.0	<5.0	0.59 J
1,4-Dichlorobenzene (1,4-DCB)	38.0	30.0	24.0	23.0	28.0	27.0	18.0	3.0	8.4	19.3 J	27.3	27.6	52.7	83.8	45.4	46.9	37.8	27.0	27.1	22.7	14.5	13.4	10.4
Chlorobenzene	9.1	<20	<20	<10	<10	2.9	<10	2.0	<5.0	<20	<20	<20	<20	4.3 J	2.4 J	<10	2.2 J	2.2 J	1.5	1.6 J	2.8 J	1.6 J	1.2 J
Ethylbenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<20	<20	<20	<20	<10	<10	<10	<10	<10	<1.0	<5.0	<5.0	<5.0	<2.5
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<2.0	<10	<10	<10	<2.5
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<2.0	<10	<10	<10	<2.5
1,2,3- Trichlorobenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<2.0	<10	<10	<10	<5.0
1,2,4- Trichlorobenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<2.0	<10	<10	<10	<5.0
n-Butylbenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<20	<10	<10	<10	<2.5
s-Butylbenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<20	<10	<10	<10	<2.5
t-Butylbenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<20	<10	<10	<10	<2.5
Isopropylbenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<20	<20	<20	<20	<10	<10	<10	<10	<10	<1.0	<5.0	<5.0	<5.0	<2.5
n-Propylbenzene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<2.0	<10	<10	<10	<2.5
Toluene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<20	<20	<20	<20	<10	<10	<10	<10	<10	<1.0	<5.0	<5.0	<5.0	<2.5
p-Isopropyltoluene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<100	<20	<20	<20	<20	<20	<2.0	<10	<10	<10	<2.5
Total Xylenes (p/m- and o- xylene)	<1.0	<20	<1.0	<1.0	<10	<2.0	<2.0	<2.0	<2.0	<20	<20	<20	<40	<40	<40	<40	<20	<20	<2.0	<10	<10	<10	<7.5
Methyl tert-butyl ether (MTBE)	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<20	<20	<20	<20	<10	<10	<10	<10	<10	<1.0	<5.0	<5.0	<5.0	<2.5
Tert-Butyl Alcohol (TBA)	<10	<200	<200	<100	<100	<20	<100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<50	<50	<50
Di isopropyl ether (DIPE)	3.9	<40	<40	<20	<20	<4.0	<20	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<2.5
Tetrachloroethene (PCE)	150	110	94	70	65	60	56	19	45	124	143	126	137	118	94	95.6	66.5	91.1	96.0	64.9	93.3	77.1	76.3
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<100	<100	<100	<20	<10	<10	<10	<10	<10	0.23 J	<5.0	<5.0	<5.0	<2.5
1,1,2-Trichloroethane (1,1,2-TCA)	6.9	<20	<20	<10	<10	2.3	<10	3	<5.0	<100	<100	<100	<20	<10	<10	<10	<10	<10	<1.0	<5.0	<5.0	<5.0	<2.5
Trichloroethene (TCE)	1900	1200	950	900	700	660	700	670	850	965	1,080	882	983	705	362	290	410	319	214	227	420	232	174
1,1-Dichloroethane (1,1-DCA)	50	36	27	28	18	15	19	18	21	14.2 J	15.8 J	12.9 J	12.2 J	8.5 J	4.6 J	3.6 J	4.4 J	4.8 J	4.6	5.2	6.2	4.9 J	3.9
1,2-Dichloroethane (1,2-DCA)	370	170	150	180	93	81	74	69	95	67.9	73.2	65.8	62.9	45.8	22.4	16.7	18.7	14.7	8.7	14.5	29.7	13.3	9.5
1,1-Dichloroethene (1,1-DCE)	21	<20	<20	17	10	8.9	11	10	13	10.5 J	13.4 J	<20	11.7 J	9.7 J	4.7 J	3.5 J	6.2 J	3.3 J	3.3	3.7 J	5.9	2.8 J	2.1 J
cis-1,2-Dichloroethene (cis-1,2-DCE)	160	200	160	160	130	120	160	180	130	45	53.3	35.1	46.9	46.1	25.4	20.7	32.7	23	15	20.2	35.9	17.2	18.0
trans-1,2-Dichloroethene (trans-1,2-DCE)	7.6	<20	<20	<10	<10	4.6	<10	6.7	6.5	<20	<20	<20	<20	3.4 J	<10	<10	2.5 J	<10	1.1	1.6 J	<5.0	1.3 J	<2.5
Vinyl Chloride	1.8	<10	<10	<5.0	<5.0	1.10	<5.0	1	<2.5	<20	<20	<20	<20	<10	<10	<10	<10	<10	0.26 J	<5.0	<5.0	<5.0	<2.5
Carbon Tetrachloride	<0.50	<10	<10	<5.0	<5.0	<1.0	<5.0	<0.50	<2.5	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<5.0	<5.0	<5.0	<2.5
Styrene	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<20	<20	<20	<20	<10	<10	<10	<10	<10	<1.0	<5.0	<5.0	<5.0	<2.5
1,2-Dibromomethane	<1.0	<20	<20	<10	<10	<2.0	<10	<1.0	<5.0	<20	<20	<20	<20	<10	<10	<10	<10	<10	<1.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane (1,2-DCP)	26	22	<20	18	11	9	13	15	<5.0	<20	<20	<20	<20	3.2 J	<10	<10	<10	<10	0.60 J	1.0 J	1.9 J	<5.0	<2.5
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	93	64	40	46	37	37	39	28	26	18.3	12.7	22.6	15.4	10.7	6.0	14.4	6.7	5.7	4.0	0.76	--	4.0	3.0

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-7D																						
Date	05/25/06	12/08/06	06/06/07	11/28/07	07/16/08	7/16/08 Dup	12/03/08	06/17/09	12/31/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/29/15	10/26/15*	04/20/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																							
C6-C10	--	--	--	--	--	--	--	--	--	1,270	1,700	913 J	1,690	1,760	726	623	849	886	712	383	967	457	130
C10-C28	--	--	--	--	--	--	--	--	--	--	170	62.4 J	443	587	653	594	149	337	448	248	--	488	644
C28-C40	--	--	--	--	--	--	--	--	--	--	<190	<190	<190	115	<190	142 J	106 J	73.0 J	235	274	--	197	218
C6	--	--	--	ND	ND	ND	44	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	300	310	91	67	250	100	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	86	23	23	11	6	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	180	180	28	ND	77	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	76	29	86	130	87	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	41	27	ND	2.1	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	44	31	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	68	29	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	22	9.8	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	14	1.7	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	8.1	ND	22	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	9.4	ND	2.8	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	850	640	<500	<500	<500	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																							
Antimony	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	0.0149	0.0082	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	--	0.127	0.239	4.09	4.79	0.0795	0.0341	0.972	1.26	0.319	0.744	0.717	0.953	3.04	2.29	0.516	0.951	1.58	<0.010	0.133	1.58	1.04
Barium	--	--	0.0190	0.01900	0.0289	0.0309	0.0203	0.0220	0.0245	0.0232	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	--	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	0.0174	0.0159	<0.0020	0.00620	0.0223	0.0154	0.0145	0.0178	0.00540	0.00600	0.00530	0.00370	0.00300	<0.0050
Chromium	--	--	<0.005	<0.00500	<0.00500	<0.00500	0.00579	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	--	0.0224	0.0149	0.0234	0.0243	0.0085	0.0059	0.0108	0.0251	0.0291	0.0241	0.0184	0.0271	0.0186	0.0167	0.0157	0.0064	0.0086	0.0096	0.0081	0.0064	<0.050
Copper	--	--	0.0457	0.0474	0.0726	0.0721	0.0610	0.0369	0.0771	0.2570	0.3300	0.1650	0.0830	0.2330	0.1080	0.0898	0.0577	0.0894	0.1000	0.0969	0.0783	0.0614	0.0286
Lead	--	--	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	--	--	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	--	0.0396	0.0472	0.0348	0.0346	0.0444	0.0573	0.0553	0.0505	0.0506	0.0447	0.0418	<0.020	0.0380	0.0400	0.0457	0.0449	0.0441	0.0417	0.0415	0.0407	<0.050
Nickel	--	--	0.2910	0.316	0.184	0.154	0.272	<0.0150	0.290	0.331	0.413	0.323	0.270	0.291	0.225	0.262	0.206	0.217	0.192	0.232	0.267	0.264	0.224
Selenium	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0185
Silver	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	--	<0.005	<0.00500	0.0362	0.0424	<0.00500	<0.00500	<0.0100	0.0124	0.0061	<0.010	<0.010	<0.010	0.0232	0.0194	<0.010	<0.010	0.0130	<0.010	<0.010	0.0161	<0.050
Zinc	--	--	0.0632	0.05330	0.144	0.175	0.028	0.0217	0.0722	0.0730	0.0282	0.0460	0.0358	0.0480	0.162	0.116	0.0243	0.0314	0.102	<0.020	<0.020	0.204	0.104
Field Measurements																							
pH (Standard units)	7.06	7.04	8.12	7.69	6.60	6.60	6.61	7.23	7.13	7.13	7.18	8.24	7.14	7.48	7.07	7.48	7.81	7.28	6.93	6.90	7.88	6.68	--
Specific Conductance (milliSiemens per centimeter)	0.515	0.501	0.472	0.487	0.510	0.510	0.480	0.538	5.180	5.180	3.780	4.870	4.550	4.560	4.540	4.570	4.570	4.820	4.290	4.510	4.240	5.170	--
Oxidation-Reduction Potential (ORP) (millivolts)	-65	-55	-65	-107.0	60.0	60.0	-69.0	-42.0	-99.0	-99.0	70.0	37.0	113.0	28.0	3.0	52.0	-11.0	-67.0	109.0	78.0	68.0	240.0	--
Dissolved Oxygen (DO) (mg/L)	0.66	1.62	0.18	0.00	2.54	2.54	1.70	5.90	1.70	1.70	8.70	2.97	6.06	7.75	4.90	7.92	0.67	10.39	8.01	10.64	8.12	9.43	--
Temperature (Degrees Celsius)	25.03	20.50	23.92	22.58	25.30	25.30	21.80	26.22	17.78	17.78	19.07	23.44	18.63	25.42	23.71	24.58	24.58	27.63	22.72	26.13	29.29	20.38	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-8																					
Date	05/23/06	12/06/06	06/04/07	11/27/07	07/15/08	12/03/08	06/16/09	12/31/09	06/30/10	12/16/10	06/20/11	12/20/11	06/08/12	12/05/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/27/15*	04/20/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																						
Acetone	<10	<10	<50	<50	<50	<50	<50	<50	<20	<20	<20	<20	5.3 J	--	<20	<20	25	15.1 J	8.8 J	4.9 J	6.0 J	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<10	<10	--	<10	<2.0	10	--	<10	<10	<10	<5.0
Chloroform	<1.0	<1.0	2.0	<1.0	2.1	2.8	<1.0	1.7	1.7	10.3	0.47 J	0.46 J	3.7	--	1.9	<1.0	4.7	1.5 J	5.9	6.0	8.1	<1.0
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	--	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<10	<10	--	<10	<10	<10	<20	<20	<1.0	<1.0	<10
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<10	<10	--	<10	<10	<10	<2.0	<2.0	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<10	<10	--	<10	<10	2.6 J	<20	1.6 J	1.2 J	<10	<5.0
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<2.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<2.0	<2.0	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	--	--	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	NS	NS	<10	<10	<10	<10	<10	--	<10	<10	<10	<20	<20	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	NS	<5.0	<5.0	<5.0	<2.0	0.32 J	--	<2.0	<2.0	<2.0	<4.0	<4.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	4.9	5.8	5.9	17.0	16.0	6.0	<1.0	2.7	24.7	1.4	13.9	16.0	--	8.3	<1.0	39.5	6.3	23.8	26.6	36.2	6.7
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	1.5	9.8	10	7.6	36.0	46.0	7.0	5.4	13.6	89.8	6.1	20.2	47.5	--	21.2	1.1	87.8	20.8	66.4	73.7	77.8	14.7
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.33 J	<1.0	<1.0	0.30 J	--	<1.0	<1.0	0.49 J	<2.0	0.69 J	0.76 J	1.2	<1.0
1,2-Dichloroethane (1,2-DCA)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	1.1	<1.0
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.34 J	--	<1.0	<1.0	0.35 J	<2.0	0.30 J	<1.0	0.71 J	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	<1.0	1.2	2.0	1.5	6.4	12.0	4.4	7.7	7.8	55.4	5.0	4.9	44.7	--	17.1	<1.0	79.0	55.2	188	127 b	126	18.9
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.55 J	<1.0	0.25 J	1.4	--	0.47 J	<1.0	2.3	0.66 J	3.9	2.7	5.0	0.64a J
Vinyl Chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<2.0	<2.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.66 J	<1.0	<1.0	0.51 J	--	0.31 J	<1.0	0.82 J	0.43 J	1.4	1.3	2.4	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.95	<0.95	<0.99	<0.95	0.14 J	--	0.23 J	0.37 J	0.49	0.83	<1.9	--	1.0	0.41

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-8																					
Date	05/23/06	12/06/06	06/04/07	11/27/07	07/15/08	12/03/08	06/16/09	12/31/09	06/30/10	12/16/10	06/20/11	12/20/11	06/08/12	12/05/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/27/15*	04/20/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																						
C6-C10	--	--	--	--	--	--	--	--	28.0 J	225	<50	47.9 J	214	--	69.6	<50	509	139	444	523	489	<100
C10-C28	--	--	--	--	--	--	--	--	--	230	85.4 J	968	186	--	136	83.8 J	177	534	610	--	1,280	519
C28-C40	--	--	--	--	--	--	--	--	--	369	300	1,160	509	--	602	269	295	311	1,130	--	2,380	186
C6	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	3.0	ND	ND	47.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	2.4	ND	ND	17.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	21	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	41	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	12	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	17	9.8	ND	ND	1.8	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	64	23	36	ND	33	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	9.0	ND	4.6	ND	4.4	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	8.2	ND	6.0	ND	50.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	8.1	ND	ND	ND	130.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	13	ND	ND	ND	290.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	ND	ND	ND	ND	910.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	ND	ND	ND	ND	610.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	ND	ND	ND	ND	580.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	ND	ND	ND	ND	450.0	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	ND	<500	<500	<500	3,100	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																						
Antimony	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	--	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	--	0.205	0.139	0.263	0.445	0.139	0.524	0.161	0.855	0.197	0.421	0.294	--	0.102	0.136	0.136	0.0510	0.140	0.027	22.4	1.10
Barium	--	--	0.0821	0.0837	0.106	0.103	0.525	0.110	0.089	<0.10	<0.20	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	--	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0020	0.0188	<0.0020	0.00350	<0.0020	--	0.00200	0.00470	0.00200	<0.0020	<0.0020	<0.0020	0.00500	<0.0050
Chromium	--	--	0.00101	<0.00500	<0.00500	0.01060	0.0168	<0.0100	<0.0050	0.0126	<0.010	<0.010	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	--	0.0388	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	--	--	<0.005	0.00554	<0.00500	<0.00500	0.1250	0.01030	0.00570	0.0769	<0.010	0.0433	0.0135	--	0.0107	0.0121	0.0289	0.0150	0.0434	<0.010	0.0208	0.0667
Lead	--	--	<0.010	<0.0100	<0.0100	0.0141	0.0666	<0.0100	<0.0050	0.0232	<0.010	0.02340	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0110
Mercury	--	--	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	--	0.0421	0.0407	0.0440	0.0414	0.0496	0.0447	0.0467	0.0088	0.0468	<0.020	0.0222	--	0.0547	0.0408	0.0341	0.0482	0.0536	0.0716	0.0481	0.0561
Nickel	--	--	0.00814	<0.00500	<0.00500	0.00517	0.00814	<0.0100	<0.0050	0.01180	<0.0050	0.0088	0.0157	--	<0.0050	0.00880	0.01830	0.01200	<0.0050	<0.0050	0.249	<0.040
Selenium	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	--	<0.005	<0.00500	<0.00500	<0.00500	0.00713	<0.0100	<0.0050	0.00640	<0.010	<0.010	<0.010	--	<0.010	<0.010	0.01440	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	--	--	0.0126	0.0187	<0.0100	0.0247	0.609	0.0410	0.0410	0.823	0.0569	0.541	0.331	--	0.120	0.0452	0.451	0.0906	0.154	0.0231	0.447	0.486
Field Measurements																						
pH (Standard units)	7.27	7.34	7.70	7.23	7.30	6.80	7.32	7.21	7.01	6.05	8.88	6.71	7.79	--	7.83	7.16	6.70	6.72	7.06	8.00	6.52	--
Specific Conductance (milliSiemens per centimeter)	0.098	0.105	0.101	0.102	0.110	0.110	0.105	1.100	1.830	0.134	1.140	0.333	0.813	--	0.775	0.677	0.935	1.020	1.000	0.801	1.760	--
Oxidation-Reduction Potential (ORP) (millivolts)	-77	-89	-33	-105	-94	-105	-112	-104	67	15	-82	11	-32	--	-31	-69	-12	-82	-43	-108	3	--
Dissolved Oxygen (DO) (mg/L)	0.062	1.54	0.33	1.26	0.87	2.30	5.22	2.07	0.00	7.75	1.86	2.67	8.74	--	9.45	0.87	10.44	8.33	10.45	8.41	9.56	--
Temperature (degrees Celsius)	26.89	22.6	26.30	23.96	30.90	21.00	28.47	20.20	22.10	19.27	27.83	18.18	22.51	--	23.52	21.72	28.50	20.91	28.45	24.39	21.58	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-9																							
Date	5/23/06 [1]	5/23/06 [2]	5/23/06[3]	12/06/06	06/05/07	11/27/07	07/14/08	12/02/08	06/16/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/08/13	10/07/13	05/13/14	10/20/14	04/29/15	10/26/15*	04/20/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																								
Acetone	<10	<10	<10	<10	<10	<50	<50	<50	<50	<50	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	16	16	17	43	38	40	41	42	27	20	22.7	19.4	16.3	18.4	19.3	16	18.5	17.4	18.6	26.7	23.9	17.0	17.2	10.2
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	4.1	4.1	2.9	6.8	6.7	7.2	8.1	8.1	4.0	2.6	2.7	1.8	1.2	1.3	1.3	0.99 J	1.1	0.96 J	0.97 J	1.4	1.5	1.8	1.8	0.96 J
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.37 J	0.43 J	0.49 J	0.34 J	<1.0	<1.0	<1.0	0.28 J	0.60 J	0.41 J	3.5	5.5	5.1
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	<10	<10	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	NS	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	3.8	3.6	3.2	7.0	5.6	7.0	4.9	5.3	4.1	1.8	2.8	2.2	2.4	3.2	2.8	2.5	2.9	2.3	2.1	2.5	2.4	2.8	2.9	3.6
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	16	17	16	19	15	16	14	15	14	14	19.1	19.2	18.2	23.9	21	18.9	17.3	16.1	16.2	19.4	14.4	15.6	14.9	14.9
1,1-Dichloroethane (1,1-DCA)	2.0	1.9	<1.0	1.7	1.8	1.4	1.7	1.6	16.0	1.9	1.6	1.7	1.4	1.9	1.5	1.1	1.3	1.2	1.2	1.7	1.6	2.2	2.3	2.8
1,2-Dichloroethane (1,2-DCA)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	1.2	1.1	1.1	1.2	1.5	1.1	1.1	1.4	1.1	1.4	1.1	1.2	1.1	1.4	1.3	1.1	0.83 J	0.94 J	0.85 J	1.2	1.1	1.3	1.1	1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	4.9	5.2	5.2	6.6	9.0	8.0	12.0	12.0	14.0	18.0	22.4	28.4	27.2	37.1	36.8	28.3	28.7	27.4	28.7	33.9	20.1	38.2	39.6	34.2
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	1.4	1.5	1.8	1.9	1.5	1.4	1.4	1.4	1.7	1.1	1.7	1.6	1.5a
Vinyl Chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	0.38 J	<1.0	<1.0	0.29 J	<1.0	0.24 J	0.29 J	<1.0	0.35 J	<1.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	3.0	2.9	3.1	4.8	2.6	2.7	2.8	2.3	2.3	<2.0	0.89 J	0.58 J	0.64 J	0.57 J	0.56	0.51	0.45 J	0.37 J	0.22 J	0.39 J	0.26 J	--	1.5	2.6

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-9																						
Date	5/23/06 [1]	5/23/06 [2]	5/23/06[3]	12/06/06	06/05/07	11/27/07	07/14/08	12/02/08	06/16/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/08/13	10/07/13	05/13/14	10/20/14	04/29/15	10/26/15*	04/20/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																							
C6-C10	--	--	--	--	--	--	--	--	--	--	50.2	67.2	45.4 J	86.4	105	77.3	112	80.7	100	93.3	32.1 J	98.5	84.6	<100
C10-C28	--	--	--	--	--	--	--	--	--	--	--	103	<95	143	177	154	158	109	111	176	214	--	306	491
C28-C40	--	--	--	--	--	--	--	--	--	--	--	<190	<190	<190	174	59.3	142 J	131 J	84.0 J	153 J	238	--	209	234
C6	--	--	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	ND	36	ND	34	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	7.3	1.3	ND	2.8	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	39	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	18	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	14	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	12	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	7.9	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	11	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	10	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	ND	<500	<500	<500	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																								
Antimony	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	--	--	--	<0.010	<0.0100	<0.0100	0.0156	<0.0100	<0.0100	<0.0100	<0.030	<0.010	<0.010	<0.010	0.0127	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	--	--	--	--	0.0292	0.0293	0.0295	0.0334	0.0386	0.0350	0.0343	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	--	--	--	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	--	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.00450	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	--	--	--	--	<0.005	<0.00500	<0.00500	0.00501	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	--	--	--	0.0142	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	--	--	--	--	0.0327	0.0339	0.0265	0.0261	0.0221	0.0173	0.0169	0.0148	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	--	--	--	--	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	--	--	--	--	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	--	--	--	0.0466	0.0476	0.0457	0.0489	0.0557	0.0572	0.0609	0.0651	0.0597	0.0627	0.0525	0.0663	0.0665	0.0666	0.0651	0.0609	0.0572	0.0597	0.0642	0.0606
Nickel	--	--	--	--	0.0732	0.0659	0.0614	0.0589	0.0505	0.0429	0.0350	0.0323	0.0234	0.0220	<0.0050	0.0138	0.0156	0.0121	0.0093	0.0128	0.0145	0.0174	0.0251	<0.040
Selenium	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	--	--	--	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	--	--	--	0.0148	0.0141	0.0139	0.0147	0.0150	0.0147	0.0139	0.0156	0.0152	0.0155	0.0168	0.0170	0.0177	0.0164	<0.010	0.0160	0.0134	0.0146	0.0151	<0.050
Zinc	--	--	--	--	<0.010	0.0154	0.0505	<0.0100	<0.0100	0.0140	<0.0100	<0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Field Measurements																								
pH (Standard units)	7.34	7.37	7.38	7.43	8.44	7.93	6.90	6.30	7.43	7.56	7.12	6.85	8.84	7.44	7.65	7.64	7.77	7.60	7.07	7.02	7.36	8.02	6.79	--
Specific Conductance (milliSiemens per centimeter)	0.269	0.266	0.276	0.273	0.266	0.275	0.300	0.260	0.265	2.460	2.420	2.210	2.460	2.350	2.180	2.180	2.230	2.260	2.490	2.180	2.630	2.26	2.55	--
Oxidation-Reduction Potential (ORP) (millivolts)	103	100	103	-101	-58	-76	-54	-48	-120	156	15	-5	40	132	105	103	147	82	8	77	87	113	1.51	--
Dissolved Oxygen (DO) (mg/L)	1.41	3.02	1.41	6.25	3.03	0.00	0.77	1.50	5.89	2.42	4.74	9.23	1.45	6.38	8.12	9.16	7.05	0.64	6.46	0.47	7.91	7.60	10.45	--
Temperature (degrees Celsius)	26.81	28.35	26.81	23.90	21.87	23.22	31.20	21.90	23.15	17.89	23.00	16.95	29.72	18.02	22.25	20.48	20.35	24.69	26.11	22.79	28.18	32.71	29.82	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample
* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-10																							
Date	5/23/06 [1]	5/23/06 [2]	5/23/06 [3]	12/07/06	06/05/07	11/28/07	07/15/08	12/02/08	06/15/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/09/13	10/07/13	05/12/14	10/20/14	04/29/15	10/26/15*	04/19/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																								
Acetone	<10	<10	<10	<50	<50	<50	<50	<50	<50	<50	<40	<40	<40	<40	<40	<50	<50	<50	<50	<50	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<40	<40	<10	<25	<25	<25	<25	--	<10	<10	<10	<5.0
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<13	<13	<13	<13	<13	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<40	<40	<20	<25	<25	<25	<25	<25	<10	<10	<10	<10
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<40	<40	<20	<25	<25	<2.5	<25	<25	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<40	<40	<40	<20	<25	<25	<25	<25	<25	<10	<10	<10	<5.0
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.62	0.62	0.66 J	0.76 J	<2.0	<2.0	0.59 J	0.71 J	0.68 J	0.58 J	<2.5	<2.5	0.26 J	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	7.0	5.4	5.2	7.9	6.1	6.6	7.9	7.2	5.5	6.0	5.4	4.3	2.9	2.6	2.2	2.3 J	2.4	2.1 J	2.0 J	1.6 J	0.94 J	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.77 J	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	2.6	2.3	2.2	3.5	2.2	2.4	<1.0	3.7	4.8	7.3	8.1	7.1	5.4	5.4	5.9	12.7	15.6	<2.5	3.8	1.8 J	0.29 J	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<8.0	<8.0	<8.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	<10	<10	NS	NS	<20	<20	<20	<20	<20	<25	<25	<25	<25	<25	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	NS	<10	<10	<10	<10	<4.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	25	21	22	25	18	18	18	19	21	21	27.6	26.4	21.9	24.7	22.0	25.7	26.7	20.3	15.7	15.7	13.6	14.3	13.0	13.6
1,1-Dichloroethane (1,1-DCA)	2.1	1.8	1.8	1.8	1.4	1.3	1.7	2.5	2.9	4.0	4.0	5.0	5.1	6.6	5.4	5.7	6.0	5.7	5.9	7.0	10.0	16.7	22.8	24.1
1,2-Dichloroethane (1,2-DCA)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	4.8	4.1	4.0	4.4	4.0	3.8	3.5	4.5	3.6	3.8	3.4	3.7	3.4	3.7	3.3	3.3	3.0	2.9	2.4 J	2.7	3.1	4.7	3.9	4.1
cis-1,2-Dichloroethene (cis-1,2-DCE)	71	64	64	57	40	37	44	52	73	110	112	133	119	139	152	154	171	142	105	78.4	67.8	65.3	55.7	48.5
trans-1,2-Dichloroethene (trans-1,2-DCE)	3.6	3.2	3.2	3.1	2.1	2.5	<1.0	2.6	3.9	5.0	6.2	5.6	5.5	5.6	6.8	6.7	7.7	5.5	4.3	3.5	3.2	3.4	2.9	2.4a
Vinyl Chloride	0.60	0.56	0.61	0.65	0.61	1	1	1	1	1	0.76 J	0.60 J	<2.0	0.74 J	0.96 J	0.75 J	<2.5	<2.5	<2.5	<2.5	0.77 J	0.70 J	0.63 J	<1.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.5	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	15	15	16	15	8.8	8.9	11	4.8	13	13	6.8	5.7	9.7	6.2	7.0	3.8	3.4	4.0	5.1	8.5	16.1	--	125	197

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-10																							
Date	5/23/06 [1]	5/23/06 [2]	5/23/06 [3]	12/07/06	06/05/07	11/28/07	07/15/08	12/02/08	06/15/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/04/12	04/09/13	10/07/13	05/12/14	10/20/14	04/29/15	10/26/15*	04/19/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																								
C6-C10	--	--	--	--	--	--	--	--	--	--	166	215	156	227	348	283	434	267	266	259	124	149	112	66.8 J
C10-C28	--	--	--	--	--	--	--	--	--	--	--	66.6	73.2 J	253	342	353	421	258	190	131	260	--	53.0 J	218
C28-C40	--	--	--	--	--	--	--	--	--	--	--	<190	<190	<190	170	111	220	197	60.8 J	<190	282	--	56.1 J	124
C6	--	--	--	--	--	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	ND	2.2	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	8.9	14.0	ND	34.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	35	6.2	ND	2.8	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	14	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	14	14.0	2.1	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	46	42.0	21.0	ND	15	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	9.4	11.0	1.6	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	9.1	8.5	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	11	7.0	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	11	2.5	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	15	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	ND	<500	<500	<500	<500	<500	166	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																								
Antimony	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	--	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	--	--	--	<0.010	<0.0100	<0.0100	<0.0100	--	<0.0100	<0.0100	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	--	--	--	--	0.0307	0.0266	0.0294	0.0353	--	0.0387	0.0343	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	--	--	--	<0.001	<0.00100	<0.00100	<0.00100	--	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	--	--	--	<0.005	<0.00500	<0.00500	<0.00500	--	<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.00260	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	--	--	--	--	<0.005	<0.00500	<0.00500	<0.00500	--	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	--	--	--	0.01620	<0.00500	<0.00500	<0.00500	--	<0.0100	<0.0050	<0.0050	0.00540	<0.0050	0.00510	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	--	--	--	--	0.00913	0.00919	0.00595	0.00723	--	<0.0100	0.00810	0.00730	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	--	--	--	--	<0.010	<0.0100	<0.0100	<0.0100	--	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	--	--	--	--	<0.0005	<0.000500	<0.000500	<0.000500	--	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00026	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	--	--	--	0.0717	0.0717	0.0764	0.0795	--	0.0915	0.0927	0.0929	0.0898	0.0930	0.0797	0.0976	0.0934	0.0860	0.0997	0.0968	0.0811	0.0797	0.0771	0.0789
Nickel	--	--	--	--	0.0612	0.0516	0.0562	0.0562	--	0.0621	0.0599	0.0631	0.0607	0.0622	0.0416	0.0523	0.0512	0.0423	0.0450	0.0478	0.0483	0.0516	0.0673	0.0819
Selenium	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	--	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	--	--	--	<0.005	<0.00500	<0.00500	<0.00500	--	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	--	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	--	--	--	0.00533	<0.00500	<0.00500	0.00630	--	<0.0100	<0.0050	0.00550	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	--	--	--	--	0.13600	0.01380	<0.0100	<0.0100	--	0.02640	<0.0100	<0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0359	<0.020
Field Measurements																								
pH (Standard units)	7.23	7.26	7.28	7.27	8.43	7.92	7.00	6.83	7.44	7.30	7.18	7.26	8.69	7.40	7.44	7.58	7.77	7.42	7.10	7.40	7.19	7.87	7.76	--
Specific Conductance (milliSiemens per centimeter)	0.29	0.294	0.276	0.350	0.292	0.298	0.300	0.290	0.301	3.000	3.620	2.140	2.950	2.760	2.500	2.470	2.530	2.500	2.750	2.180	2.710	2.300	2.590	--
Oxidation-Reduction Potential (ORP) (millivolts)	-80	24.0	118.0	-52.0	-61.0	-66.0	-34.0	-70.0	-48.0	80.0	9.0	-10.0	-18.0	-23.0	59.0	16.0	152.0	102.0	-8.0	101.0	110.0	106.0	167.0	--
Dissolved Oxygen (DO) (mg/L)	0.92	1.64	4.09	1.32	0.70	0.43	2.20	2.50	6.97	8.22	2.61	9.31	1.76	6.57	9.76	6.47	7.45	0.58	10.77	0.88	8.08	7.61	10.59	--
Temperature (degrees Celsius)	25.71	26.38	27.47	21.1	22.62	20.76	22.10	21.60	25.69	15.10	23.30	18.46	32.24	18.09	25.50	21.90	22.69	24.93	24.69	22.80	25.69	30.55	29.26	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-11																							
Date	5/23/06 [1]	5/23/06 [2]	5/23/06 [3]	12/07/06	06/05/07	11/28/07	07/15/08	12/02/08	06/15/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/27/15	04/19/16	10/25/16
VOCs by EPA Method 8260 (µg/L)																								
Acetone	<10	<10	<10	<50	<50	<50	<50	<50	<50	<50	<40	<20	<20	<20	<20	<20	<20	<20	<20	<20	16.9 J	5.4 J	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<20	<20	<10	5.3 J	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	1.4	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<40	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.63 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.28 J	0.29 J	0.40 J	0.27 J	<1.0	0.23 J	0.82 J
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.21 J	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.21 J	<1.0	0.57 J	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	<10	<10	NS	NS	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	NS	<10	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	0.24 J	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	1.1	<1.0	3.2	2.1	3.7	3.5	3.7	2.1	1.1	2.0	1.0	0.80 J	<1.0	0.54 J	<1.0	0.53 J	0.87 J	0.46 J	0.52 J	0.49 J	0.64 J	1.3	5.4
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	37	44	45	60	43	46	45	40	48	45	98.6	27.9	37	5.6	34.4	4.1	36.7	67.6	47.3	52.9	25.5	19.7	31.5	84.4b
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	1.2	2.0	0.36 J	0.85 J	<1.0	0.74 J	<1.0	0.72 J	1.9	1.9	4.6	3.1	1.4	2.2	5.1
1,2-Dichloroethane (1,2-DCA)	2.1	2.2	2.4	1.8	1.3	1.9	2.3	2.1	4.0	3.8	6.6	0.98 J	2.5	<1.0	1.6	<1.0	1.7	3.2	1.4	1.4	0.56 J	0.24 J	0.39 J	1.1
1,1-Dichloroethene (1,1-DCE)	1.3	1.3	1.7	2.0	1.9	1.5	1.1	<1.0	1.0	1.2	2.6	0.64 J	1.4	<1.0	1.7	<1.0	1.5	3.8	2.3	3.7	1.9	0.67 J	1.3	3.8
cis-1,2-Dichloroethene (cis-1,2-DCE)	4.8	5.3	5.3	5.0	4.0	3.6	3.6	3.0	3.5	3.7	7.1	1.7	4.3	0.58 J	4.3	0.35 J	4.7	16.5	39.4	69.2	31.3	11.1	15.3	35.8
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.83 J	<1.0	<1.0	<1.0	0.48 J	<1.0	0.45 J	1.2	1.8	2.9	1.5	0.54 J	0.80 J	1.8a
Vinyl Chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.36 J	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	<2.0	<2.0	<2.0	2.3	<2.0	2.2	2.5	2.2	3.4	3	1.9	0.43	1.7	<0.95	1.4	<0.94	2.2	1.5	2	5.7	6.4	--	6.9	14.1

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-11																						
Date	5/23/06 [1]	5/23/06 [2]	5/23/06 [3]	12/07/06	06/05/07	11/28/07	07/15/08	12/02/08	06/15/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/27/15	04/19/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																								
C6-C10	--	--	--	--	--	--	--	--	--	--	121	42.0 J	29.4 J	<50	78.4	<50	67.4	155	179	197	122	68.2	67.7	69.5
C10-C28	--	--	--	--	--	--	--	--	--	--	--	56.0 J	<94	232	70.8	420.0	81.2 J	113	86.3 J	147	81.7 J	--	64.8 J	250
C28-C40	--	--	--	--	--	--	--	--	--	--	--	<190	<190	148	<0.19	745.0	<100	194	60.5 J	110 J	79.3 J	--	106 J	123
C6	--	--	--	--	0.0	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	8.6	13	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	ND	2.9	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	8.7	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	43	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	18	11	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	16	15	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	44	53	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	9.3	16	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	9.6	17	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	11	0.10	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	14	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	ND	<500	<500	<500	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																								
Antimony	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	--	--	--	<0.010	0.0185	0.0143	0.0176	0.0725	0.0146	<0.0100	<0.030	<0.010	<0.010	0.0116	0.0253	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	--	--	--	--	0.0163	0.0327	0.0577	0.190	1.10	<0.0100	0.0234	<0.10	<0.20	<0.20	<0.20	0.297	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	--	--	--	<0.001	<0.00100	<0.00100	<0.00100	<0.0100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	--	--	--	0.0344	0.0243	0.0241	0.0403	0.285	<0.0100	0.0217	0.0025	<0.0020	<0.0020	0.0028	0.0882	0.0056	0.0068	0.0107	0.0029	<0.0020	0.0028	<0.0020	<0.0050
Chromium	--	--	--	--	0.0283	0.0253	0.0246	0.0749	0.107	0.0169	0.0160	0.0065	0.0130	0.0206	<0.010	0.0389	0.0106	<0.010	<0.020	<0.010	0.0130	<0.010	<0.010	<0.010
Cobalt	--	--	--	--	0.114	0.0942	0.0732	0.0690	0.0655	0.0276	0.0348	0.0060	0.0170	<0.0050	0.0082	0.0114	0.0090	0.0213	0.0105	0.0166	0.0075	0.0121	0.0111	<0.050
Copper	--	--	--	--	0.777	0.755	0.552	0.584	1.45	0.167	0.201	0.0475	0.0686	0.0140	0.0605	0.291	0.0572	0.0681	0.0363	0.0361	0.0145	0.0260	0.0261	0.0280
Lead	--	--	--	--	0.01120	<0.0100	<0.0100	0.04280	0.41300	<0.0100	0.00640	<0.010	<0.010	<0.010	<0.010	0.181	<0.010	<0.010	<0.010	<0.010	<0.010	0.0113	<0.010	0.00520
Mercury	--	--	--	--	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	--	--	--	0.00875	0.00153	0.00761	<0.00500	<0.00500	0.01250	0.01770	0.00810	<0.020	<0.020	<0.020	0.10900	<0.020	0.0536	0.0446	0.0645	0.0388	0.0774	0.0293	0.0777
Nickel	--	--	--	--	0.463	0.464	0.402	0.399	0.464	0.318	0.546	0.0944	0.270	0.0191	0.138	0.118	0.229	0.524	0.321	0.295	0.142	0.191	0.155	0.304
Selenium	--	--	--	--	<0.015	<0.0150	<0.0150	0.01810	0.150	<0.0150	<0.0200	<0.030	<0.010	<0.010	0.0136	0.0457	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	--	--	--	<0.005	<0.00500	<0.00500	<0.00500	0.0145	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	0.0128	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	--	--	--	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	--	--	--	0.0200	0.0340	0.0517	0.108	0.446	0.0137	0.0172	0.0098	0.0114	<0.010	<0.010	0.0880	0.0281	0.0160	<0.010	0.0138	<0.010	0.0132	0.0105	<0.050
Zinc	--	--	--	--	0.0403	0.0686	0.0791	0.0659	0.8130	0.0345	0.0708	0.0586	0.0291	0.0698	0.0480	0.910	0.102	<0.020	<0.020	0.0457	0.0619	0.0928	0.0714	0.0425
Field Measurements																								
pH (Standard units)	7.00	7.06	7.14	7.07	8.46	7.83	7.10	6.97	7.40	6.97	7.18	7.42	8.65	7.51	7.35	6.60	7.48	7.36	6.69	7.00	7.08	8.10	6.75	--
Specific Conductance (milliSiemens per centimeter)	0.72	0.762	0.783	0.840	0.776	0.800	0.850	0.780	0.780	5.510	6.510	1.520	5.130	0.802	3.690	0.290	3.360	3.300	4.310	3.880	3.170	2.690	2.900	--
Oxidation-Reduction Potential (ORP) (millivolts)	90	133	132	155	110	120	105	83	102	117	131	96	50	115	28	89	64	26	43	41	-22	33	227	--
Dissolved Oxygen (DO) (mg/L)	1.77	5.41	28.29	2.72	4.74	0.30	6.51	5.00	6.69	8.96	3.29	9.10	6.18	6.45	9.06	4.88	7.76	0.71	10.39	7.97	10.96	8.45	9.63	--
Temperature (degrees Celsius)	24.57	26.11	29.26	18.80	21.25	17.93	29.20	22.10	22.72	15.43	22.90	18.50	27.11	18.49	25.55	28.99	24.81	25.19	26.53	20.95	35.49	25.78	19.73	--

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds

EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-12																								
Date	05/23/06	5/23/06 Dup	12/06/06	06/05/07	06/05/07 Dup	11/27/07	11/27/07 Dup	07/15/08	12/02/08	06/16/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/26/15	04/18/16	10/24/16
VOCs by EPA Method 8260 (µg/L)																									
Acetone	<10	<10	<10	<50	<10	<50	<50	<50	<50	<50	<50	<20	<20	<20	<20	5.7 J	<20	7.0 J	<20	<20	<20	<20	<20	4.1 J	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	4.1	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	NS	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	1.4	1.3	1.6	1.3	1.4	1.6	1.4	1.6	1.3	<1.0	1.1	1.1	0.78 J	0.92 J	0.79 J	0.70 J	0.62 J	0.61 J	0.57 J	0.54 J	0.70 J	0.58 J	0.61 J	0.75 J	0.60 J
1,1-Dichloroethane (1,1-DCA)	14	14	19	15	15	11	10	9.3	7.7	5.7	5.2	3.5	3.7	3.1	3.2	2.8	2.9	3.5	2.7	2.3	2.6	1.8	3.2	3.8	2.6
1,2-Dichloroethane (1,2-DCA)	<0.50	<0.50	0.54	0.56	0.55	0.53	0.62	<0.50	<0.50	0.50	<0.50	<1.0	0.39 J	<1.0	0.43 J	0.28 J	0.34 J	0.33 J	<1.0	<1.0	<1.0	<1.0	0.22 J	0.22 J	<1.0
1,1-Dichloroethene (1,1-DCE)	18	17	19	18	18	15	15	16	17	13	10	8.2	10	7.3	11	8.2	8.5	8.6	7.3	4.6	4.2	2.3	8.7	8.4	5.3
cis-1,2-Dichloroethene (cis-1,2-DCE)	4.1	4.0	6.6	7.2	7.2	8.2	8.4	11.0	9.9	7.0	3.0	2.3	2.5	1.3	1.9	1.5	2.0	2.3	1.9	1.4	1.3	0.68 J	2.8	3.8	2.9
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.20 J	<1.0
Vinyl Chloride	1.1	1.3	1.2	1.1	1.1	1.0	0.84	1.00	1.20	0.90	0.74	0.49 J	0.47 J	<1.0	0.50 J	0.46 J	0.45 J	<1.0	<1.0	<1.0	<1.0	<1.0	0.37 J	0.51 J	<1.0
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	44	44	82	110	120	170	170	260	260	97	49	22.9	18.8	18.1	19.9	16.8	15.9	15.8	16.2	6.6	6.0	3.0	--	14.7	16.1

Appendix C - Summary of Groundwater Analytical Results, 2006 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-12																								
Date	05/23/06	5/23/06 Dup	12/06/06	06/05/07	06/05/07 Dup	11/27/07	11/27/07 Dup	07/15/08	12/02/08	06/16/09	12/30/09	06/30/10	12/15/10	06/20/11	12/19/11	06/07/12	12/03/12	04/08/13	10/07/13	05/12/14	10/20/14	04/28/15	10/26/15	04/18/16	10/24/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)																									
C6-C10	--	--	--	--	--	--	--	--	--	--	--	<50	<50	<50	<50	29.4	<50	33.3 J	<25	--	--	<50	<50	32.2 J	<100
C10-C28	--	--	--	--	--	--	--	--	--	--	--	--	66.5 J	<94	652	169	735	1,540	1,330	1,900	1,720	598	--	1,590	2,180
C28-C40	--	--	--	--	--	--	--	--	--	--	--	--	<190	<190	<190	88.4	112.0	695 J	356	671	665	434	--	513	292
C6	--	--	--	0.0	0.0	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	ND	ND	10	10	ND	10	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	ND	ND	3.7	4.9	ND	4.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	ND	ND	ND	ND	ND	15.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	ND	ND	ND	ND	ND	19.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	ND	ND	ND	ND	ND	19.0	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	ND	ND	ND	ND	ND	7.6	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	ND	ND	ND	ND	ND	6.8	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	ND	ND	3.6	ND	ND	6.8	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	ND	ND	ND	ND	ND	6.4	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	ND	ND	<500	<500	<500	<500	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)																									
Antimony	--	--	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0100	<0.030	<0.0060	<0.0060	<0.0060	<0.0060	--	--	--	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	--	--	--	<0.010	<0.010	<0.0100	<0.0100	<0.0100	0.0138	<0.0100	<0.0100	<0.0100	<0.030	<0.010	<0.010	<0.010	<0.010	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	--	--	--	0.0883	0.0710	0.0767	0.0762	0.120	0.108	0.117	0.0852	0.119	0.153	<0.20	<0.20	<0.20	<0.20	--	--	--	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	--	--	--	<0.001	<0.001	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	--	--	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	--	--	--	0.00962	0.0103	<0.00500	<0.00500	<0.00500	<0.00500	0.00615	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	--	--	--	0.0202	0.0301	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	--	--	--	0.0582	<0.0005	<0.00500	<0.00500	<0.00500	0.00723	<0.00500	<0.0100	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	--	--	--	<0.010	<0.010	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	--	--	--	<0.0005	<0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000200	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	--	--	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	--	--	--	0.0644	0.0627	0.0612	0.0621	0.0611	0.0633	0.0634	0.0721	0.0639	0.0575	0.0624	0.0537	0.0289	0.0242	--	--	--	0.0668	0.0648	0.0530	0.0673	0.0624
Nickel	--	--	--	0.0567	0.0557	0.0620	0.0615	0.0748	0.0824	0.0692	0.0213	0.0179	0.0302	<0.0050	0.0137	0.0086	0.0062	--	--	--	<0.0050	<0.0050	0.0290	0.0331	0.0402
Selenium	--	--	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	--	--	--	<0.005	<0.005	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	--	--	--	<0.015	<0.015	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150	<0.0200	<0.030	<0.010	<0.010	<0.010	<0.010	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	--	--	--	<0.005	<0.005	<0.00500	<0.00500	0.00516	<0.00500	<0.00500	<0.0100	<0.0050	0.00740	0.01700	<0.010	<0.010	<0.010	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	--	--	--	0.0215	0.0285	0.0222	0.0220	0.0171	0.0109	<0.0100	0.0131	<0.0100	<0.010	0.0251	<0.020	0.103	<0.020	--	--	--	0.0228	<0.020	<0.020	<0.020	<0.020
Field Measurements																									
pH (Standard units)	7.18	7.18	7.27	8.26	8.26	7.66	7.66	7.30	6.76	7.35	6.97	7.10	6.85	7.09	7.19	7.36	6.71	7.13	7.33	6.87	7.00	7.21	7.87	5.58	7.42
Specific Conductance (milliSiemens per centimeter)	0.254	0.254	0.295	0.274	0.274	0.299	0.299	0.300	0.290	0.319	2.470	1.630	2.210	2.930	2.910	2.660	2.940	3.000	31.030	2.970	2.520	7.520	2.540	0.924	2.51
Oxidation-Reduction Potential (ORP) (millivolts)	-119	-119	-109	-100	-100	-126	-126	-59	-107	-89	-13	-100	-5	-5	-28	-31	-35	-24	-98	-40	-58	-81	-21	272	-17
Dissolved Oxygen (DO) (mg/L)	4.41	4.41	1.07	5.69	5.69	0.00	0.00	2.32	2.70	5.27	8.35	97.00	9.23	9.44	6.79	9.51	0.20	7.62	1.25	18.23	9.03	7.81	8.42	10.07	1.80
Temperature (degrees Celsius)	22.40	22.40	23.00	20.73	20.73	23.01	23.01	25.20	20.90	25.52	17.78	23.00	16.95	20.47	17.21	20.45	19.58	19.02	25.23	24.23	21.24	27.47	31.09	30.04	28.21

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

1. Methyl bromide was detected in the sample collected on 4/18/16 at a concentration of 0.22 J.

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-13A									
Date	06/08/12	12/05/12	04/09/13	10/09/13	05/13/14	10/21/14	04/27/15	10/29/15	04/18/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	5.1 J	--	5.1 J	<20	<20	<20	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	--	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	0.28 J	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	--	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	--	0.20 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	--	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	0.45 J	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane (1,1-DCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	0.23 J	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	0.29 J	--	0.20 J	0.21 J	<1.0	<1.0	<1.0	0.24 J	0.23 J	<1.0
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	0.6	--	0.33 J	0.30 J	0.69	--	--	--	0.12	<0.29

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-13A									
Date	06/08/12	12/05/12	04/09/13	10/09/13	05/13/14	10/21/14	04/27/15	10/29/15	04/18/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	<50	--	<50	<50	<50	--	<50	<50	<50	<100
C10-C28	--	--	--	--	--	--	--	--	--	--
C28-C40	--	--	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	--	--	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	0.0148	--	--	--	--	0.0172	0.0193	0.0161	0.0193	0.0147
Barium	<0.20	--	--	--	--	0.230	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	--	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	--	--	--	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	0.0224	--	--	--	--	0.0265	0.0159	<0.010	<0.010	<0.010
Cobalt	0.0097	--	--	--	--	0.0112	0.0067	0.0057	<0.0050	<0.050
Copper	0.0332	--	--	--	--	0.0366	0.0237	0.0177	0.0148	<0.025
Lead	0.0115	--	--	--	--	0.0171	0.0137	<0.010	<0.010	<0.0050
Mercury	<0.00020	--	--	--	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	0.0507	--	--	--	--	0.0536	0.0519	0.0453	0.0546	0.0522
Nickel	0.0204	--	--	--	--	0.0214	0.0128	0.0103	0.00650	<0.040
Selenium	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	--	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	0.0548	--	--	--	--	0.0570	0.0274	0.0211	0.0131	<0.050
Zinc	0.0834	--	--	--	--	0.100	0.0519	0.0549	0.0331	0.0226
Field Measurements										
pH (Standard units)	7.71	--	7.93	--	--	--	--	7.85	6.42	8.06
Specific Conductance (milliSiemens per centimeter)	2.19	--	2.02	--	--	--	--	1.86	2.02	1.56
Oxidation-Reduction Potential (ORP) (millivolts)	-117	--	-109	--	--	--	--	-174	96	38
Dissolved Oxygen (DO) (mg/L)	7.21	--	7.38	--	--	--	--	8.77	9.13	4.08
Temperature (degrees Celsius)	26.58	--	26.64	--	--	--	--	21.99	33.21	26.69

Notes:
-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-13B									
Date	06/08/12	12/05/12	04/09/13	10/09/13	05/13/14	10/21/14	04/27/15	10/29/15	04/18/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	<20	--	<20	<20	<20	<20	<20	4.7 J	<20	<25
2-Butanone (methyl ethyl ketone)	<10	--	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	--	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	--	4.2 J	4.8 J	<10	2.5 J	<10	<10	<10	<20
Di isopropyl ether (DIPE)	0.55 J	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	3.7	--	8.9	9.8	9.0	0.69 J	0.63 J	<1.0	<1.0	<1.0
1,1-Dichloroethane (1,1-DCA)	1.0	--	5.2	6.6	6.5	6.8	6.9	11.1	7.0	5.1
1,2-Dichloroethane (1,2-DCA)	5.1	--	0.44 J	0.45 J	0.44 J	0.42 J	0.33 J	0.48 J	0.35 J	0.36 J
1,1-Dichloroethene (1,1-DCE)	0.61 J	--	3.4	4.7	4.7	4.8	5.7	7.5	6.1	4.9
cis-1,2-Dichloroethene (cis-1,2-DCE)	3.0	--	7.1	10.8	10.7	16.6	15.4	21.1	14.6	11.0
trans-1,2-Dichloroethene (trans-1,2-DCE)	0.30 J	--	0.31 J	0.40 J	0.35 J	0.36 J	0.26 J	0.48 J	0.45 J	<1.0
Vinyl Chloride	<1.0	--	0.81 J	0.61 J	0.78 J	0.50 J	0.64 J	0.68 J	0.49 J	<1.0
Carbon Tetrachloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	17.9	--	40.4	57.1	48.4	--	--	--	19.4	14.4

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-13B									
Date	06/08/12	12/05/12	04/09/13	10/09/13	05/13/14	10/21/14	04/27/15	10/29/15	04/18/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	<50	--	53.1	63.3	73.3	52.3	49.3 J	64.2	53.4	<100
C10-C28	856	--	--	--	--	--	--	--	--	--
C28-C40	<190	--	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	--	--	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	--	--	--	--	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	--	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	--	--	--	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	<0.0050	--	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	<0.00020	--	--	--	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	<0.020	--	--	--	--	0.0678	0.0659	0.0269	0.0462	<0.050
Nickel	0.117	--	--	--	--	0.0526	0.0517	0.0290	0.0191	<0.040
Selenium	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	--	--	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	--	--	--	--	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	<0.020	--	--	--	--	0.0272	0.0274	0.0368	0.0292	<0.020
Field Measurements										
pH (Standard units)	7.67	--	8.05	7.46	--	--	--	7.86	6.40	7.16
Specific Conductance (milliSiemens per centimeter)	3.13	--	2.76	2.74	--	--	--	2.16	2.09	1.93
Oxidation-Reduction Potential (ORP) (millivolts)	-235	--	-150	-180	--	--	--	-189	26	-31
Dissolved Oxygen (DO) (mg/L)	8.63	--	8.36	1.18	--	--	--	8.55	9.40	8.60
Temperature (degrees Celsius)	24.96	--	25.63	18.43	--	--	--	21.93	28.82	25.81

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-13C									
Date	06/08/12	12/05/12	04/09/13	10/09/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	9.0 J	--	5.8 J	7.0 J	<20	6.0 J	17.2 J	<200	<200	32.2
2-Butanone (methyl ethyl ketone)	<10	--	<10	<10	<10	--	2.2 J	<100	<100	2.7 J
Chloroform	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
Naphthalene	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<50	<5.0
2-Hexanone (methyl butyl ketone)	<10	--	<10	<10	<10	<10	<10	<100	<100	<10
Methylene chloride	0.33 J	--	0.63 J	<1.0	<10	0.32 J	0.64 J	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	--	<10	<10	<10	<10	<10	<100	<100	<5.0
Benzene	0.28 J	--	0.31 J	0.24 J	0.24 J	<1.0	<1.0	<10	<10	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
Chlorobenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
Ethylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<1.0
1,2,3- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<2.0
1,2,4- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<2.0
n-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<1.0
s-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<1.0
t-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<1.0
Isopropylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
n-Propylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	<1.0
Toluene	7.8	--	4.9	3.4	2.9	<1.0	0.41 J	<10	<10	0.32 J
p-Isopropyltoluene	<4.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<20	1.1
Total Xylenes (p/m- and o- xylene)	<1.0	--	--	<2.0	<2.0	<2.0	<2.0	<20	<20	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
Tert-Butyl Alcohol (TBA)	<10	--	<10	<10	<10	<10	<10	<100	<100	<20
Di isopropyl ether (DIPE)	5.0	--	2.3	1.6 J	1.9 J	<2.0	<2.0	<20	<20	<1.0
Tetrachloroethene (PCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
Trichloroethene (TCE)	2.6	--	0.99 J	0.90 J	0.83 J	0.54 J	0.59 J	<10	<10	0.28 J
1,1-Dichloroethane (1,1-DCA)	0.52 J	--	0.53 J	0.43 J	0.47 J	0.33 J	0.58 J	<10	<10	0.68 J
1,2-Dichloroethane (1,2-DCA)	16	--	7.1	5.4	6.4	0.50 J	0.45 J	<10	<10	0.34 J
1,1-Dichloroethene (1,1-DCE)	0.36 J	--	0.22 J	0.28 J	<1.0	<1.0	<1.0	<10	<10	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	14.5	--	5.3	4.5	4.9	0.39 J	0.53 J	<10	<10	0.33 J
trans-1,2-Dichloroethene (trans-1,2-DCE)	1.2	--	0.38 J	0.34 J	0.28 J	<1.0	<1.0	<10	<10	<1.0
Vinyl Chloride	<1.0	--	0.24 J	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
Carbon Tetrachloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
Styrene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<1.0
1,2-Dibromomethane	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<10	<2.0
1,2-Dichloropropane (1,2-DCP)	1.9	--	0.72 J	0.57 J	0.64 J	<1.0	<1.0	<10	<10	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	1.4	--	2.9	1.7	2.0	--	--	--	2.6	2.4

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-13C									
Date	06/08/12	12/05/12	04/09/13	10/09/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	79.6	--	50.8	43.0 J	52.5	--	26.3 J	<500	<500	<100
C10-C28	27.4	--	--	--	--	--	--	--	--	--
C28-C40	<190	--	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	<0.0060	--	<0.0060	<0.0060	<0.0060	0.00950	0.00700
Arsenic	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	0.0363	0.0240
Barium	<0.20	--	--	<0.20	--	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	--	--	<0.0020	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	0.0274	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	<0.010	--	--	<0.010	--	<0.010	0.016	0.0153	0.0183	<0.025
Lead	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	<0.00020	--	--	<0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	<0.020	--	--	<0.020	--	<0.020	<0.020	<0.020	<0.020	<0.050
Nickel	0.0069	--	--	0.0093	--	0.0066	0.011	0.0123	0.0153	<0.040
Selenium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	0.0131	--	--	<0.010	--	<0.010	0.0102	0.0139	<0.010	<0.050
Zinc	0.0321	--	--	<0.020	--	0.0483	0.0494	0.0417	0.0497	0.0509
Field Measurements										
pH (Standard units)	8.29	--	12.04	9.89	--	--	--	--	9.71	--
Specific Conductance (milliSiemens per centimeter)	1.82	--	1.34	0.906	--	--	--	--	0.924	--
Oxidation-Reduction Potential (ORP) (millivolts)	-176	--	-121	-223	--	--	--	--	2	--
Dissolved Oxygen (DO) (mg/L)	7.95	--	9.07	1.64	--	--	--	--	8.57	--
Temperature (degrees Celsius)	24.16	--	25.89	17.56	--	--	--	--	30.79	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-14A									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/29/15	04/19/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	<20	--	<20	<4.0	<20	<20	<20	4.4 J	NS	<25
2-Butanone (methyl ethyl ketone)	<10	--	<10	<10	<1.0	--	<10	<10	NS	<5.0
Chloroform	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
Naphthalene	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NS	<5.0
2-Hexanone (methyl butyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	NS	<10
Methylene chloride	<10	--	<10	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	NS	<5.0
Benzene	<1.0	--	<1.0	<1.0	0.33	0.25 J	0.25 J	0.29 J	NS	0.23 J
1,2-Dichlorobenzene (1,2-DCB)	1.3	--	1	1.5	2.1	2.8	2.5	0.76 J	NS	0.91 J
1,3-Dichlorobenzene (1,3-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
1,4-Dichlorobenzene (1,4-DCB)	0.26 J	--	0.27 J	0.39 J	0.48 J	0.68 J	0.65 J	0.21 J	NS	<1.0
Chlorobenzene	4.5	--	1.5	<1.0	6.2	6.2	5.8	4	NS	2.6
Ethylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
1,2,3- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<2.0
1,2,4- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<2.0
n-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
s-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
t-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
Isopropylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
n-Propylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
Toluene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
p-Isopropyltoluene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
Tert-Butyl Alcohol (TBA)	<10	--	<10	<10	<10	<10	<10	<10	NS	<20
Di isopropyl ether (DIPE)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
Tetrachloroethene (PCE)	<1.0	--	<1.0	<1.5	<1.0	<1.0	<1.0	<1.0	NS	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	--	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	--	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	NS	<1.0
Trichloroethene (TCE)	7.2	--	2.6	7.6	20.3	14	13.9	26.4	NS	14.7
1,1-Dichloroethane (1,1-DCA)	19.6	--	7.0	6.8	13.5	10.9	11.2	17.3	NS	11.5
1,2-Dichloroethane (1,2-DCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	0.26 J	NS	0.32 J
1,1-Dichloroethene (1,1-DCE)	1.5	--	<1.0	0.80 J	1.9	1.3	1.3	2.8	NS	1.2
cis-1,2-Dichloroethene (cis-1,2-DCE)	95.6	--	28.6	29.5	49.8	41.3	36.9	51.3	NS	27.4
trans-1,2-Dichloroethene (trans-1,2-DCE)	4.7	--	1.2	1.5	3.0	2.4	2.0	2.7	NS	1.6
Vinyl Chloride	0.68 J	--	<1.0	<1.0	<1.0	<1.0	<1.0	0.61 J	NS	<1.0
Carbon Tetrachloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
Styrene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
1,2-Dibromomethane	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	4.1	--	8.1	56.7	141	--	--	--	NS	513

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-14A									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/29/15	04/19/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	186	--	93.6	78.5	199	124	122	59.2	NS	61.8
C10-C28	--	--	--	--	--	--	--	--	NS	--
C28-C40	--	--	--	--	--	--	--	--	NS	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	<0.0060	--	<0.0060	<0.0060	<0.0060	NS	<0.0060
Arsenic	0.0229	--	--	0.0254	--	0.0249	0.0126	0.0125	NS	0.0196
Barium	0.266	--	--	0.625	--	0.501	<0.20	<0.20	NS	0.437
Beryllium	0.0073	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	NS	<0.0040
Cadmium	<0.0020	--	--	<0.0020	--	<0.0020	<0.0020	<0.0020	NS	<0.0050
Chromium	0.0367	--	--	0.102	--	0.0991	0.0183	<0.010	NS	0.0702
Cobalt	0.0156	--	--	0.0398	--	0.0377	0.0091	0.0056	NS	<0.050
Copper	0.0455	--	--	0.0724	--	0.0986	0.0226	<0.010	NS	0.105
Lead	<0.010	--	--	0.0203	--	0.0319	<0.010	<0.010	NS	0.0151
Mercury	<0.00020	--	--	<0.00020	--	0.00048	<0.00020	<0.00020	NS	<0.00050
Molybdenum	0.0265	--	--	0.0379	--	0.0342	0.0251	0.0216	NS	<0.050
Nickel	0.0397	--	--	0.0950	--	0.0940	0.0937	0.0851	NS	0.1200
Selenium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	NS	<0.010
Silver	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	NS	<0.010
Thallium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	NS	<0.010
Vanadium	0.0758	--	--	0.171	--	0.185	0.0360	<0.010	NS	0.127
Zinc	0.111	--	--	0.263	--	0.415	0.0667	0.0353	NS	0.310
Field Measurements										
pH (Standard units)	7.5	--	8.09	--	--	--	--	8.12	6.85	--
Specific Conductance (milliSiemens per centimeter)	2.14	--	1.91	--	--	--	--	1.91	2.14	--
Oxidation-Reduction Potential (ORP) (millivolts)	-110	--	144	--	--	--	--	-77	172	--
Dissolved Oxygen (DO) (mg/L)	8.6	--	8.71	--	--	--	--	8.94	9.1	--
Temperature (degrees Celsius)	24.05	--	25.96	--	--	--	--	21.19	27.7	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-14B									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/29/15	04/18/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	<40	--	4.2 J	<20	<40	<20	<20	6.5 J	<200	<63
2-Butanone (methyl ethyl ketone)	<10	--	<10	<10	<20	--	<10	<10	<10	<13
Chloroform	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<2.5
Naphthalene	<10	--	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<50	<13
2-Hexanone (methyl butyl ketone)	<20	--	<10	<10	<20	<10	<10	<10	<100	<25
Methylene chloride	<20	--	<10	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<13
4-Methyl-2-pentanone (methyl isobutyl ketone)	<20	--	<10	<10	<20	<10	<10	<10	<100	<13
Benzene	<2.0	--	<1.0	0.34 J	<2.0	<1.0	<1.0	0.96 J	<10	0.66 J
1,2-Dichlorobenzene (1,2-DCB)	38	--	15.3	69.9	150	6.4	6.4	453 b	344	447b
1,3-Dichlorobenzene (1,3-DCB)	<2.0	--	<1.0	0.31 J	0.72 J	<1.0	<1.0	1.7	<10	2.1 J
1,4-Dichlorobenzene (1,4-DCB)	6.3	--	2.5	11.1	23.5	1.2	1.2	65.8	47.1	58.6
Chlorobenzene	5.6	--	2.8	<1.0	2.6	1.2	0.97 J	6.1	5.0 J	4.8
Ethylbenzene	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<2.5
1,2,4-Trimethylbenzene (1,2,4-TMB)	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<2.5
1,3,5-Trimethylbenzene (1,3,5-TMB)	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<2.5
1,2,3- Trichlorobenzene	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<5.0
1,2,4- Trichlorobenzene	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<5.0
n-Butylbenzene	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<2.5
s-Butylbenzene	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<2.5
t-Butylbenzene	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<2.5
Isopropylbenzene	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<2.5
n-Propylbenzene	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<2.5
Toluene	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<2.5
p-Isopropyltoluene	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<2.5
Total Xylenes (p/m- and o-xylene)	<8.0	--	--	<2.0	<4.0	<2.0	<2.0	<2.0	<20	<7.5
Methyl tert-butyl ether (MTBE)	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<2.5
Tert-Butyl Alcohol (TBA)	<20	--	<10	<2.4	<20	<10	<10	34.0	<100	<50
Di isopropyl ether (DIPE)	<4.0	--	<2.0	<2.0	<4.0	<2.0	<2.0	2.7	<20	0.59 J
Tetrachloroethene (PCE)	15.7	--	1.4	14.9	23.4	0.85 J	0.54 J	75.6	35.2	71.3
1,1,1-Trichloroethane (1,1,1-TCA)	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<20	<2.5
1,1,2-Trichloroethane (1,1,2-TCA)	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	0.39 J	<10	<2.5
Trichloroethene (TCE)	110	--	50.8	117	243	6	3	265 b	107	161
1,1-Dichloroethane (1,1-DCA)	16.4	--	15	10.8	4.0	7.4	6.1	4.8	2.8 J	2.4 J
1,2-Dichloroethane (1,2-DCA)	3.4	--	2.6	12.4	9.6	1.5	1.4	17.6	8.2 J	7.3
1,1-Dichloroethene (1,1-DCE)	2.1	--	1.4	4.3	3.0	0.60 J	0.40 J	6.6	4.5 J	4.1
cis-1,2-Dichloroethene (cis-1,2-DCE)	82.6	--	89.3	163	80.1	51.8	46.2	279 b	260	186
trans-1,2-Dichloroethene (trans-1,2-DCE)	4.3	--	3.2	3.3	3.5	1.7	1.3	9.9	5.3 J	5.7
Vinyl Chloride	0.41 J	--	<1.0	<1.0	<2.0	<1.0	<1.0	0.29 J	<10	<2.5
Carbon Tetrachloride	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<2.5
Styrene	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<2.5
1,2-Dibromomethane	<2.0	--	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<10	<5.0
1,2-Dichloropropane (1,2-DCP)	0.54 J	--	0.26 J	1.2	0.81 J	<1.0	<1.0	3.30	<10	0.98 J
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	5.4	--	4.9	3.6	3.0	--	--	--	3.5	4.3

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-14B									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/29/15	04/18/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	368	--	299	510	644	121	101	1,170 b	831	246
C10-C28	127	--	--	--	--	--	--	--	--	--
C28-C40	<190	--	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	<0.0060	--	<0.0060	<0.0060	0.0106	<0.0060	<0.0060
Arsenic	0.0143	--	--	<0.010	--	0.0141	0.0142	0.0436	<0.010	<0.010
Barium	<0.20	--	--	<0.20	--	<0.20	<0.20	1.970	<0.20	<0.20
Beryllium	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	--	--	<0.0020	--	<0.0020	<0.0020	0.00580	<0.0020	<0.0050
Chromium	0.0127	--	--	<0.010	--	<0.010	<0.010	0.296	<0.010	0.0206
Cobalt	0.0068	--	--	0.0058	--	<0.0050	<0.0050	0.189	<0.0050	<0.050
Copper	0.0105	--	--	<0.010	--	0.0105	<0.010	0.489	0.0118	<0.025
Lead	<0.010	--	--	<0.010	--	<0.010	<0.010	0.117	<0.010	0.00610
Mercury	<0.00020	--	--	<0.00020	--	<0.00020	<0.00020	0.00120	<0.00020	<0.00050
Molybdenum	0.0243	--	--	<0.020	--	0.0349	0.0330	0.0277	0.0383	<0.050
Nickel	0.0306	--	--	0.101	--	0.0492	0.0509	0.461	0.150	0.104
Selenium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	0.0228	--	--	0.0164	--	<0.010	<0.010	0.694	0.0119	<0.050
Zinc	0.0448	--	--	<0.020	--	0.100	0.0420	1.06	0.0357	0.0909
Field Measurements										
pH (Standard units)	7.53	--	8.77	--	--	--	--	8.12	8.58	8.30
Specific Conductance (milliSiemens per centimeter)	2.27	--	1.57	--	--	--	--	2.78	3.11	2.79
Oxidation-Reduction Potential (ORP) (millivolts)	-114	--	-137	--	--	--	--	-68	20	9
Dissolved Oxygen (DO) (mg/L)	7.57	--	8.25	--	--	--	--	9.99	10.39	2.61
Temperature (degrees Celsius)	25.1	--	24.58	--	--	--	--	19.52	25.99	22.89

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-14C									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	5.8 J	--	4.4 J	<20	<20	<20	<20	4.6 J	6.2 J	18.5 J
2-Butanone (methyl ethyl ketone)	<10	--	<10	<1.0	<1.0	--	<10	<10	<10	<5.0
Chloroform	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	0.93 J	--	<10	<10	<10	2.4	2.4	2.9	2.1	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	0.49 J	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	0.67 J	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	--	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	4.3	--	2.8	3.8	3	1.7 J	1.6 J	2.3	1.6 J	1.9
Tetrachloroethene (PCE)	<1.0	--	<1.0	<1.0	<1.0	0.30 J	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	--	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	--	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	0.68 J	--	1.1	<1.0	0.63 J	1.3	1.5	1.1	0.85 J	0.90 J
1,1-Dichloroethane (1,1-DCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	0.20 J	0.21 J	<1.0
1,2-Dichloroethane (1,2-DCA)	0.82 J	--	0.85 J	<1.0	0.44 J	0.62 J	0.48 J	0.60 J	0.41 J	0.73 J
1,1-Dichloroethene (1,1-DCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	0.64 J	--	0.87 J	0.50 J	0.41 J	0.59 J	0.57 J	0.49 J	0.38 J	<1.0
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	0.57	--	0.8	0.84	1.1	--	--	--	1.7	2.1

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-14C									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	<50	--	38.1 J	<50	29	32.7 J	32.9 J	<50	33.8 J	<200
C10-C28	69.6	--	--	--	--	--	--	--	--	--
C28-C40	<190	--	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	<0.0060	--	<0.0060	0.0085	<0.0060	<0.0060	<0.0060
Arsenic	0.0146	--	--	<0.010	--	<0.010	0.0101	<0.010	0.0514	0.0510
Barium	<0.20	--	--	<0.20	--	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	--	--	<0.0020	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	<0.010	--	--	<0.010	--	0.0152	0.0188	<0.010	<0.010	<0.010
Cobalt	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	<0.010	--	--	<0.010	--	<0.010	0.0255	<0.010	<0.010	<0.025
Lead	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	<0.00020	--	--	<0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	<0.020	--	--	<0.020	--	<0.020	<0.020	<0.020	<0.020	<0.050
Nickel	0.0112	--	--	<0.0050	--	0.0068	0.0122	<0.0050	0.0054	<0.040
Selenium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	0.0857	--	--	<0.020	--	0.0463	0.0774	<0.020	0.0481	0.0408
Field Measurements										
pH (Standard units)	7.7	--	7.77	--	--	--	--	--	9.22	8.66
Specific Conductance (milliSiemens per centimeter)	1.8	--	2.23	--	--	--	--	--	1.58	1.52
Oxidation-Reduction Potential (ORP) (millivolts)	-136	--	-140	--	--	--	--	--	-11	-18
Dissolved Oxygen (DO) (mg/L)	2.98	--	7.78	--	--	--	--	--	9.67	2.82
Temperature (degrees Celsius)	23.33	--	24.96	--	--	--	--	--	30.75	22.59

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-15A									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	<20	--	<20	<20	<20	<20	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	--	<10	<10	<10	--	<10	<10	<10	<5.0
Chloroform	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	--	<10	<10	<10	<10	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	3	--	3.2	2.9	3.8	1.9	2.5	2.4	1.5	2.9
1,3-Dichlorobenzene (1,3-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	0.69 J	--	0.74 J	0.65 J	0.82 J	0.44 J	0.55 J	0.56 J	0.38 J	0.70 J
Chlorobenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	--	<2.0	<0.20	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	--	<2.0	<0.20	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	--	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	10.6	--	8.6	7.9	8.7	6.2	6.8	6.2	4.4	6.0
1,1-Dichloroethane (1,1-DCA)	0.42 J	--	0.33 J	<1.0	0.28 J	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	1.1	--	0.80 J	0.86 J	0.76 J	0.54 J	0.68 J	0.68 J	0.40 J	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	60.1	--	50.1	40.8	46.8	27	35.4	35.3	22.7	24.9
trans-1,2-Dichloroethene (trans-1,2-DCE)	3.6	--	3.2	2.4	2.9	2.3	2.1	2.4	1.6	1.6
Vinyl Chloride	0.23 J	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	0.28 J	--	0.25 J	0.20 J	<0.63	--	--	--	--	<0.29

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-15A									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	108	--	132	83.6	115	97.2	79.6	<50	55.5	<100
C10-C28	--	--	--	--	--	--	--	--	--	--
C28-C40	--	--	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	<0.0060	--	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	0.0120	--	--	0.0140	--	0.0182	0.0264	0.0210	0.0326	0.0110
Barium	<0.20	--	--	0.267	--	0.266	0.306	<0.20	0.466	<0.20
Beryllium	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	--	--	<0.0020	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	<0.010	--	--	0.0362	--	0.0371	0.0445	<0.010	0.0706	<0.010
Cobalt	<0.0050	--	--	0.0145	--	0.0130	0.0159	<0.0050	0.0249	<0.050
Copper	0.0115	--	--	0.0454	--	0.0569	0.0651	<0.010	0.127	<0.025
Lead	<0.010	--	--	0.0136	--	0.026	0.0324	<0.010	0.0432	<0.0050
Mercury	<0.00020	--	--	<0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	0.0487	--	--	0.0607	--	0.0718	0.0664	0.0654	0.0656	0.0591
Nickel	0.0063	--	--	0.0359	--	0.0319	0.0344	0.0054	0.0546	<0.040
Selenium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	0.0168	--	--	0.072	--	0.0746	0.0805	<0.010	0.139	<0.050
Zinc	0.0219	--	--	0.134	--	0.115	0.115	<0.020	0.193	<0.020
Field Measurements										
pH (Standard units)	7.71	--	7.77	--	--	--	--	--	--	--
Specific Conductance (milliSiemens per centimeter)	1.74	--	1.67	--	--	--	--	--	--	--
Oxidation-Reduction Potential (ORP) (millivolts)	-114	--	9.95	--	--	--	--	--	--	--
Dissolved Oxygen (DO) (mg/L)	9.87	--	7.76	--	--	--	--	--	--	--
Temperature (degrees Celsius)	25.86	--	23.69	--	--	--	--	--	--	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-15B									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	<20	--	4.3 J	<20	<20	<20	<20	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	--	<10	<2.0	<2.0	--	<10	<10	<10	<5.0
Chloroform	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	<10	--	<10	<10	<10	<10	<10	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	--	<10	<10	<10	<10	<10	<10	<10	<5.0
Benzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	0.41 J	--	0.48 J	0.33 J	0.38 J	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Toluene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	--	<10	<10	<10	<10	<10	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.26 J
Tetrachloroethene (PCE)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene (TCE)	3.9	--	3.6	3.1	2.3	12.8	11.9	13.9	9.3	19.3
1,1-Dichloroethane (1,1-DCA)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	<1.0	--	<1.0	<1.0	<1.0	2	1.7	2.5	1.6	3.2
1,1-Dichloroethene (1,1-DCE)	0.71 J	--	0.60 J	0.64 J	0.29 J	<1.0	<1.0	0.75 J	0.27 J	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	33.7	--	31.9	26.3	20.0	20.4	18.9	72.2	24.7	48.4
trans-1,2-Dichloroethene (trans-1,2-DCE)	1.8	--	1.7	1.4	1.2	3.5	3.0	15.0	5.5	12.9
Vinyl Chloride	<1.0	--	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	0.19 J	--	0.16 J	0.20 J	<0.48	--	--	--	3.5	3.1

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-15B									
Date	06/08/12	12/05/12	04/09/13	10/08/13	05/13/14	10/21/14	04/27/15	10/26/15*	04/18/16	10/26/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	57.9	--	85.5	57.1	50.2	101	66.7	47.5 J	79.4	<100
C10-C28	324	--	--	--	--	--	--	--	--	--
C28-C40	104	--	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	--	--	<0.0060	--	<.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	0.0116	--	--	<0.010	--	0.0940	0.0588	<0.010	0.0419	0.0100
Barium	<0.20	--	--	<0.20	--	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	--	--	<0.0020	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	<0.010	--	--	<0.010	--	0.0255	0.0188	<0.010	<0.010	<0.010
Cobalt	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	<0.00020	--	--	<0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	0.0634	--	--	0.0843	--	0.0646	0.0582	0.0674	0.0641	0.0630
Nickel	<0.0050	--	--	0.0058	--	0.0110	0.0110	0.0150	0.0141	<0.040
Selenium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	--	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	--	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	<0.020	--	--	<0.020	--	0.0215	<0.020	<0.020	<0.020	<0.020
Field Measurements										
pH (Standard units)	7.64	--	7.83	--	--	--	--	--	7.15	6.97
Specific Conductance (milliSiemens per centimeter)	1.91	--	1.81	--	--	--	--	--	1.86	1.89
Oxidation-Reduction Potential (ORP) (millivolts)	-109	--	-120	--	--	--	--	--	165	60
Dissolved Oxygen (DO) (mg/L)	7.81	--	9.14	--	--	--	--	--	8.98	3.59
Temperature (degrees Celsius)	25.45	--	24.56	--	--	--	--	--	34.42	20.95

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-16									
Date	06/08/12	12/03/12	04/09/13	10/07/13	05/12/14	10/20/14	04/29/15	10/27/15	04/20/16	10/25/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	6.9 J	<20	<20	<20	<20	<20	<20	<1,000	<200	<25
2-Butanone (methyl ethyl ketone)	<10	<1.0	<10	<10	<10	--	<10	<500	<100	<5.0
Chloroform	0.29 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	0.56 J
Naphthalene	<5.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<50	<5.0
2-Hexanone (methyl butyl ketone)	<10	<1.0	<10	<10	<10	<10	<10	<500	<100	<10
Methylene chloride	0.23 J	<1.0	<10	<10	<10	<10	<10	<50	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<500	<100	<5.0
Benzene	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
1,2-Dichlorobenzene (1,2-DCB)	0.39 J	<2.0	0.22 J	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<2.0	w3	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	0.2 J	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
1,2,3- Trichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<2.0
1,2,4- Trichlorobenzene	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<2.0
n-Butylbenzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
s-Butylbenzene	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
t-Butylbenzene	<2.0	0.22 J	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
n-Propylbenzene	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
Toluene	0.34 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
p-Isopropyltoluene	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	0.37 J	<4.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
Tert-Butyl Alcohol (TBA)	<10	0.72 J	<10	<10	<10	<10	<10	<500	<100	<20
Di isopropyl ether (DIPE)	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<100	<20	<1.0
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	7.2 J	15.1
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<20	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
Trichloroethene (TCE)	2.1	<1.0	1.5	1.1	0.85 J	0.69 J	0.35 J	<50	<10	7.4
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
1,2-Dichloroethane (1,2-DCA)	0.45 J	<1.0	0.39 J	0.31 J	0.30 J	0.29 J	0.25 J	<50	<10	<1.0
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	0.95 J	<10	0.71 J	<1.0	0.79 J	1.1	1.3	<50	<10	1.3
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
Vinyl Chloride	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
Carbon Tetrachloride	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
Styrene	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
1,2-Dibromomethane	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<10	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	0.36 J	19.47	0.42 J	0.32 J	0.34 J	--	--	--	1.0	1.1

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-16									
Date	06/08/12	12/03/12	04/09/13	10/07/13	05/12/14	10/20/14	04/29/15	10/27/15	04/20/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	<50	<50	26.2 J	<50	--	--	<50	<2,500	<500	<100
C10-C28	303	156	--	--	--	--	--	--	--	--
C28-C40	146	<190	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	<0.0060	--	<0.0060	--	<0.0060	<0.0060	0.0319	0.0185	0.00690
Arsenic	<0.010	<0.010	--	<0.010	--	<0.010	0.0170	7.20	6.03	5.40
Barium	<0.20	<0.20	--	<0.20	--	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	<0.0020	--	<0.0020	--	<0.0020	<0.0020	0.0335	<0.0020	<0.0050
Chromium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	0.0232	<0.010	<0.010
Cobalt	<0.0050	<0.0050	--	<0.0050	--	<0.0050	<0.0050	0.0069	0.0069	<0.050
Copper	0.0135	<0.010	--	<0.010	--	<0.010	0.0102	0.0318	0.0150	<0.025
Lead	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	<0.00020	<0.00020	--	<0.00020	--	<0.00020	<0.00020	0.00034	<0.00021	<0.00050
Molybdenum	0.0654	0.0474	--	0.0322	--	0.0258	<0.020	0.0540	0.0500	0.105
Nickel	0.0067	0.0057	--	0.0115	--	0.0120	0.0218	0.0159	0.106	0.0928
Selenium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	<0.0050	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	0.0238	<0.010	<0.050
Zinc	0.106	0.0221	--	<0.020	--	<0.020	0.0619	0.0803	0.654	0.0329
Field Measurements										
pH (Standard units)	7.99	6.65	7.97	7.26	7.38	--	7.30	7.47	6.24	6.93
Specific Conductance (milliSiemens per centimeter)	1.320	0.685	0.993	1.46	1.80	--	1.63	2.11	2.72	--
Oxidation-Reduction Potential (ORP) (millivolts)	-221	-42	-194	-189	-197	--	-188	-82	213	90
Dissolved Oxygen (DO) (mg/L)	8.77	0	7.5	1.78	19.96	--	8.42	8.18	8.79	2.50
Temperature (degrees Celsius)	21.86	19.47	20.35	22.75	28.32	--	20.75	26.23	30.93	18.74

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-16C									
Date	06/08/12	12/03/12	04/09/13	10/07/13	05/12/14	10/21/14	04/29/15	10/27/15*	04/20/16	10/25/16
VOCs by EPA Method 8260 (µg/L)										
Acetone	4.2 J	<20	<20	<20	<20	<20	<20	<20	<100	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	--	<10	<10	<50	<5.0
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
Naphthalene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10
Methylene chloride	1.2	<10	<10	<10	<10	<10	<10	<10	<50	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	1.5 J	<10	<10	<10	<10	<10	<50	<5.0
Benzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	0.35 J	0.23 J	3.2	2.9	3.8	<1.0	<1.0	<1.0	<5.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	0.74 J	0.65 J	0.82 J	<1.0	<1.0	<1.0	<5.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<1.0
1,2,3- Trichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<2.0
1,2,4- Trichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<2.0
n-Butylbenzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<1.0
s-Butylbenzene	<2.0	<2.0	<2.0	<0.20	<2.0	<2.0	<2.0	<2.0	<10	<1.0
t-Butylbenzene	<2.0	**<2.0**	<2.0	<0.20	<2.0	<2.0	<2.0	<2.0	<10	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
n-Propylbenzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<1.0
Toluene	0.49 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
p-Isopropyltoluene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<1.0
Total Xylenes (p/m- and o- xylene)	<4.0	**<4.0**	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	**<10**	<10	<10	<10	<10	<10	<10	<50	<20
Di isopropyl ether (DIPE)	1.8 J	0.86 J	0.87 J	1.2 J	1.2 J	1.9 J	1.6 J	6.2	<10	3.4
Tetrachloroethene (PCE)	<1.0	**<1.0**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
Trichloroethene (TCE)	3.2	1.9	1.2	0.33 J	0.36 J	0.29 J	0.23 J	3.8	<5.0	0.38 J
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
1,2-Dichloroethane (1,2-DCA)	1.6	0.91 J	0.86 J	1.1	1.1	1.7	1.2	9.5	1.3 J	4.7
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	7.3	4	4.5	5.8	6.3	10.1	8.3	40.1	5.4	22.8
trans-1,2-Dichloroethene (trans-1,2-DCE)	0.36 J	<1.0	<1.0	0.23 J	0.22 J	0.44 J	0.25 J	2.8	<5.0	1.5
Vinyl Chloride	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.49 J	<5.0	<1.0
Carbon Tetrachloride	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<2.0
1,2-Dichloropropane (1,2-DCP)	0.44 J	0.27 J	0.21 J	0.31 J	0.30 J	0.48 J	<1.0	1.8	<5.0	1.1
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	0.59	--	0.42 J	0.38 J	0.34 J	--	--	--	0.31	0.59

Appendix C - Summary of Groundwater Analytical Results, 2012 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-16C									
Date	06/08/12	12/03/12	04/09/13	10/07/13	05/12/14	10/21/14	04/29/15	10/27/15*	04/20/16	10/25/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)										
C6-C10	29.4	<50	30.9 J	32.7 J	31.2 J	39.1 J	35.2 J	105	<500	<100
C10-C28	169	155	--	--	--	--	--	--	--	--
C28-C40	88.4	<190	--	--	--	--	--	--	--	--
C6	--	--	--	--	--	--	--	--	--	--
C7	--	--	--	--	--	--	--	--	--	--
C8	--	--	--	--	--	--	--	--	--	--
C9-C10	--	--	--	--	--	--	--	--	--	--
C11-C12	--	--	--	--	--	--	--	--	--	--
C13-C14	--	--	--	--	--	--	--	--	--	--
C15-C16	--	--	--	--	--	--	--	--	--	--
C17-C18	--	--	--	--	--	--	--	--	--	--
C19-C20	--	--	--	--	--	--	--	--	--	--
C21-C22	--	--	--	--	--	--	--	--	--	--
C23-C24	--	--	--	--	--	--	--	--	--	--
C25-C28	--	--	--	--	--	--	--	--	--	--
C29-C32	--	--	--	--	--	--	--	--	--	--
C33-C36	--	--	--	--	--	--	--	--	--	--
C37-C40	--	--	--	--	--	--	--	--	--	--
C41-C44	--	--	--	--	--	--	--	--	--	--
C6-C44 Total	--	--	--	--	--	--	--	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)										
Antimony	<0.0060	<0.0060	--	<0.0060	--	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	0.0128	0.339	0.0711
Barium	<0.20	<0.20	--	<0.20	--	<0.20	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	<0.0020	--	<0.0020	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Chromium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Cobalt	<0.0050	<0.0050	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Copper	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.025
Lead	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.0050
Mercury	<0.00020	<0.00020	--	<0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050
Molybdenum	0.0289	0.0242	--	<0.020	--	<0.020	<0.020	<0.020	0.0224	<0.050
Nickel	0.0086	0.0062	--	0.007	--	<0.0050	<0.0050	<0.0050	0.00830	<0.040
Selenium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	<0.0050	<0.0050	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010
Vanadium	<0.010	<0.010	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.050
Zinc	0.103	<0.020	--	<0.020	--	<0.020	<0.020	<0.020	0.0593	<0.020
Field Measurements										
pH (Standard units)	8.1	6.11	8.11	7.25	7.48	--	7.49	--	6.64	7.16
Specific Conductance (milliSiemens per centimeter)	0.911	0.699	0.763	1.330	1.470	--	1.56	--	0.754	1.52
Oxidation-Reduction Potential (ORP) (millivolts)	-208	-35	-218	-177	-206	--	-167	--	73	-44
Dissolved Oxygen (DO) (mg/L)	8.42	0	10.43	0.77	10.02	--	12.26	--	8.48	2.58
Temperature (degrees Celsius)	19.72	21.12	20.60	22.30	28.30	--	20.25	--	27.90	19.22

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

* - Split samples were collected by EPA during 2SA2015 Groundwater Monitoring Event; metals samples were analyzed for dissolved metals.

Appendix C - Summary of Groundwater Analytical Results, 2015 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-17A		
Date	10/26/15	04/18/16	10/24/16
VOCs by EPA Method 8260 (µg/L)			
Acetone	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<5.0
Chloroform	<1.0	<1.0	<1.0
Naphthalene	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10
Methylene chloride	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<5.0
Benzene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<5.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o-xylene)	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	6.9 J	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0
Trichloroethene (TCE)	7.1	4.9	5.4
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	5.3	3.6	5.3
trans-1,2-Dichloroethene (trans-1,2-DCE)	0.42 J	0.31 J	<1.0
Vinyl Chloride	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	--	0.063 J	<0.30

Appendix C - Summary of Groundwater Analytical Results, 2015 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-17A		
Date	10/26/15	04/18/16	10/24/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)			
C6-C10	30.3 J	30.8 J	<100
C10-C28	--	24.3 J	--
C28-C40	--	<190	--
C6	--	--	--
C7	--	--	--
C8	--	--	--
C9-C10	--	--	--
C11-C12	--	--	--
C13-C14	--	--	--
C15-C16	--	--	--
C17-C18	--	--	--
C19-C20	--	--	--
C21-C22	--	--	--
C23-C24	--	--	--
C25-C28	--	--	--
C29-C32	--	--	--
C33-C36	--	--	--
C37-C40	--	--	--
C41-C44	--	--	--
C6-C44 Total	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)			
Antimony	<0.0060	<0.0060	<0.0060
Arsenic	<0.010	<0.010	<0.010
Barium	0.205	<0.20	<0.20
Beryllium	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	<0.0020	<0.0050
Chromium	0.0211	0.0122	<0.010
Cobalt	0.0077	<0.0050	<0.050
Copper	0.0274	0.0215	<0.025
Lead	0.0105	<0.010	<0.0050
Mercury	<0.00020	<0.00020	<0.00050
Molybdenum	0.104	0.101	0.110
Nickel	0.0126	0.0072	<0.040
Selenium	<0.010	<0.010	<0.010
Silver	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	<0.010
Vanadium	0.0370	0.0216	<0.050
Zinc	0.0675	0.0648	0.0228
Field Measurements			
pH (Standard units)	6.93	6.6	--
Specific Conductance (milliSiemens per centimeter)	1.18	1.32	--
Oxidation-Reduction Potential (ORP) (millivolts)	164	296	--
Dissolved Oxygen (DO) (mg/L)	9.22	8.78	--
Temperature (degrees Celsius)	23.70	25.31	--

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2015 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-17B		
Date	10/26/15	04/18/16	10/24/16
VOCs by EPA Method 8260 (µg/L)			
Acetone	<20	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<5.0
Chloroform	<1.0	<1.0	<1.0
Naphthalene	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10
Methylene chloride	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<5.0
Benzene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o-xylene)	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<20
Di isopropyl ether (DIPE)	<2.0	<2.0	<1.0
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0
Trichloroethene (TCE)	<1.0	<1.0	<1.0
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	<1.0	<1.0	<1.0
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (ci- 1,2-DCE)	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0
Vinyl Chloride	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	--	0.026 J	<0.28

Appendix C - Summary of Groundwater Analytical Results, 2015 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-17B		
Date	10/26/15	04/18/16	10/24/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)			
C6-C10	<50	<50	<100
C10-C28	--	--	--
C28-C40	--	--	--
C6	--	--	--
C7	--	--	--
C8	--	--	--
C9-C10	--	--	--
C11-C12	--	--	--
C13-C14	--	--	--
C15-C16	--	--	--
C17-C18	--	--	--
C19-C20	--	--	--
C21-C22	--	--	--
C23-C24	--	--	--
C25-C28	--	--	--
C29-C32	--	--	--
C33-C36	--	--	--
C37-C40	--	--	--
C41-C44	--	--	--
C6-C44 Total	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)			
Antimony	<0.0060	<0.0060	<0.0060
Arsenic	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	<0.0020	<0.0050
Chromium	<0.010	<0.010	0.0184
Cobalt	<0.0050	<0.0050	<0.050
Copper	<0.010	<0.010	<0.025
Lead	<0.010	<0.010	<0.0050
Mercury	<0.00020	<0.00020	<0.00050
Molybdenum	0.0528	0.0611	<0.050
Nickel	<0.0050	<0.0050	<0.040
Selenium	<0.010	<0.010	<0.010
Silver	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	<0.010
Vanadium	0.0111	<0.010	<0.050
Zinc	0.0299	0.0314	0.0609
Field Measurements			
pH (Standard units)	7.81	6.69	6.61
Specific Conductance (milliSiemens per centimeter)	0.677	0.689	0.953
Oxidation-Reduction Potential (ORP) (millivolts)	-108	92	88
Dissolved Oxygen (DO) (mg/L)	9	9.3	4.05
Temperature (degrees Celsius)	25.04	25.48	19.92

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Appendix C - Summary of Groundwater Analytical Results, 2015 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-17C		
Date	10/26/15	04/18/16	10/24/16
VOCs by EPA Method 8260 (µg/L)			
Acetone	4.6 J	<20	<25
2-Butanone (methyl ethyl ketone)	<10	<10	<5.0
Chloroform	0.28 J	0.23 J	<1.0
Naphthalene	<5.0	<5.0	<5.0
2-Hexanone (methyl butyl ketone)	<10	<10	<10
Methylene chloride	<10	<10	<5.0
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<5.0
Benzene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene (1,2,4-TMB)	<2.0	<2.0	<1.0
1,3,5-Trimethylbenzene (1,3,5-TMB)	<2.0	<2.0	<1.0
1,2,3- Trichlorobenzene	<2.0	<2.0	<2.0
1,2,4- Trichlorobenzene	<2.0	<2.0	<2.0
n-Butylbenzene	<2.0	<2.0	<1.0
s-Butylbenzene	<2.0	<2.0	<1.0
t-Butylbenzene	<2.0	<2.0	<1.0
Isopropylbenzene	<1.0	<1.0	<1.0
n-Propylbenzene	<2.0	<2.0	<1.0
Toluene	<1.0	<1.0	<1.0
p-Isopropyltoluene	<2.0	<2.0	<1.0
Total Xylenes (p/m- and o-xylene)	<2.0	<2.0	<3.0
Methyl tert-butyl ether (MTBE)	<1.0	<1.0	<1.0
Tert-Butyl Alcohol (TBA)	<10	<10	<20
Di isopropyl ether (DIPE)	0.26 J	0.24 J	0.34 J
Tetrachloroethene (PCE)	<1.0	<1.0	<1.0
1,1,1-Trichloroethane (1,1,1-TCA)	<1.0	<1.0	<1.0
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0
Trichloroethene (TCE)	1.3	0.72 J	2.0
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0
1,2-Dichloroethane (1,2-DCA)	0.34 J	0.25 J	<1.0
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene (cis-1,2-DCE)	2.1	1.7	3.0
trans-1,2-Dichloroethene (trans-1,2-DCE)	<1.0	<1.0	<1.0
Vinyl Chloride	<1.0	<1.0	<1.0
Carbon Tetrachloride	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<2.0
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0
1,4-Dioxane by EPA Method 8270C (M) (µg/L)	--	0.052 J	<0.28

Appendix C - Summary of Groundwater Analytical Results, 2015 to Present
Brenntag – South Gate (Former L.A. Chemical Facility)
4545 Ardine Street, South Gate, California

Well ID	MW-17C		
Date	10/26/15	04/18/16	10/24/16
TPH C6-C10 by EPA Method 8260B (µg/L); TPH C10-C44 by EPA Method 8015B (µg/L)			
C6-C10	<50	25.2 J	<100
C10-C28	--	--	--
C28-C40	--	--	--
C6	--	--	--
C7	--	--	--
C8	--	--	--
C9-C10	--	--	--
C11-C12	--	--	--
C13-C14	--	--	--
C15-C16	--	--	--
C17-C18	--	--	--
C19-C20	--	--	--
C21-C22	--	--	--
C23-C24	--	--	--
C25-C28	--	--	--
C29-C32	--	--	--
C33-C36	--	--	--
C37-C40	--	--	--
C41-C44	--	--	--
C6-C44 Total	--	--	--
Metals by EPA Method 6010B/7470A (mg/L)			
Antimony	<0.0060	<0.0060	<0.0060
Arsenic	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20
Beryllium	<0.0050	<0.0050	<0.0040
Cadmium	<0.0020	<0.0020	<0.0050
Chromium	<0.010	<0.010	<0.010
Cobalt	<0.0050	<0.0050	<0.050
Copper	0.0112	<0.010	<0.025
Lead	<0.010	<0.010	<0.0050
Mercury	<0.00020	<0.00020	<0.00050
Molybdenum	0.0220	<0.020	<0.050
Nickel	0.0064	<0.0050	<0.040
Selenium	<0.010	<0.010	<0.010
Silver	<0.0050	<0.0050	<0.010
Thallium	<0.010	<0.010	<0.010
Vanadium	0.0176	<0.010	<0.050
Zinc	0.0460	0.0227	<0.020
Field Measurements			
pH (Standard units)	8.05	6.8	6.85
Specific Conductance (milliSiemens per centimeter)	0.975	1.1	1.20
Oxidation-Reduction Potential (ORP) (millivolts)	-190	125	-21
Dissolved Oxygen (DO) (mg/L)	8.56	10.77	3.18
Temperature (degrees Celsius)	25.88	27.09	20.84

Notes:

-- - Not analyzed
mg/L - Milligrams per liter
ug/L - Micrograms per liter
ND; <0.00500 - Non-detect
NS - Not sampled
TPH - Total petroleum hydrocarbons
VOCs - Volatile organic compounds
EPA - U.S. Environmental Protection Agency
J - Indicates an estimated value
D - Data qualified from a diluted sample
B - Indicates analyte found in associated method blank
Dup - Duplicate sample

Reference:
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Contaminant Transport Through Aquitards:

Technical Guidance for Aquitard Assessment

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CHAPTER 2
FACTORS IN AQUITARD VULNERABILITY

This chapter provides a brief overview of the geologic, hydraulic, and contaminant properties that affect flow and chemical transport between aquitards and aquifers. *Contaminant Transport Through Aquitards: A State-of-the-Science Review*, the companion report to this technical guidance, includes a detailed review of these topics and relevant examples from the scientific literature.

TYPES OF AQUITARDS

Aquitards typically consist of *unlithified*, fine-grained sediments such as clay and silt, or *lithified*, low-*permeability* rock formations, such as shale or mudstone. Unlithified aquitards are often the focus of hydrogeologic investigations at contamination sites, because they are usually encountered at shallow depths. Bedrock aquitards may be positioned deeper in the subsurface, where they are more likely to effect regional groundwater flow systems.

Very few aquitards are geologically *homogeneous*; most aquitards contain sediment or rock of various *lithologies.* For example, aquitards may be composed of layers of clay interbedded with sand and gravel lenses, or layers of shale or siltstone interbedded with sandstone layers. Although aquitards are often lithologically *heterogeneous*, they yield relatively small volumes of groundwater and impede groundwater flow to aquifers. Geologically heterogeneous aquitards may be treated as a single hydrogeologic unit in the analysis of the regional flow system or for the purposes of well design and construction. However, the specific effects of these heterogeneities must be evaluated when contaminant migration is of interest.

Another significant characteristic of aquitards is the occurrence of *fractures*. Fractures are critical to the risk of contaminant transport to a well because through-going fractures can act as a preferential pathway, providing rapid transport of contaminants through an otherwise low-permeability formation.

SUSCEPTIBILITY OF REGIONAL AQUIFERS AND WELLS

Aquitards generally restrict groundwater flow, but no geologic formations are completely impermeable; some groundwater flows across even the lowest conductivity aquitards. Aquitards decrease the susceptibility of aquifers and wells to contamination by increasing both the time of travel and the flow path length from a contaminant source. Long travel times to a well may be associated with increases in dilution, retardation and degradation of groundwater contaminants. An unfractured, clayey aquitard only tens of feet thick can cause delays of up to thousands of years, but the transport time scale may be reduced to years or less if substantial, through-going fractures exist.

When siting a new well, system managers are likely constrained by several very practical considerations, such as locating the well in proximity to the area of water demand, or the acquisition cost of a particular land parcel. The total and cased depth of a new well may be constrained by cost, or by the well yield necessary to meet demand. However, if the long-term preservation of high quality groundwater is of concern, the relationship of the site and well design to the hydrogeologic setting is of primary importance. Figure 1.1 illustrates the significance of well location and design relative to the groundwater flowpaths in a complex (but

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realistic) hydrogeologic setting. In Figure 1.1, well A receives some groundwater from the west, but also receives a portion of its flow directly from recharge from the near-by land surface. Because well A is completed in a surficial aquifer with no overlying aquitard, it is extremely susceptible to contamination. Well B is less susceptible because it is cased through a surficial aquitard, and the flow paths to the well (from the east) are longer, providing more distance (and therefore, more time) for contamination to dissipate along the flow path. Although located close to well B, well C is drilled and cased deeper in the flow system. Groundwater pumped from well C originates from a different source area than that pumped from well B, and may be of a very different quality.

Flowpaths can diverge around the edge of the aquitard, providing recharge to the underlying aquifer. The resulting flow path from the surface to the deeper system provides a route of contaminant migration around the edge of the aquitard to the deeper aquifer. As illustrated in Figure 1.1, although well D is cased into the bedrock formation, the upper, uncased portion of the well receives groundwater from the same region as well C, which is open to the unlithified aquifer only. Well D is also open to the deeper bedrock aquifer, resulting in a blend of waters from the upper unlithified formations and the very deep flow system. The water quality at wells C and D may be very different due to this blending. Wells D and E may cost significantly more money to drill and construct than wells A, B and C, but may have very different groundwater quality than the shallower wells. Wells D and E are less susceptible to contamination than wells A, B and C. Well E receives the maximum protection possible from overlying aquitards. It is significantly less susceptible to contamination than well D because the additional casing depth restricts flow from the upper portions of the system.

The time of travel through or around aquitards can range from less than a year to thousands of years, depending on the type of contaminant pathway present and the hydraulic properties of the system. The time of travel of groundwater to a pumping well is a function of the well's position in the flow field relative to an aquitard, as illustrated in Figure 2.1. In the absence of an overlying aquitard, there is a rapid time of travel from the ground surface to a pumping well completed in an unconfined aquifer and the well is very susceptible to contamination (Figure 2.1a).

Figure 2.1b illustrates a well completed below a fractured aquitard. In this case, only a small volume of water may travel through the aquitard along the preferential pathway (the fracture), but the time of travel to the well is very rapid. Several factors will determine if the aquitard, although fractured, provides adequate protection for the well. These include the contaminant concentration migrating through the fracture, the concentration of the contaminant that is of regulatory concern, and the degree of dilution provided from mixing with groundwater from other flow paths to the well.

Figure 2.1c illustrates a third case, wherein contaminated water reaches the well via a relatively long flow path around the edge of the aquitard. In this case, the longer time of groundwater travel to the well may favor attenuation of contaminant concentrations by processes such as *dilution*, and chemical or biological *degradation*.

Pumping from wells can reverse the direction of hydraulic gradients and flow within the groundwater system, and thereby decrease the natural protection afforded by an overlying aquitard. As illustrated in Figure 1.1 at wells F, G, H and I, vertical gradients near a regional discharge area will be upwards from an underlying aquifer to a surface water body. However, pumping from a deep aquifer can reverse the natural gradient across an aquitard, promoting contaminant migration through fractures or windows in the aquitard. Well F is located relatively

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far west of the eastern edge of the lower unlithified aquitard. Under natural conditions well F receives all of its flow from the west, and is more susceptible to contamination than well I. If the drawdown in groundwater levels is large due to pumping from well I, the natural upward direction of groundwater flow may be reversed near the well. In this case, well I may receive some groundwater from the east and is more susceptible than well F to surface contamination via flow around the eastern edge of the aquitard. Well H would be more expensive to construct but vulnerability to contamination would be minimized. The well yield of well H may be significantly different than wells F, G, and I, depending on the transmissivities of the aquifers.

TRANSPORT PATHWAYS

Discrete pathways for groundwater flow and contaminant transport across aquitards are common in many settings. These include fractures and *macropores,* or large openings, caused by tree roots or burrowing animals. Human-constructed pathways such as uncased or abandoned wells, or wells constructed with an ineffective seal between the well casing and borehole wall, also provide pathways across aquitards.

Windows

Geologic processes that occurred tens of thousands of years ago may result in high-permeability *windows* within an aquitard. For example, laterally extensive deposits of low permeability glacial till or lake sediments often contain discontinuous lenses of sand and gravel. Erosional processes may result in large-scale removal of, or incision through, an otherwise extensive aquitard. Understanding the geologic history of a region provides insight into the likelihood of windows or preferential flowpaths in the aquitard.

Fractures and sink holes

Here, we use the term “fracture” to refer to an open feature that allows water flow. Many other fractures may exist that are closed. Fractures form due to imposed stresses at some point in geologic time, and they may be open or closed at the present time depending on geologic conditions subsequent to their formation.

Several processes cause fractures in fine-grained unlithified aquitards. Unsaturated aquitards with lower clay content are particularly susceptible to extensive fracturing by geologic stresses or deformation. Where unlithified aquitards are subject to weathering, shrinking and drying of the sediments can cause fractures to form, particularly in the unsaturated zone above the water table. The density of fractures in these settings typically decreases significantly with depth below the weathered portion of the aquitard, but fractures can extend to depths on the order of 30 to 150 ft below the water table. Deposits with higher percentages of clay may be relatively plastic. The plasticity can promote fracture closure at depth, at some later time, if sand or silt has not been washed into the fracture.

In some near-surface settings, aquitards consisting of relatively soluble carbonate rock, such as limestone, are vulnerable to the formation of *karst* features. *Karst* terrain is characterized by fractures, caves and sinkholes that may breach the integrity of the aquitard.

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Multi-aquifer wells

Some relatively deep water supply wells and other subsurface borings are constructed with an open, un-cased borehole across more than one aquifer. This design may maximize well yield and minimize the cost of casing material, but it can create a pathway for contaminant transport across an aquitard. The borehole of these multi-aquifer wells provides a "short circuit" across an aquitard that would otherwise restrict the hydraulic connection between overlying and underlying aquifers. A borehole open to two aquifers is a transport pathway when the head in the upper aquifer is greater than the head in the lower aquifer, inducing flow from the upper to the lower aquifer (Figure 2.2).

Relatively few multi-aquifer wells are required to significantly increase the effective K_v of an aquitard. For example, Hart and Bradbury (2006) estimated the volume of flow through an open-borehole well in Wisconsin to be 2.6×10^5 gallons/day (1000 m^3/day). Very rapid transport of contaminants to the underlying aquifer can occur in these boreholes, across an otherwise protective aquitard. Similar to a poorly grouted well casing, this preferential pathway provides an opening that can facilitate transport of *particulate* and *aqueous* contaminants.

CONTAMINANT TYPES

Three general types of contaminants in groundwater include aqueous contaminants (those that are dissolved in water), non-aqueous phase liquid (NAPL, typically petroleum products or chlorinated solvents) and particulate matter (*colloidal* size particles that may be inert or biologically active). The fate and transport behaviour of each type of contaminant in a groundwater system depends on their respective chemical properties, such as their density, solubility, or reactivity. There is also considerable variability in the concentration at which various types of contaminants pose significant threats to human health (for example, the drinking water maximum concentration limit (MCL) for nitrate is 10 parts per million, while the MCL for carbon tetrachloride is 5 parts per billion).

Aqueous Contaminants

Aqueous contaminants include inorganic major ions (e.g. sulfate and chloride), nutrients (e.g. nitrate and phosphate), trace elements (e.g. chromium, arsenic, and lead) and dissolved portions of organic contaminants (e.g. trichloroethylene (TCE), benzene). Aqueous contaminants are transported along with the *advective* flow of groundwater, following groundwater flow paths governed by the hydrologic system. Some aqueous phase contaminants, such as chloride, are non-reactive, meaning that they do not degrade as they are transported in the groundwater system. As non-reactive contaminants migrate, their concentrations are influenced only by flow (*advection*) and *dilution* due to mixing (molecular diffusion and/or mechanical dispersion).

Some aqueous contaminants tend to sorb onto geologic sediments. *Sorption* does not reduce the total chemical mass in the hydrogeologic system, but it does delay ("*retard*") the transport of contaminant mass through the groundwater flow system. Examples of contaminants strongly influenced by sorption are lead and the soluble portion of polychlorinated biphenyls (PCBs).

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Some aqueous contaminants are subject to biological, chemical or radioactive *degradation* in the groundwater system. These processes result in chemical transformations that can reduce the overall contaminant mass in, and retard the rate of migration through, the flow system. A contaminant may degrade to a product that is also a contaminant, such as when TCE transforms to cis, 1,1 dichloroethylene or vinyl chloride. In this case, the degradation of TCE may, overall, cause an increase in the severity of the groundwater contamination.

NAPLs

NAPLs include liquids that are less dense than water (light non-aqueous phase liquids (LNAPLs), such as gasoline and fuel oil) and those that are denser than water (dense non-aqueous phase liquids (DNAPLs), such as chlorinated solvents, creosote and PCB liquids). NAPLs move through the subsurface under the influence of their density, which can lead to the migration of the liquid product in directions different from groundwater flow.

Due to their higher density, DNAPLs have the greatest propensity to migrate through fractured aquitards. Typical chlorinated solvent DNAPLs readily flow downward through small fractures, including fractures so small that they cause the K_{bv} to be only slightly (and often imperceptibly) larger than unfractured conditions. If aquitards have preferential pathways such as through-going networks of fractures, DNAPLs may migrate downward through the aquitard even where groundwater hydraulic gradients are upward.

In very low-permeability unfractured aquitards, aqueous contaminants can move by molecular diffusion downward even if the groundwater gradients are upward, but, the downward migration may be very limited. In an area of upward hydraulic gradients across an aquitard, these gradients would prevent particulate contaminants from being transported downward. In this case, the aquitard would have generally good integrity with respect to particulate and aqueous contaminants, but could have poor integrity for DNAPLs.

Within the class of NAPLS, there are extreme differences in subsurface behaviour due to differing degrees of solubility, sorption and reactivity. For example, TCE poses a much greater potential to cause widespread groundwater contamination than PCBs because TCE is moderately soluble in water and PCBs are nearly insoluble relative to their MCLs. Also, TCE is much less strongly sorbed to aquifer and aquitard solids than PCBs. Dissolved TCE can be transported large distances relatively quickly by groundwater flow, and this is the primary reason why TCE is commonly found in groundwater and PCBs are not.

NAPL contaminants are present in the aqueous phase, as well as the undissolved ("product") phase, because all NAPLs are soluble in water to some degree. Solubilized portions of NAPL contaminants behave similarly to other aqueous contamination in that they are transported by the flow of groundwater.

Particulates

Particulate contaminants include extremely small, *colloidal*-sized particles occurring in two categories. The first is comprised of mineral matter or organic matter typically derived from plants, wood or coal. These particles are usually not contaminants on their own, however, they may cause contaminant migration by carrying attached (sorbed) contaminants. For example, a mobile colloid composed of mineral matter may carry sorbed molecules of hazardous metals such as cadmium. A second category of particulate contaminants includes bacteria and viruses,

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which are biologically active. The potential for transport of bacteria and viruses across aquitards is reviewed in the companion report, *Contaminant Transport Through Aquitards: A State-of-the-Science Review*. We have included much of this review and specific references here, because this material is not widely disseminated amongst hydrogeologists and water supply engineers. Viruses have been detected in groundwater at depths up to 67 meters (Keswick and Gerba 1980), and they have been reported to move laterally as far as 408 m in glacial till and 1600 m in fractured limestone (Keswick and Gerba 1980; Robertson and Edberg 1997). Transport of viruses through aquifers is further evidenced by their widespread occurrence in drinking water wells (Gerba and Rose 1990). In one study of 448 groundwater sites in 35 states, 141 sites (31.5%) were positive for at least one virus type (Abbaszadegan et al. 2003).

Particulate contaminants are transported in the same general manner as aqueous contaminants, along with the advective flow of groundwater. However, transport of particulates may be limited by filtration at small pore sizes between mineral grains in rock or sediments, or by sorption to rock or sediments.

Some features in the subsurface, such as fractures and root holes in clayey aquitards, may be large enough to facilitate the transport of viruses into underlying aquifers. Viruses can pass through fractured clay till in openings as small as 3 to 5 microns. Preferential flow along fractures or other pathways results in colloids moving substantially faster than aqueous contaminants. Several studies have documented virus transport through clay fractures at velocities ranging from 2 to 360 meters/day (McKay et al. 1993, Hinsby et al. 1996). Poorly grouted well casings may also provide a preferential pathway for viruses to reach an aquifer.

In order for a well to become virus contaminated there must be a fecal source nearby. Leaking sanitary sewer lines, septic systems, landfills, field-applied sludge or septage, effluent holding ponds, wastewater infiltration or irrigation facilities, and surface waters that recharge groundwater, are potential sources of viruses to the groundwater system.

The greater the fecal loading onto or into the ground the greater the opportunity for the underlying groundwater to become virus contaminated. A well located in the middle of a large city underlain with leaking sanitary sewers stands a greater chance of becoming pathogen contaminated than a well adjacent to a few septic systems. Intuitively, the greater the level of fecal loading near the ground surface, the greater the level of viruses reaching the upper boundary of an aquitard, and the greater the opportunity for viral movement through the aquitard.

Preventing virus contamination of a confined aquifer begins with decreasing fecal loading above the aquifer and increasing the distance from a fecal source to a drinking water well. There are many uncertainties in predicting viral transport, so determining an effective distance between a fecal source and a well drawing from an unconfined aquifer is largely educated guesswork. Consideration of an aquitard, for which there is even less virus transport information, in determining the appropriate setback distance between fecal source and a well completed in a confined aquifer, is more uncertain. The presence of an aquitard should increase protection from viruses for properly constructed wells. Viruses were detected in samples collected from wells completed in a confined aquifer during field studies conducted as a part of this research project (Borchardt et al., in review; Chapter 9).

For people to become virally infected from drinking contaminated groundwater not only do the viruses need to be transported to the well, they must also survive the transport process and remain infectious. Treatment systems at the wellhead, such as disinfection, may inactivate viruses. The most important determinant of virus inactivation in groundwater is temperature, as temperature increases so does the inactivation rate (Hurst et al. 1980, Yates et al. 1985, Yates

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and Yates 1988). Therefore, confined aquifers in arid regions with warm groundwater temperatures (e.g. 20°C) may be less prone to contamination with infectious viruses. The travel time for a virus to reach a well is also an important factor. If the travel time is greater than the virus survival time, it is unlikely that a virus reaching the well would be infectious. Although the upper limit for survival time in groundwater has not been determined for many viruses, water that has a travel time to a pumping well on the order of a year would be more likely to transport an infectious virus than waters with travel times on the order of 10 to 100 years.

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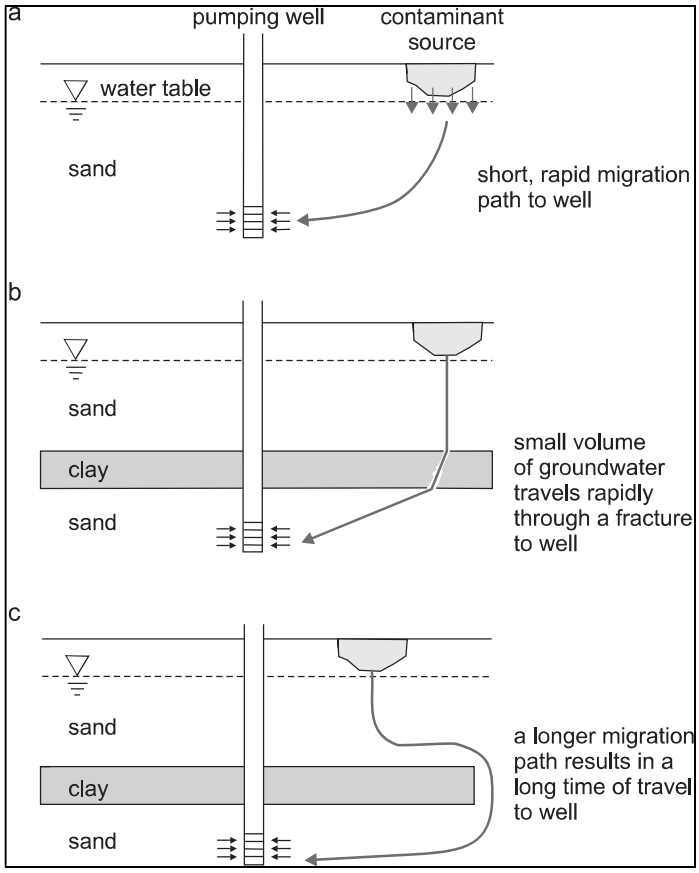

Figure 2.1. Travel times and flowpaths to a pumping well.

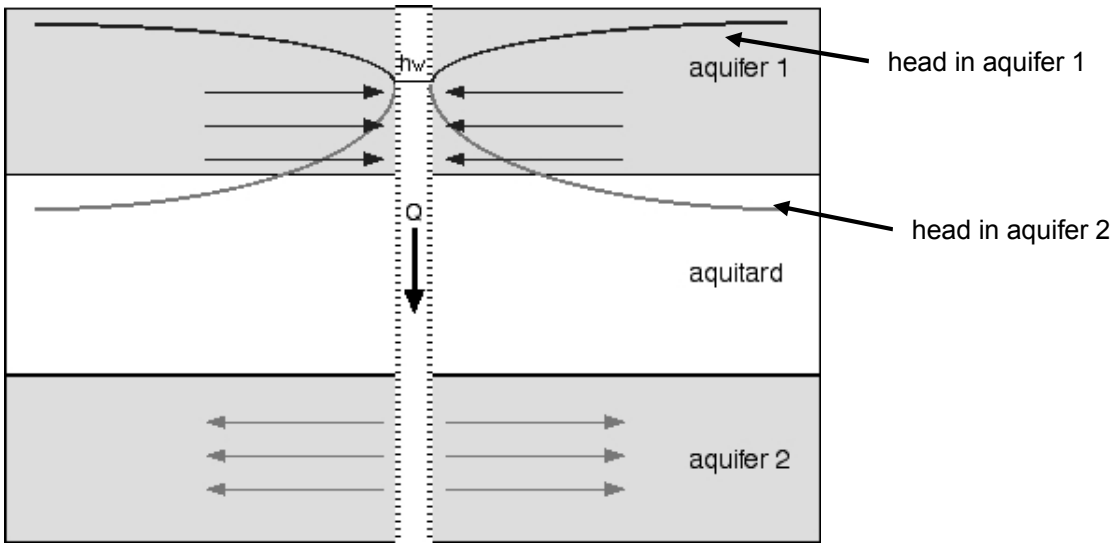

Figure 2.2 Flow across aquitard through a multi-aquifer well. Arrows show direction of groundwater flow to and from the well. h_w indicates the water level in the well, Q represents direction of flow within the borehole.

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Reference:
BBD, 1948

WELL LOG

BARBER-BRIDGE DRILLING CORP., Ltd.
3020 Empire Ave.
BURBANK, CALIFORNIA

25/12W-31D015

WRD# 200118

Drilled for Tract 349 Mutual Water Co.

LOCATION Santa Ana Street, Cudahy ✓

Well No. 3 ✓

WORK STARTED August 23, 1947 WORK COMPLETED March 15, 1948 ✓

1403 ft. of 16 ✓ in 8 xx/ga. casing 1400 left in well
" " 6 " " " " " "
" " " " " " " "
" " " " " " " "

Type of perforator used Hyd. Louvre- B&B Special

Perforated 949 ft. to 963 ft. 8 holes per 6 in.
" 975 " 981 " 8 " " 6 "
" 986 " 1003 " 8 " " 6 "
" " " " " " "
" B & B Special: " " "
" 1295 " 1305 " 7 " " 12 "
" 1340 " 1354 " 7 " " 12 "
" 1356 " 1371 " 7 " " 12 "
" Perforations are taken from top
" of casing after completion. "

Diameter of perforations 7/16 3/8 in., length 4 1 3/4 Louvre in.
Depth at which water was first found ft.
Standing level before perforating 73 ft.
Standing level after perforating 73 ft.
Note your observation of any change in water level while drilling

	FIRST TEST:	Second Test
Date tested	February 20,	Mar. 8, 1948
Water level when first started test	76'	dropped to 81 ft.
Draw down from standing level	116	71 ft.
G. P. M. at beginning of test	400	1190
G. P. M. at completion of test	1135	1240
Draw down at completion of test	93	63 ft.

If reducing strings of casings were cut off, state how cut

Depth from surface cut ft.
Size of casing cut in.
Lap in larger casing ft.
Was adapter or cement used?
If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Is well straight top to bottom, if not, what is the variation? slight

Will there be any detrimental effect on pump, and if so, what?

Give any additional data which may be of future value:

Total depth of well 1400 ✓ ft.

Formation: Mention size of water gravel—

0 ft.	to 11 ft.	Sand
11 "	23 "	Sand and gravel
23 "	42 "	Clay sandy yellow
42 "	67 "	Clay sandy blue
67 "	82 "	Clay blue
82 "	94 "	Gravelly clay blue
94 "	122 "	Clay blue, streaks grave
122 "	147 "	Clay yellow
147 "	218 "	Clay blue, streaks grave
218 "	229 "	Clay yellow sandy
229 "	234 "	Gravelly clay yellow
234 "	251 "	Clay blue
251 "	364 "	Clay yellow, streaks sti
"	"	clay blue
364 "	381 "	Cemented gravel dirty
381 "	392 "	Gravely clay yellow
"	"	streaks cemented
392 "	394 "	Sand & gravel tight yll
394 "	402 "	Clay yellow gravel in
"	"	clay
402 "	405 "	Sand & gravel 1"
405 "	408 "	Clay yellow
408 "	411 "	Sand & gravel 1/4"
"	"	yellow tight
411 "	419 "	Clay yellow
419 "	427 "	Decomposed granite
427 "	434 "	Sand & gravel 3/8" some
"	"	to 1" (good)
434 "	441 "	Sand & gravel 3/4" same
"	"	as 427-434 only larger
441 "	449 "	Sand & gravel some to 1
449 "	453 "	Clay yellow
453 "	458 "	Clay blue
458 "	474 "	Gravely clay blue
474 "	493 "	Clay blue sticky
493 "	536 "	Gravelly clay blue
536 "	546 "	Clay yellow sandy
546 "	578 "	Gravely clay yellow
578 "	586 "	Sand & gravel dirty
586 "	597 "	Clay blue

Date of Report March 15, 1948

James W. Busby
Driller.

WELL LOG

BARBER-BRIDGE DRILLING CORP., Ltd.
3020 Empire Ave.
BURBANK, CALIFORNIA

2S/12W-31D01S

Drilled for Tract 349 Mutual Water Co.

LOCATION .....

..... Well No. .....

WORK STARTED ..... WORK COMPLETED .....

..... ft. of ..... in ..... lb./ga. casing ..... left in well
..... " ..... " ..... " " ..... " " "
..... " ..... " ..... " " ..... " " "
..... " ..... " ..... " " ..... " " "

Type of perforator used .....

Perforated ..... ft. to ..... ft. ..... holes per ..... in.
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "

Diameter of perforations ..... in., length ..... in.

Depth at which water was first found ..... ft.

Standing level before perforating ..... ft.

Standing level after perforating ..... ft.

Note your observation of any change in water level while drilling

.....

.....

Date tested ....., 19 .....

Water level when first started test ..... ft.

Draw down from standing level ..... ft.

G. P. M. at beginning of test .....

G. P. M. at completion of test .....

Draw down at completion of test ..... ft.

If reducing strings of casings were cut off, state how cut .....

.....

Depth from surface cut ..... ft.

Size of casing cut ..... in.

Lap in larger casing ..... ft.

Was adapter or cement used? .....

If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

.....

.....

Is well straight top to bottom, if not, what is the variation? .....

.....

Will there be any detrimental effect on pump, and if so, what?

.....

Give any additional data which may be of future value: .....

.....

.....

Total depth of well ..... ft.

Formation: Mention size of water gravel—

597	ft. to	603	ft.	Gravely clay blue
603	"	619	"	Clay yellow streaks sticky
619	"	625	"	Sandy clay yellow
625	"	627	"	Sandy gravel very dirty tight
637	"	687	"	Clay blue sticky
687	"	703	"	Clay yellow streaks gravely clay
703	"	728	"	Clay yellow sticky
728	"	733	"	Mucky sand
733	"	735	"	Mucky sand and gravel
735	"	743	"	Mucky sand pea gravel
743	"	774	"	Clay blue
774	"	778	"	Mucky sand & gravel
778	"	782	"	Clay blue
782	"	803	"	Clay yellow
803	"	807	"	Mucky sand few gravel
807	"	819	"	Clay yellow
819	"	834	"	Mucky sand
834	"	839	"	Clay blue sticky
839	"	858	"	Clay yellow
858	"	871	"	Mucky sand blue wood
871	"	888	"	Clay blue
888	"	909	"	Mucky sand blue wood
909	"	917	"	Gravel sandy clay
917	"	923	"	Sea mud shells
923	"	927	"	Clay blue sticky
927	"	942	"	Mucky sand & gravel blue
942	"	952	"	Sand & gravel 1/2" very dirty & tight
952	"	959	"	Sand & gravel tight 1/2"
959	"	966	"	Sand & gravel 3/4" some to 3"
966	"	978	"	Clay yellow
978	"	984	"	Sand & gravel 1"
984	"	989	"	Clay yellow
989	"	1006	"	Sand & gravel streaks yellow clay

Date of Report ....., 19 .....

.....
Driller.

2S/12W-31D015

WELL LOG

BARBER-BRIDGE DRILLING CORP., Ltd.
3020 Empire Ave.
BURBANK, CALIFORNIA

Drilled for .....

LOCATION .....

..... Well No. 3

WORK STARTED ..... WORK COMPLETED .....

..... ft. of ..... in ..... lb./ga. casing ..... left in well
..... " ..... " ..... " ..... " ..... " ..... " " "
..... " ..... " ..... " ..... " ..... " ..... " " "
..... " ..... " ..... " ..... " ..... " ..... " " "

Type of perforator used .....

Perforated ..... ft. to ..... ft. ..... holes per ..... in.
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
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" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "
" ..... " ..... " ..... " " ..... "

Diameter of perforations ..... in., length ..... in.

Depth at which water was first found ..... ft.

Standing level before perforating ..... ft.

Standing level after perforating ..... ft.

Note your observation of any change in water level while drilling

.....

.....

Date tested ....., 19 .....

Water level when first started test ..... ft.

Draw down from standing level ..... ft.

G. P. M. at beginning of test .....

G. P. M. at completion of test .....

Draw down at completion of test ..... ft.

If reducing strings of casings were cut off, state how cut .....

.....

Depth from surface cut ..... ft.

Size of casing cut ..... in.

Lap in larger casing ..... ft.

Was adapter or cement used? .....

If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

.....

.....

Is well straight top to bottom, if not, what is the variation? .....

.....

Will there be any detrimental effect on pump, and if so, what?

.....

Give any additional data which may be of future value: .....

Total depth of well ..... ft.

Formation: Mention size of water gravel—

1006	ft. to	1029	ft.	Clay yellow
1029	"	1038	"	Clay blue
1038	"	1076	"	Clay yellow
1076	"	1123	"	Clay blue
1123	"	1162	"	Mucky sand blue
1162	"	1168	"	Clay blue
1168	"	1202	"	Sea mud shells wood
1202	"	1286	"	Sandy clay blue some
	"		"	shells
1286	"	1296	"	Mucky sand some gravel
1296	"	1300	"	Sand & gravel 3/4"
1300	"	1308	"	Sand & gravel 3/8"
1308	"	1321	"	Clay blue hard sticky
1321	"	1327	"	Clay yellow sandy
1327	"	1331	"	Sand & gravel yellow
	"		"	streaks cemented grave
1331	"	1343	"	Clay yellow sticky
1343	"	1346	"	1/8" Sand & gravel tigh
1346	"	1349	"	Cemented gravel
1349	"	1357	"	1/4" Sand & gravel tigh
1357	"	1359	"	Clay yellow
1359	"	1374	"	Sand & gravel 1/8"
1374	"	1383	"	Caly yellow
1383	"	1400	"	Clay blue
.....	"	.....	"	.....
.....	"	.....	"	.....
.....	"	.....	"	.....
.....	"	.....	"	.....
.....	"	.....	"	.....
.....	"	.....	"	.....
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Date of Report ....., 19.....

.....
Driller.

Reference:
BEI, 1994

A225 0005
0751

Bechtel

50 Beale Street
San Francisco, CA 94105-1895
Mailing address: P.O. Box 193965
San Francisco, CA 94119-3965

SFUND RECORDS CTR
2275423

Memorandum

To: Dana D. Barton, EPA Region IX
Thru: Philip Armstrong
Subject: Completed Work
Date: October 14, 1994
cc: Catherine C. Walton, BEI ARCS

Attached is the following completed document:

PA _____ SI _____ Other Site Inspection Prioritization

Site Name: Stauffer Chemical Company

EPA ID: CAD 008353211 1015

City, County, State: South Gate, Los Angeles County, Calif.

For EPA Use Only

Latitude: 33° 57' 22.0" N Longitude: 118° 11' 09.5" W

CERCLIS Changes: (SIP - SP = C3101)

EPA Further Action Determination: SIP Complete, L ESI

Lead Agency: F

Sign-Off Date: 11/3/94

Initials of Work ~~Assignment~~ SAM Manager: DDB

Document Screening Coordinator: [signature] 11/9/94

Chief, Site Evaluation and Grants Section: [signature] 11/7/94

A225 0005

Bechtel

50 Beale Street
San Francisco, CA 94105-1895
Mailing address: P.O. Box 193965
San Francisco, CA 94119-3965

FINAL EPA File Copy

Site Inspection Prioritization

Site: Stauffer Chemical Company
4570 Ardine St.
South Gate, CA 90280

Site EPA ID Number: CAD 008353211

Work Assignment Number: 60-32-9JZZ, ARCSWEST Program

Submitted to: Dana D. Barton
Site Assessment Manager
EPA Region IX

Thru: Philip Armstrong

Date: October 14, 1994

Prepared by: Virginia Demetrios

Review and Concurrence: Catherine C. Walton

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region IX, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), has tasked Bechtel Environmental, Inc. (BEI) to conduct a site inspection prioritization (SIP) of the Stauffer Chemical Company (Stauffer) site in South Gate, Los Angeles County, Calif., using the EPA's Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances at the site. The HRS has been adopted by the EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which the EPA may conduct remedial response actions. This report summarizes the results of the SIP for the Stauffer site.

The Stauffer site is located at 4570 Ardine St., in South Gate, Calif. The geographic coordinates for the site are 33° 57' 22.0" N latitude and 118° 11' 09.5" W longitude (Township 2 South, Range 13 West, Section 4, South Gate Quadrangle, San Bernadino Baseline and Meridian, 7.5-minute quadrangle) (1). The location of the site is shown in Figure 1-1.

The Stauffer site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) November 1, 1979 (CAD 008353211). A site inspection (SI) was completed for the EPA on September 1, 1986 by Ecology & Environment, Inc. (2,3)

1.1 Apparent Problem

The apparent problem at the site is as follows:

- From approximately 1910 to 1960, arsenic sludge generated from the phosphoric acid plant was disposed of into an onsite, unlined surface impoundment. (3) Analytical results of soil samples collected in 1981 and 1982 from the surface impoundment area indicated the presence of arsenic at concentrations up to 127 milligrams per kilogram (mg/kg); arsenic was found in background soil samples at concentrations up to 3.7 mg/kg. In addition, arsenic was detected at concentrations up to 1,659 milligrams per liter (mg/l) in soil samples collected from the unlined surface impoundment. (4)

2.0 SITE DESCRIPTION

The site occupies approximately 7 acres at 4570 Ardine St. in an industrial area of South Gate, Calif. The site is bordered by U.S. Gypsum to the west, Southern Pacific railroad tracks to the south, Ardine Street to the north, and Union Pacific railroad tracks to the east and north. (3)

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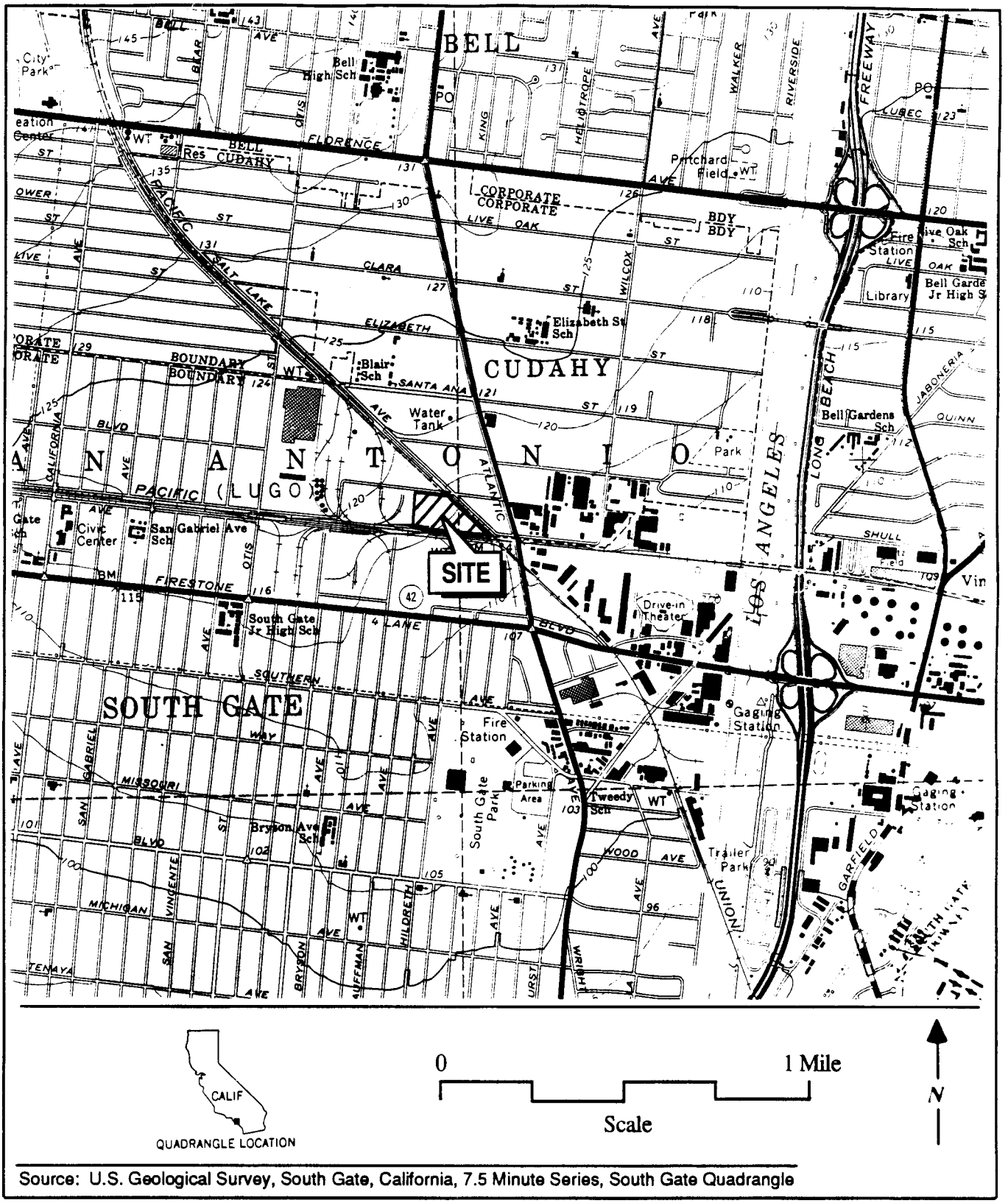

Source: U.S. Geological Survey, South Gate, California, 7.5 Minute Series, South Gate Quadrangle

Figure 1-1 Site Location

Prior to 1952, A.R. Maas owned and operated the plant. Victor Chemical occupied the site from 1952 to 1963. In 1963, the site was acquired by Stauffer Chemical Company. In 1987, the site was acquired by Rhone-Poulenc Basic Chemicals Company (Rhone-Poulenc) through an acquisition of Stauffer Chemical Company properties. Rhone-Poulenc ceased onsite operations in the spring of 1993. Since that time, all the buildings have been dismantled and removed from the site, except an office and three warehouse buildings. The entire site was covered with asphalt, except the railroad spur on the southern portion of the site. Currently, there are no manufacturing operations on the site. Rhone-Poulenc intends to subdivide the property. The southeast corner of the site, where the unlined surface impoundment is located, will be retained by Rhone-Poulenc. The remainder of the site will be sold or leased. (3,5,6)

Operations conducted on site remained relatively unchanged from approximately 1910 to 1993. The plant manufactured three products: trisodium phosphate (TSP), sodium sulfide, and phosphoric acid. The raw materials used to manufacture these chemicals included soda ash, phosphorus, sulfuric acid, and sodium hydroxide. The phosphoric acid plant, which operated from approximately 1910 to 1981, generated arsenic sludge consisting of 2.8 percent arsenic trisulfide and 2 to 3 percent phosphoric acid. The arsenic sludge was disposed of into the onsite, unlined surface impoundment from approximately 1910 to the early 1960s. The surface impoundment was approximately 180 feet long, 130 feet wide, and 25 feet deep. According to a site representative, the unlined surface impoundment was paved over in the early 1960s, before Stauffer Chemical Company took over operations at the site. After the surface impoundment was paved, the waste was stored in an onsite storage tank, removed, and hauled off site by a vacuum truck. Since operations ceased at the phosphoric acid plant in 1981, no arsenic sludge has been generated. (3)

TSP is formed by creating a reaction of soda ash, caustic soda, and phosphoric acid. The waste consisted of solids filtered from the product, which was stored and removed by a permitted waste hauler. In the sodium sulfide process, a sulfur-burning unit and scrubber were used to separate out the impurities. Waste generated from this process was also stored and then removed from the site by a permitted waste hauler. (7)

3.0 SITE INSPECTION PRIORITIZATION CONSIDERATIONS

In July 1981, the California Department of Health Services Abandoned Site Project in Sacramento advised Stauffer to sample soils in and around the unlined surface impoundment. In 1981 and 1982, Stauffer drilled 14 soil borings to depths up to approximately 55 feet below ground surface (bgs) to determine the extent of the contamination. In 1981, soil samples were collected from seven locations and analyzed for arsenic, cadmium, chromium, lead, mercury, and selenium. Analytical results of the soil samples collected on site indicated concentrations of arsenic up to 739 mg/kg, cadmium up to 17 mg/kg, and chromium up to 253 mg/kg. In addition, arsenic was detected at a concentration up to 1,659 mg/l in soil samples collected from the onsite, unlined surface impoundment area. In 1982, one background and six onsite soil samples from the unlined surface impoundment area were collected and analyzed for arsenic. Analytical results of onsite soil samples indicated arsenic at concentrations up to 127 mg/kg and from background soil samples at concentrations of arsenic up to 3.7 mg/kg.(3,4)

In 1982, two water samples were collected on site when piezometers were being installed. According to Stauffer, the piezometers were situated in the unlined surface impoundment and in areas where arsenic had been detected at high concentrations in soil. According to a contact report

included in the SI report, arsenic was detected in the water samples. Stauffer believed that the results were not representative of the groundwater beneath the site since the samples were collected from a perched groundwater zone beneath the site. Therefore, Stauffer did not submit the results to E&E during the SI. (3,4)

The site lies on the Coastal Plain of Los Angeles County. Geologically, the Coastal Plain consists mainly of unconsolidated sediments underlain by bedrock. Hydrogeologically, the site lies in the northern portion of the Central Basin. Most groundwater extracted from the Central Basin comes from aquifers in the San Pedro Formation that include, in ascending order, the Sunnyside, Silverado, Lynwood, Jefferson, and Hollydale aquifers. The overlying Lakewood Formation also contains groundwater in the Gage-Gardena, Artesia-Exposition, and Gaspur aquifers. The water table in the uppermost Lakewood Formation aquifer occurs at approximately 150 feet bgs in the vicinity of the site. The Lakewood Formation and San Pedro Formation are considered to be interconnected. In surrounding areas, contaminants have been detected in ground surface and in both groups of aquifers. In addition, there are a number of abandoned agricultural and industrial wells in the area that could be acting as conduits to the lower aquifer group. (8,9,10)

In 1993, during the dismantling of the site, leakage occurred during the removal of two petroleum tanks. Rhone-Poulenc is currently developing a soil vapor venting project under the guidance of the Los Angeles County, Department of Public Works (DPW). The DPW is requesting quarterly status reports. (5)

4.0 PERTINENT HAZARD RANKING SYSTEM FACTORS

The following pertinent Hazard Ranking System factors are associated with the site:

- The groundwater migration pathway appears to be of concern because, although there are clay layers between the ground surface and the water table, the aquifers are interconnected beneath the site. Contaminants have been detected in both the upper and lower aquifer groups within 2 miles of the site, and there are a number of abandoned agricultural and industrial wells in the area that may be acting as conduits to the lower aquifer group. In addition, 64 groundwater wells within 4 miles of the site contribute to municipal drinking-water systems, which serve approximately 388,200 people.

- The surface water migration pathway does not appear to be of concern because there are no intakes or sensitive environments associated with surface water bodies within 15 miles downstream of the site.

- The soil exposure and air migration pathways do not appear to be of concern because there are no residences, schools, or daycare centers on the site. The site, except the railroad tracks, is entirely fenced and its surface is completely covered with either pavement or buildings.

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IX

Site Name: STAUFFER CHEMICAL COMPANY **EPA ID#:** CAD 008353211

Alias Site Names:

City: SOUTH GATE **County or Parish:** LOS ANGELES **State:** CA

Refer to Report Dated: 10/14/94 **Report type:** SITE INSPECTION PRIORITIZATION

Report developed by: Bechtel Environmental, Inc.

DECISION:

| X | **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**

| | 1a. Site does not qualify for further remedial site assessment under CERCLA (Site Evaluation Accomplished - SEA)

| | 1b. Site may qualify for further action, but is deferred to: | | RCRA | | NRC

| X | **2. Further Assessment Needed Under CERCLA:** 2a. (optional) Priority: | | Higher | X | Lower

2b. Activity Type: | | PA | X | ESI | | SI | | HRS evaluation

| | Other:

DISCUSSION/RATIONALE:

Report Reviewed, Approved, and Site Decision Made by: DANA D. BARTON **Signature:** Dana D. Barton **Date:** 11/3/94

APPENDIX A

REFERENCE LIST

Site: Stauffer Chemical Company

1. U.S. Geological Survey, South Gate Quadrangle, California - Los Angeles County, 7.5 Minute Series (topographic), Photorevised 1981.

2. U.S. Environmental Protection Agency (EPA), Comprehensive Environmental Response, Compensation, and Liability Information System, April 6, 1994.

3. Chaewsky, Suzanne, Ecology and Environment, Inc., Site Inspection for Stauffer Chemical Company prepared for the EPA, September 1984.

4. McClellan, Bruce S., Stauffer Chemical Company, Letter (with attachments) to Suzanne Chaewsky, Ecology and Environment, Inc., May 14, 1984.

5. Fehler, Richard, Rhone-Poulenc Basic Chemicals Company, Conversation Recorded in Contact Report by Virginia Demetrios, Bechtel Environmental, Inc., July 13, 1994.

6. Brown, Bob, Rhone-Poulenc Basic Chemicals Company, Conversation Recorded in Contact Log, August 9, 1994.

7. Hunsucker, Lee, Rhone-Poulenc Basic Chemicals Company, Conversation Recorded in Contact Log, August 8, 1994.

8. State of California Department of Water Resources, Southern District, Bulletin No. 104, Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Appendix A Ground Water Geology, June 1961.

9. West Basin and Central Basin Municipal Water Districts, Cooperative Basin-Wide Title 22 Groundwater Monitoring Program, 1992 Annual Water Quality Report, June 1993.

10. California Water Well Driller Report, South Gate Well 7 (2S/12W-31M2), March 4, 1936.

APPENDIX B

CONTACT LOG

Site: Stauffer Chemical Company

EPA ID: CAD 008353211

Name	Affiliation	Phone	Date	Information
Art Montano	Los Angeles Health Department, Office of Drinking Water	(213) 620-2980	12/2/92	See Contact Report by Deborah Tharp. Bechtel Environmental, Inc. (BEI).
Dwayne C. Maxwell	State of California, Department of Fish and Game	(310) 590-5137	12/2/92	See Contact Report by Deborah Tharp, BEI.
Ronald Fick	Maywood Mutual Water Company No. 3	(213) 771-5985	4/14/94	See Contact Report.
Adrian Yasutake	City of Vernon Water Department	(213) 583-8811	4/14/94	See Contact Report.
Edwina Provencal	Tract 349 Mutual Water Company	(213) 560-1601	4/15/94	See Contact Report.
Warren Rickabaugh	Maywood Mutual Water Company No. 2	(213) 581-5816	4/18/94	See Contact Report.
Randy Long	Tract 180 Water Company	(213) 771-6682	4/18/94	See Contact Report.
Janet Borden	Walnut Park Mutual Water Company	(213) 585-7321	4/18/94	See Contact Report.
Tony Vasquez	City of Downey, Water Division	(310) 904-7202	4/20/94	See Contact Report by Maynard Geisler, BEI.
Monte Jewett	Maywood Mutual Water Company No. 1	(213) 560-2439	4/20/94	See Contact Report by Maynard Geisler, BEI.
Bency Armijo	City of Huntington Park, Dept. of Public Works	(213) 587-5969	4/25/94	See Contact Report.
Van Nguyen	City of Lynwood, Dept. of Water	(310) 603-0220	4/25/94	See Contact Report by Maynard Geisler, BEI.

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CONTACT LOG (Cont'd)

Site: Stauffer Chemical Company

Name	Affiliation	Phone	Date	Information
Librarian	City of Los Angeles, Public Library	(213) 228-7300	4/28/94	According to the 1990 Census of Populations and Housing Characteristics, Calif., from the U.S. Bureau of Census, the average number of people per household in Downey is 2.77. Call made by Heather McAdams, BEI.
John Chambers	City of South Gate, Public Works Dept.	(213) 563-5790	5/3/94	See Contact Report by Maynard Geisler, BEI.
Hamid Saebhar	California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), Region 3, Acting Chief	(818) 551-2800	7/12/94	Requested information concerning DTSC involvement with the site.
Bill Davenport	DTSC, file room	(818) 551-2886	7/12/94	There are two site mitigation files. The site is not on the list of active DTSC sites.
Jenny Au	California Environmental Protection Agency, Regional Water Quality Control Board (RWQCB), Los Angeles Region, Site Cleanup Unit	(213) 266-7500	7/12/94	There is no file for Stauffer Chemical Company in South Gate. I should call Joe Hernandez at the RWQCB, Underground Tank Unit, at (213) 266-7579.
Joe Hernandez	RWQCB, Underground Tank Unit	(213) 266-7579	7/12/94	There is no file on the site and it is not listed as active. I should contact Los Angeles County, Department of Public Works.

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CONTACT LOG (Cont'd)

Site: Stauffer Chemical Company

Name	Affiliation	Phone	Date	Information
Mr. Sijoberg	Los Angeles County, Department of Public Works (DPW)	(818) 458-3539	7/13/94	Open file. Currently listed on the tank cleanup list. The engineer handling the site is Mohammed Farzan at (818) 458-3980.
Mohammed Farzan	DPW, Engineer	(818) 458-3980	7/13/94	The last entry was in April 1993. The letter requested remedial action pertaining to a petroleum spill that occurred during the removal of two underground petroleum tanks. A notice of non-compliance will be written if there is no response by August 1, 1994. The letter was sent to the site and to the consultant, Rouh Associates, at (510) 602-2333.
Paul Stuppel	Rouh Associates	(510) 602-2333	7/13/94	Stauffer Chemical Company, now owned an operated by Rhone-Poulenc Basic Chemicals Company (Rhone-Poulenc), is no longer a client. A contact is Richard Fehler, the regional environmental manager for Rhone-Poulenc, at (510) 228-5530.
Richard Fehler	Rhone-Poulenc, Regional Environmental Manager	(510) 228-5530, ext. 294.	7/13/94	See Contact Report.

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CONTACT LOG (Cont'd)

Site: Stauffer Chemical Company

Name	Affiliation	Phone	Date	Information
Lee Hunsucker	Rhone-Poulenc	(310) 637-8080	8/8/94	Trisodium phosphate (TSP) is created by the reaction with soda ash, caustic soda and phosphoric acid. There was minimal waste. The solids were filtered out and removed by a permitted waste hauler. For the sulfur sulfide process, a small sulfur burning unit and scrubber were used to separate the impurities. Waste generated from this process was also removed from the site by a permitted waste hauler. The two underground storage tanks containing petroleum liquid leaked during removal in 1993. Rhone-Poulenc is developing a vapor extraction system to remediate the spill. The dismantling process was completed in May 1994. I should contact Bob Brown, Rhone-Poulenc environmental coordinator.
Bob Brown	Rhone-Poulenc	(310) 885-6724	8/9/94	Currently on site are an office building, two to three warehouses, and the silos used to store raw materials (i.e., soda ash). All chemical processing equipment has been removed. There have been some mechanical problems with the vapor extraction unit.

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CONTACT LOG (Cont'd)

Site: Stauffer Chemical Company

Name	Affiliation	Phone	Date	Information
Van Nguyen	City of Lynwood, Dept. of Water	(310) 603-0220	8/10/94	Well 20 (standby well) has not been operational within the last year. Well 20 will be abandoned soon. Call made by Maynard Geisler, BEI.

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APPENDIX C

CONTACT REPORT

~~REFERENCE 34~~

AGENCY/AFFILIATION: Los Angeles Health Department		
DEPARTMENT: Office of Drinking Water		
ADDRESS: 1449 West Temple Street	CITY: Los Angeles	
COUNTY: Los Angeles	STATE: CA	ZIP: 90026

CONTACT(S)	TITLE	PHONE
Art Montano	Sanitary Engineer	(213) 620-2980

BEI PERSON MAKING CONTACT: Deborah Tharp DT SM	DATE: 12/2/92
SUBJECT: Surface Water Intakes	
SITE NAME: Tulip Corporation	EPA ID: CAD 075267880

DISCUSSION:

There are no drinking water intakes from surface water associated with the Los Angeles River.

CONTACT CONCURRENCE: _____ DATE: _____

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CONTACT REPORT

~~REFERENCE 35~~

AGENCY/AFFILIATION: State of California		
DEPARTMENT: Department of Fish and Game		
ADDRESS: 330 Goldenshore Ave., Ste. 50	CITY: Long Beach	
COUNTY: Los Angeles	STATE: CA	ZIP: 90802
CONTACT(S)	TITLE	PHONE
Dwayne C. Maxwell		(310) 590-5137
BEI PERSON MAKING CONTACT: Deborah Tharp DT SM		DATE: 12/2/92
SUBJECT: Surface Water Intakes		
SITE NAME: Tulip Corporation	EPA ID: CAD 075267880	

DISCUSSION:

There are no commercial fisheries associated with the Los Angeles River.

CONTACT CONCURRENCE: Dwayne C. Maxwell DATE: 12/8/92

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CONTACT REPORT

AGENCY/AFFILIATION: Maywood Mutual Water Company 3		CODE: gw
DEPARTMENT:		
ADDRESS: P.O. Box 669	CITY: Maywood	
COUNTY: Los Angeles	STATE: CA	ZIP: 90270
CONTACT(S) Ronald Fick	TITLE Field Superintendent	PHONE (213) 771-5985
BEI PERSON MAKING CONTACT: Virginia Demetrios VD		DATE: 4/14/94
SUBJECT: Information on the Maywood Mutual Water Company 3 municipal water system		
SITE NAME: Harshaw/Filtrol (Bandini Blvd Facility)	EPA ID: CAD 980884332	

DISCUSSION:

As we discussed during our telephone conversation, the information included in the attached contact report dated September 24, 1992 concerning the Maywood Mutual Water Company 3 municipal water system is still accurate. The company's name was misspelled in the original contact report as Maywood Municipal Water Company 3.

CONTACT CONCURRENCE: _____ **DATE:** _____

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~~332 00006~~
~~332 00010~~
A163-0005

CONTACT REPORT

AGENCY/AFFILIATION: Maywood Municipal Water Company 3		
DEPARTMENT:		
ADDRESS: P.O. Box 669	CITY: Maywood	
COUNTY: Los Angeles	STATE: CA	ZIP: 90270
CONTACT(S)	TITLE	PHONE
Mr. Ronald Fick	Field Superintendent	213-771-5985
BEI PERSON MAKING CONTACT: Gary Yao G.Y. SM		DATE: 9/24/92
SUBJECT: Information on the Maywood Municipal Water Company 3		
SITE NAME: Indian Wells Estates, Inc.	EPA ID: CAD 008375776	

DISCUSSION:

Mr. Fick informed me that Maywood Municipal Water Company 1, Maywood Municipal Water Company 2, and Maywood Municipal Water Company 3 are all separate water companies. Maywood Municipal Water Company 3 serves the cities of Bell, Maywood, and Vernon. It has three active wells in its system. These wells are located at the following locations:

FX-9 Wells [redacted]

Well 1 contributes approximately 40 percent of the total water supplied by this blended system. According to Mr. Fick, the system serves approximately 10,000 people (2,000 connections X average of five people per connection). The wells are analyzed for hazardous substances by the Central Basin as required by the state. No well has ever been closed due to contamination of hazardous substances.

CONTACT CONCURRENCE: Ronald E Fick DATE: 10-1-92

~~A163 0004~~

A163 0012

CONTACT REPORT

AGENCY/AFFILIATION: City of Vernon		CODE: gw
DEPARTMENT: Water Department		
ADDRESS: 4305 Santa Fe Avenue	CITY: Vernon	
COUNTY: Los Angeles	STATE: CA	ZIP: 90058
CONTACT(S) Adrian Yasutake	TITLE	PHONE (213) 583-8811
BEI PERSON MAKING CONTACT: Virginia Demetrios VD		DATE: 4/14/94
SUBJECT: Information on the City of Vernon municipal water system		
SITE NAME: Harshaw/Filtrol (Bandini Blvd Facility)	EPA ID: CAD 980884332	

DISCUSSION:

As we discussed during our telephone conversation, the information included in the attached contact report dated September 23, 1992 concerning the City of Vernon's municipal water system is still accurate.

CONTACT CONCURRENCE: Adrian Yasutake **DATE:** 5.4.94

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~~332 00003~~
~~332 00009~~
ATTACHMENT FOR:
~~A163 0004~~
A163 0012

CONTACT REPORT

AGENCY/AFFILIATION: City of Vernon, Water Department		
DEPARTMENT:		
ADDRESS: 4305 Santa Fe Avenue	CITY: Vernon	
COUNTY: Los Angeles	STATE: CA	ZIP: 90058
CONTACT(S)	TITLE	PHONE
Mr. Adrian Yasutake		213-583-8811
BEI PERSON MAKING CONTACT: Gary Yao G.Y. GM		DATE: 9/23/92
SUBJECT: Information on the City of Vernon municipal water system		
SITE NAME: Indian Wells Estates, Inc.	EPA ID: CAD 008375776	

DISCUSSION:

Mr. Yasutake informed me that the City of Vernon obtains all of its drinking water from nine active groundwater wells. These wells are perforated approximately 500 feet below ground surface, and are located at the following locations:

FX-9 Wells

[redacted]

According to Mr. Yasutake, the wells contribute equal amounts of water to the system. These wells are also analyzed for hazardous substances every 3 years, and no well has been closed due to contamination. There are no standby wells in the City of Vernon municipal water system.

(daytime population) Ad
Approximately 47,000 people are served by this blended municipal system. Two private water companies, California Water and Maywood Mutual #3, also supply drinking water for the City of Vernon.

CONTACT CONCURRENCE: Adrian Yasutake DATE: 9-28-92

~~A163 0006~~
A163 0013

CONTACT REPORT

AGENCY/AFFILIATION: Tract 349 Mutual Water Company		CODE: gw
DEPARTMENT:		
ADDRESS: 4630 Santa Ana St.	CITY: Cudahay	
COUNTY: Los Angeles	STATE: CA	ZIP: 90201
CONTACT(S) Edwina Provencal	TITLE Executive Secretary	PHONE (213) 560-1601
BEI PERSON MAKING CONTACT: Virginia Demetrios VD		DATE: 4/15/94
SUBJECT: Information on the Tract 349 Mutual Water Company municipal water system		
SITE NAME: Harshaw/Filtrol (Bandini Blvd Facility)	EPA ID: CAD 980884332	

DISCUSSION:

As we discussed during our telephone conversation, the information included in the attached contact report dated October 29, 1992 concerning the Tract 349 Mutual Water Company municipal water system is still accurate.

CONTACT CONCURRENCE: Edwina Provencal **DATE:** May 4, 1994

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~~331 00002~~

~~331 00007~~

A163-0013

CONTACT REPORT

AGENCY/AFFILIATION: Tract 349 Mutual Water Company		
DEPARTMENT:		
ADDRESS: 4630 Santa Ana St.	CITY: Cudahy	
COUNTY: Los Angeles	STATE: CA	ZIP: 90201
CONTACT(S)	TITLE	PHONE
Erwina Provencal	Executive Secretary	(213) 560-1601
BEI PERSON MAKING CONTACT: Deborah Tharp DT		DATE: 10/29/92
SUBJECT: Tract 349 Mutual Water Company Wells		
SITE NAME: Tulip Corporation	EPA ID: CAD 075267880	

DISCUSSION:

Tract 349 Mutual Water Company has two active groundwater wells in its system. One of these wells is located at FX-9 Wells [redacted], the other is located at FX-9 Wells [redacted]. The two wells contribute equally to the water supply. Approximately 6,500 people are served by this system. Neither of these wells has ever been closed due to contamination from hazardous substances.

CONTACT CONCURRENCE: Erwina Provencal DATE: 11-2-92

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~~A163 0009~~

A163 0014

CONTACT REPORT

AGENCY/AFFILIATION: Maywood Mutual Water Company 2		CODE: GW
DEPARTMENT:		
ADDRESS: 3521 E. Slauson Avenue	CITY: Maywood	
COUNTY: Los Angeles	STATE: CA	ZIP: 90270
CONTACT(S) Warren Rickabaugh	TITLE Field Superintendent	PHONE (213) 581-5816
BEI PERSON MAKING CONTACT: Virginia Demetrios		DATE: 4/18/94
SUBJECT: Information on the Maywood Mutual Water Company 2 municipal water system		
SITE NAME: Harshaw/Filtrol (Bandini Blvd Facility)		EPA ID: CAD 980884332

DISCUSSION:

As we discussed during our telephone conversation, the information included in the attached contact report dated September 24, 1992 concerning the Maywood Mutual Water Company 2 municipal water system is still accurate, except that the total number of people served by this system is 6,600. In addition, due to an upgrading of the system in 1993, the 52nd Street well has been able to generate 1,000 gallons per minute.

CONTACT CONCURRENCE: _____ **DATE:** _____

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~~332 00008~~
~~332 00015~~
A163 0014

CONTACT REPORT

AGENCY/AFFILIATION: Maywood Mutual Water Company 2		
DEPARTMENT:		
ADDRESS: 3521 E. Slauson Avenue	CITY: Maywood	
COUNTY: Los Angeles	STATE: CA	ZIP: 90270

CONTACT(S)	TITLE	PHONE
Mr. Warren Rickabaugh	Field Superintendent	213-581-5816

BEI PERSON MAKING CONTACT: Gary Yao G.Y. GM	DATE: 9/24/92
SUBJECT. Information on the Maywood Mutual Water Company 2	
SITE NAME: Indian Wells Estates, Inc.	EPA ID: CAD 008375776

DISCUSSION:

Mr. Rickabaugh informed me that Maywood Mutual Water Company 2 serves the City of Maywood and a small portion of Huntington Park. It has two active wells in its system. One well is located at FX-9 Wells [redacted] and the other one is located at FX-9 Wells [redacted] The Maywood Well is perforated intermittently between 528 and 1,276 feet below ground surface (bgs). This well can generate 1,300 gallons per minute. The 52nd Well is perforated intermittently between 473 and 1,094 feet bgs, and can generate approximately 700 gallons per minute. According to Mr. Rickabaugh, 50 percent of the drinking water in the system comes from the Metropolitan Water District.

The Maywood Mutual Water Company 2 groundwater wells are analyzed for hazardous substances, and no well has ever been closed due to contamination. Approximately 9,200 people are currently being served by this system.

MAYWOOD MUTUAL WATER CO. #2
3521 E. SLAUSON AVE.
MAYWOOD, CA 90270

CONTACT CONCURRENCE: [signature] DATE: 10-5-92

~~A163 0007~~

A163 0017

CONTACT REPORT

AGENCY/AFFILIATION: Tract 180 Water Company		CODE: gw
DEPARTMENT:		
ADDRESS: 4544 E. Florence Avenue	CITY: Cudahay	
COUNTY: Los Angeles	STATE: CA	ZIP: 90201
CONTACT(S) Randy Long	TITLE General Manager	PHONE (213) 771-6682
BEI PERSON MAKING CONTACT: Virginia Demetrios 400 12		DATE: 4/18/94
SUBJECT: Information on the Tract 180 Water Company municipal water system		
SITE NAME: Harshaw/Filtrol (Bandini Blvd Facility)		EPA ID: CAD 980884332

DISCUSSION:

As we discussed during our telephone conversation, the information included in the attached contact report dated October 29, 1992 concerning the Tract 180 Water Company municipal water system is still accurate.

CONTACT CONCURRENCE: Randall D. Long **DATE:** 5-25-94

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~~331 00003~~
~~331 00009~~

CONTACT REPORT

A163-0017

AGENCY/AFFILIATION: Tract 180 Water Company		
DEPARTMENT:		
ADDRESS: 4544 E. Florence Avenue	CITY: Cudahay	
COUNTY: Los Angeles	STATE: CA	ZIP: 90201
CONTACT(S)	TITLE	PHONE
Randy Long	General Manager	(213) 771-6682
BEI PERSON MAKING CONTACT: Deborah Tharp DT		DATE: 10/29/92
SUBJECT: Tract 180 Water Company Wells		
SITE NAME: Tulip Corporation	EPA ID: CAD 075267880	

DISCUSSION:

Tract 180 Water Company maintains two drinking water wells. The wells are located at 4[redacted] The water system distributes 100 percent groundwater with each well contributing equally. Tract 180 Water Company serves a population of 14,000 people. Both of the wells are tested regularly and neither well has ever been shut down due to contamination from hazardous substances. The wells are both drilled to an approximate depth of 1,300 feet.

CONTACT CONCURRENCE: Randall Long DATE: 11-6-92

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~~A163 0008~~

A163 0015

CONTACT REPORT

AGENCY/AFFILIATION: Walnut Park Mutual Water Company		CODE: GW
DEPARTMENT:		
ADDRESS: 2460 Florence Ave.	CITY: Huntington Park	
COUNTY: Los Angeles	STATE: CA	ZIP: 90255
CONTACT(S) Janet Borden	TITLE Office Manager	PHONE (213) 585-7321
BEI PERSON MAKING CONTACT: Virginia Demetrios		DATE: 4/18/94
SUBJECT: Information on the Walnut Park Mutual Water Company ~~municipal water system~~		
SITE NAME: Harshaw/Filtrol (Bandini Blvd Facility)	EPA ID: CAD 980884332	

DISCUSSION:

As we discussed during our telephone conversation, the information included in the attached contact report dated October 29, 1992 concerning the Walnut Park Mutual Water Company ~~municipal water system~~ is still accurate, except that the percentage of groundwater and imported surface water supplied to the system has changed due to drought conditions and restrictions on groundwater use in the Los Angeles area. Since June 1, 1993, approximately 80 percent of the drinking water is supplied by imported surface water from the Metropolitan Water District.

CONTACT CONCURRENCE: Janet L. Borden **DATE:** May 9, 1994

Please delete municipal water system and show only "Walnut Park Mutual Water Company".

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~~331 00007~~

~~331 00008~~
A163-0015

CONTACT REPORT

AGENCY/AFFILIATION: Walnut Park Mutual Water Company		
DEPARTMENT:		
ADDRESS: 2460 Florence Ave.	CITY: Huntington Park	
COUNTY: Los Angeles	STATE: CA	ZIP: 90255
CONTACT(S)	TITLE	PHONE
Janet Borden	Office Manager	(213) 585-7321
BEI PERSON MAKING CONTACT: Deborah Tharp DT		DATE: 10/29/92
SUBJECT: Information on Walnut Park Mutual Water Company Groundwater Wells		
SITE NAME: Tulip Corporation	EPA ID: CAD 075267880	

DISCUSSION:

The Walnut Park Mutual Water Company serves the population of Walnut Park with drinking water from the company's four wells located at [redacted]. The approximate population served by the well water is 14,722 according to 1990 census data. From May through October, the Walnut Park Mutual Water Company blends approximately 60 percent groundwater with 40 percent Metropolitan Water District Water. From October through May, the drinking water system is supplied by 100 percent groundwater. The company's four wells are drilled to the following depths: Well 8 is 1,200 feet deep; Well 9 is 1,050 feet deep; Well 10 is 1,616 feet deep; Well 11 is 1,520 feet deep. The newest of the four wells, Well 11, contributes over 40 percent of the groundwater. None of the wells have ever been closed due to contamination from hazardous substances.

CONTACT CONCURRENCE: Janet L. Borden DATE: NOV 0 3 1992

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CONTACT REPORT

AGENCY/AFFILIATION: City of Downey		CODE: GW
DEPARTMENT: Water Division		
ADDRESS: 9252 Stewart and Gray Rd.	CITY: Downey	
COUNTY: Los Angeles	STATE: CA	ZIP: 90241
CONTACT(S) Tony Vasquez	TITLE Superintendent Pumping	PHONE (310) 904-7202
BEI PERSON MAKING CONTACT: Maynard Geisler MG		DATE: 4/20/94
SUBJECT: Water Supply System		
SITE NAME: Shellmar Products Corporation	EPA ID: CAD 983576190	

DISCUSSION:

The City of Downey Water Division operates 21 active water supply wells and five inactive water supply wells. There are no standby wells in the system. The 21 active wells are wells 1, 2, 4, 5, 7, 8, 9, 10, 12, 14, 15, 16, 17, 19, 23, 24, 25, [redacted], 28, 29, and 30. The inactive wells are wells 6, 21, [redacted], 26, and 27. Well 6 is inactive due to the presence of an oily substance in the groundwater pumped from this well. The source of the oily substance is unknown. Wells 21, [redacted], 26, and 27 are scheduled to be destroyed for reasons not related to groundwater contamination. Water supplied by the City of Downey Water Division is [redacted] percent groundwater. Well 4 provides greater than [redacted] percent of the system's water supply during the summer months (May through September). The are 23,000 service connections to the system.

CONTACT CONCURRENCE: Tony Vasquez **DATE:** 5-4-94

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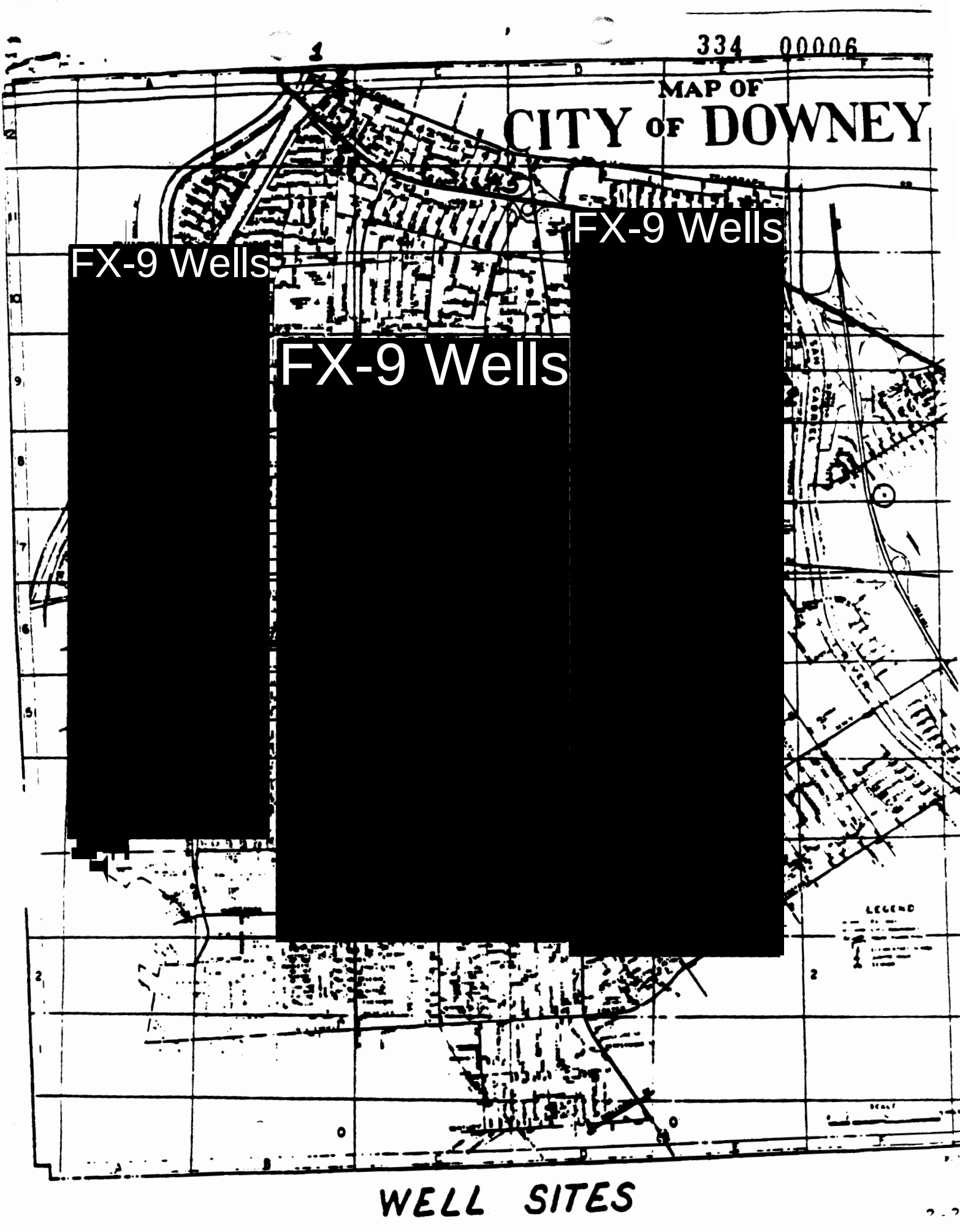
334 00006
MAP OF
CITY OF DOWNEY
FX-9 Wells
FX-9 Wells
FX-9 Wells
LEGEND
WELL SITES

WELL #	LOCATION
1	FX-9 Wells
2	FX-9 Wells
3	FX-9 Wells
5	FX-9 Wells
6	FX-9 Wells
7	FX-9 Wells
8	FX-9 Wells
9	FX-9 Wells
10	FX-9 Wells
11	FX-9 Wells
12	FX-9 Wells
13	FX-9 Wells
14	FX-9 Wells
15	FX-9 Wells
4	

WELL #	LOCATION
16	FX-9 Wells
17	FX-9 Wells
18	FX-9 Wells
19	FX-9 Wells
20	FX-9 Wells
21	FX-9 Wells
22	FX-9 Wells
23	FX-9 Wells
24	FX-9 Wells
25	FX-9 Wells
26	FX-9 Wells
27	FX-9 Wells
29	FX-9 Wells
30	FX-9 Wells

CONTACT REPORT

AGENCY/AFFILIATION: Maywood Mutual Water Company No. 1		CODE: GW
DEPARTMENT:		
ADDRESS: 5953 Gifford Ave.	CITY: Huntington Park	
COUNTY: Los Angeles	STATE: CA	ZIP: 90255
CONTACT(S) Monte Jewett	TITLE	PHONE (213) 560-2439
BEI PERSON MAKING CONTACT: Maynard Geisler MG #3		DATE: 4/20/94
SUBJECT: Water Supply System		
SITE NAME: Shellmar Products Corporation	EPA ID: CAD 983576190	

DISCUSSION:

The Maywood Mutual Water Company No. 1 has two wells, Well 3 and Well 4, in its system. Well 3 is located at FX-9 Wells [redacted] and Well 4 is located at FX-9 Wells [redacted]. Approximately 33 percent of the water supplied by the Maywood Mutual Water Company No. 1 is surface water imported from the Metropolitan Water District. Wells 3 and 4 each supply 33 percent of the system's supply. The Maywood Mutual Water Company No. 1 serves approximately 5,000 people. No contaminants have been detected is groundwater collected from these wells.

CONTACT CONCURRENCE: _____ **DATE:** _____

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CONTACT REPORT

AGENCY/AFFILIATION: City of Huntington Park		CODE: GW
DEPARTMENT: Department of Public Works		
ADDRESS: 6900 Bissell St.	CITY: Huntington Park	
COUNTY: Los Angeles	STATE: CA	ZIP: 90255
CONTACT(S) Bency Armijo	TITLE	PHONE (213) 587-5969
BEI PERSON MAKING CONTACT: Virginia Demetrios		DATE: 4/25/94
SUBJECT: City of Huntington Park municipal water system		
SITE NAME: Harshaw/Filtrol (Bandini Blvd Facility)	EPA ID: CAD 980884332	

DISCUSSION:

As we discussed during our telephone conversation, the information included in the attached contact report dated September 24, 1992 concerning the City of Huntington Park municipal water system is still accurate, except for the operation of two additional wells (wells 15 and 18). According to Mr. Armijo, Well 15, at FX-9 Wells [redacted], will be in full operation on April 26, 1994. The well had been closed due to trichloroethylene contamination. Under the direction of the Water Replenishment Department, Well 15 was remediated and currently meets state drinking water standards. Well 18 is located at FX-9 Wells [redacted]

CONTACT CONCURRENCE: _____ **DATE:** _____

~~332 00001~~
~~332 00025~~

A163-0010

CONTACT REPORT

AGENCY/AFFILIATION: City of Huntington Park. Department of Public Works		
DEPARTMENT:		
ADDRESS: 6900 Bissell Street	CITY: Huntington Park	
COUNTY: Los Angeles	STATE: CA	ZIP: 90255
CONTACT(S)	TITLE	PHONE
Mr. Bency Armijo		213-582-6161
BEI PERSON MAKING CONTACT: Gary Yao G.Y. GY		DATE: 9/24/92
SUBJECT: Information on the City of Huntington Park municipal water system		
SITE NAME: Indian Wells Estates, Inc.	EPA ID: CAD 008375776	

DISCUSSION:

Mr. Armijo informed me that the City of Huntington Park obtains all of its drinking water from four active groundwater wells. These wells are located at the following locations:

[redacted]

[redacted] EX-9 Well

Well 17 contributes approximately 40% of the total water supplied. Well 15 (located at Cottage Street and Saturn Avenue) was closed approximately 5 years ago due to trichloroethylene (TCE) contamination. The City of Huntington Park does not have any standby wells in its system. The city tests its active wells for hazardous substances once a month. According to Mr. Armijo, approximately 52,000 people are served by the ~~blended~~ groundwater municipal system.

CONTACT CONCURRENCE: Bency Armijo DATE: 9/28/92

CONTACT REPORT

AGENCY/AFFILIATION: City of Lynwood		CODE: GW
DEPARTMENT: Department of Water		
ADDRESS: 11330 Bullis Rd.	CITY: Lynwood	
COUNTY: Los Angeles	STATE: CA	ZIP: 90262
CONTACT(S) Van Nguyen	TITLE	PHONE (310) 603-0220
BEI PERSON MAKING CONTACT: Maynard Geisler MG		DATE: 4/25/94
SUBJECT: Water Supply System		
SITE NAME: Shellmar Products Corporation	EPA ID: CAD 983576190	

DISCUSSION:

The City of Lynwood Department of Water operates seven active and one standby water supply wells. Active wells include:

[redacted]

Standby well, Well 20, is located at FX-9 Wells [redacted]

The system serves approximately 65,000 people. In 1992 the water supply was approximately 75 percent groundwater and 25 percent surface water from the Metropolitan Water District (MWD). In 1993 the water supply was 37 percent groundwater and 63 percent MWD water. Currently the water supplied is approximately 7 percent groundwater and 93 percent MWD water.

Annual groundwater sampling indicates that groundwater from wells 5 and 15 contains perchloroethylene (PCE) at approximately 1.0 microgram per liter at each location.

CONTACT CONCURRENCE: _____ **DATE:** _____

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~~A192 0001~~

A192 0007

CONTACT REPORT

AGENCY/AFFILIATION: City of South Gate		CODE: GW
DEPARTMENT: Public Works Department		
ADDRESS: 4244 Santa Ana St.	CITY: South Gate	
COUNTY: Los Angeles	STATE: CA	ZIP: 90280
CONTACT(S) John Chambers	TITLE Water Department Supervisor	PHONE (213) 563-5790
BEI PERSON MAKING CONTACT: Maynard Geisler MG		DATE: 5/3/94
SUBJECT: City of South Gate Water Supply System		
SITE NAME: Shellmar Products Corporation	EPA ID: CAD 983576190	

DISCUSSION:

The City of South Gate operates 14 drinking water supply wells. Seven of the wells are active and seven of the wells are standby. Active wells include wells 2, 7, 14, 24, 25, 26, and 27. Standby wells include wells 13, 17, 18, 19, 20, 22B, and 23. Groundwater from standby wells 13, 17, 18, 19, and 22B contains perchloroethylene (PCE). These standby wells can be reactivated only if the groundwater is treated to remove the PCE. Standby wells 20 and 23 may be activated at any time. The City of South Gate water supply system uses 100 percent groundwater and supplies drinking water to approximately 75,000 people. No single well provides more than 40 percent of the total water supply. The attached data sheet lists City of South Gate well locations and capacities.

CONTACT CONCURRENCE: John E. Chambers **DATE:** 5-10-94

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A192 0007

CITY OF SOUTH GATE
WELL PRODUCTION DATA
SYSTEM #1910152

STATE WELL #	OWNER WELL #	LOCATION	CAPACITY
02S/13W-35A01	2	FX-9 Wells [redacted]	850 GP.M
02S/12W-31M02	7	[redacted] FX-9 Wells	950 GP.M
03S/13W-01G01	8	FX-9 Wells [redacted]	450 GP.M
03S/12W-06D01	13	FX-9 Wells [redacted]	1650 GP.M
03S/12W-06D02	14	FX-9 Wells [redacted]	2900 GP.M
03S/12W-06D03	18	FX-9 Wells [redacted]	2500 GP.M
03S/12W-06D04	19	FX-9 Wells [redacted]	2500 GP.M
02S/13W-36F02	20	FX-9 Wells [redacted]	850 GP.M
03S/12W-05M01	22-B	[redacted] FX-9 Wells [redacted]	950 GP.M
03S/12W-06B03	23	FX-9 Wells [redacted]	1200 GP.M
02S/12W-31Q03	24	[redacted] FX-9 Wells [redacted]	3000 GP.M
02S/12W-31Q02	25	FX-9 Wells [redacted]	3000 GP.M
02S/13W-34Q03	26	[redacted] FX-9 Wells	1600 GP.M
02S/13W-34R01	27	[redacted] FX	1800 GP.M

TANKS & RESERVOIRS

Hawkins Reservoir	9021 W. Frontage Rd.	2-2 1/2 Million Gals.
Santa Fe Tank	Santa Fe & Ardmore Ave.	500,000 Gals.
Kauffman Tank	10117 Kauffman Ave.	150,000 Gals.
Well #2 Tank	3414 Ardmore Ave.	150,000 Gals.
Salt Lake Tank	9595 Salt Lake Ave.	500,000 Gals.

~~A225 0002~~

A225 0003

CONTACT REPORT

AGENCY/AFFILIATION: Rhone-Poulenc Basic Chemicals Company (Rhone-Poulenc)		CODE:
DEPARTMENT:		
ADDRESS: 100 Mococo Road	CITY: Martinez	
COUNTY: Contra Costa	STATE: CA	ZIP: 94553
CONTACT(S) Richard Fehler	TITLE Regional Environmental Manager	PHONE (510) 228-5530 ext. 294
BEI PERSON MAKING CONTACT: Virginia Demetrios		DATE: 7/13/94
SUBJECT: Site operations		
SITE NAME: Stauffer Chemical Company	EPA ID: CAD 008353211	

DISCUSSION:

The following information was discussed with Mr. Fehler during a telephone conversation on July 13, 1994:

- There are currently no manufacturing operations occurring on site. The site was acquired by Rhone-Poulenc in late 1987 through an acquisition of Stauffer Chemical Company properties. Site operations remained the same under Rhone-Poulenc until April or May of 1993 when the site operations ceased. The onsite buildings were demolished and the entire site was paved, except for the railroad tracks.

Changed my mind

- The site is currently managed by the Rhone-Poulenc facility in Carson City, but all correspondence can be sent to ~~Mr. Fehler at the regional office in Martinez, Calif.~~ ~~Bob Brown~~ Lee Hunsucker Plant Manager ~~RP~~ Rhone-Poulenc P.O. Box 22776 Long Beach CA 90801 310/637-[illegible]

- Prior to ~~In~~ 1993, leakage occurred during the removal of two petroleum tanks. A soil vapor vent project is currently being developed under the guidance of the Los Angeles County, Department of Public Works (DPW). The DPW is requesting quarterly status reports.

- Future use plans for the site include subdivision. Current plans are that The southeast corner of the site, where the arsenic sludge pond was located, will be ~~leased and the remainder of the site will be sold.~~ subdivided and retained by R-P. The remainder of the site will be sold or leased.

Mr. Fehler requested a copy for the 1984 site inspection report for the Stauffer Chemical Company site in South Gate, Calif.

CONTACT CONCURRENCE: Rich Fehler **DATE:** 7-27-94

11-4-94 0751

TRANSMITTAL LIST for SITE INSPECTION PRIORITIZATION

Site: Stauffer Chemical Company - South Gate

EPA ID: 008353211

Lee Hunsucker
Plant Manager
Rhone-Poulenc Basic Chemicals Company
P.O. Box 22776
Long Beach, CA 90801

Satish Gulati
California Environmental Protection Agency
Department of Toxic Substances Control, Los Angeles Region
1011 Grandview Ave.
Glendale, CA 91201

Jenny Au
California Environmental Protection Agency
Regional Water Quality Control Board, Los Angeles Region
101 Centre Plaza Dr.
Monterey Park, CA 91754-2156

Mohammed Farzan
Los Angeles County, Department of Public Works
P.O. Box 1460
Alhambra, CA 91802-1460

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Reference:
CTE, 2011

City of Vernon

2010 Urban Water Management Plan

Volume 1 - Report

June 2011

Prepared by

CIVILTEC engineering inc.

GENERAL CIVIL, MUNICIPAL, WATER AND WASTEWATER ENGINEERING
PLANNING, CONSTRUCTION MANAGEMENT AND SURVEYING

Providing Professional Engineering Services since 1986

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CHAPTER TWO – SYSTEM DESCRIPTION

2.1 General Description

The City of Vernon is located in the Los Angeles-Long Beach metro area, approximately 15 miles northeast of the Los Angeles International Airport. The location of the City is shown in Figure 1.

Figure 1 – Vicinity Map[1]

[1] Excerpt from vicinity map developed by Infrastructure Engineering Corporation as past of the 2006 Vernon Water Distribution System Hydraulic Analysis Report

2.2 Service Area Description

§10631(a) Describe the service area of the supplier.

Most of the geographical area of Vernon is supplied by the City's Water Department. The California Water Service Company (East Los Angeles District, Commerce System) serves some of the northeast portion of Vernon, and a small portion of southeast Vernon is serviced by the Maywood Mutual Water Company Number 3. The service areas of the three water suppliers serving Vernon are shown in Figure 2. All analyses with respect to service area refer to activity within the City of Vernon Service Area Boundary.

2.3 Climate

§10631(a) (Describe the service area) climate.

Information on climate was provided by the IDcide.com website[2] and based on data complied from the National Climactic Data Center, the National Oceanic and Atmospheric Administration and the National Weather Service per continuous meteorological data collected at the USC Weather Station (approximately 4.4 miles from Vernon). Table 2 provides a breakdown of normal temperatures typical to the vicinity of Vernon.

Table 2 – Normal Temperatures

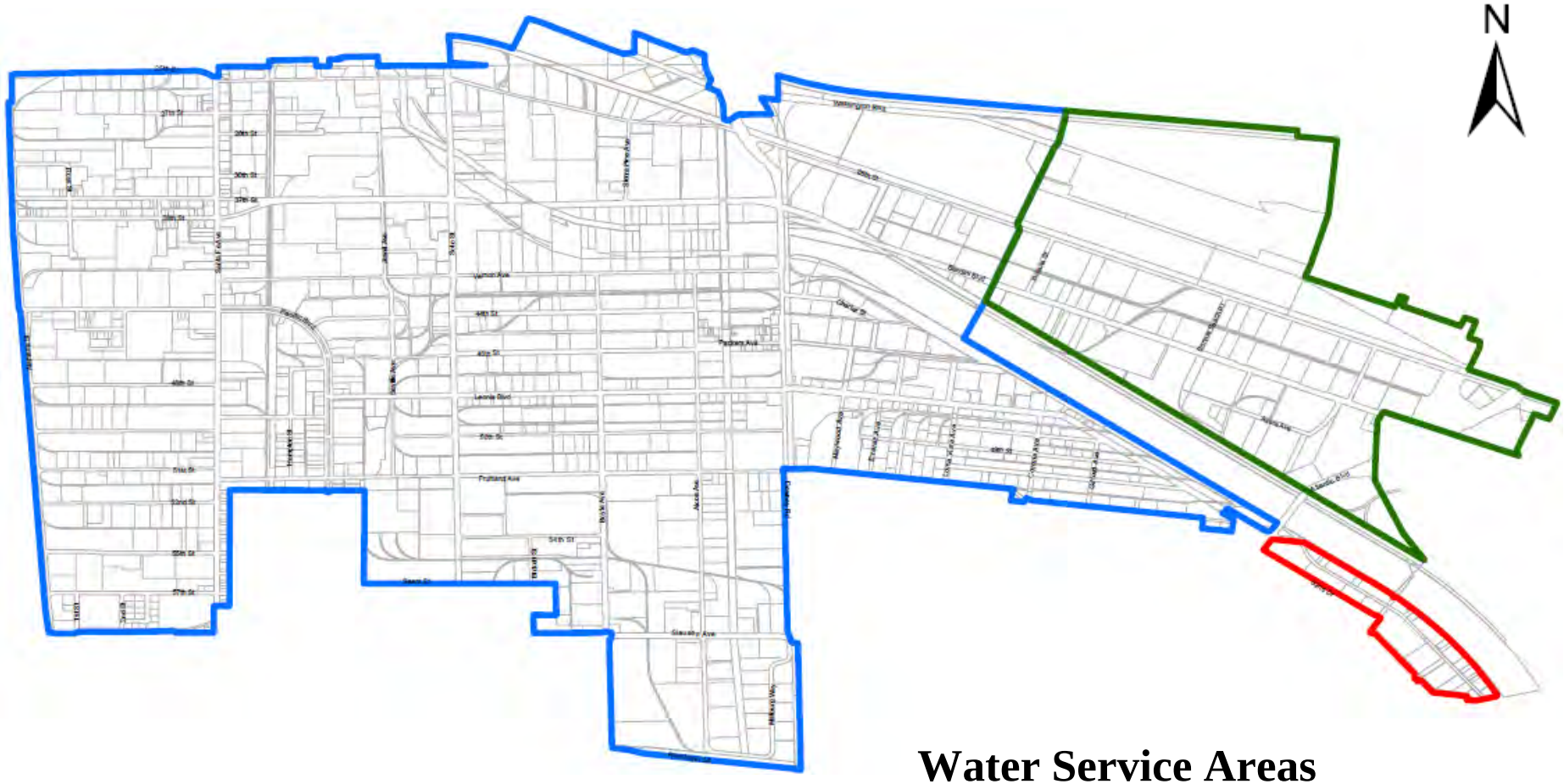
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max °F	68.1	69.6	69.8	73.1	74.5	79.5	83.8	84.8	83.3	79.0	73.2	68.7	75.6
Mean °F	58.3	60.0	60.7	63.8	66.2	70.5	74.2	75.2	74.0	69.5	62.9	58.5	66.2
Min °F	48.5	50.3	51.6	54.4	57.9	61.4	64.6	65.6	64.6	59.9	52.6	48.3	56.6

The warmest month of the year is August with an average maximum temperature of 84.8 ºF, while the coldest month of the year is December with an average minimum temperature of 48.3 ºF. Temperature variations between night and day tend to be moderate during both summer and winter with an average difference that can reach 19 ºF.

The annual average precipitation is 15.1 inches. Rainfall in is fairly evenly distributed throughout the year. The wettest month of the year is February with an average rainfall of 3.7 inches.

[2] IDcide website: http://www.idcide.com/weather/ca/vernon.htm (accessed March 29, 2011)

Figure 2 – Service Area Map



Excerpt from study area map developed by Infrastructure Engineering Corporation as past of the 2006 Vernon Water Distribution System Hydraulic Analysis Report

2.4 Population

§10631(a) (Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . . (population projections) shall be in five-year increments to 20 years or as far as data is available.

§10608.20(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

The 2009 Vernon General Plan established the current and projected population of the City as shown Table 3.

Table 3 – Current and Projected Population

Year	2010	2015	2020	2025	2030	2035
Service area population	100	101	102	103	104	105

2.5 Demographics

§10631(a) Describe . . . other demographic factors affecting the supplier's water management planning.

City founders recognized the significance of the three major railroads running through the area. The founders convinced railroad executives to run spur tracks off the main lines and later incorporated the adjacent three miles as an "exclusively industrial" city named after a dirt road, Vernon Avenue, crossing its center.

The first industry in the City dealt with livestock. Two giant stockyards with meat packing facilities became Vernon's signature industry. Twenty-seven slaughterhouses lined Vernon Avenue from Soto Street to Downey Road through the 1960s.

In the 1920s and 1930s, heavy industries proliferated including steel (U.S. and Bethlehem), aluminum (Alcoa), glass (Owens), can-making (American Can) and automobile production (Studebaker). In the 1940s and 1950s, more industries opened for business in Vernon including aerospace contractors (Norris Industries), box and paper manufacturers, drug companies (Brunswig), and food processors (General Mills, Kal Kan). A strong, unionized labor force contributed to excellent middle class incomes for thousands of families in the region.

In 1932, a Vernon bond authorized the construction of the City's own Light & Power plant, which is still operational today. Low-cost power and water, along with low taxes, attracted businesses to Vernon. Today, smaller industrial and commercial establishments are characteristic of the business community in Vernon including fashion design, garment-making, film production, electronics, and waste recycling.

Current statistical demographic data are presented in Table 4. These data were collected and disseminated by the Southern California Association of Governments (SCAG) in its 2009 Profile of the City of Vernon and verified for accuracy by Vernon Community Services and Water Department staff. The most striking discrepancy is the ratio of employees to residents at more than 400 to one. This exemplifies the nature of the City as a center for commercial and industrial activity which is consistent with the City's mission of

"maintaining Vernon as an ideal location for industry in Southern California" per the 2009 Vernon General Plan.

Table 4 – Demographic Statistics

Demographic	Quantity	Unit
Population (2008)	95	persons
Median Age	27.8	years
Number of Housing Units	31	units
Home Ownership Rate	16.1	percent
Average Household Size	3.1	persons per unit
Median Family Income (2007)	79,167	dollars
Number of Jobs (2008)	38,255	employees

CHAPTER THREE – SYSTEM DEMANDS

3.1 General Description

All of the City's service area, which is comprised predominately of commercial and industrial land uses, is built-out with almost no new accounts anticipated in the future. Currently, 90.7% the City's water supply is delivered to the commercial and industrial sectors, and 8.7% is dedicated to power generation. The remaining fraction of 1% of supply is delivered to the residential and institutional sectors. The City has no agricultural or landscaping users.

Due to the nature of Vernon as a center of commercial and industrial activity, water demand within the city is linked to the impacts of the marketplace on the region and beyond. For this reason, there is still potential for increases in water demand despite being built-out. Water demand in the commercial and industrial sectors is linked more directly to intensity and productivity than to the size or needs of the local population. Furthermore, Vernon's infrastructure is designed to meet the needs of the commercial and industrial sectors in general whatever they may be, rather than being limited to the specific needs of its current customers. As such, the infrastructure is very robust and adaptable making it capable of meeting the changing requirements necessary to fulfill its mission of being an "ideal location for industry".

Therefore, Vernon has an obligation to have a system in place capable of meeting the demands associated with high intensity and productivity in the commercial and industrial sectors whenever those demands arise as dictated by economic factors that are largely outside of the city's control.

3.2 Historical Water Demands

> *§10631(e)(1) and (2) Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural.*

The availability of data related to consumption by end users for complete calendar years of the detail requested above is limited to the period of 2007 through 2010 which coincides with the implementation of new billing software. For this reason, Table 5 deviates from the typical and preferred 5-year increment.

Table 5 – Actual Water Deliveries and System Losses from 2007 to 2010

Water use sectors	2007 (AFY)	2008 (AFY)	2009 (AFY)	2010 (AFY)
Single-family Residential	5.1	7.9	8.2	7.4
Multi-family Residential	3.4	4.3	1.0	0.9
Commercial	7,060.3	6,674.9	5,384.9	5,092.6
Industrial	2,832.2	2,695.3	2,049.1	2,154.5
Institutional and Governmental	45.6	38.6	27.5	30.6
Recycled Water (Energy)	737.8	892.1	837.6	743.3
System Losses	1,025.9	1,082.5	1,204.6	869.1
Total	11,710.2	11,395.6	9,513.1	8,898.3

3.3 Projected Water Demands

§10631(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

§10631.1(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

The business plan for the City of Vernon includes accommodating the commercial and industrial needs of the primary customers within the service area. These commercial and industrial needs are closely linked to the national and global marketplaces. A national and global economic analysis was considered to be beyond to scope and intent of the Urban Water Management Planning Act and the California Water Conservation Act. As a result, the City of Vernon has an obligation to plan for demands associated with peak economic activity which may occur at any time and for any duration. The City desires to have adequate flexibility in its water supplies to attract diverse clients and to serve 100% occupancy of existing properties. The City estimates that a potable water supply of 12,000 AFY provides sufficient flexibility to maintain the business plan.

Projected water use, as shown in Table 6, is based on the following assumptions:

- Potable water demand (i.e. residential, commercial, industrial, institutional and government and losses) is static and set at 12,000 AFY. Note that portions of this demand associated with irrigation, and industrial process water may be converted to recycled water.
- Residential and institutional and governmental water use is very low and static.
- Based on historical demand, commercial and industrial water use are approximately 63% and 26%, respectively.
- Recycled water demand (for energy) of the Malburg Generation Station is static at 800 AFY.
- For planning purposes, recycled water demand (for energy) will increase by 1,000 AFY beginning in 2015 to provide process water for a new power plant.
- System losses are set at 5% of total demand. This projection assumes the completion of Demand Management Measure 3 (Water Audits, Leak Detection and Repair).

Table 6 – Projected Water Deliveries and System Losses through 2035

Water use sectors	2015 (AFY)	2020 (AFY)	2025 (AFY)	2030 (AFY)	2035 (AFY)
Single-family Residential	10	10	10	10	10
Multi-family Residential	5	5	5	5	5
Commercial	8,000	8,000	8,000	8,000	8,000
Industrial	3,300	3,300	3,300	3,300	3,300
Institutional and Governmental	35	35	35	35	35
Recycled Water (Energy)	1,800	1,800	1,800	1,800	1,800
System Losses	650	650	650	650	650
Total	13,800	13,800	13,800	13,800	13,800

3.4 Regional Housing Needs Assessment

In July 2007, the Southern California Association of Governments adopted the final 2006-2014 Regional Housing Needs Assessment which included a future housing allocation of zero in the City of Vernon, which is consistent with previous allocations for the City. Per the Vernon General Plan, future housing growth has been deemed inappropriate due to the City's pervasive industrial environment and land use incompatibilities related to hazardous materials, background contamination, noxious odors, noise pollution, and truck and railroad traffic.

3.6 Application of the Water Conservation Act

> *§10608.20(e) An urban retail water supplier shall include in its urban water management plan . . . due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

In 2009, a number of cities in the Los Angeles Gateway Region (Gateway Region) and other interested parties formed an official Joint Powers Authority (JPA) to steer their planning efforts and provide solid governance for development and implementation of an integrated regional water management plan (IRWMP) in accordance with DWR's Regional Acceptance Process (RAP). The RAP policy is in place to provide pertinent information on the IRWMP region boundaries, make-up, and culture so that DWR can confirm that participating members can operate as a region as defined by the California Water Code.

The City of Vernon is a signatory to the Gateway Regional Alliance as noted in the Letter Agreement included in Appendix C. All references to compliance with the California Water Conservation Act of 2009 have been made in coordination with the Regional Alliance.

3.6.1 Reporting as an Individual Retail Supplier

In coordination with the Gateway Regional Alliance, initial calculations for determining baseline per capita water use and targets for interim and compliance per capita water use with respect to reporting as an individual retail water supplier are provided in Table 7 for Method 1 and Table 8 for Method 4 (all units are in terms of gallons per capita per day).

Table 7 – Reporting as an Individual Using Method 1

Method 1						
Calculation				Check		
Baseline Period	*10-Year Baseline	Target: 80% of *10-Year Baseline	2015 Interim Target	5-Year Base	95% of 5-Year Base	Is Target > 95% of 5-Year Base
1996-2005	94111	75289	84700			
1997-2006	97225	77780	87503			
1998-2007	100037	80029	90033			
1999-2008	101764	81411	91587	102369	97251	No
2000-2009	100511	80409	90460	99291	94327	No
2001-2010	97759	78208	87983	97124	92268	No
*Since RW is 8.46% of Total water; Used 10-Year Baseline 5yr Base: (Dec '07<Base End<Dec '10)						

Table 8 – Reporting as an Individual Using Method 4

Method 4					
Calculation			Check		
Hyd Region Target for South Coast	Target: 95% of Hyd Region Target	2015 Interim Target	5-Year Base	95% of 5-Year Base	Is Target > 95% of 5-Year Base
149	142	47127			
149	142	48684			
149	142	50089			
149	142	50953	102369	97251	No
149	142	50327	99291	94327	No
149	142	48951	97124	92268	No
*Since RW is 8.46% of Total water; Used 10-Year Baseline 5yr Base: (Dec '07<Base End<Dec '10)					

3.6.2 Reporting as a Member of the Gateway Regional Alliance

All justifications, calculations and conclusions regarding reporting as a member of the Gateway Regional Alliance are included in Appendix R. In coordination with the Gateway Regional Alliance, the following information represents Vernon's involvement and obligations in the Alliance:

- Vernon is member of the Gateway Regional Alliance
- The 2010 population of the Gateway Regional Alliance is 1,236,775
- The baseline per capita water use of the Gateway Regional Alliance is 113.2 GPCD
- The interim per capita water use target of the Gateway Regional Alliance is 108.2 GPCD
- The compliance per capita water use target of the Gateway Regional Alliance is 103.1 GPCD

3.7 Water Use Reduction Plan

At the time of submittal of this UWMP, a water use reduction plan for the Gateway Regional Alliance was in development but incomplete. As a member of the Gateway Regional Alliance, Vernon is actively participating in the development of the water use reduction plan and will implement those elements of the plan upon completion.

CHAPTER FOUR – SYSTEM SUPPLIES

4.1 General Description

This chapter provides quantification and descriptions of the water supplies at Vernon's disposal.

4.2 Water Sources

§10631(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

The City of Vernon currently has three sources of water: groundwater recycled water and imported water. Groundwater is pumped from the Central Basin. Recycled water and imported water are purchased from the Central Basin Municipal Water District (CBMWD). No additional sources are anticipated to be developed over the planning horizon of this document. Table 9 provides current and projected supplies from these three sources.

Table 9 – Current and Projected Water Supplies

Water Supply	2010 (AFY)	2015 (AFY)	2020 (AFY)	2025 (AFY)	2030 (AFY)	2035 (AFY)
CBMWD[3]	673.2	1,900	1,950	2,000	2,100	2,150
Groundwater[4]	7,489.20	8,039	8,039	8,039	8,039	8,039
Recycled Water[5]	735.9	3,000	11,700	11,700	11,700	11,700
Total	8,898.30	12,939	21,689	21,739	21,839	21,889

4.2.1 Imported Water

The City currently purchases treated water from the Central Basin Municipal Water District (CBMWD). According to the *2010 Amendment to Purchase Agreement for Imported Water to Be Provided by Central Basin Municipal Water District* (Appendix O), beginning in 2010 the City has a base allocation of 1,112 AFY of which 90% (1,000 AF) is supplied at the Tier 1 rate. Additional water can be purchased from CBMWD at the Tier 2 rate. While Tier 2 imported water is available in unlimited quantities during normal years, Tier 2 water supply could be reduced in the event of a drought situation or other water shortage.

Per the CBMWD 2010 UWMP Draft, reliability of supply under drought conditions will be improved through continued development of recycled water at the local level and through implementation of the Metropolitan Water District's Water Supply Allocation Plan (WSAP) at the regional level. As a result of these efforts and through the vigilant implementation of water conservation programs at all levels,

[3] Per projections provided in CBMWD 2010 UWMP Draft, March 2011, assumed not to include "unlimited" supply at Tier 2 rates

[4] Assumes maximization of Vernon's allowed pumping allocation in the Central Basin per the Central Basin Watermaster. Does not include 20% over-pumping allocation during a single dry year.

[5] 2010 supply based on current maximum monthly rate. 2015 based 1,800 AFY for two power plants times a peaking factor of 1.65 as indicated in the CBMWD design criteria for the recycled water distribution system. Future supply for 2020 and beyond assumes completion of Phase 2 of the Southeast Water Reliability Project and is based on future demand in Vernon per the CBMWD 2008 Recycled Water Master Plan times a peaking factor of 1.65. As a rule, recycled water supply is always higher than recycled water demand.

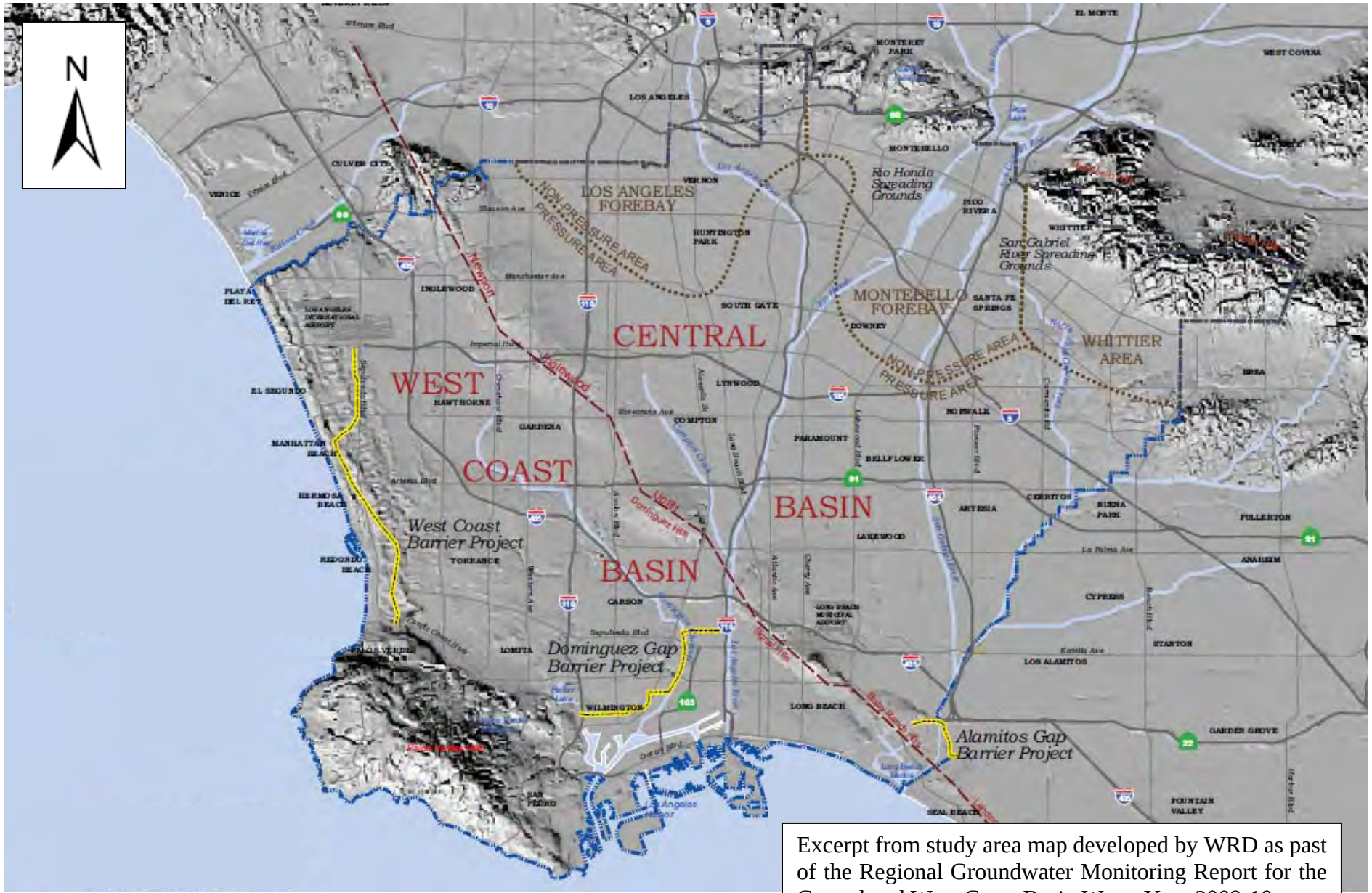
CBMWD has projected supply surpluses under all drought conditions specified in the UWMP Act. Due to CBMWD's confidence in their ability to provide a reliable supply, Vernon believes that the precept of water being "available in unlimited qualities" applies to normal years, single dry years and multiple dry years as those designations apply to this UWMP. Additional discussion of imported water reliability is provided in §5.2.1, §5.2.2 and §5.2.3 as it pertains to water purchased at Tier 2 rates.

4.2.2 Groundwater

> *§10631(b) (Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .*
>
> *§10631(b)(1) (Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.*
>
> *§10631(b)(2) (Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board. (Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.*
>
> *§10631(b)(3) (Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*
>
> *§10631(b)(4) (Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Per DWR (Bulletin 118), the Central Basin occupies a large portion of the southeastern part of the Coastal Plain of Los Angeles Groundwater Basin (Figure 3). The Central Basin is bounded on the north by a surface divide called the La Brea high, and on the northeast and east by emergent less permeable Tertiary rocks of the Elysian, Repetto, Merced and Puente Hills. The southeast boundary between Central Basin and Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift. The Los Angeles and San Gabriel Rivers drain inland basins and pass across the surface of the Central Basin on their way to the Pacific Ocean.

Figure 3 – Map of Central Basin



Excerpt from study area map developed by WRD as past of the Regional Groundwater Monitoring Report for the Central and West Coast Basin Water Year 2009-10

Throughout the Central Basin, groundwater occurs in Holocene and Pleistocene age sediments at relatively shallow depths. The Central Basin is historically divided into forebay and pressure areas. The Los Angeles forebay is located in the northern part of the Central Basin where the Los Angeles River enters the Central Basin through the Los Angeles Narrows from the San Fernando Groundwater Basin. The Montebello forebay extends southward from the Whittier Narrows where the San Gabriel River encounters the Central Basin and is the most important area of recharge. Both forebays have unconfined groundwater conditions and relatively interconnected aquifers that extend up to 1,600 feet deep to provide recharge to the aquifer system. The Whittier area extends from the Puente Hills south and southwest to the axis of the Santa Fe Springs-Coyote Hills uplift and contains up to 1,000 feet of freshwater-bearing sediments. The Central Basin pressure area is the largest of the four divisions, and contains many aquifers of permeable sands and gravels separated by semi-permeable to impermeable sandy clay to clay, that extend to about 2,200 feet below the surface. Throughout much of the Central Basin, the aquifers are confined, but areas with semipermeable aquicludes allow some interaction between the aquifers.

The main productive freshwater-bearing sediments are contained within Holocene alluvium and the Pleistocene Lakewood and San Pedro Formations. Throughout most of the Central Basin, the near surface Bellflower aquiclude restricts vertical percolation into the Holocene age Gaspur aquifer and other underlying aquifers, and creates local semi-perched groundwater conditions. The main additional productive aquifers in the Central Basin are the Gardena and Gage aquifers within the Lakewood Formation and the Silverado, Lynwood and Sunnyside aquifers within the San Pedro Formation. Historically, groundwater flow in the Central Basin has been from recharge areas in the northeast, toward the Pacific Ocean on the southwest. However, pumping has lowered the water level in the Central Basin and water levels in some aquifers are about equal on both sides of the Newport-Inglewood uplift, decreasing subsurface outflow to the West Coast Basin.

Many faults, folds and uplifted basement areas affect the water-bearing rocks in the Central Basin. Most of these structures form minor restrictions to groundwater flow. The strongest effect on groundwater occurs along the southwest boundary to the Central Basin. The faults and folds of the Newport – Inglewood uplift are partial barriers to movement of groundwater from the Central Basin to the West Coast Basin. The La Brea high is a system of folded, uplifted and eroded Tertiary basement rocks. Because the San Pedro Formation is eroded from this area, subsurface flow southward from the Hollywood Basin is restricted to the Lakewood formation. The Whittier Narrows is an eroded gap through the Merced and Puente Hills that provides both surface and subsurface inflow to the Central Basin. The Rio Hondo, Pico, and Cemetery faults are northeast-trending faults that project into the gap and displace aquifers. The trend of these faults parallels the local groundwater flow and does not act as a significant barrier to groundwater flow.

The City draws its groundwater supply from the Central Groundwater Basin. This source annually supplies approximately 200,000 acre-feet of potable water to the area south of the Whittier Narrows to the Pacific Ocean and from the Orange County line to the city of Compton.

In 1959, the State Legislature enacted the Water Replenishment Act, enabling the formation of the Water Replenishment District of Southern California (WRD) as it is now known to be the permanent agency in charge of replenishing both the Central and West Basins. The State Legislature has vested in WRD the statutory responsibility to manage, regulate, replenish and protect the quality of groundwater supplies within it boundaries, of which the City of Vernon is included.

The Central Groundwater Basin became an adjudicated basin in 1966 (see Appendix I). The Los Angeles County Superior Court oversees the adjudication and the California Department of Water Resources (DWR) serves as the court appointed watermaster. The Court established groundwater pumping rights at the time of adjudication, and the total allowable extractions from the basin in a given year are 217,367 acre feet. Central Basin producers may also carry over up to 20 percent of the allowable pumping rights to the next fiscal year.

Maintenance of the basin and the groundwater pumping allocation requires recharging; accomplished through facilities operated by the Los Angeles County Department of Public Works (LADPW). The groundwater basin is replenished with four sources of water: import supplies from Metropolitan Water District of Southern California (MWD), local run-off from storm flows, allocations from the Upper San Gabriel Groundwater Basin, and recycled wastewater from the Los Angeles County Sanitation Districts. The WRD purchases import supplies and recycled water for groundwater replenishment and seawater intrusion barriers. Imported water from MWD has not been available for replenishment since 2007; however, the lack of availability of this source is considered to be temporary.

The City of Vernon has adjudicated groundwater basin rights of 8,039 acre-feet per year (AFY) as indicated in the 2009-10 Central Basin Watermaster Report (Appendix P). With additional groundwater leases and carryover from previous years, the actual allowable extraction can exceed 8,039 AFY. As with all retailers in the Central Basin, the City is allowed to carry over its unused allocation of up to 20% of its adjudicated rights to the next fiscal year.

During a declared water shortage, the Central Basin Watermaster may allow the City to over-pump 20% of its water rights; however, in doing so it must decrease its allocation by 20% the following fiscal year. With this arrangement, the City can sustain itself during a declared water shortage. The City manages its supply so that when additional water is needed, due to the possibility of a shortfall in imported supply, these groundwater rights can be exercised.

Table 10 shows the volume of water pumped annually from the Central Basin for the last five years.

Table 10 – Groundwater Pumped for Last Five Years

Basin Designation	2006 (AFY)	2007 (AFY)	2008 (AFY)	2009 (AFY)	2010 (AFY)
Central Basin	8,244.7	9,004.9	8,504.4	7,327.4	7,489.2

With respect to local groundwater management options for the City, the following recommendations were published in the 2005 Hydrogeological Evaluation of the City of Vernon Groundwater Supplies:

- Due to the high potential for contamination being introduced into the groundwater from the many industries in the City, it is advisable to spread out the location of wells in order to lessen the risk of potential impacts. Wells that will be pumped simultaneously should be spaced at least 1,300 ft apart to prevent interference between wells; and wells not pumping simultaneously should be spaced at least 800 ft apart. Wells located too close to each other or a well that pumps excessively will cause a localized cone of depression to develop whereby groundwater gradients will be altered and ultimately groundwater will flow towards these wells.

- A Drinking Water Source Assessment Protection Program for City wells should be developed to inform the City's Health and Environmental Control Department as to the location of potential groundwater percolation capture zones. The City should ensure that the industries within these zones are aware that they have the potential to impact the City's groundwater supply.

- Historical data provided by the City showed evidence of pumping levels being recorded instead of true static levels. In order to obtain static levels, it is recommended that the well pump be turned off for at least six hours prior to a level being recorded. The amount of recovery time allowed before each measurement should also be recorded together with the depth to water.

- Installation of a permanent pressure transducer is recommended in each well where one doesn't already exist to collect groundwater level measurements. Access into the wells may be a problem in some instances where the pump base does not have port access for sounders. Possibilities to allow a pressure transducer to be installed into the wells include retrofitting the well with a dedicated sounding tube by strapping a PVC tube onto the pump column.

- To assist in groundwater management of the City's groundwater resources, a Groundwater Monitoring and Management Plan is an essential document that incorporates a standard methodology for the collection of data in sufficient quantities and of adequate quality to enable informed decisions regarding the management of the groundwater resources in the City's service area. The types of data to be collected include groundwater levels, groundwater production, and groundwater quality.

- For on-going groundwater management, a groundwater flow model could be developed for the City area. The model can be used to predict the actual interference effects between wells, evaluate groundwater flow direction changes due to pumping, groundwater level changes in response to various operational scenarios and potential movement of contaminants using particle tracking. The flow model could also be used to predict future groundwater conditions for up to 20 years into the future.

Jurisdiction and authority over groundwater management for the entirety of the Central Basin is currently unclear. In 2010, the Water Replenishment District of Southern California sought to expand its powers in basin management, but the Superior Court did not uphold their request (see Appendix J). Agencies with an interest in Central Basin groundwater management include the California Department of Water Resources (DWR), the Association of California Water Agencies (ACWA), the Central Basin Municipal Water District (CBMWD) and the Water Replenishment District of Southern California (WRD). CBMWD has released a groundwater management draft (Initial Study – Central Basin Groundwater Storage Plan: A Blueprint for Future Reliability) which is included in Appendix D.

4.2.3 Recycled Water

Recycled water is one of the cornerstones of CBMWD's efforts to augment local supplies and reduce dependence on imported water. Since the planning and construction of CBMWD's recycled water system in the early 1990's, CBMWD has become a leader in distributing and marketing recycled water. This new supply has assisted the City of Vernon in meeting its process water demand for power generation. It is only limited by the infrastructure needed to deliver this source to the City of Vernon. Such infrastructure, the Southeast Water Reliability Project Proposed Phase 2, is already in the planning stages and includes a 42-inch diameter, looped pipeline.

The City purchases recycled water from CBMWD in order to provide service for the on-site cooling towers of the Malburg Generation Station power plant. In order to provide this service, the City of Vernon has constructed approximately 10,000 linear feet of recycled water pipeline, capable of supplying recycled water from CBMWD. The City of Vernon has entered into an agreement with CBMWD to provide recycled water to this power plant. In the event that the recycled water supply is interrupted, this agreement stipulates that CBMWD will increase the supply of Tier 2 imported potable water to compensate for any disruption of recycled water, regardless of the drought conditions in Central Basin.

4.3 Transfer Opportunities

§10631(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Vernon maintains no interconnections with area agencies except its dedicated imported water supply connection with CBMWD. There are no feasible opportunities to develop water transfers or exchanges acting as an independent water supplier. There may be opportunities to act in cooperation with CBMWD or with the Gateway Regional Alliance; however, there are no such projects being planned at this time and initiation of such projects is expected to occur at the wholesale or JPA level.

4.4 Desalinated Water Opportunities

§10631(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Vernon is landlocked and has no opportunity to develop desalinated water. Furthermore, the Central Basin is Vernon's only source of groundwater and is also landlocked. CBMWD does not have access to the ocean or any source of brackish water and as such does not anticipate investing in desalination in the near future.

4.5 Recycled Water Opportunities

§10633 Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

§10633(a) (Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

§10633(b) (Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

§10633(c) (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

§10633(d) (Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

§10633(e) (Describe) the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

§10633(f) (Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

§10633(g) (Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

It is the City's philosophy that recycled water shall be used within the jurisdiction wherever its use is economically justified, financially and technically feasible and consistent with legal requirements, preservation of public health, safety and welfare of the environment.

To that end, the City has previously completed the task, in coordination with CBMWD, of evaluating potential recycled water use within the service area as a precursor to continued development of the Southeast Water Reliability Project. Special care was taken to exclude potential recycled water use from various industrial processes involving food processing. Vernon is satisfied that CBMWD, who is the lead agency in the Central Basin for the development and distribution of recycled water, is aware of all potential recycled water use within the service and that CBMWD makes use of this knowledge in the justification for the expansion of the recycled water system, future rate structure and phasing of implementation.

4.5.1 Disposition of Wastewater Collection and Treatment

Per the 2009 Vernon General Plan, the City owns its own sewage collection system which discharges into the system managed by the Los Angeles County Sanitation Districts (LACSD). The majority of Vernon is within District 23, but also contains territory in Districts 1 and 2. These Districts, along with more than a dozen others, are signatories to the Joint Outfall System (JOS) which provides for the operation and maintenance of an interconnected system of wastewater collection, treatment, reuse, and disposal facilities across a large portion of the urban region. The JOS includes the following water reclamation plants (WRP):

- The Joint Water Pollution Control Plant (Carson)
- Whittier Narrows WRP (South El Monte)
- Los Coyotes WRP (Cerritos)
- San Jose Creek WRP (Industry)
- Long Beach WRP (Long Beach)
- Pomona WRP (Pomona)
- La Cañada WRP (La Cañada-Flintridge)

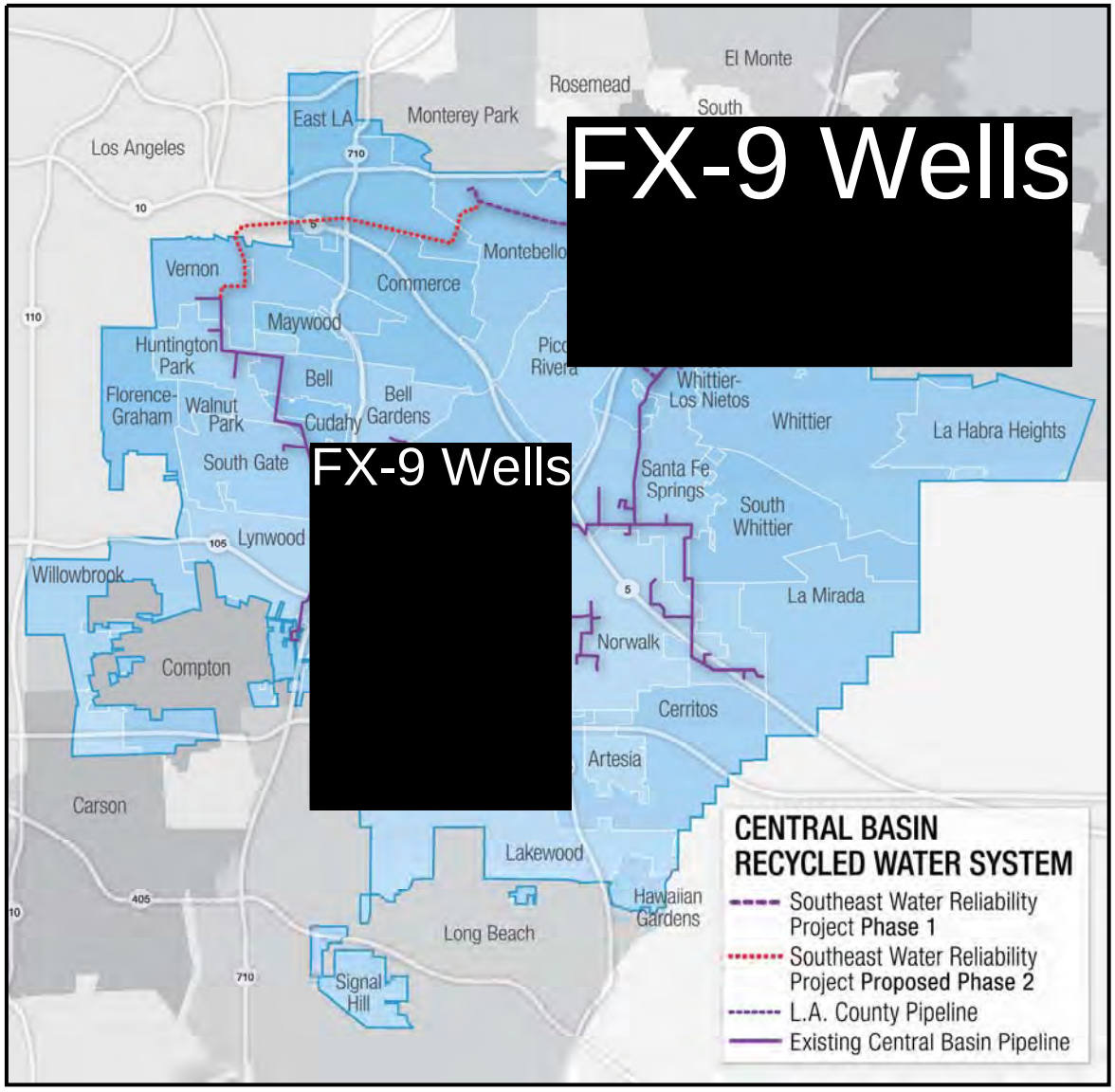
In FY 2007-08, the JOS produced a total effluent of 490,998 AFY. Of that total, 147,703 AFY met Title 22 standards for recycled water and 67,936 AFY (or 46.0%) was reused.

4.5.2 Current Recycled Water Planning

The City of Vernon has participated in the development of the Central Basin Water Recycling Master Plan. As a purveyor of both imported water and groundwater, the City has provided input on customer development, rates, facilities and impacts. The City has a current contract to purchase from CBMWD tertiary treated water, meeting all requirements of Title 22 of the California Code of Regulations.

In an effort to reduce reliance on imported water and conserve regional groundwater, CBMWD is moving forward with the Southeast Water Reliability Project (SWRP). SWRP will reduce current regional demand on imported water by 25% by delivering more than 5 billion gallons of recycled water annually to the many large industrial and irrigation sites in the Central Basin area.

Figure 4 – Central Basin Recycled Water Distribution System



4.5.3 Actual vs. Projected Recycled Water Demand for 2010

A comparison of the actual recycled water use in 2010 and the projected recycled water use as published in the 2005 Urban Water Management Plan is presented in Table 11. The discrepancy is due to the cancellation in the Southeast Regional Energy Project which had been anticipated to dramatically increase demand for recycled water as cooling tower process water.

Table 11 – Comparison of Previously Projected and Current Recycled Water Use

Use Type	2010 Actual Use (AFY)	2010 Projection from 2005 UWMP (AFY)
Geothermal/Energy	735.9	8,272

4.5.4 Potential Future Recycled Water Use

CBMWD, in coordination with its members, has taken the lead in recycled water development in the Central Basin, and the City defers to their documentation on potential uses, incentives and methods of encouragement regarding the continued development of recycled water.

Per the 2008 CBMWD Recycled Water Master Plan, Table 12 lists the potential recycled water demands by end user, address, demand, sector and type (if known). Specific demands associated with the Southeast Regional Energy Project, which was included in the 2008 CBMWD Recycled Water Master Plan, has been removed from this list. For planning purposes, one future power plant consuming 1,000 AFY of recycled water is projected to go online in Vernon in 2015. Also, potential demand associated with Tissurama Industries, Inc. has been removed from the list since this company has gone out of business subsequent to the release of the current Recycled Water Master Plan. The sum of the remaining potential recycled water demands is 5,722 AFY. Note that the Recycled Water Master Plan is currently being updated and is scheduled for release in mid-2011.

Table 12 – Potential Recycled Water Demands

End User	Address	Demand (AFY)	Sector	Type
Air Products & Chemicals, Inc	3305 E 26th St	22	Industrial	Chemical
All American Mfg Co.	2201 E 51st St	12	Industrial	Manufacturing
All West Iron, Inc.	2881 Saco St	13	Industrial	Metals
Allied Feather & Down Corp	2661 E 46th St	37	Industrial	Fabric
Aluminum Corp of America	3200 Fruitland Ave	13	Industrial	Metals
American Activewear, Inc	2807 Santa Fe Av	42	Industrial	Fabric
Ameriprid	5950 Alcoa Av	66	Industrial	Laundry
Arcadia, In	3225 Washington Blvd	31	Industrial	Manufacturing
A's Match Dyeing Co. Inc.	2522 E 37th St	556	Industrial	Fabric
Catalina Pacific Concrete	2026 E 27th St	15	Industrial	Concrete
Charleston Tex Inc.	2807 Santa Fe Av	798	Industrial	
Complete Garment, Inc	2121 E 38th St	93	Industrial	Fabric
D/K Environmental	3650 E 26th St	11	Industrial	Manufacturing
Darling International	2601 E 26th St	29	Industrial	Manufacturing
Dynix Textile Corp	4900 E 50th St	40	Industrial	Fabric
Flowserve Corporation	2300 Vernon Ave	21	Industrial	Chemical
Fortune Fashions Inc	4700 Boyle Ave	15	Industrial	Fabric
Fruitland Associates, LLC	3336 Fruitland Ave	6	Irrigation	
Hollander Home Fashions	4553 Seville Ave	47	Industrial	Fabric
JDS Finishing, Inc	5383 Alcoa Ave	510	Industrial	Fabric
Knit Heaven Inc.	2037 E 38th St	18	Industrial	Fabric
LA Washrack	4317 Downey Rd	41	Industrial	Laundry
Life Like Products, Inc.	2340 E 52nd St	14	Industrial	Manufacturing
Metro Wash & Laundry	6270 Boyle Ave	182	Industrial	Laundry
NI Industries, Inc	5215 Boyle Ave	346	Industrial	Metals
Owens Illinois, Inc.	2828 & 2910 E 50th St	26	Industrial	Manufacturing
Owens Illinois, Inc.	2923 Fruitland Ave	106	Industrial	Manufacturing
Pabco Paper Products Co.	4460 Pacific Blvd	183	Industrial	Paper
Pacific Fabric Finishing	3308 Fruitland Ave	34	Industrial	Fabric
Pacific Fabric Finishing	3314 Fruitland Ave	12	Industrial	Fabric

End User	Address	Demand (AFY)	Sector	Type
Pacific Fabric Finishing	5164 Alcoa Ave	14	Industrial	Fabric
Packaging Adv Corp	4633 Downey Rd	138	Industrial	Paper
Ramcorp Professional Services	5075 Pacific Blvd	53	Industrial	Cleaning
Robertson Ready Mix	3365 E 26th St	11	Industrial	Concrete
SC Vernon Business Park LLC	6033 Malburg Way	4	Irrigation	Office
Service Packing	3399 Vernon Ave	152	Industrial	Manufacturing
Service Packing	3425 Vernon Ave	18	Industrial	Manufacturing
Soft Touch Tissue	5353 Downey Rd	39	Industrial	Paper
Southland Box Co	4955 Maywood Ave	18	Industrial	Manufacturing
Standard Concrete Products, Inc.	2822 Soto St	11	Industrial	Concrete
Stone Blue, Inc	2501 E 28th St	529	Industrial	Laundry
TGI Fashion, Inc.	3270 E 26th St	62	Industrial	Fabric
Unipolo Fabric Corp	4900 E 50th St	482	Industrial	Fabric
US Filter Recovery Services	5375 Boyle Ave	25	Industrial	Manufacturing
Vernon Truck Wash, LLC	3308 Bandini Blvd	28	Industrial	Truck
Wimatex, Inc.	5801 E 2nd St	194	Industrial	Fabric
Zion Textiles, LLC	2300 E 52nd St	164	Industrial	Fabric
Total Potential Recycled Water Demand		**5,281**		

4.5.5 Incentives to Encourage Recycled Water Use

Per the CBMWD 2010 UWMP Draft, CBMWD's marketing efforts have been successful in changing the perception of recycled water from merely a conservation tool with minimal application to a business enhancement tool that lowers operating costs while increasing the reliability of the water supply per the following observations. Recycled water is:

- less expensive than potable water
- more reliable that imported water during a drought
- consistent with State-wide water supply and environmental goals

CBMWD is making funds available to assist customer with retrofitting on-site plumbing. Optimizing recycled water use in the Central Basin is one of the areas of focus of the CBMWD Recycled Water Master Plan Update.

4.5.6 Projected Recycled Water Use

Access to recycled water in Vernon is dependent on the completion of Phase 2 of the Southwest Water Reliability Project (SWRP). Implementation of this project is one of the areas of focus of the CBMWD Recycled Water Master Plan Update. Per CBMWD, "Using recycled water for commercial, industrial and landscape-irrigation uses instead of drinking water is an important component in Central Basin's conservation plan and will support the regional achievement of statewide water conservation targets for the year 2020."

Projected recycled water use is based on the following assumptions:

- completion of Phase 2 of the Southwest Water Reliability Project by 2015

- continued demand of 800 AFY at the Malburg Generation Station
- demand of 1,000 AFY at a new power plant beginning in 2015
- retrofit of on-site commercial and industrial plumbing by 2030
- 100% conversion of potential recycled water use (i.e. 1,760 AFY of additional recycled water use in 2020, 2025 and 2030)

Table 13 – Projected Recycled Water Use

Water Use	2015 (AFY)	2020 (AFY)	2025 (AFY)	2030 (AFY)	2035 (AFY)
Recycled Water	1,800	3,560	5,320	7,080	7,080

4.6 Future Water Projects

§10631(h) (Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

Per the Vernon Community Services and Water Department Five-Year Capital Improvement Plan for 2010-2015, there is only one planned project related to supply. A new well is planned to be completed by 2015 to replace a well abandoned in 2008. Construction of this new well is not expected to increase supply; rather, it is intended to improve flexibility in meeting peak demands.

All other future projects that may impact supply are being conducted at the wholesale and Regional Alliance levels.

Reference:
CWS, 2016

California Water Service

2015 Urban Water Management Plan

East Los Angeles District
June 2016

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List of Acronyms

AB	Assembly Bill
AF	Acre-Foot
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
BCR	Benefit-Cost Ratio
BMP	Best Management Practice
CEHTP	California Environmental Health Tracking Program
CASGEM	California Statewide Groundwater Elevation Monitoring Program
CII	Commercial, Industrial, Institutional, water use sectors
CIMIS	California Irrigation Management Information System
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
DMMs	Demand Management Measures
DOF	Department of Finance
DWR	Department of Water Resources
eARDWP	Electronic Annual Reports to the Drinking Water Program (SWRCB)
ETo	Reference Evapotranspiration
GIS	Geographic Information System
GPCD	Gallons per Capita per Day
IOU	Investor-Owned Utility
IRWM	Integrated Regional Water Management
LAFCO	Local Agency Formation Commission
MGD	Million Gallons Per Day
MOU	Memorandum of Understanding Regarding Urban Water Conservation
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PWS	Public Water System
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SB X7-7	Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009
SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
RUWMP	Regional Urban Water Management Plan
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WARN	Water/Wastewater Agency Response Network
WDR	Waste Discharge Requirement
WRR	Water Recycling Requirement
WSCP	Water Shortage Contingency Plan

Chapter 1
Introduction and Overview

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP), the relationship of this plan to the California Water Code (CWC), the relationship of this plan to other local and regional planning efforts, and how this plan is organized.

This chapter contains the following sections:

1.1 Background and Purpose

1.2 Urban Water Management Planning and the California Water Code

1.3 Relation to Other Planning Efforts

1.4 Plan Organization

1.1 Background and Purpose

California Water Service Company (Cal Water) is an investor-owned public utility supplying water service to 1.7 million Californians through 435,000 connections. Its 24 separate water systems serve 63 communities from Chico in the North to the Palos Verdes Peninsula in Southern California. California Water Service Group, Cal Water's parent company, is also serving water to communities in Washington, New Mexico and Hawaii. Rates and operations for districts located in California are regulated by the California Public Utilities Commission (CPUC). Rates are set separately for each of the systems.

Cal Water incorporated in 1926 and has provided water service to East Los Angeles and portions of Commerce, Monterey Park, Vernon, and Montebello since 1928.

The UWMP is a foundational document and source of information about East Los Angeles District's historical and projected water demands, water supplies, supply reliability and vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document by Cal Water for water supply and system planning
- Source data on population, housing, water demands, water supplies, and capital improvement projects used in
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities,
    - General Plans prepared by cities and counties,

- Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), State Water Resources Control Board (State Board or Board), or other state agencies.

UWMPs are updated every five years. The last update was completed in 2010. This document is an update to the 2010 UWMP and carries forward information from that plan that remains current and is relevant to this plan. Although this plan is an update to the 2010 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to file this plan with the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020. Colloquially known as 20x2020, the Water Conservation Act of 2009 (also referred to as SB X7-7) required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers are required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this plan lists each of these requirements and where in the plan they are addressed.

1.3 Relation to Other Planning Efforts

This plan provides information specific to water management and planning by the East Los Angeles District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these plans include city and county General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, Groundwater Management Plans and others.

This plan is informed by and helps to inform these other planning efforts. In particular, this plan utilizes information contained in city and county General Plans and local and regional water resource plans to the extent data from these plans is applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in 2015 UWMP Guidebook.

Chapter 1 - Introduction and Overview

Chapter 2- Plan Preparation

Chapter 3 - System Description

Chapter 4 - System Water Use

Chapter 5- Baselines and Targets

Chapter 6 - System Supplies

Chapter 7— Water Supply Reliability

Chapter 8 – Water Shortage Contingency Planning

Chapter 9 — Demand Management Measures

Chapter 10 — Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This plan also includes other tables, figures, and maps, to augment the set developed by DWR. The plan notes if a table, figure, or map is part of DWR's standardized set or supplemental to it.

Chapter 2
Plan Preparation

This chapter discusses the type of UWMP East Los Angeles District is preparing and includes information that will apply throughout the plan. Coordination and outreach during the development of the plan is also discussed.

This chapter includes the following sections:

2.1 Basis for Preparing a Plan

2.2 Regional Planning and Reporting

2.3 Units of Measure

2.4 Coordination and Outreach

2.1 Basis for Preparing a Plan

Per CWC §10617, East Los Angeles District is an urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. It is therefore obligated under CWC §10621(d) to update and submit its 2015 UWMP to DWR by July 1, 2016.

East Los Angeles District is an urban retail water supplier, as defined by CWC §10608.12. East Los Angeles District does not provide water at wholesale.

East Los Angeles District operates the Public Water Systems (PWS) listed in Table 2-1. Public Water Systems are the systems that provide drinking water for human consumption and these systems are regulated by the State Water Resources Control Board (Board), Division of Drinking Water. The Board requires that water agencies report water usage and other information via the electronic Annual Reports to the Drinking Water Program (eARDWP). The information provided in this UWMP is consistent with the data reported in the eARDWP. PWS data reported to the Board is used by the state to determine whether or not a retail supplier has reached the threshold (3,000 or more connections or 3,000 acre-feet of water supplied) for submitting an UWMP.

Table 2-1: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015 (AF)
1910036	East Los Angeles	26,096	14,268
	Total	**26,096**	**14,268**

2.2 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. Cal Water participates in regional water resources planning initiatives throughout California in the regions in which its 25 water districts are located. In the region in which the District is located, groundwater resources are overseen by the California Department of Water Resources (DWR), which serves as Water Master for the Central Basin Adjudication. Groundwater resources are conjunctively managed with retail water suppliers, including East Los Angeles District, by the Water Replenishment District of Southern California (WRDSC) which was created in 1959, largely out of cooperation between the West Coast Basin Water Association and the Central Basin Water Association, with the directive to facilitate artificial replenishment of groundwater as a means of eliminating overdraft and halting seawater intrusion. Regional imported water supplies are conjunctively managed by Central Basin Municipal Water District and the Metropolitan Water District of Southern California. Cal Water coordinates its water resources planning with each of these entities.

2.3 Individual or Regional Planning and Compliance

Urban water suppliers may elect to prepare individual or regional UWMPs (CWC §10620(d)(1)). East Los Angeles District is preparing an individual UWMP.

Urban retail water suppliers may report on the requirements of SB X7-7 (2009 California Conservation Act) individually or as a member of a "Regional Alliance." As described in Chapter 5, East Los Angeles District is a member of a Regional Alliance and this UWMP provides information on the District's progress towards meeting its SB X7-7 water conservation targets both as an individual urban retail water supplier and as a member of a Regional Alliance.

Table 2-2: Plan Identification	
☑	Individual UWMP
☐	Regional UWMP
Notes: East Los Angeles District is a member of a Regional Alliance. Chapter 5 provides information on the District's progress towards meeting its water conservation targets under SB X7-7 both as an individual urban retail water supplier and as a member of its Regional Alliance.	

2.4 Fiscal or Calendar Year and Units of Measure

Annual volumes of water reported in this UWMP are measured in acre-feet (AF) and are reported on a calendar year basis. Water use and planning data reported in this UWMP for calendar year 2015 cover the full twelve months of the year, as required by the UWMP Guidelines. Table 2-3 summarizes the units of measure used throughout this UWMP.

Table 2-3: Agency Identification	
Name of Agency	California Water Service: East Los Angeles District
Select one or both	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure	
☑	Acre Feet (AF)
☐	Million Gallons (MG)
☐	Hundred Cubic Feet (CCF)

2.5 Coordination and Outreach

Coordination with other water suppliers, cities, counties, and other community organizations in the region is an important part of preparing an UWMP (CWC §10620; CWC §10642). This section identifies the agencies and organizations East Los Angeles District sought to coordinate with during preparation of this plan.

2.5.1 Wholesale and Retail Coordination

Urban retail water suppliers relying on one or more wholesalers for water supply are required to provide these wholesalers with information regarding projected water supply

and demand. East Los Angeles District provided information regarding projected water supply and demand to the wholesale water suppliers listed in Table 2-4.

Table 2-4: Retail: Water Supplier Information Exchange
East Los Angeles District has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
Central Basin Municipal Water District

2.5.2 Coordination with Other Agencies and the Community

East Los Angeles District coordinated with cities, counties, and other community organizations during preparation of this UWMP. Cal Water provided notice to these entities and the communities it serves 60 days prior to the public hearing it held on June 3, 2016, to present the draft of the UWMP, address questions, and receive comments. Cities and counties receiving the public hearing notification from East Los Angeles District as required per CWC §10621 (b) are listed in Table 10-1 in Chapter 10 of this plan.

Chapter 3
System Description

This chapter provides a description of East Los Angeles District's water system and the service area, including climate, population, and demographics, to help in understanding various elements of water supply and demand.

This chapter includes the following sections:

3.1 Service Area General Description

3.2 Service Area Map(s)

3.3 Service Area Climate

3.4 Service Area Population and Demographics

3.1 Service Area General Description

The East Los Angeles District is located east of downtown Los Angeles with a western boundary approximately three miles from LA's Civic Center. Figure 3-1 shows a general location map of the district. The service area encompasses a large section of unincorporated Los Angeles County known as East Los Angeles, and portions of the cities of Montebello, Commerce, Vernon, and Monterey Park. The system is bounded on the west and north by the City of Los Angeles, on the north by the city of Monterey Park, on the east by the city of Montebello, and on the south by the cities of Commerce, Bell, and Vernon. A portion of the District's southern boundary is the Los Angeles River.

The Los Angeles Department of Water and Power (LADWP) provides retail water service to Los Angeles. The City of Monterey Park serves Monterey Park. San Gabriel Valley Water Company, the Montebello Land and Water Company, the South Montebello Irrigation District, and the City of Montebello Water Department serve Montebello. Commerce and Vernon are served by their own City Water Departments. Cal Water operates the water system for Commerce under contract with the city.

Major transportation links in the district include the Santa Ana Freeway (Interstate 5), Long Beach Freeway (Interstate 710), San Bernardino Freeway (Interstate 10), Pomona Freeway (State Highway 60), and Whittier Boulevard (State Highway 72). The Metro Gold Line operates in the district and four new stops were added in 2009. The Union Pacific Railroad and the Atchison, Topeka, and Santa Fe Railroad both have large rail yards within the District's service area. Los Angeles International Airport (LAX) is about fifteen miles west of the heart of the District.

Figure 3-1. General Location of East Los Angeles District

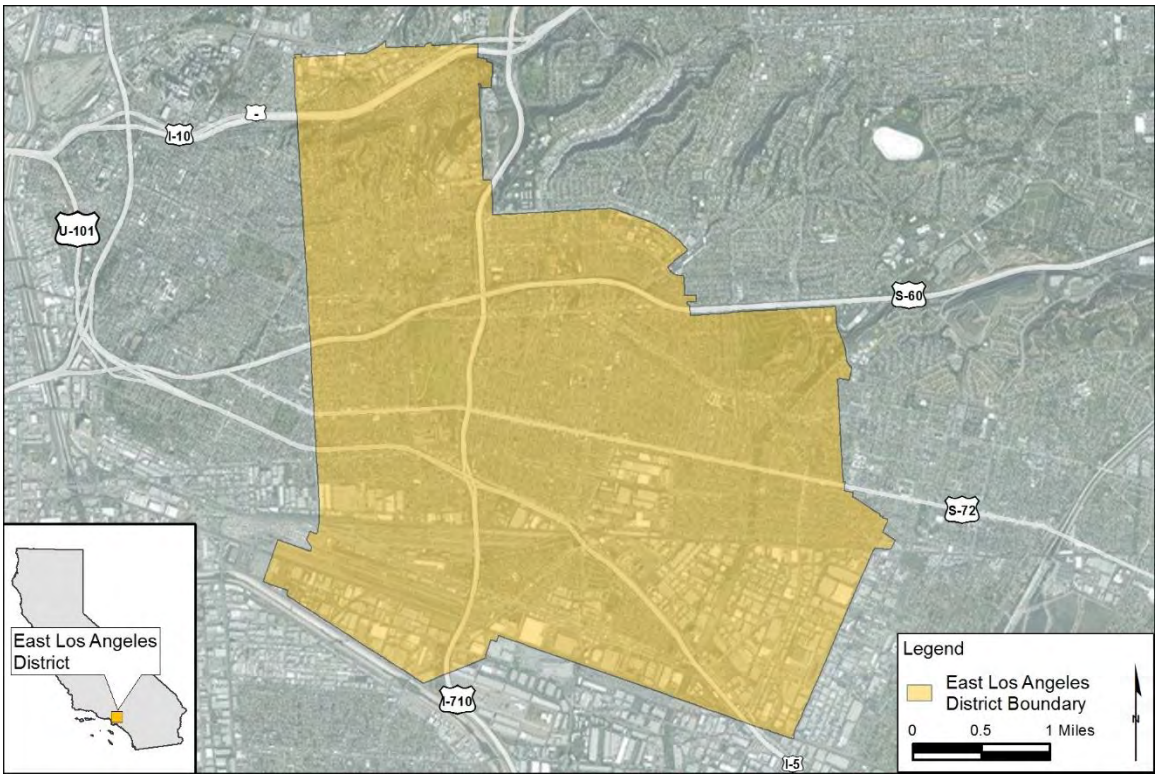
The service area is built upon the uplifted Repetto Hills and spreads down on to the alluvium of the Los Angeles coastal plain. Major geological features of the region include the Whittier Fault, which is an extension of the Elsinore Fault system, and the Workman Mill Fault. These faults are responsible for the uplift of base rock that forms the Puente Hills and Repetto Hill on which the district is built. The Newport-Inglewood Fault, which has been identified as one of the most dangerous faults in the Los Angeles area, lies ten miles southwest of the District. A major earthquake on either of these faults could disrupt water service.

Cal Water has provided water utility services in the East Los Angeles area since 1928. Water served by the District comes from a combination of local groundwater and surface water purchased from Central Basin MWD, which is imported from the Colorado River and the State Water Project. The District operates 10 groundwater wells, 17 storage tanks, 26 booster pumps, four imported water connections, and 260 of miles of pipeline. Over the last five years, the District delivered an average of 19.5 million gallons of water per day to more than 26,000 service connections.

3.2 Service Area Maps

A detailed service area map is provided in Appendix E. Figure 3-2 shows the District's service area boundaries.

Figure 3-2. East Los Angeles Service Area Boundaries



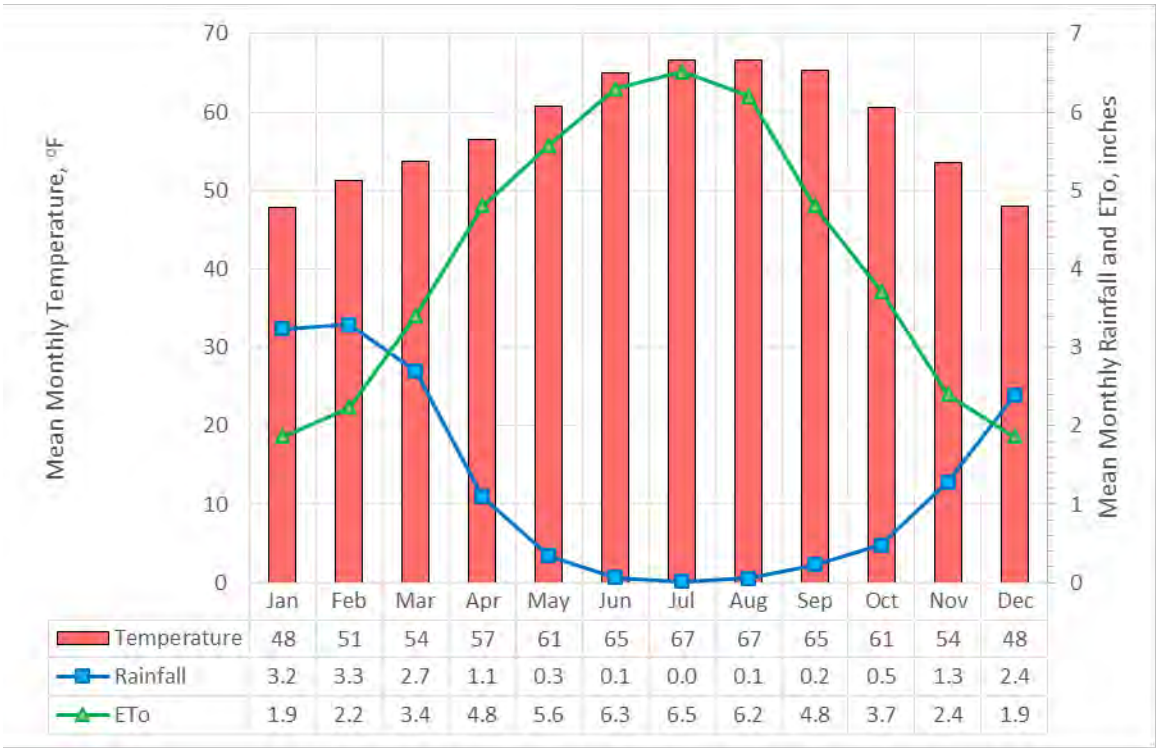
3.3 Service Area Climate

The climate for East Los Angeles District area is mild with warm dry summers and cool winters. The majority of precipitation falls during late autumn, winter, and spring. Figure 3-3 displays monthly averages for rainfall, reference evapotranspiration (ETo), and daily air temperature. Additional climate data is provided in Appendix F, worksheet 13. Rainfall and temperature data are obtained from the PRISM Climate Group.[1] ETo values are from the California Irrigation Management Information System (CIMIS).[2]

On average, the District receives 15 inches of rainfall, annually. ETo averages 50 inches, annually. Annual rainfall is 31 percent of ETo, on average. Nearly all irrigation requirements during the summer months are met with District water sources due to the lack of rainfall in the region. Annual rainfall in East Los Angeles District also is highly variable, as shown in Figure 3-4, and has been below average in nine of the last ten years. Calendar year 2013 was the driest year on record, receiving just 24 percent of average rainfall.

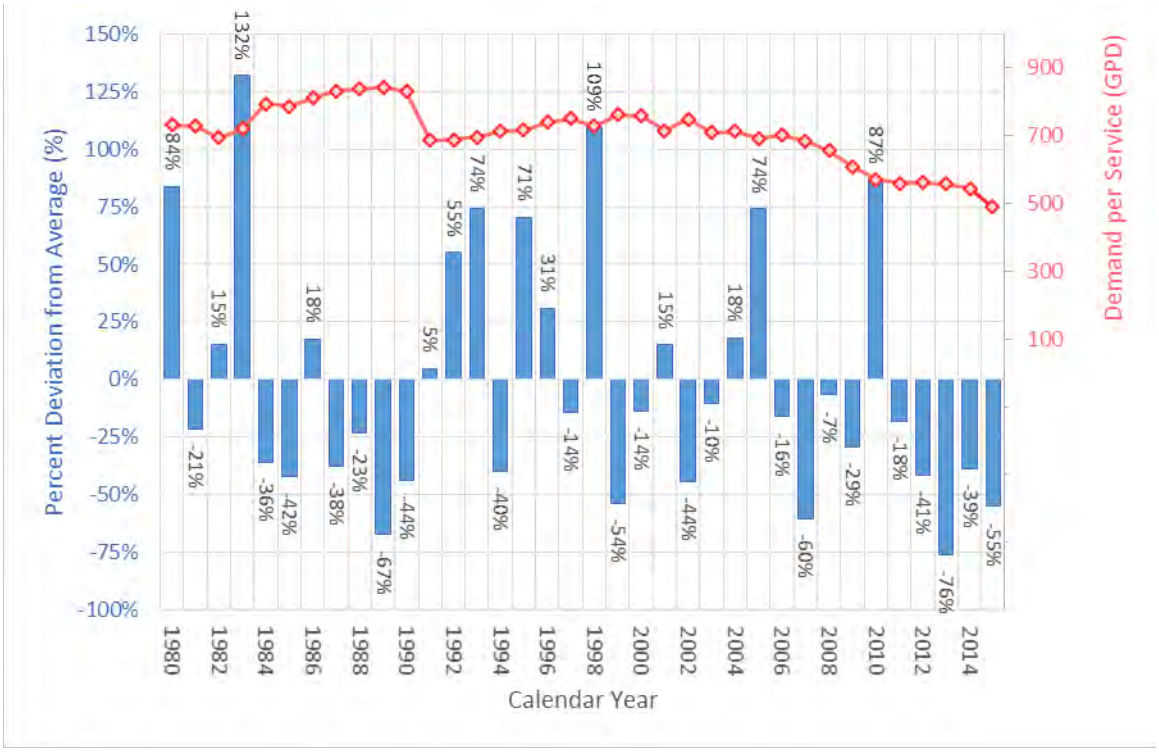
[1] www.prism.oregonstate.edu.
[2] CIMIS Zones Map, Zone 6.

Figure 3-3. Average Monthly Temperature, Rainfall, and ETo



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature	48	51	54	57	61	65	67	67	65	61	54	48
Rainfall	3.2	3.3	2.7	1.1	0.3	0.1	0.0	0.1	0.2	0.5	1.3	2.4
ETo	1.9	2.2	3.4	4.8	5.6	6.3	6.5	6.2	4.8	3.7	2.4	1.9

Figure 3-4. Annual Rainfall Deviation from Average



3.3.1 Climate Change

Potential impacts of climate change on District water demands and supplies are discussed in Chapters 4 (System Water Use), 6 (System Supplies), and 7 (Water Supply Reliability Assessment). Here it is noted that climate change is expected to bring higher average temperatures and greater variability in weather, with the potential for more frequent and deeper droughts.

The National Climatic Data Center (NCDC) has established 11 climate regions within California. Each region is defined by unique characteristics, and is shown in Figure 3-5. The East Los Angeles District is located in the South Coast Region (region H on the map). The South Coast Region has experienced a general warming trend in the last several decades, as shown in Figure 3-6. Since 1895, maximum and minimum temperatures have increased at a rate of 1.94 °F and 3.37 °F per 100 years, respectively. More recently, since 1975, maximum and minimum temperatures have increased at a rate of 1.44 °F and 3.23 °F per 100 years, respectively.

Figure 3-5. Climate Regions of California

A. North Coast Region
B. North Central Region
C. Northeast Region
D. Sierra Region
E. Sacramento-Delta Region
F. Central Coast Region
G. San Joaquin Valley Region
H. South Coast Region
I. South Interior Region
J. Mojave Desert Region
K. Sonoran Desert Region

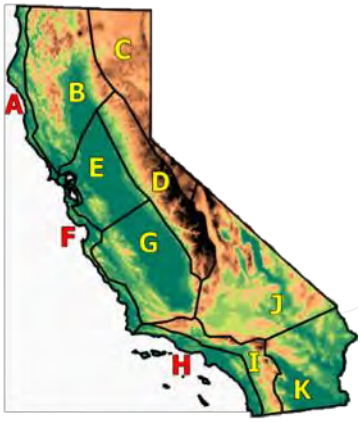
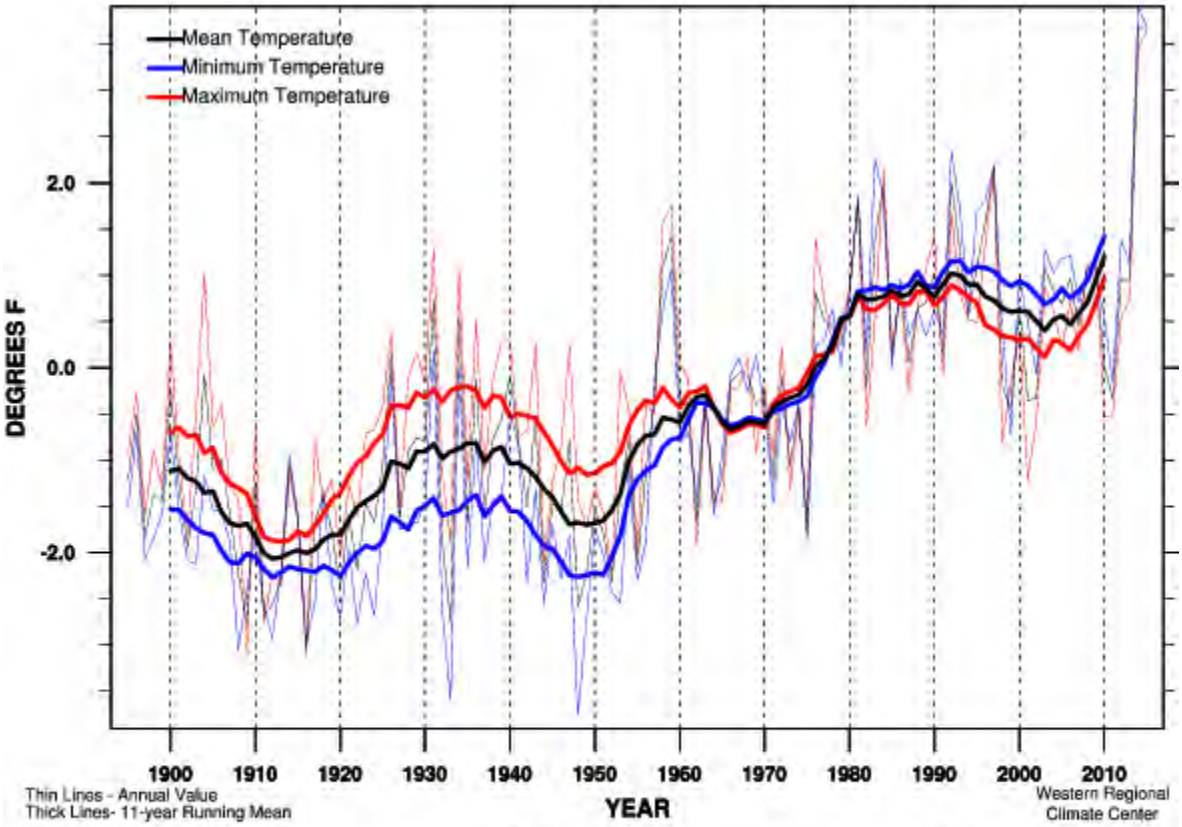


Figure 3-6. Temperature Departure, South Coast Region



	Maximum Temperature	Minimum Temperature
Linear Trend 1895-present	+ 1.94 (± 0.52) °F/100yr	+ 3.37 (± 0.52) °F/100yr
Linear Trend 1949-present	+ 3.16 (± 1.32) °F/100yr	+ 5.19 (± 1.22) °F/100yr
Linear Trend 1975-present	+ 1.44 (± 2.85) °F/100yr	+ 3.23 (± 2.62) °F/100yr

3.4 Service Area Population and Demographics

Cal Water estimates the service area population was 150,729 in 2015. Service area population has been growing slowly at an annual rate of 0.1 percent for the past 15 years. Between the 2000 and 2010 Censuses, it grew at an average annual rate of 0.05 percent. Between 2010 and 2015, population growth increased to an average annual rate of 0.19 percent per year. Some of the increase in population growth over this period was caused by a reclassification of commercial accounts to multi-family accounts which started in 2011. At the time of finalizing this plan, this account reclassification is still ongoing and will continue to impact the population estimates for the service area. Going forward, service area population is projected to increase at a rate of 0.41 percent annually averaged through the 2040 planning horizon. Because more commercial accounts are

expected to get reclassified to multi-family, the population estimates will need to be recalculated once 2020 Census data is available.

To estimate current service area population, Cal Water uses MARPLOT and LandView 5 software to intersect District service area boundaries with Census Blocks from the 2000 and 2010 Censuses. This yields estimates of the number of housing units and population within each Census Block in the District for 2000 and 2010. From these data, Cal Water estimates the total population and the average number of persons per housing unit in the District. Cal Water applies the average number of persons per housing unit to the number of housing units served to calculate service area population in non-Census years.

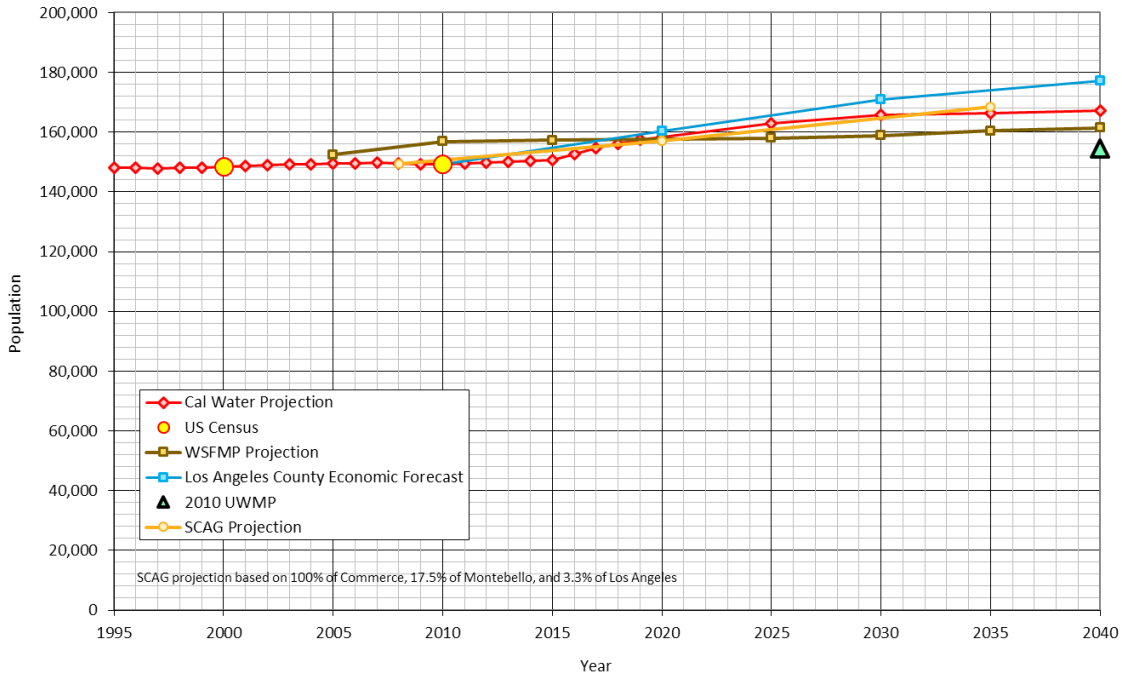
Between the 2000 and 2010 Censuses, the average number of persons per household remained decreased slightly from 3.88 to 3.83. The projection of future population is based on this lower housing unit density. Projected service area population is given in Table 3-1.

Table 3-1: Population - Current and Projected

	2015	2020	2025	2030	2035	2040
Population Served	150,729	158,497	162,982	165,790	166,437	167,087

Cal Water's current population projection for East Los Angeles District is compared in Figure 3-7 to the projections made in its 2009 Water Supply and Facility Master Plan (WSFMP) and 2010 UWMP. The figure compares the Cal Water projections to forecasts based on population growth rate projections published in California Department of Transportation's (DOT) Los Angeles County Economic Forecast and the 2012 Southern California Association of Governments (SCAG) population projections for the Cities of Commerce, Montebello, and Los Angeles.

Figure 3-7. Population Projection Comparison



Chapter 6
System Supplies

This chapter describes and quantifies the sources of water available to the East Los Angeles District. The water supply for the customers of the East Los Angeles District is a combination of imported purchased water and groundwater.

Cal Water's Allowed Pumping Allocation (APA) of 11,774 AFY is set at 80 percent of the adjudicated right, which is based on the safe yield of the groundwater basin. In the past, Cal Water did not have the ability to produce and deliver this quantity. In 2014, a new well was constructed which greatly increased the pumping capacity for the District. In 2015, nearly 9000 AF of groundwater was produced, as compared to 5000 AF in the past. The remaining groundwater is leased to other entities. Up to 60 percent of the unused APA can also be carried over into the following year. Once Cal Water's groundwater production reaches the APA, carryover will no longer be available.

The remaining supply not provided by groundwater or recycled water will come from imported water purchased from Central Basin Municipal Water District (CBMWD).

6.1 Purchased Water

In 2015, purchased imported water served approximately 37 percent of the District's water requirements. The East Los Angeles District purchases imported water from the CBMWD, one of the twenty-seven member agencies of the Metropolitan Water District of Southern California (MWD). MWD imports water through either the Colorado River Aqueduct, which is owned by MWD, or the California Aqueduct, a facility of the State Water Project, which is owned and operated by the California Department of Water Resources. CBMWD serves as the regional water wholesaler.

Cal Water signed a purchase agreement with CBMWD effective January 1, 2008 which expired on December 31, 2014 and had a base allocation of 19,533 AFY. CBMWD has elected to not require a new purchase agreement at this point, Cal Water has met our purchase requirement prior to 2012.

Delivery of imported water is made through three CBMWD service connections to the MWD distribution feeder network. The total rated capacity of these three service connections is 22,500 gallons per minute (gpm), or 32.4 mgd.

6.2 Groundwater

Groundwater extracted from the Central Basin's Lynwood and Silverado aquifers met about 63 percent of the District's water demand in 2015. This percentage is expected to

increase in the future because of the new well that has been placed on-line. Other aquifers may be used depending on the depth of perforations in specific wells.

6.2.1 Basin Description

The Central Subbasin occupies a large portion of the southeastern part of the Coastal Plain of Los Angeles Groundwater Basin. This subbasin is commonly referred to as the Central Basin and is bounded on the north by a surface divide called the La Brea High, and on the northeast and east by emergent less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills. The southeast boundary between Central Basin and the Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift. The Los Angeles and San Gabriel Rivers drain inland basins and pass across the surface of the Central Basin on their way to the Pacific Ocean.

Additional details about the basin are given in the DWR's Groundwater Bulletin 118[8].

6.2.2 Groundwater Management

The Central Basin is an adjudicated groundwater basin with a total annual Allowed Pumping Allocation (APA) of 217,367 acre-feet. This APA is set at 80 percent of the adjudicated rights established under the judgment. This limitation was imposed on all basin pumpers due to the historically severe overdraft condition of the basin. The judgment permits an annual carry-over of up to 60 percent of the APA and permits over-extraction of up to 20 percent provided the over-extraction is off-set by next year's APA or future leases. As a result, annual allowable extractions vary as the allowable carry-over amount fluctuates. The judgment contains provisions for an exchange pool and for the leasing or transfer of adjudicated rights between parties of the judgment.

Seawater intrusion has been a concern in the Central Basin since the late 1940s. The intense uncontrolled pumping of groundwater during the 40s and 50s created an overdraft in the basin that reduced the water level to as much as 100 feet below sea level. The threat of losing the basin to salt water prompted the formation of the Water Replenishment District (WRD). WRD is responsible for the acquisition of supplemental water supplies. The installation of the Alamitos Barrier in Long Beach provides protection

[8] California's Ground Water Bulletin 118, 2003; San Francisco Hydrologic Region; Livermore Valley Groundwater Basin; Groundwater Basin Number: 2-10.
http://www.water.ca.gov/pubs/groundwater/bulletin_118/california's_groundwater__bulletin_118_-_update_2003_/bulletin118_entire.pdf

against sea water intrusion in the Central Basin. The Los Angeles County Department of Public Works operates this barrier while the Water Replenishment District purchases the water used in the facility.

The East Los Angeles District exercises an annual adjudicated right of 14,717 AF, which has been limited under the judgment to an Allowed Pumping Allocation of 11,774 AF or 80 percent of the adjudicated right. Cal Water has become more active in leasing its annual unused water rights.

As the regional groundwater management agency for two of the most utilized groundwater basins in the state of California, The Water Replenishment District of Southern California (WRD) plays an integral role in overall water resource management in southern Los Angeles County. The WRD manages groundwater for nearly four million residents in 43 cities of southern Los Angeles County. The 420 square mile service area uses about 250,000 acre-feet of groundwater per year, which equates to nearly 40 percent of the total demand for water. WRD is a public agency responsible for eliminating annual overdraft, reducing historical overdraft in both the Central and West Coast Basins, and protecting these basins from seawater intrusion or other contamination. In addition, WRD manages various groundwater quality cleanup programs.

To finance its designated responsibilities, WRD levies a Replenishment Assessment on every acre-foot of groundwater produced in the Central and West Coast Basins. A copy of the 2003 WRD Strategic Plan is included in Appendix G.

Except for the capture and recharge of stormwater runoff, which is funded by the Los Angeles County Department of Public Works as part of a long standing inter-agency agreement, all other water used for replenishing the groundwater of the Central and West Coast Basins is funded by WRD through the Replenishment Assessment. The principle mechanism for recharge in the Central Basin is through percolation of water applied to surface spreading ponds in the Montebello Forebay. Injection of water into the seawater intrusion barriers and in-lieu replenishment contributes to this effort. The sources of water used for percolation include imported water purchased through CBMWD, recycled water purchased from the Los Angeles County Sanitation District, and storm runoff flowing down the Rio Hondo and San Gabriel Rivers.

WRD is the designated Watermaster for the Central Basin Adjudication and, in that capacity, accounts for all groundwater in the basin reporting annually on groundwater production and related groundwater-use transactions.

WRD's Annual Summary of Watermaster Service reports the groundwater status in the basin. This summary includes figures depicting lines of equal water level elevation in the fall and spring of each year, lines of equal change in water level, and charts showing

historical fluctuation of water level elevation in wells throughout the basin. These references clearly indicate that, since the reduction in pumping began in 1962 followed by the final adjudication in 1965, groundwater levels in the Central Basin have risen as much as one hundred feet. However, groundwater elevations in the pressure area close to the coast remain below sea level, requiring the maintenance of seawater intrusion barriers and continued replenishment operations. Data for the last several years indicates that increased pumping has occurred in the basin as imported supplies were diminished due to drought conditions.

Sustainable Groundwater Management Act

Background – On September 16, 2014, Governor Brown signed into law Assembly Bill 1739, Senate Bill 1168, and Senate Bill 1319 (AB-1739, SB-1168, and SB-1319). This three-bill legislative package is known collectively as the Sustainable Groundwater Management Act (SGMA). SGMA was amended in the later part of 2015 by Senate Bill 13, Senate Bill 226 and Assembly Bill 1390 to provide clarity to the original law and guidance on groundwater adjudications. This new legislation defines sustainable groundwater management as the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results" [Water Code § 10721(u)]. The legislation defines "undesirable results" to be any of the following effects caused by groundwater conditions occurring throughout the basin [Water Code § 10721(w) (1-6)]:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply;
- Significant and unreasonable reduction of groundwater storage;
- Significant and unreasonable seawater intrusion;
- Significant and unreasonable degraded water quality;
- Significant and unreasonable land subsidence;
- Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

The legislation provides for financial and enforcement tools to carry out effective local sustainable groundwater management through formation of Groundwater Sustainability Agencies (GSA's) consisting of local public agencies, water companies regulated by the CPUC and mutual water companies. The legislation requires that GSA's within High and Medium Priority basins under the California Statewide Groundwater Elevation Monitoring (CASGEM) program subject to critical conditions of overdraft prepare and

submit a Groundwater Sustainability Plan (GSP) for the basin by January 31, 2020 [Water Code § 10720.7(a) (1)], and requires GSA's in all other groundwater basins designated as High or Medium Priority basins to prepare and submit a GSP by January 31, 2022 [Water Code § 10720.7 (a) (2)]. Following State approval, the basin would thereafter be managed under the GSP. The legislation does not require adjudicated basins, such as the one from which the East Los Angeles District draws groundwater, to develop GSPs, but they are required to report their water use.

Intended Outcomes and Benefits – The key intended outcomes and benefits of SGMA are numerous, and include:

- Advancement in understanding and knowledge of the State's groundwater basins and their issues and challenges;
- Establishment of effective local governance to protect and manage groundwater basins;
- Management of regional water resources for regional self-sufficiency and drought resilience;
- Sustainable management of groundwater basins through the actions of GSA's, utilizing State assistance and intervention only when necessary;
- All groundwater basins in California are operated to maintain adequate protection to support the beneficial uses for the resource;
- Surface water and groundwater are managed as "a Single Resource" to sustain their interconnectivity, provide dry season base flow to interconnected streams, and support and promote long-term aquatic ecosystem health and vitality;
- A statewide framework for local groundwater management planning, including development of sustainable groundwater management best management practices and plans;
- Development of comprehensive and uniform water budgets, groundwater models, and engineering tools for effective management of groundwater basins;
- Improved coordination between land use and groundwater planning;
- Enforcement actions as needed by the SWRCB to achieve region-by-region sustainable groundwater management in accordance with the 2014 legislation.

To assist in attaining the above outcomes, the California Department of Water Resources (DWR) will provide GSA's with the technical and financial assistance necessary to sustainably manage their water resources. The benefits of these outcomes include:

- A reliable, safe and sustainable water supply to protect communities, farms, and the environment, and support a stable and growing economy;

- Elimination of long-term groundwater overdraft, an increase in groundwater storage, avoidance or minimization of subsidence, enhancement of water flows in stream systems, and prevention of future groundwater quality degradation.

Cal Water Position – Cal Water's groundwater basin philosophy continues to be to work collaboratively with all stakeholders in the basins where we operate and to do what is best for the groundwater basin including the sharing of burden(s) and benefits on an equitable basis with said stakeholders. Cal Water recognizes and deeply supports the goals, objectives, and intended outcomes of the SGMA. Moreover, the company recognizes the numerous challenges of the legislation along a variety of technical, legal, political, and financial/economic dimensions, particularly when the geographical diversity of the Company's service territory is considered. None-the-less, Cal Water intends to take an active role in the local and state-wide management of groundwater resources over the next 5-25+ years by fully supporting and participating in the principal edicts of SGMA. A number of specific steps that the Company intends to take with respect to this position and role include (among others):

- Outreach to public agencies to ensure that the Company's presence, rights and interests, as well as historical and current resource management concerns are honored/incorporated within the GSA and GSP formulation process(es);

- Outreach to applicable local and regulatory agencies to ensure that the Company is at full participation, while also meeting the requirements and expectations set forth by SGMA;

- The enhanced use of digital/electronic groundwater monitoring equipment and other new technology aimed at measuring withdrawal rates, pumping water levels, and key water quality parameters within the context of day-to-day operations;

- Full participation in the development of GSP's and formulation of groundwater models being constructed in basins where the Company has an operating presence;

- Full participation in individual and/or joint projects aimed at mitigating seawater intrusion and other "undesirable results";

- Inclusion of sound groundwater management principles and data in all applicable technical reports, studies, facility master plans, and urban water management plans (including this 2015 update), particularly as these undertakings relate or pertain to water resource adequacy and reliability;

- Inclusion of sound groundwater management principles and data in all general rate case (GRC) filings and grant applications to ensure that resource management objectives remain visible and central to Cal Water's long-term planning/budgeting efforts;

SGMA related information in the 2015 UWMP – The Urban Water Management Plans prepared by Cal Water over the past decade, including the 2015 update, already contain many of the elements required by SGMA and thus already serve as a road map toward the implementation of SGMA and the basin GSP. The UWMP addresses all water supply sources including groundwater. SGMA's specific concerns with groundwater are addressed as follows:

- Chapter 4 addresses Cal Water's historic and future customer growth and water demand in the basin.

- Chapter 6 addresses Cal Water's historic and future water supplies in the basin.

- Chapter 6 addresses the potential actions Cal Water will need to take to develop additional water supplies to maintain supply reliability.

- Chapter 6 discusses water quality and necessary actions to protect and decontaminate water supplies.

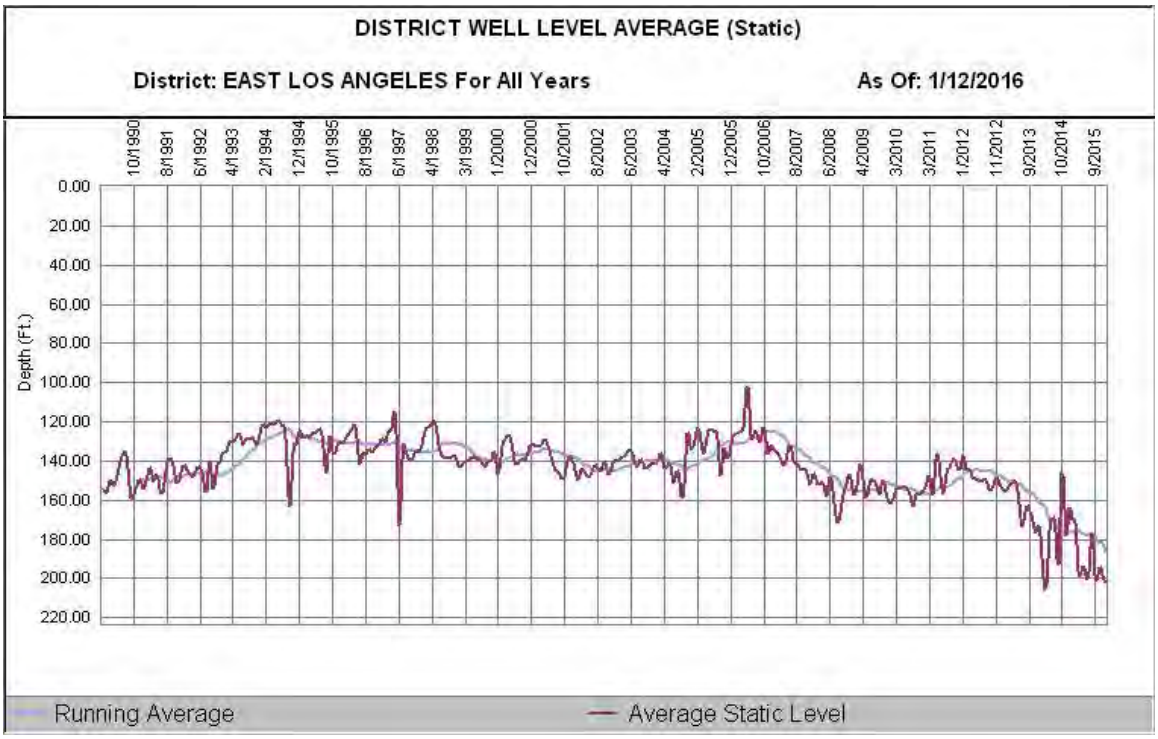
- Chapter 6 addresses supplementing water supplies with recycled water.

- Chapter 7 addresses the projected ability of the combined supply, including groundwater, to reliable serve customer demands under normal, single-dry-year and multiple-dry-year conditions.

6.2.3 Overdraft Conditions

District well levels since 1990 are shown in Figure 6-1. Water levels were fairly stable through about 2005, but have fallen significantly since then. This is due largely to dry conditions which resulted in smaller volumes of recharge and increased demands on the basin.

Figure 6-1: District Well Level Average (Static)



6.2.4 Historical Pumping

The amount of groundwater pumped over the last five years is shown in Table 6-1.

Table 6-1 Retail: Groundwater Volume Pumped (AF)						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Central Basin	5,433	5,617	5,533	5,518	8,972
Total		**5,433**	**5,617**	**5,533**	**5,518**	**8,972**

6.3 Surface Water

The East Los Angeles District does not impound or divert surface water as a means to meet supply requirements. Cal Water does not have any surface water rights in the area. However, surface water is the source for the purchased water imported by MWD.

6.4 Stormwater

There are no plans to divert stormwater for beneficial use in the East Los Angeles District. As described above, the Los Angeles County Department of Public Works does fund the capture and recharge of stormwater runoff.

6.5 Wastewater and Recycled Water

The recycling of wastewater offers several potential benefits to Cal Water and its customers. Perhaps the greatest of these benefits is to help maintain a sustainable groundwater supply either through direct recharge, or by reducing potable supply needs by utilizing recycled water for appropriate uses (e.g., industrial, landscape irrigation) now being served by potable water.

Cal Water will begin serving recycled water in its service area once the recycled pipeline extension is constructed. A maximum projected demand of approximately 800 AFY is anticipated.

6.5.1 Recycled Water Coordination

The following is a listing of the wastewater agencies and type of treatment that the Cal Water District relies on for wastewater treatment and recycled water:

- Los Angeles County Sanitation District
- Central Basin Municipal Water District

6.5.2 Wastewater Collection, Treatment, and Disposal

The Los Angeles County Sanitation Districts (LACSD) owns, operates, and maintains the sewer system consisting of gravity sewers, pumping stations, and force mains to collect wastewater from East Los Angeles District service area (Sanitation District #2 and 23). The collected wastewater is discharged to trunk sewers and interceptors owned and operated by the LACSD. Although this plant does not currently produce recycled water, it is being considered as a potential source of recycled water in the future.

The Joint Water Pollution Control Plant is the largest of the LACSD's wastewater treatment plants. It provides advanced primary and partial secondary treatment for 350 million gallons of wastewater per day and serves a population of approximately 3.5 million people. The treated wastewater is disinfected with chlorine and sent to the Pacific Ocean through a network of outfalls that extend two miles off the Palos Verdes Peninsula to a depth of 200 feet.

Estimates for the District wastewater quantity (indoor usage) are shown in Table 6-2. The calculation is based on annualizing 90 percent of January water use in Cal Water's service area.

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
Percentage of 2015 service area covered by wastewater collection system *(optional)*						
Percentage of 2015 service area population covered by wastewater collection system *(optional)*						
			Receiving Wastewater Treatment			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015 (AF)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
Los Angeles County Sanitation District	*Estimated*	12,656	*Los Angeles County Sanitation District*	Joint Water Pollution Control Plant	*No*	
Total Wastewater Collected from Service Area in 2015:		**12,656**				

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015										
✓	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treat-ment Level	2015 Volumes			
							Waste water Treated	Discharged Treated Waste water	Recycled Within Service Area	Recycled Outside of Service Area
						Total				

6.5.3 Recycled Water System

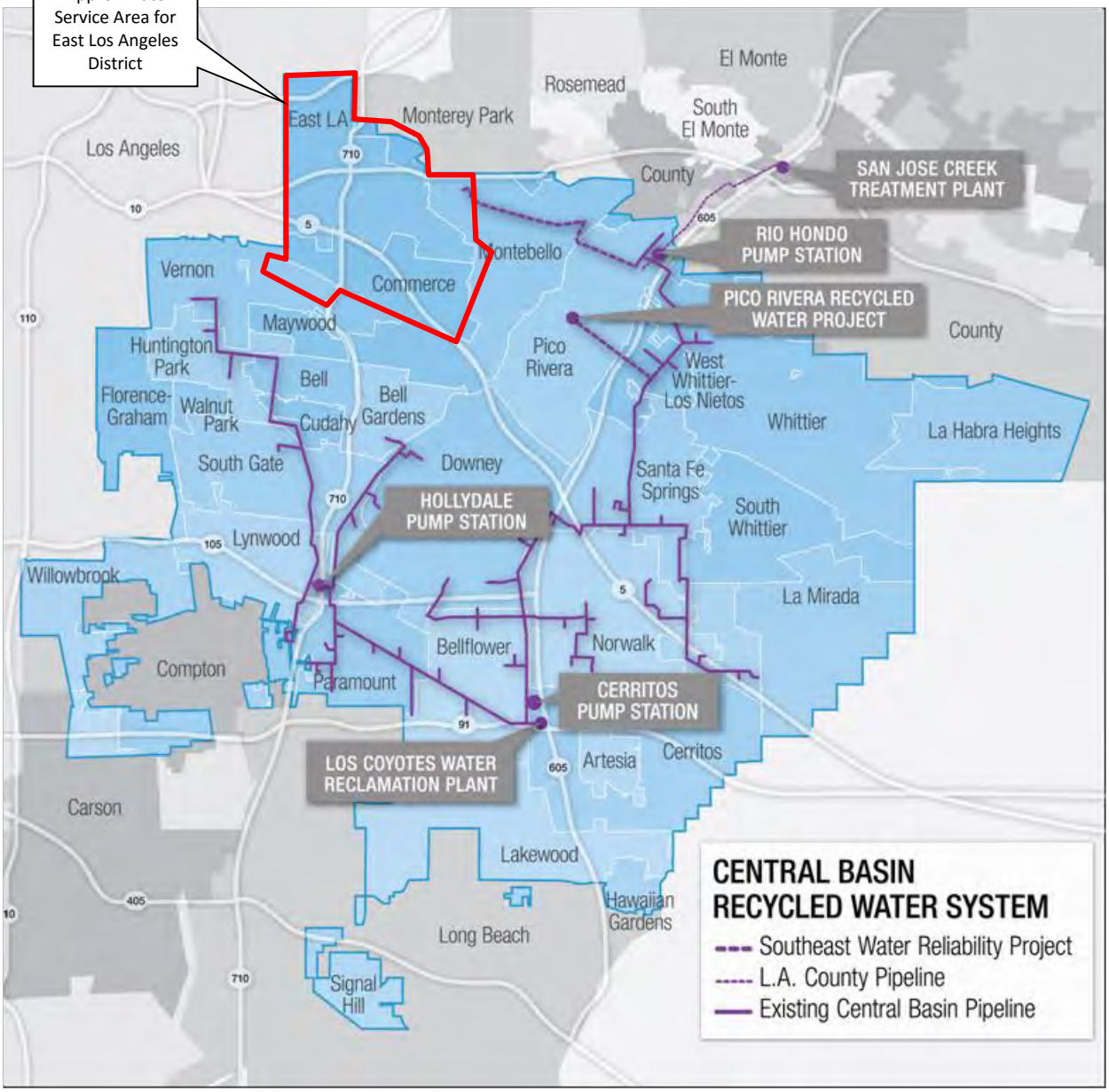
Central Basin Municipal Water District has developed a regional water recycling program. The program is comprised of two distribution systems – the E. Thornton Ibbetson Century Water Recycling Project (Century Distribution System) and the Esteban Torres Rio Hondo Water Recycling Project (Rio Hondo Distribution System) – as well as three pumping stations, including the Rio Hondo Pump Station, Hollydale Pump Station, and Cerritos Pump Station. The Century Distribution System and Rio Hondo Distribution System are interconnected by an intricate 70-mile distribution system and operate as one recycled water supply system. The combined projects are referred to as the "Central Basin Water Recycling Project." The system is shown in Figure 6-2.

In constructing the pipeline system, Central Basin is able to distribute treated recycled water obtained from the Sanitation Districts of Los Angeles County. The Central Basin Water Recycling Project delivers approximately 5,000 acre-feet of recycled water annually to over 300 industrial, commercial and landscape connections. Central Basin's use of recycled water augments the groundwater and imported water supplies of southeast Los Angeles County

Central Basin Municipal Water District has developed a feasibility study and preliminary design report for the East Los Angeles Recycled Water System Expansion in 2014 and has submitted an application with the Clean Water State Revolving Fund for grant funding in 2015.

Recycled water is not available for the District at this time; however, it is estimated that about 500 AF per year will be utilized within the District after 2020. For this plan, a projected volume of 500 AF is used for 2025 and onwards in Table 6-4.

Figure 6-2: CBMWD Existing Recycled Water Distribution System



6.5.4 Recycled Water Beneficial Uses

Central Basin is promoting recycled water as an ideal alternative for business and municipal use. Examples of recycled water use include:

- Landscape irrigation (e.g., public parks, cemeteries, golf courses);
- Industrial processes (e.g., paper manufacturing, carpet and textile dyeing, boiler feed);
- Commercial uses (e.g., cooling towers, toilet flushing, laundries, car washes);
- Construction activities (e.g., dust control, soil compaction, pipeline backfill consolidation, concrete mixing).

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

✓	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

Name of Agency Producing (Treating) the Recycled Water:	
Name of Agency Operating the Recycled Water Distribution System:	
Supplemental Water Added in 2015	
Source of 2015 Supplemental Water	

Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation								
Landscape irrigation (exc golf courses)								
Golf course irrigation								
Commercial use								
Industrial use								
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment								
Wetlands or wildlife habitat								
Groundwater recharge (IPR)								
Surface water augmentation (IPR)								
Direct potable reuse								
		Total:	**0**	**0**	**0**	**0**	**0**	**0**

IPR - Indirect Potable Reuse

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (AF)			
	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		2010 Projection for 2015	2015 actual use
Agricultural irrigation			
Landscape irrigation (exc golf courses)		500	0
Golf course irrigation			
Commercial use			
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
Total		**500**	**0**

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

With respect to the expansion of the recycled water use with the East Los Angeles District, Cal Water needs to rely on CBMWD since Central Basin is responsible for:

- Determining the technical and economic feasibility of supplying recycled water to the East Los Angeles service area
- Encouraging the use of and optimizing the use of recycled water in the East Los Angeles service area
- Expansion of recycled water lines within the East Los Angeles service area

As noted above, Central Basin has developed a feasibility study and preliminary design report for the East Los Angeles Recycled Water System Expansion in 2014 and has submitted an application with the Clean Water State Revolving Fund for grant funding in 2015.

Cal Water's supply portfolio in some districts already includes recycled water; elsewhere, the Company is participating in studies of the possibility of adding this supply source. Cal Water is eager to expand its portfolio to provide recycled water to its customers wherever possible, and to form partnerships with other agencies and jurisdictions to accomplish

this. Any such project must be economically feasible. Approval of such an investment by the CPUC is contingent on a demonstration that it is beneficial to ratepayers.

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Discounted Rate	Reduced cost of recycled water	2025	
		Total	**0**

6.6 Desalinated Water Opportunities

East Los Angeles is a considerable distance from the coast. Another option would be to drill a brackish groundwater well to use as a water source for a desal plant. Because of the District's distance from the ocean and the lack of a saline groundwater source, desalination is unlikely to be developed as a source of supply in the East Los Angeles District.

6.7 Exchanges or Transfers

The lease or purchase of additional Adjudicated Water Rights could be utilized to achieve increased supply reliability and availability. Obtaining additional adjudicated rights would result in cost savings due to the high cost of MWD water. However, at this time the District does not have sufficient production capacity to fully utilize all of its existing adjudicated right. Cal Water maintains several short term leases with local municipalities and private companies for the right to use this excess groundwater supply. As more wells are constructed in East Los Angeles, Cal Water will be able to produce a larger portion of its adjudicated right, and these leases will not be required.

6.7.1 Exchanges

There are no exchange opportunities for the District at this time.

6.7.2 Transfers

The lease or purchase of additional Adjudicated Water Rights could be utilized to achieve increased supply reliability and availability. Obtaining additional adjudicated rights would further increase the savings available to the District as compared to MWD water. However, at this time the District does not have sufficient production capacity to fully utilize all of its existing adjudicated right. Cal Water maintains several short term leases

with local municipalities and private companies for the right to use this excess groundwater supply. As more wells are constructed in East Los Angeles, Cal Water will be able to produce a larger portion of its adjudicated right, and these leases will not be required.

6.7.3 Emergency Interties

There are three emergency connections from the East Los Angeles District to neighboring water systems: one with Montebello Land and Water Company (6"), one with the South Montebello Irrigation District (8"), and one with City of Montebello (8"). These connections can be used to help offset the impact of the interruption in service to District customers. Being two-way connections, they can also be used to supply either imported water or pumped groundwater from the East Los Angeles District to the adjoining water systems.

6.8 Future Water Projects

The viability of future supplies is contingent upon how these supplies influence or are affected by several critical conditions. These conditions include operational feasibility and reliability, supply reliability, economic incentive, economic effect on customers, and regional supply ramifications.

The East Los Angeles District does not have sufficient well capacity to produce all of its APA. The distribution system has the capacity to deliver the current and future demands of the District's customers. Therefore, additional groundwater pumping facilities are required to meet demand and maintain required pressures. Developing additional production capacity can decrease the amount of money spent to purchase water and provide greater reliability during shortages. The cost of constructing facilities to provide additional production capacity increases as more facilities are constructed; and, at some point, the revenue requirements to finance this construction exceed the savings generated by the added capacity.

There are conditions that complicate the placement of wells in the Central Basin. For the most part aquifers below the East Los Angeles District are shallow, narrow, and highly mineralized. These same aquifers are deeper and wider and charged with better quality water east of existing district wells; however, this region is outside the district. If highly mineralized water is encountered during well development, increased costs for the installation of additional facilities may be incurred. Subsequently, additional property and equipment may be required driving up the total water cost.

Cal Water intends to provide facilities sufficient to maintain adequate production capacity in order to properly exercise the District's APA and to take full advantage of economic incentives that may be offered by MWD and WRDSC in the future.

Any program that modifies the operational strategy of the District or requires the installation of additional facilities to enhance supply reliability must be evaluated prior to being implemented, to determine what impact that project will have on regional supply conditions, including the following:

- The Central Basin is an adjudicated groundwater basin.
- Seawater intrusion barriers exist within the basin.
- The Central Basin Municipal Water District offers a reclamation program.
- Basin overdraft has caused declining groundwater levels.

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
✓	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. LOCATION OF THE NARRATIVE_____					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
		If Yes, Agency Name				*This may be a range*

6.9 Summary of Existing and Planned Sources of Water

Table 6-8 shows the actual volumes of purchased water for calendar year 2015. Table 6-9 shows the projected supply volumes through 2040.

Consistent with the projections of MWD and CBMWD, Cal Water is assuming that purchased water will be sufficient to serve all demand through 2040 under all hydrologic conditions. Therefore, the supply amounts shown in Table 6-9 equal the projected demand in each year.

Table 6-8 Retail: Water Supplies — Actual (AF)

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Purchased or Imported Water		5,296	Drinking Water	
Groundwater		8,972	Drinking Water	
Total		**14,268**		**0**

Table 6-9 Retail: Water Supplies — Projected (AF)										
Water Supply	**Projected Water Supply** *Report To the Extent Practicable*									
	2020		**2025**		**2030**		**2035**		**2040** *(opt)*	
	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Purchased	5,694		5,466		5,324		5,186		5,087	
Groundwater	11,774		11,774		11,774		11,774		11,774	
Total	**17,468**		**17,240**		**17,098**		**16,960**		**16,861**	

6.10 Climate Change Impacts to Supply

Cal Water recently completed an initial study of climate change impacts for a sample of its districts.[9] The sample districts account for 85% of Cal Water's total 2014 production and reflect the diversity of all Cal Water districts, including geographic, hydrologic, and climatic conditions and primary and secondary supply sources. East Los Angeles was not among the districts studied. The study was undertaken because it is critical for Cal Water to gain a better understanding of the potential impacts of climate change on the availability of its diverse supplies. The impacts are inherently uncertain, but Cal Water believes that the only responsible course is to carefully incorporate climate change into its ongoing water supply planning.

The initial study represents a first step in that path. In order for Cal Water to determine how its long-term water supply planning should reflect climate change impacts, it must first have an understanding of what the impacts of climate change on its supply sources might be. That was the purpose of the study.

Changes in climate can affect the availability of local groundwater and surface water supplies, as well as purchased imported supplies. This study separately addressed the impacts on each of these for each sample district. It relied on the best available projections of changes in climate (temperature and precipitation) through the end of the century, and then used the climate projections to examine how surface water flows and groundwater recharge rates may change. The study generally relied on studies done by or data provided by wholesale suppliers.

The study results provide an integrated view of how projected climate changes may affect water supply availability for Cal Water's service districts, and represent a first step in integrating potential future climate change impacts into Cal Water's ongoing supply planning.

6.10.1 Estimating Changes in Climate

Climate change is primarily driven by increased concentrations of greenhouse gases (GHGs) in the atmosphere. The trajectory of future climate change is a function of the rate at which those concentrations are projected to increase and the manner in which the atmosphere and oceans respond to increased concentrations. Both are difficult to model. Thus, while the scientific community overwhelmingly agrees that climate change will occur (and indeed may already have begun), the trajectory of those changes is very uncertain.

[9] California Water Service Company, *Potential Climate Change Impacts on the Water Supplies of California Water Service*. January 2016.

The projections of temperature and precipitation that underlie this study are based on 40 of the latest Global Circulation Models (GCMs) run as part of the Coupled Model Intercomparison Project Phase 5 (CMIP5). Generally speaking, this type of approach is termed an ensemble analysis, for which the downscaled climate projections for any particular Cal Water Service District were based on the median of the 40 downscaled GCM datasets. The GCMs used by the analysis are driven by two GHG emission pathways that bound the possible trajectories of GHG concentrations.

6.10.2 Impacts of Climate Change on Water Supplies

Since the supplies for each district consist of a mix of local surface water, local groundwater, and/or purchased imports, climate change impacts were estimated for each of these components. Based on the breakdown of district production among the supply sources, Table 6-10 shows the ranges of projected overall climate change impacts on available supply, relative to the historic average.

Table 6-10 Projected Changes in Average Available Supply Due to Climate Change

District	Percentage Change in Supply			
		2020	2050	2100
BK	Minimum	-10%	-10%	-12%
	Maximum	-12%	-16%	-20%
VIS	Minimum	-7%	-8%	-8%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13%	-16%	-19%
	Maximum	-16%	-21%	-31%
MPS/SSF/BG	Minimum	0%	-2%	-6%
	Maximum	0%	-7%	-15%
LAS	Minimum	-3%	-3%	-10%
	Maximum	-4%	-18%	-28%
CH	Minimum	2%	2%	0%
	Maximum	3%	1%	-3%
ORO	Minimum	0%	8%	5%
	Maximum	0%	-8%	-7%
DOM/HR/PV	Minimum	0%	0%	-1%
	Maximum	0%	-2%	-3%
STK	Minimum	0%	0%	-8%
	Maximum	0%	-14%	-17%
SLN	Minimum	-6%	-6%	-6%
	Maximum	-7%	-7%	-7%

6.10.3 Next Steps and Key Conclusions

Possible next steps for Cal Water's study of climate change include:

- Methodological enhancements to reduce some of the uncertainties in the results;
- Development and acquisition of better and more complete data;
- Extending the study to other Cal Water districts;
- Developing a plan to mitigate anticipated climate change impacts on supply; and
- Integrating climate change into the Company's ongoing water supply planning.

Three critical messages emerged from the study:

- Cal Water supplies in the 21st century are likely to be adversely affected by climate change.
- These impacts will vary considerably across districts, depending on geography and source mix. For some districts, the impacts can be significant; for others, little or no impacts are projected.
- The impacts will generally increase over time. Anticipated late-century impacts are forecast to be significantly higher in some districts than impacts at mid-century. Moreover, during the period that climate change is forecast to increasingly constrain supplies, demands are also generally forecast to increase, further exacerbating the adverse impacts on water supply reliability.

Reference:
DHS, 1985

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY GEORGE DEUKMEJIAN, *Governor*

DEPARTMENT OF HEALTH SERVICES
107 SOUTH BROADWAY, ROOM B-7011
LOS ANGELES, CA 90012
(213) 620-2380

SFUND RECORDS CTR
2275422

PRELIMINARY ASSESSMENT SUMMARY

Stauffer Chemical Company
4570 Ardine Street
South Gate, CA 90280

October 1985

Preparer: Peter J. Wood
Toxic Substances Control Division
Southern California Section
(213) 620-2380

History and Problem:

This site site has been occupied by at least three different companies since the 1930s. The earliest known operator at this location was A.R. Maas Chemical Company (ARMC) which owned and operated this site as a phosphoric acid manufacturing facility until 1952. In 1952, ARMC merged with Victor Chemical Co. (VCC) maintaining the same production process. In 1962, Stauffer Chemical Company (SCC), which is currently operating at this site, acquired VCC. SCC expanded its production capabilities at this plant to include the manufacture of tri-sodium phosphate, sodium sulfite and cleaning mixes along with the production of phosphoric acid.

Wastes generated by the manufacturing processes conducted at this site have included the following: sulfite, tri-sodium phosphate, sodium pyrophosphate and arsenic trisulfide. Evidence exists indicating that these wastes were discharged to an unlined channel that emptied into an unlined settling pond located at the southeast corner of the property. The settling pond was paved over with asphalt sometime between 1960 and 1965.

Recommendation:

Active status, high priority. Evidence exists that hazardous wastes were disposed of at this site. It is recommended that this site undergo sampling to verify the nature and extent of on-site contamination. The Toxic Substances Control Division has directed SCC to undertake a site investigation.

A copy of this report will be provided to the Los Angeles County Department of Health Services.

PRELIMINARY ASSESSMENT
Region 9

Preparer's Name Peter J. Wood Date October 1985

	SOURCE	INFORMATION
1. Site ID Number	Region IX RCRA Database 5-23-84	CAD008353211
2. Site Name	Telephone Memo Lee Erickson (10-11-85)	Stauffer Chemical Company (1962 to present)
3. Site Location	Abandoned Industrial Waste Disposal Site Survey (1-31-81)	4570 Ardine Street South Gate, CA 90280
4. County	Same as #3	Los Angeles
5. Owner (Address & Telephone No.)	a) L.A. County Engineer Industrial Waste Permit (7-26-50)	A.R. Maas 4570 Ardine Street South Gate, CA 90280 (1930s to 1952)
	b) Same as #3	Victor Chemical Company 4570 Ardine Street South Gate, CA 90280 (1952 to 1962)
	c) Memo of Call 12-18-85, Lee Erickson, Stauffer Chemical	Stauffer Chemical Company Nyala Farm Road Westport, CT 06881 (203) 222-3000

PRELIMINARY ASSESSMENT
Region 9

Preparer's Name Peter J. Wood **Date** October 1985

	SOURCE	INFORMATION
6. Operator	See #5 (a)	A.R. Maas 4570 Ardine Street South Gate, CA 90280 (1930s to 1952)
	See #5(b)	Victor Chemical Company 4570 Ardine Street South Gate, CA 90280 (1952 to 1962)
	See #2	Stauffer Chemical Company 4570 Ardine Street South Gate, CA 90280 (1962 to present)
7. Type of Ownership	See #2	A.R. Maas Chemical Co.: Private Victor Chemical Co.: Private Stauffer Chemical Company.: Private
8. Status	Telephone Memo Lee Erickson (10-11-85)	Active
9. Source Activity	See #3	Stauffer Products — % Production Phosphoric acid 56% Trisodium phosphate 10% Sodium Sulfite 15% Cleaning & Mixing Solvents 10%

PRELIMINARY ASSESSMENT
Region 9

Preparer's Name Peter J. Wood Date October 1985

	SOURCE	INFORMATION
10. Years of Operation	See #3	A.R. Maas Chemical Company (1930s to 1952) Victor Chemical Company (1952 to 1962) Stauffer Chemical Co. 1962 to 1981
11. Facility Type	a) Eckhardt Survey 04-22-80	Landfill, mono industrial waste pits/ponds/lagoons
	b) Site Visit Report 12-10-85	(1) unlined waste disposal pond approximately 20' x 15' x 15' in volume
12. Waste Type and Description	Attachment to Industrial Waste Permit No. 76	Maas Chemical Company: Sulfite Tri-sodium phosphate Bioler blowdown Sodium pyrophosphate Phosphoric acid
	See #3	Stauffer Chemical Company: Raw acid filtering sludge Effluent Acid Solution Phosphorous burning tower brick Miscellaneous scrap
	EPA Identification and Preliminary Assessment	200 tons of arsenic

PRELIMINARY ASSESSMENT
Region 9

Preparer's Name Peter J. Wood Date October 1985

	SOURCE	INFORMATION
12. Waste Type and Description	See # 11 (a)	Stauffer Chemical Company: Inorganic acid solution, with pH3 Arsenic, selenium, antimony Inorganics
	Senior Staff Information 12-12-80	Arsenic trisulfide
	Abandoned Site Project Site Information Summary	Sodium sulfide trisodium phosphate arsenic trisulfate
	Hazardous Waste Information System 10-11-85	Oil/Water separation sludge- 18.76 tons, Off-spec, aged, or surplus Organics - 10.50 tons. Asbestos waste amount unknown.

13. Contacts:

10-11-85 Lee Erickson, Stauffer Chemical Company (415) 544-9363.

14. Incidents:

None documented at agencies contacted.

15. Inspections (date, type, by whom, recommendations)

12-10-80 Meeting with Plant Manager, Abandoned Site Project Staff
02-27-82 Field Check, Abandoned Site Project Staff

16. Enforcement History (list date, type of action, requirements, outcome)

08-28-78 Notice of violation issued by L.A. County Sanitation District, Reduction of sulfide emissions to 1/mg 1.

12-05-78 Notice of violation issued by L.A. County Sanitation District, Improper handling of steam water waste.

17.a. Initial recommendation for further action:

Active status, high priority. Evidence exists indicating that historical on-site disposal af hazardous waste occurred at this location.

17.b. EPA recommendation for further action:

18. Response Termination: ___No Further Action ___Pending ___Active

Justification:

	SOURCE	INFORMATION
19. Observed Release		
20. Depth to Aquifer		
21. Net Precipitation Net seas. rainfall Evaporation		
22. Permeability of Unsaturated Zone		
23. Physical State		
24. Containment (Ground Water)		
25. Toxicity		
26. Persistence		
27. Waste Quantity		
28. Ground Water Use		
29. Distance to Well		
30. Population Served (by Ground Water)		

	SOURCE	INFORMATION
31. Facility Slope		
32. 1 yr. 24 hr. rainfall		
33. Distance to Surface Water		
34. Containment (Surface Water)		
35. Surface Water Use		
36. Distance to Sensitive Environment		
37. Population Served (by Surface Water)		
38. Distance to Water Intake		
39. Reactivity		
40. Incompatibility		
41. Toxicity (Air)		
42. Population within 4 mile radius		
43. Land Use		

AGENCY CONTACT RECORD

Agency	Contact	Date	Response
DOHS - Abandoned Site Assessment Program	File Search	10-21-85	Inspection reports, questionnaires, Industrial Waste Permit, EPA PA, Maps & Drawings
DOHS	File Search	10-28-85	No file
LA Co. Health	File Search	10-18-85	No file

Patti M Post
T-4-1

PRELIMINARY ASSESSMENT
Region 9

Name Stauffer Chemical Company, Southgate, LA Co.

Date 11-10-83

	SOURCE	INFORMATION
1. Site ID Number	ERRIS Doc.	CAD008353211
2. Site Name	"	Stauffer Chemical Co.
3. Site Location	"	4570 Ardine St., South Gate, CA 90280 LA County
4. County	"	LA
5. Owner (Address & telephone no.)	EPA form 8900-1	Stauffer Chemical Co. 213-588-2214 4570 Ardine St. South Gate, LA Co., CA 90280 3000
6. Operator (Address & telephone no.)	"	~~Same~~ Stauffer Chemical Company 4570 Ardine St. South Gate, CA 90280 LA County 213-588-2214
7. Type of Ownership	"	Private
8. Status	CA Inspections p1 E+E 5-83	~~[illegible]~~ Active
9. Source Activity	"	manufactures phosphoric acid wastes include: sodium sulfide trisodium phosphate arsenic trisulphide As_2S_3
10. Years of Operation	"	A.R. Maas - before 1952 Stauffer Chemical 1960-pres. Victa Chemical 1952-60
11. Facility Type	"	chemical company - phosphoric acids
12. Waste Type and Description	" T2070 (4/80) NOTICE 8900-1 (6/4/81) RCRA 8/18/80 NOTIFICATION	sodium sulfide over → trisodium phosphate acids metals arsenic trisulphide organics SE corner old pond - filled + paved - 200 tons arsenic pond ≈ 15' deep possible runoff ditches thiourea methanol, dichloromethane, toluene ~~thiocarbamide~~ ~~methylbenzene~~, pentachlorophenol ignitable, corrosive, toxic

22 SEP 1982

Wastes

wastewater - sulfide
1978-79 thiosulfate
violations nickel
arsenic
acidic solutions

"If pond used for acid & alkaline waste, arsenic trisulphide solubility would be affected."

-DSP

13. Contacts Stauffer Plant Manager - Ed Trainer 213-588-2214
DOHS - Ned Therien 916-324-1798 (Sue Stack)
E+E - Jeff Rubin

14. Incidents
- 9/30/80 - minor spills, LACSD violations for odor control
- 1978-79 - 4 violations documented

15. Inspections (date, type, by whom, recommendations)
1/16/81 SI by Sacto DOHS staff
1/15/81 - aerial surveillance
3/27/82 - drive by - DOHS

16. Enforcement History (list date, type of action, requirements, outcome)
None noted.

17. Comment (action required by EPA) Investigate pond area - sample to be sure no other substance than arsenic trisulphide. Conduct interviews as detailed in FIT report.

18. Response Termination: ___ No Further Action ___ Pending ___ Active

Justification:

22 SEP 1982

	SOURCE	INFORMATION
19. Observed Release		No sampling yet done
20. Depth to Aquifer	E+E 6/83	to uppermost aquifer 105-110 ft Flow N/NNW
21. Net Precipitation Net seasonal rainfall Evaporation		
22. Permeability of Unsaturated Zone	Well Log 1959?	soil, peat, sand, sandy clay
23. Physical State	E+E 6/83	liquid
24. Containment (Ground Water)	"	dumped in pond/landfill (15' deep) flowed through unlined channel
25. Toxicity		
26. Persistence		
27. Waste Quantity	"	pond - 200 tons arsenic
28. Ground Water Use		
29. Distance to Well		
30. Population Served (by ground water)		

	SOURCE	INFORMATION
31. Facility Slope		
32. 1 yr. 24 hr. rainfall		
33. Distance to Surface Water		
34. Containment (Surface Water)		
35. Surface Water Use		
36. Distance to Sensitive Environment		
37. Population Served (by Surface Water)		
38. Distance to Water Intake		
39. Reactivity		
40. Incompatibility		
41. Toxicity (air)		
42. Population within 4 mile radius		
43. Land Use		

Site Name : STAUFER CHEMICAL COMPANY

EPA I.D. Number : CAD008 353211

Site Evaluated By : TERYL NUCKOLS

Date : AUGUST 5, 1991

Industry Type : CHEMICAL COMPANY — PHOSPHORIC ACID MANUFACTURING

SSI Prioritization Project

Pursuant to TDD #F9-9105-063 EPA has tasked FIT to prioritize all active SSI's in CERCLIS to determine what further site assessment action, if any, is necessary. Based upon a limited review of existing CERCLIS file information, it appears that this site warrants further action as noted below.

PRIORITIZATION CATEGORIES :

☐ **HRS Package**

- Data appear to be of sufficient quality and quantity to support possible listing using December 14, 1990 version.
- HRS documentation record is required.

☒ **Scoresheets / NPL Prioritization Memo** *(if necessary)*

- Site appears to be eligible for listing.
- Insufficient data is available at this time to support an NFRAP determination.

☐ **Sampling**

- Sampling by EPA is warranted to generate data of sufficient quality to support possible listing.

☐ **NFRAP** (circle one)

- Data entry error *(correspondence in EPA file indicates NFRAP determination).*
- Site appears to be a part of another NPL site
- Site appears to be a RCRA TSDF.
- Site clean closed by state agency.
- Site *clearly not* eligible for listing.

☐ **No CERCLIS file could be located for this site.**

PRELIMINARY SCORING CONSIDERATIONS :

What is / are the primary pathway(s) of concern ? Air____ GW X SW____ SOIL X

Is there an observed release to that pathway ? Yes____ Projected____ No____

Type of Contamination : Metals X VOC's X Pesticides____ Other ACIDS

Target Population : High X Medium____ Low____

Is there actual contamination ? Yes____ No____

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COMMENTS / ASSUMPTIONS / RATIONALE :

(If appropriate, indicate pathway(s) of concern; analytical data gaps, assumptions made, data quality issues, etc.)

- BACKFILLED SLUDGE POND CONTAINS ARSENIC TRISULFIDE, WHICH APPEARS TO HAVE LEACHED DOWNWARD. THE SITE ALSO WORKED WITH PENTACHLOROPHENOL, DICHLOROMETHANE, TOLUENE, AMONG OTHER MATERIALS.

- NO INFORMATION IS AVAILABLE ON TARGETS. THE SITE IS LOCATED IN LOS ANGELES COUNTY, SO THE POPULATION LIVING WITHIN FOUR MILES ~~OR~~ AND THE POPULATION RECEIVING DRINKING WATER FROM WELLS WITHIN FOUR MILES COULD BE HIGH.
- NO WORK HAS BEEN DONE AT THE SITE BY EPA SINCE 1986. THERE MAY BE SOME DHS INVOLVEMENT.

EPA CONCURRENCE *(only necessary for NFRAP)*:

-

Reference:
DPW, 1995

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (818) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O.BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

January 26, 1995

IN REPLY PLEASE REFER TO FILE: I-524

MESSRS ED TRAINER AND R E BROWN
RHONE-POULENC CHEMICAL
PO BOX 22776
LONG BEACH CA 90801

Gentlemen:

UST LOCAL OVERSIGHT PROGRAM (LOP) REVIEW SHEET
QUARTERLY PROGRESS REPORT
PREPARED BY: CERES ENVIRONMENTAL
REPORT DATE: DECEMBER 9, 1994
CLOSURE PERMIT NO. 5671B
LOCATION: 4570 ARDINE STREET, SOUTH GATE

This office has reviewed the referenced document. Please continue with the groundwater monitoring program. Provide the First Quarter 1995 Groundwater Monitoring Report. Additionally, provide Quarterly Progress Report of the vapor extraction system.

Submit the requested information to this office by May 1, 1995.

Failure to comply with the Los Angeles County Department of Public Works UST LOP directives may disallow you from participating in the UST Cleanup Fund.

Notify Dave Lobato at (818) 458-4374 a minimum of 72 hours prior to commencing any significant investigation, remediation, or assessment activities on site. You may also choose to make notification either by facsimile to (818) 458-4992 or by mailing to the address below. The Los Angeles County Department of Public Works may disregard the work performed if the County was not properly notified.

Correspondence should be submitted to the Los Angeles County Department of Public Works, UST Local Oversight Program, Annex Building, P. O. Box 1460, Alhambra, CA 91802-1460.

If you have any questions regarding this matter, please contact Mohammad Farzan at (818) 458-3980, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

By _____
Mohammad Farzan
UST Local Oversight Program
Waste Management Division

Reviewed _____
UST Local Oversight Program
Waste Management Division

MF:rm
WP/524-3

cc: Mr. Richard Frizzell, Ceres Environmental (Santa Fe Springs)

Reference:
DTSC, 2014

SITE SCREENING ASSESSMENT

Prepared by: California Department of Toxic Substances Control (DTSC)
Cooperative Agreement Number: V-00T14601-0
DTSC Fiscal Year: 2013-2014

Prepared for: United States Environmental Protection Agency Region 9
Superfund Division, Site Assessment Section
San Francisco, California

Date: 6/17/2014

Site Name:	**Titan Terminal & Transport**				
City:	**South Gate**		**County:**	**Los Angeles**	
DTSC Regional Office:	**Chatsworth**				
CERCLIS ID:	**CAD008353211**	**EPA ID:**	**CAD008353211**	**Envirostor ID:**	**19280830**

EXECUTIVE SUMMARY

Narrative summary of site history and recommended action:

Titan Transport & Terminal (the Site) is located at 4570 Ardine Street in South Gate, CA. The Site is made up of 3 parcels of an 8 acre property, totaling 24 acres. The company has 30 employees and deals with the transportation and shipment of bulk liquids such as acids, bases, grain for animal feed and food grade products. Products are sometimes repackaged and loaded into drums for transfer to different facilities and /or countries. Products are generally stored up to 30 days at the facility. There is no manufacturing conducted at the Site. Historically, the Site was a chemical manufacturing plant which began in 1910. From 1910-1952, A.R. Mass operated the plant. Victor Chemical Company operated from 1952-1963. Stauffer Chemical Company operated from 1963-1987. Rhone-Poulenc acquired the site in 1987 and operated until 1996 when Titan Terminal & Transport began operations. This Site should proceed with further investigation by EPA based upon the activities of Titans' predecessors.

Final Signatures and Concurrence

DTSC Screener: _____ Folashade Simpson 8/20/14
Signature *Type Name* *Date: (MM/DD/YYYY)*

DTSC Approval: _____ Javier Hinojosa 8/26/14
Signature *Type Name* *Date: (MM/DD/YYYY)*

EPA Concurrence: _____ Matt Mitguard 8/20/14
Signature *Type Name* *Date: (MM/DD/YYYY)*

EPA Comments: _____

EPA ONLY				
CERCLIS CODING:	☐Not Valid Site	☐Not valid Site – State Lead	☐ Preliminary Assessment Needed	☐ Other:

DTSC Recommendation:					
Refer to:					
☒ EPA	☐ CADTSC	☐ CARWQCB	☐ Local Agency		☐ No Further Action
EPA Decision:					
Refer to:					
☐ EPA	☐ CADTSC	☐ CARWQCB	☐ Local Agency		☐ No Further Action

Section 1: Site Information

1.1 CERCLIS Site Name: Titan Terminal & Transport
Aliases: Titan Terminal, Rhone Poulenc Basic Chemicals, Stauffer Chemical Company

1.2 Origin of Site: I-710 Study Area
Note discovery project, referral, complaint, etc.

1.3 Site Location Information

Street Address: 4570 Ardine Street
City: South Gate **County:** Los Angeles
State: CA **Zip Code:** 90280
Latitude: + 33 . 957533
Longitude: - 118 . 187998

1.4 Regulatory Information

CERCLIS ID: No
RCRA ID: CAC002691591
Envirostor ID: 19280830
Geotracker ID: T0603702717

Section 2: Operational History

Reference all factual information and attach complete and legible copies of all cited references.

2.1 Current Operation

☒ Operational facility
☐ Nonoperational
☐ Current Operators do not use CERCLA hazardous constituents

Current owner: Kronos Properties Inc. **Current operator:** Titan Terminal & Transport
Hazardous materials used: None
Hazardous materials manifested or disposed (HWTS): Igniteable, off-spec aged or surplus inorganics, off-spec aged or surplus organics.
Dates of operation: 1996-Present
Reference(s): Appendix C9, Appendix C12

2.2 Historical owners/operators that may have used Contaminants of Concern onsite:

Owner: Rhone Poulenc Basic Chemicals **Operator:** Rhone Poulenc Basic Chemicals
Hazardous materials used: unknown
Hazardous materials suspected: unknown
Dates of operation: 1987 - 1996.
Reference(s): Appendix C8, Appendix C9, Appendix C12

Owner: Stauffer Chemical Company **Operator:** Stauffer Chemical Company
Hazardous materials used: Phosphoric acid, arsenic trisulphide, sodium sulfide

Hazardous materials suspected:
Dates of operation: 1910-1960
Reference(s): Appendix C8, Appendix C9, Appendix C12

Section 3: Site Impact Information

Reference all factual information and attach complete and legible copies of all cited references.

3.1 Land Use/Site Setting:

Check all that apply

☒ Industrial area
☐ Residential area
☐ Schools/day care centers within 200 feet
☒ Surface water within 2 miles of the site
☒ Sensitive environments or wetlands within 2 miles of site
☐ Potential source of contamination to surface water

Details, description and references:

The Site is located in an industrial corridor, surrounded by residences. The Los Angeles River is located 1 mile to the east of the Site. Sensitive Environments are located within 1 mile, and marked along with the Los Angeles River as per Figure 6 in Appendix C2.

3.2 Surface Water

☐ Surface water used for drinking water within 15 miles of the site

☐ Public / commercial supply
☐ Private supply
Approximate number of people served by the surface water:
Details/additional information:

☐ Health advisory for consuming fish
☐ Surface water within 15 miles of the site is used for recreational or commercial fishing
☐ Surface water within 15 miles of the site provides habitat for sensitive species
☐ Site is a suspected source of surface water contamination

Details, description and references:

The Los Angeles River is located within 1 mile of the Site. Surface Water in Los Angeles County is not used for drinking water purposes.

3.3 Groundwater

☒ Groundwater used for drinking water within 4 miles of site

☒ Public / commercial supply (approximate number of people served: 330,000)
☐ Private supply (approximate number of people served:)
☒ Groundwater within 4 miles of the site known to be contaminated with hazardous substances
List hazardous substances:

The Los Angeles River is located within 1 miles of the Site. Surface Water in Los Angeles County is not used for drinking water purposes.

List substances that exceed drinking water standards:

Perchloroethylene trichloroethylene, carbon tetrachloride, arsenic, and chromium all exceed drinking water standards.

☒ Site is a suspected source of groundwater contamination

SPGIT Quartile(s): In a SPGIT, Quartile 179 is located to the East
Details, description and references:

There are several water companies operating around the Site which provides drinking water to local residencies and business. The Huntington Park Mutual Water Company serves 22,000 people. The City of Southgate Mutual Water Company serves 98,000 people. The City of Down Water Department serves 110,000 people, and The Golden State Water Company serves 24,500 people. This information was obtained from EnviroStor.

There are drinking water wells located within 4 miles of the Site that have been impacted with PCE, TCE and Arsenic. The Hoffman Well 02, (Destroyed 10/26/2007) is located 2000 feet east of this Site. Another destroyed drinking water Well, (Southgate City Well 07) is located 1000 feet south-east of the Site. Both destroyed Wells have been impacted by Chromium, PCE and TCE with an upward trending contamination from 1997 through 2001. These wells had Arsenic, TCE and Chromium that exceeded the Maximum Contaminant Level's. The DTSC estimates that these wells were destroyed around 2001. The reasons for the destruction of the Wells were not mentioned in the DHS Well tool finder, however these Wells belong to the Cities of South Gate and the Golden State Water Company which serves Bell and Bell Gardens with connections from 24,500 to 98,000 people respectively. Other water companies operating in the area include Southgate Mutual Water Company serving 98,000 people, and the City of Cudahy Water Company serving 39,000 people. Mutual Water

Co. Cuddhay Well 03 is the nearest active raw Well, located 1000 feet North of the Site. This Well is impacted with high levels of cyanide.

Groundwater flows in a southerly direction. Groundwater flow at the NPL Cooper Drum Site indicates flow to the South. However, groundwater Wells at the Los Angeles Chemical Company Site, is indicated as flowing to due west of its property. (Appendix C2, C3, C4 and C5)

3.4 Community Interest

☐ High level of community interest
☐ Some community interest
☒ Low/no community interest

Details, description and references:

Section 4: Site Reconnaissance

4.1 Method of Site Reconnaissance (See Attachment B):

☒ Onsite Visit (Date: March 14, 2014)
☒ Drive-by/offsite visit (Date:March 14, 2014)
☒ Records/aerial photo review: (Date: March 14, 2014)

4.2 Adjacent properties:

North Brenntag Pacific / Los Angeles Chemical Company
South Railroad Tracks
East Salt Lake Street - Mistras Group (beyond)
West PQ Corporation

4.3 Structures onsite (e.g. office building, paint booth, repair shop, etc.): One small building that has an office. A large warehouse for storage of chemicals for Brenntag Pacific (located across the street) and food grade chemical storage location.There is also a railroad track and operating railcar runs through the Site.

4.4 Site surface description (e.g., visual staining, cracked pavement, etc.): Surface of the Site is paved with rail road tracks.

4.5 Hazardous materials observed onsite

Materials stored: Hazardous materials such as acids, bases, and other materials such as grain for animal feed is stored temporarily for shipping.

Materials in use: There are no hazardous materials used on site.

☐ N/A (records review only; see Section 2 for hazardous materials manifested/disposed)

4.6 Waste Storage and potential hazardous materials

Specify numbers, volume, and content

a) **Drums:** 100+ drums and 255 gallon totes on site.
b) **Aboveground Storage Tanks:** 40+ above ground storage tanks.
c) **Underground Storage Tanks:** Historical UST has been removed. No USTs are known to be present.
d) **Clarifiers:** None
e) **Transformers potentially containing PCBs** Pole mounted transformer on Street Side
f) **Other:**

Section 5: Summary and Recommendations/Conclusions

Use multiple pages if needed. Include parenthetical references for all statements, and attach complete copies of references used.

5.1 Summary of Site History, Historical Releases, and Potential Releases

Describe site history, historical releases, and potential for release. Include summary of relevant sampling history detailed in Attachment E.

Titan Transport & Terminal (the Site) is located at 4570 Ardine Street in South Gate, CA. The Site is made up of 3 parcels of an 8 acre property, totaling 24 acres. The company has 30 employees and deals with the transportation and shipment of bulk liquids such as acids, bases, grain for animal feed and food grade products. Products are sometimes repackage and loaded into drums for transfer to different facilities and /or countries. Products are generally stored no more than 30 days at the facility. There is no manufacturing conducted at the Site. Historically, the Site was a chemical manufacturing plant which began in 1910. From 1910-1952 A.R. Mass operated the plant. Victor Chemical Company operated from 1952- 1963. Stauffer Chemical Company operated from 1963-1987. Rhone-Poulenc acquired the site in 1987 and operated until 1996 when Titan Terminal & Transport began operations.

According to the EPA's Site Inspection Prioritization report done for Stauffer Chemical Company in 1994, the historical company manufactured phosphoric acid from 1910 to 1960. The manufacturing process produced wastes, such as: sodium sulfide, trisodium phosphate (T.S.P) and arsenic trisulphide. Previous investigations indicated that there was an Arsenic Pond at the Eastern Corner of the property, where over 200 Tons of arsenic was disposed. This pond was owned by Stauffer Chemical Company, and this portion of the property was not purchased by Titan Terminal & Transport. The arsenic pond is currently capped, fenced and periodically inspected. Arsenic has been found in the groundwater. The report details sampling done in 1981:

> In July 1981, the California Department of Health Services Abandoned Site Project in Sacramento advised Stauffer to sample soils in and around the unlined surface impoundment. In 1981 and 1982, Stauffer drilled 14 soil borings to depths up to approximately 55 feet below ground surface (bgs) to determine the extent of the contamination. In 1981, soil samples were collected from seven locations and analyzed for arsenic, cadmium, chromium, lead, mercury, and selenium. Analytical results of the soil samples collected on site indicated concentrations of arsenic up to 739 mg/kg, cadmium up to 17 mg/kg, and chromium up to 253 mg/kg. In addition, arsenic was

detected at a concentration up to 1,659 mg/1 in soil samples collected from the onsite, unlined surface impoundment area. In 1982, one background and six onsite soil samples from the unlined surface impoundment area were collected and analyzed for arsenic. Analytical results of onsite soil samples indicated arsenic at concentrations up to 127 mg/kg and from background soil samples at concentrations of arsenic up to 3.7 mg/kg.(3,4). In 1982, two water samples were collected on site when piezometers were being installed. According to Stauffer, the piezometers were situated in the unlined surface impoundment and in areas where arsenic had been detected at high concentrations in soil. According to a contact report. included in the SI report, arsenic was detected in the water samples. Stauffer believed that the results were not representative of the groundwater beneath the site since the samples were collected from a perched groundwater zone beneath the site. Therefore, Stauffer did not submit the results to E&E during the SI. (3,4). (Appendix C2, C8).

5.2 Regulatory Involvement

Provide detailed description of historical and/or ongoing regulatory involvement. Identify current lead agency.

Historically the Site had an unauthorized leaking UST. There was remediation and groundwater monitoring done, and closure was given by the County of Los Angeles Department of Public Heath Waste Management Division on June 16, 1989. The Los Angeles County Fire Department regularly inspects the facility. The Site also has a Storm Water Discharge Permit from the Regional Water Quality Control Board. The DTSC has no regulatory oversight for Titan. (Appendix C13, C14).

5.3 Recommendation/conclusion

Describe proposed follow-up actions and recommended lead agency. If no further action is recommended, describe reasons.

Titan Terminal & Transport's operations do not include manufacturing, treatment or disposal of hazardous wastes. The company only distributes packages and ships products for their clients. The facility operations are not a concern; however the Site's prior operators included the use of chemicals which may have contributed to the extensive groundwater contamination. The DTSC recommends that further investigation be conducted to evaluate the nature and extent of the previous operations namely

Stauffer Chemical Company, Rhone Poulenc Basic Chemicals, Victor Chemical Company and A.R. Mass, which have all operated on this Site from 1910 until1996.

ATTACHMENT A: Site Screening Contact Report

Provide detailed description of conversations. Attach complete copies of any documents provided by the contact. Use as many pages as necessary to report all contacts.

Contact Name:	Dana Fontaine
Affiliation:	Titan Terminal & Transport
Telephone Number:	323-562-9529x5052
Date(s) of contact:	March 14, 2014

Discussion: Site tour, and discussion of operations.

Contact Name:	Barry A. Love
Affiliation:	Titan Terminal & Transport
Telephone Number:	323-562-9529 X5051
Date(s) of contact:	March 14, 2014

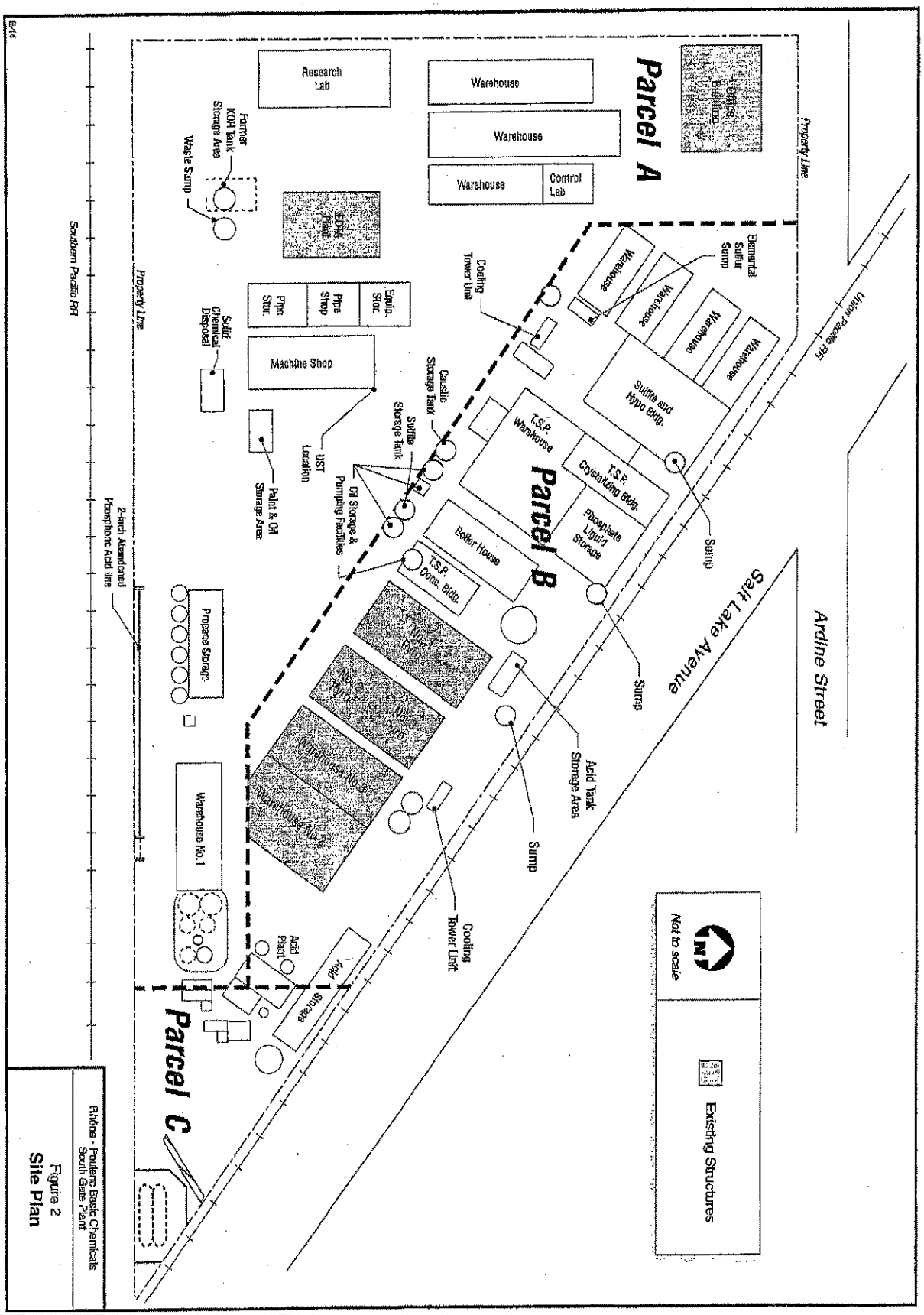
Discussion: Site tour, and discussion of operations.

Contact Name:	Yvette Caldero
Affiliation:	Los Angeles County Fire Department
Telephone Number:	
Date(s) of contact:	4/9/2014

Discussion: Files request.

ATTACHMENT B: Site Reconnaissance Report

Include photos and a site layout map showing features described in Sections 4.2-4.5.


Parcel A
Parcel B
Parcel C
Research Lab
Warehouse
Warehouse
Warehouse
Control Lab
Office Building
Former KOH Tank Storage Area
Waste Sump
EDHA Plant
Equip. Stor.
Pipe Shop
Pipe Stor.
Solid Chemical Disposal
Machine Shop
Paint & Oil Storage Area
UST Location
Oil Storage & Pumping Facilities
Caustic Storage Tank
Sulfite Storage Tank
Cooling Tower Unit
Elemental Sulfur Sump
Warehouse
Warehouse
Warehouse
Warehouse
Sulfite and Hypo Bldg.
T.S.P. Warehouse
T.S.P. Crystallizing Bldg.
Phosphate Liquid Storage
Boiler House
T.S.P. Conc. Bldg.
Sump
Sump
Sump
Sump
Propane Storage
Warehouse No.1
Warehouse No.2
Warehouse No.3
Acid Plant
Acid Storage
Cooling Tower Unit
Acid Tank Storage Area
Salt Lake Avenue
Ardine Street
Union Pacific RR
Property Line
Property Line
Southern Pacific RR
2-inch Abandoned Phosphoric Acid line
Not to scale
Existing Structures
Rhône - Poulenc Basic Chemicals
South Gate Plant
Figure 2
Site Plan

ATTACHMENT C: ATTACHMENT INDEX

Attachment #	Document Title	Date
C1	Air Photograph of the Site	
2	SPGIT Data Package	
3	The Hoffman Well 02 Histogram	
4	Cuddhay Well 03 Histogram	
5	Southgate Well 07 Histogram	
6	Second Semi-Annual 2012 Groundwater Monitoring Report Arcadis	
7	2013 Brenntag Tech Memo	
8	EPA Site Inspection Prioritization	
9	HWTS for Titan Terminal & Transport	
10	HWTS for Stauffer Chemical Company	
11	HWTS for Rhone-Poulenc	
12	Choicepoint	
13	Rhone-Poulenc Chemical UST Closure Report	
14	UST Unauthorized Leak/Contamination Site Report	

ATTACHMENT D: SITE TYPE – PRIMARY/SECONDARY ACTIVITY FORM

Fed Fac Indicator: ☐ Federal Facility ☐ Not A Federal Facility ☐ Status Undetermined

RCRA Status: ☐ Generator ☐ TSDF ☐ Transporter ☐ Not listed in RCRIS

SITE TYPES **(Designate one dominant primary category (*PC*). Designate all secondary subcategories (*SS*) that apply.) Site type designations for both primary & secondary should pertain to the operation(s) on site of environmental consequence.**

P C	*S S*	**Manufacturing/Processing/Maintenance** (Subcategory)
☐	☐	Chemicals and allied products
☐	☐	Coal gasification
☐	☐	Coke production
☐	☐	Electric power generation and distribution
☐	☐	Electronic/electrical equipment
☐	☐	Fabrics/textiles
☐	☐	Lumber and wood products/pulp and paper
☐	☐	Lumber and wood products/wood preserving/treatment
☐	☐	Metal fabrication/finishing/coating and allied industries
☐	☐	Oil and gas
☐	☐	Ordnance production
☐	☐	Plastics and rubber products
☐	☐	Primary metals/minerals processing
☐	☐	Radioactive products
☐	☐	Tanneries
☐	☐	Trucks/ships/trains/aircraft and related components

P C	S S	**Waste Management** (Subcategory)
☐	☐	Radioactive waste treatment, storage, disposal
☐	☐	Municipal solid waste landfill
☐	☐	Mine tailings disposal
☐	☐	Industrial waste landfill
☐	☐	Industrial waste facility (non generator)
☐	☐	Illegal disposal/open dump
☐	☐	Co-disposal landfill (municipal and industrial)

P C	*S S*	**Other** (Subcategory)
☐	☐	Agricultural
☐	☐	Contaminated sediment site with no identifiable source
☐	☐	Dust control
☐	☐	Ground water plume site with no identifiable source
☐	☐	Military/other ordinance
☐	☐	Product storage/distribution
☐	☐	Research, development, and testing facility
☐	☐	Retail/commercial
☐	☐	Spill or other one time event
☐	☐	Transportation (e.g. railroad yards, airports, barge docking site
☐	☐	Treatment works/septic tanks/other sewage treatment

P C	*S S*	**Mining** (Subcategory)
☐	☐	Coal
☐	☐	Metals
☐	☐	Non-metals minerals
☐	☐	Oil and gas

P C	S S	**Recycling** (Subcategory)
☐	☐	Automobiles/tires
☐	☐	Batteries/scrap metals/secondary smelting/precious metal recovery
☐	☐	Chemicals/chemicals waste (e.g. solvent recovery)
☐	☐	Drums/tanks
☐	☐	Waste/used oil

SITE TYPES **(Designate one dominant primary category (*PC*). Designate all secondary subcategories (*SS*) that apply.)**

ATTACHMENT E: SITE SCREENING ASSESSMENT SAMPLING EVENT SUMMARY TABLE					
Date	**Event**	**Lead Agency**	**Main Contaminants Detected** (include only CERCLA-eligible hazardous substances)	**Notes/Description**	**Reference**

Acronym List

(Modify as needed)

µg/L	micrograms per liter
bgs	below ground surface
AST	Aboveground Storage Tank
CADTSC	California Environmental Protection Agency, Department of Toxic Substances Control
CARWQCB	California Environmental Protection Agency, Regional Water Quality Control Board
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CUPA	Certified Unified Program Agency
EPA	U. S. Environmental Protection Agency
LUST	Leaking Underground Storage Tank
NPL	National Priorities List
PA	Preliminary Assessment
RCRA	Resource Conservation and Recovery Act
RCRAInfo	Resource Conservation and Recovery Information System
SI	Site Investigation
UST	Underground Storage Tank

Reference:
DTSC, 2017

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
ENVIROSTOR

TITAN TERMINAL & TRANSPORT (19280830)

SIGN UP FOR EMAIL ALERTS

4570 ARDINE ST.
SOUTH GATE, CA 90280
LOS ANGELES COUNTY
SITE TYPE: EVALUATION

PROJECT MANAGER: PATRICK MOVLAY
SUPERVISOR: JAVIER HINOJOSA
OFFICE: CLEANUP CHATSWORTH

Site Information

CLEANUP STATUS
ACTIVE AS OF 9/29/2015

SITE TYPE: EVALUATION
NATIONAL PRIORITIES LIST: NO
ACRES: 24 ACRES
APN: 6215002011, 6215002013, 6215002017, 6215002018
CLEANUP OVERSIGHT AGENCIES:
NONE SPECIFIED

ENVIROSTOR ID: 19280830
SITE CODE:
SPECIAL PROGRAM: EPA - PASI
FUNDING: EPA GRANT
ASSEMBLY DISTRICT: 63
SENATE DISTRICT: 33

Regulatory Profile

PAST USE(S) THAT CAUSED CONTAMINATION
NONE SPECIFIED

POTENTIAL CONTAMINANTS OF CONCERN
ARSENIC
UNCATEGORIZED

POTENTIAL MEDIA AFFECTED
NONE SPECIFIED

Site History

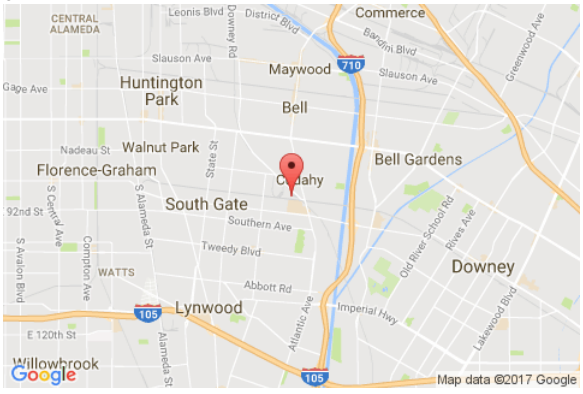
The Site will be investigated under 710 Corridor SI grant during 15/16 FY. Titan Transport & Terminal (the Site) is located at 4570 Ardine Street in South Gate, CA. The Site is made up of 3 parcels of an 8 acre property, totaling 24 acres. The company has 30 employees and deals with the transportation and shipment of bulk liquids such as acids, bases, grain for animal feed and food grade products. Products are sometimes repackage and loaded into drums for transfer to different facilities and /or countries. Products are generally stored no more than 30 days at the facility. There is no manufacturing conducted at the Site. Historically, the Site was a chemical manufacturing plant which began in 1910. From 1910-1952 A.R. Mass operated the plant. Victor Chemical Company operated from 1952-1963. Stauffer Chemical Company operated from 1963-1987. Rhone-Poulenc acquired the site in 1987 and operated until 1996 when Titan Terminal & Transport began operations. The site has been used for the manufacturing of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993. From approximately 1924 to 1960, an estimated 200 tons of arsenic-containing sludge waste was disposed of into an on-site unlined surface impoundment. Subsurface investigations conducted at the site in the early 1980s identified elevated concentrations of metals in on-site soil, groundwater, and/or surface impoundment materials including, but not limited to: arsenic, cadmium, and chromium.

Completed Activities

	DOCUMENT TYPE	DATE COMPLETED	COMMENTS
[VIEW DOCS]	PA/SI Site Investigation	11/1/2015	
[VIEW DOCS]	Correspondence	9/21/2015	
[VIEW DOCS]	PA/SI Discovery	8/20/2014	
	Site Screening	5/1/1995	03/08/1990 LA County began enforcement action on Rhone Poulenc. Total phosphate, ph, lead soil. Workplan for additional work requested. Consultant nam: Ebasco Case #90S156, log #900670. NFA for DTSC due to involvement of local authority.
	Preliminary Assessment Report	2/5/1987	PRELIM ASSESS DONE ARSENIC SLUDGE POND WAS PAVED OVER EPA IN PROCESS OF RANKING SITE
	Site Screening	1/16/1987	SITE SCREENING DONE
	Preliminary Assessment Report	12/1/1985	SOURCE ACT: IW DISP SUVEY 1/81-(STAUFFER MFG TRI-SODIUM PHOSPHATE,DOSIUM SULFITE, CLEANING MIXES ALONG W/ PROD OF PHOSPHRC ACID. (A.R.)(VICTOR) MFG PHOSPHORIC ACID FAC TYPE: UNLINED WASTE DISP POND(20'X15 'X15'). WASTE: DISCH TO UNLINED SETTLING POND LOCATED AT SE CORNER OF THE PROPRTY BTW 1960/65 THIS POND WAS PAVED OVER W/ ASPHALT. SUBMIT TO EPA PRELIM ASSESS DONE CERCLA 104
	* Discovery	9/30/1980	FACILITY IDENTIFIED FAC ID LACSD LACSD VIOS FOR ODOR CONTROL & MINOR SPIL

FOR AN INTERACTIVE MAP, CLICK ON AN IMAGE BELOW

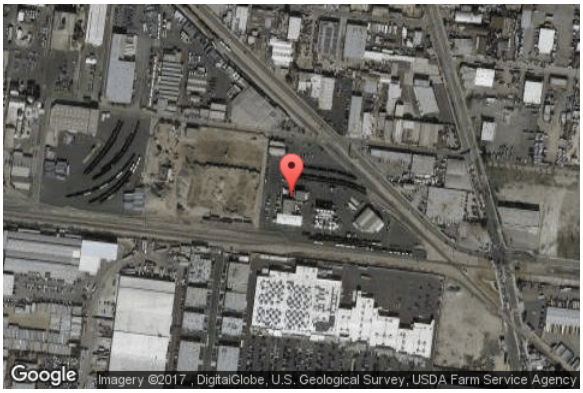
OVERVIEW:



MAP VIEW:

SATELLITE:

TERRAIN:



RELATED ENVIROSTOR SITES

NO RELATED ENVIROSTOR SITES FOUND

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0.515625 seconds

Reference:
DWR, 1948a

WRD # 200185

REGION

COUNTY

NEAR

DIVISION OF WATER RESOURCES
DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

WELL LOG

BASIN

DWR No. 76u I B & M

OTHER Nos. #1503A

Owner's # 12
2S/13W-25Q1

LOCATION FX-9 Wells

Tract 2599 Lot 244

OWNER City of Huntington Park ADDRESS

DRILLED BY Roscoe Moss Co. ADDRESS

DRILLING METHOD GRAVEL PACKED DATE COMPLETED Nov. 17, 1945

SIZE OF CASING DEPTH 14" STRUCK WATER AT

PERFORATIONS 522-1504' - 70 holes / 12" SIZE No.

WATER LEVEL BEFORE PERFORATING AFTER

TEST DATA: DISCHARGE G. P. M. DRAWDOWN FT. HOURS RUN

OTHER DATA AVAILABLE: WATER LEVEL RECORD ANALYSIS

SURFACE ELEV. 125' DATUM SOURCE OF INFORMATION LACoFCD

DEPTH	ELEV. OF BOTTOM OF STRATUM	MATERIAL	THICK-NESS	SP. YIELD %	
0-20	00	Sandy clay			
20-80	00	Blue sandy clay and sand streaks			
80-130	05	Yellow clay and rocks			
130-300	05	Yellow sandy clay			
300-360	03	Sand			
360-580	35	Blue sandy clay			
580-615	21	Tight sand and gravel			
615-640	05	Blue sandy clay			
640-672	23	Sand			
672-770	05	Blue sandy clay			
770-830	16	Packed sand			
830-895	20	Hard sand			
895-960	23	Sand			
960-1230	05	Blue sandy clay			
1230-1240	10	Hard sand			
1240-1335	16	Packed sand			
1335-1470	05	Blue sandy clay			
1470-1485	03	Sand			
1485-1525	05	Blue sandy clay			

MICROFILMED

FOR FIELD COPIES USE ALTERNATE LINES

LOG OBTAINED BY CER DATE 10/19/48 SHEET 1 OF

FORM 263. 8642 12-54 5M ⓢ SPG

Reference:
DWR, 1948b

WRD # 200120

REGION

COUNTY

NEAR

DIVISION OF WATER RESOURCES
DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

WELL LOG

BASIN

DWR No. 2S/12W-31M2 B & M

OTHER Nos. B-77c

Loc. # 7
#1514A

LOCATION About 20' from old #7 Well (1514)
Probably N.E.

OWNER Southgate Water Dept. ADDRESS

DRILLED BY Lyon Bros. ADDRESS 1363 Carmona Ave., L. A.

DRILLING METHOD GRAVEL PACKED DATE COMPLETED March 4, 1936

SIZE OF CASING DEPTH 16" STRUCK WATER AT

PERFORATIONS 500' - 600' - about 780 holes SIZE No.

WATER LEVEL BEFORE PERFORATING AFTER

TEST DATA: DISCHARGE G. P. M. DRAWDOWN FT. HOURS RUN

OTHER DATA AVAILABLE: WATER LEVEL RECORD ANALYSIS

SURFACE ELEV. 111' DATUM SOURCE OF INFORMATION L.A.CoFCD

DEPTH	ELEV. OF BOTTOM OF STRATUM	MATERIAL	THICKNESS	SP. YIELD %
0-12	11	Fine sand		
12-35		Packed silt		
35-69	0[illegible]	Mucky sand, water		
69-85				
85-89	2[illegible]	Blue sand & gravel		
89-114	0[illegible]	Sticky clay		
114-123	1[illegible]	Packed sand		
123-127	2[illegible]	Sand & gravel, water		
127-169	[illegible]	Sandy clay		
169-182	2[illegible]	Sand & gravel, water		
182-248	16	packed sand		
248-252	05	Mucky sand		
252-306	05	Sandy clay		
306-398	16	Packed sand		
398-411	2[illegible]	Sand & small gravel		
411-492	05	Hard sandy clay		
492-495	10	Cemented sand & gravel		
495-497	16	Packed sand		
497-517	2[illegible]	Good loose gravel, water		
517-539	[illegible]	Clay		
539-545	10	Cemented gravel		
545-555	2[illegible]	Good sand & gravel		
555-562	05	Gravelly clay		
562-574	21	Sand & gravel		

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FOR FIELD COPIES USE ALTERNATE LINES

LOG OBTAINED BY CER DATE 10/19/48 SHEET 1 OF

DWR 263A
INVESTIGATION

WRD # 200120 25/12W-24A2

DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

SHEET 2

NUMBER B-77c

WELL LOG

Loc [redacted] #1514A

DEPTH	ELEVATION OF BOTTOM OF STRATUM	MATERIAL	THICKNESS FEET	% VOIDS	ABSOLUTE VOIDS FEET	TOTAL VOIDS FEET
574-582		Sand & small gravel				
582-609		Clay				
609-646		Cemented sand				
646-751		Very hard sandy clay				
751-754		Hard cemented sand				
754-756		Sticky clay				
756-807		Cemented sand				
807-855		Very hard, sandy clay				
855-883		Very hard clay				

MICROFILMED

FOR FIELD COPIES USE ALTERNATE LINES

93524 3-59 5M ① SPO

F. C. Dist. Form 106—1M 5-36 Sheet 1

300±' N.E. inter. of Mason St. & Nevill Ave; At N.E. end of Nevill Ave; 47' S.W. ℄ of U.P.R.R.; 13±' N.E. of well 1514.

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DEPARTMENT
WELL DATA

Location and description About 20' from Old #7 well (1514) Probably N.E.
N. end of Neville Ave. & Atlantic Ave. 47' S. of ℄ of Salt Lake U.P. Railroad tracks

Description of reference point
(a) Airgage of Base of Pump, 1' above grd. surface
(b) & (c) See below

R. P. elev. above sea level (a) ~~114.6~~ 113.9 (b) 113.9 ~~114.6~~ (c) Equiv. elev. 114.6 Datum U.S.G.S.

How determined R.P. (a); (b); (c) Rel. to owner's levels

R. P. elev. above, below, ground

Owner Southgate Water Dept

Use Municipal Supply

Capacity of well Tested from 2-2-36 to 4-3-36. See sht #1A 200 g.p.m. at start; 1300 g.p.m. at end with drawdown of 25'

Depth of well 883'

Size of well 16" Type

Power used

Type of motor, engine Make HP 150 100

Type of pump Make Ser. No. 639360

Capacity of pump 900 G.P.M. See sht. No. 1A

Year drilled or dug 3-4-36 Driller

Depth to water when drilled
R.P. (b) 11-17-54 1" hole in pumpbase, 0.1' above pump foundation
~~Salinity of water~~ 1±' above grd.
R.P. (c) 2-1-69 ½" hole in discharge line, 0.9' up & 0.8' out
~~Temperature of water~~ from pump column at grd level

Artesian when drilled Yes No

Artesian on date Yes No

Airline length 138
Owners Levels:- Pump foundation elev. 113.72 prior to [illegible] & from 2-27-57 elev. 113.78'.

Well Numbers: Owners New #7 | DWR B-77C 25/12W-31M2 | F. C. Well No. 1514 A

25/12W-31M1 and M2

LOG OF WELL NO. 1514 A

Drilled by Lyon Bros., 1363 Cormona Ave., L. A.

Date drilled Dec. 20, 1935 To March 4, 1936

Depth from ground surface 883'

Struck water at 47' ft. from ground. after test

Water rose to ..... ft. from ground.

FROM	TO	CLASSIFICATION OF MATERIALS			
0	12	Fine sand	497	517	Good loose grvl. - Water
	35	Packed silt		539	Clay
	69	Mucky Sand - Water		545	Cemented grvl.
	85			555	Good sand + grvl
	89	Blue sand + gravel		562	Gravely clay
	114	Sticky Clay		574	Sand + gravel
	123	Packed sand		582	Snd. + Sml. grvl.
	127	Sand + gravel - Water		609	Clay ◇
	169	Sandy Clay		646	Cemented sand
	182	Sand + gravel - Water		757	Very hard sndy. cly
	248	Packed sand		754	Hard cem'd sand
	252	Mucky sand		756	Sticky clay
	306	Sandy clay		807	Cemented sand
	398	Packed Sand		855	Very hard sndy. cl.
	411	Sand + Sml. grvl.	855	883	Very hard Clay
	492	Hard Sndy. cly.			
	495	Cem. Snd. + grvl.			
495	497	Packed sand			

Perf. 500' To 600'
about 781 holes
(Copper - S.P.)

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDROGRAPHIC DEPARTMENT

SHEET NO. [illegible]

[illegible] REFERENCE POINT _____ WELL NO. 1514A

RPM Motor + Pump	1456
Static Water Level	50.8
[illegible] (DRAWDOWN)	12.7
Discharge head in feet	172.3
Total pumping head in feet	239.8
[illegible] pumped	919.
Miners inches	102.1

Pumping Test

8:00A to 9:00A	pumped GPM	1028.
9:00A to 10:00A	" "	1095.

(OVER)

Reference:
DWR, 1961

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT

BULLETIN NO. 104

PLANNED UTILIZATION OF THE GROUND WATER BASINS OF THE COASTAL PLAIN OF LOS ANGELES COUNTY

APPENDIX A
GROUND WATER GEOLOGY

EDMUND G. BROWN
Governor

WILLIAM E. WARNE
Director

JUNE 1961

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(Bound at end of report)

Attachment No.

1 Bibliography

2 Specific Yield Values and Transmissibility Tests

3 Well Numbering System and Definitions

CHAPTER IV STRATIGRAPHY

This chapter describes the stratigraphy, or the physical characteristics of the natural groupings of the rocks and sediments, in the Coastal Plain of Los Angeles County, including the age of rocks and sediments, their order in relationship to each other, and their position in the area. In order to simplify the discussion of stratigraphy, the rocks and sediments in the coastal plain are divided into water-bearing deposits and nonwater-bearing rocks.

The water-bearing deposits include the unconsolidated and semiconsolidated marine and nonmarine alluvial sediments of Recent, Pleistocene, and Pliocene age which form ground water basins. These materials absorb, transmit, and yield water readily to wells. Sizes of individual particles may grade from coarse gravel and boulders to clay. Coarse sands and gravels form the conduits for transmission of ground water and are called aquifers, while the finer sands, silts and clays, which also transmit ground water, but very slowly, are known as aquicludes.

The types of materials encountered by surface and subsurface geologic exploration and water well drilling, as reported by various individuals and agencies, are summarized on Table 1, which is bound at the end in this report. Based upon this information, the areal extent, thickness, and depths of the various aquifers and aquicludes underlying the coastal plain were estimated. The aquifers were named and their stratigraphic positions are illustrated schematically on Plate 5, entitled "Generalized Stratigraphic Column, Coastal Plain of Los Angeles County". Since the aquicludes which separate aquifers are generally of secondary interest, and because of additional complications of nomenclature, only the surface aquiclude is named. An attempt has been made to bring together and clarify the nomenclature

used by many individuals and agencies. Therefore Plate 5 also relates the nomenclature system utilized in this report with that employed by others in the past.

The term "nonwater-bearing rocks" used in this report should not be construed to mean rocks which contain no water, but rather materials from which wells produce relatively limited quantities of water. Nonwater-bearing rocks are the parent rocks from which alluvium is derived. These rocks flank, underlie, and sometimes form the limits of the ground water basins and provide watersheds for runoff or drainage to valley-fill areas. Nonwater-bearing rocks include granitic, metamorphic, volcanic, and consolidated sedimentary types. Locally, the sedimentary rocks may yield a small amount of brackish, saline, or other poor quality waters. Water which drains from these rocks may also affect the quality of water in the sediments of valley-fill areas. Even within the crystalline basement rocks, some extractable water is contained within the joints, fractures, and solution cavities. In the highland areas, wells in volcanic flows and breccias yield limited quantities of water. The yield of wells in the volcanics, however, is usually restricted either because there is a lack of connected interstices or because they are so situated topographically or structurally that cementation, folding and faulting interferes with the vertical and lateral flow of ground water.

The following sections describe the water-bearing deposits and nonwater-bearing rocks in detail beginning with the geologically most recent, and working backward in time to the oldest strata. The surface outcroppings of the various formations are delineated on Plate 3. The conclusions of this study relating to the depth and thickness of the various aquifers and aquicludes in the coastal plain are illustrated by a series of idealized

geologic sections cutting the area in east-west and north-south directions. These sections are shown on Plates 6A through 6G, entitled "Idealized Geologic Sections"; and the geographic locations of the sections are indicated on Plate 3, together with the locations of wells and test holes from which the geologic sections were derived. In addition to the wells and test holes shown on these plates, there were two to three times as many wells and test holes that were studied. These data were used to assist in delineating the boundaries of the aquifers and aquicludes.

In constructing the geologic sections, it was much easier to correlate aquifers from well log to well log in the marine sediments found southwest of the Newport-Inglewood uplift than it was in the area to the northeast. Consequently, the correlations in the continental sediments, especially those adjacent to the high lands are more definitive than are those in the marine sediments closer to the ocean. Also, the geologic sections in the West Coast Basin (this basin is described in Chapter 6) were mainly based on data taken from the Report of Referee (Calif. D.W.R. 1952a), modified slightly by unpublished data obtained from the Los Angeles County Flood Control District.

Subsurface structure and positions of aquifers in the area downstream from Whittier Narrows are illustrated by a series of cut-away diagrams shown on Plate 7, entitled "Cut-Away Diagrams of Aquifers in Vicinity of Whittier Narrows". These diagrams are of assistance in following the discussion of stratigraphic relationships but are discussed in detail in Chapter V. Detailed discussions of structural features referred to in the following sections are also contained in Chapter V.

Quaternary System

Sediments of Quaternary and late Pliocene age comprise the water-bearing formations in the coastal plain. The Quaternary deposits are divided into the Recent and Pleistocene series.

Alluvial materials and rocks of Recent and Pleistocene age usually are unconsolidated and have suffered deformation to a lesser degree than the older underlying rocks. These younger alluvial materials are generally more heterogeneous than the older sediments although this may be more apparent than real, since more detailed information is usually available for younger sediments than for those older in age. In the detailed studies of oil fields, by contrast, the heterogeneity of older sediments is apparent.

Ground water extracted from wells is obtained primarily from aquifers of Recent and Pleistocene age, with the exception of a few wells in the Lakewood and North Long Beach areas which are perforated in sediments of late Pliocene age.

Deposition of Quaternary sediments has been controlled by tectonic activity, geomorphic processes, changes in climate, and world-wide changes in sea level, as previously discussed. The physical characteristics of those water-bearing series that favor high production of ground water are: their unconsolidated and permeable nature, their relatively undeformed state, their low topographic position, which permits infiltration of drainage from higher surrounding areas, their freedom from obstructions to flow in most areas, the ease with which their materials may be dewatered, or drained, and the ease with which in certain areas they may be naturally or artificially recharged.

Recent Series

Reade (1872) first defined the Recent epoch as that time which has elapsed since the beginning of the last major rise in sea level, and this definition has been adopted for use in this report. An approximate age of 15,000 years has been assigned to the Recent epoch by Shepard (1956) and Hopkins (1959).

Recent materials were laid down upon the erosional surface that existed toward the end of the last glacial stage. In most of the Coastal Plain of Los Angeles County these sediments are stream deposits but near the ocean they include tidal, marine, and wind-deposited materials.

Recent deposits are recognizable by:their generally coarse, unconsolidated or uncemented nature (however, on Recent flood plains, alluvial fans, and certain marine deposits, fine-grained silts and clays are common), their unconformable relationship with the underlying late Pleistocene and older deposits, their relationship to the present drainage system including numerous gaps along the coast and other physiographic features, and the youthful or poorly developed soil normally found on the surface. Little deformation of the Recent sediments has occurred except where they cross tectonically active areas, as in Dominguez and Ballona Gaps. Two major members of the Recent series are shown in the areal geology presented on Plate 3 namely, alluvium, represented by the symbol Qal and active dune sand represented by Qsr.

Alluvium. Recent Alluvium is primarily stream deposited gravel, sand, silt and clay with some interbedded littoral and estuary or bay deposits near the ocean. Geologic members found within the alluvial deposits include the Semiperched aquifer, Bellflower aquiclude, Gaspur aquifer, and

Ballona aquifer. Portions of the Semiperched aquifer and Bellflower aquiclude are of late Pleistocene age, placing them in the Lakewood formation. They are described here, however, together with the deposits of Recent age.

Semiperched Aquifer. Coarse sands and gravels, called the Semiperched aquifer, are found on or near the surface of much of the Coastal Plain of Los Angeles County. These materials vary in thickness from 0 to 60 feet and may contain significant amounts of unconfined water where they are more than 20 feet thick. The most important areas where this aquifer appears are in the Los Angeles and Montebello Forebay Areas, and irregular patches occur throughout the rest of the coastal plain.

Where the underlying aquifers are confined, the Semiperched aquifer is generally separated from them by silts and clays or other material of relatively low permeability, called the Bellflower aquiclude. These materials inhibit the free percolation of water from the Semiperched aquifer to the underlying aquifers.

Permeable sediments of both Recent and late Pleistocene age are included within the Semiperched aquifer. Most of the sediments are probably remnants of abandoned stream channels, although marine deposits previously known as the Palos Verdes Sand are a part of the aquifer underlying portions of the Torrance Plain.

Little beneficial use is made of water in the Semiperched aquifer since wells perforated in it yield very small quantities of water. Furthermore, the poor quality of the water in some areas makes it undesirable for widespread use.

Bellflower Aquiclude. Lying directly beneath the Semiperched aquifer are sediments of lesser permeability which restrict vertical movement of ground water. These relatively impermeable materials, referred to in numerous reports in generalized terms, have been designated the Bellflower aquiclude. Physical features and dimensions of this aquiclude are delineated on Plate 8, entitled "Lines of Equal Elevation on the Base of the Bellflower Aquiclude", and on Plate 9, entitled "Lines of Equal Thickness of the Bellflower Aquiclude". The Bellflower aquiclude comprises all of the fine grained sediments that extend from the ground surface, or from the base of the Semiperched aquifer, down to the first aquifer below. Other names that have been used to refer to these materials are: "Upper Division of the Alluvial Deposits of Recent Age" (Poland, et al 1956); "Upper Fine Grained Phase" in California D.W.R. 1952b; and "clay cap" in California D.W.R., 1952c, 1957a, and 1958b. The flood plain deposits referred to by Poland, (1959b) which are found in many portions of the Downey Plain may be equivalent, at least in part, to the Bellflower aquiclude as here defined. Although other reports refer to these sediments as Recent in geologic age, the Bellflower aquiclude, as defined in this report, is composed of both Recent sediments in some areas, and late Pleistocene deposits in others.

The Bellflower aquiclude extends throughout most of the Coastal Plain of Los Angeles County, except for the Los Angeles and Montebello Forebay Areas. According to drillers logs and from visual observation of exposed formations in excavations, this aquiclude is a heterogeneous mixture of fine grained continental, marine, and wind-blown sediments. In about a third of the coastal plain, the aquiclude consists only of clays and silty clays, but extensive lenses and pockets of sandy or gravelly clays occur in the remainder of the area, as shown on Plate 9. These predominantly

sandy and gravelly clays may permit waters to percolate slowly to the underlying aquifer or aquifers, or ground water in these latter areas may move upward if pressure levels in the underlying aquifer are sufficiently high. Classification of materials from the descriptions usually found in well logs is difficult; however, in logs where descriptions of materials are more precise and presumably of greater reliability, the sand content is greater than has been generally assumed. Consequently, the aquiclude is believed to have a somewhat greater, though still restricted, permeability than has been supposed in the past.

That portion of the aquiclude of Recent age has not been appreciably faulted or folded; however, the portion of late Pleistocene age has been affected to some extent by tectonic movements.

The thickness of the Bellflower aquiclude, as shown on Plate 9, varies from zero to 200 feet. The areas of greatest thickness occur along the center and east flank of the Gardena Syncline in the West Coast Basin. Other areas of considerable thickness, ranging up to 140 feet, are generally aligned with the South Gate-Santa Ana Depression.

Gaspur Aquifer. The basal coarse phase of the Recent series has been referred to in previous reports as the Gaspur water-bearing zone. These sediments were described by Poland, et al (1956) and in California D.W.R. 1952a and 1952b. The term "aquifer" is used in this report rather than "water-bearing zone", the expression previously employed, as being more descriptive of the function of the deposits. According to Poland, et al (1956) the name of the aquifer is derived from the identification of a typical section in the log of a well near Gaspur Station at the coastal end of Dominguez Gap.

The extent of the Gaspur aquifer is shown on Plate 10, entitled "Lines of Equal Elevation on the Base of the Gaspur, Ballona, Artesia, and Exposition Aquifers". Its westerly arm, extending southerly from the Los Angeles Narrows, joins the easterly arm extending southwesterly from the Whittier Narrows near Downey and continues southwesterly through Dominguez Gap to the ocean. Throughout the 23 mile length of the aquifer the width varies from one to five and a half miles.

The type cobbles and pebbles in the Gaspur aquifer indicate that they are derived from the San Gabriel Mountains and other highland areas surrounding the San Gabriel and San Fernando Valleys.

The continental stream deposits found in the Gaspur aquifer range in size from boulder gravel to silt and clay. In vertical section, the upper part is medium to coarse-textured sand while the lower part consists of sand, gravel, and cobbles as large as four or five inches in diameter. There is also a lateral variation in lithology. Well logs north of Rosecrans Boulevard generally show 80 to 90 percent coarse sands and gravels with 10 to 20 percent finer-grained materials. South of Rosecrans Boulevard, about 40 to 50 percent of the sediments comprising the Gaspur aquifer are fine-grained. The fine-grained patches are discontinuous within the Whittier Narrows, and occur as stringers, or elongated lenses. Variations in the thickness and width of the Gaspur aquifer seem to indicate that the stream or streams responsible for original deposition were meandering, braiding, eroding and aggrading. The absence of fine deposits in the lower portion suggests that they were removed by erosion during flood stages. Thickness of the Gaspur aquifer ranging up to about 120 feet, is delineated on Plate 11 entitled, "Lines of Equal Thickness of the Gaspur, Ballona, Artesia, and Exposition Aquifers".

The Gaspur aquifer is merged with surface deposits in the Montebello Forebay between the Rio Hondo and San Gabriel River, extending as far south as Slauson Avenue. It also crops out in the Los Angeles Narrows in an area bounded by the Los Angeles River and the Harbor Freeway, and extends from the Narrows as far south as Firestone Boulevard. These two outcrops areas are shown on Plate 10A.

The gradient of the base of the westerly arm of the Gaspur aquifer is 44.5 feet per mile (a 300-foot drop in elevation in 6.75 miles). The gradient of the base of the Gaspur aquifer along the easterly arm is about 19 feet per mile (a drop of 200 feet in 10.5 miles). Between San Pedro Bay and the point where the two arms of the Gaspur aquifer join, the gradient is 10 feet per mile (a 60-foot drop in elevation in 6.0 miles). The steepness of the westerly arm may indicate uplift to the north and west, although greater rock hardness in Los Angeles Narrows and/or a difference in stream flow regimen caused by changing debris loads also may have caused this steep gradient. Minor warping of both the aquifer and overlying Recent deposits has probably occurred within the Whittier Narrows and Dominguez Gap. The Gaspur aquifer has apparently not been affected by faulting.

Water levels and well histories indicate that the Gaspur aquifer has been partially dewatered. The majority of new wells drilled in the area under which this aquifer lies do not depend solely on this aquifer but are usually drilled into and perforated in deeper aquifers as well. Many existing wells, however, depend only on this aquifer for their supply, and in these wells the yields are usually high. Permeabilities in this aquifer range up to 6000 gallons per day per square foot. (See Table D in Attachment 2 for general values of permeabilities used in the coastal plain).

The Gaspur aquifer is merged with the deeper aquifers in the area immediately south of Los Angeles Narrows, which at one time served as a recharge area. However, this area is now completely covered by buildings and paved streets. Little, if any, direct percolation of water is possible; even the channel of the Los Angeles River is now lined where it passes through this area.

In the vicinity of Whittier Narrows, the deeper aquifers are also merged with the Gaspur aquifer and receive their natural recharge waters through it. Because percolation in the Los Angeles Narrows has been rendered infeasible, the Whittier Narrows is the most suitable remaining location for artificial recharge of the underlying aquifers. Consequently, the principal recharge basins and projects for recharging local surface flood waters and imported waters are located in this area, from whence natural percolation processes carry this water into the deeper aquifers.

Ballona Aquifer. The other principal aquifer of Recent age is the Ballona aquifer, which has previously been termed the "50-foot gravel". Poland, et al (1959a) originally assigned the name "50-foot gravel" to the lower divisions of the Recent series in Ballona Gap, because these occurred at an average depth of 50 feet below the surface. Although this aquifer is included within the Recent series it is believed that at least part of it may be of late Pleistocene age.

The Ballona aquifer lies north of the Ballona escarpment and extends inland to a point east of the Overland Avenue fault. The extent of this aquifer is shown on Plate 10. It is composed of coarse sand, rounded to subrounded gravel, and cobbles up to five inches in diameter that are of both granitic and metamorphic origin. Slate pebbles in this aquifer suggest

that the Santa Monica Mountains were a possible source of material; on the other hand, granitic rocks and pebbles appear to come from the San Gabriel Mountains. The Los Angeles River has flowed north of the Baldwin Hills and along Ballona Creek channel in historic time, but no attempt has been made to determine the relative contribution to the Ballona aquifer from the two drainage systems.

The Ballona aquifer varies in thickness from less than 10 feet at the coast to 40 feet near Beverly Hills. Thickness of the Ballona aquifer is delineated on Plate 11.

The base of the Ballona aquifer drops from more than 100 feet above sea level beneath the Sawtelle Plain to 60 feet below sea level near the Ballona Escarpment, a gradient of about 40 feet per mile. There is a southward tilt to the base, which corresponds to the southerly dip into West Coast Basin of the San Pedro formation, and may be due to either erosion and depositional processes or to tilting, or possibly both.

Well yields from the Ballona aquifer are highly variable, ranging from 100 to 800 gpm (Poland, et al 1959a). This may be due to the irregularity and discontinuity of its composition and thickness.

Miscellaneous Alluvial Deposits. Other Recent alluvial deposits include beach deposits, playa lake deposits and lagoonal marshland deposits. These have been described more elaborately (Poland, et al 1959a), and are treated only briefly in this report.

Narrow strips of beach deposits, with materials ranging in size from fine sand to cobbles, are found adjacent to wave-cut cliffs along the coastline. They also exist as barrier beaches across the various gaps along the coast. The beach deposits act as a source for wind-blown material

for the coastal-dune belt and may also serve as a permeable conduit for seawater intrusion into aquifers near the surface along the coast.

Playa lake deposits found near the intersection of the Coast Highway and Vermont Avenue, about one mile west of Wilmington, have been deposited in shallow closed depressions. Standing water accumulates in these closed drainage areas after heavy rains. These deposits are usually fine-grained sands, silts, and clays.

Lagoonal marshlands extend along the coastal reaches of the Los Angeles and San Gabriel Rivers and Ballona Creek for a distance of one-half to three miles inland. Deposits in these areas appear to be heterogeneous in nature, lenticular, and mostly fine-grained. These sediments may also include medium sand, silty sand, clay and peat deposits.

Active Dune Sand. Wind-blown sands occur in a narrow strip 0.2 to 0.5 miles inland and parallel to the coast and continue from Ballona Escarpment southward to Redondo Beach for a distance of about nine miles. These deposits are known as the Active Dune Sands. Plate 3B shows the extent of these deposits which are identified by the symbol Qsr. These eolian deposits are lenticular, and composed of fine to medium, white or grayish sand, usually well sorted. These sediments may also include medium sand, silty sand, clay and peat deposits. The Active Dune Sands range up to 70 feet in thickness. Being above the zone of saturation, the sands do not yield water to wells. However, they are relatively permeable and water held in closed depressions after heavy rains does percolate vertically downward and laterally. The dune sands may therefore serve as recharge media to any water bodies that underlie this area.

Pleistocene Series

The Pleistocene series is divided into upper Pleistocene and lower Pleistocene in most of coastal California, primarily because they are separated by an angular unconformity in many uplift areas. Fossils are used as an additional index to separation of the Pleistocene series. The boundary between deposits of Pliocene and Pleistocene age is difficult to determine and consequently is somewhat arbitrary in many areas.

In the coastal plain the upper Pleistocene is represented by the Older Dune Sands and the Lakewood formation, while the lower Pleistocene consists of the San Pedro formation (Poland, et al, 1956). Where they appear on the surface the Older Dune Sands, Lakewood formation, and the San Pedro formation are identified by the symbols Qso, Qlw, and Qsp, respectively. on Plate 3. A small zone of transitional material, cropping out between the San Pedro formation and the underlying Pico formation of Pliocene age is also shown on Plate 3 and identified by the symbol Qsp-Pp.

Older Dune Sand. Dune deposits occur in West Coast Basin which are older than those described under the Recent Series. These wind-blown materials are sufficiently significant in manner of deposition, lithology and topography, to be considered in this report as a separate unit. The term "Older Sand Dunes" has been previously used to designate these wind-blown deposits; however, in this report, the more descriptive term "Older Dune Sand" is used to identify these deposits.

The Older Dune Sand has been described by Poland, (1956, 1959b) and in Calif. D.W.R. 1952a and 1957c. Although these sediments have been previously classed as Recent materials, they are now considered to be of late Pleistocene age.

The Older Dune Sand covers an area three to four miles wide and about 13 miles long extending along the Santa Monica Bay Coast line south of Ballona Escarpment. Surface exposures and well logs indicate that the dune sediments cover the Ocean Park Plain as well as a portion of the West Coast Basin. In the Ballona Creek area the older dunes have been removed. In the West Coast Basin the Older Dune Sand together with the Active Dune Sand form the El Segundo Sand Hills.

The Older Dune Sand consists of fine to medium sand with minor sandy silt, clay, and gravel lenses. Within the weathered zone the materials are yellow to brown in color although the unweathered formation in place is white, gray and black in color. The Older Dune Sand generally consists of three divisions: a deeply weathered surface, an intermediate horizon of clean sands and basal beach sands and gravels, and a lowermost horizon which apparently includes a zone of transition to the underlying Bellflower aquiclude.

Cross-bedding, and fossils in exposures near the Hyperion Sewage Treatment Plant at El Segundo and elsewhere, indicate that the sands were originally beach deposits with associated coarse gravels. These beach deposits were exposed to the wind by lowering of the sea level, resulting in formation of the present Older Dune Sand. Deep weathering has oxidized the iron minerals which, through cementation and leaching processes, have partially filled the interstices between individual grains, thus reducing the permeability of the weathered Older Dune Sand to some extent. Uplifting may have gently tilted these dunes toward the southwest.

Deep percolation of surface water occurs in most of the Older Dune Sand area, especially where closed depressions occur. Directly beneath these older dunes in part of the El Segundo Sand Hills, the fine sediments

of the Bellflower aquiclude restrict downward movement of ground water. However, the aquiclude is missing along the ocean and ground water can move laterally into an area where downward percolation can again occur.

Lakewood formation. The Lakewood formation includes all upper Pleistocene deposits other than the Older Dune Sand. It includes what has previously been termed "terrace deposits", "Palos Verdes sand", and "unnamed upper Pleistocene deposits". Other names which have been used for upper Pleistocene deposits or parts of these deposits include the Sunny Hill formation (Hoskins, 1954,), and San Dimas formation (Eckis, 1928). These names, however, are awkward for use in the entire coastal plain since the named formations have been described as existing only in the limited associated area. The present designation was selected from a typical section indicated in the log of a well at Lakewood where this formation reaches a maximum thickness of approximately 340 feet.

In the upper part of the Lakewood formation lithologic changes are rapid, with discontinuous permeable zones and considerable variation in particle size. No shell zones have been found in the upper part of this formation. These features represent typical stream type alluviation with flood plain fine-grained sediments comprising from 40 to 80 percent of the total deposits. In the lower horizons the gravels and coarse sands are confined to a narrow belt extending over the Newport-Inglewood uplift. Gravels range from pea-size to cobbles, three to four inches in diameter. Over the balance of the coastal plain, coarse basal deposits of sand and gravel are fairly continuous with discontinuous lenses of sandy silt and clay. The basal part of the Lakewood formation in the Cheviot Hills area of Beverly Hills has been called the Medill sand by Rodda (1957)..

The Lakewood formation extends beneath most of the coastal plain. In portions of the Baldwin Hills, Signal Hill, Palos Verdes Hills, and Coyote Hills, it has been eroded, exposing the underlying San Pedro and older formations. In the La Brea, Santa Monica, and Montebello Plains, and on the flanks of the Palos Verdes Hills and Puente Hills, the Lakewood formation unconformably overlies the lower Pleistocene San Pedro formation, the Pliocene Pico and Repetto formations, and the Miocene Puente formation.

The Lakewood formation is divided into the Artesia-Exposition aquifers, the Gage-Gardena aquifers, and the unnamed aquicludes between the aquifers. In some areas, portions of the Semiperched aquifer and the Bellflower aquiclude, described under Recent alluvium, are included. The base of the Lakewood formation generally coincides with the base of the Gage and Gardena aquifers. The aquifers of the Lakewood formation are discussed in the following paragraphs.

Artesia-Exposition Aquifers. The Artesia and Exposition aquifers, although located in separate geographical areas, are similar in composition and mode of deposition; this leads to the conclusion that they are contemporaneous. They are, therefore, jointly discussed in this section. The Artesia aquifer appears to be related to the San Gabriel River, Coyote Creek, and Santa Ana River systems, and the Exposition aquifer is related to the Los Angeles River drainage system. As shown on geologic section C-C'-C", Plate 6B, these aquifers extend beneath the Gaspur aquifer at which point they merge with each other and with the overlying Gaspur aquifer. On Plates 10 and 11, the contours on the base of the Artesia-Exposition aquifers and lines of equal thickness are not extended beneath the Gaspur aquifer since it is difficult to distinguish the separate aquifers.

The Artesia aquifer extends from the middle of the Santa Fe Springs Plain southward, where it underlies the northern portions of the Bouton Plain, Signal Hill, and Bixby Ranch Hill. It follows the general trend of the present San Gabriel-Coyote Creek drainage as shown on Plate 10. The Artesia aquifer extends southeasterly from the Gaspur aquifer to and beyond the Los Angeles-Orange County line. However, since no study has been made of the extension of this or any other aquifer outside the area of investigation, it is terminated at the county line.

The Artesia aquifer is composed of coarse gravel, coarse to fine sand and interbedded silts and clays. In some areas, individual gravel members within the aquifer can be identified in drillers logs for considerable distances. The Artesia aquifer has a general southwesterly dip, and varies in thickness (Plate 11) and bottom configuration (Plate 10).

The ancestral San Gabriel and Santa Ana Rivers, and Coyote Creek, appear to have been the main source of the sediments comprising this aquifer. The Santa Ana River may have contributed sediments to the southern portion of the area since this river once flowed directly west and joined the San Gabriel River near its present confluence with Coyote Creek.

The geographical extent of the Exposition aquifer is shown on Plate 10. This aquifer consists of one to four discontinuous coarse members. Materials range in size from coarse gravels to clay, with the fine deposits separating the lenticular sandy and gravelly beds. Changes in lithology are frequent as evidenced by the many lenses of silt and clay encountered in the drillers logs.

Deposition of this material appears to have been controlled by the ancestral Los Angeles River, which may have flowed through the Silver Lake

area (Riveroll, 1957) in the geologic past, as well as by tributary streams from the Santa Monica Mountains, Elysian Hills, and Repetto Hills. The configuration of the base of the Exposition aquifer, as well as the Artesia aquifer, is highly irregular and it appears that both were deposited on an erosional surface. A study of well logs indicates that the upper coarse members of the Exposition aquifer were either eroded and backfilled by Gaspur deposits or that some of the upper members were deposited contemporaneously with the formation of the Gaspur aquifer. Highway excavations in the vicinity of Boyle Heights and other areas along the south slope of the Repetto Hills and along the east bank of the Los Angeles River have exposed clean sands and gravels which are apparently an upper member of the Exposition aquifer.

The maximum thickness of the Exposition aquifer is 100 feet. Lines of equal thickness of the aquifer, including interbedded fine materials as well as the permeable zones, are shown on Plate 11.

Stratigraphically, the Artesia and Exposition aquifers lie above the Gage aquifer, described subsequently, and are generally deeper than the Gaspur aquifer, although some of the upper coarse members abut directly into the Gaspur aquifer and may be of the same age. At Boyle Heights and other places, the Artesia and Exposition aquifer have been uplifted and are now higher in elevation than the adjacent Gaspur aquifer. Lower members of the Exposition continue beneath the Gaspur aquifer and merge laterally with the Artesia aquifer. The Exposition aquifer merges with the underlying Gage aquifer approximately three miles northwest of downtown Los Angeles and also in the triangular area between the easterly and westerly arms of the Gaspur aquifer on the Montebello Plain, as shown on Plate 12, "Lines of Equal Elevation on the Base of the Gage and Gardena Aquifers".

The Potrero fault is the only known structure that displaces the Exposition aquifer. However, both the Artesia and Exposition aquifers have been affected by folding and show slight warping near the Newport-Inglewood uplift and in the downwarped area of the Central Basin.

Gage Aquifer. The basal or lowest member of the Lakewood formation is termed the Gage aquifer. The name "200-foot sand" was applied to this aquifer by Poland, et al (1948 and 1959a), later by Richter (1950) and in the "Report of Referee", (Calif. D.W.R. 1952a). Originally the designation of the "200-foot sand" was used because the aquifer occurred about 200 feet below land surface in the syncline extending from Inglewood southeasterly through Gardena. In the Central Basin the base of the aquifer varies from 100 to over 350 feet below the surface; consequently the term "200-foot sand" is inapplicable. The lowest elevation this aquifer attains is in the vicinity of Lynwood, where an elevation of 350 feet below sea level occurs. The Gage aquifer extends over most of the Coastal Plain of Los Angeles County, although insufficient data is available to verify its extension beneath the Santa Monica Plain. Contours on the base of the aquifer are shown on Plate 12.

The composition of the Gage aquifer varies from a fine to medium sand with variable amounts of gravel, sandy silt, and clay in the West Coast Basin, to a coarse yellow sand and minor gravel (two to four inches in diameter) in the center of the Central Basin, and to a fine yellow sand and gravel toward the Whittier Narrows region. The thickness varies from 10 feet to a maximum of 160 feet in the Torrance area. The thickness of the aquifer is shown on Plate 13, "Lines of Equal Thickness of the Gage and Gardena Aquifers".

Deposits that comprise this aquifer are of both marine and continental origin. Along the northerly boundary of the Central Basin, that is, along the base of the Santa Monica Mountains and the Elysian and Repetto Hills, the deposits appear to be continental in origin. In the southeastern half of the coastal plain the aquifer consists mainly of mixed continental and marine, or in some areas, solely marine sediments.

Subsurface structures which either cut the aquifer or against which the aquifer terminates are shown on Plate 12. Areas where the aquifer is merged with overlying aquifers are also shown on this plate.

While this aquifer generally consists of sand, wells have been perforated in it only in areas where coarser materials exist. Approximately 200 wells have been drilled into the Gage aquifer in the West Coast Basin in the vicinity of Gardena but it is unimportant as a producing aquifer in other areas.

Gardena Aquifer. In 1950 Richter described the coarse deposits comprising this aquifer within the West Coast Basin under the term "Gardena Water-bearing Zone". In "Report of Referee" (Calif. D.W.R. 1952a) the description of the Gardena Water-bearing Zone was further elaborated. In the present investigation the extent of the Gardena water-bearing zone in the Central Basin was determined and these deposits have been designated the "Gardena aquifer". This term now applies to all of the coarse deposits that are contemporaneous with the Gage aquifer (fine grained deposits) in both the Central and West Coast Basins.

The Gardena aquifer extends inland from Redondo Beach beneath the City of Gardena, across the Newport-Inglewood uplift and into the Central Basin, where it loses its identity near Lynwood. Further inland, identical

coarse deposits are again discernible underlying the Montebello Plain and within the Whittier Narrows. These two areas, however, are separated by the Gage aquifer which underlies that part of the Central Basin where the water-bearing deposits are deepest. In the western part of the coastal plain, the deposits form a strip one to four and one-half miles wide extending from Lynwood to the coast. Other coarse deposits, believed to be at the same stratigraphic horizon, extend southwesterly from the Whittier Narrows and then form two southeasterly trending lobes. One lobe reaches the area south of downtown Los Angeles and the Elysian Hills, and the other extends along the south side of the Santa Fe Springs Plain to the vicinity of Norwalk. The extent of these deposits is shown on Plate 12.

The lithology of the Gardena aquifer in the West Coast Basin is given by Richter (1950) as coarse sand and gravel with discontinuous lenses of sandy silt and yellow to blue clay, with the gravel sizes ranging from pea-size to cobbles three to four inches in diameter and the sand ranging from fine to coarse. Deposits in the Central Basin also contain coarse sands and gravels, with minor lenses of sand, silty clay, and clay. The deposits are similar in thickness and elevation to those of the Gage aquifer and are in direct continuity with the Gage materials. According to Richter (1950), the thickness within the West Coast Basin varies from 50 to 75 feet between the Avalon-Compton fault and the City of Gardena; from 75 to 100 feet west of Gardena, and is over 100 feet where it overlaps the merged Lynwood and Silverado aquifers near the coast. The present study indicates that the Gardena aquifer varies in thickness from 40 feet near Lynwood to 100 feet near Gardena and increases to 160 feet northwest of Torrance. Lines of equal thickness are shown on Plate 13.

As shown on Plate 12, the lowest elevation of the base of this aquifer is 350 feet below sea level in the Central Basin and 200 feet below sea level in the West Coast Basin. On the Newport-Inglewood uplift, as well as in the merged area near the coast, the elevation of the base is 100 feet below sea level.

Richter (1950) indicated that this aquifer was one of fluvial origin since the alignment over the Newport-Inglewood uplift was narrow and perpendicular to probable ancient shore lines; furthermore, these deposits are similar to other Recent alluvial deposits in Dominguez and other Gaps. However, Poland (1959a) suggested that this coarse deposit may have been laid down beyond a shore line fringing the Newport-Inglewood uplift. Work in conjunction with this investigation, however, leads to the same conclusion outlined by Richter.

Some ancestral river flowing southwesterly incised a channel across the Newport-Inglewood uplift and eroded away most of the sediments comprising the Gage aquifer ("200-foot sand"). In this channel coarse fluvial deposits were laid down during a subsequent rise of sea level. Coastward from the uplift some shells have been found in wells drilled in this aquifer suggesting that fluvial action may have been affected by shallow lagoons or estuaries. From further study conducted during this investigation, it appears that the Rio Hondo-San Gabriel River systems have been the principal transporting agencies for sediments comprising the Gardena aquifer. However, because the two inland lobes of the Gardena aquifer extend parallel to the inland foothills there is a possibility that the Los Angeles River may have deposited portions of it.

In the Whittier Narrows, the Gardena aquifer is cut by the Rio Hondo fault shown on Plate 7, and it has been folded up to 11 degrees along

the edge of the area near Boyle Heights. Recent uplift along the crest of the Rosecrans anticline has arched the Gardena aquifer, and this is shown on Plate 12 by contours plotted of the base of the aquifer.

The Gardena aquifer has yielded large quantities of water to wells. Because of its coarse texture and continuity, it is an important aquifer in the coastal plain. It is in hydraulic continuity with the Gage aquifer throughout most of its extent and for this reason the isopachs (lines of equal thickness) and elevation contours are plotted on the same maps as the Gage aquifer.

San Pedro Formation. The San Pedro formation has previously been defined to Poland, et al (1945, 1948, 1956, 1959a), as "that stratigraphic unit underlying the unnamed upper Pleistocene deposits and overlying the Pico formation of the late Pliocene age..... Essentially, the San Pedro formation embraces all strata of lower Pleistocene age." Richter (1950) defined the San Pedro formation as "all of the deposits of lower Pleistocene age which underlie West Basin." The original type section of the San Pedro formation contained San Pedro sand, Timms Point silt, and Lomita marl; however, Poland has stated that the San Pedro formation "includes some strata that are younger and may include some that are older than any exposed in the type section cited."

Eckis, (Calif. D.W.R., 1934) used the term "Fernando Group" for the lower Pleistocene and upper Pliocene strata that occurs along the inland foothills of the coastal plain. Since this term included the upper Pliocene deposits, not considered important fresh-water-bearing sediments, the designation "San Pedro formation" is used in this report for the heterogeneous materials comprising the lower Pleistocene horizons.

The San Pedro formation underlies most, if not all, of the Coastal Plain of Los Angeles County as well as portions of the Santa Monica and San Pedro shelves offshore. In the type section along the north flank of the Palos Verdes Hills the San Pedro formation is composed of stratified sand with some beds of fine gravel, silty sand, and silt. Crossbedding occurs frequently in the outcrop. Some pebbles of limestone, siliceous Miocene shales and schist are also found. Away from the Palos Verdes Hills the percentage of granitic fragments increase. In 1950, Richter described the lithology of the San Pedro formation as it occurs in West Coast Basin as "gray sand, which weathers brown or reddish brown on exposure, and interbeds of small gravel are characteristic. Sand and gravel fragments are mainly granitic, indicating a common source area, probably the San Gabriel Mountains". Fine-grained members are generally marine type, blue to black clays, sea muds, or quicksand with abundant shells. The Anchor silt found in the Cheviot Hills (Rodda, 1957) is one of these members. It is correlative with the Timms Point silt, of lower Pleistocene age, and to the lower part of the San Pedro formation. The Coyote silt found in the Coyote Hills (Hoskins, 1954) is also of lower Pleistocene age and resembles the Anchor silt.

The thickness of the San Pedro formation is about 1050 feet beneath the Downey Plain along the South Gate-Santa Ana Depression, and increases to a maximum of 1350 feet in the area about two miles east and southeast of Norwalk along the Norwalk synclinal axis. Where section C-C'-C" (Plate 6b) crosses the Rosecrans anticline, the thickness is 570 feet. Within the West Coast Basin the thickness is greatest along the Gardena syncline, varying from 400 feet about 1 1/2 miles west of Inglewood to 500 feet 1 mile north of Hawthorne, 700 feet at Gardena, and to as much as 1050 feet near the intersection of Carson and Alameda Streets.

The San Pedro formation crops out along the south side of the Repetto, Merced, and Puente Hills; on the Coyote Hills, Baldwin Hills, and Beverly Hills; along the north side of the Palos Verdes Hills; and on Signal Hill. Around the margins of the coastal plain, the San Pedro formation is upturned, and in some local areas is beveled and capped by younger strata.

Most of the structures encountered within the area of study affect at least part of the San Pedro formation. Elevation contour maps on the bases of the aquifers that comprise this formation indicate which fault or faults displace the aquifers. Much folding and warping, along with erosion, also has affected many of the aquifers. The structures affecting the San Pedro formation will be discussed in the descriptions of individual aquifers to follow.

On Plate 3 the San Pedro formation, where it appears at the ground surface, is represented by the symbol "Qsp". Although the formation is shown as one unit for convenience, it has been divided into various stratigraphic units or members. Only those members capable of storing or conveying ground water in suitable quantities have been named as aquifers, while the intervening finer-grained zones were not named. In downward succession, excluding the fine-grained interbedded layers, the aquifers are: The Hollydale aquifer, the Jefferson aquifer, the Lynwood aquifer ("400-foot gravel"), the Silverado aquifer, and the Sunnyside aquifer. Since most of the important aquifers used for production within the coastal plain are contained within the San Pedro formation, their complex water-bearing characteristics are discussed in Chapter VI rather than in the following description.

Hollydale Aquifer. The uppermost aquifer within the San Pedro formation is named the Hollydale aquifer. Although discontinuous in extent, it reaches from the Newport-Inglewood uplift north and northeastward to the south line of the Elysian, Repetto, Merced, and Puente Hills, and eastward and southeastward to and beyond the Los Angeles-Orange County line. Plate 14, entitled "Lines of Equal Elevation on the Base of the Hollydale Aquifer", shows the sinuous irregular courses of this aquifer.

The lithology of this aquifer is variable and consists of yellow sands and gravels (pea-size to two inches) in the northeastern portion of the area, while grey, blue, and black sands, with muds, clays, and marine shells become more predominant toward the Newport-Inglewood uplift. Well log reports are the only means of determining the lithology for this aquifer because it does not crop out on the surface. The well logs indicate that some of the marine sands are mushy, while others are cemented and hard.

The irregular, sinuous, and meander-like courses of the aquifer suggests a stream deposition, but the lithology of the aquifer over three-fourths of the area indicates shallow marine deposition. Because the two main lobes of the aquifer open toward the Los Angeles and Whittier Narrows, it is assumed that streams flowing through these two narrows have controlled the deposition of those parts, while a part of the sediments were laid down beneath shallow water in lagoons or estuaries.

Lines of equal thickness of this aquifer are shown on Plate 15, "Lines of Equal Thickness of the Hollydale Aquifer". The thickness varies from less than 10 feet to a maximum of 100 feet near Lakewood.

In stratigraphic position the Hollydale aquifer is the first important aquifer beneath the Gage-Gardena aquifers. The Hollydale aquifer is overlain and underlain, in most areas, by fine-grained members or aquicludes

of the San Pedro formation. Elevation contours on the base of the Hollydale aquifer and areas of mergence with overlying aquifers are shown on Plate 14. The aquifer attains its greatest depth at an elevation of 500 feet below sea level about two miles east of Compton. In the area between the towns of Norwalk and Bellflower, the depth is about 450 feet below sea level. The slope of the base of the Hollydale aquifer is generally toward these two areas of greatest depth.

Upfolding along the Newport-Inglewood uplift has apparently limited the depositional area of the Hollydale aquifer to the Central Basin. Within the Central Basin the aquifer does not exist in upfolded areas. Downfolding along the axis of the Paramount and Norwalk synclines has, however, placed the base of the aquifer at an elevation of 500 feet below sea level.

This aquifer apparently does not yield large quantities of water to wells, therefore few wells are perforated in this interval and even then only when producing horizons above and below are also perforated. Low productivity of the Hollydale aquifer may be due to the fineness of the materials of which it is composed and the lack of continuity in its extent.

Recharge of the Hollydale aquifer can be accomplished only where it merges with the overlying Gage or younger aquifers (Plate 14) because of the absence of outcrop areas.

Jefferson aquifer. Within the Central Basin, the second aquifer in downward succession within the San Pedro formation is designated the Jefferson aquifer. This aquifer extends over most of the Central Basin, although it is not known to reach the surface. Lobes of this aquifer extend into the Whittier Narrows, into the La Brea Plain, and south of the Coyote Hills through Buena Park into Orange County. Within the boundaries of

the aquifer, some irregular areas exist where the aquifer has not been identified, as indicated on Plate 16, "Lines of Equal Elevation on the Base of the Jefferson Aquifer". This aquifer has not been located in the West Coast Basin. The Jefferson aquifer occurs in sinous courses extending from both the Los Angeles and Whittier Narrows into Orange County.

The lithology of the Jefferson aquifer is known only from drillers logs of water wells. The sediments comprising this aquifer are, for the greater part, fine-grained. Gravels are most extensive in the Whittier Narrows but also occur in scattered patches through the rest of the Central Basin. The remainder of the aquifer consists primarily of sand with some gravelly and clayey lenses.

From the pattern of distribution of sediments comprising this aquifer, source areas are assumed to have been the San Fernando and San Gabriel Valleys and their surrounding highlands. The Los Angeles and San Gabriel Rivers appear to have transported the material through the Los Angeles and Whittier Narrows into or through three possible areas: the La Habra Piedmont slope, the Buena Park area, and southward toward Seal Beach. Extensions of these areas into Orange County have not been determined.

The thickness of the Jefferson aquifer is shown on Plate 17, "Lines of Equal Thickness of the Jefferson Aquifer", and varies from a few feet to a maximum of 140 feet along the Los Alamitos fault. At Norwalk the Jefferson aquifer is 120 feet thick. The Jefferson aquifer has been considerably folded and its base varies in elevation from 700 feet below sea level to 50 feet above sea level.

Structures that affect the Jefferson aquifer are the Los Alamitos, Rio Hondo, Pico, and Cherry Hill faults, and possibly the Seal Beach fault.

It is believed that the general upwarped area along the Newport-Inglewood uplift has controlled or confined to the Central Basin the deposition of sediments comprising this aquifer.

Although it does not crop out on the surface, the Jefferson aquifer does merge with the overlying Hollydale aquifer and also with the Gage aquifer along the Elysian Hills, Repetto Hills, and within the Whittier Narrows. These areas of mergence are shown on Plate 16.

Artificial recharge within the Whittier Narrows would have some effect on this aquifer. Since less than 10 percent of the wells in the Central Basin are perforated in this horizon, and then only in areas where coarse sandy and gravelly zones are found, it is not considered an important water producing aquifer.

Lynwood Aquifer. The Lynwood aquifer is the term used for the third aquifer in stratigraphic sequence within the San Pedro formation. The term "400-foot gravel" has been applied to this aquifer in the West Coast Basin. This latter term was first used by Poland (1948) and defined as "a distinct water-bearing zone in the upper part of the San Pedro formation .... its base is about 400 feet below land surface along the axis of the syncline" (southwest of the Newport-Inglewood uplift). Plate 18, "Lines of Equal Elevation on the Base of the Lynwood Aquifer", and Plate 19, "Lines of Equal Thickness of the Lynwood Aquifer" show the extent, elevation of the base, and thickness of this aquifer.

The Lynwood aquifer extends throughout the Central and West Coast Basins and its existence has been verified in the Hollywood Basin. There is no evidence to show that it exists in the Santa Monica Basin, nor has it been identified in the Baldwin Hills.

Materials of which the Lynwood aquifer is composed appear to be both continental and marine in origin. Continental deposits, of yellow, brown, and red coarse gravels, sands, silts, and clays, are found in the vicinity of the Montebello Forebay Area. A line bounding this area extends from the Whittier Narrows to Bellflower, thence to Compton, South Gate, Huntington Park, and back to the Whittier Narrows. One arm of continental sediments extends from the area just described toward Hawthorne. Sediments of the Lynwood aquifer surrounding the Montebello Forebay Area are mostly marine deposits and are characterized by sand and gravel and blue, grey, and black silts and clays. Some of the sands and gravels have been cemented. The several areas where the marine deposits consist predominantly of fine-grained materials vary from less than 100 acres to about six or seven square miles in extent, and are shown on Plate 19.

From the study of well logs and the materials from wells drilled into this aquifer, it appears that the Rio Hondo and San Gabriel River systems have been the major contributing source for the continental sediments. Marine-type deposits appear to have been laid down when the area was covered by shallow seas.

The Lynwood aquifer ranges from less than 50 feet to about 200 feet in thickness near Wilmington, as shown on Plate 19. Near Lakewood, Torrance, Inglewood, and Montebello it is about 150 feet in thickness. The base contours and lines of equal thickness are not shown west of the Gardena syncline because of mergence with the Silverado aquifer.

In stratigraphic sequence the Lynwood aquifer is overlain and underlain in most of the area by fine-grained materials such as clays, silts, and sandy and silty clays. It is beneath the Jefferson aquifer and above the Silverado aquifer. Known areas of mergence with the overlying aquifers

are shown on Plate 18, while the areas of mergence with the Silverado aquifer are shown on Plate 20, "Lines of Equal Elevation on the Base of the Silverado Aquifer".

Folding has been the primary structural factor affecting the Lynwood aquifer. Upfolding or upwarping has occurred along the coast in the West Coast Basin, over the Newport-Inglewood uplift, in the Artesia area over the Santa Fe Springs uplift, along the edge of the Elysian, Repetto, and Puente Hills, and within the Whittier Narrows. Downwarping has affected the aquifer in the Hawthorne-Long Beach depression extending to San Pedro, within the South Gate-Santa Ana depression (includes Paramount and Norwalk synclines), and within the La Habra syncline. Within the West Coast Basin the Charnock fault has offset the Lynwood aquifer. Along the Newport-Inglewood uplift, the Inglewood, Potrero, Avalon-Compton, Cherry Hill, Northeast Flank, and other associated transverse faults cut the aquifer. Within the Central Basin the Los Alamitos fault offsets the Lynwood aquifer as does the Rio Hondo and Pico faults within and south of Whittier Narrows.

The Lynwood aquifer is an important producer of ground water and is discussed in more detail in the descriptions of the ground water basins in Chapter VI. Most wells in the coastal plain drilled to or below this aquifer are perforated in it. Yields of wells perforated only in the Lynwood aquifer vary from 200 to 2100 gallons per minute.

Surface and subsurface flow of water through the Whittier Narrows moves downward through the shallow aquifers into the Lynwood aquifer. Water is also artificially spread in shallow pits below the Whittier Narrows where the Lynwood aquifer is in contact with the permeable materials extending upward into the pits, thus permitting this water to reach the Lynwood aquifer. This artificial method of recharging is not generally

applicable in other areas where the Lynwood aquifer is merged with the overlying aquifers because of the greater depth of those aquifers as well as the Lynwood aquifer below the surface, the lack of continuous permeable materials to conduct water vertically downward, and the lack of available space for large surface pits. In these areas, therefore, other methods of recharge would be necessary, such as injection wells drilled into and perforated in this aquifer.

Silverado Aquifer. The Silverado aquifer is the name applied in this report to those water-bearing materials which are stratigraphic equivalents of the "Silverado Water-Bearing Zone" in the West Coast Basin. Originally named by Poland, et al (1956), from its typical occurrence in a well in Silverado Park, Long Beach, the Silverado Water-Bearing Zone has been found throughout the rest of the Coastal Plain of Los Angeles County and extends across the Los Angeles County line into Orange County. For the purpose of this report the term, "Silverado aquifer", will apply to these materials throughout the Coastal Plain of Los Angeles County. Areas of Pleistocene deposits occurring in the Santa Monica and San Pedro shelves offshore may be continuations of the Silverado and underlying Sunnywide aquifers. Plate 20 shows the known extent and elevation contours of the base of the Silverado aquifer.

Sediments comprising the Silverado aquifer are both continental and marine. Where continental deposits predominate, yellow to brown, coarse to fine sands and gravels are interbedded with yellow to brown silts and clays. Marine deposits which comprise the Silverado aquifer over the remainder of the basin are primarily blue to grey sand, gravel, silt, and clay. Some black sands, quicksand, marine shells, peat, and wood fragments

are also shown on drillers logs of wells located in the area of marine sediments. In the West Coast Basin, Richter (1950) describes the lithology as fine to coarse, blue-black arkosic sand with the larger grains composed of granite, granodiorite, and diorite. Along the flanks of the Palos Verdes Hills, limestone and schist pebbles are abundant, while in the Ballona Gap area slate, schist, and volcanic pebbles are commonly found.

The ancestral Rio Hondo and San Gabriel River systems have been the major transporting agent for materials comprising the continental portion of the Silverado aquifer in Central Basin, although some contributions may have been added by the Santa Ana River flowing in one of its earlier courses. The regional evidence indicates that the Los Angeles River did not flow into the coastal plain during much of the lower Pleistocene time and probably did not contribute sediment to the Silverado aquifer. However, streams flowing from the Santa Monica Mountains, Elysian Hills, and Palos Verdes Hills have added debris from these areas. Much of this material was deposited beneath the shallow ocean that covered the coastal plain at this time. The continental deposits appear to have been laid down when the sea was retreating from the coastal plain.

The varying thickness of the Silverado aquifer is depicted on Plate 21, "Lines of Equal Thickness of the Silverado Aquifer". This aquifer reaches a maximum thickness of 500 feet between the Wilmington anticline and the Cherry Hill fault. One mile west of Lakewood, along Carson Street, the Silverado aquifer is 450 feet thick. Along the south side of the Santa Fe Springs Plain and also two miles southeast of Huntington Park it is 300 feet thick.

The maximum depth reached by the base of the Silverado aquifer, 1200 feet below sea level, is found southwest of the Cherry Hill fault

within Dominguez Gap, along the north side of the Los Alamitos fault, and about three miles southeast of Norwalk. A depth of 1100 feet below sea level occurs near Long Beach Harbor.

The Silverado aquifer crops out along the northeast flank of the Palos Verdes Hills, possibly on the continental shelf beneath Santa Monica Bay, along the southern margin of the Baldwin Hills, in the Repetto and Merced Hills, along the south slope of the Puente Hills, and possibly in the Coyote Hills. Outcrops in the areas named are shown as the San Pedro formation, Qsp on Plate 3, because insufficient data are available to definitely identify the aquifer involved.

Areas where the Silverado aquifer merges with overlying aquifers are shown on Plate 20. In the Montebello Forebay Area and Whittier Narrows the Silverado aquifer is directly overlain by and merges with aquifers younger than the Lynwood aquifer. Merged areas are irregular in extent but are generally found along the Newport-Inglewood uplift, in the area from Huntington Park to Santa Fe Springs, and also within the Whittier Narrows. In the West Coast Basin the Silverado is merged with the overlying Lynwood aquifer everywhere except beneath the Gardena syncline and the Wilmington anticline. Near Santa Monica Bay the Silverado aquifer is in hydraulic continuity with the Gardena and Gage, as well as the Lynwood aquifers. In the Montebello Forebay Area the Silverado aquifer merges with the overlying Lynwood, Jefferson, Hollydale and Gardena aquifers, as delineated on Plate 20A.

The Silverado aquifer has suffered a greater degree of folding than the overlying Lynwood aquifer. It has been deformed by all of the major anticlinal and synclinal folds. All the major faults shown on Plate 3 seem to have affected this aquifer. After faulting occurred, the aquifer

may be found at either different or the same elevation but separated by a region of altered permeability. Sufficient data is lacking to determine whether the geologic structure just south of Santa Fe Springs is a fault or downfold. On the basis of the data available it is believed that the postulation of a sharp downfold would explain the existing structure in a more adequate manner than the assumption of a fault.

This aquifer is one of the most important ground water producers in the coastal plain. Specific capacities of wells perforated in it range up to a maximum of 159 gallons per minute per foot of drawdown and yields range up to 4700 gallons per minute.

In the Whittier Narrows the Silverado aquifer is merged with many overlying aquifers and recharging the shallow aquifers in that area would cause additional water to reach the Silverado aquifer. Recharge from the surface in the Los Angeles Forebay Area may also reach the Silverado aquifer where it is truncated by the Gaspur. Other possible recharge areas for the Silverado aquifer are in the outcrop along the Coyote and Baldwin Hills, or in the Ballona Gap, where the Silverado aquifer is directly beneath the Ballona aquifer and close to the surface. Natural recharge takes place in those areas shown on Plate 3 where the San Pedro formation crops out on the surface.

Sunnyside Aquifer. The water-bearing materials occurring within the Central Basin beneath the Silverado aquifer but above the Pico formation have been termed the "Sunnyside aquifer" after a typical occurrence illustrated by the log of a well located in Sunnyside Cemetery in North Long Beach.

The Sunnywide aquifer extends throughout the Central Basin. Its extent and elevation of its base are shown on Plate 22, "Lines of Equal

Elevation on the Base of the Sunnyside Aquifer". Recent drilling along the coastal region from Palos Verdes Hills to Ballona Escarpment has revealed a zone of coarse deposits approximately 500 feet thick occurring beneath the Silverado aquifer, but separated from it by silts and clays. These coarse materials are similar to the Sunnyside aquifer in the Central Basin and may be the extension of the Sunnyside aquifer in the West Coast Basin.

The materials comprising this aquifer are coarse-grained sands and gravels separated by fine-grained interbeds of sandy clay and clay. The lithology shown on a typical well log near the intersection of Del Amo and Cherry Streets is compacted blue sand, coarse blue gravel (up to four inches in diameter), hard blue sandy clay, and clay. Toward the Los Angeles-Orange County line, mushy blue sands and coarse gravels with greater amounts of blue clay are found. At Spring Street and Bloomfield Avenue, well logs indicated that instead of clay, fine blue sand with minor clay streaks was present. Along the center of the coastal plain, about one mile north of Manchester and near Alameda Avenue, fine to medium gravel (one quarter to one inch in diameter), and partly cemented blue clay, and grey to brown shale are typical materials. In Whittier Narrows hard grey sands and gravels, boulders, and blue sandy shale are present.

From drillers descriptions of materials, it is believed that the aquifer is of marine origin and has been affected very little by weathering. Many well logs show marine shells included with the sediments in addition to the interbedded marine-type clays and shales.

The Sunnyside aquifer attains its maximum known thickness of about 300 feet about one to one and a half miles southeast of Maywood in the vicinity of Slauson Avenue and the Long Beach Freeway. Plate 23, "Lines of Equal Thickness of the Sunnyside Aquifer", gives the thickness of the

Sunnyside aquifer. No data is available to determine thickness in the central downfolded area because none of the water wells have reached the aquifer in this area.

It is not definitely known whether the Sunnyside aquifer crops out in any particular location within the Central Basin; however, it is assumed that some of the outcrop areas shown as the San Pedro formation on Plate 3 include the Sunnyside aquifer also. The most likely areas for this to occur are along the south slope of the Repetto, Merced, and Puente Hills, and especially on the top of the Coyote Hills.

In stratigraphic position the Sunnyside aquifer is overlain by the fine-grained Timms Point silt and Lomita marl and underlain by the Pico formation. It may be correlated in age with the unit mapped by Hoskins (1954) as the Coyote silt, the Anchor silt of Rodda (1957), and the La Habra conglomerate of Eckis (Calif. D.W.R., 1934).

Structurally, the Sunnyside aquifer is offset by most, if not all, of the faults within the Central Basin. Some of the faults appear to act as boundaries for the aquifer. Northeast of the Los Alamitos fault the base of the Sunnyside aquifer occurs at a maximum depth of about 1500 feet below sea level.

The Sunnyside merges with the Silverado and other overlying aquifers in many areas delineated on Plate 22, "Lines of Equal Elevation on the Base of the Sunnyside Aquifer". In these merged areas hydraulic continuity is possible through a series of aquifers to the surface. The only known areas where this aquifer may be recharged are limited to outcrops of the San Pedro formation and merged areas where folds have lifted the Sunnyside aquifer near the surface of the ground.

Yields of wells perforated in this aquifer range up to 1500 gallons per minute. Specific capacities of known wells using only this aquifer for production are only fair, ranging from 6 to 25 gallons per minute per foot of drawdown.

Undifferentiated Plio-Pleistocene Sediments

An area of sediments of either Pliocene or Pleistocene age, or possibly both, is shown on Plate 3 in the Repetto Hills southeasterly of Monterey Park. In the geologic literature these sediments have been classified variously as both Pliocene and Pleistocene. Although various fossils are present, age designation based upon them is uncertain. While these sediments are somewhat permeable they have relatively little significance as far as ground water in the coastal plain is concerned; therefore, no attempt was made to determine their age.

These undifferentiated sediments consist of thin bedded to massive silts, sands, and gravels that are locally well indurated and contain limited marine fossil remains. The sediments have been folded and many minor faults and fractures are seen in outcrops.

Although these sediments are considered to be relatively unimportant as far as ground water is concerned, a drainage well constructed in 1959 reportedly yields fair quantities of good quality water. Firm conclusions, however, cannot be drawn from this limited experience.

Tertiary System

Aquifers have not been differentiated in sediments and rocks older than Pleistocene age because of limited well log data. Few wells extend into these materials and little ground water of suitable quality is extracted from them. Some fresh water is now being extracted from the upper member

of the Pico formation, discussed first in this section. For pre-Pleistocene materials in general, the sediments and rocks are described by formations or broad age classification.

Pliocene Series

The Pliocene series is divided into two formations, the Pico formation and the Repetto formation. In addition, the Pico formation is divided into upper, middle, and lower divisions.

Pico Formation. The Pico formation is shown, where it outcrops at the surface, on Plate 3 by the symbol "P_p". The upper division or upper member of the Pico formation is a potential source of ground water. It has not been exploited to date, though wells along Carson Street near Lakewood do obtain water from upper Pico aquifers. This member is thickest in the synclinal areas, and it outcrops on the hills surrounding the coastal plain.

The upper Pico formation is generally composed of sand, silt, and clay of marine origin interbedded with marine gravels. Beds of gravels and sands range in thickness from 20 to 100 feet and are separated by beds of micaceous siltstone and clays.

Unconformably beneath this upper member are the middle and lower members of the Pico formation, or in some areas, the Repetto formation. The middle and lower divisions of the Pico formation are differentiated from upper Pico sediments by the contained foraminiferal faunas. Lithologically, the middle and lower divisions are composed of greenish-grey micaceous siltstone and fine to coarse light grey feldspathic sandstone interbedded with claystone and shale. The thickness of these lower division materials ranges from 400 to more than 2,000 feet. Throughout most of the coastal plain these rocks are far below the depths reached by the deepest

water wells. Oil well data indicate that, although portions of these sediments may be sufficiently permeable to transmit water in usable quantities, the water is of poor quality and unsuitable for general use.

Repetto Formation. The Repetto formation, of early Pliocene age, is exposed in several areas adjacent to the coastal plain. The outcrops of this formation are identified by the symbol "Pr" on Plate 3. These deposits are composed mostly of siltstone with layers of sandstone and conglomerate, containing fragmental marine shells locally. The Repetto formation is about 5,000 feet in thickness. Wissler (1943) states that the maximum thickness occurs in the Montebello-Santa Fe Springs area. Conrey (1958) and Slosson (1958) confirm this and discuss the distribution and thickness of the Repetto rocks in some detail.

Miocene Series

Rocks of Miocene age are shown on Plate 3 by the symbols "Ms" for sedimentary rocks and "Mv" for volcanic rocks. Nomenclature of the sediments of Miocene age is somewhat complicated; however, the relationship between the various names and brief descriptions of the various formations are presented in Table 1.

Sedimentary Rocks. Sedimentary rocks of middle and late Miocene age have been called the Monterey formation in the Palos Verdes Hills, the Modelo formation in the Santa Monica Mountains, and the Puente formation beneath the coastal plain and in the Repetto and Puente Hills. These formations, up to 11,000 feet thick, consist predominantly of clay shales but siliceous shales, sandstones, and conglomerates are common.

The Topanga formation is of middle and possibly early Miocene age. It is interbedded with and lies below the Miocene volcanic rocks. The formation attains a thickness of 7,500 feet and consists of shale, sandstone, and conglomerate.

No wells are known to produce fresh water from these formations in the immediate area of the coastal plain. However, water wells in other parts of Southern California do obtain limited supplies from hard fractured shales and poorly consolidated sandstones and conglomerates of these formations.

Volcanic Rocks. Calcic andesite flows, tuffs, and breccias underlie at least parts of the coastal plain, and usually contain interbedded marine sand, conglomerate, and shale. Where these materials outcrop on the surface they are identified by the symbol "Mv" on Plate 3. Available data indicate that the fractured sills, dikes, and flows, along with interbedded sand and gravels, yield water to wells, while the conglomerates and agglomerates are relatively nonwater-bearing.

Older Tertiary Sedimentary Rocks

Rocks of Eocene and Oligocene age are missing beneath West Coast Basin, though they may underlie the Central Basin. Hoots (1931) gives some evidence for the presence of the Sespe and Vaqueros formations of Oligocene(?) or early Miocene age in the Santa Monica Mountains. Paleocene rocks crop out in the Santa Monica Mountains and may underlie a part of the coastal plain. Hoots (1931) termed these rocks the Martinez formation. Other exposures of Martinez sandstone and conglomerate were found in the Santa Monica Mountains by Durrell (1954) and others. Outcrops of Eocene and Oligocene rocks are shown on Plate 3 by the symbols "E" and "Ø", respectively, while outcrops of Paleocene rocks are marked by the symbol "E-K".

Cretaceous System

A sequence of Upper Cretaceous sediments within the Santa Monica Mountains are differentiated and have been called the Chico formation by Hoots (1931). Durrell (1954) however, appears to have divided the same sequence into the Chico and Trabuco formations. The symbol "K_s" represents the areas of outcrops of these rocks on Plate 3.

Quartz dioritic intrusive rocks, shown by the symbol "K_g" on Plate 3 have previously been assumed to be Jurassic by comparison with similar rocks in the Sierra Nevada (Durrell, 1954). On the basis of dating by lead-alpha activity ratios of intrusive rocks in Southern California, Larsen, et al (1958) suggests that these rocks are of an early Late Cretaceous age rather than Jurassic.

Jurassic System

Rocks, called the Catalina schist, crop out on the Palos Verdes Hills and are identified on Plate 3 by the symbol "J". These have been also referred to as the Western bedrock complex because they underlie Miocene rocks of the West Coast Basin. The age of these schistose rocks is questionable and, according to Woodford, et al (1954), may be either Mesozoic (when compared to the Jurassic Franciscan formation of the coast ranges) or Precambrian (when compared with the Pelona schist of the San Gabriel Mountains). In this report they are mapped as Jurassic.

Triassic System

Metamorphosed black shale and sandstone crops out in the Santa Monica Mountains and have been called the Santa Monica slate (Hoots, 1931) and the Santa Monica formation (Durrell, 1954). Intrusion of these rocks

by the quartz dioritic magma was responsible for changing these rocks into grey to black slates, mica schists, and spotted slates. These rocks are dated as Triassic by comparison with similar rocks of Triassic age in the Santa Ana Mountains. In the coastal plain, these are presumably the oldest rocks known, although the Cataline schist mentioned under the Jurassic System may possibly be older. These Triassic rocks are identified on Plate 3 by the symbol "T_R".

CHAPTER VI. DESCRIPTION OF GROUND WATER BASINS

This chapter describes the ground water basins in the Coastal Plain of Los Angeles County and discusses the occurrence and movement of ground water within each basin. Information regarding geologic features presented in earlier chapters is summarized here for each ground water basin to show what effect these features have on ground water flow into, through, and out of each basin. The relationships between the geologic features and the occurrence and movement of ground water as discussed in this chapter are intended to clarify the geologic setting of the area for future studies of hydrology, water quality, and problems involving the use of ground water.

Basin Boundaries

The ground water basin as herein used is defined as the area underlain by one or more permeable formations capable of furnishing a substantial water supply. It does not necessarily coincide with the surface drainage basins and is usually smaller in size because the essentially nonwater-bearing hills and mountains of the surface drainage basin (watershed) are excluded. Ground water basins are separated from adjacent basins by geologic features such as nonwater-bearing rock, faults, or other geologic structures which impede ground water movement, and by natural or artificial mounds or divides in the water table or piezometric surface. Geologic features generally establish well defined, fixed boundaries while ground water mounds are subject to change in time, particularly with changes in the development and use of ground water. However, both of these types of boundaries do define limits of ground water movement.

Central Basin

The Central Basin extends over most of the Coastal Plain of Los Angeles County east and northeast of the Newport-Inglewood uplift (Plate 2). It is bounded on the north by the Hollywood Basin and a series of low hills extending from the Elysian Hills on the northwest to the Puente Hills on the southeast. Where the Los Angeles and Whittier Narrows break the otherwise continuous line of hills, the Central Basin is separated from the ground water basins to its north by arbitrary lines. The Central Basin is bounded on the west and south by the Newport-Inglewood uplift and on the southeast by the Los Angeles-Orange County line. All of these boundaries do not coincide with the ones defined in earlier reports. In Bulletin No. 8 (Calif. D.W.R. 1952c) the Central Basin included the area referred to in this report as the Hollywood Basin. The present Central Basin includes part of the area formerly known as the Los Angeles Narrows Basin, and the Whittier Area which was formerly the western part of the La Habra Basin.

The Central Basin was historically divided internally into three areas (Calif. D.W.R. 1934): the Los Angeles and Montebello Forebay Areas and the Central Basin Pressure Area. This division is shown on Plate 2. The forebay areas have been described as intake areas (areas of free or unconfined ground water) where substantial infiltration of surface water could occur. In the pressure area, the aquifers were pictured as being confined between relatively impervious layers of considerable lateral extent that restricted percolation of water from the ground surface downward to the underlying aquifers. This investigation has shown that such a simplified division is not possible because aquicludes were found to extend into the so-called forebay areas and the pressure area aquicludes were found locally

to contain large amounts of sandy and gravelly clay and silts where considerable deep percolation could occur. The area of essentially unrestricted percolation of surface waters to the underlying ground water is limited to small areas in the vicinity of the Los Angeles and Whittier Narrows (Plate 9A). These areas are considerably smaller in extent than the historically defined Los Angeles and Montebello Forebay Areas. However, in large portions of the remainder of the basin, including the pressure area, the upper aquiclude is only partly effective in restricting downward percolation. Because of the heterogeneous pattern of these relatively permeable areas in and around the more impermeable aquicludes and the general gradation from one to the other, an attempt to divide the basin into pressure and forebay areas along a definite line for purposes of hydrologic analysis would not only be difficult but would have to be completely arbitrary. Nevertheless, the old delineation of forebay and pressure areas are used in the discussion of the geology of the Central Basin to follow because of their historical significance and descriptive usefulness.

The Central Basin is divided into four parts for descriptive purposes: the Los Angeles Forebay Area, the Montebello Forebay Area, the Whittier Area, and the Central Basin Pressure Area. The Los Angeles and Montebello Forebay Areas are located in the northern part of the Central Basin immediately south of the two breaks in the line of low hills bordering the basin. Through these breaks the Los Angeles River and the Rio Hondo-San Gabriel River systems flow from the valleys to the north into the coastal plain (Plate 2). These forebay areas spread southward from the two narrows in irregular semicircles. The southern boundary of the two forebay areas roughly coincides with the northernmost limit of the line of flowing

artesian wells delineated by Mendenhall in 1903. As explained above, these forebay areas are not true forebays in the academic sense of the word but are used herein for descriptive purposes.

The Whittier Area is located in the northeastern part of the Central Basin east of the Montebello Forebay Area, south of the Puente Hills and west of the Orange County line. The Whittier Area was described as part of the La Habra Basin in Bulletin 45 (Calif. D. W. R. 1934). However, since the aquifers present in this area, especially the deeper ones, are interconnected to varying degrees with the aquifers in the Central Basin, the area was renamed and treated as part of the Central Basin.

The Central Basin Pressure Area is the largest of the four divisions of the Central Basin. It encompasses all of the area east and northeast of the Newport-Inglewood uplift and northwest of the Orange County line that is not included in the other three areas. It is called a "pressure area" because the aquifers within it are confined by aquicludes or relatively impermeable layers of clay and silt over most of the area. One of the most important aquicludes is at or near the surface. As noted previously, this near surface aquiclude is missing in local areas and contains zones of relatively more permeable material in many places where water could move into or out of the underlying aquifer. Accordingly, completely confined conditions do not exist in the pressure area.

It should also be noted in this discussion of basin divisions that the pressure area could be further divided on the basis of a ground water mound which has existed in the northwestern portion of the basin since the early 1930's. This mound effectively divides the ground water movement in that portion of the basin into two parts; that which moves northward

toward the Hollywood Basin and that which moves southeasterly toward the center of the old pressure area and the Los Angeles Forebay Area. This ground water mound was used in the formulation of a portion of the northern boundary of the Central and West Basin Water Replenishment District organized in 1959 (Calif. D.W.R. 1959).

In the sections which follow, the geologic features of the Los Angeles Forebay Area, the Montebello Forebay Area, the Whittier Area and finally the Central Basin Pressure Area are summarized. For each area these summaries include information about the aquifers present, the areas where these aquifers merge, and barriers to ground water movement. The flow of water into and out of the Central Basin as a whole, replenishment of the aquifers, and areas of free ground water and storage change are described in a separate section under the heading of "Occurrence of Ground Water in the Central Basin".

Geologic Features of the Los Angeles Forebay Area

The Los Angeles Forebay Area, located in the northern part of the Central Basin, is shown on Plate 2. In general it is a free ground water area; however, in the course of this investigation it became evident that the Bellflower aquiclude extends into the southerly portion of the forebay area. The aquiclude in this area contains a high percentage of sand, and vertical percolation of water is apparently more rapid here than in other portions of the basin covered by it. Where the Bellflower aquiclude is missing within the forebay area (see Plate 8A), the aquifers are in direct hydraulic continuity with the surface.

The Los Angeles Forebay Area is overlain by parts of the La Brea, Downey, and Montebello Plains. The known water-bearing sediments extend to

The Sunnyside aquifer also has been identified throughout the Whittier Area. It consists of 200 to 300 feet of sand and gravel with some interbedded clay (Plate 23). It is the lowest of the aquifers identified, reaching a maximum depth of about 1,000 feet (700 feet below sea level, Plate 22). The gravels exposed in the Coyote Hills and along the north side of the area are believed to be surface outcrops of the Sunnyside aquifer.

The Pliocene and Miocene sediments below the San Pedro formation generally contain saline water in this area, but may locally contain fresh water. Plate 24A shows the approximate elevation of the base of fresh water-bearing sediments.

The available data suggest that some of the water-bearing sediments in the Whittier Area may have been faulted. However, the location of such faulting and its effect on ground water has not been determined.

The water-bearing sediments of the Whittier Area comprise part of the generally east-west trending La Habra syncline. The Recent deposits are essentially undisturbed. The Lakewood formation underlying the Recent alluvium is also generally flat-lying, though in some areas it is slightly tilted. The San Pedro formation, however, which unconformably underlies the Lakewood formation, has been folded sharply and its flanks are exposed in the Coyote Hills and on the south side of the Puente Hills. The effects of this unconformity and the outcrops of the moderately dipping San Pedro formation upon the occurrence and movement of ground water will be discussed later.

Geologic Features of the Central Basin Pressure Area

The Central Basin Pressure Area, previously known as the Central Coastal Plain Pressure Area, is overlain by the Downey Plain and parts of

the Santa Fe Springs, Montebello, La Brea, and Bouton Plains. The area is generally flat and slopes gently to the south. Water-bearing sediments in the Central Basin Pressure Area range in age from Recent to Pliocene and extend to a probable maximum depth of 2,200 feet northeast of the City of Lakewood. Aquifers have been defined in the Recent alluvium and the Lakewood and San Pedro formations.

In this pressure area the aquifers are confined by many aquicludes, only one of which has been named. This is the near surface Bellflower aquiclude which restricts vertical percolation into the Gaspur and other underlying aquifers. Water levels in the confined area form a piezometric or pressure surface rather than a free ground water surface. As pressures change from aquifer to aquifer, the corresponding piezometric water levels in wells tend to vary according to which aquifer or aquifers are used for production. Also, as the aquicludes vary in extent, configuration, permeability, and thickness, their effectiveness as confining members also changes from place to place and with this change an exchange of water between aquifers may take place, depending on the direction of the pressure gradient.

The Recent alluvium covers most of the Central Basin Pressure Area, and attains a probable maximum depth of 200 feet near the City of Bellflower. It contains the Semiperched aquifer, the Bellflower aquiclude, and the Gaspur aquifer. The Semiperched aquifer consists of sands and gravels 20 to 60 feet thick overlying the Bellflower aquiclude.

The Bellflower aquiclude is found throughout the pressure area and is composed mainly of clay and silt; however, there are numerous areas where it consists mainly of clayey sands and gravels and where its effectiveness as an aquiclude is limited. It ranges from a few feet to 160 feet in

thickness (Plate 9A). It extends downward to about 200 feet (140 feet below sea level) southwest of the City of Bellflower (Plate 8A). The Bellflower aquiclude is also present in the Lakewood formation but no effort has been made to define separately the areas where the aquiclude is identified with each age. The Gaspur aquifer extends south from the forebay areas in two separate arms which merge in the vicinity of the City of Lynwood and then extend south along the course of the Los Angeles River to the ocean. The Gaspur aquifer consists of coarse sand and gravel and ranges in thickness from 40 to 100 feet (Plate 11A). The maximum depth of about 190 feet (170 feet below sea level) occurs in the vicinity of Terminal Island in San Pedro Bay (Plate 10B).

The Lakewood formation, of late Pleistocene age, extends over all of the Central Basin Pressure Area. It contains part of the Bellflower aquiclude and the Artesia, Exposition, Gage, and Gardena aquifers. The water-bearing materials immediately underlying the Bellflower aquiclude west of the easterly arm of the Gaspur aquifer are called the Exposition aquifer. The water-bearing materials immediately underlying the Bellflower aquiclude east of this arm of the Gaspur aquifer are called the Artesia aquifer and are believed to be contemporary both in age and mode of deposition with the materials in the Exposition aquifer. The boundary between the Artesia and Exposition aquifers is somewhere in the center of the basin under the Gaspur aquifer. All three aquifers are in hydraulic continuity. Both the Artesia and Exposition aquifers consist of sand and gravel with local areas of interbedded clay. The Exposition aquifer ranges from 20 to over 100 feet in thickness (Plate 11A) and reaches a maximum depth of about 230 feet (120 feet below sea level) southeast of Huntington Park (Plate 10A).

The Artesia aquifer consists of 10 to 140 feet of sand and gravel with some interbedded clays (Plate 11A). It extends down to a maximum depth of 230 feet (220 feet below sea level) southeast of the City of Lakewood (Plate 10A).

The Gage and Gardena aquifers of the Lakewood formation are also considered to be the same age. Their relationship was discussed in this chapter in the section on the West Coast Basin. The Gage aquifer consists of fine-grained sand and silty sand ranging from 5 to 120 feet in thickness (Plate 13A). The maximum depth attained is 380 feet (350 feet below sea level) west of the City of Lakewood (Plate 12A). The Gardena aquifer consists of coarse-grained sand and gravel from 10 to 60 feet in thickness. It extends down to a depth of about 390 feet (350 feet below sea level) near the City of Lynwood. The Gage and Gardena aquifers mark the base of the Lakewood formation and along this base they abut the underlying San Pedro formation unconformably.

The San Pedro formation, present throughout the Central Basin Pressure Area, contains some of the most important aquifers in the area. In all, five aquifers, the Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside, have been delineated.

Two relatively minor aquifers, the Hollydale and Jefferson aquifers, are present in the upper part of the San Pedro formation in the Central Basin Pressure Area. The Hollydale aquifer, uppermost of the two, (Plates 14 and 15) extends over approximately 60 percent of the area. It is mostly sand and silty sand with interbedded clays, though some gravel is found locally. It ranges from approximately 10 to 100 feet in thickness, and the maximum depth of about 570 feet (500 feet below sea level) is reached a few miles east of the City of Compton. The Jefferson aquifer (Plates 16 and 17)

is present over only 40 to 50 percent of the pressure area. It is mostly fine-grained sand with scattered lenses of gravel, and ranges in thickness from about 10 feet to over 140 feet. The maximum depth of approximately 720 feet (650 feet below sea level) is found near the Orange County line southeast of the City of Norwalk. Although these two aquifers are not continuous over the entire Central Basin Pressure Area, they are important sources of water in some localities.

Both the Lynwood and Silverado aquifers yield considerable water to wells in the Central Basin Pressure Area. The Lynwood aquifer (Plates 18A and 19A) is composed mainly of coarse-grained sands and gravels, ranging in thickness from less than 50 feet to over 150 feet. The maximum depth of about 1,030 feet (950 feet below sea level) occurs southeast of the City of Norwalk. The Silverado aquifer (Plates 20A and 21A) is composed largely of sands and gravels, ranging in thickness from about fifty feet to over 450 feet. The greatest depth is found north of the City of Lakewood, where its base is about 1,240 feet below the ground surface (1,200 feet below sea level). The base of the Silverado aquifer was thought to correspond to the base of the Pleistocene deposits and of fresh water in the West Coast Basin, where it was first named. In the Central Basin, however, the Sunnyside aquifer has been differentiated below the Silverado aquifer.

The Sunnyside aquifer (Plates 22 and 23) marks the base of the San Pedro formation in most parts of the Central Basin Pressure Area. It varies from about 70 feet to over 500 feet in thickness and consists of sand, and sand and gravel. The maximum depth of about 1,700 feet (1,660 feet below sea level) occurs east of the City of Lakewood.

Below the Sunnyside aquifer is a thick section of Pliocene deposits, the coarse zones of which contain fresh water, as indicated by electric logs of oil wells. Around the margins of the Central Basin Pressure Area, where many oil fields exist and more data are available, it is apparent that the fresh water was introduced into the Pliocene sediments by flushing the saline water toward the ocean. Much of the pressure area is in the South Gate-Santa Ana depression where only widely scattered exploratory type oil well data are available. No contours depicting the base of fresh water could be drawn through this area; however, the replacement of saline waters with fresh water appears to have occurred here as well.

The structural features which control or influence the occurrence and movement of ground water in the Central Basin Pressure Area are the South Gate-Santa Ana depression and the Newport-Inglewood uplift. The South Gate-Santa Ana depression extends from south of Beverly Hills into Orange County. It is bounded by transitional structures adjacent to the Puente and Repetto Hills on the northeast and the Newport-Inglewood uplift on the southwest. The Recent sediments in this depression are generally flat-lying as are the underlying deposits of the Lakewood formation. The San Pedro formation, however, is moderately folded and unconformably underlies the younger formations in most of the Central Basin.

The major structural features in the South Gate-Santa Ana depression are the Paramount syncline and Los Alamitos fault, and the Norwalk syncline. These structures appear to be developed only in the San Pedro formation, and they do not affect the overlying younger sediments. The Paramount syncline underlies the City of Paramount and extends northwesterly to the Inglewood fault north of the Baldwin Hills. The Los Alamitos fault

appears as an extension of the axis of the Paramount syncline southeast of the City of Paramount. The Norwalk syncline extends from the City of Norwalk southeasterly to the Orange County line. It is separated from the Los Alamitos fault by an unnamed anticlinal fold which extends into Orange County. None of these structural features appear to materially affect ground water movement in the Central Basin Pressure Area.

The faults and anticlinal folds of the Newport-Inglewood uplift mark the west and southwest boundary of the Central Basin Pressure Area and are partial barriers to movement of ground water from the Central Basin to the West Coast Basin, as has been previously discussed.

Occurrence of Ground Water in the Central Basin

In all four areas of the Central Basin ground water is found in the Recent alluvium, the Lakewood and San Pedro formations, and sometimes in the older sediments. The aquifers in these formations have been discussed above under separate headings for each area of the Central Basin. The paragraphs that follow will take up the movement of ground water into and through the Central Basin as a whole, rather than by separate areas.

Ground water enters the Central Basin through surface and subsurface flow and by direct percolation of precipitation, stream flow, and applied water. The main surface and subsurface flow into the basin is through the Los Angeles and Whittier Narrows from the ground water basins in the interior valleys. However, minor subsurface flow probably enters the area from the bordering relatively impermeable formations, and some subsurface flow can take place from the other surrounding ground water basins.

Replenishment of the aquifers by percolation of precipitation, stream flow, and applied water occurs in the forebay areas where permeable sediments are exposed at ground surface. In addition, some water also moves into the aquifers where they crop out on the surface against the surrounding highlands and in those portions of the pressure area where the Bellflower aquiclude is missing or contains considerable sand and gravel.

In the Los Angeles and Montebello Forebay Areas the aquifers are in hydraulic continuity in varying degrees, with each other and with the ground surface. In some instances this hydraulic continuity results from the aquifers being superposed one on another with no intervening clay members. Areas where each aquifer is merged with the overlying one are shown on the plates depicting lines of equal elevation on the base of each aquifer

(Plates 10A, 12A, 14, 16, 18A, 20A, and 22). In other portions of the forebay areas aquicludes present between the aquifers restrict direct movement of ground water between aquifers. However, these aquicludes are not continuous over the entire area; consequently, the hydraulic gradient controls the lateral movement of ground water to points where the aquifers are merged.

The areas of contact between aquifers and areas of contact with the ground surface are important because it is only through these areas that surface water can be introduced by spreading into the aquifers in major quantity. The most important area in this regard in the Coastal Plain of Los Angeles County is in the vicinity of the Whittier Narrows in the Montebello Forebay Area because of the interconnection of the deeper aquifers through the shallower ones to the ground surface. This condition also exists in the vicinity of the Los Angeles Narrows in the Los Angeles Forebay Area, but the paving of this area has essentially eliminated surface recharge to the aquifers below.

Plate 25, entitled "Areas Where Aquifers are Merged with Permeable Surface Deposits or Overlying Aquifers in Vicinity of Whittier Narrows" shows the generalized interconnections in and near the Whittier Narrows in the Montebello Forebay Area and the areas of essentially direct connection between the aquifers and the ground surface. This plate was derived from the detailed delineation of the areas of mergence shown on the plates depicting lines of equal elevation on the base of each aquifer.

Water applied on the surface can move directly into the Gaspur aquifer within the area shown on Plate 25. The Gage and Gardena aquifers immediately underlie the Gaspur aquifer and they are in hydraulic continuity. Below the Gage and Gardena aquifers are the Hollydale and Jefferson

aquifers which are generally merged with the Gage and Gardena aquifers. This relationship is shown on Plates 12A, 14, 16, and Plate 25. These interconnections provide essentially complete continuity with the surface through the Gaspur aquifer. The areas of mergence of the deeper aquifers with the overlying ones are much more restricted and these limited areas are shown on Plate 25 as well as on Plates 18A, 20A, and 22. It will be noted from Plate 25 that the area of direct vertical recharge from the ground surface to the Lynwood aquifer is about one-third of the area of the Gaspur in contact with the ground surface. The area of direct vertical recharge to the Silverado and Sunnyside aquifers is even more restricted and is limited to a very small area in the immediate vicinity of Whittier Narrows Dam. These limited areas of interconnection severely restrict the amount of recharge that can directly reach the deeper aquifers from the ground surface. Fortunately, the areas of mergence through which water can reach the lower aquifers by devious paths is considerably larger than shown on Plate 25 (see Plates 12A, 14, 16, 18A, 20A, and 22). Therefore, even though the direct downward infiltration may be restricted or entirely impeded by an intervening aquiclude, water can move laterally in one aquifer to a point where the aquifer is merged with a lower one, permitting water applied at the surface to reach and replenish the deeper aquifers.

The areas of mergence between aquifers in the Los Angeles Forebay also are shown on the plates depicting lines of equal elevation on the base of each aquifer. It is evident that considerable opportunity existed for infiltration of water from the ground surface into the Gaspur aquifer and on into the deeper aquifers of the basin. However, as noted before, this area now is essentially covered with impervious material and the opportunity for surface recharge of the aquifers is practically nonexistent.

This is unfortunate from the standpoint of ground water basin utilization since the available storage capacity in the Los Angeles Forebay is large.

Under present conditions, ground water in the Montebello Forebay Area moves into the Los Angeles Forebay Area, the Whittier Area, and the Central Basin Pressure Area. Ground water from the Los Angeles Forebay Area also moves into the Central Basin Pressure Area. In the northern portion of the pressure area a ground water mound exists which separates ground water movement into two parts. North of this mound ground water moves northward into the Hollywood Basin while south of this mound ground water moves southwesterly toward the West Coast Basin.

Ground water movement in the Whittier Area in July 1958 was to the west and southwest in both the deep and shallow aquifers. The Santa Fe Springs-Coyote Hills uplift, the axis of which serves as the southern boundary of the Whittier Area, appears to restrict ground water movement to the south into the Central Basin Pressure Area in the aquifers of the Lakewood formation. The aquifers of the San Pedro formation are continuous across the uplift and it is reasonable to assume that ground water movement to the south could take place if the hydraulic gradient sloped in that direction.

Historically, subsurface flow took place from the Central Basin across the Newport-Inglewood uplift into the West Coast Basin. However, pumping has lowered the water level in the Central Basin and at present water levels in some aquifers are about equal on both sides of the Newport-Inglewood uplift. Further lowering of water levels on either side of the uplift could result in a hydraulic gradient being established which would slope toward the point of the lower water level with a consequent flow of water in that direction. A relatively small amount of subsurface flow occurs out of the Central Basin Pressure Area because most of the ground

water moves to a series of pumping holes developed along the Newport-Inglewood uplift north of Dominguez Hill, along the Cherry Hill fault, north of Signal Hill and in the Lakewood area. From these areas the water is removed by pumping for industrial, irrigation, and domestic uses.

The movement of ground water across the Los Angeles-Orange County line, which forms the eastern boundary of the Central Basin, is entirely dependent on the hydraulic gradient in that area, as no physical barrier to ground water movement exists except for the Coyote Hills.

Transmissibility rates of aquifers in Central Basin as shown on Plates 26A through 26I are extremely variable, ranging up to 400,000 gallons per day per foot of width, although most of the aquifers have transmissibility rates of less than 100,000.

The Gaspur aquifer (Plate 26A) generally has a transmissibility rate of less than 200,000 gallons per day per foot, but has a maximum of 400,000 in a small area in Whittier Narrows. Transmissibility rates in the Artesia-Exposition aquifer average about 30,000 with a maximum transmissibility rate of about 70,000 in several small areas (see Plate 26B, "Lines of Equal Transmissibility of the Artesia-Exposition Aquifers"). The Gage and Gardena aquifers (Plate 26C) also have average rates of about 30,000 but reach a maximum value of about 100,000 near Long Beach and in the Whittier Narrows. The transmissibility rates of the Hollydale and Jefferson aquifers, shown on Plates 26D and 26E entitled, "Lines of Equal Transmissibility of the Hollydale Aquifer" and "Lines of Equal Transmissibility of the Jefferson Aquifer", respectively, have average values of about 20,000 gallons per day per foot of width. The Lynwood aquifer rates (Plate 26F) average about 40,000 but attain a maximum transmissibility rate of about 100,000 gallons per day per foot of width in several areas.

The Silverado aquifer (Plate 26G) averages about 60,000 but reaches a maximum of 400,000 near the intersection of Carson and Atlantic Boulevards. Data on the Sunnyside aquifer in the middle, deeper portion of Central Basin is not very complete, but it appears to have an average transmissibility rate of about 100,000 with a maximum of 300,000 in several areas as shown on Plate 26H, "Lines of Equal Transmissibility of the Sunnyside Aquifer".

The overall transmissibility of all aquifers in the Central Basin is of considerable importance. It may be noted on Plate 26I that high transmissibility rates exist from Whittier Narrows toward Long Beach and Compton, but that an area of low transmissibility separates the Montebello and Los Angeles Forebays. This low transmissibility partly explains the existence of the large pumping depression around Huntington Park and Vernon, where pumping rates are generally not much higher than in the Downey area but there no pumping depression exists.

While the Central Basin Pressure Area is, as its name signifies, essentially an area of confined aquifers, free ground water conditions exist in the Semiperched aquifer overlying the Bellflower aquiclude, and probably in the vicinity of Baldwin Hills where the San Pedro formation is exposed at the surface. In addition, changes in ground water storage have occurred immediately south of the two forebay areas in the upper aquifers directly underlying the Bellflower aquiclude.

In past ground water studies of the Central Basin, it was believed that the clay layer or cap covered all of the basin south of the forebay areas and effectively prevented any percolation of surface water into the aquifers below. Plate 9 shows places where this clay cap, the Bellflower aquiclude, contains considerable amounts of sand and gravel. In

these areas, water applied on the surface could percolate down into the underlying aquifers and it is possible that free ground water conditions may exist from the surface down through one or more of the upper aquifers. These areas increase the total area of the Central Basin where changes in ground water storage can occur with changing water levels and where replenishment by deep percolation can occur. In addition, changes in storage in the Bellflower aquiclude itself is believed to occur as water levels are lowered. These changes in storage are relatively small however, because of the relatively low specific yield assigned to much of these sediments.

Total capacity to store ground water in the Central Basin above the base of the Sunnyside aquifer, or the Silverado aquifer where the Sunnyside is missing, is about 13,800,000 acre-feet. Historically utilized storage since 1904 amounts to about 780,000 acre-feet. As noted before, this change in storage has occurred primarily in the Montebello and Los Angeles Forebay Areas; however, some of the change in storage occurred in the pressure area immediately south of these areas where water levels were lowered below the base of the Bellflower aquiclude and near the Repetto and Whittier Hills where the San Pedro formation crops out at the surface. The storage capacity between high water levels, which occurred in 1904, and sea level amounts to about 1,340,000 acre-feet.

The storage and storage change for the Central Basin listed above may be broken down between the generalized areas delineated on Plate 2 as follows:

	Total storage to base of deepest aquifer	Storage between high water and sea level	Historically utilized storage
Los Angeles Forebay Area	1,800,000	430,000	190,000
Montebello Forebay Area	1,800,000	410,000	230,000
Whittier Area	600,000	60,000	20,000
Central Basin Pressure Area	9,600,000	440,000	340,000
Total	13,800,000	1,340,000	780,000

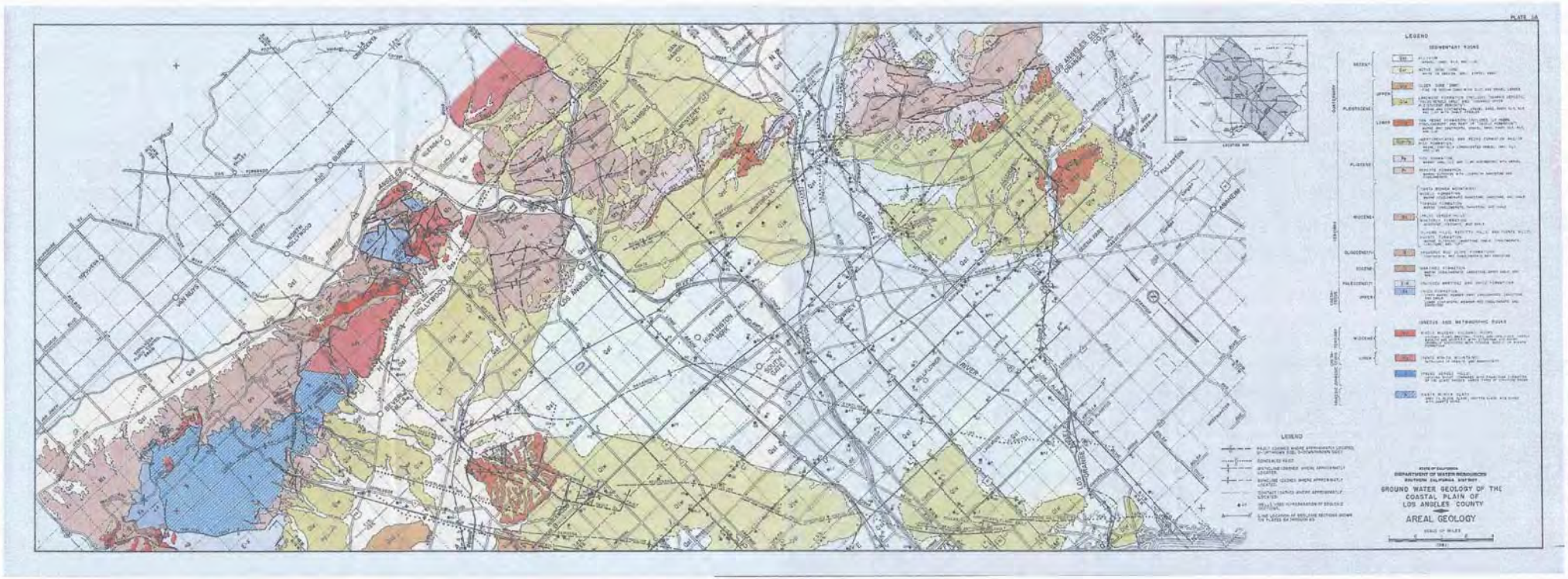
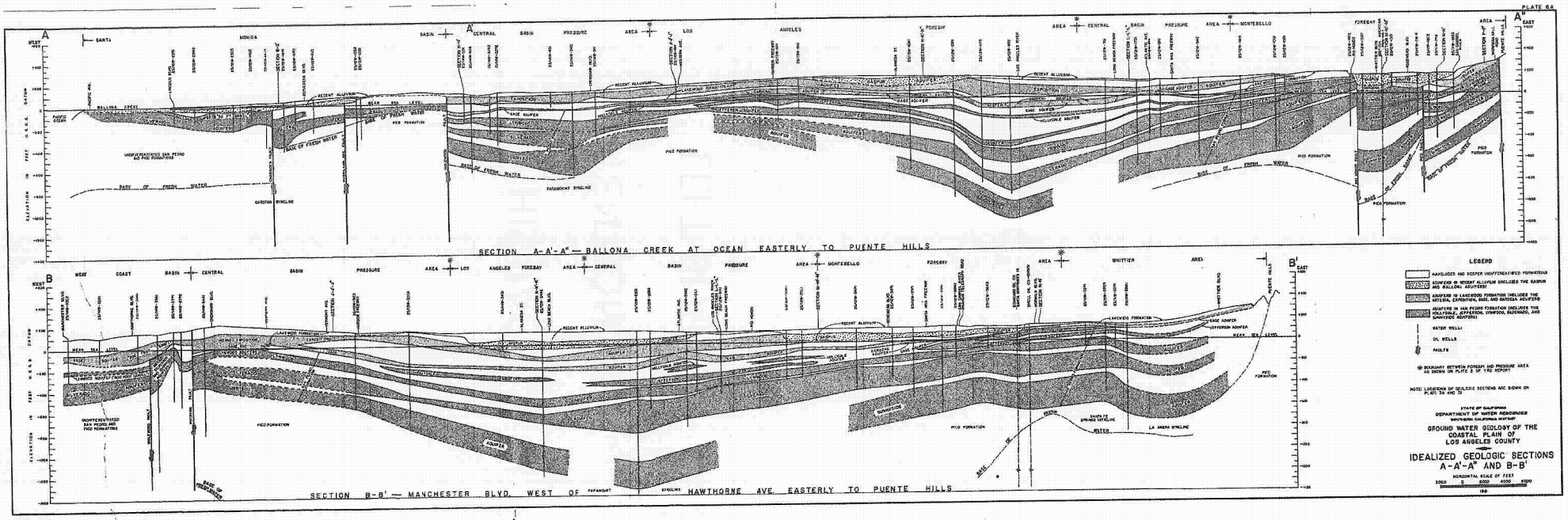


PLATE 1A
LEGEND
SEDIMENTARY ROCKS
LEGEND
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
SOUTHERN CALIFORNIA DISTRICT
GROUND WATER GEOLOGY OF THE
COASTAL PLAIN OF
LOS ANGELES COUNTY
AREAL GEOLOGY
SCALE OF MILES
(1961)

PLATE 6A


SECTION A-A'-A" — BALLONA CREEK AT OCEAN EASTERLY TO PUENTE HILLS
SECTION B-B' — MANCHESTER BLVD. WEST OF PARAMOUNT SYNCLINE HAWTHORNE AVE. EASTERLY TO PUENTE HILLS
LEGEND
WATER WELLS
OIL WELLS
FAULTS
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
SOUTHERN CALIFORNIA DISTRICT
GROUND WATER GEOLOGY OF THE COASTAL PLAIN OF LOS ANGELES COUNTY
IDEALIZED GEOLOGIC SECTIONS A-A'-A" AND B-B'
HORIZONTAL SCALE OF FEET

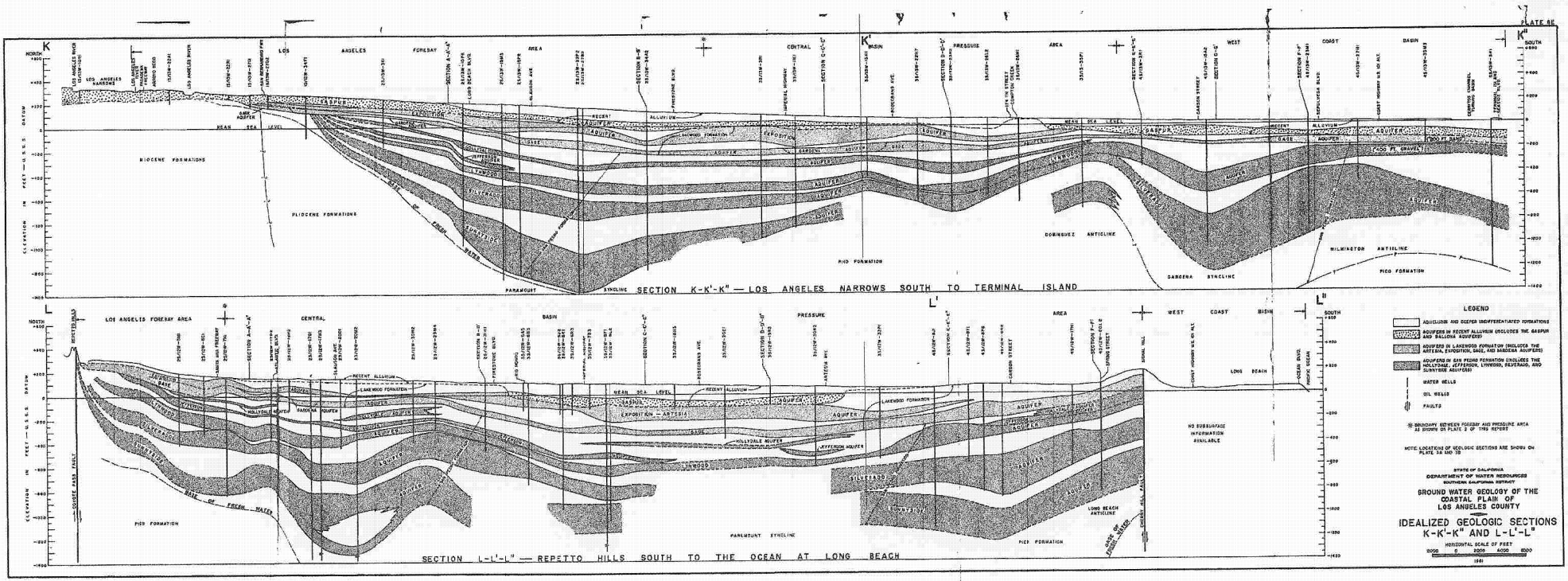


PLATE 8E
K
K'
K"
NORTH
SOUTH
ELEVATION IN FEET — U.S.G.S. DATUM
MEAN SEA LEVEL
LOS ANGELES FOREBAY AREA
CENTRAL BASIN PRESSURE AREA
WEST COAST BASIN
SECTION K-K'-K" — LOS ANGELES NARROWS SOUTH TO TERMINAL ISLAND
L
L'
L"
SECTION L-L'-L" — REPETTO HILLS SOUTH TO THE OCEAN AT LONG BEACH
LEGEND
AQUICLUDE AND DEEPER UNDIFFERENTIATED FORMATIONS
AQUIFERS IN RECENT ALLUVIUM (INCLUDES THE GAGE AND BALDWIN AQUIFERS)
AQUIFERS IN LAKEWOOD FORMATION (INCLUDES THE ARTESIA, EXPOSITION, GAGE, AND BANDINI AQUIFERS)
AQUIFERS IN SAN PEDRO FORMATION (INCLUDES THE HOLLYDALE, JEFFERSON, LYNWOOD, SILVERADO, AND LONG BEACH AQUIFERS)
WATER WELLS
OIL WELLS
FAULTS
BOUNDARY BETWEEN FOREBAY AND PRESSURE AREA AS SHOWN ON PLATE 2 OF 1961 REPORT
NOTE: LOCATIONS OF GEOLOGIC SECTIONS ARE SHOWN ON PLATE 3A AND 3B
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
SOUTHERN CALIFORNIA DISTRICT
GROUND WATER GEOLOGY OF THE COASTAL PLAIN OF LOS ANGELES COUNTY
IDEALIZED GEOLOGIC SECTIONS K-K'-K" AND L-L'-L"
HORIZONTAL SCALE OF FEET
2000 0 2000 4000 6000
1961

Reference:
DWR, 2004

Coastal Plain of Los Angeles Groundwater Basin, Central Subbasin

- Groundwater Basin Number: 4-11.04
- County: Los Angeles
- Surface Area: 177,000 acres (277 square miles)

Basin Boundaries and Hydrology

The Central Subbasin occupies a large portion of the southeastern part of the Coastal Plain of Los Angeles Groundwater Basin. This subbasin is commonly referred to as the "Central Basin" and is bounded on the north by a surface divide called the La Brea high, and on the northeast and east by emergent less permeable Tertiary rocks of the Elysian, Repetto, Merced and Puente Hills. The southeast boundary between Central Basin and Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift. The Los Angeles and San Gabriel Rivers drain inland basins and pass across the surface of the Central Basin on their way to the Pacific Ocean. Average precipitation throughout the subbasin ranges from 11 to 13 inches with an average of around 12 inches.

Hydrogeologic Information

Water Bearing Formations

Throughout the Central Basin, groundwater occurs in Holocene and Pleistocene age sediments at relatively shallow depths. The Central Basin is historically divided into forebay and pressure areas. The Los Angeles forebay is located in the northern part of the Central Basin where the Los Angeles River enters the Central Basin through the Los Angeles Narrows from the San Fernando Groundwater Basin. The Montebello forebay extends southward from the Whittier Narrows where the San Gabriel River encounters the Central Basin and is the most important area of recharge in the subbasin. Both forebays have unconfined groundwater conditions and relatively interconnected aquifers that extend up to 1,600 feet deep to provide recharge to the aquifer system of this subbasin (DWR 1961). The Whittier area extends from the Puente Hills south and southwest to the axis of the Santa Fe Springs-Coyote Hills uplift and contains up to 1,000 feet of freshwater-bearing sediments. The Central Basin pressure area is the largest of the four divisions, and contains many aquifers of permeable sands and gravels separated by semi-permeable to impermeable sandy clay to clay, that extend to about 2,200 feet below the surface (DWR 1961). The estimated average specific yield of these sediments is around 18 percent. Throughout much of the subbasin, the aquifers are confined, but areas with semi-permeable aquicludes allow some interaction between the aquifers (DWR 1961).

The main productive freshwater-bearing sediments are contained within Holocene alluvium and the Pleistocene Lakewood and San Pedro Formations (DWR 1961). Throughout most of the subbasin, the near surface Bellflower aquiclude restricts vertical percolation into the Holocene age Gaspur aquifer and other underlying aquifers, and creates local semi-perched groundwater

conditions. The main additional productive aquifers in the subbasin are the Gardena and Gage aquifers within the Lakewood Formation and the Silverado, Lynwood and Sunnyside aquifers within the San Pedro Formation (DWR 1961). Specific yield of deposits in this subbasin range up to 23 percent in the Montebello forebay, 29 percent in the Los Angeles forebay, and 37 percent in the Central Basin pressure area (DWR 1961). Historically, groundwater flow in the Central Basin has been from recharge areas in the northeast part of the subbasin, toward the Pacific Ocean on the southwest. However, pumping has lowered the water level in the Central Basin and water levels in some aquifers are about equal on both sides of the Newport-Inglewood uplift, decreasing subsurface outflow to the West Coast Subbasin (DWR 1961).

There are several principal aquifers/aquicludes present in this subbasin.

Aquifers/ Aquiclude	Age	Formation	Lithology	Maximum Thickness (feet)
Gaspur	Holocene		Coarse sand, gravel	120
Semiperched	Holocene		Sand, gravel	60
Bellflower	Pleistocene	Lakewood Formation	Clay, sandy clay	140
Gardena	Pleistocene	Lakewood Formation	Sand, gravel	160
Gage			Sand	120
Silverado	Lower Pleistocene	San Pedro Formation	Sandy gravel	300
Lynwood			Coarse sand and gravel	150
Sunnyside				350

Restrictive Structures

Many faults, folds and uplifted basement areas affect the water-bearing rocks in the Central Basin. Most of these structures form minor restrictions to groundwater flow in the subbasin. The strongest effect on groundwater occurs along the southwest boundary to the Central Subbasin. The faults and folds of the Newport – Inglewood uplift are partial barriers to movement of groundwater from the Central Basin to the West Coast Basin (DWR 1961). The La Brea high is a system of folded, uplifted and eroded Tertiary basement rocks. Because the San Pedro Formation is eroded from this area, subsurface flow southward from the Hollywood Basin is restricted to the Lakewood formation (DWR 1961). The Whittier Narrows is an eroded gap through the Merced and Puente Hills that provides both surface and subsurface inflow to the Central Basin (DWR 1961). The Rio Hondo, Pico, and Cemetery faults are northeast-trending faults that project into the gap and displace aquifers. The trend of these faults parallels the local groundwater flow and do not act as significant barriers to groundwater flow (DWR 1961).

Recharge Areas

Groundwater enters the Central Basin through surface and subsurface flow and by direct percolation of precipitation, stream flow, and applied water; and replenishes the aquifers dominantly in the forebay areas where permeable sediments are exposed at ground surface (DWR 1961). Natural replenishment of the subbasin's groundwater supply is largely from surface inflow through Whittier Narrows (and some underflow) from the San Gabriel Valley. Percolation into the Los Angeles Forebay Area is restricted due to paving and development of the surface of the forebay. Imported water purchased from Metropolitan Water District and recycled water from Whittier and San Jose Treatment Plants are used for artificial recharge in the Montebello Forebay at the Rio Hondo and San Gabriel River spreading grounds (DWR 1999). Saltwater intrusion is a problem in areas where recent or active river systems have eroded through the Newport Inglewood uplift. A mound of water to form a barrier is formed by injection of water in wells along the Alamitos Gap (DWR 1999).

Groundwater Level Trends

Water levels varied over a range of about 25 feet between 1961 and 1977 and have varied through a range of about 5 to 10 feet since 1996. Most water wells show levels in 1999 that are in the upper portion of their recent historical range.

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity of the Central Basin is 13,800,000 (DWR 1961).

Groundwater in Storage.

Groundwater Budget (Type A)

A complete water budget could not be constructed due to the lack of data available. Recharge to the subbasin is accomplished through both natural and artificial recharge. The Watermaster reported natural recharge for the subbasin to be 31,950 af and artificial recharge to be 63,688 af for 1998 (DWR 1999). Additionally, the subbasin receives 27,000 af/yr of water through the Whittier Narrows from the San Gabriel Valley Basin in the form of subsurface flow (SWRB 1952). Urban extractions for the subbasin were 204,335 af in 1998 (DWR 1999).

Groundwater Quality

Characterization. TDS content in the subbasin ranges from 200 to 2,500 mg/l according to data from 293 public supply wells. The average for these 293 wells is 453 mg/l.

I

Impairments.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	316	15
Radiological	315	1
Nitrates	315	2
Pesticides	322	0
VOCs and SVOCs	344	43
Inorganics – Secondary	316	113

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production characteristics

	Well yields (gal/min)
Municipal/Irrigation	
	Total depths (ft)
Domestic	
Municipal/Irrigation	

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
USGS	Groundwater levels	90
DWR	Groundwater levels	87
Los Angeles County Public Works	Groundwater levels	212 / Bi-monthly
USGS	Miscellaneous water quality	64
Department of Health Services and cooperators	Title 22 water quality	294

Basin Management

Groundwater management:	Central Basin was adjudicated in 1965, and the Department of Water Resources was appointed Watermaster. Every month extractions are reported to the Watermaster by each individual pumper. This allows the Watermaster to regulate the water rights of the subbasin. (DWR 1999)
Water agencies	
Public	City of Bellflower, Bellflower-Somerset MWC, City of Compton, City of Huntington Park, City of Long Beach, City of Los Angeles DWP, City of Montebello, City of Paramount, City of Pico Rivera, City of Santa Fe Springs, Sativa LA County WD, City of Signal Hill, South Montebello ID, City of South Gate, City of Vernon, City of Whittier. (DWR 1999)
Private	California-American Water Company, Montebello Land and Water Company, Bellflower Home Garden Water Co., California Water Service, Lynwood Park MWC, Maywood MWC, Park Water Company, Pearless Water Company, San Gabriel Valley Water Company, Southern California Water Company, Tract No. 180 Water Company, Tract 349 MWC, Western Water Company.(DWR 1999)

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Water Replenishment District of Southern California. 2000. *Annual Report on Results of Water Quality Monitoring Water Year 1998-1999.*

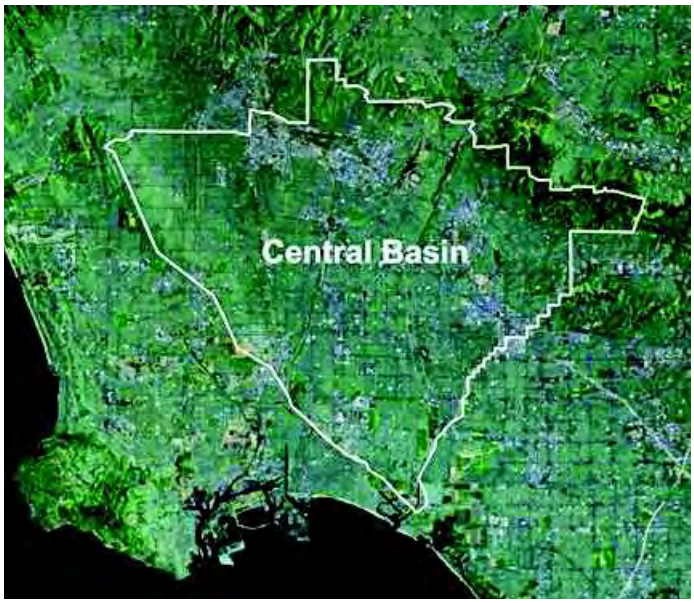
____. 2000. *Engineering Survey and Report.*

Errata

Changes made to the basin description will be noted here.

Reference:
DWR, 2013

State of California
California Natural Resources Agency
DEPARTMENT OF WATER RESOURCES
SOUTHERN REGION OFFICE



WATERMASTER SERVICE
in the
CENTRAL BASIN
Los Angeles County

July 1, 2012 - June 30, 2013

October 2013

Edmund G. Brown Jr.
Governor
State of California

John Laird
Secretary for Natural Resources
California Natural Resources Agency

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Summary of Pertinent Data

Item	Fiscal year 2011-2012	Fiscal year 2012-2013
Parties to Judgment	132	132
Active pumpers	67	67
Active nonparties	4	3
Allowed Pumping Allocation (acre-feet)	217,367	217,367
Rainfall (inches)	7.51	5.55
Injection at the Alamitos Barrier Project (acre-feet)	4,335	5,490[1]
Spreading operations (acre-feet)[1]	105,165	66,389
Watermaster expenses, total	$503,367	$403,293
Watermaster expenses, per APA	$2.32	$1.86
Extractions (acre-feet)[2]	185,914	196,262
Recycled water use by parties (acre-feet)	13,112	13,622
Imported water use by parties (acre-feet)[3]	128,465	117,983
Exported water by parties (acre-feet)	-2,527	-2,506
Total water use by parties (acre-feet)	324,964	325,361

Introduction

The Central Basin Watermaster Service Area overlies about 227 square miles of the Central Basin (Basin) in southeastern Los Angeles County. Figure 1 shows the location and boundaries of the Central Basin Watermaster Service Area. The Watermaster Service Area is bounded by the Newport-Inglewood Uplift on the southwest, the Los Angeles-Orange County line on the southeast, and an irregular line that approximately follows Stocker Street, Martin Luther King Boulevard, Alameda Street, Olympic Boulevard, the boundary between the City of Los Angeles and unincorporated East Los Angeles, and the foot of the Merced Hills and Puente Hills on the north. Twenty-three incorporated cities and several unincorporated communities are found within the Watermaster Service Area. Groundwater from the Basin provides a substantial portion of the water supply needed by the residents, businesses, and industries in the area overlying the Basin.

More than 60 years ago, groundwater overdraft and declining water levels in the Basin threatened the area's groundwater supply and caused the intrusion of sea water into the southern part of the Basin. However, timely legal action and adjudication of the water rights halted the overdraft and helped to prevent further damage to the Basin. Since that

[1] Provisional information from Los Angeles County Department of Public Works.
[2] Excludes extractions by parties with non-consumptive water use permits and by nonparties.
[3] Excludes groundwater imported from the San Gabriel Basin.

time, groundwater extraction from the Basin is limited to the amounts set by a Superior Court Judgment[4] and is monitored by a Court-appointed Watermaster.[5]

The Watermaster assists the Court in the administration and enforcement of the provisions of the Judgment.[6] Among other duties, the Watermaster monitors extractions and reports significant water-related events in the Basin to the Court and to the parties to the Judgment. The activities of the Watermaster are key components for the effective management of the groundwater resources of the Basin.

This report, which is required by the Judgment,[7] summarizes the activities of the Watermaster, the conditions of the groundwater supply, and the quantities of water used in the area overlying the Basin and for the replenishment of the Basin; it also includes a financial report for the 2012-2013 fiscal year.[8]

Water Use

Water used in the area overlying the Basin includes groundwater extracted from the Basin, imported water, and recycled water. Figure 2 shows the water use since 1953.

Extractions by Parties. The Judgment limits the amount of groundwater each party may extract annually from the Basin.[9] This limit, referred to as the Allowed Pumping Allocation (APA), is shown in Table 1 for each party. A recipient of Exchange Pool water may pump the amount released to it in addition to its APA. The volume of water extracted from most wells is reported monthly.[10] Table 2 lists, by party, the volume of groundwater extracted each month from each active well in the Basin. Figure 3 shows the pattern of groundwater extractions during 2012-2013.

To provide flexibility in the control of groundwater extractions, the Judgment contains provisions allowing each party to carry over into the succeeding administrative year[11] a portion of its unused APA and in some cases to over extract.[12] This flexibility was necessary to meet unforeseen water demand.

One provision allows each party to carry over from one administrative year to another any unused APA not to exceed 20 percent of its APA or 20 acre-feet, whichever is

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[4] ***Central and West Basin Water Replenishment District, etc., vs. Charles E. Adams, et al.,*** Los Angeles County Superior Court Case No. 786,656, Second Amended Judgment, May 6, 1991.
[5] Judgment Part II.
[6] Judgment Part II. 1.
[7] Judgment Part II. 1. (d)
[8] July 1 through June 30
[9] Judgment Part I. 2.
[10] Parties extracting small volumes of water report extractions quarterly.
[11] July 1 through June 30
[12] Judgment Part III. Subpart B.

greater.[13] In addition, any unused Exchange Pool water can be carried over into the following fiscal year.

Overextractions. The Judgment provides for overextractions under certain conditions.[14] A party may over extract by 20 percent of its APA or 20 acre-feet, whichever is greater.[15] When a party overextracts in violation of the Judgment, Watermaster notifies the party to resolve the overextraction issue. Under certain circumstances, a party may overextract in a greater amount; however, prior approval must be obtained from the Watermaster.[16] The overextraction must be made up in the following administrative year unless Watermaster concludes that to require the party to make up the overextraction would create an unreasonable hardship for the party. In such cases, Watermaster may grant relief from the requirement that the party must make up the overextraction in the following year, such as prorating the reduction in the party's APA over a period of up to five years.[17]

Table 3 lists the names of parties that have over extracted groundwater during the year and shows the amount of overextraction by each party. During 2012-2013, six parties had a combined overextraction of 23,657.02 acre-feet. The table also identifies one party, State of California (CalTrans), that has over extracted in violation of the Judgment. Since 1997-1998, CalTrans has been pumping groundwater for dewatering beneath the 105 freeway in Downey.[18] CalTrans extracted 22,844.75 acre-feet of water during 1997-1998 through 2011-2012 and 671.41 acre-feet in 2012-2013. Watermaster has suspended its effort to address the overextraction of groundwater by CalTrans.[19]

Extractions by Nonparties. Table 4 shows extractions by nonparties totaled 1.04 acre-feet. Extractions by nonparties are shown by well and by month in Table 2.

Extractions of Contaminated Groundwater. Any party may petition the Water Replenishment District of Southern California (WRD) for a Non-consumptive Water Use Permit (NCWUP) as part of a project to remedy or ameliorate groundwater contamination. If the petition is granted, the party may extract the groundwater without the production counting against its production rights.[20] Table 5 lists current Non-

[13] Judgment Part III. Subpart A. 1. The Judgment was amended to permit each party to carry over a maximum of 100 percent of its APA from 1976-1977 and 1977-1978 because of drought.
[14] Judgment Part III. Subpart B.
[15] Judgment Part III. Subpart B. 1. (a)
[16] Judgment Part III. Subpart B. 1. (b)
[17] Judgment Part III. Subpart B. 2.
[18] CalTrans has been discharging this water to the Los Angeles and the San Gabriel Rivers after treatment through granulated activated carbon units.
[19] In a letter to the Director of the Department of Water Resources, dated September 25, 2008, the Central Basin Water Association, which represents the majority of the water right holders, said that taking legal action against Caltrans to address overextraction from the Central Basin "may at best confuse the issues before the court [regarding groundwater storage], and at worst create unnecessary delay and difficulty for a judge to resolve both questions."
[20] Judgment Part III. Subpart B. 7.

consumptive Water Use Permits issued by WRD and the amounts of groundwater extracted under those permits during 2012-2013.

Transfers of Allowed Pumping Allocations. Each year, APAs are transferred between parties through sales and leases. Table 6 shows the succession of APAs in the Basin as of June 30, 2013. Sales have reduced the number of parties from 508 in 1966-1967 to 133 in 2012-2013. Figure 4 shows samples of suggested water rights transfer agreements.

Table 7 shows transfers of APAs through sales and leases. During 2012-2013 there were four sales of APAs that totaled 635.5 acre-feet and 52 leases that totaled 28,381.47 acre-feet. Each party's APA, as of June 30, 2013, is also shown in Table 1.

When land is sold on which a water right has been developed, the Watermaster must be furnished a copy of the sale document if the water right is also sold. The water right does not pass to the new land owner unless the sale document specifies that the water right was sold with the land. For the proper accounting of the water right, the sale document must specify the exact amount of water right.

In transferring water rights, parties must specify (1) the type of right (i.e., APA, normal carryover, or drought carryover), (2) the amount of right to the nearest 0.01 acre-foot, and (3) the period of the lease, if applicable. Moreover, all leases must be made on a fiscal year basis and must be executed by the parties and received by Watermaster by June 30 of the year in which the lease is effective.

For parties wanting to buy, sell, or lease water rights, Watermaster maintains a web page.[21] Any party wishing to be listed should call the Watermaster. This is a courtesy to assist parties unable to resolve problems regarding a surplus or deficiency of water supply. Watermaster will make no recommendation regarding transactions conducted relative to the use of this service.

Exchange Pool. The Judgment authorizes an Exchange Pool to provide additional water rights to parties without sufficient water.[22] If a party's estimated water requirement for the following fiscal year exceeds its total available water supply, that party may request additional water from the Exchange Pool. Any party wishing to purchase water from the Exchange Pool must file the request with the Watermaster before April 1. If no requests are received by April 1, the Exchange Pool will not operate in the following fiscal year, and Watermaster will not process Exchange Pool forms. Table 8 shows that there were no requests for Exchange Pool water during 2013-2013.

Status of Extraction Wells. In the Basin there are 306 reported active extraction wells and 231 reported inactive extraction wells (Table 2). The locations of the active extraction wells are shown on Figure 3. Table 9 shows four new extraction wells were completed and 11 extraction wells were destroyed.

[21] www.water.ca.gov/watermaster
[22] Judgment Part III, Subpart C.

Meter Testing Program. Accurate measurement of groundwater extractions is essential for the successful management of groundwater in the Basin. Therefore, Watermaster requires an operative water meter to be installed at each extraction well.[23] It is the responsibility of each party to ensure that its meter and test facilities are installed properly and are maintained in good working condition. It is the goal of Watermaster to test the water meter at each active extraction well at least once every two years or when a party requests a meter calibration.[24] Watermaster tests meters by volumetric or pitot comparisons. Watermaster notifies a party that it must repair or replace its meter when the meter registers beyond 5 percent accuracy. Watermaster calculates the monthly water production for each well using the meter readings and Unit of Measure Code reported for the well that month. If the registration accuracy of the meter deviates by as much as 10 percent, the calculated well production could be subject to revision.[25]

During 2012-2013, Watermaster visited 57 parties, tested 239 meters, and performed 20 well investigations. Tests showed that four meters were more than 5 percent fast, with registration accuracies of plus 6.5 percent to plus 18 percent, and two meters were more than 5 percent slow with registration accuracies of minus 12 percent to mimus 34 percent. Meters at three sites were inoperative, and meters at nine sites could not be tested because the well sites lacked test points or the pumps were inoperative. Watermaster notified and required the responsible parties to make the needed repairs.

Water Supply

Water supplies available to the communities overlying the Basin include groundwater extracted from the Basin, imported surface water and groundwater, and recycled water.

Precipitation. Because layers of materials of low permeability overlie the primary water-producing aquifers throughout much of the Basin and largely impermeable surfaces (i.e., pavement and buildings) cover most of the forebay areas, precipitation over the Basin has relatively little direct influence on the replenishment of the groundwater in the Basin. However, during years of high rainfall, increased runoff from the areas upstream of the Basin would result in increased replenishment to the Basin and would probably result in decreased water demand by the water users overlying the Basin which, in turn, could result in lower rates of groundwater extraction from the Basin.

During 2012-2013, the following amounts of precipitation were measured at six precipitation stations: 5.02 inches at 96th and Central, 7.58 inches at Montana Ranch, 4.72 inches at La Mirada, 5.01 inches at Whittier City Yard, 4.80 inches at USC, and 6.16 inches at Imperial Yard.[26] Figure 1 shows the locations of these precipitation

[23] Judgment Part II. 1. (b)
[24] Judgment Part II. 1. (c)
[25] The Board of Directors of the Central Basin Water Association concurs with this Watermaster policy regarding adjustments to reported well production amounts.
[26] Provisional data provided by Los Angeles County Department of Public Works.

stations, and Figure 5 shows the monthly average of the rainfall measured at these stations. Based on the rainfall measured at these stations, the mean precipitation over the Central Basin was 5.55 inches, which is 40 percent of the long-term mean precipitation at these stations.[27]

Groundwater Recharge. Natural replenishment of the groundwater in the Basin is largely from surface flow and underflow through Whittier Narrows from the San Gabriel Valley. As mentioned above, little of the rainfall over the Basin would be likely to infiltrate into deeper aquifers of the Basin.

Intentional replenishment of groundwater in the Basin is accomplished by spreading water at the Rio Hondo and the San Gabriel River spreading grounds in the Montebello forebay (Figure 1).[28] The sources of this replenishment water include local storm runoff, purchased imported water, and recycled water from three reclamation plants located upstream of the Basin.[29] Table 10 shows the sources and quantities of water spread to replenish the groundwater. In 2012-2013, replenishment water included 8,274 acre-feet of local storm runoff (which is 32,140 acre-feet less than in 2011-2012), 58,113 acre-feet of recycled water, and 2 acre-feet of untreated imported water. Local runoff accounted for 13 percent of the water, recycled water accounted for 86 percent, and the untreated imported water accounted for 1 percent.

In-Lieu Replenishment. During the 1965-1966 water year,[30] the WRD, in cooperation with the Metropolitan Water District of Southern California (MWD), began an in-lieu replenishment program. WRD may contract with any producer having access to supplemental water that could be used in lieu of extracting groundwater from the Basin.[31]

The use of supplemental water in lieu of pumping groundwater does not change a party's water right,[32] but it counts as water pumped under the Judgment. The program may be used to (1) alter pumping patterns within the Basin, (2) replenish the groundwater in areas of low transmissivity where conventional recharge techniques are ineffective, (3) heighten the effect of injecting water to form a sea water barrier by reducing extractions, (4) reduce the amount of replenishment water purchased by WRD, and (5) reduce the annual extractions from the Basin. Table 11 shows that the City of Long Beach participated in the in-lieu replenishment program.

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[27] Calculation of the long-term precipitation included the Downey Fire Department precipitation station rather than the Imperial Yard station.

[28] Water injected at the Alamitos Barrier Project also contributes to the replenishment of the Central Basin.

[29] The three water reclamation plants are the Whittier Narrows, San Jose Creek, and Pomona plants. The locations of the first two plants are shown on Figure 1, but the Pomona plant is farther upstream and is not shown on the figure.

[30] October 1, 1965 through September 30, 1966

[31] California Water Code Section 60230(p).

[32] Water Code Section 1005.1

Imported Water. Water is imported from northern California via the State Water Project and from the Colorado River and is made available to water users by MWD through its member agencies: Central Basin Municipal Water District (CBMWD) and the Cities of Compton, Long Beach, and Los Angeles. The City of Los Angeles also imports water from the Owens River-Mono Basin, and the California Domestic Water Company, the San Gabriel Valley Water Company, the Suburban Water Systems, and the City of Whittier import groundwater from the San Gabriel Valley groundwater basin, which lies to the northeast and upstream of the Basin. Table 12 shows that in fiscal year 2012-2013, a total of 117,983 acre-feet of water was imported to the area overlying the Central Basin. The Water Replenishment District of Southern California (WRD) did not purchase seasonally discounted spreading water because the Metropolitan Water District of Southern California (MWD) discontinued the delivery of discounted water for groundwater replenishment in August 2011.

Quality of Imported Water

Constituent	Colorado River Water[33] (mg/L)	State Water Project Water[34] (mg/L)
Chloride	84	67
Sulfate	222	42
Hardness (as $CaCO_3$)	274	109
Total Dissolved Solids	574	259

Exported Water. California-American Water Company exported 2,505.68 acre-feet of groundwater from the Basin to its service area that overlies a portion of the West Coast Basin.

Recycled Water. Table 13 shows that 14,318 acre-feet of recycled water were used in the area overlying the Basin during 2012-2013. This amount is 560 acre-feet more than that used in 2011-2012. These amounts do not include the recycled water used to replenish groundwater in the Basin.

Alamitos Sea Water Intrusion Barrier Project. Sea water intrusion in the Alamitos Gap near the mouth of the San Gabriel River poses a threat to the groundwater in the Central Basin. The Alamitos Barrier Project is designed to prevent sea water intrusion into the fresh water aquifers of the Basin. The location of the barrier is shown on Figure 1. The Los Angeles County Department of Public Works operates the barrier project, which is comprised of four extraction wells that can be used to create a groundwater trough and 43 injection wells that create a groundwater ridge to halt sea water intrusion. In addition, the project includes 220 observation wells that are used to monitor groundwater levels and quality in the area. Table 14 shows the quantities of imported water and of recycled water injected into the barrier wells and the quantity of

[33] at Lake Mathews
[34] at Castaic Lake

water extracted. Figure 6 shows the quantities of water used in the barrier project since operation of the project began in 1965. The sea water intrusion problem has been contained by the barrier project.

Groundwater Levels. Figure 7 shows the locations of selected wells that are used to monitor groundwater level elevations. Figure 8 shows the water level elevations in key wells located in the Montebello forebay, and Figure 9 shows the water level elevations in wells perforated in the principal water producing aquifers in the Basin.

Watermaster Administration Costs and Budget

The Judgment requires Watermaster to report its administration costs.[35] Table 15 shows that Watermaster income was $462,765 and that expenditures were $403,293.

The Judgment requires Watermaster to prepare an annual budget and to apportion it among the parties.[36] The total amount billed was $356,000, and the total amount paid was $357,484.86. The budget was submitted to the Parties on May 1, 2012, and it was adopted as the final budget on June 1, 2012. Table 16 shows the approved budget of $560,000.

Table 17 shows the apportionment of the budget among the parties. A penalty of 5 percent is assessed if payments become delinquent. Seventeen parties were penalized because their payments were not made within the allowable 30 days after service of the invoice. Late fees totaling $1,484.86 were collected for deliquent payments.

Significant Water-Related Events

Motion to Amend the Judgment. On May 9, 2012, the State Supreme Court dismissed the petitions for review of the Court of Appeal decision that reversed the ruling of the Superior Court that denied jurisdiction over the motion to amend the Central Basin Judgment.[37] The case was remanded to the trial court.

On November 30, 2012, the case was assigned to Superior Court Judge Joanne O'Donnell, and she ruled that the Central Basin and the West Coast Basin Groundwater Storage Amendment cases are related. On April 3, 2013, both cases were assigned to Superior Court Judge Abraham Khan.

Replenishment Assessment Exemptions. On December 7, 2012, WRD adopted a new policy regarding Replenishment Assessment Exemptions (RAE) in the West Coast

[35] Judgment Part II. 1. (d)
[36] Judgment Part II. 1. (e)
[37] In 2009, some of the parties to the Judgment filed a motion to amend the Judgment to allow for groundwater storage in the Basin. Litigation of the case is ongoing. See earlier Annual Reports for more information.

Basin and in the Central Basin. A party with a Non-Consumptive Water Use Permit will not be granted a RAE if the party extracts water and does not return the water to the Basin.

Water Emergency Declaration. On February 6, 2013, Judge O'Donnell lifted the stay order on the implementation of the Drought Carryover Provisions of the Central Basin Judgment.[38] On May 16, 2013, Watermaster issued a draft rule on Application of Drought Carryover Provisions, and on June 17, 2013, the Rule[39] was adopted. On July 3, 2013, Watermaster mailed letters to the Parties informing them of their Drought Carryover 1991 (DCO-91) allocations[40]. However, the motion challenging the November 19, 2010, WRD declaration of a water emergency in the Basin has not been withdrawn.

Extraction of Imported Water. On April 26, 2013, CBMWD re-filed the motion for an order declaring that extraction of non-native imported water does not diminish a Party's Allowed Pumping Allocation under the Judgment.[41]

[38] Implementation of the WRD drought emergency declaration was stayed by Judge Kendig on July 13, 2011.

[39] See Appendix A for the Rule on Application of the Drought Carryover Provision in the Judgment.

[40] See Appendix B for Revised Table of Water Rights Accounting for 2010-2011 and Appendix C for Revised Table of Water Rights Accounting for 2011-2012.

[41] CBMWD initially filed the motion with the court on September 19, 2011.

Reference:
E&E, 1984

SUPERFUND RECORDS CENTER
DOC. [redacted] VOL. [redacted]

HAZARDOUS
SITE CONTROL
DIVISION

Remedial Planning/ Field Investigation Team (REM/FIT)

ZONE II

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68-01-6692

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Site Inspection

Stauffer Chemical Company
South Gate, California

9/84

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Purpose: Site Inspection

Facility: Stauffer Chemical Company
South Gate, California

9/84

Date Investigation Began: April 1984

TDD Number: R-9-8307-24a

Report Number: C(81)C398

FIT Project Officer: Suzanne Chaewsky
Karen Greig, P.E.

Report Prepared By: Suzanne Chaewsky
George Muehleck

Report Date: September, 1984

Submitted to: Robert M. Mandel, Chief
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1.0 INTRODUCTION

Stauffer Chemical Company in South Gate, California was identified by the Eckhardt Survey in 1979 and was included in the State of California, Department of Health Services Abandoned Sites Project (ASP) due to the disposal of arsenic trisulfide sludge in an on-site unlined pond. As a result of these assessments, the South Gate site was included in EPA's inventory of potential hazardous waste sites. A preliminary assessment of this site indicated that insufficient information existed to apply the site to EPA's National Hazardous Ranking System (HRS). Ecology and Environment, Inc., Field Investigation Team (FIT) was subsequently assigned to gather the information needed to apply the site to the HRS and to further define any potential impacts associated with the site. The purpose of this report is to summarize FIT's investigative efforts to date.

In gathering background data on the Stauffer Chemical Company site in South Gate, California, FIT personnel assembled all existing information available from the EPA, the California Regional Water Quality Control Board (RWQCB), the California Department of Health Services and additional state and county agencies. A complete list of individuals and organizations contacted are as follows:

David Chase	California Department of Health Services Los Angeles, CA
Hank Yacoub	California Regional Water Quality Control Board, Los Angeles, CA
Arvind Shah	California Department of Health Services Sacramento, CA
George Farag	Los Angeles County Flood Control District Los Angeles, CA
Armad Massan Bill Hudson	California Department of Water Resources Los Angeles, CA

When it was determined that a site visit would be necessary to obtain more detailed information, the representatives of Stauffer Chemical Company in South Gate were contacted. Information obtained from the aforementioned sources was used to evaluate the site history and description section of this report and to plan field inspection efforts.

2.0 SITE HISTORY AND DESCRIPTION

2.1 Site History

Stauffer Chemical Company is a privately owned company headquartered in Westport, Connecticut which operates various types of chemical plants throughout the United States. Stauffer purchased the South Gate plant in 1963 from Victor Chemical which owned and operated the facility from 1952-1963. Prior to 1952, A.R. Maas owned and operated the plant. It is not known how long A.R. Maas owned the site. According to the current Plant Manager, Ed Trainer, the chemical plant has existed at the site since at least 1910 and during the entire lifetime of the facility, regardless of ownership, the operations at the plant remained unchanged.

The facility occupies approximately 6.9 acres and is located about 3/4 mile west of the Long Beach Freeway in South Gate (see Figure 2-1). The site is bordered by U.S. Gypsum to the west and Ardine Street to the north. Southern Pacific railroad tracks border the site to the south and Union Pacific railroad tracks border the site from Ardine Street to the Southern Pacific tracks.

The plant production levels have varied with the chemical market. At the time of the inspection, the facility was operating 24 hours per day with three shifts, five days per week. The maximum number of employees ever employed at the plant was 150. Presently, there are about 50 employees. Stauffer has considered closing down operations at this facility sometime in the next few years.

2.2 Process Description

The Stauffer Chemical South Gate Plant historically manufactured three products: trisodium phosphate, sodium sulfide and phosphoric acid. The raw materials used to manufacture these chemicals include soda ash, phosphorus, sulfuric acid and sodium hydroxide. The dry soda ash and phosphorus were shipped to the plant in railcars. A facility plot plan is presented in Figure 2-2 identifying plant process areas.

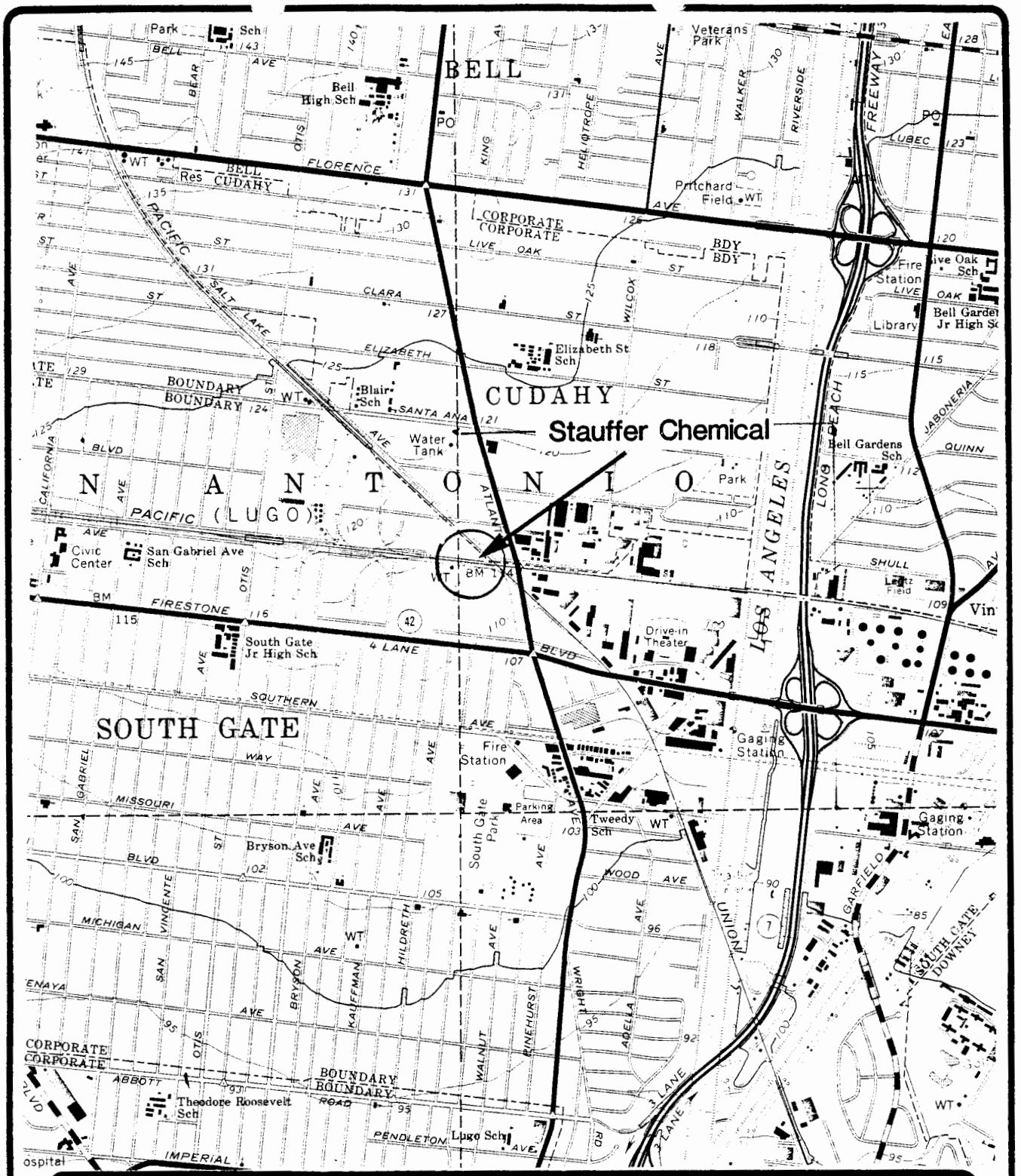

Figure 2-1 Site Location

Stauffer Chemical, South Gate Facility

Scale: 1:24,000 Source: USGS Topo Map South Gate Quadrangle

The site's phosphoric acid plant ceased operation in 1981 and Stauffer is in the process of dismantling the tanks and equipment which comprised this operation. The raw phosphorus used in the phosphoric acid plant contained arsenic as an impurity. The waste generated as a result of phosphoric acid manufacturing was an arsenic sludge containing 2.8% arsenic trisulfide and 2-3% phosphoric acid. This waste constituted the only routine hazardous waste generated at the South Gate Plant and therefore, since 1981 there has been no routine hazardous waste generated at the site. Occasionally there may be small quantities of wastes requiring off-site disposal.

2.3 Waste Management Practices

Up until 1960, the arsenic sludge generated form the phosphoric acid plant was disposed on-site in an unlined pond at the southeast corner of the plant property. According to Stauffer representatives, this pond was filled in and paved in 1960, prior to their ownership. However, according to a 1982 Staff Report from the Department of Health Services Abandoned Site Project, the pond was still present and visible in aerial photographs dated December 1962. In any event, on-site disposal to the pond ceased prior to Stauffer ownership.

After the pond was paved, the arsenic sludge generated at the plant was stored in an on-site storage tank and hauled off-site for disposal by a vacuum truck. Since the closure of the phosphoric acid plant in 1981, there has been no arsenic sludge or other routine wastes at the plant.

The area of the old sludge pond is estimated to be about 0.35 acres in size. The dimensions of the pond reportedly were approximately 180 feet long, 130 feet wide and 25 feet deep. Arsenic sludge from the phosphoric acid plant and occasional venting of cooling water as boiler blowdown were released into this unlined pond. The EPA estimated (1981) that approximately 100-200 tons of waste sludge were disposed in the pond between 1950 and 1960. When the pond was no longer used, it was paved over without evacuation of any waste material.

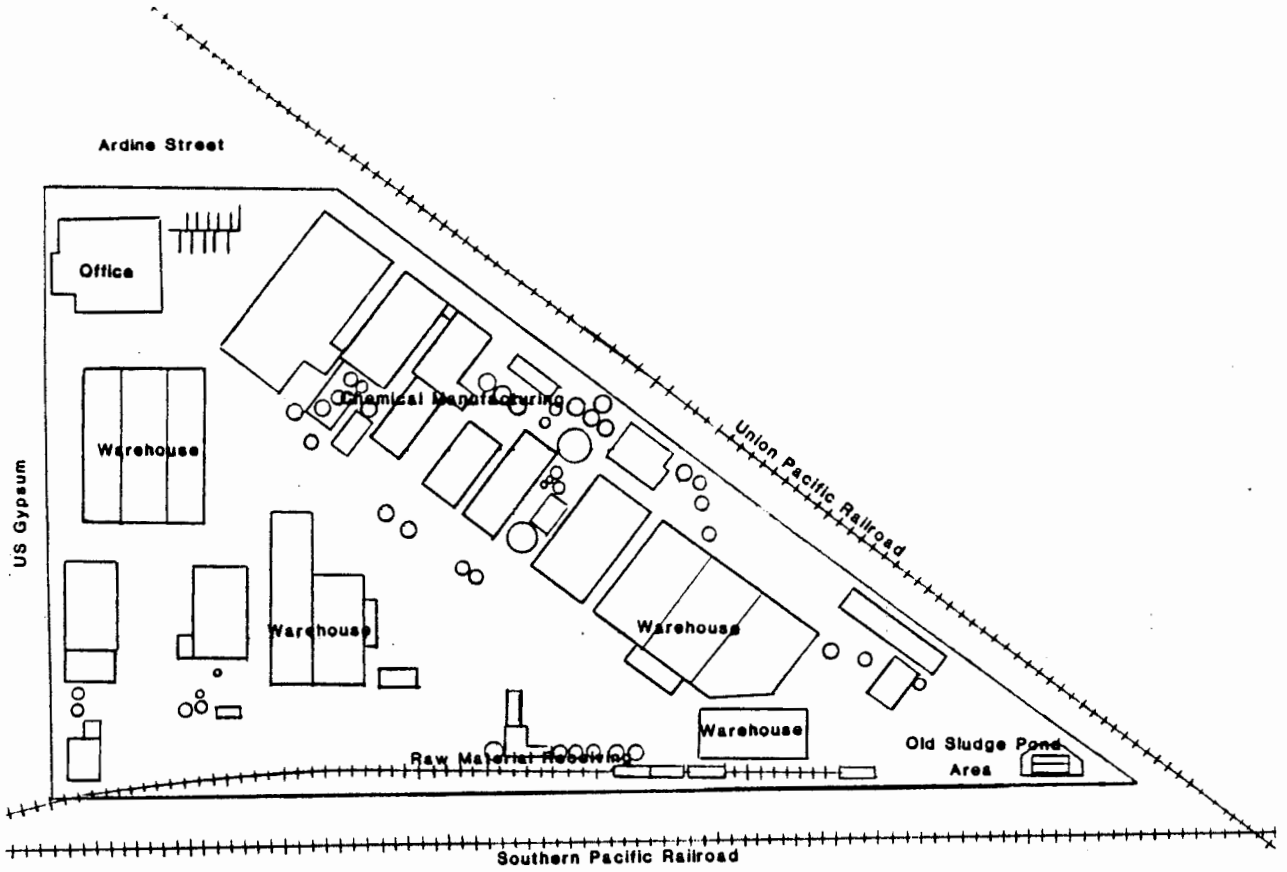

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Figure 2-2 Facility Plot Plan

Stauffer Chemical, South Gate Facility

No Scale

3.0 DESCRIPTION OF SURROUNDING AREA/ENVIRONMENTAL CHARACTERISTICS

3.1 Physical Setting

The Stauffer Chemical, South Gate Plant is located in the Los Angeles Coastal Basin approximately eight miles south of downtown Los Angeles and ten miles east of the Pacific Ocean. The Los Angeles River is located 3/4 mile to the east of the site. The population of South Gate in 1983 was 70,600 (1).

The basin receives about 16 inches of rainfall each year, concentrated in the winter and spring (2). The one year 24-hour rainfal is two inches (3).

3.2 Hydrogeology

The Stauffer Site is underlain by a series of aquifers known as the Exposition, Gage, Jefferson, Lynwood and Silverado respectively from surface to depth. Some of these aquifers could be merged successively while less permeable lenses known as aquicludes or aquitards separate others. An idealized stratigraphic sequence underlying the site is as follows:

Recent Alluvium	0-55 feet
Bellflower Aquiclude	55-110 feet
(Fine Grained Deposits)	
Exposition Aquifer	110-215 feet
Aquitard	215-240 feet
Gage Aquifer	240-310 feet
Aquitard	310-410 feet
Jefferson Aquifer	410-490 feet
Aquitard	490-505 feet
Lynwood Aquifer	505-595 feet
Aquitard	595-640 feet
Silverado Aquifer	640-900 feet

This sequence interpreted from California Department of Water Resources (DWR) Bulletin #104, Appendix A, appears well defined in idealized cross section; however, local geologic logs indicate the underlying lithology is much more heterogeneous. Deposits range from clean fine to medium grained sand interbedded with sandy clays and hard clays. Minor lenses of gravel to gravelly clays are also locally deposited.

The shallow aquifers are perched, semiconfined to confined. Hydraulic conductivity values for shallow deposits of relative material range from 10^{2} to 10^{-2} gallons/day/ft^{2} (Freeze and Cherry 1979). Hydraulic conductivities of the preceding values indicate that water has the potential to move slowly through the more permeable deposits (sands) laterally and vertically depending on the extent of underlying clay lenses. At this time, there is no site specific well or soil permeability data to substantiate these values.

Borings performed by Stauffer (1981-1982) on the site indicate that most material underlying the site is unsaturated to a depth of 43 feet. Moist soils were encountered around 20 feet. These borings characterize material underlying the site as medium to fine sands and silts with minor amounts of clay. This material would probably exhibit slightly higher hydraulic conductivity values on the order of 10^{3} - 10^{-1} gallons/day/ft^{2}. The L.A. County Flood Control District (LACoFC) Coastal Plain, Fall 1978, Groundwater Contour Map indicates shallow groundwater at a depth of 115 feet below land surface. Groundwater in this zone moves in a north northwest direction.

Most publications as well as Los Angeles County Flood Control and California DWR personnel indicate that the shallow aquifer in the coastal plain is of limited use only. Groundwater quality is poor with high dissolved solids. Wells perforated in the shallow semiperched aquifer of the coastal plain commonly produce too low a yield to be of beneficial use. The shallow aquifers were used for irrigation prior to development of the Los Angeles metropolis.

In the study area, substantive fine grained silt, clays and sand-clay mixes probably inhibit vertical recharge. More defined aquicludes or aquitards separate deeper water bearing zones. The near surface aquiclude known as the Bellflower aquiclude is thought to restrict vertical percolation into the Exposition aquifer and perched shallow groundwater. Fine gained deposits separating the Exposition and successive aquifers further inhibit vertical percolation. The Bellflower aquiclude comprises all of the fine grained sediments that extend from the ground surface, or from the base of the semiperched zone down to the first aquifer below. The Bellflower aquiclude is found throughout the study area and is composed mainly of clay and silt; however, there are numerous areas where it consists of clayey sands and clayey gravels where its effectiveness as an aquiclude is limited. Well logs nearby the site indicate there are fairly substantial lenses of sandy clay up to 150 feet below the site, however, numerous lenses of fine to medium sand with some gravel could provide routes to the shallow aquifer. According to the DWR Bulletin #104, Appendix A, these predominantly sandy or gravelly clays may permit water to percolate slowly to the underlying aquifers. The likelihood of movement of contaminants below the site is unknown and any potential route through the shallow system is undefined at this time.

The deeper Lynwood and Silverado aquifers are extensively used for the Los Angeles County drinking water supply. The Lynwood aquifer lies approximately 500 feet below the site and is about 100 feet thick. The Silverado Aquifer lies about 640 feet below the site. Los Angeles County deep aquifer contour maps from the fall of 1978 indicate that the piezometric surface is 161 feet below land surface. Groundwater flows in a west northwest direction in these aquifers. Differences in the depth of the aquifer relative to the piezometric surface indicate that these aquifers are under considerable hydrostatic pressure. The nature and thickness of the overlying deposits and the high hydrostatic pressure within these aquifers make potential for leaking of contaminants to these zones extremely unlikely.

4.0 SUMMARY OF PAST SAMPLING ACTIVITIES

In July 1981 the California Department of Health Services Abandoned Site Project in Sacramento suggested to Stauffer Chemical that soil sampling be conducted in and around the pond area to identify the types and concentrations of materials present (see letter from Department of Health Services to Stauffer Chemical, July 1981 in Appendix D).

Stauffer had already performed three borings (B1-B3) in the old pond area in 1979. These borings were performed by Stauffer to determine subsoil stability. In 1981 and 1982, Stauffer performed 14 borings (SG-2 through SG-5 and SG-9 through SG-18) to attempt to determine the extent of the old pond area and to investigate subsurface contamination. Stauffer provided Ecology and Environment, Inc. with the logs and the sampling results from these borings. The logs are in Appendix D and the sampling results are summarized in Table 4.1. The locations of these borings are identified in Figure 4.1.

To date, the 1981 and 1982 borings are the most recent samples taken of the pond. The samples taken in 1981 were analyzed for arsenic, cadmium, chromium, lead, mercury and selenuim. The samples taken in 1982 were analyzed for arsenic only. The samples were not analyzed for pH and organics.

PVC piezometers were installed in four holes, SG-4, SG-9 and SG-12 and SG-13. SG-9 and SG-12 no longer exist and SG-4 was observed at the time of the inspection. The status of SG-13 is unknown. Water samples were collected from SG-4 and SG-9 by Stauffer which were located in high arsenic soils. SG-12 was reported to be dry at the time of its installation. Stauffer did not provide the analyses from the water samples because they felt that the samples were not representative of area groundwater. (see letter dated May 14, 1984 from Bruce S. McClellan, Stauffer Chemical Company to Suzanne Chaewsky, Ecology and Environment, Inc., Appendix D)

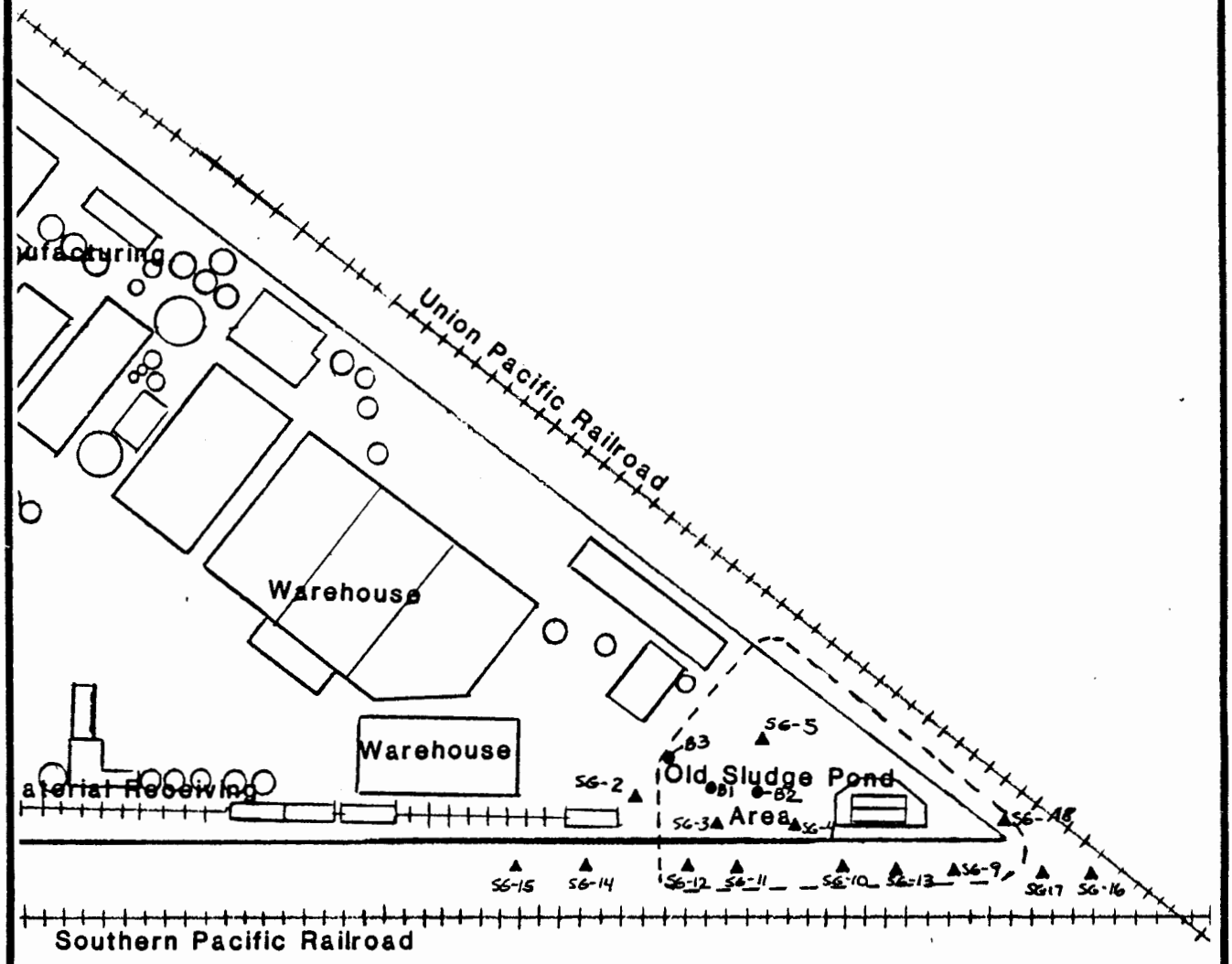

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Figure 4-1 Soil Boring Locations

Stauffer Chemical, South Gate Facility

No Scale

TABLE 4.1
SUMMARY OF SOIL BORING SAMPLING RESULTS

BORING NUMBER	DEPTH	ARSENIC LEVEL (mg/kg)
SG-2	10	14
	15	4
	20	8
SG-3	10	24
	15	?
	20	8
	25	2
SG-4	10	25
	15	260-384
	20	35
SG-5	10	94
	15	?
	20	21
SG-9	10	11
	15	22
	20	29?
	25	4
SG-10	10	1
	15	740-1660
	20	12
	25	23
SG-11	10	14
	15	225
SG-12	5	3
	10	17
	15	?
SG-13	15	127
	20	32
	25	50
	30	12
	35	10

TABLE 4.1 (cont'd)

BORING NUMBER	DEPTH	ARSENIC LEVEL (mg/kg)
SG-14	10	10
	15	19
	20	15
	25	1
	30	3
	35	0.5
SG-15	10	1
	15	4
	20	14
	25	4
	30	2
	35	1
SG-16	10	70
	15	3
	20	17
	25	14
	30	5
SG-17	10	4
	15	1
	20	7
	25	6
	30	12
SG-18	10	7
	15	28
	20	6
	25	4

5.0 SUMMARY OF FIT INVESTIGATION EFFORTS

A preliminary field inspection of the Stauffer Chemical Company, South Gate facility was conducted by Suzanne Chaewsky and Karen Greig, on April 4, 1984 at 8:00 A.M.. FIT personnel were accompanied by: Ed Trainer, South Gate Plant Manager; Lee E. Erickson, Western Environment Control Manager from San Francisco; and Bruce S. McClellan, Senior Hydrogeologist from Westport, Connecticut. The purpose of this inspection was to collect information necessary to adequately assess the site to determine if a threat to public health or the environment exists.

The inspection was initiated with a meeting to discuss the purpose of the inspection. At this time, FIT representatives were provided with information on the plant's operations, waste management practices and ownership history. FIT representatives were then given a tour of the facility beginning with the trisodium phosphate and sodium sulfide manufacturing areas, and ending up at the location of the paved arsenic sludge pond. FIT representatives walked the plant perimeter and also inspected the operations in all on-site buildings. After the complete tour, we explained that an inspection report would be forthcoming and made available upon request from the EPA.

Arsenic trisulfide sludge from the phosphoric acid plant of the facility was disposed in the on-site unlined pond until 1960. EPA estimated that 100-200 tons of sludge was disposed in the pond between 1950 and 1960; however, the actual total quantity of sludge in the pond is unknown. Since Stauffer Chemical Company owned the site in 1963, arsenic trisulfide sludge was hauled off-site for disposal. The pond was paved with asphalt between 1960 and 1963 and the pond contents remained in place.

The facility itself has been in existence since approximately 1910. Based on observations made during the inspection and on information provided by company representatives, the facility had not changed very much since 1910. The phosphoric acid plant closed down in 1981 and was still being dismantled at the time of the inspection. Company representatives indicated that the entire plant may close within a few years.

The facility site slope is towards the pond area. At the time of the inspection, the pavement in the pond area was warped and was buckling in some areas. Upgradient of the pond area, there are two large sodium hydroxide liquid storage tanks (about 5000 gallons each) which in the event of a leak or rupture could lead to the release of this caustic chemical to the pond area. Even small spills of other chemicals in the plant have a potential of being released to the pond area via rainwater runoff.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Further work is recommended on this site by the FIT. Based on available file information, this site was being considered by the California Department of Health Services for ranking on the state's Superfund List of Hazardous Waste Sites. Attempts to determine the status of this site with the State have been unsuccessful and therefore additional investigation by the EPA is recommended.

The major concern at the site should be one of determining the potential mobility of arsenic underlying the site identified in Stauffer's report on soil borings. Ordinarily, arsenic trisulfide is insoluble in water, however, it may become soluble when the environment becomes highly alkaline or acidic. Apparently, contaminants still lie in the unsaturated zone and the ability to move through this zone is unknown. An assessment of soil pH, wetness, and further characterization on the nature, thickness and effectiveness of fine deposits underlying the site relative to migration inhibition should be conducted.

Although it is unlikely that contamination from the site will affect the water quality of deeper potable water bearing zones, movement of contaminants to the shallow aquifer is at best speculative. The site slope is towards the pond area and therefore the potential for acidic or alkaline runoff from the facility to the pond area is high. The only available information at this time is that the vertical and lateral extent of arsenic contamination has been somewhat defined by previous soil borings by Stauffer in 1981-82. A more complete characterization of wastes by additional soil borings would further define the nature and extent of all contaminants.

Analytical results from water samples taken from piezometers SG-4 and SG-9 should be requested. Stauffer's contention that these samples are not representative of groundwater quality is justifiable only from the distinction that the sampled zones are unsaturated. Samples obtained from this zone, however, are indicative of leaching material prior to percolation into saturated conditions. Although concentrations found in this zone are expected to be elevated, samples would place a numerical value on leachate concentrations. Based on these analytical results provided by Stauffer, additional sampling of liquids in the unsaturated zone may be required.

REFERENCES

1. Los Angeles County, Popular Street Atlas, Thomas Bros. Maps, 1983 edition.

2. Climatic Atlas of the United States, United States Department of Commerce, June 1968.

3. Rainfall Frequency Atlas of the United States, Technical Paper No. 40, United States Department of Agriculture, May 1961.

4. Hydrology of the Long Beach - Santa Ana Area, California, U.S. Geological Survey Water Supply Paper 1471, Government Printing Office, A59.

5. Freeze, R.A.; Cherry, J.A., Groundwater, Prentice-Hall, Inc., 1979.

6. Coastal Plain, Groundwater Contours Map, Deep Aquifers, Los Angeles County Flood Control District, Fall 1978.

7. Coastal Plain, Groundwater Contours Map, Shallow Aquifer, Los Angeles County Flood Control District, Fall 1978.

8. Planned Utilization of the Groundwater Basins of the Coastal Plain of Los Angeles County, Bulletin No. 104, Appendix A, Department of Water Resources, June 1961.

APPENDIX A
CONTACT REPORT

CONTACT REPORT

AGENCY: Dept. of Health Services, Hazardous Waste Management

ADDRESS: 1219 "K" St., Sacramento, CA

PERSON CONTACTED: Ned Therien

PHONE NO.: (916) 324-1798

FROM: Jeff Rubin JLN

TO: Files

DATE: Oct. 5, 1983 (3:00 PM)

SUBJECT: Stauffer Chemical

cc: M. Bradford

The Stauffer Chemical site is among nine likely hazardous waste disposal sites in LA County (70 total within the State) which are being ranked for possible inclusion on the State Superfund List. This revised list will come out in January. This information has been referred to several agencies: RWQCB (LA), SWQCB, LA County Health Dept. (Director of Health Dept. (LA)), Planning Dept.-South Gate. It also has been referred to the Regional Office (LA HWMB-LA Hazardous Waste Management Branch). Contacts at LA HWMB are John Hinton and Carl Nelson (213) 620-2380.

JR: eb

10/6/83

ecology and environment, inc.
120 HOWARD STREET, SUITE #540, SAN FRANCISCO, CALIFORNIA 94105, TEL. 415-777-2811

International Specialists in the Environmental Sciences

March 21, 1984

Mr. Ed Trainer
Stauffer Chemical Company
4670 Ardine Street
South Gate, CA 90280

Dear Mr. Trainer:

As per our telephone conversation of March 21st, enclosed is a sample letter of introduction identifying Ecology and Environment, Inc.'s (E & E) authorization to perform various site inspections for the Environmental Protection Agency (EPA). E & E is presently a sub-contractor to the EPA working under EPA Contract No. 68-01-6692 (CH_2M Hill - prime contractor). Under our contractual relationship with EPA and CH_2M Hill, E & E is responsible for assisting EPA in identifying and investigating "potential hazardous waste sites".

In accordance with Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA or Superfund) and Section 3007 of the Resource Conversation and Recovery Act of 1976 (RCRA), the U.S. Environmental Protection Agency (EPA) is currently undertaking a nationwide inventory and screening of sites and facilities where hazardous substances have been disposed of or have otherwise come to be located. Your facility has been identified on EPA's inventory of sites as being a "potential hazardous waste site"; however, presently there is insufficient information available to determine the extent of the problem at the site (if any) and to provide a data base sufficient to determine what action to undertake next (i.e., additional investigation, remedial action, or no further action).

The purpose of a site inspection is to gather information to assist us in this determination. The following types of information are generally gathered during a site inspection:

1. Name, ownership, and location of the site;
2. Identification of potential responsible parties;
3. Sketch of the site and photographs;
4. Description of the type and history of the site;
5. Description of storage, treatment, and disposal operations;
6. Characteristics of hazardous substances present;
7. Amount of hazardous substances present;
8. Assessment of geological and hydrological situation;
9. Identification of sensitive receptors; and
10. Data compilation and analysis.

recycled paper

An inspection of your facility has been scheduled for 8:00 a.m., April 4th, 1984. Accompanying me on this inspection will be Karen Greig, P.E. of my office. If you have any additional questions please feel free to contact me or Ron Karpowicz at our San Francisco office at (415) 777-2811 or Bob Mandel (915) 974-8362 or Keith Takata (415) 974-7076 of the Environmental Protection Agency.

Very truly yours,

Suzanne Chaewsky

Suzanne Chaewsky

encl.

SC:jw

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

215 Fremont Street

San Francisco, Ca 94105

LETTER OF INTRODUCTION

This is to certify that Suzanne Chaewsky, of Ecology and Environment, Inc., whose signature, photograph, and physical description appear below, is a duly authorized consultant for the Environmental Protection Agency. It is requested that, upon presentation of this letter, she be allowed to:

a. enter any facility maintained by any person where hazardous wastes are generated, stored, treated, disposed of or transported;

b. collect samples from your facility of any hazardous wastes and samples of any containers;

c. have access to and to copy all records relating to such wastes;

d. determine compliance with any effluent limitation or other limitation, prohibition or effluent standard, pretreatment standard, standard of performance, levels of performance, sanitary landfill criteria, standards applicable to waste generators, transporters, and owners and operators of hazardous waste treatment, storage and disposal facilities, or other standards, any permit, compliance order, or court order issued pursuant to the Resource Conservation Recovery Act;

e. talk to employees concerning waste management practices;

f. determine compliance with Section 311 of the Clean Water Act.

The statutory basis for these inspections is contained in Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980; Section 3007 of the Resource Conservation and Recovery Act; Section 114 of the Clean Air Act; Section 9 of the Federal Insecticide, Fungicide and Rodenticide Act; Section 3 of the Toxic Substances Control Act; and Section 308 of the Clean Water Act.

In addition, it is requested that she be allowed access to the scene of emergency incidents to:

a. monitor cleanup/mitigation operations and assess potential impacts of the incident on public health and the environment;

b. collect and analyze samples, and assess damages to natural resources and the environment.

Federal response to emergency incidents is authorized under Sections 311 and 504 of the Clean Water Act, and Section 7003 of the Resource Conservation and Recovery Act. Response actions are coordinated through the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300).

Requested industry information may not be withheld from EPA on the grounds that it is considered to be confidential or proprietary. EPA can protect information deemed to be privileged or confidential, trade secrets, and commercial or financial information (40 C.F.R. §§2.203, 2.204). Accordingly, please indicate any information which you consider to be privileged or confidential so that the Agency may take appropriate protective measures.

The regulations at 40 C.F.R. §2.211 preclude EPA employees from wrongfully using or disclosing any business information which was obtained during the performance of the employee's official duties. In addition, EPA employees must take all appropriate action to safeguard confidential business information from improper disclosure. EPA employees who violate these requirements are subject to dismissal, suspension or fines. Criminal action may be taken against EPA employees who willfully disclose business information. A contractor with EPA who obtains business information durjng execution of an EPA contract can disclose information only as allowed in the contract. EPA regulations on confidentiality of business information in 40 CFR Part 2 Subpart B require that the Contractor agree to the Clause entitled "Treatment of Confidential Business Information" before any confidential business information may be furnished to the Contractor. Violation of these requirements by a contractor may be grounds for suspending the contract or contractor employee.

Height: 5'9"
Weight: 145 lbs
Color of Eyes: Green
Color of Hair: Brown
Date of Birth: 7/29/57
Signature Suzanne Craevisky
Expiration Date September 30, 1985

Harry Seraydarian
Director
Toxics and Waste Management Division

Stauffer Chemical Company
Westport, Conne[illegible] 06881 / Tel. (203) 222-3000 / Cable "Staufchem"

March 29, 1984

Ms. Susan Chaewsky
Ecology & Environment, Inc.
120 Harold Street
Suite 840
San Francisco, CA 94106

Dear Ms. Chaewsky:

It is the understanding of Stauffer Chemical Company ("Stauffer") that Ecology & Environment, Inc. ("EPA Contractor") has requested the opportunity to visit Stauffer's site located at 4670 Ardine Street, Southgate, California, (the "Plant").

Stauffer shall allow the EPA Contractor's visit upon the following terms and conditions:

1. EPA Contractor is entering the Plant under authority of 42 U.S.C. §9604(e), as amended, and the scope of EPA Contractor's inspection shall be limited to that authorized pursuant to 42 U.S.C. §9604(e). Stauffer hereby objects to and reserves the right to challenge any inspection beyond that authorized by such statutory authority.

2. Stauffer does not warrant the condition of the portions of the Plant to which EPA Contractor will have access during its inspection. EPA Contractor shall conduct the inspection at its own risk and shall be fully and solely responsible for any injury or damage to its property and/or personnel sustained during the course of such inspection.

3. EPA Contractor hereby certifies that it has no association of any nature whatsoever with any person or entity which might create a conflict of interest in its inspection of the Plant, including but not limited to, any conflicts of interest which might: 1) place in jeopardy the confidential and proprietary information and/or trade secrets of Stauffer which EPA Contractor may observe or which may be disclosed by Stauffer during the course of the Plant visit; or 2) affect the objectivity of any of the EPA Contractor's work performed in connection with the contract it has with EPA.

4. Stauffer hereby notifies EPA Contractor that certain information about the Plant (or about Stauffer) which may be observed by EPA Contractor or disclosed to EPA Contractor by Stauffer during the inspection may be confidential and proprietary. All such information shall be held by EPA Contractor in confidence in accordance with all applicable statutes, regulations, and EPA contract(s), including, but not limited to, the provisions of 42 U.S.C. 9604(e)(2)(B) as amended.

5. If any sampling is performed during the Plant visit, EPA Contractor shall, prior to leaving the Plant, give to Stauffer a receipt describing any sample(s) taken by EPA Contractor, as well as a portion of each sample taken, equal in volume or weight to the portion of the sample retained by EPA Contractor. If an analysis of any such sample is made by EPA Contractor and/or EPA, Stauffer shall promptly be furnished a copy of the results of such analysis.

6. Stauffer hereby requests that it be furnished with a copy of any report or other document prepared by EPA Contractor based on or relating to the plant visit or Stauffer within 30 days after its preparation, in order to permit Stauffer to ascertain whether any confidential and proprietary information of Stauffer is contained in such report or other document. All information about the plant or about Stauffer contained in any such report or other document shall be held by EPA Contractor and the EPA in confidence in accordance with all applicable statutes, regulations and EPA contract(s) until such time as Stauffer has been permitted an opportunity to review such report or document and has advised EPA Contractor and the EPA of those portions of the information about Stauffer or the plant contained therein which are nonconfidential. EPA Contractor shall, at the time it submits any such report or other document to the EPA, advise the EPA that all information about the plant or about Stauffer contained therein is confidential and proprietary information of Stauffer and shall be held in confidence in accordance with all applicable laws and regulations until such time as Stauffer has been permitted an opportunity to review such report or document and has advised the EPA of those portions of the information about Stauffer or the plant contained therein which are nonconfidential.

Please sign and return the enclosed copy of this letter.

Accepted and Agreed to:

EPA Contractor:

By: Ronald M. Kaysen

Title: REGIONAL PROJ. MGR.

Very truly yours,

STAUFFER CHEMICAL COMPANY

By: _____

Title: _____

CONTACT REPORT

AGENCY: Department of Health Services, Hazardous Waste Management Branch

ADDRESS: 107 S. Broadway, Los Angeles, CA

PERSON CONTACTED: Dave Chase

PHONE NO.: (213) 620-2381

FROM: Sue Chaewsky

TO: File

DATE: March 29, 1984

SUBJECT: Stauffer Chemical, South Gate, CA

cc: Mark Bradford

Inguired as to whether Stauffer Chemical in South Gate was ranked yet by DOHS for possible inclusion to the State Superfund List. I also inquired about recent or proposed DOHS activities regarding the site.

Dave Chase believed that the site had not been ranked and suggested that I call Arvind Shah, DOHS, in Sacramento ((916) 324-2447) for more information on this issue.

Insofar as L.A. DOHS activities, Dave Chase has an inspection scheduled for March 30, 1984 of the facility. The inspection is to review activities at the site and to investigate Stauffer's request for a demolition permit to demolish a few on-site structures and to remove some machinery off-site. Dave Chase anticipates continued DOHS activities regarding the site but could not elaborate on them at this time.

SC:jw
3/30/84

CONTACT REPORT

AGENCY: Department of Health Services, Hazardous Waste Management Services

ADDRESS: Power Inn Road, Sacramento

PERSON CONTACTED: Arvind Shah

PHONE NO.: (916) 324-2447

FROM: Sue Chaewsky

TO: File

DATE: April 2, 1984

SUBJECT: Stauffer Chemical, Southgate, CA

cc: Mark Bradford

An EPA Record of Communication between Ayn Schmit, EPA and Ned Therian, Abandoned Sites Project, stated that this site was given to Arvind Shah, the State HRS Coordinator, to assess for ranking. According to Mr. Shah, he was not given the Stauffer Chemical site in Southgate to assess. He was given another Stauffer Chemical site to assess but it is not located in Southern California.

SC:jw
4/3/84

CONTACT REPORT

AGENCY: Stauffer Chemical Company

ADDRESS: Westport, Connecticut

PERSON CONTACTED: Bruce McClellan, Senior Hydrogeologist

PHONE NO.: (203) 222-3551

FROM: Sue Chaewsky

TO: File

DATE: April 5, 1984

SUBJECT: Stauffer Chemical Co., SouthGate, CA Site Inspection

cc: Mark Bradford, Ron Karpowicz

Bruce McClellan called to correct the highest arsenic concentration found in soil samples taken from the location of the old arsenic sludge pond at their SouthGate, California facility. At the site inspection he recalled that the highest arsenic concentration found was about 700 ppm (mg/kg) but upon reviewing the sample analytical results after our meeting he discovered that the highest concentration of arsenic found was 1600 ppm (mg/kg).

I requested a copy of the sampling results and he said it would be best if I formally requested these results in a letter directed to him.

In our discussion, he informed me that there were three piezometers installed in the vicinity of the old pond. The one observed during the site inspection is located on Stauffer property. This piezometer is considered to be in a wet zone. The two other piezometers are located on railroad property. One of these piezometers was in a wet zone and the other was in a dry zone. These two off-site piezometers no longer exist because railroad grading activities around the tracks destroyed them. I was informed that these two piezometers were located next to the railroad tracks because the pond had extended beyond the property line towards the railroad tracks. All three piezometers were installed to a depth of 20 to 25 feet.

Almost all of the samples taken were soil samples. The concentration range of arsenic found was from 0 to 1600 ppm. Concentrations decreased horizontally and vertically from the approximate location of the bed bottom at 25 feet. Only a few water samples were taken and concentrations of arsenic in these samples were from 0.8 to 1.6 ppm. These water samples were taken when the on-site piezometer was considered wet.

SC:jw
4/6/84

CONTACT REPORT

AGENCY: Abandoned Sites Project, Department of Health Services

ADDRESS: 714 "P" Street, Sacramento, CA 95814

PERSON CONTACTED: Ned Therien

PHONE NO.: (916) 324-1796

FROM: Sue Chaewsky

TO: File

DATE: April 9, 1984

SUBJECT: Stauffer Chemical Company, South Gate, CA Facility

cc: Mark Bradford

Ned does not know how the ranking of this site for the State Superfund List is progressing. He suggested that I call Arvind Shah in the Superfund Ranking Group for more information.

Ned does have a file on this site and I arranged to review it and make copies of necessary documents when we review the ASP files on the 5 Butte County sites and one Sacramento site.

SC:jw
4/10/84

ecology and environment, inc.
120 HOWARD STREET, SUITE #640, SAN FRANCISCO, CALIFORNIA 94105, TEL. 415-777-2811
International Specialists in the Environmental Sciences

April 9, 1984

Mr. Bruce McClellan
Senior Hydrogeologist
Stauffer Chemical Company
Westport, CT 06881

Dear Mr. McClellan:

This letter will serve to confirm our telephone conversation of April 5 wherein I requested that you send me the following information:

1. Updated maps/drawings/sketches pertaining to the old arsenic sludge pond which delineate:
   - -the lateral and vertical extent of its boundaries,
   - -the locations of all soil borings and piezometers,
   - -the lateral and vertical extent of arsenic contamination in the soil and water;

2. Updated and complete summary of all analytical data from water and soil sampling activities;

3. Any other findings from the soil and water sampling activities which can be used to adequately assess the site such as: hydrogeologic characteristics of the area, forms of arsenic compounds suspected to be present, and water content of the soil samples.

Your cooperation is most appreciated. If you have any questions please do not hesitate to call me at (415) 777-2811.

Sincerely yours,

Suzanne Chaewsky

Suzanne Chaewsky

SC:jw

recycled paper

CONTACT REPORT

AGENCY: Stauffer Chemical Company

ADDRESS: Westport, CT

PERSON CONTACTED: Bruce McClellan

PHONE NO.: (203) 222-3551

FROM: Sue Chaewsky

TO: File

DATE: May 2, 1984

SUBJECT: Stauffer Chemical, South Gate, Ca Facility

cc: Mark Bradford

Mr. McClellan called to inform me that he is working on gathering the information that I had requested in my letter of April 9, 1984. Most of his background hydrogeologic information is based on existing data from the L.A. County Flood Control District and other local agnecies in the L.A. area.

Before he can send me the requested information, it has to first go through an internal review.

SC:sg
5/8/84

EXHIBIT B

STAUFFER CHEMICAL COMPANY

NOTICE

TO EPA CONTRACTOR AND EPA CONTRACTOR'S EMPLOYEES

Plant Location SOUTH GATE

Name of Contractor ECOLOGY AND ENVIRONMENT INC

Name(s) of Contractor Employee(s) Conducting Inspection

SUZANNE CHAEWSKY

Date of Inspection 4-4-84

1. Stauffer Chemical Company ("Stauffer") has admitted you to its plant mentioned above pursuant to the showing of proper credentials and a Notice of Inspection.

2. You are entering the plant under authority of 42 U.S.C. §6927, as amended, and the scope of your inspection shall be limited to that authorized pursuant to 42 U.S.C. §6927. Stauffer hereby objects to and reserves the right to challenge any inspection beyond that authorized by such statutory authority.

3. Stauffer does not warrant the condition of the portions of its plant to which you will have access during your inspection pursuant to the authority set forth above. You shall conduct the inspection at your own risk and you shall be fully and solely responsible for any injury or damage to your property and/or person sustained during the course of this inspection.

4. Stauffer hereby notifies you that certain information about the plant (or about Stauffer) which may be observed by you or disclosed to you by Stauffer during your inspection may be confidential and proprietary. All such information shall be held by you in confidence in accordance with all applicable statutes, regulations, and EPA contract(s), including, but not limited to, the provisions of 42 U.S.C. §6927, as amended.

5. Stauffer further notifies you that under 42 U.S.C. §6927, EPA is precluded from using private contractors who have possible conflicts of interest for inspection purposes. Stauffer hereby objects to your inspection and expressly reserves all of its rights to challenge the inspection and to institute suit against you and/or EPA in connection with this inspection if you have any association of any nature whatsoever with any person or entity which might create a conflict of interest in your inspection of Stauffer's plant, including, but not limited to any conflict of interest which might: (1) place in jeopardy the confidential and proprietary information and/or trade secrets of Stauffer which you may observe or which may be disclosed to you by Stauffer during the course of the plant visit; or (2) affect the objectivity of any of your work performed in connection with your contract with EPA.

6. If any sampling is performed during the plant visit, you shall, prior to leaving the plant, give to Stauffer a receipt describing any sample(s) taken by you, as well as a portion of each sample taken, equal in volume or weight to the portion of the sample retained by you. If an analysis of any such sample is made by you and/or EPA, Stauffer shall promptly be furnished a copy of the results of such analysis.

7. Stauffer hereby requests that it be furnished with a copy of any report or other document prepared by you based on or relating to the plant visit within 30 days after its preparation, in order to permit Stauffer to ascertain whether any confidential and proprietary information of Stauffer is contained in such report or other document. All information about the plant or about Stauffer contained in any such report or other document shall be held by you and EPA in confidence in accordance with all applicable statutes, regulations, and EPA contract(s) until such time as Stauffer has been permitted an opportunity to review such report or document and has advised you of those portions of the information about Stauffer or the plant contained therein which are nonconfidential. You shall, at the time you submit any such report or other document to EPA, advise EPA that all information about the plant or about Stauffer contained therein is confidential and proprietary information of Stauffer and shall be held in confidence in accordance with all applicable laws and regulations until such time as Stauffer has been permitted an opportunity to review such report or document and has advised EPA of those portions of the information about Stauffer or the plant contained therein which are nonconfidential.

STAUFFER CHEMICAL COMPANY

By Ed Bruner

Title PLANT MANAGER

APPENDIX B

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
EPA FORM 2070-13

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number

II. SITE NAME AND LOCATION

01 Site Name (Legal, common, or descriptive name of site)	02 Street, Route No., or Specific Location Identifier				
Stauffer Chemical Company	4670 Ardine Street				
03 City	**04 State**	**05 Zip Code**	**06 County**	**07 County Code**	**08 Cong Dist**
South Gate	CA	90280	Los Angeles		

09 Coordinates Latitude	Longitude	10 Type of Ownership (Check one)
33° 57' 30.0"	118° 11' 00.0"	[X] A. Private [ ] B. Federal _____ [ ] C. State [ ] D. County [ ] E. Municipal [ ] F. Other _____ [ ] G. Unknown

III. INSPECTION INFORMATION

01 Date of Inspection	02 Site Status	03 Years of Operation
04 /04 /84 (Month Day Year)	[X] Active [ ] Inactive	1910 (Beginning Year) | Present (Ending Year) _____ Unknown

04 Agency Performing Inspection (Check all that apply)
[ ] A. EPA [X] B. EPA Contractor Ecology & Environment Inc (Name of firm) [ ] C. Municipal [ ] D. Municipal Contractor _____ (Name of firm)
[ ] E. State [ ] F. State Contractor _____ (Name of firm) [ ] G. Other _____ (Specify)

05 Chief Inspector	06 Title	07 Organization	08 Telephone No.
Suzanne Chaewsky	Environmental Engineer	E&E	(415)777-2811
09 Other Inspectors	**10 Title**	**11 Organization**	**12 Telephone No.**
Karen Greig	Environmental Engineer	E&E	(415)777-2811
			( )
			( )
			( )
			( )

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
Ed Trainer	Plant Manager	Stauffer Chemical South Gate, CA	(213)588-2214
Lee E. Erickson	Environmental Control Manager	Stauffer Chemical Co. 636 California St., S.F., CA	(415)544-9363
Bruce S. McClellan	Senior Hydrogeologist	Stauffer Chemical Co. Westport, CT	(203)222-3551
			( )
			( )
			( )

17 Access Gained By (Check one)	18 Time of Inspection	19 Weather Conditions
[X] Permission [ ] Warrant	0800	Cloudy, warm.

IV. INFORMATION AVAILABLE FROM

01 Contact	02 Of (Agency/Organization)	03 Telephone No.
Ed Trainer	Stauffer Chemical Company	(213)588-2214

04 Person Responsible for Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
Sue Chaewsky		E&E	(415)777-2811	09/ 19/ 84 (Month Day Year)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 Physical States (Check all that apply)

- ☐ A. Solid
- ☐ B. Powder, Fines
- ☒ C. Sludge
- ☐ D. Other _____ (Specify)
- ☐ E. Slurry
- ☐ F. Liquid
- ☐ G. Gas

02 Waste Quantity at Site (Measure of waste quantities must be independent)

Tons 200

Cubic Yards _____

No. of Drums _____

03 Waste Characteristics (Check all that apply)

- ☒ A. Toxic
- ☒ B. Corrosive
- ☐ C. Radioactive
- ☐ D. Persistent
- ☐ E. Soluble
- ☐ F. Infectious
- ☐ G. Flammable
- ☐ H. Ignitable
- ☐ I. Highly Volatile
- ☐ J. Explosive
- ☐ K. Reactive
- ☐ L. Incompatible
- ☐ M. Not Applicable

III. WASTE TYPE

Category	Substance Name	01 Gross Amount	02 Unit of Measure	03 Comments
SLU	Sludge	200	tons	Arsenic trisulfide sludge pond.
OLW	Oily Waste			
SOL	Solvents			
PSD	Pesticides			
OCC	Other Organic Chemicals			
IOC	Inorganic Chemicals			
ACD	Acids			
BAS	Bases			
MES	Heavy Metals			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 Category	02 Substance Name	03 CAS Number	04 Storage/Disposal Method	05 Concentration	06 Measure of Concentration

V. FEEDSTOCKS (See Appendix for CAS Numbers)

Category	01 Feedstock Name	02 CAS Number	Category	01 Feedstock Name	02 CAS Number
FDS	Soda ash		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 State | 02 Site Number

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. Groundwater Contamination
03 Population Potentially Affected: 70,600
02 ☐ Observed (Date: 1982) ☒ Potential ☐ Alleged
04 Narrative Description

None documented. Population affected: City of South Gate.

01 ☐ B. Surface Water Contamination
03 Population Potentially Affected: _____
02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented

01 ☐ C. Contamination of Air
03 Population Potentially Affected: _____
02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

No potential - pond area paved.

01 ☐ D. Fire/Explosive Conditions
03 Population Potentially Affected: _____
02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None

01 ☐ E. Direct Contact
03 Population Potentially Affected: _____
02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

01 ☐ F. Contamination of Soil
03 Area Potentially Affected: 0.35
02 ☐ Observed (Date: 1982) ☐ Potential ☒ Alleged
04 Narrative Description

Contamination by arsenic trisulfide waste product from phosphoric acid plant. Soil arsenic concentrations up to 1660 mg/kg.

01 ☐ G. Drinking Water Contamination
03 Population Potentially Affected: unknown
02 ☐ Observed (Date: _____) ☒ Potential ☐ Alleged
04 Narrative Description

None documented to date. Shallow aquifer unusable however deeper aquifers may be water source.

01 ☐ H. Worker Exposure/Injury
03 Workers Potentially Affected: _____
02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

01 ☐ I. Population Exposure/Injury
03 Population Potentially Affected: _____
02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 State | 02 Site Number

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. Damage to Flora — 02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

01 ☐ K. Damage to Fauna — 02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

01 ☐ L. Contamination of Food Chain — 02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

01 ☒ M. Unstable Containment of Wastes (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ Observed (Date: 1982) ☒ Potential ☐ Alleged
03 Population Potentially Affected: _____ 04 Narrative Description

Arsenic trisulfide sludge is being stored in unlined pit approximately 15-25 feet deep and 0.35 acres in area.

01 ☐ N. Damage to Offsite Property — 02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

01 ☐ O. Contamination of Sewers, Storm/Drains, WWTPs — 02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

01 ☐ P. Illegal/Unauthorized Dumping — 02 ☐ Observed (Date: _____) ☐ Potential ☐ Alleged
04 Narrative Description

None documented.

05 Description of Any Other Known, Potential, or Alleged Hazards

III. TOTAL POPULATION POTENTIALLY AFFECTED:

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number

II. PERMIT INFORMATION

01 Type of Permit Issued (Check all that apply)	02 Permit Number	03 Date Issued	04 Expiration Date	05 Comments
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. Local (Specify)				
☐ I. Other (Specify)				
☐ J. None				

III. SITE DESCRIPTION

01 Storage/Disposal (Check all that apply)	02 Amount	03 Unit of Measure
☒ A. Surface Impoundment	100-200	tons
☐ B. Piles		
☐ C. Drums, Above Ground		
☐ D. Tank, Above Ground		
☐ E. Tank, Below Ground		
☐ F. Landfill		
☐ G. Landfarm		
☐ H. Open Dump		
☐ I. Other (Specify)		

04 Treatment (Check all that apply)

- ☐ A. Incineration
- ☐ B. Underground Injection
- ☐ C. Chemical/Physical
- ☐ D. Biological N/A
- ☐ E. Waste Oil Processing
- ☐ F. Solvent Recovery
- ☐ G. Other Recycling/ Recovery
- ☐ H. Other (Specify)

05 Other

- ☒ A. Buildings On Site — about 15

06 Area of Site

<7 Acres

07 Comments

IV. CONTAINMENT

01 Containment of Wastes (Check one)

☐ A. Adequate, Secure ☐ B. Moderate ☒ C. Inadequate, Poor ☐ D. Insecure, Unsound, Dangerous

02 Description of Drums, Diking, Liners, Barriers, etc.

Arsenic sludge is still stored in old pond area. Site is paved over. Slope at plant is towards the pond area. Pond is unlined and contains approximately 100-200 tons of arsenic triculfide waste.

V. ACCESSIBILITY

01 Waste Easily Accessible: ☐ Yes ☒ No

02 Comments

Area where waste is stored in paved over by asphalt.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 State | 02 Site Number

II. DRINKING WATER SUPPLY

01 Type of Drinking Supply (Check as applicable)

	SURFACE	WELL
Community	A. ☐	B. ☒
Non-Community	C. ☐	D. ☒

02 Status

	ENDANGERED	AFFECTED	MONITORED
Community	A. ☐	B. ☐	C. ☒
Non-Community	D. ☐	E. ☐	F. ☒

03 Distance to Site
A. 0.5 (mi)
B. 0.2 (mi)

III. GROUNDWATER

01 Groundwater Use in Vicinity (Check one)

☐ A. Only Source for Drinking
☒ B. Drinking (Other sources available) Commercial, Industrial, Irrigation (No other water sources available)
☒ C. Commercial, Industrial, Irrigation (Limited other sources available)
☐ D. Not Used, Unuseable

02 Population Served by Ground Water _____
03 Distance to Nearest Drinking Water Well _____ (mi)

04 Depth to Groundwater	05 Direction of Groundwater Flow	06 Depth to Aquifer of Concern	07 Potential Yield of Aquifer	08 Sole Source Aquifer
115' Shallow 161' Deep (ft)	NNW Shallow WNW Deep	500 (ft)	1500 GPD/FT^2 (gpd)	☐ Yes ☒ No

09 Description of Wells (Including useage, depth, and location relative to population and buildings)

Drinking water wells are located any where from 0.2 to 0.5 miles upgradient and downgradient of the site respectively. The wells are all deep 600-1400' and are perforated at least 500' below and surface in confined aquifers known as the Lynwood and Silverado. An industrial supply well is located less than 0.1 miles from site, upgradient. It is 600 feet deep and perforated from 417' to 568'.

10 Recharge Area
☐ Yes
☒ No
Comments: Rain Water may infiltrate slowly to shallow water bearing zones but will not percolate to drinking aquifers.

11 Discharge Area
☐ Yes
☒ No
Comments:

IV. SURFACE WATER

01 Surface Water (Check one)

☐ A. Reservior, Recreation Drinking Water Source
☐ B. Irrigation, Economically Important Resources
☐ C. Commercial, Industrial
☒ D. Not Currently Used

02 Affected/Potentially Affected Bodies of Water

Name:	Affected	Distance to Site
Los Angeles River/East of site	☐	3/4 (mi)
Rio Hondo/East of site	☐	1.5 (mi)
Confluence of LA River and Rio Hondo/SSE of site	☐	1.7 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 Total Population Within

One (1) Mile of Site	Two (2) Miles of Site	Three (3) Miles of Site
A. >10,000	B. >50,000	C. >70,000
No. of Persons	No. of Persons	No. of Persons

02 Distance to Nearest Population
1/8 (mi)

03 Number of Buildings Within Two (2) Miles of Site
urban area - high building density

04 Distance to Nearest Off-Site Building
20 feet ( )

05 Population Within Vicinity of Site (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The site is in an industrial area of South Gate. South Gate Junior High School is located 3/4 mile southwest of the site. The vicinity of the site is urban with a high population and building density near the site.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 State | 02 Site Number

VI. ENVIRONMENTAL INFORMATION

01 Permeability of Unsaturated Zone (Check one)

☐ A. 10^{-6} - 10^{-8} cm/sec ☒ B. 10^{-4} - 10^{-6} cm/sec ☐ C. 10^{-4} - 10^{-3} cm/sec ☐ D. Greater Than 10^{-3} cm/sec

02 Permeability of Bedrock (Check one)

☒ A. Impermeable (Less than 10^{-6} cm/sec) ☐ B. Relatively Impermeable (10^{-4} - 10^{-6} cm/sec) ☐ C. Relatively Permeable (10^{-2} - 10^{-4} cm/sec) ☐ D. Very Permeable (Greater Than 10^{-2} cm/sec)

03 Depth to Bedrock	04 Depth of Contaminated Soil Zone	05 Soil pH
1000+ (ft)	2.5 (ft)	Unknown

06 Net Precipitation	07 One Year 24 Hour Rainfall	08 Slope: Site Slope	Direction of Site Slope	Terrain Average Slope
-44.0 (in)	2.0 (in)	1-2 %	SSE	0-2 %

09 Flood Potential
Site is in _____ Year Floodplan

10
☐ Site is on Barrier Island, Coastal High Hazard Area, Riverine Floodway

11 Distance to Wetlands (5 acre minimum)
ESTUARINE: A. _____ (mi)
OTHER: B. _____ (mi)

12 Distance to Critical Habitat (of endangered species)
Unknown (mi)
Endangered Species: _____

13 Land Use in Vicinity
Distance to:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. 50 feet (mi)	B. 1/4 (mi)	C. >5 (mi)	D. >5 (mi)

14 Description of Site in Relation to Surrounding Topography

The Stauffer Chemical, South Gate site is located in the Los Angeles Coastal Basin. The site is in a densely populated metropolitan area. There are no unusual topographic features in the vicinity of the site.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number

II. SAMPLES TAKEN

Sample Type	01 Number of Samples Taken	02 Samples Sent To	03 Estimated Date Results Available
Groundwater			
Surface Water		No samples taken at time of T&E inspection. Stauffer Chemical sampled soils and groundwater at location of sludge pond in 1981 and 1982. Arsenic levels in soils up to 1600 mg/kg.	
Waste			
Air			
Runoff			
Spill			
Soil			
Vegetation			
Other			

III. FIELD MEASUREMENTS TAKEN

01 Type	02 Comments

IV. PHOTOGRAPHS AND MAPS

01 Type ☒ Ground ☒ Aerial

02 In Custody of Ecology & Environment, Inc.
(Name of organization or individual)

03 Maps ☒ Yes ☐ No

04 Location of Maps
Ecology & Environment, Inc.

V. OTHER FIELD DATA COLLECTED (provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number

II. CURRENT OWNER(S)

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code
Stauffer Chemical Co.		4670 Ardine Street		South Gate	CA	90280

PARENT COMPANY (If applicable)

08 Name	09 D+B Number	10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	12 City	13 State	14 Zip Code
Stauffer Chemical				Westport	CT	06881

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code

08 Name	09 D+B Number	10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	12 City	13 State	14 Zip Code

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code

08 Name	09 D+B Number	10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	12 City	13 State	14 Zip Code

III. PREVIOUS OWNER(S) (List most recent first)

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code
A.R. Maas		4670 Ardine Street		South Gate	CA	90280
Victor Chemical		4670 Ardine Street		South Gate	CA	90280

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 Name	02 D+B Number	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	05 City	06 State	07 Zip Code

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 State	02 Site Number

II. PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. Barrier Walls Constructed — 02 Date _____ — 03 Agency _____
04 Description

01 ☒ S. Capping/Covering — 02 Date 1961 — 03 Agency MAAS Chemical
04 Description Sludge pond filled in and paved over.

01 ☐ T. Bulk Tankage Repaired — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ U. Grout Curtain Constructed — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ V. Bottom Sealed — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ W. Gas Control — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ X. Fire Control — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ Y. Leachate Treatment — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ Z. Area Evacuated — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ 1. Access to Site Restricted — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ 2. Population Relocated — 02 Date _____ — 03 Agency _____
04 Description

01 ☐ 3. Other Remedial Activities — 02 Date _____ — 03 Agency _____
04 Description

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number

II. ENFORCEMENT INFORMATION

01 Past Regulatory/Enforcement Action ☐ Yes ☐ No

02 Description of Federal, State, Local Regulatory/Enforcement Action

To date, the site is being dealt with by the California Department of Health Services in Los Angeles. File information indicated that this site was to be ranked on the state's Superfund List early in 1984 but apparently there is insufficient information to rank the site.

Efforts to contact the Department of Health Services in Los Angeles regarding this site have not provided additional information.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

APPENDIX C
PHOTOGRAPHIC DOCUMENTATION

1. Stauffer Chemical Company,
South Gate, California

Facing southeast: Phosphoric acid tanks being dismantled inside diked area atop of paved sludge pond.

PHOTO 1
P_4 TANKS BEING DISMANTLED
INSIDE DIKED AREA

2. Stauffer Chemical Company,
South Gate, California

Facing south east: Paved pond area as seen from acid plant deck.

PHOTO 2 POND AREA FROM
ACID PLANT DECK

3. Stauffer Chemical Company,
South Gate, California

Facing southeast: View of paved sludge pond from phosphoric acid plant deck.

PHOTO 3 PAVED AREA AT PHOSPHORIC ACID PLANT POND AREA

4. Stauffer Chemical Company,
South Gate, California

Facing northeast: View of paved sludge pond from phosphoric acid plant.

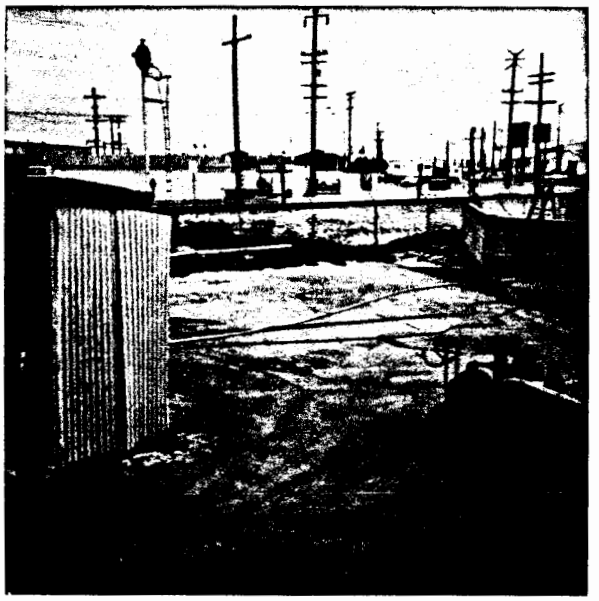


PHOTO 4 UNION PACIFIC SIDE OF PHOSPHORIC ACID PLANT

5. Stauffer Chemical Company,
South Gate, California

Facing northeast from sludge pond area: View of old phosphoric acid plants. Plants were shut down in 1981 and were being dismantled at time of visit.

PHOTO 5 #1 & #2 PHOSPHORIC ACID PLANTS SHUTDOWN 1981

6. Stauffer Chemical Company,
South Gate, California

Facing west at south border of site: View of rainwater runoff from railcar unloading area. White substance is soda ash.

PHOTO 6 RAIN WATER RUN OFF - SOUTHERN PACIFIC SIDE OF PLANT

APPENDIX D
SUPPORTING DOCUMENTS

Staffmember's Report - Abandoned Site Action

Site Name: Stauffer Chemical Company
aka Maas Chemical Company
aka Victor Chemical

Address: 4570 Ardine St.
Southgate, CA 90280

Company Contacts: Ed Trainer, Plant Manager
Carey Hoffman, Engineer
(213) 588-2214

Staffmember Responsible: Sue Stack

Problem: Abandoned unlined arsenic and filtercake settling pond on site has been filled with dirt and paved over for about 20 years.

History: This chemical plant has been in existence since at least 1940. It was originally owned by a company called Maas Chemical. Sometime around 1950, Maas was merged with Victor Chemical, then in 1960, Victor merged with (was taken over by) Stauffer.

During the years (approximation) 1940 - 1960 an unlined settling pond was used as a disposal site for impurities and filtercake containing mostly arsenic (arsenic trisulphide, $As_2 S_3$). This pond was the only on-site disposal at the plant.

Stauffer took over in 1960, and Stauffer representatives report the pond was filled with dirt (from off-site, apparently, and paved with asphalt). Shortly thereafter, aerial photography dated Dec 1962 shows the pond still present.

Record search for information on this site has been mostly fruitless. The only information obtained was the industrial waste permit issued to Maas in 1950, from LA County Engineer's Office. No inspection report obtainable. Permit was number 76 issued 7-26-50.

ASP Action to Date: We have visited the plant and seen the location of the pond. Its current condition is paved, fenced, with some evidence of surface runoff and "distress".

Other Agencies Now Involved: This site is on the Eckhardt list. As far as staff knows, no regulatory agency action is on-going at this time.

Action Proposed: The settling pond was at least fifteen feet deep, so sampling would require a drilling rig. During the ASP visit,

the plant manager intimated that this Stauffer plant may close within one or two years. Senior staff may wish to characterize the abandoned wastes as soon as possible, before Stauffer sells the property. If, as is expected, hazardous materials are found on site, plant closure could be accelerated.

Stauffer should be advised of the need to drill and sample the soil. If contamination is detected, the parcel should be considered for designation as a hazardous waste property or satisfactorily cleaned up by the owner.

Other comments: ASP staff should assist the chemical evaluations unit in arranging for core sampling according to attached sampling plan. Chemical evaluations unit should advise what impurities besides As_2S_3 are often present in phosphoric acid impurities.

Arsenic Trisulphide, according to Merck, is not very soluable in water, so this probably poses little threat to groundwater quality. However, the substance is toxic and is likely to react with acids and alkalines (both present onsite in the plant's current processes), and may even emit toxic fumes upon contact with water.

Staffmember's Report on Site Visit

Site Name: Stauffer Chemical Company
aka Maas Chemical Company
aka Victor Chemical

City: Southgate, California

County: Los Angeles

Company Contacts: Ed Trainer, Plant Manager
Carey Hoffman, Engineer
(213) 588-2214

Staff People Responsible: Sue Stack
Prem Saint

Problem: This chemical plant has been in existence since at least 1940. It was originally owned by a company called Maas Chemical. Sometime around 1950, the company was merged with Victor Chemical, then in 1960, Victor merged with (was taken over by) Stauffer.

During the years (approximation) 1940 - 1960 an unlined settling pond was used as a disposal site for impurities and filter cake containing mostly arsenic (arsenic trisulphide, $As_2 S_3$). This pond was the only on-site disposal at the plant.

Sometime around 1960, when Stauffer took over, the pond was filled with dirt (from off-site, apparently, and paved with asphalt). The residues inside were not removed.

History: Record search for information on this site has been mostly fruitless. The only information obtained was the industrial waste permit issued to Maas in 1950, from LA County Engineer's Office. No inspection reports obtainable.

ASP Action to Date: We have visited the plant and seen the location of the pond. Its current condition is paved, fenced, with some evidence of surface runoff and "distress". No other regulatory agency activity.

Other Comments: This site was investigated as an "Eckhardt's List" followup.

Arsenic Trisulphide, according to Merck is not very soluable in water, so this probably poses little threat to groundwater quality. However, the substance is toxic and is likely to react with acids and alkalines (both present onsite in the plant's current processes), and may even emit toxic fumes upon contact with water.

Stauffer

ED TRAINER

PLANT MANAGER
INDUSTRIAL CHEMICAL DIVISION
STAUFFER CHEMICAL COMPANY

4570 ARDINE STREET
SOUTH GATE, CA 90280
(213) 588-2214

c.c. to Prem Saint

ABANDONED SITE PROJECT

FIRM: STAUFFER CHEMICAL COMPANY
4570 Ardine St.
South Gate

STATUS: active

FORMER OCCUPANT: A.R. Maas Chemical Company

FINDINGS: 1) This site is an Eckhardt Site.

2) Maas operated Site from about 1940 to 1960. The Site was an phosphoric acid plant with wastes consisting of sulfite, tri-sodium phosphate, sodium pyrophosphate and arsenic trisulphide.

These wastes were discharged into channel along side of property and carried to an unlined settling pond on the southeast corner of the property. (see map).

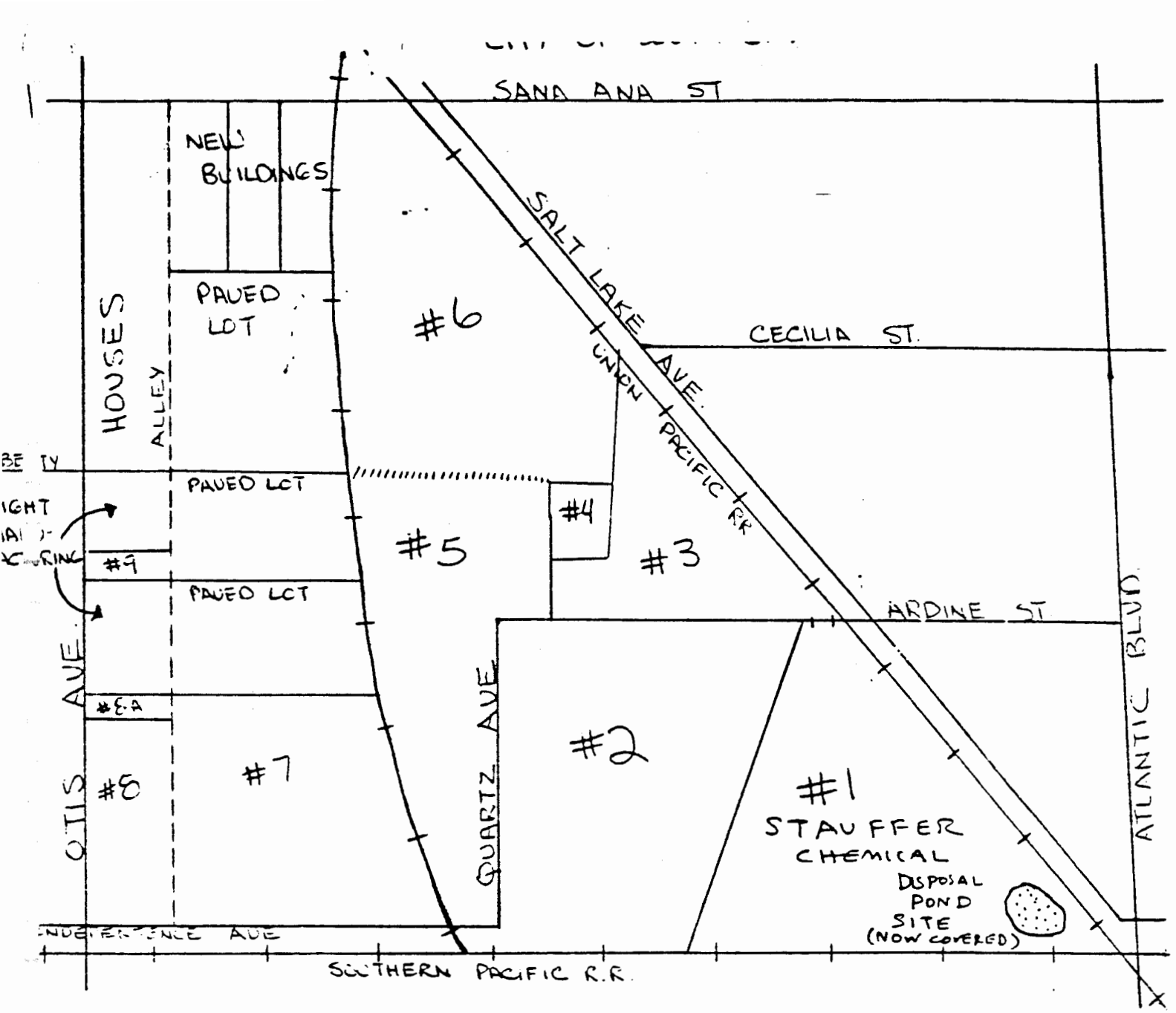
The settling pond was at least fifteen feet deep. The unlined arsenic and filtercake settling pond is now paved over and filled with dirt since about 1960.

3) An EPA Identification and Preliminary Assessment Report indicates that 200 tons of arsenic were deposited into the unlined pond from 1950-1960.

4) Stauffer Chemical had four violations for excessive limits on sulfite, thiosulphate, acidic, nickel, arsenic, during 1978 and 1979 in plant waste water.

CURRENT ACTION: A Site visitation was made by ASP Staff and Sacramento SDOHS representative.

RECOMMENDATION: SDOHS recommendation on action is:
Sample site with a drilling rig. During ASP visit, the plant manager intimated that this Stauffer Plant may close within one or two years. Therefore, sampling should take place soon before stauffer sells the property. If, as is expected, hazardous materials are found on site, plant closure could be accelerated. Parcel should be considered for desognation as a hazardous waster property.


SANA ANA ST
NEW BUILDINGS
PAVED LOT
#6
SALT LAKE AVE.
UNION PACIFIC RR
CECILIA ST.
HOUSES
ALLEY
PAVED LOT
#4
#5
#3
#9
PAVED LOT
ARDINE ST
AVE
#8
#7
QUARTZ AVE
#2
#1
STAUFFER CHEMICAL
DISPOSAL POND SITE (NOW COVERED)
ATLANTIC BLVD
SOUTHERN PACIFIC R.R.

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY

EDMUND G. BROWN JR., Governor

DEPARTMENT OF HEALTH SERVICES
1'744 P STREET
SACRAMENTO, CA 95814
(916) 323-6042

July 30, 1981

Mr. Ed Trainer
Stauffer Chemical
4570 Ardine Street
Southgate, CA 90280

Dear Mr. Trainer:

This letter is to indicate the status of the Abandoned Site Project investigation of Stauffer's Southgate plant.

Since wastes disposed at the plant are believed to be buried at least 15 feet below the asphalted surface of the soil, our investigation has not developed any conclusive information. The information your company has provided about the composition, the quantity, and the location of the disposed waste leads us to believe it does not pose a significant threat to environmental or public health at this time. However, without physical evidence to substantiate the information already provided, the possibility remains that additional wastes, of which we are not aware, were also present in the disposal pond. Specifically, it is possible a previous occupant of the plant used the disposal pond for acid or alkaline waste water, which could dramatically affect the solubility of the arsenic trisulphide waste and thus create the potential for groundwater contamination.

Although these wastes may have been legally disposed prior to the passage of the State Hazardous Waste Control Law, the Department still has an interest in determining their potential for causing environmental and public health problems. Therefore we urge that you consider the feasibility of conducting an indepth study, which would include drilling, soil sampling, and laboratory analysis. Such a study would provide an opportunity for the State to split any samples taken and analyze those samples in the Hazardous Materials Laboratory. The information developed from such a study would probably enable the Hazardous Materials Management staff to make a recommendation as to whether the buried wastes could be safely left underground or should be excavated or encapsulated to insure safety if land use at the plant should change in the future.

Your property may fall under the provisions of Assembly Bill 2370 (Statutes of 1980), which added Article 11 to Chapter 6.5, Division 20 of the Health and Safety Code. Section 25232 allows the Department of Health Services to designate land which has received a significant disposal of hazardous waste as a hazardous waste property, and thus restrict land use on that property. Voluntary cleanup of the property to the Department's satisfaction would satisfy the

requirements of Article 11, since no designation would then be necessary. Please contact Mr. Lloyd Batham, III, Property Evaluation Unit, at the address on this letterhead for more information.

I would like to discuss with you by phone or in person your thoughts regarding this situation. You can reach me by mail or by phoning (916) 323-6042.

Sincerely,

Sue Stack

Sue Stack
Abandoned Site Project
Hazardous Materials Management Section

Enclosure

Reference:
EPA, 2015

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

SITE DECISION AND RATIONALE: Titan Terminal & Transport
EPA ID #: CAD008353211

Titan Terminal & Transport ("the Site") is located at 4570 and 4610 Ardine Street in South Gate, California. The site is situated on three distinct Los Angeles County parcels and occupies approximately 6.4 acres in an industrial and commercial area.

Historical operations at the Site include manufacture of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993. No manufacturing operations or generation of hazardous waste are currently conducted at the site.

Wastes generated from chemical manufacturing activities at the Site were generally stored on-site and subsequently removed by an outside waste hauler. The phosphoric acid plant, which operated from approximately 1924 through 1981, generated an arsenic-containing sludge waste. From approximately 1924 to 1960, an estimated 200 tons of arsenic-containing sludge material was disposed of into an unlined surface impoundment located at the southeastern portion of the Site. The surface impoundment was reportedly resurfaced with asphalt in approximately 1960.

Since 1994, Titan Terminal & Transport has been operating at the Site as a hazardous and non-hazardous materials distribution and bulk storage facility. Bulk materials are typically stored on-site for no more than 30 days. Dilution and/or blending of bulk liquids within on-site aboveground storage tanks (ASTs) is also conducted at the Site. Stored materials are occasionally repackaged and loaded into drums for transfer to various facilities.

In the early 1980s, under the direction and oversight of the California Department of Toxic Substances Control (DTSC), subsurface investigations were conducted in the vicinity of the on-site surface impoundment. During these investigations soil matrix, groundwater, and/or surface impoundment materials were found to contain elevated concentrations of metals including, but not limited to: arsenic, cadmium, and chromium. A solid surface impoundment sample was identified with an arsenic concentration of 1,659 mg/kg (milligrams per kilogram). The residential Regional Screening Level (RSL) for arsenic is 0.67 mg/kg. Specific groundwater data were not properly reported.

Groundwater beneath the Site has been identified as containing elevated concentrations of volatile organic compounds (VOCs) including, but not limited to: trichloroethylene (TCE); 1,1-dichloroethylene (DCE); cis-1,2-DCE; and trans-1,2-DCE. No documentation was found regarding the historical use or storage of VOCs at the Site.

In conclusion, this report finds that there is evidence to indicate that a release of hazardous substances, primarily metals, to groundwater may have occurred from one or more sources on the Site based on the historic use and storage of hazardous substances at the Site. Analytical data taken at the Site and the immediate area also substantiates this concern. Some of substances found on site have also been found in adjacent public drinking water wells. The shallow groundwater flow direction at the site has not been adequately determined. The regional groundwater flow direction within the deeper aquifers in the vicinity of the site generally trends towards the southwest with temporal fluctuations from west to south-southwest. The nearest impacted drinking water well, which was closed in 2002 due to VOC and metals contamination, was located approximately 0.26 mile southeast of the site. There are another 167 drinking water wells within 4 miles of the Site that include one non-impacted well, which is 0.2 mile to the north-northwest, and another impacted well that is 0.47 mile to the east-northeast, which was closed in 2000 due to metals contamination. Many of the remaining drinking water wells in the 4 mile radius are hydrologically downgradient from the Site and could potentially be impacted by aquifer contamination from the Site. For these reasons, the Site warrants further Federal attention so that soil and groundwater data can be collected in order to determine if the Site is a contributing source of regional groundwater contamination.

Site Assessment Manager: _____ Date: 4/30/15

Matthew A. Mitguard

Reference:
EPA, 2017a

EPA ID / SITE ID	SITE NAME / STREET 1 / STREET 2 / CITY, STATE / COUNTY NAME (FIPS CODE)	ZIP / CONG DIST.	LATITUDE / LONGITUDE / SOURCE	OU	ACTION CODE	NAME	SEQ	START (ACTUAL)	FINISH (ACTUAL)	QUAL	CURRENT ACTION LEAD
				00	PA	PA	1	07/01/2014	08/26/2015	H	St Perf
CAD008339467 0904837	JERVIS B. WEBB CO. 9301 RAYO AVE AND 5030 FIRESTONE BLVD SOUTH GATE, CA LOS ANGELES (06037)	90280 29,44	+33.950278 -118.176946 EPA HQ	NPL STATUS: F FEDERAL FACILITY: N							
				00	DS	DISCVRY	1	05/14/1993	05/14/1993		EPA Perf
				00	SI	SI	1	07/07/1994	09/30/1994	L	EPA Perf
				00	PA	PA	1	09/30/1994	09/30/1994	H	EPA Perf
				00	OO	SITE REASS	1	09/26/2001	05/15/2002	L	St Perf
				00	OO	SITE REASS	2	05/23/2006	05/23/2006	H	EPA Perf
				00	VA	OTHR CLEANUP	1	05/23/2006	01/18/2011	H	St Perf
				00	HR	HAZRANK	1	01/18/2011	09/16/2011		EPA Perf
				00	NP	PROPOSED	1	09/16/2011	09/16/2011		EPA Perf
				00	NF	NPL FINL	1	05/10/2012	05/10/2012		EPA Perf
CAD008339863 0904523	ACROMILL 18421 RAILROAD ST. CITY OF INDUSTRY, CA LOS ANGELES (06037)	91748 33		NPL STATUS: A FEDERAL FACILITY: N ASSOCIATED SITE: CAD980817985SAN GABRIEL VALLEY (AREA 4)							
				00	DS	DISCVRY	1	07/23/1992	07/23/1992		EPA Perf
CAD008353211 0901075	STAUFFER CHEMICAL (FORMER) 4570 ARDINE ST SOUTH GATE, CA LOS ANGELES (06037)	90280 29		NPL STATUS: N FEDERAL FACILITY: N NON-NPL STATUS: SI Ongoing							
				00	SI	SI	1	03/01/1984	09/01/1986	L	EPA Perf
				00	PA	PA	1	03/01/1984	03/01/1984	L	EPA Perf
				00	DS	DISCVRY	1	03/01/1984	03/01/1984		EPA Perf
				00	OO	SITE REASS	3	07/01/2013	10/01/2014	H	St Perf
				00	PA	PA	2	10/01/2014	04/30/2015	H	EPA Perf

EPA ID / SITE ID	SITE NAME / STREET 1 / STREET 2 / CITY, STATE / COUNTY NAME (FIPS CODE)	ZIP / CONG DIST.	LATITUDE / LONGITUDE / SOURCE	OU	ACTION CODE	NAME	SEQ	START (ACTUAL)	FINISH (ACTUAL)	QUAL	CURRENT ACTION LEAD
				00	SI	SI	2	04/30/2015			EPA Perf
CAD008362758 0901081	NEVILLE CHEM CO 12800 E IMPERIAL HWY SANTA FE SPRINGS, CA LOS ANGELES (06037)	90670 33		NPL STATUS: N FEDERAL FACILITY: N NON-NPL STATUS: Other Cleanup Activity: State-Lead Cleanup							
				00	DS	DISCVRY	1	08/01/1980	08/01/1980		EPA Perf
				00	PA	PA	1		03/01/1985	H	EPA Perf
				00	HR	HAZRANK	1		08/01/1985		St Perf
				00	SI	SI	1		08/01/1985	H	St Perf
				00	SI	SI	2		08/28/1990	L	EPA Perf
				00	VA	OTHR CLEANUP	1	10/01/2000		L	St Perf
				00	OO	SITE REASS	1		06/22/2001	H	St Perf
CAD008375776 0904375	FIRESTONE TIRE & RUBBER COMPANY 2525 E. FIRESTONE BLVD. SOUTH GATE, CA LOS ANGELES (06037)	90280 29		NPL STATUS: N FEDERAL FACILITY: N NON-NPL STATUS: Other Cleanup Activity: State-Lead Cleanup							
				00	DS	DISCVRY	1	03/17/1992	03/17/1992		EPA Perf
				00	SI	SI	1	10/14/1992	08/23/1994	L	EPA Perf
				00	EA	INT ASSESS	1	10/14/1992	08/23/1994	L	EPA Perf
				00	PA	PA	1		12/21/1992	H	EPA Perf
				00	OO	SITE REASS	1		06/27/2001	H	St Perf
				00	OO	SITE REASS	2		05/23/2006	H	EPA Perf
				00	VA	OTHR CLEANUP	1	05/23/2006		H	St Perf
CAD008379729 0905377	STANDARD NICKEL-CHROMIUM-PLATING COMPANY 826 EAST 62ND STREET LOS ANGELES, CA LOS ANGELES (06037)	90001		NPL STATUS: N FEDERAL FACILITY: N NON-NPL STATUS: Other Cleanup Activity: State-Lead Cleanup							
				00	DS	DISCVRY	1	09/25/1997	09/25/1997		St Perf

Reference:
EPA, 2017b

https://oaspub.epa.gov/enviro/rcrainfoquery_3.facility_information?pgm_sys_id=CAD008353211

EPA United States Environmental Protection Agency

Envirofacts

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Report an Error

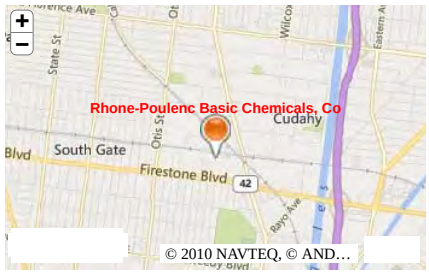
RHONE POULENC BASIC CHEMICALS CO
Handler ID: CAD008353211
4570 ARDINE ST
SOUTH GATE, CA 90280

County Name: LOS ANGELES

Latitude: 33.95735
Longitude: -118.18782

Hazardous Waste Generator: Small Quantity Generator

Owner Name:



You can navigate within the map with your mouse.

No BIENNIAL REPORT data is available for the facility listed above.

LIST OF FACILITY CONTACTS

NAME	STREET	CITY	STATE	ZIP CODE	PHONE	TYPE OF CONTACT
						Public
ENVIRONMENTAL MANAGER	4570 ARDINE ST	SOUTH GATE	CA	90280	213-588-2214	Permit
WILLIAM E TRAINER					213-588-2214	Permit

HANDLER / FACILITY CLASSIFICATION

Unspecified Universe for the facility listed above.

HANDLER TYPE
Small Quantity Generator

No PROCESS INFORMATION is available for the facility listed above.

LIST OF NAICS CODES AND DESCRIPTIONS

NAICS CODE	NAICS DESCRIPTION
325188	ALL OTHER BASIC INORGANIC CHEMICAL MANUFACTURING

No Waste Codes are available for the facility listed above.

Go To Top Of The Page

Total Number of Facilities Retrieved: 1

Last updated on 4/12/2017

Reference:
EPA, 2017c

EPA United States Environmental Protection Agency

Envirofacts

Search Results

TRI

Envirofacts Report

<< Return

Query executed on APR-12-2017
Results are based on data extracted on MAR-08-2017

Click on "View Facility Information" to view EPA Facility information for the facility.

Facility Name:	RHONE-POULENC BASIC CHEMICALS, CO	Mailing Name:	RHONE-POULENC BASIC CHEMICALS, CO		
Address:	4570 ARDINE ST SOUTH GATE CA 90280	Mailing Address:	4570 ARDINE STSOUTH GATE CA 90280		
County:	LOS ANGELES	Region:	9		
Facility Information:	View Facility Information	TRI ID:	90280STFFR4570A	DUNS Number:	008353211
		FRS ID	110002140665		
Latitude:	33.95735	Longitude:	-118.18782		
Public Contact:	G. L. HUNSUCKER	Phone:	3106378080		
Assigned Public Contact:	G. L. HUNSUCKER				
Parent Company:	RHONE-POULENC INC	Standardized Parent Company:		Parent DUNS:	001350263
BIA Tribal Code:		Tribe:			

Starting with Reporting Year 2006, TRI Facilities began reporting NAICS codes, instead of SIC codes, to identify their Primary Business Activities.

NAICS Codes for 1993

NAICS CODE	PRIMARY	NAICS DESCRIPTION
325188	YES	All Other Basic Inorganic Chemical Manufacturing

The above information comes from 1993, which was the last year NAICS code data was reported for this facility. The earliest NAICS code data on file for this facility was reported in 1987.

Industry Code for 1993

INDUSTRY CODE	INDUSTRY DESCRIPTION
325	Chemicals

SIC Codes for 1993

SIC CODE	PRIMARY	SIC DESCRIPTION
2819	YES	INDUSTRIAL INORGANIC CHEMICALS, NEC

The above information comes from 1993, which was the last year SIC code data was reported for this facility. The earliest SIC code data on file for this facility was reported in 1987.

Map this facility

Map this facility using one of Envirofact's mapping utilities.

Besides TRI, this facility also does the following:

- handles hazardous waste

More information about these additional regulatory aspects of this facility can be found by pressing the other regulatory data button below.

Other Regulatory Data

Total Aggregate Releases of TRI Chemicals to the Environment:

For all releases estimated as a range, the mid-point of the range was used in these calculations. This table summarizes the releases reported by the facility. ***NR*** *- signifies nothing reported by this facility for the corresponding medium.*

Total Aggregate Releases of TRI Chemicals excluding Dioxin and Dioxin-like Compounds
(Measured in Pounds)

Media	1993	1992	1991	1990	1989	1988	1987
Air Emissions	NR	NR	NR	0	0	0	0
Surface Water Discharges	NR	0	0	0	0	0	500
Releases to Land	NR	NR	NR	0	0	0	0
Underground Injection	NR	NR	NR	0	0	0	0
Total On-Site Releases	NR	0	0	0	0	0	500
Transfer Off-Site to Disposal	250	250	250	250	NR	NR	NR
Total Releases	250	250	250	250	0	0	500

Graphic Summary of this Table

Total Aggregate Releases of Dioxin and Dioxin-like Compounds
(Measured in Grams)

Media	1993	1992	1991	1990	1989	1988	1987
Air Emissions	NR	NR	NR	NR	NR	NR	NR
Surface Water Discharges	NR	NR	NR	NR	NR	NR	NR
Releases to Land	NR	NR	NR	NR	NR	NR	NR
Underground Injection	NR	NR	NR	NR	NR	NR	NR
Total On-Site Releases	NR	NR	NR	NR	NR	NR	NR
Transfer Off-Site to Disposal	NR	NR	NR	NR	NR	NR	NR
Total Releases	NR	NR	NR	NR	NR	NR	NR

TRI Chemicals Reported on Form A:
Please note that there were no chemicals reported on Form A for this facility

NOTE:
All chemicals reported below have release or transfer amounts greater than zero. To see a list of all chemicals reported by this facility click here.

Names and Amounts of Chemicals Released to the Environment by Year.

For all releases estimated as a range, the mid-point of the range was used in these calculations. ***NR*** *- signifies nothing reported for this facility by the corresponding medium. Rows with all "0" or "NR" values were not listed.*

Chemical Name	Media	Unit Of Measure	1993	1992	1991	1990	1989	1988	1987
PHOSPHORIC ACID (TRI Chemical ID: 007664382)	DISP NON METALS	Pounds	250	250	250	250	NR	NR	NR
PHOSPHORIC ACID (TRI Chemical ID: 007664382)	WATER	Pounds	NR	0	0	0	0	0	250
SODIUM HYDROXIDE (SOLUTION) (TRI Chemical ID: 001310732)	WATER	Pounds	NR	NR	NR	NR	NR	0	250

Discharge of Chemicals into Streams or Bodies of Water:

For all releases estimated as a range, the mid-point of the range was used in these calculations. Rows with Release Amount equal to "0" were not listed.

Chemical Name	Year	Unit Of Measure	Release Amount	Stream Or Body of Water	REACH Code
PHOSPHORIC ACID (TRI Chemical ID: 007664382)	1987	Pounds	250	LOS ANGELES RIVER	
SODIUM HYDROXIDE (SOLUTION) (TRI Chemical ID: 001310732)	1987	Pounds	250	LOS ANGELES RIVER	

Transfer of Chemicals to Off-Site Locations other than POTWs:

For all releases estimated as a range, the mid-point of the range was used in these calculations. Rows with Total Transfer Amount equal to "0" were not listed.

Chemical Name	Year	Unit Of Measure	Total Transfer Amount	Transfer Site Name and Address	Type Of Waste Management
PHOSPHORIC ACID (TRI Chemical ID: 007664382)	1993	Pounds	250	**CHEMICAL WASTE MANAGEMENT 35251 OLD SKYLINE RD. KETTLEMAN CITY, CA 93239**	Landfill/Disposal Surface Impoundment
PHOSPHORIC ACID (TRI Chemical ID: 007664382)	1992	Pounds	250	**U.S. POLLUTION CONTROL INC. 3 MILES E. & 7 MILES N., OF KNOLLS EXIT 41 ON I-80 CLIVE, UT**	Landfill/Disposal Surface Impoundment
PHOSPHORIC ACID (TRI Chemical ID: 007664382)	1991	Pounds	250	**U.S. POLLUTION CONTROL INC. 3 MILES EAST & 7 MILES NORTH, OF KNOLLS EXIT 41 ON I-80 SALT LAKE CITY, UT 84122**	Landfill/Disposal Surface Impoundment
PHOSPHORIC ACID (TRI Chemical ID: 007664382)	1990	Pounds	250	**U.S. POLLUTION CONTROL INC. 3 MILES EAST & 7 MILES NORTH, OF KNOLLS EXIT 41 ON I-80 SALT LAKE CITY, UT 84122**	Landfill/Disposal Surface Impoundment

Summary of Waste Management Activities

Please note that chemical amounts shown here are not included in Total Aggregate Releases shown above.

Summary of Waste Management Activities excluding Dioxin and Dioxin-like Compounds

(Measured in Pounds)

Year	On-Site Recycling	Off-Site Recycling	On-Site Energy Recovery	Off-Site Energy Recovery	On-Site Treatment	Off-Site Treatment	Total Amount
1992	0	0	0	0	300	0	300
1993	0	0	0	0	300	0	300
1994 (Projected)	0	0	0	0	0	0	0
1995 (Projected)	0	0	0	0	0	0	0

Summary of Waste Management Activities for Dioxin and Dioxin-like Compounds
(Measured in Grams)

This facility did not report any waste management activities for Dioxin and Dioxin-like Compounds.

Chemicals Under Waste Management:

Please note that chemical amounts shown here are not included in the Total Aggregate Releases shown above. Transfers to Publicly Owned Treatment Works are listed on a separate table.

Chemical Name	Year	Unit Of Measure	On-Site Recycling	Off-Site Recycling	On-Site Energy Recovery	Off-Site Energy Recovery	On-Site Treated	Off-Site Treated	Total Amount
PHOSPHORIC ACID	1992	Pounds	0	0	0	0	300	0	300
	1993	Pounds	0	0	0	0	300	0	300
	1994 (Projected)	Pounds	0	0	0	0	0	0	0
	1995 (Projected)	Pounds	0	0	0	0	0	0	0

Publicly Owned Treatment Works (POTW) that Chemicals were Transferred to in 2011 and after:

This facility did not transfer any chemicals to a Publicly Owned Treatment Works (POTW) in 2011 and after.

Publicly Owned Treatment Works (POTW) that Chemicals were Transferred to PRIOR to 2011:

Prior to reporting year 2011, TRI only required facilities to report a total for all transfers of a chemical to one or more POTWs. In cases where a facility transferred waste to more than one POTW, it was not possible to list the quantities transferred to the individual POTWS. Displayed below is the history of POTW transfers prior to 2011 showing the chemical, year and POTW Name and Address. For all releases estimated as a range, the mid-point of the range was used in these calculations. Rows with Total Transfer Amount equal to "0" were not listed.

Chemical Name	Year	Unit Of Measure	Total Transfer Amount
SODIUM HYDROXIDE (SOLUTION)	1987	Pounds	250
SODIUM HYDROXIDE (SOLUTION)	1988	Pounds	250

Chemical Name	Year	POTW Name and Address
PHOSPHORIC ACID	1987	**LOS ANGELES COUNTY SANITATION, DISTRICTS 1955 WORMAN MILL ROAD WHITTIER, CA 90607**
PHOSPHORIC ACID	1988	**LOS ANGELES COUNTY, SANITATION DISTRICT 1955 WORKMAN MILL RD. WHITTIER, CA 90607**
PHOSPHORIC ACID	1989	**LOS ANGELES COUNTY SANITATION, DISTRICT 1955 WORKMAN MILL RD. WHITTIER, CA 90607**
PHOSPHORIC ACID	1990	**LOS ANGELES COUNTY SANITATION, DISTRICT 1955 WORKMAN MILL RD. WHITTIER, CA 90607**
PHOSPHORIC ACID	1991	**LOS ANGELES COUNTY SANITATION, DISTRICTS 1955 WORKMAN MILL RD. WHITTIER, CA 90607**
PHOSPHORIC ACID	1992	**NA ,**
PHOSPHORIC ACID	1993	**NA ,**
SODIUM HYDROXIDE (SOLUTION)	1987	**LOS ANGELES COUNTY SANITATION, DISTRICTS 1955 WORKMAN MILL RD. WHTTIER, CA 90607**
SODIUM HYDROXIDE (SOLUTION)	1988	**LOS ANGELES COUNTY, SANITATION DISTRICT 1955 WORKMAN MILL RD. WHITTIER, CA 90607**

Non Production Releases:

This report shows the quantities of the chemicals released to the environment by reporting year as a result of remedial actions, catastrophic events, or other one-time events not associated with production processes. Chemicals with zero release amounts are not shown.

Chemical Name	Reporting Year	Unit Of Measure	Release Quantity
PHOSPHORIC ACID	1993	Pounds	69
PHOSPHORIC ACID	1992	Pounds	275
PHOSPHORIC ACID	1991	Pounds	180

Additional Source Reduction and Pollution Prevention Data:

The P2 Report *summarizes chemical-specific Pollution Prevention (P2) data for multiple years, including Newly Implemented Source Reduction Activities (Section 8.10) and Optional Pollution Prevention Information (Section 8.11). A "P2 Data" data entry indicates that P2 data was reported for that specific chemical and year. A NR signifies that no Pollution Prevention data was reported for that specific chemical and year.*

View all P2 Information for this facility

Chemical Name	P2 Report	5-Year Waste Trend	1992	1991
PHOSPHORIC ACID	P2 Details	NA	P2	P2

"**P2**" indicates that P2 activity codes and/or descriptions were provided for the chemical and year in question. "**B**" indicates barriers to P2 was reported. "No P2" indicates that a Form R was submitted but no P2 information was included. "NR" indicates that no Form R was submitted.

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Reference:
Johnson et al., 2011

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MODELING THE POTENTIAL IMPACT OF SEASONAL AND INACTIVE MULTI-AQUIFER WELLS ON CONTAMINANT MOVEMENT TO PUBLIC WATER-SUPPLY WELLS[1]

R.L. Johnson, B.R. Clark, M.K. Landon, L.J. Kauffman, and S.M. Eberts[2]

ABSTRACT: Wells screened across multiple aquifers can provide pathways for the movement of surprisingly large volumes of groundwater to confined aquifers used for public water supply (PWS). Using a simple numerical model, we examine the impact of several pumping scenarios on leakage from an unconfined aquifer to a confined aquifer and conclude that a single inactive multi-aquifer well can contribute nearly 10% of total PWS well flow over a wide range of pumping rates. This leakage can occur even when the multi-aquifer well is more than a kilometer from the PWS well. The contribution from multi-aquifer wells may be greater under conditions where seasonal pumping (e.g., irrigation) creates large, widespread downward hydraulic gradients between aquifers. Under those conditions, water can continue to leak down a multi-aquifer well from an unconfined aquifer to a confined aquifer even when those multi-aquifer wells are actively pumped. An important implication is that, if an unconfined aquifer is contaminated, multi-aquifer wells can increase the vulnerability of a confined-aquifer PWS well.

(KEY TERMS: groundwater hydrology; simulation; drinking water; nonpoint source pollution; point source pollution; source water protection; water supply.)

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INTRODUCTION

Public water-supply (PWS) wells are often sited in confined aquifers because confined systems generally offer more protection from near-surface sources of groundwater contamination than do unconfined aquifers. However, even aquifers beneath laterally extensive confining units can be vulnerable to contamination if natural or man-made preferential flow pathways through the confining unit exist (Santi *et al.*, 2006). This is particularly the case for multi-aquifer wells; that is, wells screened across confining units. Seasonal irrigation wells are important in this context because, in many areas, these wells have been and continue to be installed with long screened intervals that connect multiple aquifers. As a result, they may provide a direct connection between unconfined aquifers and deeper confined aquifers.

At the same time, high-volume pumping (e.g., irrigation) in confined aquifers frequently creates significant downward hydraulic gradients between the

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confined and overlying unconfined aquifers (Chen *et al.*, 2005). These downward hydraulic gradients can encompass multiple square-kilometer areas. During periods of heavy pumping, it is not uncommon for vertical hydraulic head differences between aquifers to be several meters of water or more (e.g., Chen *et al.*, 2005; Clark *et al.*, 2008). Thus, if wells are screened in both confined and unconfined aquifers, substantial downward flow to the confined aquifer can occur. If shallow groundwater in the vicinity of these wells is contaminated with natural or anthropogenic contaminants, including pathogens, then relatively young contaminated water can quickly reach the confined aquifer without the benefit of attenuation processes otherwise provided by the overlying confining unit.

The goal of the work presented here is to show that a simple numerical model can provide site-specific insight into the potential impact of multi-aquifer wells that are seasonally pumped (e.g., irrigation) and/or inactive (e.g., unused, abandoned and improperly decommissioned wells, test holes) on a confined-aquifer PWS well. As seasonally pumped wells frequently play a controlling role in overall aquifer stress (e.g., Clark *et al.*, 2008), understanding their effect on the movement of potentially contaminated water to PWS wells in confined aquifers also is an important objective of the work presented here.

Previous Studies

The impact of inactive multi-aquifer wells on confined aquifers has been examined previously using both mathematical modeling and field studies. Silliman and Higgins (1990) developed analytical solutions for steady-state flow between aquifers through an open well. More recently, Zinn and Konikow (2007) conducted a numerical modeling study on the effects of wellbores with long screened or open intervals on the transport of water and solutes. Their results demonstrate that inactive wells completed in multiple aquifer layers can transport water and solutes rapidly over large vertical distances. Results were highly dependent on assumed flow conditions, but in all simulations the inactive wells substantially altered the groundwater age distribution in the aquifer. When pumping in proximity to an inactive well was simulated, the inactive well served as a conduit for downward flow of recently recharged (i.e., "young") water to deeper parts of the aquifer, even where the inactive well had served as a conduit for upward flow of older water prior to pumping. Likewise, an earlier modeling study by Lacombe *et al.* (1995) indicated that contaminants from an upper aquifer can rapidly migrate downward along an open or sediment-filled borehole and result in an extensive contaminant plume in a lower aquifer. At the regional scale, wells screened across multiple aquifers have been shown to influence the overall water balance of confined aquifers (Williamson *et al.*, 1989; Hanson *et al.*, 2004; Hart *et al.*, 2006). For example, Hanson *et al.* (2004) used simulations to estimate that wellbore flow represented 19% of total groundwater flow between layered aquifers in the Santa Clara Valley, California.

Delineation of Wellhead Protection Areas in Relation to Multi-aquifer Wells

Since passage of the Amendments to the Safe Drinking Water Act (SDWA) in 1986, an extensive literature on delineation of wellhead protection areas (WHPAs) has developed, including "Guidelines for delineation of wellhead protection areas" (USEPA, 1987) and "Wellhead protection strategies for confined-aquifer settings" (USEPA, 1991). These and other publications use a range of terminologies to describe wellhead protection areas, including one that will be used here. USEPA (1987) defined the "zone of transport" (ZOT) as the 2D projection to land surface defined by "an isochrone indicating the time necessary for water or a conservative contaminant to reach the well."

In the context of contaminant transport to PWS wells, a 40-year time of travel is recommended for differentiating semiconfined and highly confined conditions (USEPA, 1991; Savoca *et al.*, 2002). As an approximation of the area over which multi-aquifer wells would be anticipated to impact a confined-aquifer PWS well, an estimate of the 40-year ZOT can be calculated from the volume of water pumped over 40 years divided by the thickness of the transmissive zone and divided by the porosity of the aquifer [i.e., the so called "cylinder" or "volumetric flow" calculation (USEPA, 1987)].

Numerical models can simulate more realistic conceptual models of groundwater flow than what is simulated with the cylinder model. However, standard approaches for using numerical models to estimate ZOTs (e.g., USEPA, 1987) do not take multi-aquifer wells into account. This is partly because commonly used numerical modeling programs (e.g., MODFLOW, Harbaugh *et al.*, 2000) have not had the capability of simulating wells with screens extending across multiple layers while allowing water to simultaneously flow into and out of different portions of the well screen. This changed for MODFLOW with development of the Multi-Node Well (MNW) package (Halford and Hanson, 2002).

In cases where anthropogenic contaminants have impacted a PWS well, it is typically difficult to document whether or not multi-aquifer wells within the

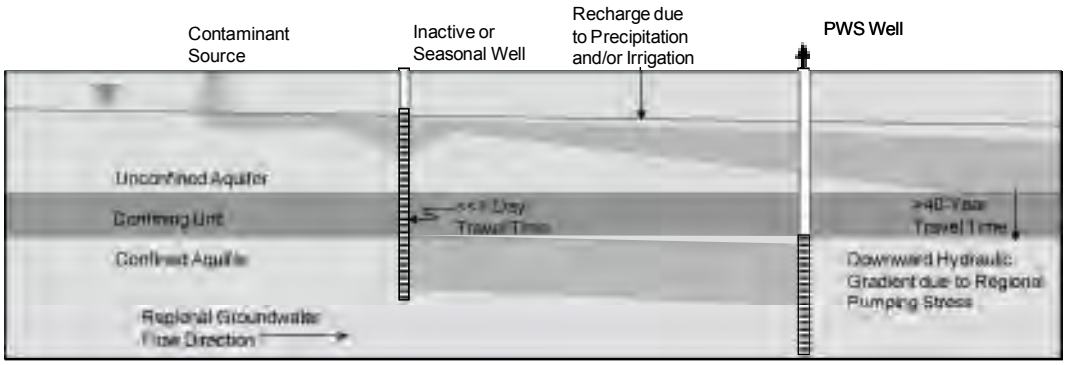

FIGURE 1. Conceptual Drawing Showing the Impact of an Inactive Multi-aquifer Well on Contaminant Movement to a Public Water-Supply Well.

ZOT for the well have played a substantial role. At the same time, it is difficult to determine *a priori* the likelihood that such contamination will occur, even if multi-aquifer wells are known to be present in a given study area. Johnson *et al.* (2000) used a probabilistic approach to estimate the potential impact of releases to shallow groundwater on PWS wells. The focus of that work was on releases from underground storage tanks near the water table. Their numerical modeling analysis indicated that, for most scenarios, there was a pumping rate threshold below which contamination would not be drawn down to the PWS well screen. Not surprisingly, that analysis showed that a confining unit between the water table and the PWS well screen substantially increased that threshold. In the work discussed here, it is shown that the threshold may be reduced or eliminated by rapid transport (leaking) from an overlying unconfined aquifer into a confined aquifer because of the presence of one or more multi-aquifer wells (Figure 1) and downward hydraulic gradients across the confining unit due to regional pumping (e.g., for irrigation and or PWS).

To demonstrate that simple models can be used to assess the potential impact of multi-aquifer wells on confined-aquifer PWS wells, we use a well-studied example from York, Nebraska (Clark *et al.*, 2008; Landon *et al.*, 2008). At that location, U.S. Geological Survey researchers identified 62 multi-aquifer production wells (primarily irrigation wells) and test holes in an ≈62-km^2 area – a density of approximately 1 multi-aquifer well per km^2. Interspersed among the multi-aquifer wells were 58 confined-aquifer wells. Heavy pumping from the confined aquifer put a significant hydraulic stress on the aquifer and resulted in downward hydraulic gradients of more than 10 m throughout the area during irrigation seasons (Landon *et al.*, 2008).

Using aquifer and pumping conditions similar to those in York, a volumetric calculation of the 40-year ZOT for a confined-aquifer PWS well gives an area of ≈12 km^2 and suggests that ≈12 multi-aquifer wells could lie within the ZOT (Table 1, top). Assuming an annual average regional downward hydraulic gradient of 3 m, the volume of water that would be estimated to leak down an inactive multi-aquifer well for

TABLE 1. Calculation of a 40-Year Zone of Transport, Number of Multi-aquifer Wells Potentially Impacting a Public Water-Supply Well, and Volumetric Flow Down an Inactive Multi-aquifer Well: Example for Confined-Aquifer Setting Similar to York, Nebraska.

Daily pumping rate	1,200 m^3/day
Total volume pumped over 40 years	17,520,000 m^3
Aquifer thickness	10 m
Effective aquifer porosity	0.15
40-year zone of transport	17,520,000 m^3/10 m/0.15 ≈12 km^2
Estimated density of multi-aquifer wells	1.0 well/km^2
Number of multi-aquifer wells potentially impacting the PWS well	12 km^2 × 1.0 well/km^2 12 wells
$Q = 2\ K_C b_C (H_U \quad H_C)/\ln(r_C/r_W)$ where, K_C is the hydraulic conductivity of the confined aquifer (≈9 m/day), b_C is the thickness of the confined aquifer (≈10.5 m), ($H_U \quad H_C$) is the hydraulic head difference across the confining unit (3 m), r_C is the radius at which the hydraulic head is measured in the confined aquifer (assumed here to be 100 m, at which point the confined head will likely not be significantly influenced by flow down the leaking well), and r_W is the radius of the well (0.1 m, assumed) (Silliman and Higgins, 1990)[1]	
Volumetric flow down inactive multi-aquifer well ≈2 × 9 × 10.5 × 3/ln(100/0.1) ≈260 m^3/day ≈0.06 million gallons per day	

Note: PWS, public water supply.

[1]Assumptions inherent in this calculation include that the hydraulic head in the well equals that in the unconfined aquifer and the well is fully screened across the confined aquifer. The flow calculated by this equation may be significantly reduced if there is resistance to flow through the well (see, for example, the discussion in Halford and Hanson, 2002).

the York example is ≈260 m^3/day (Table 1, bottom). Taken together, the total volume leaked down the 12 wells potentially within the 40-year ZOT (≈3,120 m^3/day) is significantly greater than the typical pumping rates for PWS wells near York (400-2,000 m^3/day). Thus, if one or more inactive, multi-aquifer wells were contaminated, there could be a potentially significant impact on a PWS well. Of course, both the presence of multi-aquifer wells and seasonal pumping would affect the ZOT for a PWS well, but their combined effect cannot be estimated using the simple calculations in Table 1. However, as shown below, a simple numerical model can be used to take these interactions into account.

METHODS

Schematic plan and cross-section views for a simple numerical model of a confined-aquifer setting similar to York, Nebraska are shown in Figure 2. The model domain is 16 km long by 8 km wide by ≈63 m thick and is composed of 11 layers with grid blocks that are 40 m on a side. To simulate the regional groundwater flow, "constant-head" boundaries were used on the "short" sides – 74.9 and 59.4 m for the left and right sides respectively. "No-flow" boundaries were used on the "long" sides of the model domain because (1) the effects of pumping the PWS well extended only ≈2 km beyond the well, (2) these boundaries are approximately parallel to the regional groundwater flow direction, and (3) it is reasonable to assume that regionally extensive irrigation pumping is similar inside and outside the model domain and that the model boundaries are, therefore, lines of symmetry. Water-table conditions were assumed in the unconfined aquifer, and no-flow conditions were assumed along the bottom boundary. Recharge was applied at 0.0001 m/day, except in the vicinity of irrigation wells for the four months each year when water was applied. For recharge during irrigation, the application rate was 0.00025 m/day to a 1-km^2 rectangle centered on each irrigation well.

In the vicinity of the PWS well, the confined aquifer is represented by three layers at the bottom of the model with an overall thickness of 10.5 m and with horizontal hydraulic conductivity values of 6.1-15 m/day (Table 2, adapted from Clark *et al.*, 2008). The confined aquifer is overlain by a 22.4-m-thick confining unit with a horizontal hydraulic conductivity of

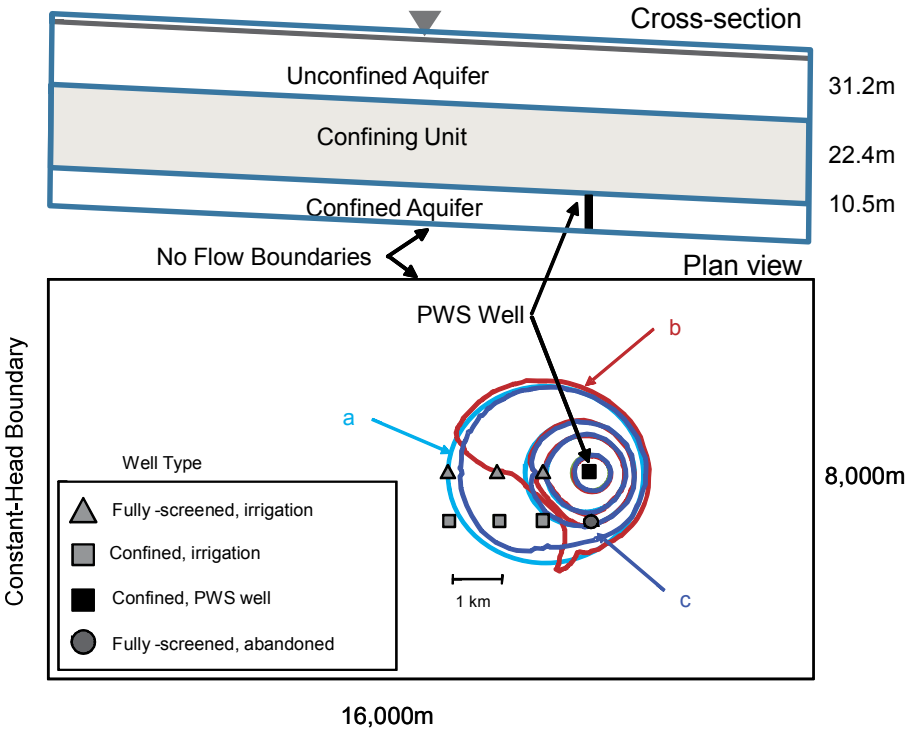

FIGURE 2. Map Showing Simplified Numerical Model Domain and Simulated Effects of Multi-aquifer Wells on Flow to a Confined-Aquifer Public Water-Supply (PWS) Well. The extent of the simulated 1-, 5-, 10-, and 40-year zones of transport (ZOT) in the confined aquifer for the PWS well are shown for the (a) PWS-well-only scenario, (b) seasonal scenario, and (c) inactive scenario. The pumping rate at the PWS well for these model results was 1,200 m^3/day.

TABLE 2. Model Parameters Used in the Simplified Numerical Model (adapted from Clark *et al.*, 2008).

Layer	Thickness (m)	Horizontal (m/day)	Vertical (m/day)	Porosity	Specific Storage	Specific Yield	Representative Aquifer or Unit
1	4.2	55	1.5	0.15	0.00001	0.15	Unconfined aquifer
2	18.6	55	1.5	0.15	0.00001	0.15	Unconfined aquifer
3	4.2	34	1.1	0.15	0.00001	0.15	Unconfined aquifer
4	4.2	12	0.4	0.15	0.00001	0.15	Unconfined aquifer
5	5.6	0.03	0.001	0.35	0.00001		Confining unit
6	5.6	0.03	0.001	0.35	0.00001		Confining unit
7	5.6	0.03	0.001	0.35	0.00001		Confining unit
8	5.6	0.03	0.001	0.35	0.00001		Confining unit
9	3.5	6.1	0.2	0.15	0.00001		Confined aquifer
10	3.5	15	0.5	0.15	0.00001		Confined aquifer
11	3.5	6.1	0.2	0.15	0.00001		Confined aquifer

0.03 m/day. A 31.2-m-thick unconfined aquifer with horizontal hydraulic conductivity values from 12 to 55 m/day overlies the confining unit. A vertical anisotropy value of 30 was used for all layers in these simulations.

The model domain described above was used to examine three different scenarios. First, a single PWS well and steady recharge were simulated. No additional wells were included in this simulation ("PWS-well-only" scenario). Second, the PWS-well-only scenario was simulated with the addition of six seasonal irrigation wells and one abandoned well ("seasonal" scenario) (see Figure 2, plan view, for well configuration). Third, the seasonal scenario was simulated without any pumping for irrigation ("inactive" scenario). To assess sensitivity of the results to PWS well pumping, three different PWS well pumping rates were examined in each scenario (400, 1,200, and 2,000 m^3/day or approximately 0.1, 0.3, and 0.5 million gallons per day). For the seasonal scenario, the irrigation wells were pumped at a rate of 1,200 m^3/day per well for a four-month period and then were inactive for the remaining eight months of each year. Three of the six irrigation wells were fully screened across the model domain, and three were screened only in the confined aquifer (Figure 2). All of the wells were simulated using MODFLOW 2000 (Harbaugh *et al.*, 2000) and the MNW package (Halford and Hanson, 2002).

For each model scenario and pumping rate, ZOTs were estimated using backward particle tracking in MODPATH (Pollock, 1994). This was accomplished by starting particles in an array on each face of the cells representing the PWS well. Particles were tracked backwards within the confined aquifer until they reached a source of water (in this case, MNW cells that leaked water) or until the desired travel time (1, 5, 10, or 40 years) was reached. The ZOTs were then calculated using the maximum horizontal extent of the tracked particles within the confined aquifer for each travel time.

To determine the fractions of leaked water reaching the PWS well within 40 years or less travel time, forward particle tracking in MODPATH was used. Particles were started on the faces of model cells where there was a source of flow from an MNW. The particles were released during the first year of the simulation and tracked until they reached a pumping well or the end of the 40-year simulation period. The cells representing the PWS wells were strong sinks, so a volume of water could be assigned to each tracked particle by dividing the flow across the model-cell face where a particle was started by the number of particles started on that face. The percentage of water pumped by the PWS well that originated as leakage down a given up-gradient multi-aquifer well was computed by summing the volumes associated with the particles released in the leaking MNW cells that reached the PWS well, dividing the computed volume by the volume of water pumped at the PWS well, and multiplying by 100.

RESULTS AND DISCUSSION

A steady-state simulation for the PWS-well-only scenario at the middle pumping rate (1,200 m^3/day) produced a 40-year ZOT in the confined aquifer of 11.6 km^2 (Figures 2 and 3). This value is similar to the simple cylinder model calculation presented in Table 1 ($\approx$12 km^2). The 40-year ZOT for the seasonal scenario was notably smaller (8.8 km^2) because much of the water pumped at the PWS well was supplied by leakage down the abandoned well and the nearest multi-aquifer irrigation well (Table 3). The shape of the 40-year ZOT in this scenario was affected by pumping at the confined-aquifer irrigation wells. The size of the 40-year ZOT for the inactive scenario was between those computed for the PWS-well-only and the seasonal scenarios because some of the water

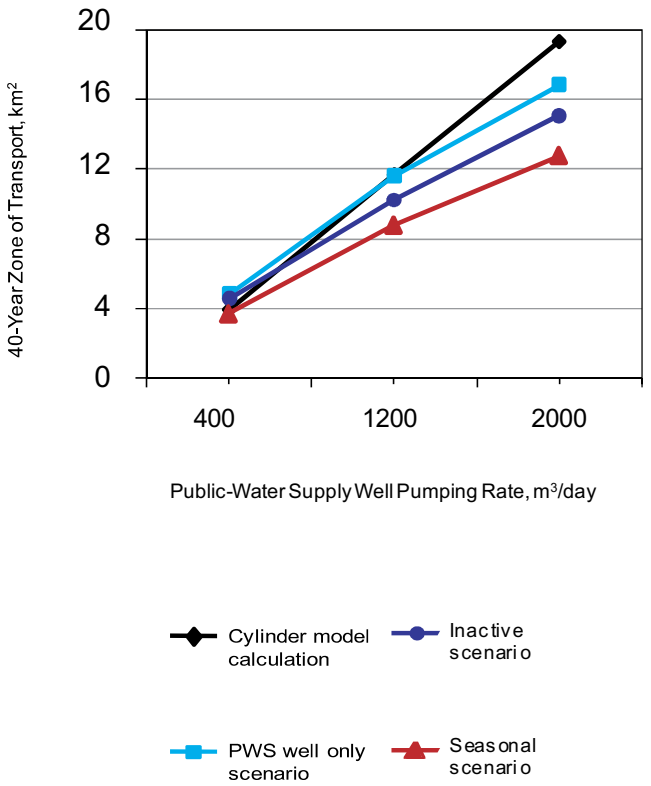

FIGURE 3. Graph Showing 40-Year Zones of Transport for Various Public Water-Supply (PWS) Well Pumping Rates in the Simplified Numerical Model.

pumped at the PWS well was supplied by leakage down multi-aquifer wellbores, but, as discussed below, flow down the multi-aquifer wells for the inactive case was less than for the seasonal case because the downward hydraulic gradients were smaller. The one- and five-year ZOTs for the three different scenarios were essentially the same because the ZOTs did not extend beyond the closest multi-aquifer wells (Figure 2).

As in many confined aquifer settings developed for water supply, hydraulic head differences were observed across the confining unit in the simulated scenarios. For the PWS-well-only scenario with a pumping rate of 1,200 m^3/day, differences of a meter or more were observed in the vicinity of the PWS well (Figure 4a). In contrast, when the seasonal wells were active, hydraulic head differences of more than a meter were observed throughout most of the model domain (Figure 4b). When the irrigation wells were present but not pumped (the inactive scenario; Figure 4c), the hydraulic head differences were similar to those in the PWS-well-only scenario.

Differences in the vertical hydraulic gradients among the scenarios resulted in differences in the multi-aquifer wells that contributed flow to the PWS well and the amount of water leaked down the multi-aquifer wells (Table 3). Not all of the leaked water reached the PWS well during the simulations. For the seasonal scenario, however, multi-aquifer wells contributed a total of about 20% of the flow to the PWS well regardless of the pumping rate at the PWS well. This is because the three confined-aquifer irrigation wells collectively had a greater influence on vertical hydraulic gradients – and thus the downward flow of water to the confined aquifer – than did the PWS well. The smaller vertical hydraulic gradients in

TABLE 3. Wellbore Leakage Rates and Percents of PWS Well Flow Rates from Multi-aquifer Wells.

		PWS Well Pumping Rate (m^3/day)					
		Inactive Scenario (no irrigation pumping)			Seasonal Scenario (seasonal irrigation pumping)		
Well	Distance From PWS Well (km)	2,000	1,200	400	2,000	1,200	400
Net wellbore flow rate from unconfined to confined aquifer (m^3/day)[1]							
Abandoned well	1	153	95	37	195	137	80
Multi-aquifer irrigation well	1	149	92	36	176	120	64
Multi-aquifer irrigation well	2	49	32	16	86	70	54
Multi-aquifer irrigation well	3	23	17	11	52	46	40
All wells (abandoned + three irrigation wells)		374	237	100	510	373	237
Percent of water pumped at the PWS well from multi-aquifer wellbore leakage 40 years after leakage began							
Abandoned well	1	8	8	0	10	11	6
Multi-aquifer irrigation well	1	7	8	9	9	10	13
Multi-aquifer irrigation well	2	2	2	2	2	0	0
Multi-aquifer irrigation well	3	1	0	0	0	0	0
All wells (abandoned + three irrigation wells)		17	17	11	20	21	20

Notes: PWS, public water supply; MNW, Multi-Node Well.
[1]Inactive scenario values from the MODFLOW MNW QSUM file. Seasonal scenario values derived from the MODFLOW MNW QSUM file; reported rates are averages from the time steps representing the last year of the simulation weighted by the time-step lengths.

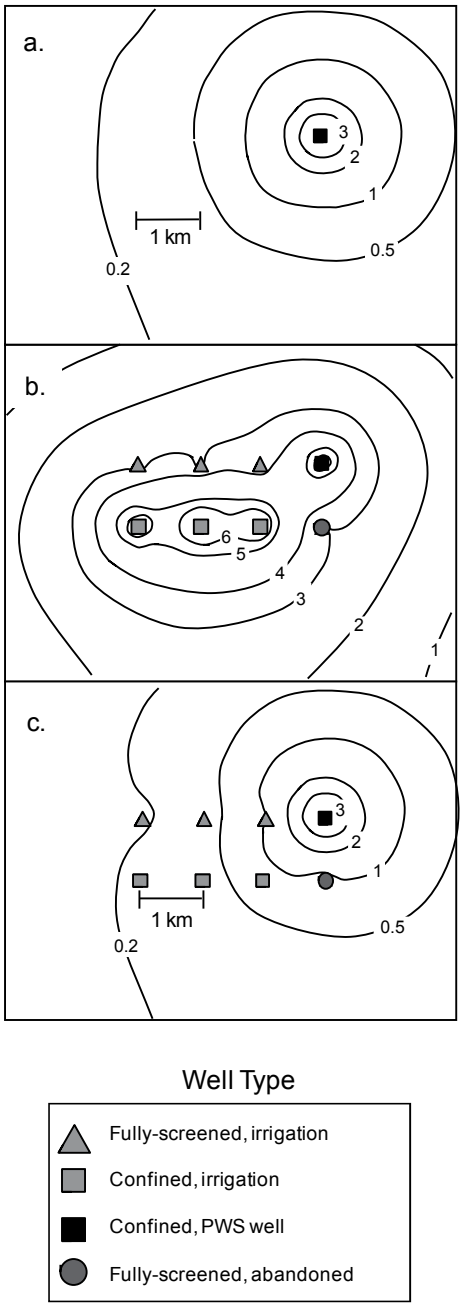

FIGURE 4. Contours of Hydraulic Head Difference Between the Confined and Unconfined Aquifers (in meters) During Irrigation and Nonirrigation Conditions. Scenarios are (a) PWS-well-only, (b) seasonal, and (c) inactive.

the inactive scenario resulted in less water leaked down individual multi-aquifer wells. Consequently, the volume of water needed to satisfy the pumping demand at the PWS well had to come from a larger area, and more multi-aquifer wells contributed flow to the PWS well. Unlike in the seasonal scenario, however, the pumping rate at the PWS well in the inactive scenario affected the percentage of leaked water that reached the PWS well. The smallest percentage of leaked water produced by the PWS well (11%) was for the inactive scenario simulation with the lowest pumping rate (400 m^3/day). Both the inactive and seasonal scenarios demonstrated that nearly 10% of the water produced by a confined-aquifer PWS well can come through a single multi-aquifer well (Table 3), even when the well is a kilometer away from the PWS well.

Interestingly, for the multi-aquifer irrigation wells, water continued to flow from the unconfined aquifer to the confined aquifer even when the wells were actively pumped. For example, the model indicated that if the total flow out of each multi-aquifer irrigation well was 1,200 m^3/day, then flow from the unconfined aquifer into the irrigation wells ranged from 1,246 to 1,320 m^3/day (determined near the end of the four-month irrigation period). At the same time, a portion of the water that entered the wells from the unconfined aquifer (46-120 m^3/day) flowed down the wells and *out* of the lower portions of the same irrigation wells into the confined aquifer. This occurred because the pumping rate at the multi-aquifer irrigation wells was too low to overcome the downward flow of water between aquifers that resulted from the large downward hydraulic gradients established in response to pumping at the confined-aquifer wells.

In the absence of multi-aquifer wells (i.e., the PWS-well-only scenario), travel times associated with water flowing from the unconfined aquifer through the confining unit to the confined aquifer were >40 years. In contrast, the model indicated that if a multi-aquifer well was 1 km from the PWS well and the PWS pumping rate was 1,200 m^3/day, water moving down the multi-aquifer well could reach the PWS well after $\approx$5 years of travel. Although the model presented here is conceptually simple and contains far fewer multi-aquifer wells than are reported for York, Nebraska, conclusions drawn from the model results are similar to those reached by Clark *et al.* (2008) based on the more-detailed numerical model constructed for the York area.

In other settings, the impact of multi-aquifer wells could be different. For example, a higher hydraulic conductivity in the confined aquifer for a given hydraulic head difference between aquifers would result in a higher flow rate out of the well and into the confined aquifer. However, given similar boundary conditions, a higher hydraulic conductivity would lead to a smaller hydraulic head difference and therefore a smaller flow rate out of the well. Thus, if the impact of multi-aquifer wells on a PWS well is to be explored using a simple numerical model, the model should be constructed to represent the setting of interest.

IMPLICATIONS FOR PROTECTION OF PUBLIC WATER-SUPPLY WELLS

Predicting the impact of contaminants on a PWS well due to leaking multi-aquifer wells is, in general, not possible. However, the modeling steps described here can provide site-specific insight into the potential for multi-aquifer wells to affect a confined-aquifer PWS well. First, the ZOT for the PWS well can be estimated to assess whether a multi-aquifer well might present a problem. The ZOT should be defined within the confined aquifer (rather than, for example, only considering water reaching the well from the water table within a specific time period). This is because multi-aquifer wells can reduce or eliminate any protection offered by transport through either the unconfined aquifer or the confining unit. Second, site-specific vertical hydraulic gradient data should be obtained so that the volumetric flow down inactive wells from the unconfined aquifer to the confined aquifer can be estimated using the approach developed by Silliman and Higgins (1990). Third, if the setting of interest has complexities such as numerous inactive or seasonally active multi-aquifer wells, the kind of simple numerical model discussed here can be constructed to better understand the potential contributions of those wells to the PWS well.

Although the focus here has been on volumetric water flow rather than water quality, estimates of volumetric flow through multi-aquifer wells do provide insight into the issue of contamination of PWS wells. The numerical modeling data from this study suggest that, if a leaking multi-aquifer well lies within the ZOT of a PWS well, on the order of 10% of the total PWS flow could come from that well. Stated another way, water produced from the PWS well could be expected to have concentrations that are within a factor of 10 of the concentration leaked into the confined aquifer via the multi-aquifer well. As a result, if a leaky well were contaminated, it is likely that the contaminant concentration would be high enough to impact water quality at the PWS well.

For the simulations presented here, seasonal pumping had a controlling impact on the hydraulic gradient across the confining unit during the irrigation season (i.e., when in operation, irrigation wells – especially those screened in the confined aquifer alone – placed substantial stress on the confined aquifer). An important and unexpected result for the case examined here was that, during irrigation, water levels in the multi-aquifer wells remained above the potentiometric surface for the stressed confined aquifer. As a result, water entering those wells flowed from the unconfined aquifer to the confined aquifer under both inactive and actively pumped conditions. In addition, active pumping of the irrigation wells had the potential to draw contaminants to the irrigation wells through the unconfined aquifer at the same time they continued to leak water from the unconfined aquifer to the confined aquifer.

A national survey of PWS wells concluded that anthropogenic volatile organic contaminants (VOCs) were nearly as likely to be found in water from confined aquifers as from unconfined aquifers (62 *vs.* 67% probability of detection) (Squillace and Moran, 2007). For VOC contamination of a confined aquifer to occur, both downward hydraulic gradients and preferential flow pathways through the confining layer are likely to be necessary. Thus, the Squillace and Moran data suggest that preferential flow pathways may occur frequently. Although multi-aquifer wells represent only one type of preferential flow pathway, the modeling results presented here indicate that, where they exist, multi-aquifer wells could be a major factor contributing contaminants to impacted confined-aquifer PWS wells. As a result, multi-aquifer wells, including those that are seasonally active, can lead to situations that may affect public health.

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Golden State
Water Company
A Subsidiary of American States Water Company

FINAL REPORT

2015 Urban Water Management Plan

Bell/Bell Gardens

Corporate Office
630 E. Foothill Blvd.
San Dimas CA 91773

Kennedy/Jenks Consultants

July 2016

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Chapter 3: System Description

3.1 General Description

CWC Section 10631

Describe the service area of the supplier.

The Bell-Bell Gardens System is located in Los Angeles County and serves the Cities of Bell, Bell Gardens and Cudahy. Figure 3-1 illustrates the service area of the Bell-Bell Gardens System. The service area is primarily characterized by a mixture residential and commercial land use.

3.2 Service Area Climate

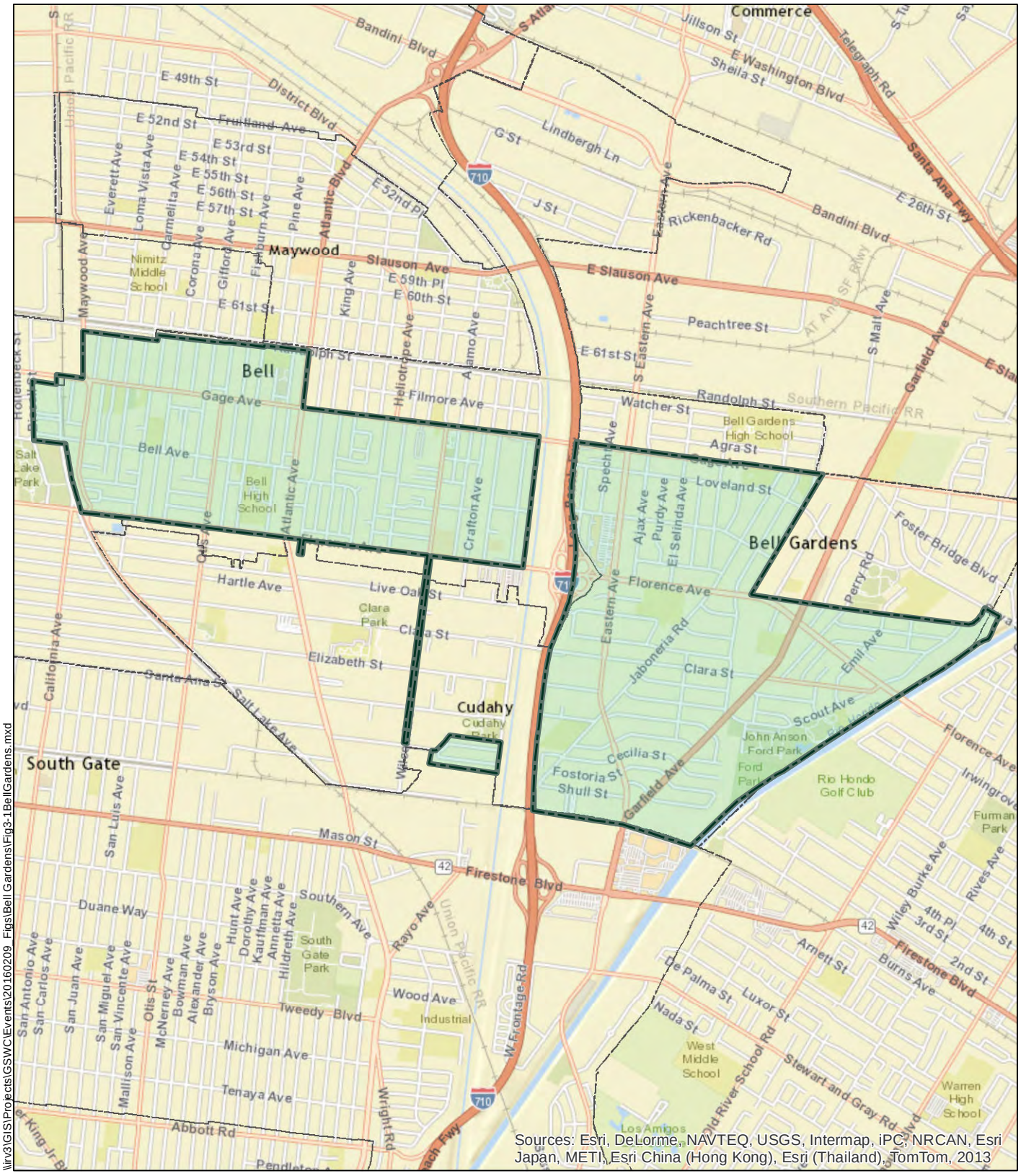
CWC Section 10631

Describe the service area of the supplier, including... climate...

Bell-Bell Gardens System has cool, humid winters and warm, dry summers. Western Regional Climate Center (WRCC) maintains historic climate data for selected cities throughout the West (WRCC 2016). WRCC does not have a station at the cities of Bell or Bell Gardens, but does maintain 32 years of climate records for the City of Montebello station, 7 miles from Bell. Data obtained from the WRCC website (www.wrcc.dri.edu) for the Montebello station was utilized for the climate data analysis below.

In the winter, the lowest average monthly temperature is approximately 47 degrees Fahrenheit. The highest average monthly temperature reaches approximately 90 degrees Fahrenheit in the summer. The rainy season is typically from November to March. Monthly precipitation during the winter months ranges from 1 to 4 inches. Low humidity occurs in the summer months from May to October. The warm and dry weather during the summer months typically results in moderately high water demand.

Similar to the WRCC in the Bell-Bell Gardens area, the California Irrigation Management Information System (CIMIS) website (http://www.cimis.water.ca.gov) tracks and maintains records of evapotranspiration (ETo) for selected cities (DWR 2016b). ETo statistics used for this system come from Glendale station, which are based on 19 years of climate records. ETo is a standard measurement of environmental parameters that affect the water use of plants. ETo is given in inches per day, month, or year and is an estimate of the evapotranspiration from a large field of well-watered, cool-season grass that is 4- to 7-inches tall. Figure 3-2 presents the monthly average precipitation, ETo, maximum temperature, and minimum temperature. As the figure indicates, a greater quantity of water is evaporated during July and August in correlation to high temperatures and low humidity, which may result in high water demand.



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Legend

- Bell-Bell Gardens System Boundary
- City Boundary

N

0 1,500 3,000

Feet

Kennedy/Jenks Consultants

Golden State Water Company
2015 Urban Water Management Plan

Bell - Bell Gardens System Service Area

K/J 1570027.00
July 2016

Figure 3-1

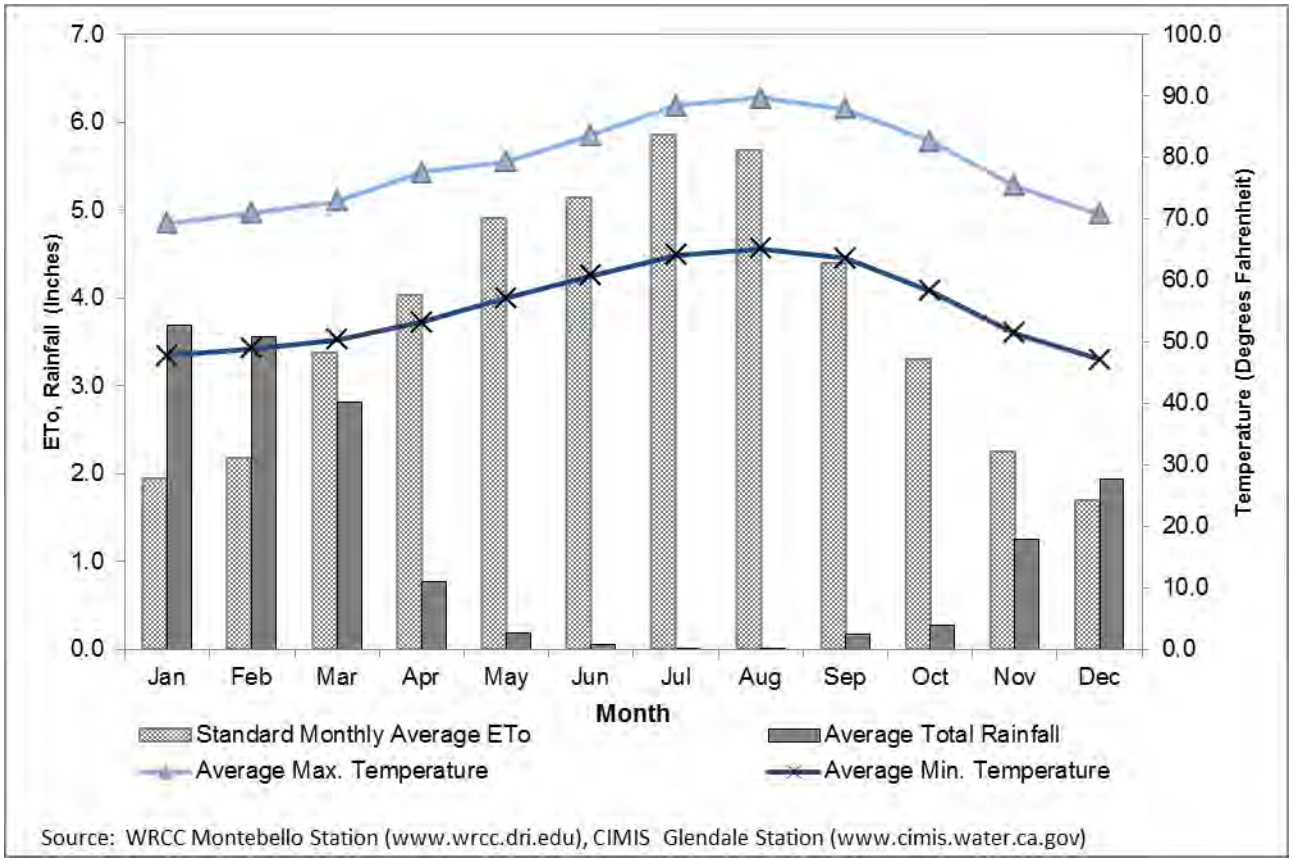

Figure 3-2: Monthly Average Climate Data in Bell-Bell Gardens System

3.3 Service Area Population and Demographics

CWC Section 10631

Describe the service area of the supplier, including current and projected population ...The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

In 2015 the estimated population of the Bell-Bell Gardens service area was 58,457, according to the DWR Population Tool and methodology described in Chapter 5. The following sections discuss population and other demographics that will influence water use.

3.3.1 SCAG Population Projection Development Methodology

Population, housing, and employment projections were developed for the Bell-Bell Gardens System using the Southern California Association of Governments (SCAG) population, housing, and employment data. SCAG updated its projections in 2012 for population, household, and employment growth through the year 2035 using 2010 U.S. Census data (SCAG 2012). SCAG's methodology is described below, followed by the derivation of population projections for the Bell-Bell Gardens System. Similar to the 2010 UWMP projections, the population projections use 2010 U.S. Census data.

The SCAG is a regional planning agency that provides demographic and economic data analysis for Imperial County, Los Angeles County, Orange County, Riverside County, San Bernardino County, and Ventura County. SCAG's Integrated Growth Forecasting process uses a variety of estimates and projections from the federal and state governments. Sources include the U.S. Department of Labor, Internal Revenue Service (IRS), U.S. Citizenship and Immigration Services, U.S. Department of Health and Human Services, California Department of Finance (DOF), California Employment Development Department, and information received through the Intergovernmental Review process. On a regional level, the SCAG forecast uses a cohort component model to project birth and death rates based on demographic factors and estimates migration based on economic fluctuations. Projected growth of an individual jurisdiction is assumed to be proportionate to the jurisdiction's historic contribution to county growth.

A detailed explanation of the population, household and employment projection process employed by SCAG can be found in the report: "Growth Forecast", a supplemental report to the SCAG "Regional Transportation Plan, 2012-2035".

3.3.2 Historical and Projected Population

SCAG city level projections were used to determine projected population from 2020 to 2040. The Bell-Bell Gardens System serves the Cities of Bell, Bell Gardens, and Cudahy. The SCAG historic growth rate for the City of Bell more closely matches that of the Bell-Bell Gardens System's historic population growth rate than that for the surrounding cities. Therefore, the SCAG growth rate for 2015 through 2035 for the City of Bell was used to project the population, household, and employment of the Bell-Bell Gardens System. Table 3-1 presents the current and projected population for the Bell-Bell Gardens System. This methodology applies the SCAG growth rate to a consistent system boundary through 2040; therefore it is assumed that the projected population accounts for system in-fill only and does not include geographic growth such as tariff area expansion.

Table 3-1: Population – Current and Projected

Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	58,457	58,731	59,002	59,275	59,549	59,824

NOTES:
1. 2015 population estimated using the DWR Online Population Tool.
2. Projected population based on SCAG population growth rate for the City of Bell.

3.3.3 Other Demographic Factors

CWC 10631

Describe the service area of the supplier, including...other demographic factors affecting the supplier's water management planning.

The City of Bell Gardens was chosen as demographically representative of the Bell-Bell Gardens System. According to 2010 U.S. Census Data, the median age of Bell-Bell Gardens'

residents is 28.9 years. Bell-Bell Gardens has an average household size of 3.93 and a median household income of approximately $36,496 in 2014 dollars (2010-2014 American Community Survey 5-Year Estimates).

According to SCAG data for Bell Gardens, by 2040, population is expected to increase by a total of three (3) percent from 2008 to 2035, which translates to a 0.1 percent growth rate per year. The number of households is expected to grow one (1) percent during the same period, which equates to an annual household growth rate of 0.04 percent. Employment is expected to grow eight (8) percent during the same period, which equates to an annual employment growth rate of 0.3 percent.

Chapter 6: System Supplies

This chapter addresses the water supply sources of the Bell-Bell Gardens System of GSWC. GSWC's current sources of water supply for the Bell-Bell Gardens System are imported water, groundwater, and recycled water. Imported water and recycled water are purchased from the Central Basin Municipal Water District (CBMWD).

6.1 Purchased or Imported Water

CBMWD is a large purveyor of water in southern California that provides water to several agencies, including GSWC. GSWC obtains water from CBMWD for the Bell-Bell Gardens System, as well as several other systems. CBMWD obtains its imported water supply from the Metropolitan Water District of Southern California (Metropolitan). Water purchased from the CBMWD is delivered to the Bell-Bell Gardens System through Metropolitan's CB-3 connection, which has a design capacity of 3,366 gallons per minute ([gpm], 5,432 acre-feet per year [AFY]). Between 2011 and 2015, purchased water quantities ranged from 8 AF to 155 AF. It should be noted that the connection capacity to deliver purchased water to GSWC is significantly higher than the projected purchased water supply that is expected to meet normal year demands.

GSWC entered into a 5-year purchase agreement between GSWC and CBMWD effective January 1, 2008 through December 31, 2012. The agreement was extended an additional two years to December 31, 2014. The purchase agreement established Tier 1 water purchase limits, shared by all of GSWC's systems served by CBMWD. The Tier 1 annual maximum was 90 percent of the Base Allocation of 12,691 AFY, equal to 11,422 AFY, with a total 5-year commitment of 38,073 AF. The agreement stipulated that the purchase commitment for the 5-year period was 60 percent of the Base Allocation over the 5-year period (60% X 5 years X 12,691 = 38,073 AF). Effective January 1, 2015, CBMWD entered into a new 10-year purchase agreement with Metropolitan through December 31, 2024. CBMWD did not enter into purchased water agreements with its customer agencies but instead staff proposed Tier 1 budgets for each agency establishing annual Tier 1 water purchase limits.

6.2 Groundwater

The Bell-Bell Gardens System is supplied by five active GSWC-owned wells in the Central Subbasin of the Coastal Plain of Los Angeles County Groundwater Basin. A sixth well is currently offline.

6.2.1 Basin Description

CWC 10631

(b) *If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

(2) *A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.*

The Central Subbasin of the Coastal Plain of Los Angeles Groundwater Basin in Los Angeles County, commonly referred to as the “Central Basin”, is shown on Figure 6-1. The Bell-Bell Gardens System’s wells are located within the adjudicated Central Basin Watermaster Service Area, which overlies approximately 227 square miles in the southeastern part of the 277 square mile Central Basin. The Central Basin Watermaster Service Area is bounded by the Newport-Inglewood Uplift on the southwest, the Los Angeles-Orange County line on the southeast, and an irregular line that approximately follows Stocker Street, Martin Luther King Boulevard, Alameda Street, Olympic Boulevard, the boundary between the City of Los Angeles and unincorporated East Los Angeles, and the foot of the Merced and Puente Hills on the north. Within the Central Basin, groundwater provides a significant portion of the water supply (DWR, 2013).

The Central Basin is subdivided into four areas: The Los Angeles forebay, the Montebello forebay, the Whittier area, and the Central Basin pressure area. The Los Angeles forebay is located in the northern part of the Central Basin where the Los Angeles River enters the Basin through the Los Angeles Narrows. The Montebello forebay extends southward from where the San Gabriel River enters the Central Basin through the Whittier Narrows. The Montebello forebay is considered the most important area of recharge in the Central Basin (DWR, 2004). Both forebay areas have unconfined groundwater conditions and aquifers that extend up to 1,600 feet deep to provide recharge to the aquifer systems of the Central Basin (DWR, 1961). The Whittier area extends south and southwest from the Puente Hills to the axis of the Santa Fe Springs-Coyote Hills uplift. The Whittier area contains up to 1,000 feet of freshwater-bearing sediments (DWR, 2004). The Central Basin pressure area contains many aquifers of permeable sands and gravels separated by semi-permeable to low permeability sandy-clay to clay. Aquifers in the Central Basin pressure area extend approximately 2,200 feet below the surface (DWR, 1961). The aquifers in the Whittier area and Central Basin pressure area are generally confined, but areas with semi-permeable aquitards allow some interaction between aquifers (DWR, 2004).

The main freshwater-bearing aquifers are contained within the Holocene alluvium and the Pleistocene Lakewood and San Pedro Formations. The main productive aquifers within the Basin are the Gardena and Gage aquifers in the Lakewood Formation and the Silverado, Lynwood, and Sunnyside aquifers in the San Pedro Formation (DWR, 1961). The Gardena and Gage aquifers are primarily comprised of sand and gravel and have a total maximum thickness of 280 feet (DWR, 2004). Aquifers within the San Pedro Formation are comprised of coarse sand, gravel, and sandy gravel and have a combined maximum thickness of 800 feet (DWR, 2004).

Recharge occurs from percolation of precipitation, stream flow, and return flow of applied waters (e.g. irrigation), from artificial recharge activities at spreading grounds, and from injection of imported water into the Alamitos Barrier Project (a seawater intrusion barrier located in the southeastern part of the Basin). Recharge of the Basin occurs in the forebay areas due to the presence of permeable sediments. Recharge in the pressure area is precluded by overlying, less permeable silt and clay units. Purchased water from Metropolitan and recycled water from the Whittier and San Jose Treatment Plants are used for recharge in the spreading grounds in the Montebello forebay area. The total groundwater storage capacity of the Central Basin is approximately 13,800,000 acre-feet (DWR, 1961). Groundwater flow is predominantly from the foothills northeast of the Central Basin towards the ocean to the southwest.

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Legend

- Bell-Bell Gardens System
- County Boundary

N

0 1 2 3 4

Miles

Kennedy/Jenks Consultants

Golden State Water Company
2015 Urban Water Management Plan

Groundwater Basin Map

K/J 1570027.00
July 2016

Figure 6-1

The groundwater wells in the system meet all current California Title 22 drinking water standards. However, the Bell-Bell Gardens System is impacted by VOC and manganese (Mn) contamination. The VOCs include trichloroethylene (TCE), tetrachloroethylene (PCE), and 1,2-dichloroethane (1, 2-DCA). Maximum Contaminant Levels (MCLs) for PCE and TCE are exceeded at Gage No. 2 and Watson No. 1 wells. As a result, Granular Activated Carbon (GAC) treatment plants are in use at the Watson and Gage plant sites. At Otis Well No. 3 and Watson No. 1, 1,4-dioxane has exceeded the notification level of 1 ppb. According to DDW regulations, there are no actions needed at this time for 1,4-dioxane removal.

Concentrations of Mn exceeding the Secondary MCL of 50 µg/L have been observed at Bissell No. 2. Pyrolusite filtration is applied for manganese removal, however, Bissel No. 2 is currently offline. Bissell No. 3 also has manganese levels very close to the Secondary MCL and is currently running through the treatment plant for Bissell No. 2 while it is offline. Otis Well No. 3 has manganese levels just below the Secondary MCL and may need treatment in the future.

6.2.2 Groundwater Management

CWC 10631

(b) *...If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

(1) *A copy of any groundwater management plan adopted by the urban water supplier... or any other specific authorization for groundwater management.*

(2) *...For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.*

In 1965, the Central Basin was adjudicated in the case *Central and West Basin Water Replenishment District vs. Charles E. Adams, et al* (Superior Court, County of Los Angeles, Case No. 786656). The Central Basin Judgment (Appendix H) limits the amount of groundwater each party can extract annually from the Basin. This limit is referred to as the "Allowed Pumping Allocation" (APA), which is a fraction of each party's water rights and is monitored by a court-appointed Watermaster. The Watermaster administers and enforces the terms of the Judgment and reports annually to the Court on significant groundwater-related events that occur in the Basin. In 2013, the Third Amended Judgment was accepted by the Court. The Third Amended Judgment modified the structure of the Watermaster from being administered by DWR to a three panel structure: an administrative body administering Watermaster accounting and reporting, a water rights panel made up of seven water right holders, and a storage panel. The amendment now allows storage in the basin by the water right holders. The Court retained jurisdiction to monitor ongoing management of the Basin, including the conjunctive use of Basin storage space, to assure the Basin will be capable of supplying sufficient water to meet local needs, including future growth and development.

The Central Basin adjudication limit for groundwater extraction across the entire basin is 217,367 AFY. GSWC maintains an APA of 16,439 AFY. GSWC's APA is shared between all of their systems that extract groundwater from the Central Basin: Norwalk, Florence-Graham, Hollydale, Willowbrook, Artesia, Bell-Bell Gardens, and portions of the Southwest System. GSWC reports total groundwater extractions (on a per-well basis) to the Watermaster.

Three agencies, LACDPW, WRDSC, and CBMWD, work with the water producers to ensure that the APA is available to the pumpers in the Central Basin. LACDPW operates and maintains

the Rio Hondo and San Gabriel spreading grounds in the Montebello forebay. LACDPW diverts and recharges storm flows from the Rio Hondo and San Gabriel Rivers, highly treated wastewater from the LACSD (Whittier and San Jose Wastewater Reclamation Plants), and purchased water from Metropolitan (including both State Water Project water and Colorado River water). LACDPW, in conjunction with Orange County Water District, operates and maintains the Alamitos Barrier Project to recharge imported water into this injection barrier, which is designed to prevent seawater intrusion into the Central Basin. WRDSC collects a replenishment assessment from all groundwater producers in the Basin to pay for water supplies to replenish the Basin. Annually, by statute, WRDSC is required to determine replenishment requirements. WRDSC pays CBMWD for imported and recycled water for recharge into the Central Basin.

Under the Sustainable Groundwater Management Act of 2014, the Central Basin is exempted from the requirements to form a Groundwater Sustainability Agency (SGMA) since it is an adjudicated basin.

6.2.3 Overdraft Conditions

CWC 10631

(b)(2) *For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.*

Prior to adjudication, groundwater supply in the Central Basin was threatened by overdraft and seawater intrusion. The overdraft has since been stopped as groundwater extraction is now limited by the Judgment.

6.2.4 Historical Groundwater Pumping

CWC 10631

(b)*...If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

(3) *A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Table 6-0 lists the wells, along with the well capacity, status, and water quality assessment for the Bell-Bell Gardens System. GSWC's Bell-Bell Gardens System currently has a total active normal year well capacity of 6,950 gpm (11,220 AFY).

Table 6-0: Well Name and Capacity, and Water Quality Assessment						
Well	**Design Well Capacity (gpm)[1]**	**Design Well Capacity (AFY)**	**Status**	**Water Quality Issue/Concern**	**Existing Treatment**	**Recommendation**
Bissell No. 2[2]	0	0	Offline	Mn, sand	Pyrolusite	Solve sand issue
Bissell No. 3	2,000	3,226	Active	Mn		Mn Treatment
Clara No. 2	1,000	1,613	Active	None	None	
Gage No. 1[3]	0	0	Inactive			
Gage No. 2	1,000	1,613	Active	PCE, TCE	GAC	Continue Treatment
Otis No. 3	1,000	1,613	Active	Mn	None	Mn Treatment
Priory No. 2[3]	0	0	Inactive			
Watson No. 1	950	1,532	Active	TCE, PCE	GAC	Continue Treatment
Total Capacity	**6,950**	**11,220**				

Note:
1. Design well production capacity is provided; actual and annual average pumping capacity may vary for each well.
2. Bissell Well No. 2 – currently offline, but future plans to repair and bring back to service at a lower capacity
3. Gage Well No. 1 and Priory Well No. 2 are abandoned and scheduled to be destroyed

GSWC has historically obtained leases to augment its APA in the Central Basin, averaging 4,190 AFY from 1999 to 2015. Leases for additional groundwater in the Central Basin are renewed annually, on an as-needed basis, and after an evaluation of the economic benefits to their rate payers. The Central Basin Watermaster tracks the total unused APA from all users in the Central Basin. Since 2004, between 27,392 and 61,067 AFY of available APA has not been pumped each year. A portion of this unpumped water could be available for GSWC to lease, on an annual basis, to augment their Central Basin APA and support overall water supply reliability. Water transfers and exchanges may also be undertaken as part of conjunctive use storage programs to be developed.

Table 6-1 shows the groundwater pumping history for the Bell-Bell Gardens System from calendar years 2011 through 2015. The total groundwater pumping for the Bell-Bell Gardens System has ranged from 4,619 AFY to 5,280 AFY. Pumping amounts have generally been consistent over the last 5 years, with a decrease in 2015 likely attributable to statewide mandatory demand reduction regulations. With this exception, there were no limitations or challenges for obtaining groundwater during the last 5 years, and the available groundwater quantity was sufficient.

Table 6-1: Groundwater Volume Pumped						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Central Basin of Coastal Plan of Los Angeles County	4,832	5,280	5,150	4,973	4,618
	TOTAL	4,832	5,280	5,150	4,973	4,618
NOTES: Volume is in AF						

6.3 Surface Water

The Bell-Bell Gardens System purchases surface water through CBMWD, but does not self-supply surface water. Therefore this section is left blank.

6.4 Stormwater

In the Bell-Bell Gardens System service area, stormwater is managed by the City of Bell and GSWC does not have infrastructure for beneficial reuse of stormwater. Therefore, this section is left blank.

6.5 Wastewater and Recycled Water

6.5.1 Recycled Water Coordination

> ***CWC 10633***
>
> *The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.*

CBMWD, acting as the recycled water wholesaler, is the lead agency in implementing the recycled water plan and distribution network. GSWC provides data to CBMWD and Los Angeles County for use in planning a potential recycled water distribution system expansion, and identifying additional recycled water customers.

The Sanitation District of Los Angeles County (LACSD) provides a reliable supply of recycled water that meets California recycled water quality standards set forth in Title 22 of the California Code of Regulations.

6.5.2 Wastewater Collection, Treatment, and Disposal

> ***CWC 10633***
>
> ***(a)*** *(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*
>
> ***CWC 10633***
>
> ***(b)*** *(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

Wastewater in the Bell-Bell Gardens System is collected by gravity sewers and lift stations owned by the City of Bell Gardens, and LACSD. The wastewater is transported through trunk sewers to LACSD's Los Coyotes Water Reclamation Plant (WRP) in Cerritos for treatment.

The Los Coyotes WRP provides primary, secondary, and tertiary treatment for an average dry weather flow (DWF) design capacity of 37.5 million gallons of wastewater per day (mgd). The plant serves a population of approximately 370,000 people. Of the total water treated, over 21.2 mgd of purified water is reused at more than 270 reuse sites. The uses for recycled water include irrigation of schools, golf courses, parks, nurseries and greenbelts, as well as industrial

use at local companies for carpet dying and concrete mixing. The remaining effluent (approximately 19 mgd in 2015) is discharged into the San Gabriel River (LACSD 2016).

Because the Los Coyotes WRP treats wastewater for a larger population than exists in the Bell-Bell Gardens service area, an estimated per capita wastewater generation factor was used to calculate the volume of wastewater generated by the customers in the Bell-Bell Gardens System for Table 6-2. The wastewater generation factor is based on the populations served and the average DWF for the treatment plant. The Los Coyotes WRP serves approximately 370,000 residents and treated 24.41 mgd in 2015, making the average per capita wastewater generation factor for the Los Coyotes WRP 66 gpd.

Table 6-2: Wastewater Collected Within Service Area in 2015

Wastewater Collection			Recipient of Collected Wastewater		
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Estimated	4,320	Sanitation Districts of Los Angeles County	Los Coyotes Water Reclamation Plant	No
Total Wastewater Collected from Service Area in 2015:		4,320			

NOTES: Volume is in AFY

Currently, the wastewater that is collected and treated by the Los Coyotes WRP is either recycled or discharged into the unlined portions of the San Gabriel River. The discharge point is not located within the Bell-Bell Gardens System service area, therefore Table 6-3 is left blank.

All of the effluent from Los Coyotes WRP is treated to meet Title 22 recycled water standards, however, out of the total 24.41 mgd wastewater effluent in 2015, only approximately 5.69 mgd (23 percent) was actively reused throughout the region. Approximately 126 AFY (0.10 mgd) was actively reused within the Bell-Bell Gardens System service area. While it is not considered an active recycled water use, the majority of the water that is discharged into the San Gabriel River will contribute to groundwater recharge through the river bed.

Table 6-3: Wastewater Treatment and Discharge Within Service Area in 2015

☑	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
					Total	0	0	0	0

NOTES:

6.5.3 Recycled Water System

CWC 10633

(c) *(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

CBMWD acquires, controls, distributes, and sells recycled water to several cities, agencies, and customers in the greater Los Angeles area. CBMWD owns and operates the recycled water distribution infrastructure in its service area. The Bell-Bell Gardens System currently receives recycled water from CBMWD as part of the district's Central Basin Recycled Water Project (CBRWP). CBRWP consists of two interconnected distribution systems (the E. Thornton Ibbetson Century Recycled Water Project and the Esteban Torres Rio Hondo Recycled Water Project). CBRWP receives reclaimed water from LACSD's Los Coyotes WRP as well as the San Jose Creek WRP, which does not supply recycled water to the Bell-Bell Gardens System. In addition to GSWC, CBRWP provides recycled water to more than 150 industrial, commercial, and landscape irrigation sites throughout southeast Los Angeles County.

CBMWD owns two existing recycled water pipelines that fall within the boundaries of the Bell-Bell Gardens System, but does not currently have plans to expand its recycled water distribution network to reach any more of GSWC's Bell-Bell Gardens customers. One of the existing recycled water lines is located in the City of Bell and runs the length of Otis Avenue (from Florence Avenue to Randolph Street) and continues on Randolph Street (from Otis Avenue to Bear Avenue). The pipeline is a main distribution line that carries recycled water to the north of the City of Bell. However, within the boundaries of GSWC's Bell-Bell Gardens System, the pipeline alignment mostly runs through residential areas, and there are currently no potential recycled water customers located immediately along this alignment. However, there are potential customers located within a one-mile radius which could be connected to the recycled water pipeline if, and when, funding to construct recycled water laterals becomes available. If CBMWD does make plans to construct recycled water laterals in this area, the additional recycled water demand will need to be updated in future UWMPs for the Bell-Bell Gardens System.

The second existing recycled water line is located in the City of Bell Gardens. The recycled water line is the terminus of a main distribution line that travels north along the border between the cities of South Gate and Downey. Within the boundaries of GSWC's Bell-Bell Gardens System, the pipeline bisects John Ford Park and runs the length of Park Lane (from Scout Avenue to Garfield Avenue). The average recycled water use from 2005 through 2015 was 138 AFY. During this time period, the maximum recycled water used was 156 AFY in 2005. The maximum (156 AFY) is categorized as the existing potential recycled water use for the Bell-Bell Gardens System, given that this demand was met 2005.

6.5.4 Potential Recycled Water Beneficial Uses

CWC 10633

(d) *(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

CWC 10633

(e) *(Describe) the projected use of recycled water within the supplier's service area at the end of 5,10,15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

6.5.4.1 Current and Planned Uses of Recycled Water

In 2015, about 126 AF of recycled water was used within the Bell-Bell Gardens System. Development of additional recycled water usage in the Bell-Bell Gardens System is the responsibility of CBMWD, the Cities of Bell and Bell Gardens, and GSWC.

CBMWD and the City of Bell Gardens are investigating options to expand the recycled water supply into the City. Central Basin plans to extend an existing 16-inch pipeline that runs through the Bell-Bell Gardens System service area to connect Suva Elementary School. CBMWD also plans to add an 8-inch pipeline along Emil Avenue from Florence Avenue to connect Bell Gardens Veterans Park. The intended recycled water customers, Suva Elementary School and Bell Gardens Veterans Park, are both outside of the GSWC Bell-Bell Gardens System service area.

Within the GSWC Bell-Bell Gardens System service area, CBMWD does not plan to expand its recycled water distribution networks at this time. However, of the six existing recycled water connections, four connections are for the City of Bell Gardens Department of Public Works. In addition to the recycled water connections, the Department of Public Works has other potable water connections that are classified as irrigation lines and are located along the recycled water pipeline alignment. There is a potential, therefore, to convert this potable water use into an additional recycled water use for the Bell-Bell Gardens System; thereby reducing the demand on potable water supplies.

Based on historical usage records, the average water use for the Public Works' potable water irrigation connections was 20 AFY; this volume is categorized as the additional potential recycled water use for the Bell-Bell Gardens System. The total potential recycled water use in the future for the Bell-Bell Gardens System would likely not occur before 2020; therefor in 2020 it is the existing potential recycled water use (212 AFY) and beginning in 2025 it is the sum of the existing potential recycled water use plus the additional potential recycled water use (20 AFY) for a total of 232 AFY, as summarized in Table 6-4.

Table 6-4: Current and Projected Retailers Provided Recycled Water Within Service Area*									
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Agency Producing (Treating) the Recycled Water:		Sanitation Districts of Los Angeles County							
Name of Agency Operating the Recycled Water Distribution		Central Basin Municipal Water District							
Supplemental Water Added in 2015									
Source of 2015 Supplemental Water									
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)
Landscape irrigation (excludes golf courses)	Existing Customers	Tertiary	126	156	176	176	176	176
		Total:	126	156	176	176	176	176
IPR - Indirect Potable Reuse									
NOTES: 1. Volume is in AFY. 2. Projected (2020-2040) recycled water use based on the existing potential recycled water demand and additional potential demand.									

Metropolitan has partnered with LACSD since 2010 to investigate the technical and regulatory constraints of indirect potable reuse (IPR) and estimate approximate costs associated with a system. In September 2015, representatives gave a presentation to Metropolitan's Board of Directors, detailing the potential to develop an IPR water supply to recharge groundwater basins similar to the Orange County Water District's Groundwater Replenishment System. For additional information on the presentation, the program and potential recycled water use see the CBMWD 2015 UWMP

6.5.4.2 Planned Versus Actual Use of Recycled Water

CWC 10633

(e) *(Provide) a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

Due partly to the economic downturn and a plateau in demand, the actual volume of recycled water delivered in the Bell-Bell Gardens System was 126 AF in 2015, which was lower than the demand projected in the 2010 UWMP (see Table 6-5).

Table 6-5: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual		
☐	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.	
Use Type	2010 Projection for 2015	2015 actual use
Landscape irrigation (excludes golf courses)	130	126
Total	130	126
NOTES: Volume is in AF		

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

CWC 10633

(f) *(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

CWC 10633

(g) *(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

GSWC provides data to CBMWD for planning system expansion and identifying potential recycled water customers. Once identified, GSWC works with the wholesaler in explaining the benefits of using recycled water. CBMWD would then lead the way in securing a contract and implementing retro-fit installations for conversion to recycled water.

GSWC participates in the local workshops held by the wholesalers, and distributes conservation materials and literature including a discussion of recycled water and its benefits at local community events. GSWC has developed a special recycled water tariff approved by the CPUC which allows recycled water to be sold at a discount from the potable water rates.

Table 6-6 provides a summary of the actions performed by GSWC to encourage recycled water use and the resulting projected use. For the Bell-Bell Gardens System, the assumption is that the financial incentives of using recycled water account for 100 percent of the recycled water sales in the system. The CPUC encourages recycled water use and is currently conducting a proceeding to evaluate targets for recycled water use and potential penalties for not participating in the program. Additional program actions, such as this, may support increased recycled water use within the service area in the future.

Table 6-6: Methods to Expand Future Recycled Water Use

☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
6-12	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	0
NOTES:			

6.6 Desalinated Water Opportunities

CWC 10631

(h) *Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

Wholesalers providing water to the Bell-Bell Gardens System are actively pursuing seawater desalination projects. Water produced by these desalination projects would increase the total available water supply for the wholesalers and would, in-turn, improve the reliability of water supply for the Bell-Bell Gardens System. However, it is not possible at this point to quantify the amount of desalinated water that would be available for the GSWC's Bell-Bell Gardens System. The following discussion summarizes the desalination plans of water wholesalers.

Metropolitan and its member agencies view seawater desalination as a component of a diversified water supply portfolio. Recent and continuous breakthroughs in membrane technology have helped to reduce desalination costs, leading to the consideration of desalination among the alternative resource options outlined in Metropolitan's 2010 Integrated Resources Plan (IRP) Update. This updated plan describes a diversified regional strategy to include recycled water, groundwater recharge, and seawater desalination in its portfolio of methods to ensure robust water supply reliability. In 2001, Metropolitan established the Seawater Desalination Program to encourage its member agencies to develop desalination projects, and in the 2004 IRP Update established a target goal of up to 150,000 AFY of desalination capacity from its retailers by 2025. In 2014, Metropolitan included desalination projects in its Local Resources Program. This is an important component of the total estimated water supply production for the region. (Metropolitan, 2016)

Metropolitan is also involved in efforts to assess current desalination projects and to compare project features and applicability to Southern California. Furthermore, Metropolitan, in association with member agencies, is involved in assessing established and emerging desalination treatment technologies, pretreatment alternatives, and brine disposal issues, as well as the permitting and regulatory approvals associated with the delivery of desalinated seawater to regional and local distribution systems. (Metropolitan, 2016)

CBMWD is land locked without direct access to the ocean and therefore does not view desalination as a practical nor economically feasible water supply option at this time. Additionally, seawater barriers are not employed within CBMWD's service area, so recovery and desalination of brackish groundwater is not a viable potential water resource. However, CBMWD could provide financial assistance to other SWP contractors or wholesalers such as WBMWD in the construction of their seawater desalination facilities in exchange for SWP supplies.

6.7 Exchanges or Transfers

CWC 10631

(d) *Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

No specific transfer or exchange opportunities have been identified in the Bell-Bell Gardens System at this time, and there are no anticipated sales to other agencies for the Bell-Bell Gardens System.

6.7.1 Emergency Interties

The Bell-Bell Gardens System has the following emergency connections:

- The City of Huntington Park with a capacity of 750-1,000 gpm.
- Maywood Mutual Water Company No. 3 with a capacity of 750-1,000 gpm.
- The City of Bell-Bell Gardens with a capacity of 1,500 gpm.

There is also an emergency connection with Tract 180 Water Company, however, the connection only supplies Tract 180 Water Company; GSWC does not receive water from Tract 180 Water Company.

6.8 Future Water Projects

CWC 10631

(g) *...The urban water supplier shall include a detailed description of expected future projects and programs... that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

Table 6-7: Expected Future Water Supply Projects or Programs

☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.
6-14	Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
NOTES:						

GSWC plans to purchase and store water in the Central Basin in accordance with the Third Amended Judgment. Implementation of storage programs may involve constructing new wells and other infrastructure improvements. In addition, GSWC will construct new wells, pipelines, and treatment systems as part of its normal operations and maintenance. Such efforts are part of GSWC's ongoing Capital Investment Program to maintain its supply and meet distribution system requirements.

A potential long-term water supply transfer opportunity that GSWC is evaluating is the Cadiz Valley Water Conservation, Recovery and Storage Project (Cadiz Project). The project is designed to capture and conserve thousands of acre-feet of native groundwater currently being lost to evaporation through an aquifer system beneath Cadiz's property in eastern San Bernardino County, California. By implementing established groundwater management practices, the project will create a new, sustainable annual water supply for project participants. In addition, the project offers storage capacity that can be used by participants to carry-over – or "bank" – annual supplies, without the high rates of evaporative loss suffered by local surface reservoirs.

The Cadiz Project will produce up to 50,000 AFY for fifty years. GSWC is one of five entities that have expressed an interest in receiving water from the project. In 2009, GSWC signed a letter of intent to purchase up to 5,000 AFY and committed to paying a share of the cost of the project's environmental evaluation. GSWC continues to evaluate the economics and technical feasibility of this project.

6.9 Summary of Existing and Planned Sources of Water

CWC 10631

(b) *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision 10631 (a).*

(4) *(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

As described in the preceding sections, GSWC currently obtains its water supply for the Bell-Bell Gardens System from three sources: GSWC-operated groundwater wells, imported water, and recycled water. Imported water is purchased from CBMWD, which obtains its imported water supply from Metropolitan. Recycled water is also supplied by CBMWD. GSWC operates several groundwater wells within the Bell-Bell Gardens System, and has adjudicated allowed groundwater pumping allocation in the Central Basin. In addition to adjudicated groundwater pumping rights, GSWC also has the ability to lease groundwater rights when they are available. Table 6-8 summarizes the actual water supplied to GSWC for the Bell-Bell Gardens System in 2015.

Table 6-9 summarizes the planned water supplies available to GSWC for the Bell-Bell Gardens System that will meet their projected water demands during normal water year conditions. The availability of water from each source is estimated through the year 2040, in accordance with GSWC's long-term water supply planning projections and those of its wholesale suppliers. GSWC's groundwater rights and future leases within the Central Basin are shared among all GSWC's systems in the basin. Therefore, the actual pumping amounts for wells in each of their systems could vary based on GSWC's overall system management. Access to local groundwater and purchased water affords GSWC flexibility to meet demands in all systems. In addition to GSWC's APA in the Central Basin, GSWC also has the ability to annually lease groundwater rights, if needed and available. Leased groundwater quantities are determined annually for all GSWC systems that obtain groundwater from the basin. While quantifiable estimates of groundwater leases are not available for future years, projections are based on historical pumping amounts, including leased groundwater, and assume that available unpumped groundwater will continue to be available as in the past.

GSWC's water supply is projected to increase by approximately 23 percent from 2015 to 2040 to meet projected water demands which will be met by groundwater, the expected implementation of conjunctive use groundwater storage programs, and by imported water.

Table 6-8: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015	
May use each category multiple times.		Actual Volume	Water Quality
Purchased or Imported Water	CBMWD	13	Drinking Water
Groundwater	Central Basin of Coastal Plan of Los Angeles County	4,618	Drinking Water
Recycled Water	CBMWD	126	Recycled Water
	Total	4,757	
NOTES: Volume is in AF			

Table 6-9: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*				
May use each category multiple times.		**2020**	**2025**	**2030**	**2035**	**2040** *(opt)*
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Add additional rows as needed						
Purchased or Imported Water	CBMWD	518	565	610	656	702
Groundwater	Central Basin	5,000	5,000	5,000	5,000	5,000
Recycled Water	CBMWD	156	176	176	176	176
	Total	5,674	5,741	5,786	5,832	5,878
NOTES: Volume is in AF						

For 2015, imported water made up less than 1 percent of the available supply, whereas approximately 97 percent of the supply was from GSWC groundwater pumping and 2 percent was provided by recycled water sources. In future years, the imported water supply may be as great as 20 percent or higher depending on groundwater allocations, the availability to lease additional groundwater rights, and groundwater quality considerations. Therefore, GSWC is actively pursuing the availability of a reliable, cost effective supply of imported water through the implementation of conjunctive use storage programs in the Central Basin. Storage programs could utilize water purchased from CBMWD or water purchased from other suppliers.

Reference:
KJC, 2016b

Golden State
Water Company
A Subsidiary of American States Water Company

FINAL REPORT

2015 Urban Water Management Plan

Florence-Graham

Corporate Office
630 E. Foothill Blvd.
San Dimas CA 91773

Kennedy/Jenks Consultants

July 2016

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Chapter 3: System Description

3.1 General Description

CWC Section 10631

Describe the service area of the supplier.

The Florence-Graham System is located in Los Angeles County and serves the unincorporated Los Angeles County areas of Florence-Graham, and a portion of the City of Huntington Park. Since 2000, the boundaries of Florence-Graham System have changed. The new service area boundary includes developed and underdeveloped land area to the north of the Florence-Graham System. Figure 3-1 illustrates the service area of the Florence-Graham System. The service area is primarily characterized by residential and commercial areas.

3.2 Service Area Climate

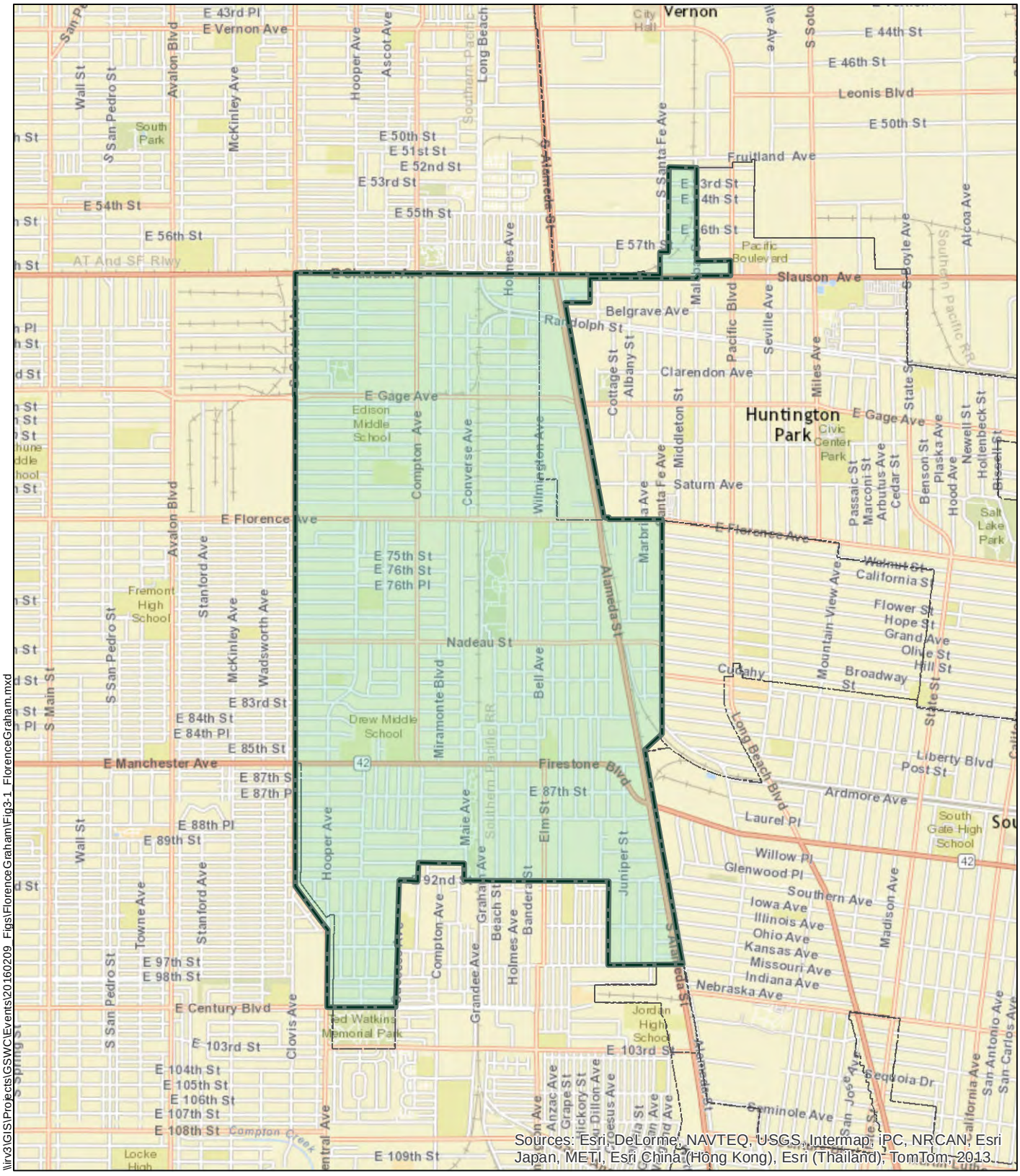
CWC Section 10631

Describe the service area of the supplier, including... climate...

The Florence-Graham System has cool, humid winters and warm, dry summers. Western Regional Climate Center (WRCC) has maintained 30 years of historical climate records for some cities (WRCC 2016). WRCC does not have a station at Florence-Graham and therefore the Los Angeles Downtown USC Campus station, 6 miles from Florence-Graham, was utilized for the climate data analysis. The WRCC's website (www.wrcc.dri.edu) has climate records for the past 138 years for the Los Angeles Downtown USC Campus station.

In the winter, the lowest average monthly temperature is approximately 48 degrees Fahrenheit. The highest average monthly temperature reaches approximately 83 degrees Fahrenheit in the summer. The rainy season is typically from November to March. Monthly precipitation during the winter months ranges from 1 to 4 inches. Low humidity occurs in the summer months from May to October. The moderately hot and dry weather during the summer months typically results in moderately high water demand.

Similar to the WRCC in the Florence-Graham area, the California Irrigation Management Information System (CIMIS) website (http://www.cimis.water.ca.gov) tracks and maintains records of evapotranspiration (ETo) for only a few cities only (DWR 2016b). ETo statistics used for this system come from the Glendale station, which maintains 19 years of climate records. ETo is a standard measurement of environmental parameters that affect the water use of plants. ETo is given in inches per day, month, or year and is an estimate of the evapotranspiration of a large field of well-watered, cool-season grass that is 4- to 7-inches tall. Figure 3-2 presents the monthly average precipitation, ETo, maximum temperature, and minimum temperature. As the figure indicates, a greater quantity of water evaporated during July and August in correlation to high temperatures and low humidity, which may result in high water demand.



\\ir\3\GIS\Projects\GSWC\Events\20160209_Figs\FlorenceGraham\Fig3-1_FlorenceGraham.mxd

Legend

- Florence Graham System Boundary
- City Boundary

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Golden State Water Company
2015 Urban Water Management Plan

Florence-Graham System Service Area

K/J 1570027.00
July 2016

Figure 3-1

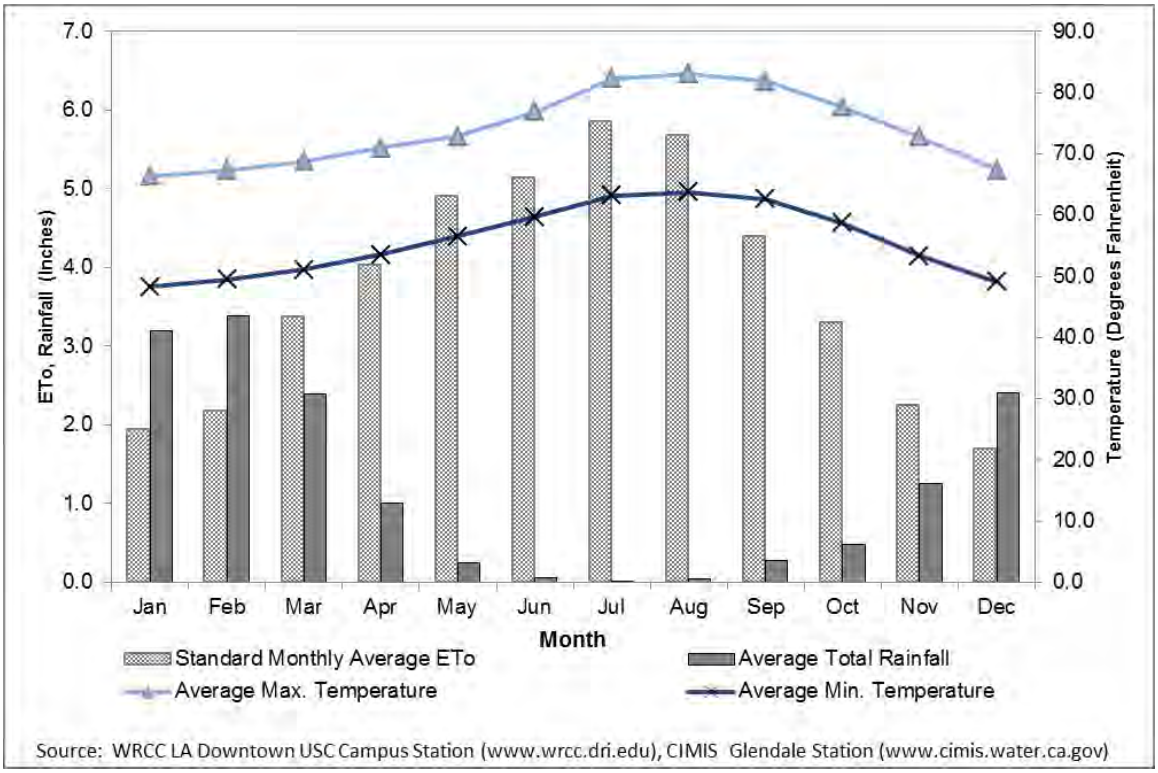


Figure 3-2: Monthly Average Climate Data in Florence-Graham System

3.3 Service Area Population and Demographics

CWC Section 10631

Describe the service area of the supplier, including current and projected population ...The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

In 2015 the estimated population of the Florence-Graham service area was 65,559, according to the DWR Population Tool and methodology described in Chapter 5. The following sections discuss population and other demographics that will influence water use.

3.3.1 SCAG Population Projection Development Methodology

Population, housing, and employment projections were developed for the Florence-Graham System using the Southern California Association of Governments (SCAG) population, housing, and employment data. SCAG updated its projections in 2012 for population, household, and employment growth through the year 2035 using 2010 U.S. Census data (SCAG 2012). SCAG's methodology is described below, followed by the derivation of population projections for the Florence-Graham System. Similar to the 2010 UWMP projections, the population projections use 2010 U.S. Census data.

The SCAG is a regional planning agency that provides demographic and economic data analysis for Imperial County, Los Angeles County, Orange County, Riverside County, San Bernardino County, and Ventura County. SCAG's Integrated Growth Forecasting process uses

a variety of estimates and projections from the federal and state governments. Sources include the U.S. Department of Labor, Internal Revenue Service (IRS), U.S. Citizenship and Immigration Services, U.S. Department of Health and Human Services, California Department of Finance (DOF), California Employment Development Department, and information received through the Intergovernmental Review process. On a regional level, the SCAG forecast uses a cohort component model to project birth and death rates based on demographic factors and estimates migration based on economic fluctuations. Projected growth of an individual jurisdiction is assumed to be proportionate to the jurisdiction's historic contribution to county growth.

A detailed explanation of the population, household and employment projection process employed by SCAG can be found in the report: "Growth Forecast", a supplemental report to the SCAG "Regional Transportation Plan, 2012-2035".

3.3.2 Historical and Projected Population

SCAG city-level projections were used to determine projected population from 2020 to 2040. The Florence-Graham System serves the unincorporated Los Angeles County areas of Florence-Graham, and portions of the Cities of Huntington Park, South Gate, and Vernon. The SCAG historic growth rate for the City of South Gate more closely matches that of the Florence-Graham System's historic population growth rate than that for the surrounding cities or unincorporated areas. Therefore, the SCAG growth rate for 2015 through 2035 for the City of South Gate was used to project the population, household, and employment of the Florence-Graham System. This methodology applies the SCAG growth rate to a consistent system boundary through 2040; therefore, it is assumed that the projected population accounts for system in-fill only and does not include geographic growth such as tariff area expansion. Table 3-1 presents the current and projected population for the Florence-Graham System.

Table 3-1: Population – Current and Projected

Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	65,559	67,487	69,389	71,345	73,355	75,423

NOTES:
1. 2015 population estimated using the DWR Online Population Tool.
2. Projected population based on SCAG population growth rate for the City of South Gate.

3.3.3 Other Demographic Factors

CWC 10631

Describe the service area of the supplier, including...other demographic factors affecting the supplier's water management planning.

The City of South Gate was chosen as demographically representative of the Florence-Graham System. According to 2010 U.S. Census Data, the median age of South Gate's residents is 29.4 years. The City of South Gate has an average household size of 4.05 and a median household income of approximately $43,526 in 2014 dollars (2010-2014 American Community Survey 5-Year Estimates).

According to SCAG data for South Gate, population is expected to increase by a total of 17 percent from 2008 to 2035, which translates to a 0.6 percent growth rate per year. The number of households is expected to grow 12 percent during the same period, which equates to an annual household growth rate of 0.4 percent. Employment is expected to grow five (5) percent during the same period, which equates to an annual employment growth rate of 0.2 percent.

Chapter 6: System Supplies

This chapter addresses the water supply sources of the Florence-Graham System of GSWC. GSWC currently obtains its water supply for the Florence-Graham System from local groundwater and imported water from the Central Basin Municipal Water District (CBMWD).

6.1 Purchased and Imported Water

CBMWD is a large purveyor of water in Southern California that provides water to several agencies including GSWC. GSWC obtains water from CBMWD for several systems, including the Florence-Graham System. CBMWD obtains its imported water supply from the Metropolitan Water District of Southern California (Metropolitan). Water imported from the CBMWD is delivered to the Florence-Graham System through the following connections:

- Metropolitan CB-5 connection with a capacity of 2,244 gpm
- Metropolitan CB-6 connection with a capacity of 5,628 gpm
- Metropolitan CB-12 connection with a capacity of 1,795 gpm

These connections have a combined active design capacity of 9,425 gpm. Between 2011 and 2015, purchased water quantities ranged from 491 AFY to 2,021 AFY. It should be noted that the connection capacity to deliver imported water to GSWC is significantly higher than the projected imported water supply that is expected to meet normal year demands.

GSWC entered into a 5-year purchase agreement between GSWC and CBMWD effective January 1, 2008 through December 31, 2012. The agreement was extended an additional two years to December 31, 2014. The purchase agreement established Tier 1 water purchase limits, shared by all of GSWC's systems served by CBMWD. The Tier 1 annual maximum was 90 percent of the Base Allocation of 12,691 AFY, equal to 11,422 AFY, with a total 5-year commitment of 38,073 AF. The agreement stipulated that the purchase commitment for the 5-year period was 60 percent of the Base Allocation over the 5-year period (60% X 5 years X 12,691 = 38,073 AF). Effective January 1, 2015, CBWMD entered into a new 10-year purchase agreement with Metropolitan, through December 31, 2024. CBMWD did not enter into purchased water agreements with its customer agencies but instead staff proposed Tier 1 budgets for each agency establishing annual Tier 1 water purchase limits.

Metropolitan and CBMWD are responsible for meeting all drinking water standards as water leaves the surface water treatment plant and at inter-connections CB No. 5, CB No. 6, and CB No. 12 with the Florence/Graham System.

6.2 Groundwater

The Florence-Graham System is supplied by seven active, GSWC-owned wells in the Central Basin of the Coastal Plain of Los Angeles Groundwater Basin.

6.2.1 Basin Description

CWC 10631

(b) *If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

(2) *A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.*

The Central Subbasin of the Coastal Plain of Los Angeles Groundwater Basin in Los Angeles County, commonly referred to as the "Central Basin", is shown on **Figure** 6-1. The Florence-Graham System's wells are located within the adjudicated Central Basin Watermaster Service Area overlies, which overlies approximately 227 square miles in the southeastern part of the 277 square mile Central Basin. The Central Basin Watermaster Service Area is bounded by the Newport-Inglewood Uplift on the southwest, the Los Angeles-Orange County line on the southeast, and an irregular line that approximately follows Stocker Street, Martin Luther King Boulevard, Alameda Street, Olympic Boulevard, the boundary between the City of Los Angeles and unincorporated East Los Angeles, and the foot of the Merced and Puente Hills on the north. Twenty-three incorporated cities and several unincorporated areas are found within the Watermaster Service Area. Within the Central Basin, groundwater provides a significant portion of the water supply (DWR, 2013).

The Central Basin is subdivided into four areas: The Los Angeles Forebay, the Montebello Forebay, the Whittier area, and the Central Basin Pressure Area. The Los Angeles Forebay is located in the northern part of the Central Basin where the Los Angeles River enters the Basin through the Los Angeles Narrows. The Montebello Forebay extends southward from where the San Gabriel River enters the Central Basin through the Whittier Narrows. The Montebello Forebay is considered the most important area of recharge in the Central Basin (DWR, 2004). Both forebay areas have unconfined groundwater conditions and aquifers that extend up to 1,600 feet deep to provide recharge to the aquifer systems of the Central Basin (DWR, 1961). The Whittier area extends south and southwest from the Puente Hills to the axis of the Santa Fe Springs-Coyote Hills uplift. The Whittier area contains up to 1,000 feet of freshwater-bearing sediments (DWR, 2004). The Central Basin pressure area contains many aquifers of permeable sands and gravels separated by semi-permeable to low permeability sandy-clay to clay. Those aquifers in the Central Basin pressure area extend approximately 2,200 feet below the surface (DWR, 1961). Those aquifers in the Whittier area and Central Basin pressure area are generally confined, but areas with semi-permeable aquitards allow some interaction between aquifers (DWR, 2004).

The main freshwater-bearing aquifers are contained within the Holocene alluvium and the Pleistocene Lakewood and San Pedro Formations. The main productive aquifers within the Basin are the Gardena and Gage aquifers in the Lakewood Formation and the Silverado, Lynwood, and Sunnyside aquifers in the San Pedro Formation (DWR, 1961). The Gardena and Gage aquifers are primarily comprised of sand and gravel and have a total maximum thickness of 280 feet (DWR, 2004). Aquifers within the San Pedro Formation are comprised of coarse sand, gravel, and sandy gravel and have a combined maximum thickness of 800 feet (DWR, 2004).

\\ir\3\GIS\Projects\GSWC\Events\20160209_Figs\FlorenceGraham\Fig6-1_FlorenceGraham.mxd

Legend

- Florence Graham System
- County Boundary

N

0 1 2 3 4

Miles

Kennedy/Jenks Consultants

Golden State Water Company
2015 Urban Water Management Plan

Groundwater Basin Map

K/J 1570027.00
July 2016

Figure 6-1

Recharge occurs from percolation of precipitation, stream flow, and return flow of applied waters (e.g. irrigation), from artificial recharge activities at spreading grounds, and injection of imported water into the Alamitos Barrier Project (a seawater intrusion barrier located in the southeastern part of the Basin). Recharge of the Basin occurs in the forebay areas due to the presence of permeable sediments, whereas the pressure area is overlain by less permeable silt and clay units that preclude significant recharge in these areas. Purchased water from Metropolitan and recycled water from the Whittier and San Jose Treatment Plants are used for recharge in the spreading grounds in the Montebello Forebay area. The total groundwater storage capacity of the Central Basin is approximately 13,800,000 AF (DWR, 1961). Groundwater flow is predominantly from the foothills northeast of the Central Basin towards the ocean to the southwest.

The groundwater wells in the system meet all current California Title 22 drinking water standards. However, the Florence-Graham System is impacted by VOC contamination. The Florence-Graham System has detections of carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), tetrachloroethylene (PCE), trichloroethylene (TCE), and perchlorate in excess of the maximum contaminant levels (MCLs). GAC treatment is employed at Converse No. 1, Miramonte Nos. 1, 2 and 3, Nadeau No. 3, and Goodyear No. 4 to address VOC contamination. Ion exchange treatment is employed at Goodyear Well No. 4 and water from Converse Well No. 2 is blended to address perchlorate contamination.

6.2.2 Groundwater Management

CWC 10631

(b) *...If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

(1) *A copy of any groundwater management plan adopted by the urban water supplier... or any other specific authorization for groundwater management.*

(2) *...For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.*

In 1965, the Central Basin was adjudicated in the case *Central and West Basin Water Replenishment District vs. Charles E. Adams, et al* (Superior Court, County of Los Angeles, Case No. 786656). The Central Basin Judgment (Appendix H) limits the amount of groundwater each party can extract annually from the Basin. This limit is referred to as the "Allowed Pumping Allocation" or APA, which is a fraction of each party's water rights, and is monitored by a court-appointed Watermaster. The Watermaster administers and enforces the terms of the Judgment and reports annually to the Court on significant groundwater-related events that occur in the Basin. In 2013, the Third Amended Judgment was accepted by the Court. The Third Amended Judgment modified the structure of the Watermaster from being administered by DWR to a three panel structure: an administrative body administering Watermaster accounting and reporting, a water rights panel made up of seven water right holders, and a storage panel. The amendment now allows storage in the basin by the water right holders. The Court also retained jurisdiction to monitor ongoing management of the Basin, including the conjunctive use of Basin storage space, to assure the Basin will be capable of supplying sufficient water to meet local needs, including future growth and development.

The Central Basin adjudication limit (total of the allowed pumping allocations of each party) for groundwater extraction across the entire basin is 217,367 AFY. GSWC maintains an APA of

16,439 AFY. GSWC's APA is shared between all of their systems that extract groundwater from the Central Basin: Norwalk, Florence-Graham, Hollydale, Willowbrook, Artesia, Bell/Bell Gardens, and portions of the Southwest System. GSWC reports total groundwater extractions (on a per-well basis) to the Watermaster.

Three agencies, LACDPW, WRDSC, and CBMWD, work with the water producers to ensure that the APA is available to the pumpers in the Central Basin. These agencies include the Los Angeles County Department of Public Works (LACDPW), the Water Replenishment District of Southern California (WRDSC), and CBMWD. LACDPW operates and maintains the Rio Hondo and San Gabriel spreading grounds in the Montebello Forebay. LACDPW diverts and recharges storm flows from the Rio Hondo and San Gabriel Rivers, highly treated wastewater from the Sanitation Districts of Los Angeles County (Whittier and San Jose Wastewater Reclamation Plants), and water from Metropolitan (including both State Water Project water and Colorado River water). LACDPW, in conjunction with Orange County Water District, operates and maintains the Alamitos Barrier Project to recharge imported water into this injection barrier, which is designed to prevent seawater intrusion into the Central Basin. WRDSC collects a replenishment assessment from all groundwater producers in the Basin to pay for water supplies to replenish the Basin. Annually, by statute, WRDSC is required to determine replenishment requirements. WRDSC pays CBMWD for imported and recycled water for recharge into the Central Basin.

Under the Sustainable Groundwater Management Act of 2014, the Central Basin is exempted from the requirements to form a Groundwater Sustainability Agency (SGMA) since it is an adjudicated basin.

6.2.3 Overdraft Conditions

CWC 10631

(b)(2) *For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.*

Prior to adjudication, groundwater supply in the Central Basin was threatened by overdraft and seawater intrusion. The overdraft has since been stopped as groundwater extraction is now limited by the Judgment.

6.2.4 Historical Groundwater Pumping

CWC 10631

(b)*...If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

(3) *A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Table 6-0 lists the wells, along with the well capacity, status, and water quality assessment for the Florence-Graham System. GSWC's Florence-Graham System currently has a total active normal year well capacity of 4,600 gpm (7,424 AFY).

Table 6-0: Well Name and Capacity, and Water Quality Assessment

Well	Design Well Capacity (gpm)[1]	Design Well Capacity (AFY)	Status	Water Quality Issue/Concern	Existing Treatment	Recommendation
Converse No. 1	450	726	Active	TCE, CTC, PCE, 1,2-DCA, Perchlorate	GAC, blending	Continue Treatment
Converse No. 2	550	887	Active	None	None	Continue to Monitor
Goodyear No. 4	850	1,372	Active	TCE, Perchlorate	GAC, Ion Exchange	Continue Treatment
Miramonte No. 1	650	1,049	Active	TCE, CTC	GAC	Continue Treatment
Miramonte No. 2	800	1,290	Active	CTC, TCE	GAC	Continue Treatment
Miramonte No. 3	800	1,290	Active	TCE	GAC	Continue Treatment
Nadeau No. 3	500	807	Active	TCE	by-passed	Continue to Monitor
Total Capacity	**4,600**	**7,424**				

Note:
1. Design production capacity is provided; actual and annual average pumping capacity may vary for each well.

GSWC has historically obtained leases to augment its APA in the Central Basin, averaging 4,294 AFY over the last ten years. Since 1991, GSWC has leased up to 7,366 AFY to augment their Central Basin APA. Leases for additional groundwater in the Central Basin are renewed annually, on an as-needed basis, and after an evaluation of the economic benefits to their rate payers. Since 2004, between 27,392 and 61,067 AFY of available APA has not been pumped each year. A portion of this unpumped water could be available for GSWC to lease, on an annual basis, to augment their Central Basin APA and support overall water supply reliability. Water transfers and exchanges may also be undertaken as part of conjunctive use storage programs to be developed.

Table 6-1 shows the groundwater pumping history for the Florence-Graham System from calendar years 2011 through 2015. The total groundwater pumping for the Florence-Graham System between 2010 and 2015 has ranged from 3,099 to 4,560 AFY. Pumping amounts have generally been consistent over the last 5 years. There were no limitations or challenges for obtaining groundwater during the last 5 years, and the available groundwater quantity was sufficient.

Table 6-1: Groundwater Volume Pumped						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Central Subbasin of the Coastal Plain of Los Angeles Groundwater Basin	3,099	3,390	3,616	4,560	3,877
	TOTAL	3,099	3,390	3,616	4,560	3,877
NOTES: Volume is in AF.						

6.3 Surface Water

The Florence-Graham System purchases surface water through CBMWD as described in Section 6.1, but does not self-supply surface water. Therefore, this section is left blank.

6.4 Stormwater

In the Florence-Graham System service area, stormwater is managed by the City of Huntington Park and GSWC does not have infrastructure for beneficial reuse of stormwater. Therefore, this section is left blank.

6.5 Wastewater and Recycled Water

6.5.1 Recycled Water Coordination

> ***CWC 10633***
>
> *The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.*

CBMWD, acting as the recycled water wholesaler, would lead the way in implementing the recycled water plan and distribution network. GSWC provides data to CBMWD and Los Angeles County for use in planning a potential recycled water distribution system expansion, and identifying additional recycled water customers.

The Sanitation District of Los Angeles County (LACSD) provides a reliable supply of recycled water that meets California recycled water quality standards set forth in Title 22 of the California Code of Regulations.

6.5.2 Wastewater Collection, Treatment, and Disposal

CWC 10633

(a) *(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

CWC 10633

(b) *(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

Wastewater in the Florence-Graham System is collected by gravity sewers and lift stations owned by Los Angeles County Sanitation District. The wastewater is transported through trunk sewers to LACSD's Los Coyotes Water Reclamation Plant (WRP) in Cerritos.

The Los Coyotes WRP provides primary, secondary, and tertiary treatment for an average dry weather flow (DWF) design capacity of 37.5 million gallons of wastewater per day (mgd). The plant serves a population of approximately 370,000 people. Of the total water treated, over 21.5 mgd of purified water is reused at more than 270 reuse sites. The uses for recycled water include irrigation of schools, golf courses, parks, nurseries and greenbelts, as well as industrial use at local companies for carpet dying and concrete mixing. The remaining effluent (approximately 19 mgd in 2015) is discharged into the San Gabriel River (LACSD 2016).

Because the Los Coyotes WRP treats wastewater for a larger population than exists in the Florence-Graham System, an estimated per capita wastewater generation factor was used to calculate the volume of wastewater generated by the customers in the Florence-Graham System for Table 6-2. The wastewater generation factor is based on the population served and the average DWF for the treatment plant. The Los Coyotes WRP serves approximately 370,000 residents and treated 24.41 mgd in 2015, making the average per capita wastewater generation factor for the Los Coyotes WRP 66 gpd.

Table 6-2: Wastewater Collected Within Service Area in 2015

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
Los Angeles County Sanitation District	Estimated	7,443	Los Angeles County Sanitation District	Los Coyotes Water Reclamation Plant	No	
Total Wastewater Collected from Service Area in 2015:		7,443				

NOTES: Volume is in AFY.

Currently, the wastewater that is collected and treated by the Los Coyotes WRP is either recycled, or discharged into the unlined portions of the San Gabriel River. The discharge point is not located within the Florence-Graham System service area; therefore, Table 6-3 is left blank.

All of the effluent from Los Coyotes WRP is treated to meet Title 22 recycled water standards, however, out of the total 24.41 mgd wastewater effluent in 2015, only approximately 5.69 mgd (23 percent) was actively reused throughout the region. None of the recycled water was used in the Florence-Graham service area, according to correspondence from LACSD. While it is not

considered an active recycled water use, the majority of the water that is discharged into the San Gabriel River will contribute to groundwater recharge through the river bed.

Table 6-3: Wastewater Treatment and Discharge Within Service Area in 2015

☑	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
							2015 volumes			
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
						Total	0	0	0	0
NOTES:										

6.5.3 Recycled Water System

CWC 10633

(c) *(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

CBMWD acquires, controls, distributes, and sells recycled water to several cities, agencies, and customers in the greater Los Angeles area. CBMWD owns and operates the recycled water distribution infrastructure in its service area. However, recycled water is not currently used or planned to be used in the Florence-Graham System, so this section is intentionally left blank.

6.5.4 Potential Recycled Water Beneficial Uses

CWC 10633

(d) *(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

CWC 10633

(e) *(Describe) the projected use of recycled water within the supplier's service area at the end of 5,10,15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

Metropolitan has partnered with LACSD since 2010 to investigate the technical and regulatory constraints of indirect potable reuse (IPR) and estimate approximate costs associated with a system. In September 2015, representatives gave a presentation to Metropolitan's Board of Directors, detailing the potential to develop an IPR water supply to recharge groundwater basins similar to the Orange County Water District's Groundwater Replenishment System. For additional information on the presentation, the program and potential recycled water use see the CBMWD 2015 UWMP.

Table 6-4: Current and Projected Retailers Provided Recycled Water Within Service Area*

☑	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Agency Producing (Treating) the Recycled Water:	
Name of Agency Operating the Recycled Water Distribution System:	
Supplemental Water Added in 2015	
Source of 2015 Supplemental Water	

Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)
		Total:	0	0	0	0	0	0
IPR - Indirect Potable Reuse								

NOTES:

Table 6-5: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

☑	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.

Use Type	2010 Projection for 2015	2015 actual use
Total	0	0

NOTES:

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

CWC 10633

(f) *(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

CWC 10633

(g) *(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

CBMWD is responsible for determining the technical and economic feasibility of supplying recycled water to the Florence-Graham System. Since there are currently no plans to provide recycled water directly to the Florence-Graham System, there are no actions in place at this time by which GSWC is able to encourage the use of recycled water in the Florence-Graham System. Therefore, Table 6-6 is not applicable for this system and has been intentionally left blank.

Indirect water reuse through groundwater recharge benefits all groundwater users and does not necessitate incentives for customers. Groundwater recharge increases the available potable water supply, keeping the cost of water to consumers lower by decreasing the need to import water or develop new water supply sources.

Table 6-6: Methods to Expand Future Recycled Water Use			
☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
6-10	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	0
NOTES:			

6.6 Desalinated Water Opportunities

CWC 10631

(h) *Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

Wholesalers providing water to the Florence-Graham System are actively pursuing seawater desalination projects. Water produced by these desalination projects would increase the total available water supply for the wholesalers and would, in-turn, improve the reliability of water supply for the Florence-Graham System. However, it is not possible at this point to quantify the amount of desalinated water that would be available for the GSWC's Florence-Graham System. The following discussion summarizes the desalination plans of water wholesalers.

Metropolitan and its member agencies view seawater desalination as a future component of a diversified water supply portfolio. Recent and continuous breakthroughs in membrane technology have helped to reduce desalination costs, warranting the consideration of desalination among alternative resource options outlined in Metropolitan's 2010 Integrated Resources Plan (IRP) Update. This updated plan describes a diversified regional strategy to include recycled water, groundwater recharge, and seawater desalination in its portfolio of methods to ensure robust water supply reliability. In 2001, Metropolitan established the Seawater Desalination Program to encourage its member agencies to develop desalination projects, and in the 2004 IRP Update established a target goal of up to 150,000 AFY of seawater desalination by 2025. In 2014, Metropolitan included desalination projects in its Local Resources Program. This is an important component of the total estimated water supply production for the region. (Metropolitan, 2016)

Metropolitan is also involved in efforts to assess current desalination projects and to compare project features and applicability to Southern California. Furthermore, Metropolitan, in association with member agencies, is involved in assessing established and emerging desalination treatment technologies, pretreatment alternatives, and brine disposal issues, as well as the permitting and regulatory approvals associated with the delivery of desalinated seawater to regional and local distribution systems. (Metropolitan, 2016)

CBMWD is land locked without direct access to the ocean and therefore does not view desalination as a practical nor economically feasible water supply option at this time. Additionally, seawater barriers are not employed within CBMWD's service area, so recovery and

desalination of brackish groundwater is not a viable potential water resource. However, CBMWD could provide financial assistance to other SWP contractors or wholesalers such as WBMWD in the construction of their seawater desalination facilities in exchange for SWP supplies.

6.7 Exchanges or Transfers

CWC 10631

(d) *Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

No specific transfer or exchange opportunities have been identified in the Florence-Graham System at this time, and there are no anticipated sales to other agencies.

6.7.1 Emergency Interties

The system has an emergency connection with the City of Huntington Park, with a capacity of 2,560 gpm.

6.8 Future Water Projects

CWC 10631

(g) *...The urban water supplier shall include a detailed description of expected future projects and programs... that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

Table 6-7: Expected Future Water Supply Projects or Programs

☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.
6-12	Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
NOTES:						

GSWC plans to purchase and store water in the Central Basin in accordance with the Third Amended Judgment. Implementation of storage programs may involve constructing new wells and other infrastructure improvements. In addition, GSWC will construct new wells, pipelines, and treatment systems as part of its normal operations and maintenance. Such efforts are part

of GSWC's ongoing Capital Investment Program to maintain its supply and meet distribution system requirements.

A potential long-term water supply transfer opportunity that GSWC is evaluating is the Cadiz Valley Water Conservation, Recovery and Storage Project (Cadiz Project). The project is designed to capture and conserve thousands of acre-feet of native groundwater currently being lost to evaporation through an aquifer system beneath Cadiz's property in eastern San Bernardino County, California. By implementing established groundwater management practices, the project will create a new, sustainable annual water supply for project participants. In addition, the project offers storage capacity that can be used by participants to carry-over – or "bank" – annual supplies, without the high rates of evaporative loss suffered by local surface reservoirs.

The Cadiz Project will produce up to 50,000 AFY for fifty years. GSWC is one of five entities that have expressed an interest in receiving water from the project. In 2009, GSWC signed a letter of intent to purchase up to 5,000 AFY and committed to paying a share of the cost of the project's environmental evaluation. GSWC continues to evaluate the economics and technical feasibility of this project.

6.9 Summary of Existing and Planned Sources of Water

CWC 10631

(b) *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision 10631 (a).*

(4) *(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

As described in the preceding sections, GSWC currently obtains its water supply for the Florence-Graham System from two primary sources: imported water and GSWC-operated groundwater wells. Imported water is purchased from CBMWD, which obtains its imported water supply from Metropolitan. GSWC operates several groundwater wells within the Florence-Graham System, and has adjudicated allowed groundwater pumping allocation in the Central Basin. In addition to adjudicated groundwater pumping rights, GSWC also has the ability to lease groundwater rights when they are available. Table 6-8 summarizes the actual water supplied to GSWC for the Florence-Graham System in 2015.

Table 6-8: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
May use each category multiple times		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	Central Basin Municipal Water District	827	Drinking Water	
Groundwater	Central Subbasin of the Coastal Plain of Los Angeles Groundwater Basin	3,877	Drinking Water	
	Total	4,704		0
NOTES: Volume is in AF.				

Table 6-9 summarizes the planned water supplies available to GSWC for the Florence-Graham System that will meet their projected water demands during normal water year conditions. The availability of water from each source is estimated through the year 2040, in accordance with GSWC's long-term water supply planning projections and those of its wholesale suppliers. GSWC's groundwater rights and future leases within the Central Basin are shared among all GSWC systems in the basin; therefore, the actual pumping amounts for wells in each of their systems could vary based on GSWC's overall system management. Access to local groundwater and imported water affords GSWC flexibility to meet demands in all of its systems. In addition to GSWC's APA in the Central Basin, GSWC also has the ability to annually lease groundwater rights, if needed and available. Leased groundwater quantities are determined annually for all GSWC systems that obtain groundwater from the basin. While quantifiable estimates of groundwater leases are not available for future years, projections are based on historical pumping amounts, including leased groundwater, and assume that available unpumped groundwater will continue to be available as in the past.

GSWC's water supply is projected to increase by about 27 percent from 2015 to 2040 to meet projected water demands, which will be met by groundwater, the expected implementation of conjunctive use groundwater storage programs, and by imported water. There is no recycled water supply planned for this system.

Table 6-9: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	**Projected Water Supply** *Report To the Extent Practicable*				
May use each category multiple times.		**2020**	**2025**	**2030**	**2035**	**2040** *(opt)*
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	Central Basin Municipal Water District	1,603	1,699	1,797	1,896	1,997
Groundwater	Central Subbasin of the Coastal Plain of Los Angeles Groundwater Basin	4,000	4,000	4,000	4,000	4,000
	Total	5,603	5,699	5,797	5,896	5,997
NOTES: Volume is in AFY.						

Reference:
LACA, 2017

Parcel Details

- Property records are kept at the Headquarters Office
- How frequently is this site updated? (and other FAQs)

Property Information

Assessor's ID No:	6215-002-017
Address:	4570 ARDINE ST SOUTH GATE CA 90280
Property Type:	Commercial / Industrial
Region / Cluster:	29 / 29885
Tax Rate Area (TRA):	15186

- View Assessor Map
- View Index map

Recent Sales Information

Latest Sale Date:

Indicated Sale Price:

Search for Recent Sales

2016 Roll Values

Recording Date:	10/02/2008
Land:	$1,435,627
Improvements:	$99,627
Personal Property:	$0
Fixtures:	$0
Homeowners' Exemption:	$0
Real Estate Exemption:	$0
Personal Property Exemption:	$0
Fixture Exemptions:	$0

- 2016 Annual taxes
- Property tax payment FAQs
- Estimate supplemental taxes

Property Boundary Description

P M 270-94-95 LOT 1

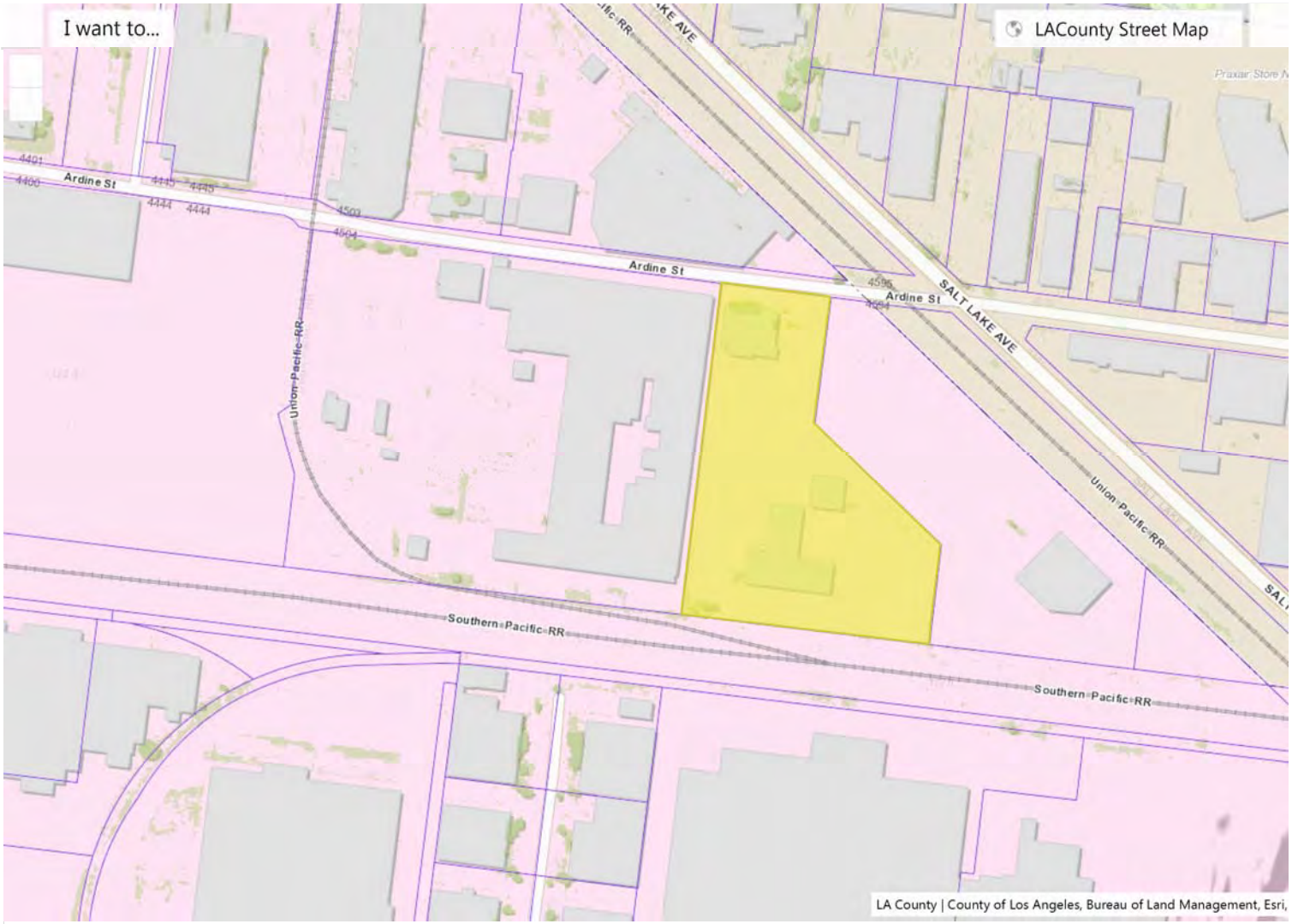
Building Description

Building Improvement 1

Square Footage:	8,082
Year Build / Effective Year Built:	1940 / 1970
Bedrooms / Bathrooms	0 / 0
Units	1

Building Improvement 2

Square Footage:	4,000
Year Build / Effective Year Built:	1956 / 1956
Bedrooms / Bathrooms	0 / 0



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- View Index map

Recent Sales Information

Latest Sale Date:

Indicated Sale Price:

Search for Recent Sales

2016 Roll Values

Recording Date:	10/02/2008
Land:	$1,227,929
Improvements:	$70,156
Personal Property:	$0
Fixtures:	$0
Homeowners' Exemption:	$0
Real Estate Exemption:	$0
Personal Property Exemption:	$0
Fixture Exemptions:	$0

- 2016 Annual taxes
- Property tax payment FAQs
- Estimate supplemental taxes

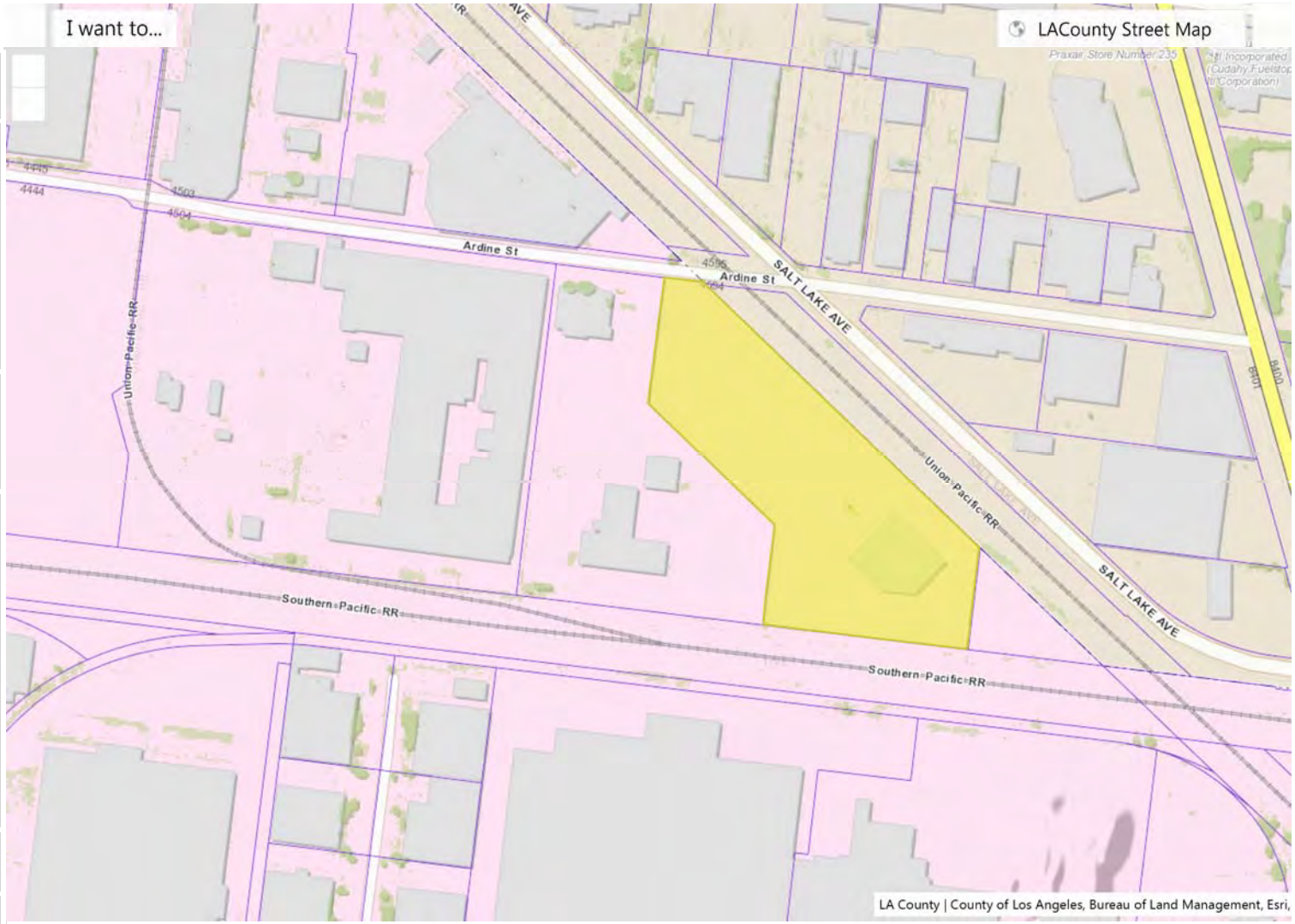
Property Boundary Description

P M 270-94-95 LOT 2

Building Description

Building Improvement 1

Square Footage:	10,712
Year Build / Effective Year Built:	1946 / 1950
Bedrooms / Bathrooms	0 / 0
Units	0



0 100 200ft

Parcel Details

- Property records are kept at the Headquarters Office
- How frequently is this site updated? (and other FAQs)

Property Information

Assessor's ID No:	6215-002-019
Address:	Address Not Available
Property Type:	Vacant Land
Region / Cluster:	29 / 29885
Tax Rate Area (TRA):	15186

- View Assessor Map
- View Index map

Recent Sales Information

Latest Sale Date:

Indicated Sale Price:

Search for Recent Sales

2016 Roll Values

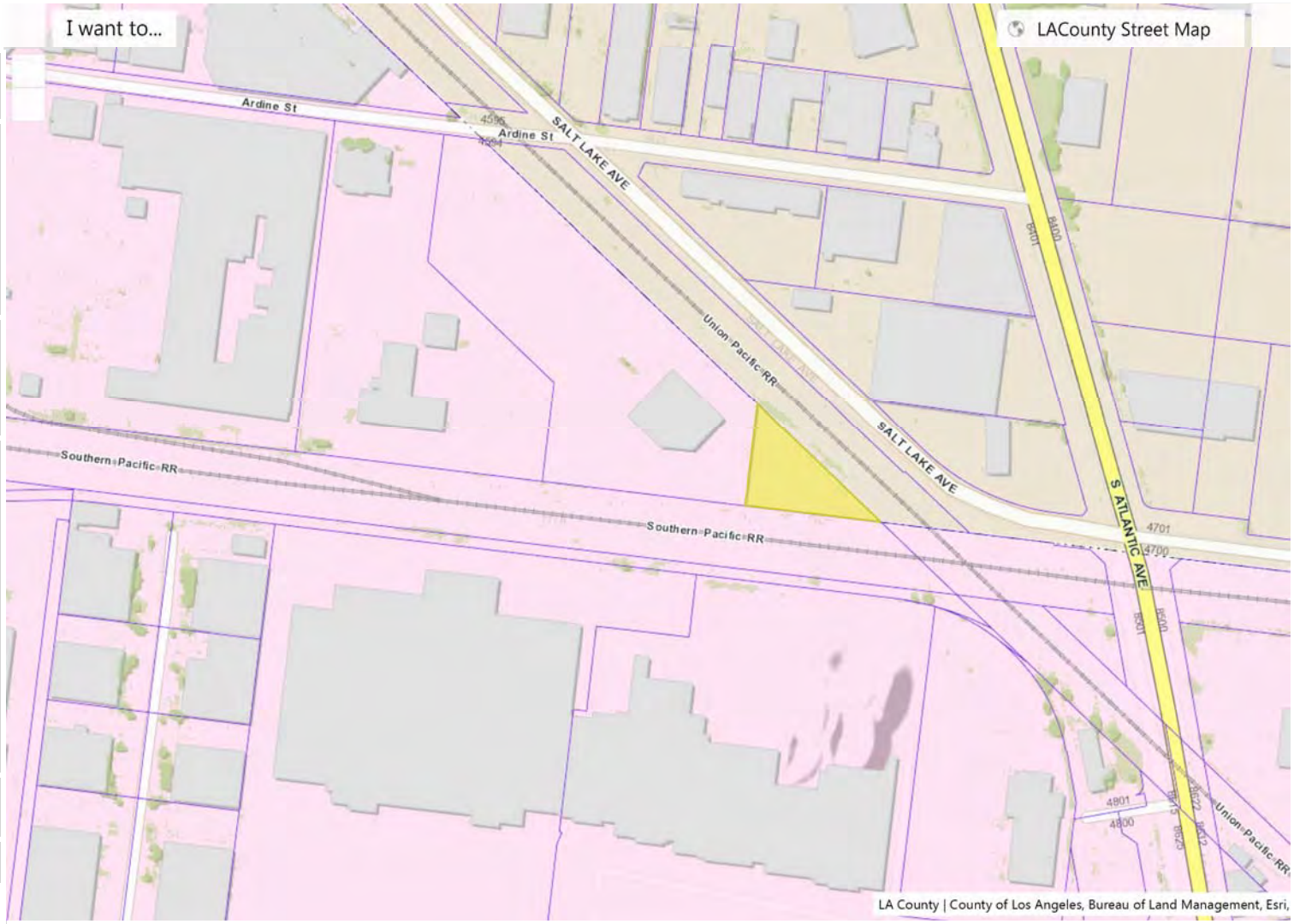
Recording Date:	03/19/1985
Land:	$208,127
Improvements:	$0
Personal Property:	$0
Fixtures:	$0
Homeowners' Exemption:	$0
Real Estate Exemption:	$0
Personal Property Exemption:	$0
Fixture Exemptions:	$0

- 2016 Annual taxes
- Property tax payment FAQs
- Estimate supplemental taxes

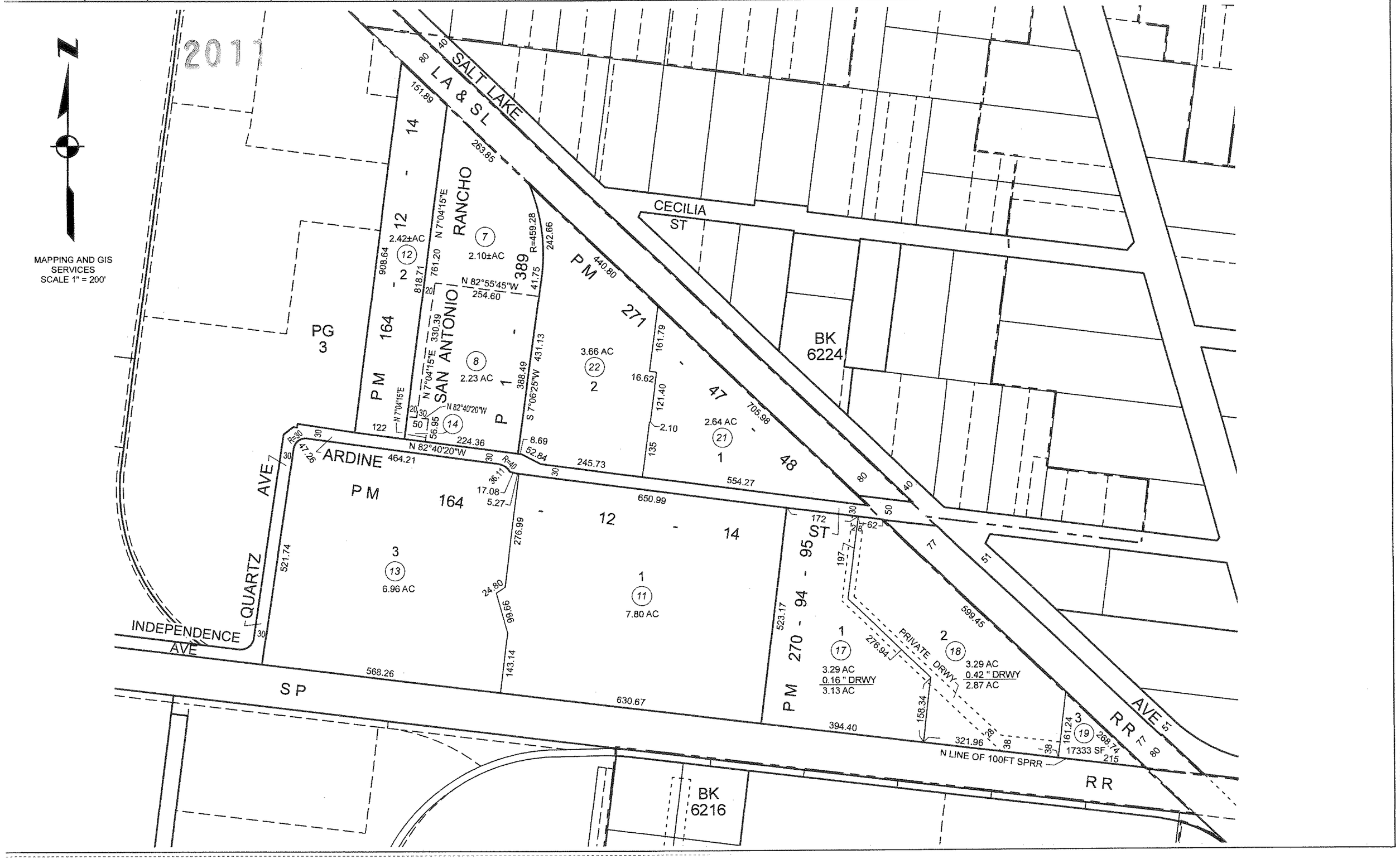
Property Boundary Description

P M 270-94-95 LOT 3

Building Description



6215	2 SHEET	P. A. 394-2 6215-1	TRA 15186	REVISED 96032602002001-27 96032602002002-27	20110303				SEARCH NO		OFFICE OF THE ASSESSOR COUNTY OF LOS ANGELES COPYRIGHT © 2002



Reference:
MWM, 2016

Liberty Utilities (Park Water) Corp.
2015 Urban Water Management Plan

FINAL

June 24, 2016

Liberty Utilities

MADDAUS WATER MANAGEMENT INC.

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2. PLAN PREPARATION

This section describes the basis for the 2015 UWMP preparation, regional planning, compliance, calendar year, units of measure, and coordination and outreach.

2.1 Basis for Preparing a Plan

In accordance with the CWC, urban water suppliers with 3,000 or more service connections or supplying 3,000 or more acre-feet of water per year are required to prepare an UWMP every five years.

Liberty Park Water, as defined in the California Water Code section 10617, qualifies as an "Urban Water Supplier". Liberty is an investor-owned water utility that provides retail water service to approximately 28,000 connections in southeast Los Angeles County, so an UWMP is required to be completed for 2015 and every five years thereafter and submitted to the California Department of Water Resources.

Current water supplies include Central Basin groundwater (the basin is managed by the Water Replenishment District of Southern California [WRD]), imported water purchased from the Central Basin Municipal Water District (CBMWD), and recycled water. CBMWD is a member agency of the Metropolitan Water District of Southern California (MWD or Metropolitan). This subsection provides the cooperative framework within which the 2015 UWMP will be implemented including agency coordination, public outreach, and resources maximization.

2.1.1 Public Water Systems

Public Water Systems (PWSs) are the systems that provide drinking water for human consumption. These systems are regulated by the State Water Resources Control Board, Division of Drinking Water (DDW). The California Health and Safety Code 116275 (h) defines a "Public Water System" as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

Table 2-1 lists name and number of connections for each PWS that is managed by Liberty and reported in this UWMP.

Table 2-1. Public Water Systems

Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
	Liberty Utilities (Park Water) Corp.	27,353	9,787
1910161	Lynwood/Rancho Dominguez System		
1910211	Bellflower/Norwalk System		
1910021	Compton/Willowbrook System		
	TOTAL	27,353	9,787
NOTES: DDW considers Liberty's service area to be 3 systems.			

2.2 Regional Planning

Before developing the UWMP, water agencies should consider the extent to which they will become involved in regional planning processes. Developing a cooperative 2015 UWMP may be a natural continuation of other regional coordination

efforts, such as Integrated Regional Water Management, or may present an opportunity to begin regional collaboration. Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. Some of the other possible benefits, depending on the level of regional cooperation, can include:

- More reliable water supplies;
- Increased regional self-reliance; Improved water quality;
- Better flood management;
- Increased economic stability;
- Restored and enhanced ecosystems; and
- Reduced conflict over resources.

2.3 Individual or Regional Planning and Compliance

Table 2-2. Plan Identification

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.4 Calendar Year and Units of Measure

2.4.1 Calendar Year Reporting

Since Liberty reports on a calendar year basis rather than fiscal, it is required to include the water use and planning data for the entire calendar year of 2015. This UWMP reflects that requirement.

2.4.2 Units of Measure

Water agencies use various units of measure when reporting water volumes, such as acre-feet (AF), million gallons (MG), or hundred cubic feet (CCF). Agencies may report volumes of water in any of these units, but must maintain consistency throughout the 2015 UWMP.

Table 2-3. Agency Identification

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF

2.5 Coordination and Outreach

Water agencies are permitted by the State to work together to develop a cooperative regional plan. Due to Liberty Park Water's dependency on CBMWD and MWD for a large proportion of its water supply, it must be closely coordinated and consistent with CBMWD's and MWD's UWMPs. In addition, Liberty Park Water provides water to a number of cities, including the cities of Artesia, Bellflower, Compton, Lynwood, Norwalk, and Santa Fe Springs. These cities were notified regarding Liberty's 2015 UWMP. Agency coordination for this 2015 UWMP is summarized in Table 2-4.

A public hearing to review the draft UWMP was held on May 3 at Liberty Park Water's office in Downey. The public was notified 60 days in advance of the public hearing. The public comment period remained open through May 30, 2016. A copy of the public outreach materials, including newspaper publication, website postings, and invitation letters, are included in Appendix C.

The Final UWMP was submitted to DWR. Letters were sent to the cities we serve and other agencies noted in Table 2-4 notifying them of how to access the final report from Liberty's website.

2.5.1 Wholesale and Retail Coordination

Because Liberty Park Water relies upon CBMWD for imported water supply and CBMWD, in turn, is supplied by MWD, the suppliers are required to provide each other with information regarding projected water supply and demand.

Table 2-4. Water Supplier Information Exchange

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name *(Add additional rows as needed)*
Central Basin Municipal Water District
Metropolitan Water District of Southern California
NOTES: Imported water supplies are provided by CBMWD, a MWD member agency.

2.5.2 Coordination with Other Agencies and the Community

Liberty attended the public hearings that CBMWD had regarding their UWMP. In addition, information from MWD's UWMP was consulted in preparing Liberty's plan. Letters were sent to the agencies listed below informing them about the availability of the draft report, requesting their input, and inviting them to the public hearing on May 3.

Liberty has encouraged the involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the 2015 UWMP, as evidenced by the diverse community that received draft notices (see Table 2-5 below).

Table 2-5. Agency Coordination Summary

	Received Link to View Draft Online	Commented on Draft	Contacted for Assistance	Sent Notice of Intent to Adopt
Central Basin Municipal Water District	X		X	X
MWD Water District of Southern California	X		X	X
Water Replenishment District of Southern California	X			X
City of Artesia	X			X
City of Bellflower	X			X
City of Compton	X			X
City of Lynwood	X			X
City of Norwalk	X			X
City of Santa Fe Springs	X			X
Los Angeles County Department of Regional Planning	X			X
County Sanitation Districts of Los Angeles County (LACSD)	X	X		X

2.5.3 Notice to Cities and Counties

Liberty notified the cities within its service area and Los Angeles County of the opportunity to provide input regarding the 2015 UWMP. The timeline for public participation during the development of the 2015 UWMP is shown below. A copy of the public outreach materials, including website postings and invitation letters, are included in Appendix C.

Public Participation Timeline

April 26, 2016	Preliminary Draft UWMP	Preliminary Draft released to solicit input
May 3, 2016	Public Hearing	Solicited input from the public
June 15, 2016	Adoption of UWMP	Board adoption of 2015 UWMP per Resolution
June 24, 2016	Final UWMP	Final UWMP released

The components of public participation include:

Local Media

- Paid notice in the Long Beach Press Telegram

Water Agencies Public Participation

- Metropolitan Water District of Southern California
- Central Basin Municipal Water District
- Water Replenishment District of Southern California
- County Sanitation Districts of Los Angeles County

City/County Outreach

- Planning Divisions of local cities:
  - Artesia
  - Bellflower
  - Compton
  - Lynwood
  - Norwalk
  - Santa Fe Springs
- Los Angeles County Department of Regional Planning

Public Availability of Documents

- Liberty Utilities website

3. SYSTEM DESCRIPTION

3.1 General Description

In January 2016, Liberty Utilities acquired Liberty Park Water. Liberty Utilities is a regulated water, natural gas, and electric transmission and distribution utility that operates in 11 states. The new name is Liberty Utilities (Park Water) Corp., or "Liberty Park Water."

Liberty Park Water, originally named the Los Nietos Water Company, was formed in the post-Great Depression era for the purpose of providing water to the residents east of the Los Angeles River, north and south of Rosecrans. In 1937, this water company became incorporated as Liberty Park Water. Today, Liberty Park Water has approximately 27,300 service connections.

Liberty has been making an effort to maximize the use of available resources while minimizing the use of imported water. In 2006, Liberty became a participant in the Memorandum of Understanding Regarding Water Conservation in California (MOU), and a member of the California Urban Water Conservation Council (CUWCC). Signatories to the MOU pledge to implement fourteen comprehensive conservation Best Management Practices (BMPs).

Liberty's groundwater resources are managed by the Water Replenishment District (WRD). The WRD was formed by the Water Replenishment Act, and manages, regulates, replenishes and protects the quality of the groundwater supplies within its boundaries.

This 2015 UWMP, along with other planning documents, will be used by Liberty staff to guide water use and management efforts through 2035, subject to changing conditions as identified in the required five-year updates of the UWMP.

Several documents and efforts were used to enable Liberty to maximize the use of available resources and minimize use of imported water, including the CBMWD UWMP. Section 6 of this 2015 UWMP describes in detail the water resources available to Liberty for the 25-year period covered by the 2015 UWMP.

3.2 Service Area Boundary Maps

Liberty's service area is divided into three non-contiguous water systems including the Compton/Willowbrook Water System, the Lynwood/Rancho Dominguez Water System and the Bellflower/Norwalk Water System. These water systems are shown on the Service Area Map (Figure 3-1).

3.2.1 Other Agencies

- **Metropolitan Water District of Southern California**

  MWD is a wholesaler of water, and supplies water to most of southern California by obtaining water from the Colorado River and from the State Water Project (SWP) in northern California.

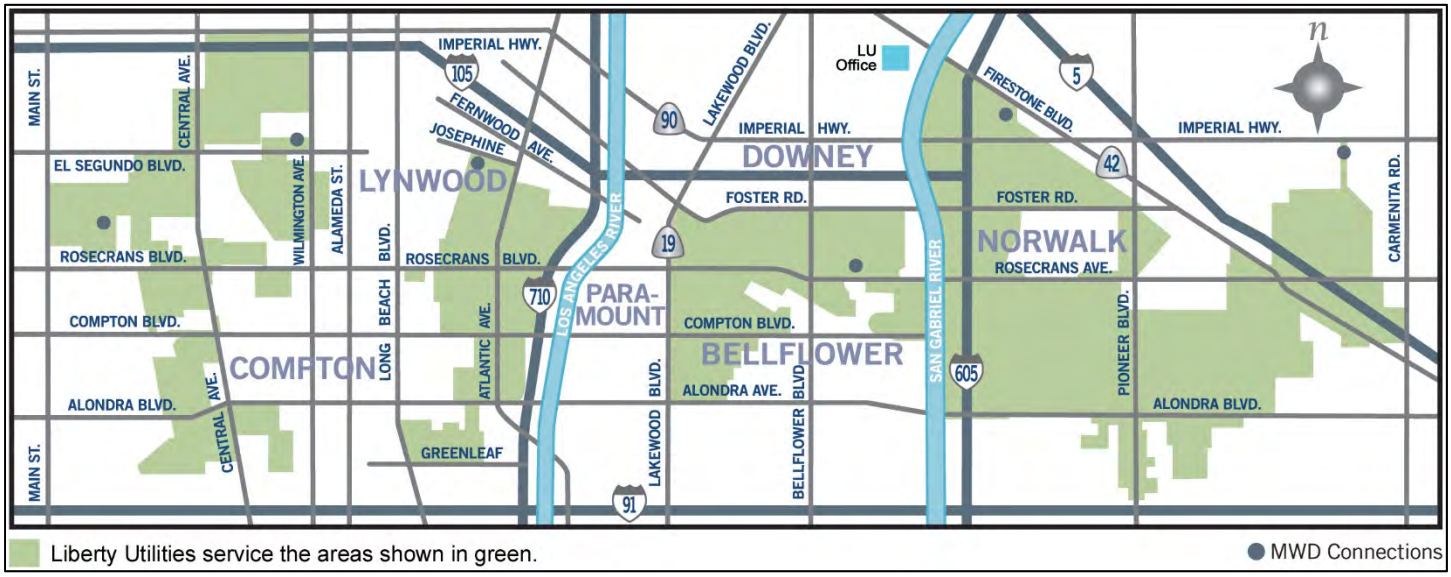
- **Central Basin Municipal Water District**

  CBMWD is a member agency of MWD that wheels MWD water to a specific area of Southern California.

- **Water Replenishment District of Southern California**

  WRD protects and manages the groundwater resources of the Central and West Coast groundwater basins of south Los Angeles County.

Figure 3-1. Liberty Park Water's Service Area Map



3.3 Service Area Climate

The climate in Liberty's service area is generally warm and dry in the summer and cool in the winters, typical of a Mediterranean climate. The average temperature is 74 degrees Fahrenheit. Average rainfall is about 12 inches per year. The average evapotranspiration (ETo) in the region is 46.3 inches per year.

Table 3-0. Period of Record General Climate Summary, Temperature and Precipitation, Long Beach

Month	Max. Temperature (°F)	Min. Temperature (°F)	Mean Temperature (°F)	Mean Precipitation (inches)
January	67.1	45.6	56.3	2.63
February	67.2	47.3	57.2	2.90
March	68.4	49.7	59.1	1.83
April	71.7	52.4	62.0	.70
May	73.5	56.8	65.2	.20
June	76.9	60.3	68.6	.06
July	82.2	63.7	73.0	.02
August	83.9	64.9	74.4	.06
September	82.3	62.9	72.6	.19
October	77.9	57.9	67.9	.42
November	72.2	50.5	61.3	1.21
December	67.0	45.3	56.1	1.80
Annual	74.2	54.8	64.5	12.01

Sources: Western Regional Climate Center. December 2015. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5085 and http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5085

3.3.1 Climate Change

Climate change poses a risk to supply reliability as it is expected to cause weather patterns to shift dramatically and unpredictably, thus affecting water supply planning. Several areas of concern for California water planners include reduction in the Sierra Nevada snowpack; increased intensity and frequency of extreme weather events; and rising sea levels resulting in seawater intrusion, erosion of levees, among other things (MWD, Draft 2015 UWMP, March 2016). At the state level, climate change management is one of DWR's five core values. Through its Climate Action Plan, DWR performs a wide range of activities to help support climate change analysis and adaption planning[1] (DWR, March 2016).

At the regional level in southern California, MWD, as the regional wholesaler of imported water, is committed to performing its due diligence with respect to climate change. Under its 2015 IRP Update, MWD recognizes additional risks and uncertainties from climate change and analyzes how vulnerable the region's reliability is to longer-term risks. The 2015 IRP process involves evaluating a wider range of water management strategies, and seeking robust and adaptive plans that respond to uncertain conditions as they evolve over time, and that ultimately will perform adequately under a wide range of future conditions (MWD, March 2016).

3.4 Service Area Population and Demographics

Table 3-1 lists the current and projected population for Liberty's service area.

Table 3-1. Population – Current and Projected

Table 3-1 Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	126,637	126,867	127,332	127,797	128,263	129,434

NOTES: Liberty Park Water's 2015 population estimate is determined in the SB X7-7 analysis using the 2010 census based population value and Liberty's 2010 UWMP reported growth rate based on estimates and projections from 2001-2035 onward determined from Department of Finance (DOF) 2010 reported data. The process for determining Liberty's 2010 population is further explained in Appendix M. Population growth from 2020 through 2040 is based on Southern California Area Government (SCAG) Draft 2016 RTP/SCS Growth Forecast by Jurisdictions as a weighted average annual growth rate for the primary Liberty Park Water jurisdictions. SCAG's Regional Council (RC) is scheduled to adopt the RTP/SCS and associated jurisdictional level growth forecasts in April 2016, and RC staff don't anticipate further changes in the growth forecasts figures at jurisdictional level. SCAG provides year 2012, 2020, 2035 and 2040 population by jurisdiction. The weighted annual average 2012-2020 SCAG growth rate was initially applied to year 2015 population to get 2020; then, the weighted annual average 2020-2035 SCAG growth rate was applied to year 2020 population to get year 2025, 2030 and 2035 population values; and finally the 2035-2040 weighted annual average SCAG growth rate was applied to year 2035 population to get year 2040 population for Liberty Park Water.

Source: SCAG Draft 2016 RTP/SCS Growth Forecast by Jurisdictions. Online. 2/25/16v1
http://www.scag.ca.gov/Documents/2016DraftGrowthForecastByJurisdiction.pdf

[1] DWR Climate Change Action Plan <http://www.water.ca.gov/climatechange/CAP.cfm>

4. SYSTEM WATER USE

Accurately tracking and reporting current water demands allow a water supplier to properly analyze the use of their resources and conduct good resource planning. Estimating future demand as accurately as possible allows water agencies to manage their water supply and appropriately plan their infrastructure investments. Assessments of future growth and related water demand, done in coordination with local planning agencies, provide essential information for developing demand projections. Agencies are encouraged to coordinate and communicate with other planning agencies when developing demand projections.

This section describes historic and current water usage and the methodology used to project future demands within Liberty's service area. Water deliveries are divided into sources including imported water, groundwater, and recycled water. Water usage is divided into sectors such as residential, industrial, landscape, and other purposes. For this evaluation, existing land use data and new housing construction information were compiled from Liberty. This information was then compared to historical trends for new water service connections and customer water usage information.

4.1 Recycled versus Potable and Raw Water Demand

Recycled water is an important source of water in southern California due to the cost of imported water supplies, a dry climate, and high demand.

CBMWD's regional water recycling program, called the "Central Basin Water Recycling Project", is comprised of two distribution systems, the E. Thornton Ibbetson Century Water Recycling Project and the Esteban Torres Rio Hondo Water Recycling Project, along with three pumping stations and a reservoir. This system provided an average of 4,800 acre-feet per year of recycled water to more than 200 industrial, commercial, and landscape irrigation sites for the last five years. This system provides the Liberty service area with recycled water.

Several commercial nurseries went out of business and Cal Trans reduced their purchases of recycled water for irrigation in the last few years, resulting in a decrease in recycled water demand. In addition, drought messaging may have contributed to the decrease in recycled demands.

4.2 Water Uses by Sector

Liberty currently serves approximately 27,330 potable water connections and 25 recycled water accounts, all of which are metered accounts. In 2015, approximately 98% of the service connections were residential and commercial. Industrial, institutional, government, and fire protection connections account for approximately 2% of Liberty's total connections.

Predicting future water supply requires accurate historic water use patterns and water usage records.

In the past, Liberty has sold water periodically to the City of Norwalk through an interconnection. Liberty supplied water regularly to Peerless Water Company until 2009.

Table 4-1. Demands for Potable and Raw Water – Actual

Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description (*as needed*)	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	6,264
Multi-Family		Drinking Water	901
Commercial		Drinking Water	1,044
Industrial		Drinking Water	87
Institutional/Governmental	Public Authority	Drinking Water	511
Other	Fire Services and Temporary Meter Services	Drinking Water	39
Losses	Non-revenue water	Drinking Water	733
		TOTAL	9,579

Historic population estimates were compared to the historical customer demands to determine historic per capita use. As discussed in the previous section, SBX7-7 calculations were used to provide a baseline and target per capita water use. Future demand estimates were then determined by multiplying the projected population by the base per capita water use. These calculations provided Liberty's projected future water demands as shown in Table 4-2. The anticipated total water demand in 2040 is approximately 10,615 AF. Demand estimates do not include reductions from demand management practices.

Table 4-2. Demands for Potable and Raw Water – Projected

Table 4-2 Retail: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description *(as needed)*	Projected Water Use				
		2020	2025	2030	2035	2040
Single Family		7,415	7,030	6,696	6,461	6,321
Multi-Family		1,353	1,276	1,209	1,162	1,132
Commercial		1,491	1,470	1,454	1,441	1,438
Industrial		113	114	114	114	115
Institutional/Governmental	Public Authority	775	778	781	784	791
Other	Fire Services and Temporary Meter Services	69	69	69	70	70
Losses	Non-revenue water	853	816	783	760	746
	TOTAL	12,069	11,553	11,107	10,791	10,615
NOTES: Water use includes projected savings from plumbing codes and low-income housing water use. Projected losses represent Liberty's conservative estimate that for planning purposes Losses or Non-revenue Water should be estimated at 7% of production.						

Liberty does not anticipate any regular or single large sales to other agencies in the future. As in the past, Liberty does not anticipate future water use related to saline barriers, groundwater recharge operations or conjunctive use. Recycled water use is expected to remain stable. For the purpose of projections, non-revenue water is assumed to be approximately 7%. Table 4-3 presents information on all projected water uses for the years 2015 to 2040.

Table 4-3. Total Water Demands

Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water From Tables *4-1 and 4-2*	9,579	12,069	11,553	11,107	10,791	10,615
Recycled Water Demand* From Table *6-4*	208	224	241	260	280	302
TOTAL WATER DEMAND	9,787	12,293	11,794	11,367	11,071	10,917

4.3 Distribution System Water Losses

Distribution system water losses (also known as "real losses") are the physical water losses from the water distribution system and the supplier's storage facilities, up to the point of customer consumption.

In the past, Liberty Park Water has not had water use related to saline barriers or groundwater recharge operations. Liberty monitors water used for system operations such as hydrant flushing, dead end flushing, flushing for water quality purposes, broken fire hydrants, main leaks, etc.

However, Liberty, like all water agencies does have some non-revenue water. Non-revenue water is the difference between the amount of water produced and the amount of water billed to customers. Over the last five years, non-revenue water has averaged less than one (1) percent of produced water within Liberty's system.

The percentage of non-revenue water was estimated by comparing water production statistics to water sales statistics. Sources of non-revenue water include:

- Fire Hydrant Operations by the Fire Department - This represents the use of water for emergencies.
- Customer Meter Inaccuracies - Customer meters represent one of the main sources of non-revenue water as they tend to under-represent actual consumption in the water system.
- Leaky water lines - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small. However, these small leaks contribute to the overall non-revenue water.

Table 4-4 indicates non-revenue water loss within the distribution system.

Table 4-4. Water Loss Summary Most Recent 12-Month Period Available (as calculated in AWWA DWR Water Audit Method worksheet)

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2013	384.21
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Used 2013 Audit as it was most recent available that is not an abnormal drought year.	

4.4 Estimating Future Water Savings

The projected demands presented in this 2015 UWMP include estimate plumbing code savings. Liberty's process of estimating future water savings, the passive savings methodology, can be found in Appendix F.

4.5 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multifamily residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. Liberty's service area includes seven jurisdictions: the City of Artesia, the City of Bellflower, the City of Compton, the City of Lynwood, the City of Norwalk, and the City of Santa Fe Springs, and an unincorporated portion of Los Angeles County near Compton. The Housing Element of each of these cities described the percentage of "extremely low," "very low," and "low" income households as a percentage of the total number of households. The weighted percentage of low-income households per jurisdiction can be found in Table 4-6. A weighted average of 44% was used for projections of water demand for single-family and multifamily customers from very low and low-income households. The projected future low-income household water use (AF) in presented in Table 4-7.

Further, Liberty will not deny nor condition approval of water services, nor reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs:

- Liberty specifically finds that it does not have sufficient water supply;
- Liberty is subject to a compliance order issued by the State Water Resources Control Board, Division of Drinking Water that prohibits new water connections; or
- The applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

Table 4-5. Inclusion in Water Use Projections

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook)	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc.… utilized in demand projections are found.	Appendix F, Table F-1
Are Lower Income Residential Demands Included In Projections?	Yes

Table 4-6. Weighted Percentage of Low-Income Households

City	Total Number of Households from Housing Element	Weighted Percentage of Households	Percentage Low Income from Housing Element	Weighted Percentage of Low Income Households
Artesia[1]	4,517	5%	44%	2%
Bellflower[2]	24,132	24%	50%	12%
Compton[3]	22,327	22%	58%	13%
Lynwood[4]	15,270	15%	39%	6%
Norwalk[5]	28,045	28%	31%	9%
Santa Fe Springs[6]	4,968	5%	40%	2%
			Weighted Percentage	**44%**

[1] "City of Artesia Housing Element HCD Submittal," November 15, 2013. http://www.cityofartesia.us/DocumentCenter/View/203

[2] *City of Bellflower 2014-2021 Housing Element*, prepared for the City of Bellflower by ESA, adopted September 23, 2013 (p. 48-49).
http://www.hcd.ca.gov/housing-policy-development/housing-resource-center/plan/he/housing-element-documents/bellflower_5th_adopted100713.pdf

[3] Housing Element Compton General Plan 2030.
http://www.comptoncity.org/civicax/filebank/blobdload.aspx?blobid=24234

[4] City of Lynwood, California, *2014-2021 Housing Element*, adopted August 6, 2013 (p. 51).
http://lynwood.ca.us/sites/default/files/City%20of%20Lynwood%20Adopted%202014-2021%20Housing%20Element.pdf

[5] *2013-2021 Housing Element of the General Plan,* Planning Division, Community Development Department.
http://www.hcd.ca.gov/housing-policy-development/housing-resource-center/plan/he/housing-element-documents/norwalk_5th_draft100313.pdf

[6] *City of Santa Fe Springs 2014-2021 Housing Element*, November 2013.
http://www.hcd.ca.gov/housing-policy-development/housing-resource-center/plan/he/housing-element-documents/santa_fe_springs_5th_draft111813.pdf

Table 4-7. Projections of Future Low-Income Household Water Use (AF)

Water Use*	2020	2025	2030	2035	2040
Estimated Very Low and Low-Income Household Water Use	3,842	3,640	3,464	3,341	3,266

* Assumes 44% of all future households in Liberty service area qualify as “very-low” or “low” income per the definition provided in Senate Bill 1087.

4.6 Climate Change

A discussion of potential climate change impacts can assist in providing a comprehensive look at the potential impacts on projected demand. For example, hotter and drier weather may lead to an increased demand in landscape irrigation. Water agencies are encouraged, but not required, to consider potential climate change impacts to their water demand.

Other factors that affect water usage are weather and conservation practices. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool, wet years, historical water usage has decreased, reflecting less water usage for exterior landscaping.

California faces the prospect of significant water management challenges due to a variety of issues including population growth, regulatory restrictions and climate change. Climate change is of special concern because of the range of possibilities and their potential impacts on essential operations, particularly operations of the SWP. The most likely scenarios involve increased temperatures, which will reduce the Sierra Nevada snowpack and shift more runoff to winter months, and accelerated sea level rise. These changes can cause major problems for the maintenance of the present water export system since water supplies are conveyed through the fragile levee system of the Sacramento-San

Joaquin Delta. The other much-discussed climate scenario or impact is an increase in precipitation variability, with more extreme drought and flood events posing additional challenges to water managers around the west[2]. The Colorado River Basin has experienced severe multi-year droughts, most recently in the mid-1990s.

In recent years, water conservation has become an increasingly important factor in water supply planning in California. Since the 2005 UWMP, there have been a number of regulatory changes related to conservation including new standards for plumbing fixtures, a state universal retrofit ordinance, new Green Building standards, demand reduction goals and more. In addition, the California Plumbing Code has instituted requirements for new construction that mandate the installation of ultra-low-flow toilets and low-flow showerheads.

Residential, commercial, and industrial usage can be expected to decrease as a result of the implementation of more aggressive water conservation practices. In southern California, the greatest opportunity for conservation is in developing greater efficiency and reduction in landscape irrigation. The irrigation demand can typically represent as much as 70% of the water demand for residential customers depending on lot size and amount of irrigated turf and plants. Conservation efforts will increasingly target this component of water demand. Section 9 discusses Demand Management Measures.

[2] Final California Water Plan Update 2009 Integrated Water Management: Bulletin 160.

5. SB X7-7 BASELINES AND TARGETS

5.1 Updating Calculations from 2010 UWMP

The Water Conservation Bill of 2009 (SB X7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Bill of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the *20 by 2020 Water Conservation Plan*. Consistent with SB X7-7, each water supplier must determine and report its existing baseline water consumption and establish future water use targets in gallons per capita per day (GPCD); reporting began with the 2010 UWMP.

In their 2015 UWMPs agencies may change the years they selected for their baseline periods as compared to their 2010 UWMPs. Agencies may choose to make this change based on changes to their calculated population, which may have affected the baseline and target GPCD values.

5.1.1 Update of Target Method

An urban retail water supplier must set a 2020 water use target (herein called the Compliance Water Use Target) and a 2015 interim target (herein called the Interim Water Use Target). There are four methods for calculating the Compliance Water Use Target:

1. Eighty percent of the urban water supplier's baseline per capita daily water use
2. Per capita daily water use estimated using the sum of the following:
    a. For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of DWR's 2016 report to the Legislature reviewing progress toward achieving the statewide 20% reduction target, this standard may be adjusted by the Legislature by statute.
    b. For landscape irrigated through dedicated or residential meters or connections, water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in section 490 et seq. of Title 23 of the California Code of Regulations[3], as in effect the later of the year of the landscape's installation or 1992.
    c. For commercial, industrial, and institutional (CII) uses, a 10% reduction in water use from the baseline CII water use by 2020.
3. Ninety-five percent of the applicable state hydrologic region target as stated in the state's April 30, 2009, draft *20 by 2020 Water Conservation Plan*. Liberty falls within the South Coast Hydrologic Region; the "2020 Plan" regional targets is 149 GPCD. The Method 3 regional targets at 95% of 149 GPCD is 142 GPCD.
4. Reduce the 10- or 15-year Base Daily Per Capita Water Use a specific amount for different water sectors:
    a. Indoor residential water use to be reduced by 15 GPCD or an amount determined by use of DWR's "Best Management Practice (BMP) Calculator".

[3] California Department of Water Resources. Model Water Efficient Landscape Ordinance, California Code of Regulations, Title 23, section 490 et seq. Online: http://www.water.ca.gov/wateruseefficiency/landscapeordinance/docs/2015%20MWELO%20Guidance%20for%20Local%20Agencies.pdf

b. A 20% savings on all unmetered uses.

c. A 10% savings on baseline CII use.

d. A 21.6% savings on current landscape and water loss uses.

The Interim Water Use Target is set as a halfway point between the Base Daily Water Use GPCD and the 2020 Compliance Water Use Target GPCD.

Finally, the selected Compliance Water Use Target must be compared against what DWR calls the "Maximum Allowable GPCD". The Maximum Allowable GPCD is based on 95% of a 5-year average base gross water use ending no earlier than 2003 and no later than 2010. The Maximum Allowable GPCD is used to determine whether a supplier's 2015 and 2020 per capita water use targets meet the minimum water use reduction of the SBX7-7 legislation. If an agency's Compliance Water Use Target is higher than the Maximum Allowable GPCD, the agency must instead use the Maximum Allowable GPCD as their target.

5.1.2 Required Use of 2010 U.S. Census Data

In the 2010 UWMP, "[p]opulation estimates and projections from 2010 onward were calculated using a growth rate determined from Department of Finance (DOF) data." In this UWMP, year 2010 population was determined using 2010 census information gathered in 2014 while developing a water use efficiency plan; the 2010 population estimate of 122,372 is based on a GIS analysis of 2010 census blocks data and the service area population-determining methodology outlined in the California State Water Resources Control Board's Instructions for Estimating Residential Gallons Per Capita per Day. Liberty's 2015 population estimate is determined using the 2010 population value and Liberty's 2010 UWMP reported growth rate based on estimates and projections from 2001-2035 onward determined from Department of Finance (DOF) 2010 reported data.

5.1.3 SB X7-7 Verification Form

In the 2015 UWMP, water agencies must demonstrate compliance with their established water use target for the year 2015. This will also demonstrate whether or not the agency is currently on track to achieve its 2020 target.

Compliance is verified by DWR's review of the SB X7-7 Verification Form submitted with the 2015 UWMP. The SB X7-7 Verification Form is found in Appendix E and summarized in Tables 5-1 and 5-2 of this section.

The two primary calculations required by SB X7-7 are:

- Base Daily Water Use calculation (average GPCD used in past years)
- Compliance Water Use Target (target GPCD in 2015 and 2020)

In addition to calculating base gross water use, SBX7-7 requires that a retail water supplier identify its water demand reduction targets. The methodologies for calculating demand reduction were described in Section 4. Liberty has selected Method 3 to calculate its 2020 Compliance Water Use Target and Interim Water Use Target.

The SB X7-7 Verification Form can be found in Appendix E.

5.2 Baseline Periods

Water use GPCD must be calculated and reported for two baseline periods, the 10- or 15-year baseline (Baseline GPCD) and the 5-year baseline (Target Confirmation). Whether an agency uses a 10- or 15-year baseline depends on the percentage of recycled water delivered in the year 2008.

5.2.1 Determination of the 10-15 Year Baseline Period (Baseline GPCD)

The Base Daily Water Use calculation is based on gross water use by an agency in each year and can be based on a ten-year average ending no earlier than 2004 and no later than 2010 or a 15-year average if 10% of 2008 demand was met by recycled water. Base Daily Water Use must account for all water sent to retail customers, excluding:

- Recycled water
- Water sent to another water agency
- Water that went into storage

Since Liberty's percentage of recycled water used in the year 2008 was less than 10%, the water agency must use a 10-year baseline period. Recycled water deliveries of 2008 and the total water deliveries of 2008 will be entered into SB X7-7 Table 1. The table will calculate the percent of recycled water delivered in 2008.

5.2.2 Determination of the 5-Year Baseline Period (Target Confirmation)

Water suppliers must also calculate water use, in GPCD, for a 5-year baseline period. This will be used to confirm that the selected 2020 target meets the minimum water use reduction requirements (see Section 5.7). This is a continuous 5-year period that ends no earlier than December 31, 2007 and no later than December 31, 2010.

Liberty falls within the South Coast Hydrologic Region which has an Urban Water Use Target of 149 GPCD. Ninety-five percent of this target is 142 GPCD. Since Liberty's 5-year Average Base Daily Per Capita Water Use is lower than 100 GPCD, no adjustments to the Urban Water Use Target are needed.

For the Interim Urban Water Use Target – the water use goal each water supplier is to achieve and report in their 2015 UWMP – the average of the Base Daily Per Capita Water Use and the Urban Water Use Target is normally used. As shown in Table 5-1 for Liberty, since the Average Base Daily Water Use is already below 100 GPCD, the Interim Urban Water Use Target will be 121 GPCD, the average of the Base Daily Per Capita Water Use of 99.8 GPCD and year 2020 target of 142 GPCD.

5.3 Service Area Population

This section describes Liberty's service area population methodologies. Liberty has a current 2015 service area population of approximately 126,637. To determine historic population estimates, Census Tract data from 1990, 2000 and 2010 were compared to GIS data of the service area, providing a population estimate for those three years. The analysis for years 1990 and 2000 was conducted as part of the 2010 UWMP. The 2010 population analysis was conducted in 2014 as part of a water use efficiency study; this analysis is presented in Appendix M. The population for the years between 1990 and 2000, and 2000 and 2010 were linearly interpolated according to the population values. In the Park Water Use Efficiency Plan a 2010 population estimate of 122,372 is based on a GIS analysis of 2010 census blocks data and the service area population-determining methodology outlined in the California State Water Resources Control Board's Instructions for Estimating Residential Gallons Per Capita per Day. Liberty's 2015 population estimate is determined using the 2010 population value and Liberty's 2010 UWMP reported growth rate based on estimates and projections from 2001-2035 onward determined from Department of Finance (DOF) 2010 reported data. Liberty's baseline population estimates can be found in Appendix E's SB X7-7 Table 3: Service Area Population. Projected population estimates can be found in Section 3.4.

5.4 Gross Water Use

Gross water use is a measure of water that enters the distribution system of the supplier over a 12-month period (either fiscal or calendar year) with certain allowable exclusions. These exclusions are:

- Recycled water delivered within the service area;

- Indirect recycled water (see Methodology 1 from the *Methodologies* document, DWR 2011);
- Water placed into long term storage (surface or groundwater);
- Water conveyed to another urban supplier;
- Water delivered for agricultural use;
- Process water.

Gross water use must be reported for each year in the baseline periods as well as 2015, the compliance year.

5.5 Baseline Daily per Capita Water Use

Consistent with SBX7-7, the 2015 UWMP must provide an estimate of Base Daily Per Capita Water Use. This estimate utilizes information on population as well as base gross water use. For the purposes of this UWMP, population was estimated as described in Section 2.1.

Recycled water did not make up 10% of the 2008 delivery to the Liberty retail service areas, and for this reason, Base Daily Per Capita Water Use has been based on a 10-year period. In addition, urban retailers must report daily per capita water use for a 5-year period from January 1, 2003 to December 31, 2010. This 5-year base period is compared to the Target Based Daily Per Capita Water Use to determine the minimum water use reduction requirement (this is described in more detail in the following sections). Table 5-1 reports the data used to calculate the Base Daily Per Capita Water Use in GPCD, and the 10- and 5-year base periods.

Liberty has selected the period 1998 to 2007 as the basis for the 10-Year Average Base Daily Per Capita Water Use, which is 99.8 GPCD. Liberty has selected the period 2003 to 2007 as the basis for the 5-year Average, which is 99.0 GPCD.

5.6 2015 and 2020 Targets

The following table presents the baseline and target summary for Liberty. Liberty is below the 100 GPCD threshold for their average baseline GPCD so their 2015 interim GPCD is the average of the baseline and 2020 target GPCD.

Table 5-1. Baselines and Targets Summary

Table 5-1 Baselines and Targets Summary *Retail Agency or Regional Alliance Only*					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1998	2007	99.8	121	142
5 Year	2003	2007	99.0		
*All values are in Gallons per Capita per Day (GPCD)					

5.7 2015 Compliance Daily per Capita Water Use (GPCD)

The 2015 per capita water use for Liberty is 68 GPCD as referenced in Appendix E, Table 5 and in the following table.

Table 5-2. 2015 Compliances

Table 5-2: 2015 Compliance: *Retail Agency or Regional Alliance Only*								
Actual 2015 GPCD*	2015 Interim Target GPCD*	**Optional Adjustments to 2015 GPCD** *From Methodology 8*				Adjusted 2015 GPCD*	2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*			
68	121	0	0	0	0	68	68	Yes
**All values are in Gallons per Capita per Day (GPCD)*								

5.8 Regional Alliance

Liberty Park Water is not part of a regional alliance.

6. SYSTEM SUPPLIES

This section describes the water resources available to Liberty for the 25-year period covered by the 2015 UWMP. These are summarized in Table 6-8 and discussed in more detail below. Both currently available and planned supplies are discussed.

6.1 Purchased or Imported Water

Imported water supplies are provided by CBMWD, a MWD member agency. MWD acquires water from the Colorado River and the SWP and distributes treated and untreated water directly to its 26 member agencies. MWD was established to develop an imported water supply from the Colorado River by constructing and operating the Colorado River Aqueduct (CRA), which has a capacity of 1.25 million acre-feet (MAF). The CRA impounds water from the Colorado River at Lake Havasu on the California-Arizona border west across the Mojave and Colorado deserts to the east side of the Santa Ana Mountains. It is one of the primary sources of drinking water for southern California. The CRA system is composed of two reservoirs, five pumping stations, 63 miles of canals, 92 miles of tunnels, and 84 miles of buried conduit and siphons.

The SWP is the largest state-built, multi-purpose water project in the country. It was authorized by the California State Legislature in 1959, with the construction of most initial facilities completed by 1973. Today, the SWP includes 34 storage facilities, reservoirs and lakes, 20 pumping plants, 4 pumping-generating plants, 5 hydro-electric plants and approximately 700 miles of aqueducts and pipelines. The primary water source for the SWP is the Feather River, a tributary of the Sacramento River. Storage released from Oroville Dam on the Feather River flows down natural river channels to the Sacramento-San Joaquin River Delta (Delta). While some SWP supplies are pumped from the northern Delta into the North Bay Aqueduct, the vast majority of SWP supplies are pumped from the southern Delta into the 444-mile-long California Aqueduct. The California Aqueduct conveys water along the west side of the San Joaquin Valley to Edmonston Pumping Plant, where water is pumped over the Tehachapi Mountains and the aqueduct then divides into the East and West Branches.

CBMWD was established in 1952 by a vote of the people to protect the Central Groundwater Basin from over-pumping. It was realized pumping would have to be curtailed and the region would require the importation of water. In 1954 CBMWD joined MWD to purchase wholesale imported water from the Colorado River and the SWP and sell it to local water agencies, both public and private.

Record dry conditions in the SWP and the Colorado River systems are the current challenges faced by MWD. Dry conditions persisted into 2015 as the fourth consecutive dry year for California. 2015 began with the driest January on record and the earlier and lowest snowpack peak in recorded history. As a result, MWD received only 20% of its contract water supplies from the SWP in 2015. The declining ecosystem in the Sacramento-San Joaquin River Delta (Bay-Delta) continues to impose operational constraints to the SWP system. SWP delivered restrictions due to regulatory requirements resulted in the loss of about 1.5 MAF of supplies to MWD from 2008 through 2014. This reduces the likelihood for the regional storage to be refilled in the near term. The Colorado River system has also seen a steady decline in total storage levels as it experiences a historic 16-year drought (MWD, 2015).

6.2 Groundwater

This section presents information about Liberty's groundwater supplies. Liberty currently owns 822.3 AF of groundwater rights and leases between 2,500-3,571 AF per year in the past five years (FY 2010-11 to 2014-15). Liberty plans to increase its purchases of groundwater in future years and reduce its purchases of imported water.

In Appendix N, please find a letter from the Water Replenishment District of Southern California, acting as Central Basin Watermaster – Administrative Body, as confirmation of Liberty Utilities (Park Water) Corporation's water rights in the Central Basin.

6.2.1 Central Groundwater Basin Description

The sole source of local groundwater for Liberty's water supply is the Central Groundwater Basin (Basin). This Basin is adjudicated (see Section 6.2.2 for more information), is made up of several large aquifers, and occupies a large portion of the southeastern part of the Coastal Plain of Los Angeles County. It has a total storage capacity of 13,800,000 AF. The Basin is bounded on the north by the La Brea high surface divide and on the northeast and east by emergent less permeable tertiary rocks of the Elysian, Repetto, Merced and Puente Hills. The southeast boundary follows Coyote Creek. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift. The Los Angeles and San Gabriel Rivers drain inland watersheds and pass across the surface of the Basin on their way to the Pacific Ocean.

Throughout the Basin, groundwater occurs in Holocene and Pleistocene age sediments at relatively shallow depths. The Basin is divided into two forebays and two pressure areas: the Los Angeles Forebay, the Montebello Forebay, the Whittier pressure area, and the Central Basin pressure area. Both forebays have unconfined groundwater conditions and interconnected aquifers that extend 1,600 feet below the surface and provide recharge for the Basin aquifer system. The Whittier pressure area contains up to 1,000 feet depth of freshwater-bearing sediments. The Central Basin pressure area contains many aquifers of permeable sands and gravels separated by semi-permeable to impermeable sandy clay to clay, that extend to about 2,200 feet below the ground surface.

6.2.2 Groundwater Management

In order to halt groundwater overdraft, and sea water intrusion in the Central Basin, groundwater extraction has been limited to the amounts set by a Superior Court Judgment to adjudicate water rights and monitor extraction. Prior to the adjudication of groundwater rights in the early 1960s, annual pumping rates reached levels as high as 259,400 AF in the Central Basin and 94,100 AF in the adjacent West Coast Basin. The combined overdraft of 353,500 AF was more than double the 173,400 AF natural safe yield of the two basins as determined by the California Department of Water Resources (DWR) in 1962. To protect the groundwater basins, the courts adjudicated the two basins to limit pumping. The adjudicated amount (or Allowed Pumping Allocation (APA)) is 217,367 AFY and 64,468.25 AFY, for the Central and West Coast Basins, respectively. The combined amount allowed to be pumped from the two WRD-managed basins are 281,835.25 AFY plus any carryover or other provisions (WRD, 2016).

The most recent judgment, the third amended judgment, in 2013 brought about a restructuring in the governance of Central Basin water rights. The third amended judgment established Water Replenishment District of Southern California (WRD) as the new Watermaster replacing DWR and set up three branches that compose the Watermaster. The three Watermaster arms include the Administrative Body, to administer accounting and reporting functions; the Water Rights Panel, to enforce issues related to the pumping rights within adjudication; and the Storage Panel, to approve certain groundwater storage efforts (WRD, 2015).

The third amended judgment allows water rights holders to carryover a portion of their unused water rights not to exceed an applicable percentage of their APA from one administrative year to the next. The third amended judgment also allows the conversion of carryover to storage, either in an individual storage account (up to 50% of APA) or in a community storage account. The combined storage cannot exceed 200% of APA. Additionally, water rights holders are allowed to extract up to 40% beyond their allowable pumping rights within a given year, excluding amount leased.

The replenishment of the groundwater basin is managed by WRD, a responsibility vested by the Water Replenishment Act. Part of the WRD's role is also to protect the quality of the groundwater supplies, which approximately 3.5 million residents and water users rely upon. WRD is enabled under the California Water Code to purchase and recharge additional water to make up any overdraft, which is known as artificial replenishment. WRD has the authority to levy a replenishment assessment on all pumping within its boundaries to raise monies necessary to purchase the artificial replenishment water and fund projects and programs necessary for replenishment and groundwater quality activities.

WRD relies on artificial replenishment to replace the annual overdraft in the groundwater basin. In addition to stormwater capture and infiltration, the various methods of replenishment include spreading, injection, and in-lieu replenishment water.

- **Spreading** – Groundwater recharge of storm water, imported water from MWD, and recycled water takes place along the spreading grounds adjacent to the Rio Hondo and San Gabriel River and the Whittier Narrows Reservoir.
- **Injection –** WRD also recharges the groundwater by injecting water into the Basin to prevent seawater intrusion. A barrier is formed by the injecting treated water from MWD and highly treated recycled water in wells along the Alamitos Gap.
- **In-lieu Replenishment Water –** The in-lieu program allows the natural recharge of the Basin by offsetting groundwater production with the use of imported water. The reduction in pumping allows the basin to recharge naturally.

WRD's 2016 Engineering Survey and Report discusses WRD's intent to recharge the basins with 103,300 AF of imported and recycled water in water year 2015-16.

6.2.3 Historical Groundwater Pumping

In 2015, 179,704 AF of groundwater was produced from the Central Basin. Groundwater supply met approximately 79% of the water demand for agencies within the CBMWD in 2015. The Central and West Coast groundwater basins are in an overdraft condition. However, the groundwater levels and amount of overdraft fluctuate with time. WRD continually monitors groundwater level trends. WRD's 2015 Engineering Survey and Report discusses groundwater levels within the basins. WRD estimates that the annual overdraft for both basins during water year 2014/2015 was 102,500 AF. WRD or others purchased a total of 89,753 AF of recharge water. The difference between inflows (natural and artificial) and outflows was -12,700 AF, which resulted in a slight decrease in storage in 2014/2015. The accumulated overdraft at the end of the water year 2015/2016 was determined to be 812,100 AF for both basins.

Liberty owns 822.3 AF of groundwater rights to the Central Basin and secures additional water rights through lease agreements with other Central Basin water rights holders. Table 6-1 provides the groundwater volume pumped by Liberty from the Central Basin. Liberty's groundwater production increased annually from 2,539 AF in FY 2010-11 to 3,520 AF in FY 2014-15.

Table 6-1. Groundwater Volume Pumped

Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Central Groundwater Basin	2,539	2,906	3,157	3,384	3,520
	TOTAL	2,539	2,906	3,157	3,384	3,520

Liberty currently produces groundwater from 10 operating wells (seven active, three standby) that vary in depth from 270 feet to 1,052 feet. Groundwater well production varies from 788 gpm to 1,750 gpm in the active wells. A new well (Well 12C) with a design capacity of 2,500 gpm is expected to come online in 2016 and will increase the total system design capacity to 10,182 gpm.

6.3 Surface Water

Liberty's water supply does not include any local surface water sources from local streams, lakes, or reservoirs.

6.4 Stormwater

Liberty's water supply does not include any stormwater captured locally.

6.5 Wastewater and Recycled Water

This section of the 2015 UWMP presents information about the wastewater collection, treatment, and disposal system and the recycled water system within Liberty's service area.

6.5.1 Recycled Water Coordination

Wastewater from Liberty's service area is collected and treated at the Los Coyotes Water Reclamation Plant (WRP) and the Joint Water Pollution Control Plant (JWPCP), which are owned and operated by the Los Angeles County Sanitation District (LACSD). CBMWD purchases recycled water from LACSD and distributed approximately 7,647 AF to customers within its service area in FY 2014-15. Liberty participates in CBMWD's regional water recycling program which comprises two distribution systems, the E. Thornton Ibbetson Century Water Recycling Project and the Esteban E. Torres Rio Hondo Water Recycling Project.

6.5.2 Wastewater Collection, Treatment, and Disposal

Wastewater Collected Within Service Area

Liberty uses the services of LACSD to collect, treat, recycle, and dispose of wastewater. Wastewater from Liberty's service area is collected and treated at the Los Coyotes WRP and the JWPCP in Carson. Municipal wastewater is generated in Liberty's service area from a combination of residential, commercial, and industrial sources. The quantities of wastewater generated are generally proportional to the population and the water used in the service area. It is estimated that customers within Liberty's service area generate wastewater based on 65% of water demand. Wastewater treated at the Los Coyotes WRP is treated to California Department of Public Health's Title 22 recycled water standards.

Table 6-2 lists the volume of wastewater collected within Liberty's service area.

Table 6-2. Wastewater Collected Within Service Area in 2015

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
☑	There is no wastewater collection system. The supplier will not complete the table below.					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Total Wastewater Collected from Service Area in 2015:		0				
NOTES: Liberty does not provide wastewater collection services within its service area. Instead, Liberty utilizes the services of LACSD to collect, treat, and dispose of wastewater. Wastewater from Liberty's service area is collected and treated at the Los Coyotes WRP and the Joint Water Pollution Control Plant in Carson.						

Table 6-3. Wastewater Treatment and Discharge Within Service Area in 2015

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015										
☑	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level ***Drop down list***	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
						Total	0	0	0	0

Wastewater Treatment and Discharge Within Service Area

Wastewater is not treated or disposed of within Liberty's service area. As described in Section 6.5.2, Liberty uses the services of LACSD to collect, treat, recycle, and dispose of wastewater at the Los Coyotes WRP and the JWPCP. Both are part of the Joint Outfall System, which is a network of seven treatment plants, trunk sewers, and pumping plants that provides wastewater treatment, reuse, and disposal for 73 cities and unincorporated areas of Los Angeles County (LACSD, 2016a).

The Los Coyotes WRP is located in the city of Cerritos at the northwest junction of the I-650 and I-91 freeways. It serves approximately 370,000 people. The plant provides primary, secondary, and tertiary treatment for 37.5 MGD of wastewater. About 5 MGD is recycled water that is used for landscape irrigation at parks, schools, golf courses, nurseries, and greenbelts, as well as industrial use. The remainder of the recycled water is discharged to the San Gabriel River (LACSD, 2016b).

The JWPCP is downstream of the Los Coyotes WRP in the city of Carson just east of the I-110 freeway. It is LACSD's largest wastewater treatment plant and one of the world's largest. The plant provides primary and secondary treatment for approximately 280 MGD and has a total permitted capacity of 400 MGD serving a population of 3.5 million in Los Angeles County. Effluent from JWPCP is disinfected and discharged into the Pacific Ocean through a network of outfalls (LACSD, 2016c).

6.5.3 Recycled Water System

Liberty's recycled water supply is provided by and purchased from CBMWD. CBMWD purchases tertiary treated recycled water from two LACSD WRP's, the Los Coyotes WRP and the San Jose Creek WRP. These plants provide approximately 100 MGD of tertiary treated (Title 22) water for distribution; no further treatment is required. CBMWD developed a regional water recycling program consisting of two major distribution systems, the E. Thornton Ibbetson Century Water Recycling Project and the Esteban Torres Rio Hondo Water Recycling Project. The two distribution systems are interconnected by a 50-mile pipeline system and operate as one recycled water supply system with three pumping stations, the Rio Hondo Pump Station, Hollydale Pump Station, and Cerritos Pump Station. Together they form the Central Basin Water Recycling Project, which delivered approximately 7,647 AFY of recycled water to 300 industrial, commercial, and landscape customers within the CBMWD's service area in FY 2014-15.

The Ibbetson Century Project began in 1992 and delivers recycled water from the Los Coyotes WRP to the cities of Bell, Bellflower, Bell Gardens, Compton, Cudahy, Downey, Huntington Liberty, Lakewood, Lynwood, Norwalk, Paramount, Santa Fe Springs, South Gate, and Vernon. The Torres Rio Hondo Project began in 1994 and delivers recycled water from the San Jose Creek WRP to the cities of Pico River and Whittier. In 2011, Phase I of the Southeast Water Reliability Project came online (HDR and Pacifica Services, 2012) and extends the recycled pipeline into Pico Rivera and Montebello.

Recycled water is acceptable for most non-potable water purposes such as irrigation and commercial and industrial processes. Although Liberty does not have a Recycled Water Master Plan, in 2008 CBMWD prepared a Recycled Water Master Plan to help identify all potential customers that could benefit from recycled water. The Recycled Water Master Plan was prepared in conjunction with various water purveyors and cities within CBMWD's service area, LACSD, and WRD. The 2008 Recycled Water Master Plan was updated in 2012 to evaluate the expansion of CBMWD's recycled water system. CBMWD's 2012 Recycled Water Master Plan identified potential customers that could benefit from recycled water. It provided potential system expansion routes and developed a phased Capital Improvement Program (CIP). The first phase of the CIP identifies projects to be performed by 2016 and the second phase identifies improvements that do not have a timeline. CBMWD is currently in the process of updating its 2012 Recycled Water Master Plan. CBMWD's recycled water system is projected to increase from its current sales of about 7,647 AF to 13,911 AF by 2040 by expanding from traditional irrigation users such as golf courses and parks to unconventional commercial and industrial users.

6.5.4 Recycled Water Beneficial Uses

This section discusses current and planned recycled water uses within the service area of urban water suppliers where recycled water use is implemented or planned and provides an overview of the current recycled water system.

Current and Planned Uses of Recycled Water

Liberty uses recycled water to augment valuable groundwater and imported water within its service area. In 2015, Liberty provided 208 AF of recycled water to its 29 locations within Liberty's service area for landscape and golf course irrigation. Landscape irrigation will continue to be the leading users of recycled water in Liberty's service area.

All recycled water is treated to tertiary levels and meets Title 22 requirements. It is estimated recycled water sold by Liberty to its customers will remain stable for many years. Liberty will continue to encourage large landscape water users, public authorities and others to consider using recycled water. The current and projected uses of recycled water used within Liberty's service area are summarized in Table 6-4.

Table 6-4. Current and Projected Recycled Water Direct Beneficial Uses Within Service Area*

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area								
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.							
Name of Agency Producing (Treating) the Recycled Water:		LACSD						
Name of Agency Operating the Recycled Water Distribution System:		CBMWD						
Supplemental Water Added in 2015		None						
Source of 2015 Supplemental Water		N/A						
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation								
Landscape irrigation (excludes golf courses)	Landscape customers	Tertiary	198	215	232	251	271	293
Golf course irrigation	Golf course	Tertiary	9	9	9	9	9	9
Commercial use								
Industrial use								
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment								
Wetlands or wildlife habitat								
Groundwater recharge (IPR)*								
Surface water augmentation (IPR)*								
Direct potable reuse								
Other *(Provide General Description)*								
		Total:	208	224	241	260	280	302
**IPR - Indirect Potable Reuse*								
NOTES: Currently, recycled water is served to landscape customers including 1 golf course. All recycled water is treated to tertiary levels and meets Title 22 requirements.								

Table 6-4b. Potential Recycled Water Customers Within 250 Feet of CBMWD's Recycled Line[1]

Business Type	5-Year Average (gallons)[2]	5-Year Average (AF)
City of Norwalk – Golf Course	5,906,956	18.13
City of Norwalk – John Zimmerman Liberty	5,899,476	18.10
City of Norwalk – Vista Verde Liberty	5,817,944	17.85
Nursery Gardens in Bellflower	2,668,864	8.19
City of Norwalk – Nature Liberty Way	2,065,976	6.34
Total		**68.62**

[1] Not all of the potable water used by these customers can be replaced with recycled water.
[2] Based on potable water use between 2011 and 2015.

As a regional effort, CBMWD has been working with its purveyors, including Liberty, to identify new customers and potential recycled water site connections. CBMWD would need to extend their existing recycled water backbone system to reach these new customers. Liberty looked at its top water users within about 250 feet of CBMWD's existing recycled water system and identified several customers that might be candidates for recycled water use as shown in Table 6-4b. Because CBMWD is in the initial stages of identifying customers, prioritizing projects, and considering financing, it is not expected that these projects would come to fruition in the next few years. Liberty supports the advancement of recycled water and will work closely with CBMWD to develop potential customers. However, it is more appropriate to update the future recycled water projections in the next UWMP.

Planned vs. Actual Use of Recycled Water

The total potential annual recycled water demand in Liberty's service area that is practical to serve is approximately 208 AFY. Recycled water use is down since its peak in 2006-2007. With the economic downturn, some nursery customers went out of business. In addition, the cost of water and conservation messaging during the drought contributed to reduced demands.

Table 6-5 compares the 2010 projections of recycled water use for 2015 with the actual recycled water use in 2015 within Liberty's service area.

Table 6-5. 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual			
☐	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation			
Landscape irrigation (excludes golf courses)		270	198
Golf course irrigation			9
Commercial use			
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
	Total	270	208

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

Liberty works collaboratively with CBMWD to market the use of recycled water within its service area. CBMWD's marketing efforts have been successful in changing the perception of recycled water from merely a conservation tool with minimal application to a cost-effective business tool. The target customer is expanding from traditional irrigation users such as golf courses and parks to unconventional commercial and industrial users.

CBMWD encourages the use of recycled water by increased marketing efforts as well as providing financial incentives. Financial incentives include wholesaling recycled water at a rate lower than potable water and funding plumbing retrofits to use recycled water. Liberty's recycled water rate is set below potable water rates to encourage recycled water use.

CBMWD provides other financial incentives as well. Some potential recycled water users do not have the financial capability to pay for on-site plumbing retrofits necessary to accept recycled water. CBMWD advances funds for retrofit expenses and are subsequently reimbursed through monthly payments. The on-site facilities fees are amortized over a period of time up to ten years at CBMWD's cost of funds. Repayment is made using the differential between potable and recycled water rates such that the customer never pays more than the potable rate. Once the loan is repaid, the rate reverts to the current recycled rates.

To accommodate anticipated growth in the CBMWD service area by identifying all potential customers who would benefit from using recycled water, CBMWD also prepared the Recycled Water Master Plan in 2008 and updated it in 2012. The 2012 Recycled Water Master Plan provided potential system expansion routes and developed a phased CIP. Projects included in the FY 2016-17 Adopted Operating Budget & Preliminary CIP Plan include:

- **West San Gabriel Recycled Water Expansion Project** to construct a pipeline to bring recycled water supply into northern area of the City of Montebello, City of San Gabriel and the City of Monterey Park to serve a demand of 800 AFY.
- **La Mirada Recycled Water Expansion Project** to expand the existing recycled water distribution system in south Santa Fe Springs into La Mirada to serve several landscaped facilities with a demand of 1,200 AFY.
- **Gateway Cities Recycled Water Expansion Project** to provide 453 AFY of recycled water to irrigate nine parks and schools in the cities of South Gate, Bell Gardens, and Lynwood.
- **Pico Rivera Mines Avenue Recycled Water Expansion Project** to construct a pipeline to expand the recycled water supply within the City of Pico Rivera to serve a demand of 275 AFY.
- **City of Downey Recycled Water Expansion Project** to construct a pipeline to expand the recycled water supply into the City of Downey to serve a demand of 125 AFY.
- **City of Monterey Park Recycled Water Expansion Project** to expand the recycled water system into the City of Monterey Park to serve a demand of 750 AFY.
- **Pico Rivera North Recycled Water Expansion Project** to expand the recycled water system into north of Pico Rivera to serve a demand of 150 AFY.
- **Pico Rivera South Recycled Water Expansion Project** to expand the recycled water system into south of Pico Rivera to serve a demand of 200 AFY.

Another aspect of optimizing recycled water use is participation in funding opportunities. CBMWD participates in MWD's Local Resources Program and federal and state funding programs for recycled water projects when available.

Table 6-6. Methods to Expand Future Recycled Water Use

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Marketing	Liberty works collaboratively with CBMWD to market the use of recycled water within its service area. CBMWD's marketing efforts have been successful in changing the perception of recycled water from merely a conservation tool with minimal application to a cost-effective business tool. The target customer is expanding from traditional irrigation users such as golf courses and parks to unconventional commercial and industrial users.	Ongoing	47
Financial Incentives	Financial incentives include wholesaling recycled water at a rate lower than potable water and funding plumbing retrofits to use recycled water. Liberty's recycled water rate is set below potable water rates to encourage recycled water use. CBMWD advances funds for recycled water retrofit expenses and are subsequently reimbursed through monthly payments. The on-site facilities fees are amortized over a period of time up to ten years at CBMWD's cost of funds. Repayment is made using the differential between potable and recycled water rates such that the customer never pays more than the potable rate. Once the loan is repaid, the rate reverts to the current recycled rates.	Ongoing	47
		Total	95

6.6 Desalinated Water Opportunities

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). Currently, there are no identified Liberty projects for desalination of seawater or impaired groundwater. However, from a regional perspective, desalination projects within the region would benefit Liberty as they would make imported supplies available to meet demands.

Because Liberty's service area is not in a coastal area, it is neither practical nor economically feasible for Liberty to implement a seawater desalination program. However, Liberty could provide financial assistance to MWD, other SWP contractors, or their member agencies in the construction of their seawater desalination facilities in exchange for SWP supplies.

Liberty has been following existing and proposed seawater desalination projects along California's coast. Most of the existing and proposed seawater desalination facilities are, or would be, operated by agencies that are not SWP contractors. However, in these cases, an exchange for imported water deliveries would most likely involve a third party (SWP contractor), CBMWD, and Liberty.

6.7 Exchanges or Transfers

Outside of groundwater lease agreements with other local pumpers of the Central Basin, Liberty has not entered into any agreements for the exchanges or transfers of water.

6.7.1 Exchanges

None to report.

6.7.2 Transfers

None to report.

6.7.3 Emergency Interties

Liberty has 16 inter-connections with other water utilities in case of any emergency. Emergency interties are addressed further in Section 8 of this 2015 UMWP.

6.8 Future Water Projects

Liberty has several water supply projects planned to increase reliability and reduce water supply costs by transitioning toward increased groundwater pumping and decreased purchasing of imported water. These projects will allow us to meet demands when imported water supplies are unavailable and allow us to use less expensive groundwater supplies. A new 2,000-gallon-per-minute groundwater well will be completed in 2016 and serve customers in the Compton West system. This well is replacing two wells that have reached the end of their useful lives. A new well is planned in the Bellflower-Norwalk system for completion in 2017. This facility will replace several groundwater wells that are reaching the end of their useful lives and are no longer able to be pumped on a regular basis. A 600,000-gallon reservoir and booster pump station are planned for the Compton East system. The reservoir will allow Liberty to pump more water during low demand periods and store it in the reservoir for use during high demand periods. Construction of the reservoir is expected in 2017. Another new well is planned to replace an old existing well in the Compton East system and is expected to be completed around 2019.

Planned future water supply projects for Liberty is discussed in the paragraph above and are not compatible with Table 6-7.

Table 6-7. Expected Future Water Supply Projects or Programs

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
p. 41	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Agency *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				

6.9 Summary of Existing and Planned Sources of Water

The following table presents Liberty's actual water supplies in year 2015.

Table 6-8. Water Supplies – Actual

Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Groundwater	The sole source of local groundwater for Liberty's water supply is the Central Groundwater Basin.	3,520	Drinking Water
Purchased or Imported Water	Imported water supplies are provided by CBMWD, a MWD member agency. MWD acquires water from the Colorado River and the SWP and distributes treated and untreated water directly to its 26 member agencies.	6,059	Drinking Water
Recycled Water	CBMWD owns the Century Recycled Water System in the cities of Vernon, South Gate, Lynwood, Paramount, Lakewood, Bellflower, Downey, and Norwalk. This system provides the Liberty service area with recycled water.	208	Recycled Water
	Total	9,787	

The total anticipated water supply for Liberty from imported water, groundwater, and recycled water is shown in Table 6-9.

Table 6-9. Water Supplies – Projected

Table 6-9 Retail: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply (reasonable available volume AFY)				
		2020	2025	2030	2035	2040
Groundwater	The sole source of local groundwater for Liberty's water supply is the Central Groundwater Basin.	5,030	5,030	5,030	5,030	5,030
Purchased or Imported Water	Imported water supplies are provided by CBMWD, a MWD member agency. MWD acquires water from the Colorado River and the SWP and distributes treated and untreated water directly to its 26 member agencies.	7,039	6,523	6,077	5,761	5,585
Recycled Water	CBMWD owns the Century Recycled Water System in the cities of Vernon, South Gate, Lynwood, Paramount, Lakewood, Bellflower, Downey, and Norwalk. This system provides the Liberty service area with recycled water.	224	241	260	280	302
	Total	12,293	11,794	11,367	11,071	10,917

6.10 Water Quality

The quality of any natural water is dynamic in nature. This is true for the SWP, Colorado River water, and local groundwater. During periods of intense rainfall or snowmelt, routes of surface water movement are changed; new constituents are mobilized and enter the water while other constituents are diluted or eliminated. The quality of water changes over the course of a year. These same basic principles apply to groundwater. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water depth is a function of local rainfall, snowmelt, and artificial recharge in the Central Basin. During periods of drought, the mineral content of groundwater increases. Water quality is not a static feature of water, and these dynamic variables must be recognized.

As required by the Safe Drinking Water Act, which was reauthorized in 1996, Liberty provides annual Water Quality Reports to its customers, also known as Consumer Confidence Reports (CCR), for each of the three water systems: Bellflower/Norwalk, Lynwood/Rancho Dominguez, and Compton/Willowbrook. This mandate is governed by the U.S. Environmental Protection Agency (EPA) and the Division of Drinking Water Programs (DDW) to inform customers of their drinking water quality. In accordance with the Safe Drinking Water Act, Liberty monitors a number of regulated and unregulated compounds in its water supply and as in years past, the water delivered to Liberty customers meets the standards required by the state and federal regulatory agencies.[4]

[4] Liberty Utilities (Park Water) Corp., Consumer Confidence Reports, 2014-2015.

As mentioned previously, Liberty's source of water is from imported water supplies, local groundwater and recycled water. This section provides a general description of the quality of Liberty's water supplies. A discussion of potential water quality impacts on the reliability of these supplies is also provided.

6.10.1 Quality of Imported Water

Liberty receives imported water through CBMWD from MWD, which receives raw water from Northern California through the SWP and from the Colorado River Basin through the Colorado River Aqueduct. Water quality is identified as a possible risk to MWD's future water supply reliability. Existing supplies could be threatened in the future because of contamination, more stringent water quality regulations, or the discovery of an unknown contaminant. Water quality issues could directly impact the amount of water supplies available to Liberty as shown in the following examples:

- If a groundwater basin becomes contaminated and cannot be used, more water will be required from other sources.
- Imported water from the Colorado River must be blended (mixed) with lower salinity water from the SWP. Higher salinity levels in the Colorado River would increase the proportion of SWP supplies required.
- High total dissolved solids (TDS) in water supplies lead to high TDS in wastewater, which increases the cost of recycled water, if additional treatment such as reverse osmosis is required.
- If diminished water quality causes a need for membrane treatment, the process typically results in losses of up to 15% of the water processed.
- Degradation of imported water supply quality could limit the use of local groundwater basins for storage.
- Changes in drinking water quality standards such as arsenic, chromium VI, radon, or perchlorate could increase demand on imported water supplies.

Because of these concerns, MWD has identified those water quality issues that are most concerning as follows:

- Salinity
- Perchlorate
- Total Organic Carbon and Bromide Formation
- Nutrients
- Arsenic
- Uranium
- Chromium VI
- N-nitrosodimethylamine (NDMA)
- PPCPs

MWD has identified necessary water management strategies to minimize the impact of these contaminants on water supplies. None of these contaminants affects water reliability in Liberty's service area. MWD has not identified any water quality risks that cannot be mitigated. Overall, MWD "anticipates no significant reductions in water supply availability from imported sources due to water quality concerns, over the next five years" (MWD, 2016).

High salinity levels remain a significant issue associated with Colorado River supplies. Under California's current drought conditions, decreased flows have altered Delta flow causing increased seawater intrusion and an observable increase in SWP salinity. However, SWP salinity is still significantly lower than the Colorado River, even under drought conditions (MWD, 2016).

The primary water quality concern for the SWP is disinfection byproduct precursors, specifically total organic carbon and bromide. Disinfection byproducts formed as a result of total organic carbon and bromide reacting with disinfectants can cause near term restrictions to MWD's ability to use SWP water. In order to mitigate this problem, MWD has installed ozone disinfection at four of its treatment plants and construction is underway for an ozone facility at Weymouth Water Treatment Plant.

Perhaps the most important difference in quality between surface water and groundwater is the presence of microbes in surface water. Surface water is exposed to a variety of microbial contaminants while groundwater in general is not. As a result, MWD water is treated at one of three filtration plants - the Jensen Filtration Plant in Mission Hills (San Fernando Valley), the Diemer Filtration Plant in Yorba Linda, and the Weymouth Filtration Plant in LaVerne – before being delivered to Liberty.

MWD tests and treats its water for microbial, organic, inorganic, and radioactive contaminants, as well as pesticides and herbicides. Protection of MWD's water system continues to be a top priority. MWD conducts more than 300,000 water quality tests each year and has contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.[5] MWD also has one of the most advanced laboratories in the country where water quality staff performs tests, collects data, reviews results, prepares reports, and researches other treatment technologies. Although not required, MWD monitors and samples elements that are not regulated but have captured scientific and/or public interest. MWD has tested for chemicals such as perchlorate, methyl tertiary butyl ether (MTBE), and chromium VI among others. In 2007, MWD implemented a program to determine the occurrence of Pharmaceuticals and Personal Care Products (PPCPs) and other organic wastewater contaminants in MWD's treatment plant effluents and selected source water locations within the Colorado River and SWP watersheds.

Water Quality Programs

In addition to monitoring for and controlling specific identified chemicals in the SWP and Colorado River water supply, Metropolitan Water District is involved in a number of programs to protect the quality of its water supplies. Some of the programs and activities include:

- Source Water Protection – MWD has an active source water protection program and continues to advocate on numerous issues to protect and enhance SWP and Colorado River water quality.
- In accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations, DDW requires large utilities delivering surface water to complete a Watershed Sanitary Survey every five years to identify possible sources of drinking water contamination, evaluate source and treated water quality, and recommend watershed management activities that will protect and improve source water quality. The most recent sanitary surveys for the Colorado River and SWP sources were completed in 2010 and 2011, respectively.
- Colorado Water Quality Partnership – MWD is a member of the Clean Colorado River Sustainability Coalition, formed in 1997 to protect and enhance the Colorado River through monitoring and analysis of water quality. MWD is also a member of the Colorado River Basin Salinity Control Forum, which facilitates coordination between Basin states and federal agencies on salinity matters and the implementation of the Colorado River Basin Salinity Control Program. In 2011, MWD, with Southern Nevada Water Authority (SNWA) and the Central Arizona Project, formed the Lower Colorado River Water Quality Partnership to identify and implement collaborative solutions to address water quality issues facing the Colorado River. MWD is also a participant of the Lake Mead Water Quality Forum, formed in 2012, with the goals to support the protection of human health and the environment and to preserve and improve the water quality of the Las Vegas Wash, Las Vegas Bay, and Lake Mead (and as a result, the Colorado River).
- SWP Water Quality Program – MWD supports DWR's policies and programs to maintain and improve the quality of the SWP water. MWD has implemented selective withdrawals from the Arvin-Edison storage program and exchanges with the Kern Water Bank to improve water quality. These programs were initially designed to

[5] MWD website. http://www.mwdh2o.com/Search-Results/Pages/Default.aspx?k=RUWMP

provide dry-year supply reliability but can also be used to store SWP water during periods of better water quality. During periods of lower SWP water quality, the better quality stored water can be withdrawn to dilute with SWP water deliveries.

- Regulatory and Legislative Action – MWD conducts reviews of regulatory and legislative actions that may have an impact on MWD's source water, including state and federal water quality standards, the California Environmental Quality Act (CEQA) documents for projects within MWD's source watershed, and National Pollution Discharge Elimination System (NPDES) permits for wastewater discharges into the Bay-Delta and Colorado River water systems. MWD also provides policies and funding requests for source water protection priorities, such as the Moab uranium tailings clean up and the Colorado River salinity control.

6.10.2 Quality of Groundwater

WRD's service area contains a large and diverse industrial and commercial base, which can potentially contribute to groundwater contamination sources, such as leaking underground storage tanks, petroleum pipeline leaks at refineries and petrochemical plants, discharges from dry cleaning facilities, and auto repair shops. Consequently, WRD established its Groundwater Contamination Prevention Program as a key component of the Groundwater Quality Program in an effort to minimize or eliminate threats to groundwater supplies.

WRD provides extensive information on groundwater quality in both its current Engineering and Survey Report (May 2015) and the Regional Groundwater Monitoring Report (February 2015). Both reports have a section devoted solely to groundwater quality management. The groundwater quality issues discussed by WRD include 11 key water quality constituents: total dissolved solids (TDS), iron, manganese, nitrate, chloride, trichloroethylene (TCE), tetrachloroethylene (PCE), arsenic, perchlorate, hexavalent chromium, and methane.

None of the contaminants listed above impact the reliability of Liberty's groundwater supplies. The Regional Groundwater Monitoring Report concludes that while there are localized areas of marginal to poor water quality that go untapped or may require treatment prior to use, overall, the groundwater in the Basin continues to be of high quality, suitable for potable and non-potable uses, and continues to meet high standards.

Liberty has not had any violations of any Maximum Contaminant Levels (MCLs), Action Levels (ALs) or Treatment Techniques (TTs). The revised Total Coliform Rule became final on February 13, 2013. Although enforcement of the revised rule in California is expected to begin February 2016, it does not appear that this revised rule will have any significant impacts on Liberty (Liberty, Application No. 15-01-001, 2015).

United States Environmental Protection Agency (USEPA)'s second 6-year regulatory review of existing drinking water regulations may include revisions of the MCLs for two volatile organic chemicals (VOCs) – tetrachloroethylene (PCE) and trichloroethylene (TCE). Liberty has several wells that have detected levels of both PCE and TCE, below the current MCL, but near the potential level of the revised MCLs, which are expected to be near the current detection level of reporting (0.5 µg/L). This could require removing several Liberty wells from service in the future while the Company decides whether to build treatment plants (Liberty, Application No. 15-01-001, 2015).

There are several significant regulatory activities pending in California. The DDW adopted an MCL for hexavalent chromium on July 1, 2014, with compliance beginning on January 1, 2015. Although initial quarterly monitoring of all sources is required in the last quarter of 2014 and continuing for three quarters in 2015, Liberty does not expect any problems with compliance with this new MCL (Liberty, Application No. 15-01-001, 2015).

Water Quality Programs

For Central Basin as a whole, WRD actively monitors the Basin for water quality issues. WRD assists purveyors in its service area in meeting drinking water standards through its Cooperative Basin-Wide Title 22 Groundwater Quality Program. The program includes wellhead testing at 84 groundwater wells from 22 participating pumpers, reservoir sample collecting, and water quality testing and reporting services.[6] WRD conducts a comprehensive Groundwater Quality Program to evaluate water quality compliance in production wells, monitoring wells, and recharge/injection areas.

As part of WRD's Regional Groundwater Monitoring Program, WRD collects groundwater samples twice a year from over 300 monitoring wells. The water quality data collected from these wells are used to assess ambient conditions of the Basin, monitor the effects of extraction, monitor the effectiveness of the seawater intrusion barriers, address poor water quality areas, and also provide early warning of emerging contaminants of concern. WRD supplements their sampling with information from production wells in order to broaden the coverage of the Basin.

CBMWD and WRD support and are involved in many programs that address water quality concerns of the groundwater basin. Some of the programs and activities include:

- WRD's Safe Drinking Water Program – This program promotes the treatment of contaminants at the wellhead for potable purposes. Currently, the program is focusing on Volatile Organic Compounds (VOCs) and provides financial assistance for the design and installation of wellhead treatment systems. This program also focuses on the secondary contaminants iron and manganese.
- CBMWD's Water Quality Protection Project – This project was developed to protect the Basin from TCE and PCE from migrating into the Central Basin from the San Gabriel Valley aquifer. The project includes two extraction wells and a treatment facility. Approximately 3,500 AFY of groundwater are treated at a site within the City of Pico Rivera.
- WRD's Groundwater Quality Program – This program monitors and evaluates the impacts of current and pending drinking regulations on the groundwater basin. Contaminants of concern such as perchlorate, NDMA, hexavalent chromium, and 1,4-dioxane are closely monitored.
- WRD's Water Augmentation Study – This study evaluates the feasibility of capturing more storm runoff in-lieu of discharge to surface waters.
- WRD's Central Basin Groundwater Contamination Study – WRD, in conjunction with the U.S. Geographical Survey (USGS), is characterizing the threat of multiple contaminants moving to deeper potable water aquifers.
- WRD's Los Angeles Forebay Groundwater Task Force – WRD formed the Los Angeles Forebay Groundwater Task Force in 2012 to coordinate and align regulators and water purveyors/agencies to collaboratively address groundwater contamination in the Los Angeles Forebay, specifically VOCs and perchlorate issues.
- WRD's Broadway Neighborhood Stormwater Greenway (Broadway) Project – Funded by Prop 84 money, WRD partnered with the City of Los Angeles Bureau of Sanitation to implement a portion of the concept design to increase stormwater infiltration and to assist the City of Los Angeles in its compliance with total maximum daily load (water quality-related) requirements.

[6] WRD Engineering Survey and Report, May 2015.

- WRD's Regional Water Quality Monitoring Program – This program has been in place for over 50 years to collect basic information used for groundwater basin management, including groundwater level data and water quality data. It currently consists of a network of over 300 WRD and USGS-installed monitoring wells at over 55 locations.

6.10.3 Water Quality Impacts on Reliability

The previous section summarized the general water quality issues of MWD's imported water and the Central Basin's groundwater. The same water quality concerns apply to Liberty's water supply. Similar to MWD's watershed survey, Liberty prepared a Source Water Assessment of its drinking water sources in April 2003. The groundwater sources were found to be most vulnerable to possible contamination from landfills and dumps, irrigated crops, sewer collection systems, gas stations, dry cleaners, metal plating/finishing/fabricating shops, military installations, chemical/petroleum processing and storage facilities, and leaking underground storage tanks. There have been no contaminants detected that exceed any federal or state drinking water standards. Hundreds of samples analyzed every month and thousands every year by Liberty and MWD laboratories assure that all primary (health related) and secondary (aesthetic) drinking water standards are being met.[7] Liberty continues to monitor its groundwater wells for the first indication of problems as part of their water management strategy.

Liberty constructed a wellhead treatment facility to reduce the levels of manganese and arsenic occurring in the water pumped from Well 9D. The installation of this treatment plant allows Liberty to maximize local groundwater supply by pumping about 850 AFY (maximum flow of 1,200 gpm) from Well 9D.

Liberty proactively monitors emerging contaminants and has some wells with 1,4-Dioxane detected at levels above the California Notification Level (not a drinking water standard) of 1 ppb. Four wells in the Bellflower-Norwalk system and one well in the Lynwood/Rancho Dominguez system have detected levels of 1,4-Dioxane ranging from 1.5 to 4.1 ppb. Concentrations have remained relatively stable since 2002. Liberty provides notice of this exceedance of the 1,4-Dioxane NL to its customers annually in its Consumer Confidence Reports (Liberty, Application No. 15-01-001, 2015).

Except for the occurrence of 1,4-dioxane and Well 9D arsenic and manganese, Liberty has not experienced any other significant water quality problems. Liberty is concerned about the potential for increasing levels of VOCs in the Central Basin as well as the potential lowering of the existing MCLs for TCE and PCE. Liberty has additional concerns about VOCs because of several plans being considered to use the Basin for conjunctive use (additional groundwater storage). This would be accomplished by spreading additional imported water and raising the groundwater level in the Basin. Raising groundwater levels has the potential to put water into the previously dry vadose zone[8] and mobilize contaminants like VOCs into the groundwater. Liberty will continue to closely monitor this situation.

The EPA's Stage 2 regulation of the disinfection byproducts rule took effect in 2013 to tighten monitoring requirements of total trihalomethanes (TTHM) and haloacetic acids (HAA5). Stage 1 was implemented in 2002 and lowered the TTHM maximum annual average concentration level in water supplies. Stage 2 changed compliance from a system-wide running annual average to a location running annual average, making it easier for utilities to fall out of compliance. The Liberty water supplies meet the requirements of both Stage 1 and 2. MWD is adding ozone treatment to their Weymouth Filtration Plant as a primary disinfectant to reduce the levels of regulated disinfection byproducts (DBPs).

[7] Liberty Utilities (Park Water) Corp., *Consumer Confidence Reports*, 2014-2015.
[8] The mostly unsaturated zone between the soil surface and the permanent groundwater table.

Ozone is already in place at the Jensen, Skinner, Mills and Diemer Plants. This should assure Liberty's compliance with Stage 2 DBP Rule into the future.

Liberty does not anticipate any significant or immediate changes in its available water supplies due to water quality issues, in part because of the mitigation actions undertaken by Liberty, MWD, CBMWD, and WRD as described earlier.

Reference:
RMP, 2011

CITY OF COMPTON

2010 Urban Water Management Plan

Prepared By:
Risk Management Professionals

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2 SYSTEM DESCRIPTION

2.1 SERVICE AREA PHYSICAL DESCRIPTION

Urban Water Management Planning Act Requirement:

10631(a) Describe the service area of the supplier.

General Location Overview

The City of Compton (City) is also known as the "Hub City" because of its unique location in the center of Los Angeles County. The City is located approximately six miles north of downtown Long Beach and is bounded by the City of Paramount to the east, the City of Lynwood and an unincorporated County area (the Willowbrook community) to the north, an unincorporated County areas to the west, and unincorporated County areas and the Cities of Carson and Long Beach to the south. One of the City's unique geographic characteristics is that its boundaries enclose three areas of unincorporated County.

The Long Beach Freeway (I-710) generally serves as the City's eastern boundary. The Artesia Freeway (SR-91) traverses the southern portion of Compton, while the Century Freeway (I-105) is located to the north of the City. Figure 2.1.1 shows the location of the City of Compton in a regional context. A Citywide map is provided in Figure 2.1.2

The City has a total land area of 10.2 square miles or approximately 6,514 acres. Land uses within the City are varied. Residential users are scattered throughout the City and includes a mix of single-family homes and multi-family developments (both apartments and condominiums). Commercial uses are concentrated along the major arterials and include retail and small office developments, neighborhood commercial centers, and a number of larger community shopping centers. Industrial users are concentrated along Alameda Street (north of Rosecrans Avenue) and in the westernmost and southern portions of the City.

The predominant land use in the City is residential, accounting for approximately forty (40) percent of the City's total land area. The next largest land use in the City is industrial, which accounts for over seventeen (17) percent of the City's total land area and wealth of jobs. The

third largest land use is commercial uses account for approximately five (5) percent of the City's land area.

Water System Overview

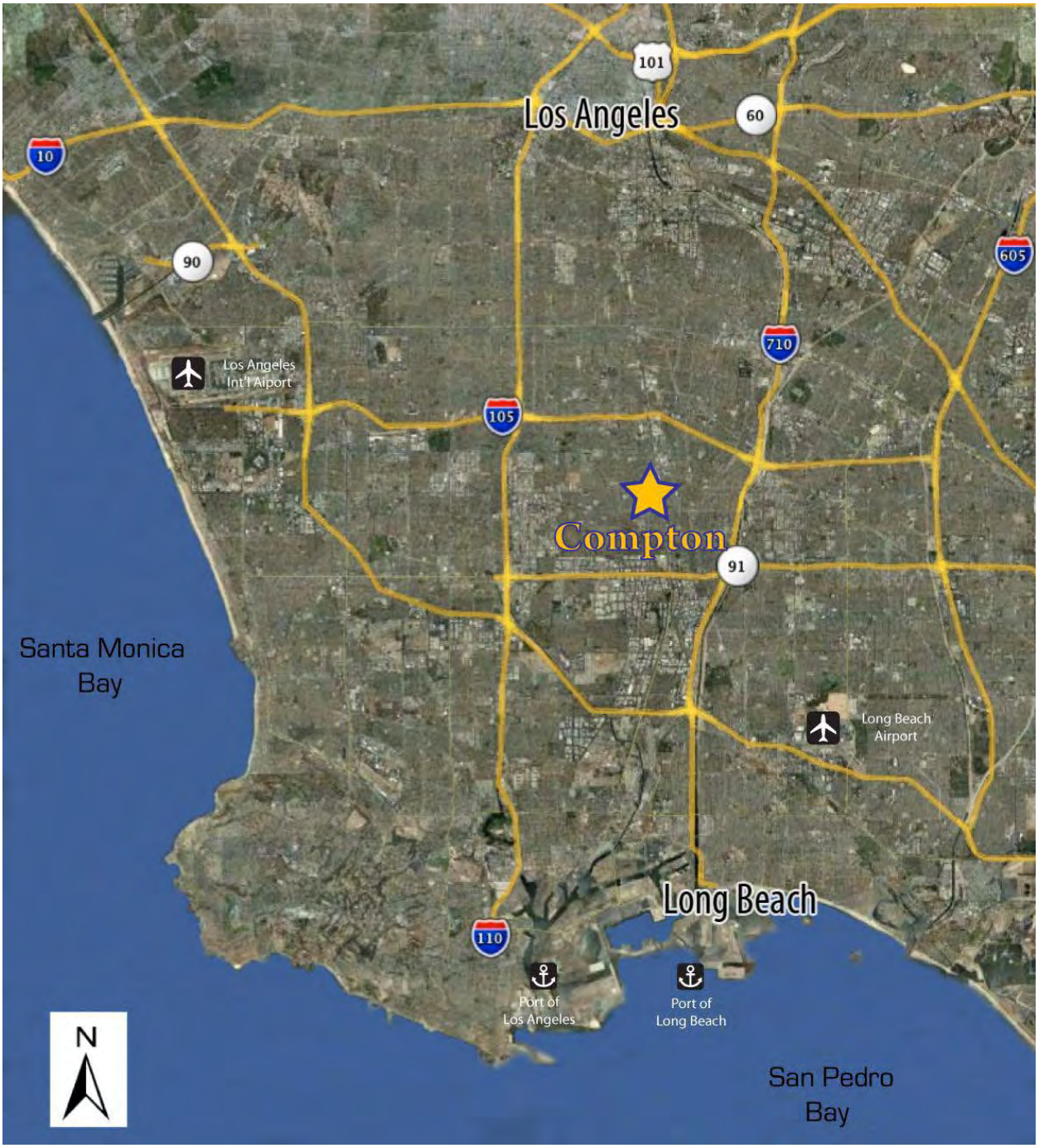
The City of Compton Municipal Water District (CMWD) has two major sources of water. It currently has access to 5,780 acre-feet of groundwater that is supplied via 7 wells. Water is pumped from these wells, and flows into a grid system, which is then distributed using a gravity fed system via 163 miles of 2 to 24-inch diameter pipes. In addition, Metropolitan Water District of Southern California (MWD) supplies approximately 30-60% of the City's water demand. MWD has three active interconnections to the City. The purchased water from MWD augments the water from the wells, via the distribution system, and flows into four 3 million gallon welded steel-plate storage tanks, for a total of 12,000 million gallons of storage. Any fluctuations in system pressure or flow deficiencies are taken up by these tanks. Table 2.1.1 shows the maximum pumping capacity of each well site.

Water supplies are currently adequate to meet normal domestic needs, but overall reservoir capacity is lower than desirable. CMWD retails water to approximately 80 percent of the City of Compton as shown in Figure 2.1.3. Private water companies provide service to the remaining residents.

Table 2.1.1
System Facility Summary

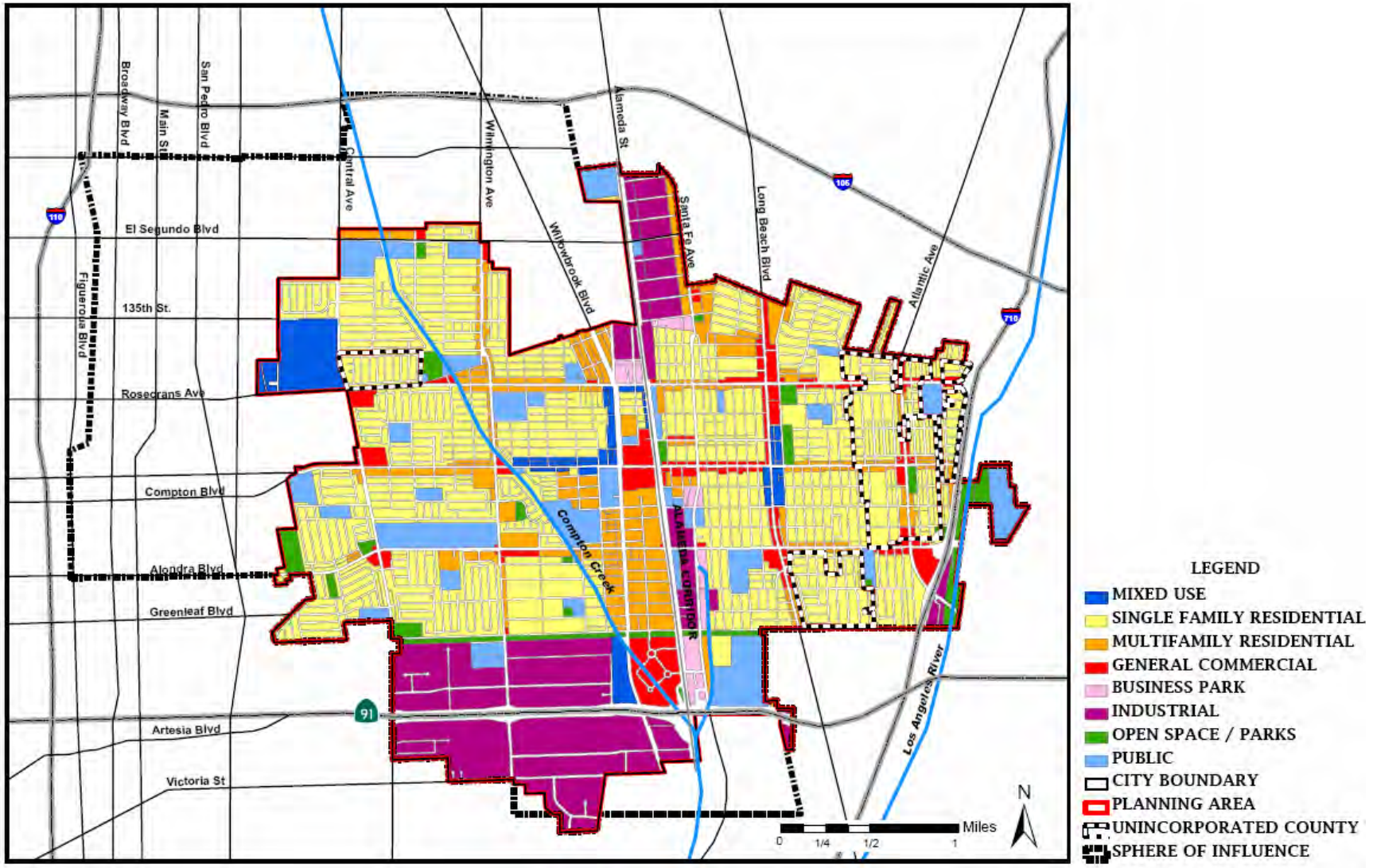
Wells	GPD (Gallons Per Day)	Reservoir (S. Wilmington Ave)	Capacity
Well Site 11	1,440,000	Elevated Tank	3 MG
Well Site 13	1,584,000	Elevated Tank	3 MG
Well Site 15	1,080,000	Elevated Tank	3 MG
Well Site 16	1,656,000	Elevated Tank	3 MG
Well Site 17	1,339,200		
Well Site 18	2,880,000		
Well Site 19	2,592,000		
Total	**9,979,200**		**12 MG**

Figure 2.1.1 – The City of Compton Regional Location[1]



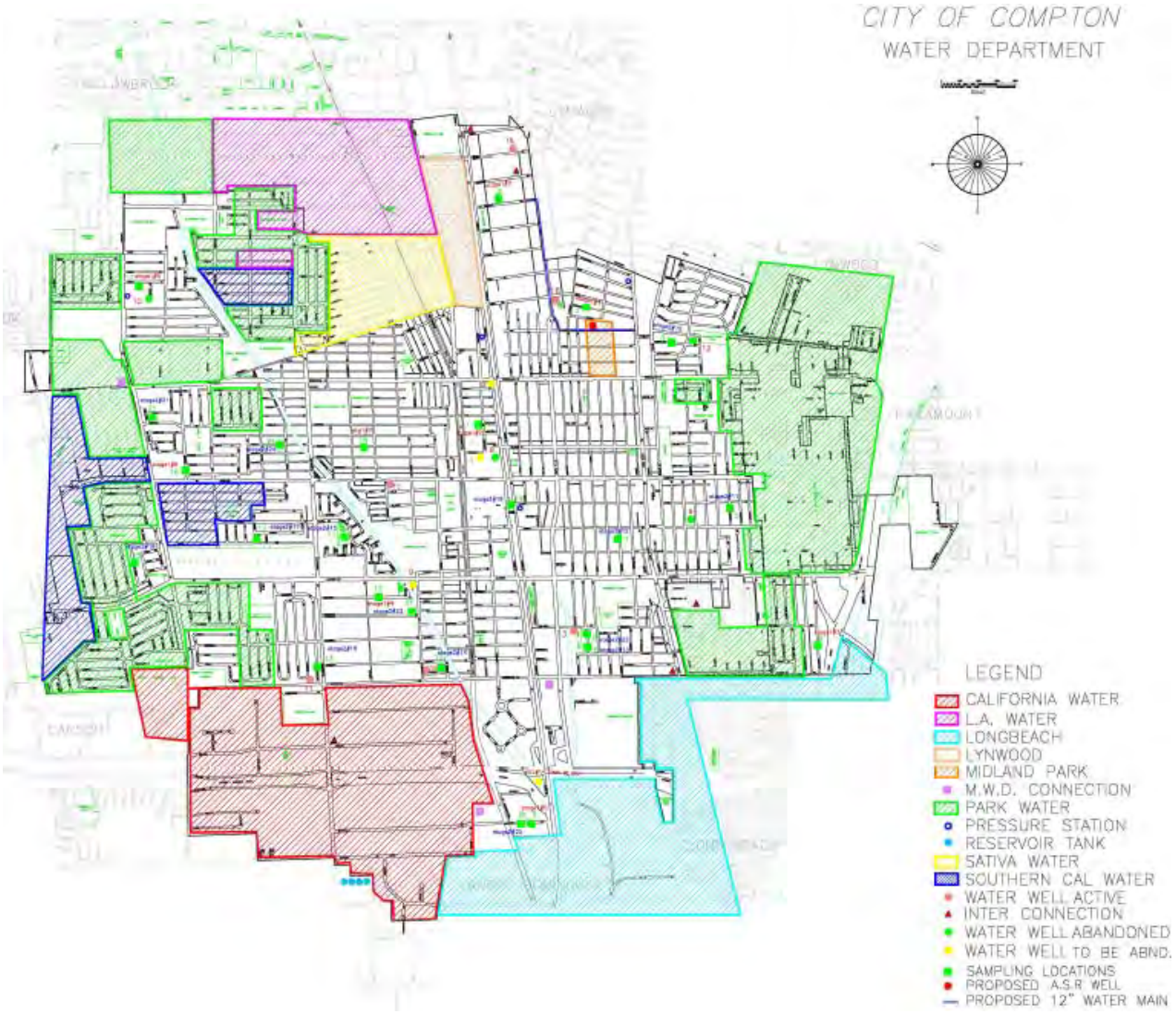
[1]Not to Scale

Figure 2.1.2 – City of Compton Map[1]



[1]Not to Scale

Figure 2.1.3 – The City of Compton Service Area[1]



[1]Not to Scale

2.2 SERVICE AREA CLIMATE

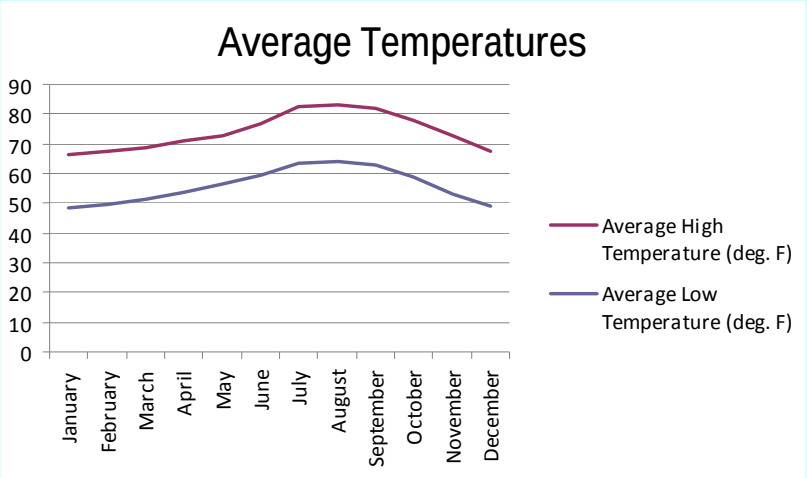
Urban Water Management Planning Act Requirement:

10631(a) Describe the service area – climate.

Temperature

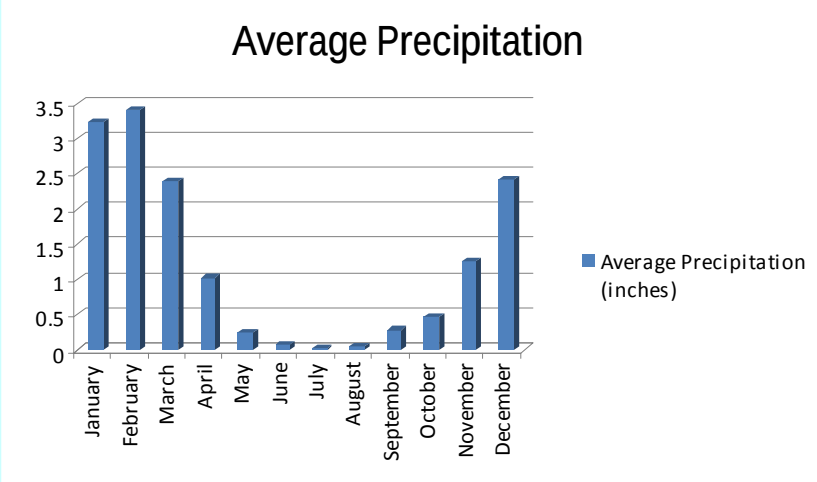
The City of Compton has a Subtropical-Mediterranean climate and receives just enough annual precipitation to avoid Koppen BSh (semi-arid climate) classification. The temperature range is generally moderate as depicted in Figure 2.2.1; the average high temperature is 74 °F and the average minimum annual temperature is 55 °F.

Figure 2.2.1 – Average Temperatures



Precipitation

Figure 2.2.2 – Average Precipitation



The City's annual average precipitation is approximately 15 inches. The average annual monthly precipitation in the City of Compton is presented in Figure 2.2.2.

Additionally, seasonal variation in temperature, rainfall, and evapotranspiration rate are illustrated in Table 2.2.1.

Table 2.2.1
Climate Data[1] (Period Record: 4/1/1906 – 12/31/2010)

	Avg. High Temp. (F)	Avg. Low Temp. (F)	Avg. Precipitation	Avg. (ETo)[2]
January	66.3	48.3	3.24	1.65
February	67.3	49.6	3.41	2.15
March	68.8	51.1	2.39	3.59
April	71.0	53.4	1.02	4.77
May	72.9	56.5	0.25	5.12
June	77.0	59.7	0.07	5.71
July	82.3	63.2	0.01	5.93
August	83.1	63.8	0.05	5.91
September	81.8	62.6	0.28	4.39
October	77.6	58.7	0.47	3.22
November	72.8	53.3	1.25	2.18
December	67.4	49.1	2.42	1.68

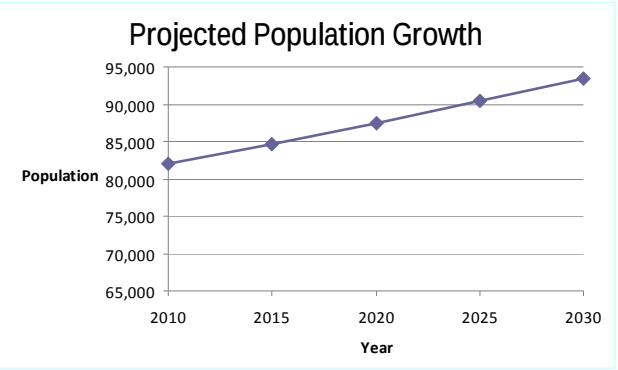
Source: (1) Western Regional Climate Center: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5115
(2) CIMIS: http://wwwcimis.water.ca.gov/cimis - Long Beach Station

2.3 SERVICE AREA POPULATION

Urban Water Management Planning Act Requirement:

10631(a) Describe the service area – current and projected population … The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier …(population projections) shall be in five-year increments to 20 years or as far as data is available.

Figure 2.3.1 – Projected Population Growth



Compton is strategically positioned on the Alameda Corridor, along which 25% of all U.S. waterborne international trade passes. The City is emerging as an industrial center in Los Angeles County for transit and distribution, business services, high technology, home and lifestyle products, and

metals. Compton is also considered an "entrepreneurial hot spot" and the City was recently listed as one of the best places in the United States to start and grow a business. The City is growing; its 2009 population is exceeds its earlier 2015 population projection. The community's population is predominantly Latino (57%) and African-American (40%) according to the most recent 2000 U.S. Census. Table 2.3.1 and Figure 2.3.1 show the service area population projection for the next 20 years.

Compton has a young population, with almost 50 percent of its residents under the age of 25 and a proportionally smaller senior population than that of the County of Los Angeles. Compton has been described as a family-oriented community because over 83% of its households are made up of families, a higher percentage than for Los Angeles County as a whole. Compton's family size is also larger than for Los Angeles County, 4.16 persons per household versus 2.98 persons per household for the County.

Table 2.3.1
Population — Current and Projected

	2010	2015	2020	2025	2030	Data source
Service Area Population[1]	81,963	84,669	87465	90353	93,336	California DOF and Census.gov Estimates

[1] Service area population is defined as the population served by the distribution system. See Technical Methodology 2: Service Area Population (2010 UWMP Guidebook, Section M).

2.4 OTHER DEMOGRAPHIC FACTORS

Urban Water Management Planning Act Requirement:

10631(a) Describe the service area – other demographic factors affecting the supplier's water management planning

Compton's employment levels are forecast to grow by about nine (9) percent over the next 30 years. The majority of jobs will be in the manufacturing, sales and service sectors. The City has about 2,700 licensed businesses. Retail businesses and offices are concentrated along Compton Boulevard, Alameda Street, Long Beach Boulevard, and Rosecrans Avenue. The major industrial businesses are located near the Artesia Freeway (SR-91) and along Alameda Street. City water demand is estimated to increase moderately in the future as a result of the projected increase in population.

3 SYSTEM DEMANDS

3.1 WATER CONSERVATION BILL OF 2009 - BASELINES AND TARGETS

Urban Water Management Planning Act Requirement:

10608.20(e) An urban retail water supplier shall include in its urban water management plan … due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

In order to improve the Sacramento-San Joaquin Delta, in 2008 Governor Schwarzenegger directed State water agencies to develop a plan to achieve a twenty percent per capita water use reduction by the year 2020. The Water Conservation Act of 2009 (Senate Bill x7-7), passed in November 2009, provides the legislative framework to implement the conservation goals, and requires retail water suppliers to detail their strategy for achieving the reduction requirement in their 2010 Urban Water Management Plan Updates. The Urban Water Management Planning Act and SBx7-7 can be found in Appendices C and D of this document, respectively.

Explicit methodologies were developed by the California Department of Water Resources (DWR) to assist retail water suppliers in complying with the Water Conservation Act of 2009, and they are detailed in the technical document, "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use." The City of Compton utilized the DWR methods when determining its baseline, interim, and water use target values, the steps of which are described in detail in the following sections.

The methodologies laid out by DWR instruct urban water suppliers to determine their baseline and target water use values through performing four main steps, which are as follows:

- Step 1: Determine Base Daily Per Capita Water Use
- Step 2: Determine Urban Water Use Target
- Step 3: Compare Urban Water Use Target to the 5-year Baseline (verification of 95% minimum reduction requirement)

- Step 4: Determine Interim Urban Water Use Target

Water suppliers are given the option of determining their 20x2020 target values either individually, or through a regional alliance. The City of Compton elected not to join a regional alliance, and has determined its baseline and target values individually.

3.1.1 Step 1: Determine Base Daily Per Capita Water Use

Baseline daily per capita water use is defined as an urban water supplier's estimate of its average gross water use, reported in gallons per capita per day (GPCD) and calculated over a continuous base period.

Steps 1A – 1C: Determine Supplier 10- to 15-year, and 5-year Base Periods

Urban retail water suppliers are required to choose a continuous, 10-year baseline period ending no earlier than December 31, 2004 and no later than December 31, 2010 when determining Base Daily Per Capita Water Use. The option to extend the baseline to a 15-year period is given to water suppliers if recycled water accounts for at least 10 percent of their 2008 retail water deliveries. The City of Compton does not utilize recycled water, and therefore a 10-year baseline period was chosen; July 1st, 2000 through June 30th, 2010.

The 5-year baseline period is used to determine the retail water supplier's minimum water use reduction, and the period must end no earlier than December 31st, 2007 and no later than December 31st, 2010. July 1st, 2005 through June 30th, 2010 was chosen as the 5-year baseline period for the City of Compton. Table 3.1.1 summarizes the City of Compton's baseline period selections.

Table 3.1.1
Base Period Ranges

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	9,690	*acre-ft*
	2008 total volume of delivered recycled water	0	*acre-ft*
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in base period	10	Years
	Fiscal Year beginning base period range	2001	
	Fiscal Year ending base period range	2010	
5-year base period	Number of years in base period	5	Years
	Fiscal Year beginning base period range	2006	
	Fiscal Year ending base period range	2010	

Units: acre-feet per year

Steps 1D – 1E: Estimate Service Area Population

The City of Compton Municipal Water Department's service area encompasses approximately 80% of the City's limits. Therefore, U.S. Census data were used in accordance with "Appendix A: Alternative Methodology for Service Area Population" from the DWR Technical Methodologies guidance to estimate the service area's total population for the baseline years (2001 – 2010).

Step 1F: Calculate Gross Water Use

The City of Compton receives potable water from two sources; imported water, purchased through the Metropolitan Water District of Southern California (MWD), and groundwater, extracted via a series of wells. Total annual volumes (reported for each fiscal year) of groundwater and imported water entering the City's distribution system were obtained from the Central Basin Municipal Water District's Watermaster Service Reports. A summary of the calculations, highlighting the steps described in DWR's guidance document, is shown in Table 3.1.2.

Table 3.1.2
Gross Water Use Calculations

Utility Name: City of Compton	12-month period from: 1-Jul to 30-Jun	Volume Units: Million Gallons

		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
1	Volume from Own Sources (raw data)	1920	2191	2317	2233	2153	1710	1955	2428	2237	2061
2	Volume from Imported Sources (raw data)	1265	1086	942	1044	971	915	1204	729	704	848
3	***Total Volume Into Distribution System = Line 1 + Line 2***	***3185***	***3277***	***3259***	***3277***	***3124***	***2625***	***3159***	***3157***	***2941***	***2909***
4	Volume Exported to Other Utilities (raw data)	-	-	-	-	-	-	-	-	-	-
5	Change in Distribution System Storage (+/-)	-	-	-	-	-	-	-	-	-	-
6	***Gross Water Use Before Indirect Recycled Water Use Deductions = Line 3 - Line 4 - Line 5***	***3185***	***3277***	***3259***	***3277***	***3124***	***2625***	***3159***	***3157***	***2941***	***2909***
7	Indirect Recycled Water Use Deduction	-	-	-	-	-	-	-	-	-	-
8	***Gross Water Use After Indirect Recycled Water Use Deductions = Line 6 - Line 7***	***3185***	***3277***	***3259***	***3277***	***3124***	***2625***	***3159***	***3157***	***2941***	***2909***
9	*Water Delivered for Agricultural Use (optional deduction)*	-	-	-	-	-	-	-	-	-	-
10	*Process Water Use (optional deduction)*	-	-	-	-	-	-	-	-	-	-
11	**Gross Water Use After Optional Deductions**	***3185***	***3277***	***3259***	***3277***	***3124***	***2625***	***3159***	***3157***	***2941***	***2909***

Steps 1G – 1I: Determine Annual and Base Daily Per Capita Water Use

Annual daily per capita water use for the City of Compton was estimated by dividing the gross water use by the service area's total population for each year of the baseline period. The average of these values over the 10-year baseline was then determined, giving the Base Daily Per Capita Water Use for the City of Compton; **106 GPCD**.

Table 3.1.3 summarizes the data used to determine the City's Base Daily Per Capita Water Use.

Table 3.1.3
Base Daily Per Capita Water Use — 10-Year Range

Base period year		Distribution System Population	Daily System Gross Water Use (MGD)	Annual Daily Per Capita Water Use (GPCD)
Sequence Year	Fiscal Year Ending			
Year 1	2001	77,733	8.73	112
Year 2	2002	78,733	8.98	114
Year 3	2003	79,524	8.93	112
Year 4	2004	80,204	8.98	112
Year 5	2005	80,593	8.56	106
Year 6	2006	80,980	7.19	89
Year 7	2007	80,915	8.66	107
Year 8	2008	80,934	8.65	107
Year 9	2009	81,384	8.06	99
Year 10	2010	81,963	7.97	97
			Base Daily Per Capita Water Use	106

3.1.2 Determine Urban Water Use Target

The Water Conservation Act of 2009 provides the retail water supplier the choice of four methods for determining the urban water use target value. The four methods are:

- Method 1: 80% of Base Daily Per Capita Water Use Value
- Method 2: Performance Standards
- Method 3: 95% of the Hydrologic Region 2020 Target Value
- Method 4: Water Savings (developed by DWR)

The City of Compton decided upon Method 3 for determining its water use reduction target, as it provides a goal that is most appropriate for the City's future plans. Compton is located in the South Coast hydrologic region, which was assigned a 149 GPCD water use target. Ninety five

percent of the region's target, or **142 GPCD**, was therefore chosen as the City of Compton's Urban Water Use Target.

3.1.3 Confirm Urban Water Use Target

The Water Conservation Act of 2009 sets a minimum reduction requirement the water supplier's urban water use target must meet or exceed. The minimum reduction is defined as 95 percent of the 5-year baseline period's Base Daily Per Capita Water Use. However, a water supplier is excluded from this requirement if the 5-year Base Daily Per Capita Water Use is equal to or less than 100 GPCD. The City of Compton's 5-year Base Daily Per Capita Water Use is 100 GPCD, and the City is therefore excluded from the minimum reduction requirement. The Urban Water Use Target is confirmed at 142 GPCD. Table 3.1.4 provides a summary of the 5-year baseline calculations.

Table 3.1.4
Base Daily Per Capita Water Use — 5-Year Range

Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Fiscal Year Ending			
Year 1	2006	80,980	7.19	89
Year 2	2007	80,915	8.66	107
Year 3	2008	80,934	8.65	107
Year 4	2009	81,384	8.06	99
Year 5	2010	81,963	7.97	97
Base Daily Per Capita Water Use				100

3.1.4 Determine Interim Urban Water Use Target

The interim urban water use target is defined as the water use goal the water supplier is to achieve and report in the 2015 UWMP Update, and equals half of the target 2020 reduction. The interim urban water use target for the City of Compton is **124 GPCD**.

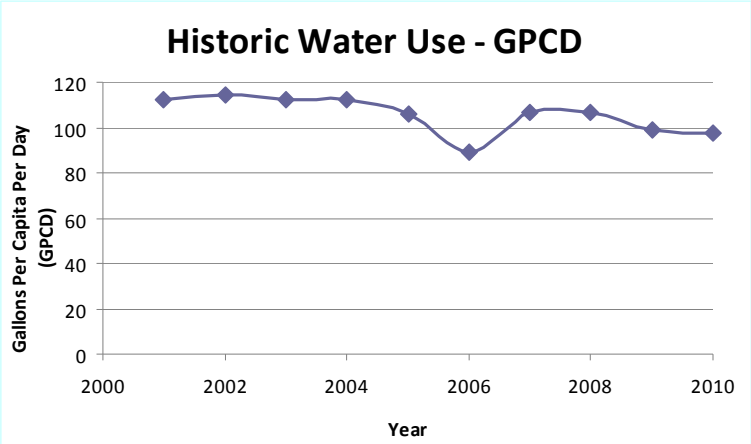
3.2 WATER DEMANDS

Urban Water Management Planning Act Requirement:

10608.20(e)(1)&(2) Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural.

3.2.1 Historic Water Use

Figure 3.2.1 – Historic Water Use



The City of Compton's Water System currently serves approximately 82,000 people within its service area. With the City being almost completely built-out, significant growth or increase in water demands are not anticipated in future years.

Key factors that affect water demands are; population growth, increases in land use development, industrial growth and reductions in annual rainfall. For the City of Compton, population and rainfall exhibit the greatest influence. Usage of water per capita day has been fairly steady throughout the past ten years, as shown in Figure 3.2.1. Consumption has ranged from a low 89 GPCD in 2006 to a maximum of 114 GPCD in 2002. The average use per day during the period from 2001 through 2010 was 106 gallons per person.

Table 3.2.1
Historic Water Use

Fiscal Year	Gross Water Use (MGY)	Population	Usage Per Capita Day (GPCD)
2001	3,185	77,733	112
2002	3,277	78,733	114
2003	3,259	79,524	112
2004	3,277	80,204	112
2005	3,124	80,593	106
2006	2,625	80,980	89
2007	3,159	80,915	107
2008	3,157	80,934	107
2009	2,941	81,384	99
2010	2,909	81,963	97

In the past, the City of Compton has not separated water use deliveries by sector, and records are not available to separate the total water deliveries for 2005. Estimates of total water use for 2005, as obtained from the CBMWD 2005 Watermaster Report, are shown in Table 3.2.2.

Table 3.2.2
Water Deliveries — Estimated, 2005

	2005				
	Metered		Not metered		Total
Water use sectors	**# of accounts**	**Volume**	**# of accounts**	**Volume**	**Volume**
Residential, Commercial, Industrial, Institutional/Governmental, Landscape, Agriculture, Other	Records Not Available	9,586	0	0	9,586
Total	Not Available	9,586	0	0	9,586

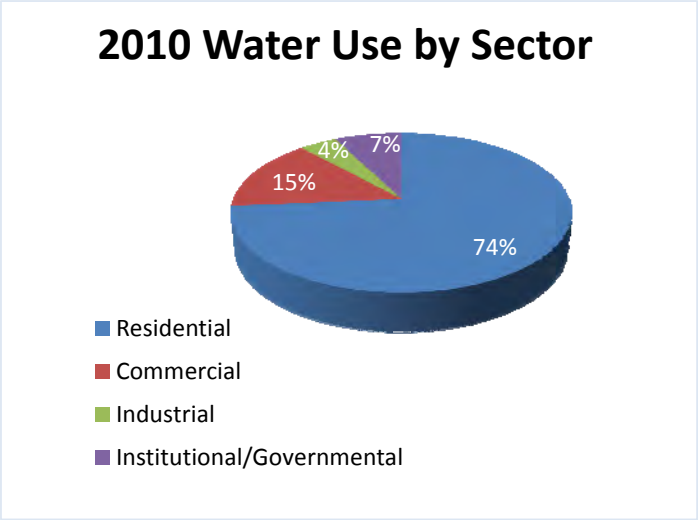
Units: acre-feet per year

3.2.2 Current and Projected Water Use by Sector

In 2010, the City used 7,111 acre-feet of water, as measured by metered sales. Average water deliveries, shown in Figure 3.2.2, are broken down into the following sectors:

- Residential
- Commercial
- Industrial
- Institutional/governmental

Figure 3.2.2 –Water Deliveries



Number of connections and water use are projected for the next 20 years, in five year increments, and are broken down by sector. The future estimations of water use and connections (by sector) are extrapolated based on the current (2010) values, anticipated population growth, and the Interim (2015) and Final (2020) Target Water Use Reduction Goals.

Residential Sector

As Tables 3.2.3 – 3.2.6 indicate, the majority of the water demand in the community will continue to be in the residential sector. Due to the lack of available space, the City of Compton does not have plans for new residential development in the near future. In the next 20 years, some form of residential redevelopment may occur; however, such development is not expected to place a heavy demand on the City's water supply.

Commercial Sector

Commercial water demand has remained fairly stable over the past few years. Current and projected water demands for the City's commercial sector are shown in Tables 3.2.3 – 3.2.6.

Industrial Sector

Industrial water demand has also remained fairly stable over the past few years. Similar to residential development, no new form of large industrial development is anticipated in the near future that will increase industrial water demand. Current and projected water demands for the City's industrial sector are shown in Tables 3.2.3 – 3.2.6.

Landscape Sector

Landscape water use is not currently tracked by the City.

Agricultural Sector

The City of Compton does not provide potable water for agricultural uses.

Table 3.2.3
Water Deliveries — Actual, 2010

	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Residential	12,393	5,232	0	0	5,232
Commercial	900	1,047	0	0	1,047
Industrial	147	299	0	0	299
Institutional/governmental	176	532	0	0	532
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	146	1	0	0	1
Total	13,762	7,111	0	0	7,111

Units: acre-feet per year

Table 3.2.4
Water Deliveries — Projected, 2015

	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Residential	12,802	5,557	0	0	5,557
Commercial	930	1,112	0	0	1,112
Industrial	152	318	0	0	318
Institutional/governmental	182	565	0	0	565
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	151	1	0	0	1
Total	14,216	7,553	0	0	7,553

Units: acre-feet per year

Table 3.2.5
Water Deliveries — Projected, 2020

	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Residential	13,225	5,741	0	0	5,741
Commercial	960	1,149	0	0	1,149
Industrial	157	328	0	0	328
Institutional/governmental	188	583	0	0	583
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	156	1	0	0	1
Total	14,686	7,803	0	0	7,803

Units: acre-feet per year

Table 3.2.6
Water Deliveries — Projected 2025 and 2030

	2025		2030	
	metered		metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume
Single family	13,662	5,930	14,113	6,126
Multi-family	992	1,187	1,025	1,226
Commercial/Institutional	162	339	167	351
Industrial	194	603	200	623
Landscape	0	0	0	0
Agriculture	0	0	0	0
Other	161	1	166	1
Total	15,171	8,061	15,672	8,327

Units: acre-feet per year

3.2.3. Sales to Outside Agencies

The City of Compton does not sell wholesale water to other agencies. Table 3.2.7 is provided to quantify that Compton does not intend to sell water to other water agencies within the planning period.

Table 3.2.7
Sales to Other Water Agencies

Water Distributed	2005	2010	2015	2020	2025	2030
Not Applicable	0	0	0	0	0	0
Total	0	0	0	0	0	0

Units: acre-feet per year

3.2.4. Other Water Uses and Losses

Systems losses were estimated by subtracting the total metered deliveries for the year from the total water volume into the system (well production and imported water). The remainder was considered water losses and/or other, unaccounted-for water uses. In 2010, water losses were approximately 20%. Adequate records were not available to estimate system losses for 2005. Current and projected system losses are summarized in Table 3.2.8.

Table 3.2.8
Additional Water Uses and Losses

Water Use	2005	2010	2015	2020	2025	2030
Saline barriers	N/A					
Groundwater recharge	N/A					
Conjunctive use	N/A					
Raw water	N/A					
Recycled water	N/A					
System losses	N/A	1,818	1,931	1,995	2,060	2,128
Other (define)	N/A					
Total	N/A	1,818	1,931	1,995	2,060	2,128

Units: acre-feet per year

3.2.5 Total Water Demands

The total past, current, and future water demands for the City of Compton are summarized in Table 3.2.9.

Table 3.2.9
Total Water Use

Water Use	2005	2010	2015	2020	2025	2030
Total water deliveries (Tables 3.2.2 to 3.2.6)	9,586	7,111	7,553	7,803	8,061	8,327
Sales to other water agencies (Table 3.2.7)	N/A	N/A	N/A	N/A	N/A	N/A
Additional water uses and losses (Table 3.2.8)	N/A	1,818	1,931	1,995	2,060	2,128
Total	9,586	8,929	9,484	9,798	10,121	10,455

Units: acre-feet per year

3.2.6 Lower Income Housing Projections

Urban Water Management Planning Act Requirement:

10631.1(a) The water use projections required by Section 10631 shall include projected water use for single-family and multi-family residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

Table 3.2.10 summarizes the lower income water use projections for the City of Compton, and the lower income water demands are also included as part of the total residential water demand estimates and projections in Tables 3.2.3 – 3.2.6. The Housing Element of the City of Compton's General Plan was used to obtain the lower income housing data, and estimates through 2014 were provided. Single-family and multi-family residential demands were estimated based on values provided in the General Plan. Demand projections beyond 2014 were estimated based on 2014 values and overall population growth to determine lower income housing needs throughout the entire UWMP planning horizon.

Table 3.2.10 Low-Income Projected Water Demands				
Low Income Water Demands	**2015**	**2020**	**2025**	**2030**
Single-family residential	8	16	24	32
Multi-family residential	4	9	14	19
Total	12	25	38	51

Units: acre-feet per year

3.3 WATER DEMAND PROJECTIONS

Urban Water Management Planning Act Requirement:

10631(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for the inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

The City of Compton relies on wholesale water from the Metropolitan Water District of Southern California (MWD) as one of the primary sources of water. Table 3.3.1 is provided to quantify the district demand projections provided to MWD for incorporation into the MWD's Urban Water Management Plan.

Table 3.3.1 Retail Agency Demand Projections Provided to Wholesale Suppliers					
Wholesaler	**2010**	**2015**	**2020**	**2025**	**2030**
MWD	2,803	2,977	3,075	3,177	3,282
Total	2,803	2,977	3,075	3,177	3,282

Units: acre-feet per year

3.4 WATER USE REDUCTION PLAN

Urban Water Management Planning Act Requirement:

CWC §10608.29 Urban wholesale water suppliers shall include in the urban water management plans … an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part (10608.36). Urban retail water suppliers are to prepare a plan for implementing the Water Conservation bill of 2009 requirements and conduct a public meeting which includes consideration of economic impacts.

SBx7-7 allows for retail water suppliers whose 5-year Base Daily Per Capita Water Use is equal to or below 100 GPCD to be excluded from further reducing their per capita water demand. The City of Compton, whose 5-year Base Daily Water Use is 100 GPCD, meets this criterion and is not required to further reduce its per capita water use. The City is committed to meeting the twenty percent statewide reduction goal set forth by SBx7-7 and will ensure that water conservation programs and efficient water use continue to be implemented within its service area. As part of this effort, the City will monitor the per capita water use during the upcoming years to verify its per capita water use remains below 100 GPCD.

4 SYSTEM SUPPLIES

4.1 WATER SOURCES

Urban Water Management Planning Act Requirement:

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

The City of Compton obtains its potable water supply from two sources: directly pumped groundwater and purchased through the Metropolitan Water District of Southern California (MWD). The City provided a total of 8,929 AF of water to a population of approximately 82,000 in 2010. As detailed in Chapter 3, demands are expected to continue to increase in the next 20 years by 17%, and identifying the water supplies for this increasing demand is crucial in identifying the reliability of the City's water system. The water supply available to the City of Compton is expected to meet the water demand in 2030. More information comparing the projected water supply and demand can be found in Chapter 5.

The City of Compton obtains its groundwater from the Central Subbasin, one of four subbasins in the Coastal Plain of Los Angeles. The Central Subbasin is commonly referred to as the Central Basin, and is identified as such through the remainder of the report. The Central Basin is an adjudicated Basin. For the supply section, it is assumed that the City of Compton pumps the total allotted amount of groundwater from the Central Basin: 5,780 AF. This is accurate, considering the total pumping capacity of the City's wells: 11,178 AF. More information on the adjudication of the Central Basin can be found in Section 4.2, which discusses the groundwater sources for the City of Compton.

The total projected supplies available to the City through MWD and pumped groundwater are provided in Table 4.1.1.

Table 4.1.1 Water Supplies — Current and Projected					
Water Supply Sources	**2010**	**2015**	**2020**	**2025**	**2030**
Supplier-Produced Groundwater – Central Basin	6,326	5,780	5,780	5,780	5,780
Metropolitan Water District of Southern California	2,603	3,704	4,018	4,341	4,675
Supplier-Produced Surface Water					
Transfers In					
Exchanges In					
Recycled Water					
Desalinated Water					
Total	8,929	9,484	9,798	10,121	10,455

Units: acre-feet per year

Groundwater Supply

The City of Compton utilizes groundwater from the Central Basin, an adjudicated basin. The groundwater supply to the City of Compton is discussed in Section 4.2.

Wholesale Water Supply

Water for use in the City of Compton is purchased through the MWD. MWD obtains its water from a number of sources, including local groundwater and surface water supplies, as well as recycled water. However, the majority of water is supplied to MWD as part of the State Water Project (SWP). The SWP is a series of reservoirs, aqueducts, and pumping facilities that convey water from Northern to Southern California. The water for use within the City of Compton is collected and delivered to MWD via the SWP, which is subsequently treated at either the Weymouth Filtration Plant or the Jensen Filtration Plant. In 2010, MWD delivered approximately 2,603 AF of water to the City of Compton. Historically, the amount of water MWD delivered to the City of Compton has been decreasing, according to the MWD 2010 UWMP, indicating that the City is becoming more reliable on its groundwater supply. However, as demand increases, this trend is expected to change as it is unlikely that the City's allotted pumping rights from the Central Basin will increase to meet demand.

Table 4.1.2 shows the estimates for the amount of imported water that will be necessary to meet the demands for the City of Compton. This number is based on the water available through groundwater and the total demand within the City's service area. The amount of water

projected to be purchased by the City of Compton is provided to MWD at the beginning of each year. If the City consumes more than set forth in the contract, the City can purchase additional water through MWD, where necessary. However, when the contracted volume is exceeded and additional imported water supplies are needed, MWD has the option to penalize the City by imposing additional fees for increased water use beyond the original projections. For this reason, it is desirable that the supplies projected below meet the City's demands in full.

Table 4.1.2
Wholesale Supplies — Existing and Planned Sources of Water

Wholesale Sources	Contracted Volume	2015	2020	2025	2030
Metropolitan Water District of Southern California	Yes	3,704	4,018	4,341	4,675

Units: acre-feet per year

Recycled Water Supply

The City of Compton does not distribute recycled water within its service.

4.2 GROUNDWATER

Urban Water Management Planning Act Requirement:
10631 (b) (Is) groundwater…identified as an existing or planned source of water available to the supplier?

The City of Compton utilizes groundwater pumped from the Central Basin. There are currently no plans to discontinue pumping water from the Central Basin for potable use, as the Central Basin is a reliable source of high quality potable water.

Urban Water Management Planning Act Requirement:
10631 (b)(1) If groundwater is identified as an existing or planned course of water available to the supplier provide…a copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

The Central Basin was adjudicated in 1965, and the Department of Water Resources (DWR) was appointed Watermaster. Every month extractions are reported to the Watermaster by each individual pumper. This allows the Watermaster to regulate the water rights of the Subbasin. The Central Basin does not have a groundwater management plan because it is adjudicated and the DWR manages groundwater extractions.

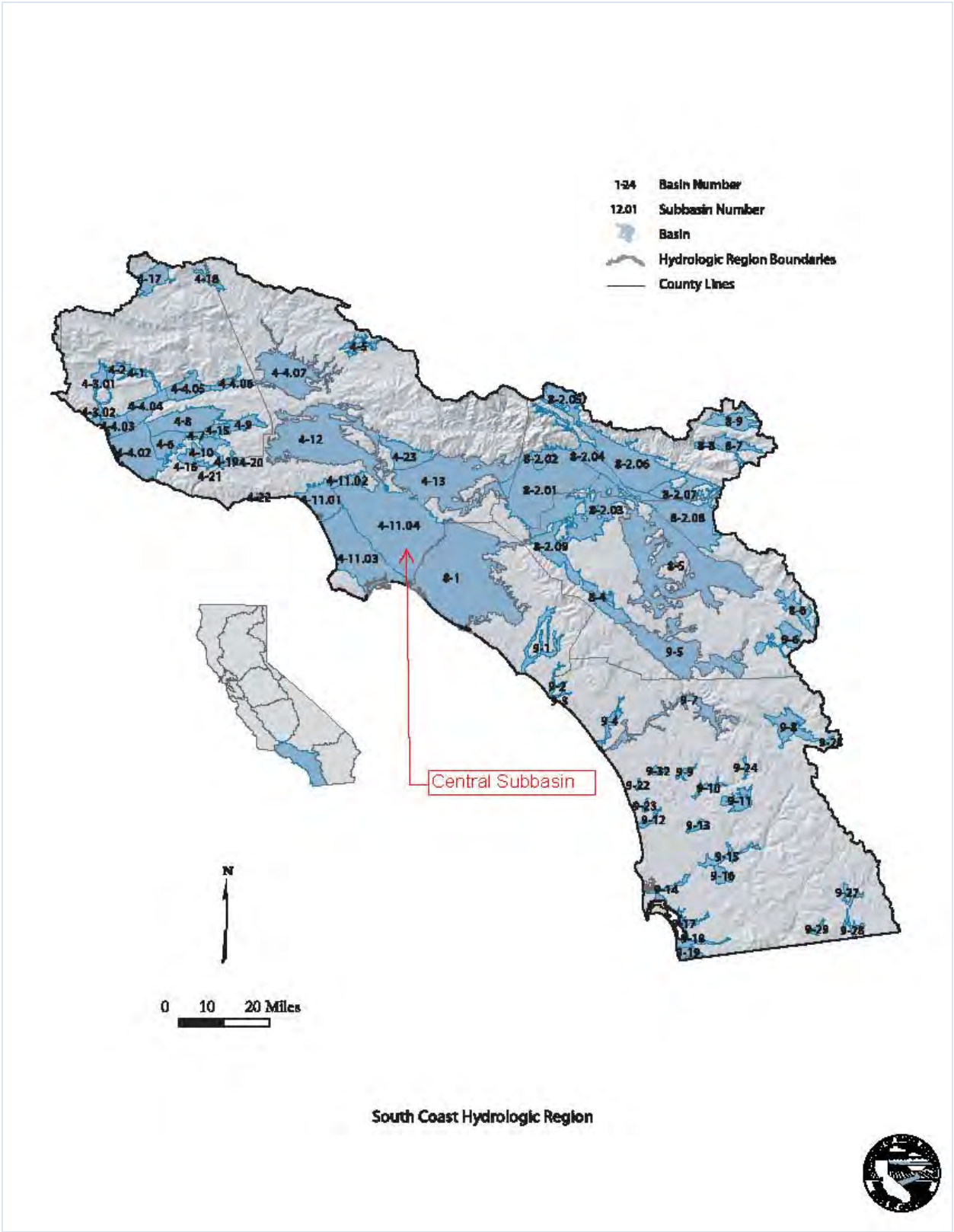
Urban Water Management Planning Act Requirement:

10631 (b)(2) If groundwater is identified as an existing or planned course of water available to the supplier provide…a description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

As mentioned above, the City of Compton pumps water from the Los Angeles County Central Subbasin, a large subbasin that makes up part of the Coastal Plan of Los Angeles Basin. The total surface area of this subbasin is approximately 177,000 acres. It is bounded on the north by a surface divide called the La Brea high, and on the northeast and east by emergent less permeable tertiary rocks of the Elysia, Repetto, Merced and Puente Hills. The southeast boundary between Central Basin and the Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift. The Los Angeles and San Gabriel Rivers drain inland basins and pass across the surface of the Central Basin on their way to the Pacific Ocean. Average precipitation throughout the Subbasin ranges from 11 to 13 inches with an average of approximately 12 inches.

The description of the Central Basin, as provided in DWR's Bulletin 118 can be found in Appendix E. Additionally, the Central Basin's location as part of the South Coast Hydrologic Region can be seen in Figure 4.2.1.

Figure 4.2.1: Central Subbasin Location



Urban Water Management Planning Act Requirement:

10631 (b)(2) For those basins for which a court or the board has adjudicated the rights to pump groundwater, provide a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

A court ordered adjudication for the Central Basin was issued in 1965. The adjudication was a response to rapidly declining groundwater levels in the basin due to overdraft that caused partial seawater intrusion. The Central Basin Judgment can be found in Appendix F.

The total allotted pumping right from the Central Basin from all wells is 233,894 AFY. The total allotted pumping rights for the City of Compton is 5,780 AFY. The City of Compton may exceed its total allotment under two circumstances. The first of these is in the case that in the previous year, the City did not pump the total 5,780 AF of water. If this occurs, up to 20% of the total allotment may be carried over to the subsequent year. The second case in which the City of Compton may exceed its water pumping rights is if another water retailer chooses to lease water pumping rights to the City. Leased pumping rights from other Cities that do not pump their fully allotted rights may supplement the water supply to the City of Compton and prevent the need to increase imported water from MWD in any given year. The latter of these options has historically been used by the City of Compton to reduce its dependence on MWD imported water. For example, in 2010, the City of Norwalk leased 1,200 AF of water pumping rights to the City of Compton. This allowed the City of Compton to pump up to 6,980 AF, beyond the normal allotment of 5,780, without penalty. Since the City of Compton pumped only 6,326, and had a water carryover from 2009 of -120 AF (due to over-extraction during this year), the City has a carryover of 534 AF for 2011.

It is known that the total allotted pumping rights exceed the natural replenishment of groundwater to the Central Basin. Although the users of the Central Basin pump below their total allotted rights (approximately 174,000 AF were pumped in 2009), possible conditions of overdraft must still be considered. To avoid conditions of overdraft, the Water Replenishment District was formed to ensure that water was purchased where necessary to fully replenish the quantity of groundwater that could not be restored through natural processes. The Water Replenishment District manages the financial and logistical aspect of purchasing water to maintain safe groundwater levels.

Urban Water Management Planning Act Requirement:

10631 (b)(2) For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

The Central Basin is an adjudicated Subbasin, and therefore this section is not applicable.

Urban Water Management Planning Act Requirement:

10631 (b)(3) (Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

Table 4.2.1 illustrates the amount of groundwater pumped from the Central Basin over the last five years.

Table 4.2.1
Groundwater — Volume Pumped

Basin name(s)	Metered or Unmetered[1]	2006	2007	2008	2009	2010
Central Basin	Metered - volumetric	5,248	6,000	7,453	6,865	6,326
Total groundwater pumped		5,248	6,000	7,453	6,865	6,326
Groundwater as a percent of total water supply		65%	62%	77%	76%	71%

Units: acre-feet per year

Table 4.2.1 shows that in the last five years, the City has pumped more than its water allotment of 5,780 AF. This is due to leased water rights, which the City has obtained from other Cities or organizations that do not pump the total amount allotted to them. The leased rights that the City of Compton has obtained in the last five years are shown in Table 4.2.2.

Table 4.2.2
Historical Pumping Right Leases to the City of Compton

Year	Lessor	Amount
2006	Angeles Abbey Memorial Park, Inc	4
	City of Norwalk – La Miranda Unified School District	378
2007	Angeles Abbey Memorial Park, Inc	4
	Smurfit-Stone Container Enterprises	510
2008	Angeles Abbey Memorial Park, Inc	4
	City of Bellflower	1,010
2009	City of Bellflower	471.51
2010	City of Norwalk	1,200

Units: acre-feet per year

Despite the leased water pumping rights, the quantity of groundwater pumped from 2006 – 2010 was still insufficient to meet the demands for the City of Compton. As a result, the City supplemented water supply with potable water purchased from MWD. Together, these two sources were sufficient in meeting the total demands of the City of Compton.

Currently, the groundwater supply is provided through seven wells, Well Nos. 11, 13, 15, 16, 17, 18 and 19. Together, these wells have a total pumping capacity of 14,081 AF; well above the allotted pumping rights available to the City of Compton. The capacity above the allotted pumping rights adds to the reliability of the supply: if one well were to go down, it would not impact the supply, as another well would be available to pump the water necessary for the groundwater supply. Although the City is pumping near its fully allotted rights, the groundwater supply is still insufficient for the City of Compton's total water needs. However, the ability to pump the fully allotted rights does reduce the City's dependence on imported water, so measures are taken (i.e. large pumping capacity) to ensure that City's allotment from the Central Basin is pumped every year.

Urban Water Management Planning Act Requirement:

10631 (b)(4) (Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

The City of Compton intends to continue using groundwater pumped from the Central Basin as the majority of the supply for the City's water demand. The projected amount of water to be pumped is shown in Table 4.2.3 below. The numbers projected in Table 4.2.3 are based on the Central Basin adjudication. Due to the large pumping capacity of the City of Compton's water wells, it is not anticipated that the groundwater use in the next 20 years will fall below the amount available to the City through the adjudication.

Table 4.2.3
Groundwater — Volume Projected to be Pumped

Basin name(s)	2015	2020	2025	2030
Central Basin	5,780	5,780	5,780	5,780
Total groundwater pumped	5,780	5,780	5,780	5,780
Percent of total water supply	61%	59%	57%	55%

4.3 TRANSFER OPPORTUNITIES

Urban Water Management Planning Act Requirement:

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

MWD seeks out opportunities for water transfer and exchanges to ensure reliability within its service area. Water transfers and exchanges help water suppliers distribute water effectively to areas with limited water supplies. For example, the MWD accepts water through the SWP and Colorado River for distribution throughout Southern California. The City of Compton, although not directly involved in the planning of these opportunities, may benefit from additional water supplies as a result of MWD's efforts in securing water transfers and exchanges. Information on new transfer and exchange opportunities to the MWD can be found in the 2010 Urban Water Management Plan.

Additionally, CMWD routinely leases water rights from local groundwater purveyors who are unable to extract groundwater for numerous reasons. This water is used to supplement the local groundwater pumping rights that CMWD is currently allotted and decrease the reliance on MWD. This is also an invaluable source of water in the event of a severe drought. Since the leased water rights are on an annual basis, they are considered a short-term transfer. The following table illustrates the potential transfer opportunities for the City of Compton:

Table 4.3.1 Transfer and Exchange Opportunities			
Transfer Agency	**Transfer or Exchange**	**Short Term or Long Term**	**Proposed Volume**
City of Norwalk	Transfer	Short Term	1,200
City of Bellflower	Transfer	Short Term	1,010
Angeles Abbey Memorial Park, Inc	Transfer	Short Term	4
Total			2,214

Units: acre-feet per year

4.4 DESALINATED WATER OPPORTUNITIES

Urban Water Management Planning Act Requirement:

10631 (i) Describe the opportunities for development of desalinated water, including but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

The City of Compton is not currently exploring the possibility of using desalinated water as a water source independently. However, MWD is currently exploring the potential for use and distribution of desalinated water as part of its supply source. As an end user of water supplied through MWD, the City of Compton may receive water or benefit in other ways (i.e. increased supplies and reliability) as a result of this effort in discovering the opportunity for desalination. Therefore, a brief description of MWD's efforts in water desalination is discussed.

In 2001, MWD created the Seawater Desalination Project (SDP) to explore the potential for using seawater as a long term water supply. The SDP provides incentives for its member agencies to develop water through desalination; up to $250 per AF for all produced supplies. Currently, four desalination projects are receiving funding through MWD's SDP program. Each program has been vital in discovering and addressing both the technical and legal challenges associated with constructing a desalination plant. As of 2011, MWD reports that the Long Beach, South Orange Coastal, and West Basin Water Desalination Projects are currently in the pilot study process, while the Carlsbad Seawater Desalination Project is in the permitting phase. Table 4.4.1 shows the projected supplies provided by these four water desalination plants. In the coming years, these projects will help to determine the feasibility of using desalinated water for distribution through the City, either by establishing a water desalinating plant or through the purchase of desalinated water through MWD or another source.

Table 4.4.1 Current Desalination Projected Capacities		
Project	**Member Agency**	**Projected Capacity (AFY)**
Long Beach Seawater Desalination Project	Long Beach Water Department	10,000
South Orange Costal Ocean Desalination Project	Municipal Water District of Orange County	16,000-28,000
Carlsbad Seawater Desalination Project	San Diego County Water Authority	56,000
West Basin Seawater Desalination Project	West Basin Municipal Water District	20,000
Total		102,000-114,000

MWD's current goal is to supply 125,000 AFY of water through seawater desalination by 2025.

4.5 RECYCLED WATER OPPORTUNITIES

Urban Water Management Planning Act Requirement:

10633 Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

The City of Compton does not distribute recycled water in its service area at this time. There are no plans to develop a recycled water system that would serve the City of Compton due to alternate priorities by the recycled water wholesaler within the service area, the Central Basin Municipal Water District (CBMWD), and a lack of funds available.

The City of Compton is a member agency of the CBMWD. CBMWD oversees water use and distribution within the Central Basin. Apart from assisting in the groundwater management of the Central Basin, CBMWD also sells potable and recycled water to its member agencies. Although the City purchases wholesale water directly from MWD, if the City of Compton were to develop a recycled water program, it would be in conjunction with CBMWD. CBMWD updated its recycled water master plan in 2008. This plan identifies only one potential recycled water customer within the service area of the City of Compton, with a demand of 42 AFY. Because of this low demand, CBMWD has opted to pursue alternative recycled water projects to expand the recycled water system to areas with a greater demand.

Urban Water Management Planning Act Requirement:

10633 (a) (Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

Wastewater in the City of Compton is collected by the LACSD sewage system and sent to one of eleven treatment or wastewater plants. At these plants, the wastewater goes through a three stage treatment process consisting of primary, secondary, and tertiary treatment stages. After tertiary treatment, water is available for use to recycled water customers, use for groundwater recharge, or discharged into the ocean. Although the City of Compton is not part of a recycled water system, wastewater collected from the City is treated to recycled water standards and can be distributed through the LACSD's recycled water supply system.

Upon collection of wastewater from the Cities of Los Angeles County, wastewater undergoes primary treatment. In this stage, water is collected in long concrete tanks that act as a river. Primary treatment refers to the removal of macroscopic waste particles in the water. Light materials will flow to the top and heavier materials will sink to the bottom. Both the light and heavier materials can be removed and are sent to the Joint Water Pollution Control Plant for disposal.

The primary treated water is sent to the second stage: secondary treatment. Secondary treatment acts as a biological treatment step to reproduce what naturally occurs in water treatment in rivers. The same microorganisms that feed on dissolved organic particles during natural water treatment are used in secondary treatment. Oxygen is supplied to create an ideal feeding environment for the microorganisms, decreasing the overall time required for treatment. As the microorganisms complete the feeding process, they sink to the bottom and are removed to be reused in another batch of wastewater.

Finally, the water enters tertiary treatment, where water is sent through filters to remove any last suspended particles in the water. The filters contain layers of anthracite coal, sand, and gravel. Once sent through the filters, the water is disinfected. Chlorine from the disinfection process must be removed prior to use. Following the disinfection process and the removal of excess chlorine, water is safe for use and is distributed to the customers of the LACSD as reclaimed water. Reclaimed water that is not used is discharged into the ocean.

Urban Water Management Planning Act Requirement:

10633 (b) (Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

All of the wastewater collected by the LACSD is treated to tertiary standards, as described above. Once the water is treated, it is either used as recycled water or discharged to the ocean.

It is estimated that the water used by the City landscape and irrigation needs and water losses is not converted to wastewater. The remainder of the water used is assumed to be sent to the LACSD for treatment. In 2010, approximately 80% of total potable water into the City's system was not used for landscape and irrigation needs, or accounted for through water losses as identified in Chapter 3. To project the total wastewater flows for the next 20 years, this factor was used. These values are shown in Table 4.5.1. In addition, Table 4.5.2 shows the amount of treated wastewater expected to be discharged. This value is obtained by multiplying the percentage of wastewater that is normally discharged by LACSD, which is approximately 56.1% of all recycled water produced. This factor was applied to the values in Table 4.5.1 to estimate the amount of wastewater from the City of Compton that would not be used for recycled water purposes, and instead discharged to the ocean. These projected discharge values are shown in Table 4.5.2.

Table 4.5.1
Recycled Water — Wastewater Collection and Treatment

Type of Wastewater	2005	2010	2015	2020	2025	2030
Wastewater collected & treated in service area	7,669	7,143	7,587	7,838	8,097	8,364
Volume that meets recycled water standard	7,669	7,143	7,587	7,838	8,097	8,364

Units: acre feet per year

Table 4.5.2
Recycled Water — Non-Recycled Wastewater Disposal

Method of Disposal	Treatment Level	2010	2015	2020	2025	2030
Discharge to Ocean	Tertiary	4,007	4,256	4,397	4,542	4,692
	Total	4,007	4,256	4,397	4,542	4,692

Units: acre feet per year

Urban Water Management Planning Act Requirement:

10633 (c) (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use

Recycled water is not distributed by the City of Compton.

Urban Water Management Planning Act Requirement:

10633 (d) (Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

The 2008 CBMWD Recycled Water Master Plan identifies areas for expansion of the entire CBMWD recycled water system. In total, the plan identifies an additional 55,479 AFY of potential for recycled water use within the service areas of the CBMWD, San Gabriel Valley Municipal Water District (SGVMWD), and the Upper San Gabriel Valley Municipal Water District (USGVMWD). Of this potential additional use, 42 AFY is identified as demand that could be supplied through a City of Compton recycled water system. The type and feasibility of this potential use are shown in Table 4.5.4 below. Expanding the recycled water system is not considered feasible at this time because the current plan by the CBMWD to expand the recycled water system does not include the City of Compton. Instead, the major project, the Southeast Water Reliability Project (SWRP), involves a much higher potential of recycled water users. The SWRP is described below.

Table 4.5.4
Recycled Water — Potential Future Use

User type	Description	Feasibility	2015	2020	2025	2030
Agricultural irrigation						
Landscape irrigation	Dominguez High School	**No**	42	42	42	42
Commercial irrigation[3]						
Golf course irrigation						
Wildlife habitat						
Wetlands						
Industrial reuse						
Groundwater recharge						
Seawater barrier						
Geothermal/Energy						
Indirect potable reuse						
	Total	**No**	42	42	42	42

Units: acre-feet per year

Urban Water Management Planning Act Requirement:

10633 (e) (Describe) the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

Table 4.5.5 shows the projected 2005 use for recycled water in 2010. The City of Compton does not have a recycled water system, and therefore a use of 0 AF in 2010 was identified in the 2005 UWMP.

Table 4.5.5 Recycled Water — 2005 UWMP Use Projection Compared to 2010 Actual		
Use type	**2010 Actual Use**	**2005 Projection for 2010**
Agricultural irrigation	0	0
Landscape irrigation	0	0
Commercial irrigation	0	0
Golf course irrigation	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/Energy	0	0
Indirect potable reuse	0	0
Total	0	0

Units: acre-feet per year

Urban Water Management Planning Act Requirement:

10633 (f) (Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

The City of Compton does not distribute recycled water. Therefore, the City does not have incentives in place to encourage the use of recycled water within its service area.

Table 4.5.5 Methods to Encourage Recycled Water Use					
Actions	**Projected Results**				
	2010	**2015**	**2020**	**2025**	**2030**
N/A	0	0	0	0	0
Total	0	0	0	0	0

Units: acre-feet per year

Urban Water Management Planning Act Requirement:

10633 (g) (Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

The 2008 Recycled Water Master Plan identifies potential use for recycled water within the City of Compton, as well as many other surrounding cities and water districts. The Plan includes recommendations and suggestions for improvement to the recycled water system. Recommendations were based on cost feasibility, as well as the potential customer demand for recycled water. Because of this, recommendations were not made to include the City of Compton in the Capital Improvement Plan for expanding the recycled water system. Instead, priority was given to a project with larger potential users. The Southeast Water Reliability Project (SWRP) will consist of 11 miles of pipeline extending from Pico Rivera to Vernon. It is expected that the SWRP will increase recycled water sales to 11,000 AFY within the first few years and ultimately up to 16,000 AFY.

4.6 FUTURE WATER PROJECTS

Urban Water Management Planning Act Requirement:

10631 (h) (Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635.

Currently, the City of Compton does not have any planned projects that will diversify or expand the water supply available to the City. The City of Compton has determined that with the adjudication agreement, the current capacity of its wells is sufficient to produce reliable groundwater. To supplement this, the City deems its potable supply from MWD sufficient and reliable, and does not identify the need to identify other water supply projects to eliminate this source. The table provided below illustrates that Compton does not currently plan to implement any projects that will increase the availability of water supply throughout the service area.

Table 4.6.1
Future Water Supply Projects

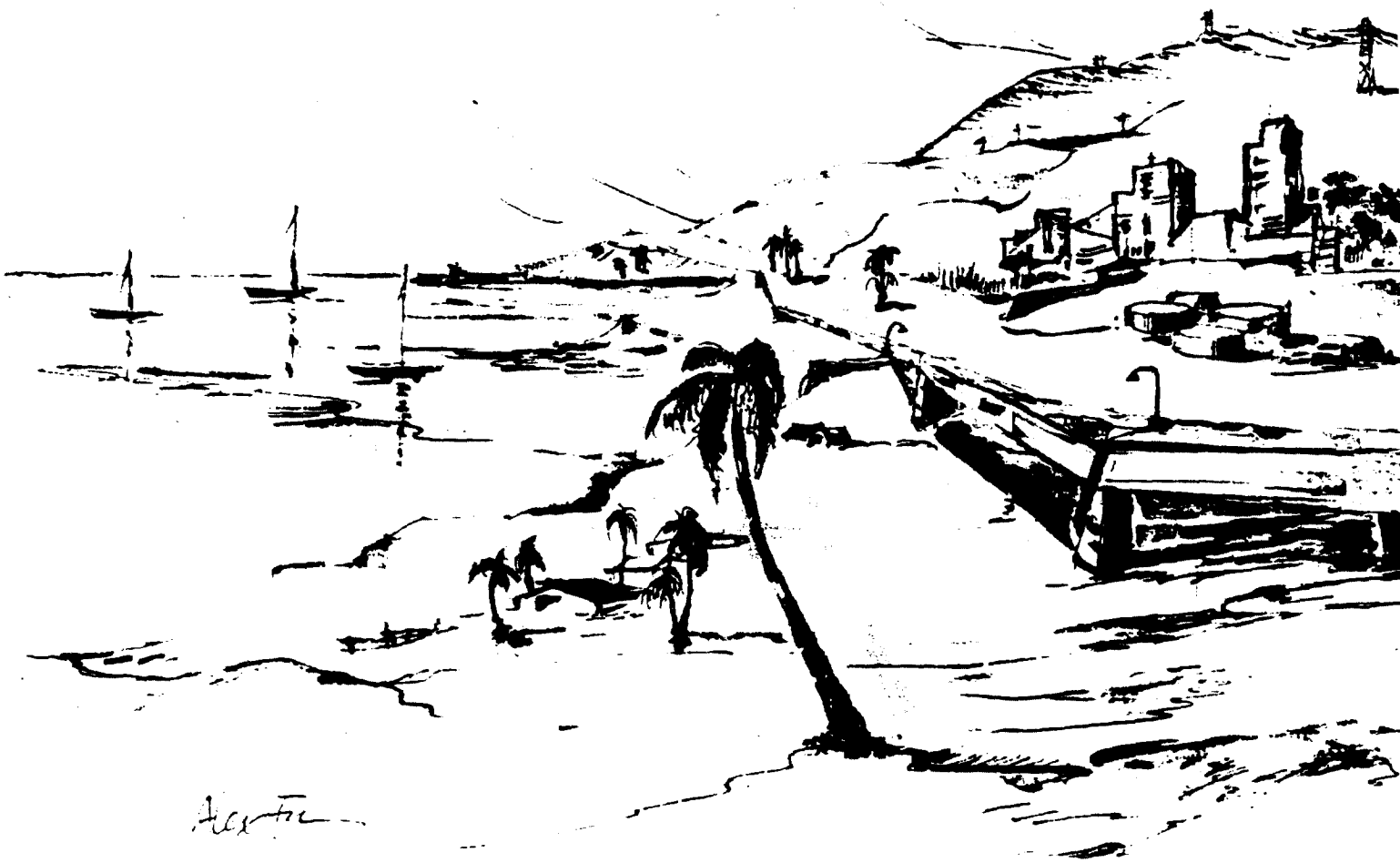
Project Name	Start & End Date	Potential Project Constraints	Normal -year supply	Single-dry year supply	Multiple -dry year first year supply[3]	Multiple -dry year second year supply[3]	Multiple -dry year third year supply[3]
N/A	N/A	N/A	0	0	0	0	0
Total			0	0	0	0	0

Units: acre-feet per year

Reference:
RWQCB, 1994

WATER QUALITY CONTROL PLAN
Los Angeles Region

Basin Plan
for the
Coastal Watersheds of
Los Angeles and Ventura Counties



California Regional Water Quality Control Board

Los Angeles Region (4)

Water Resources/Water Quality Issues

Surface and ground waters within the Los Angeles Region have proven insufficient to support the rapidly growing population in the Los Angeles Region. Water imported from other areas now meets about 50% of fresh water demands in the Region. Restrictions on imported water as well as drought conditions have necessitated water conservation measures which, at present, are voluntary. These conservation measures have slightly lessened the use of potable water in many areas of the Region. In addition, the demand for water is being partially fulfilled by the increasing use of reclaimed water for non-potable purposes such as greenbelt irrigation and industrial processing and servicing.

Surface Waters

Major surface waters of the Los Angeles Region flow from head waters in pristine mountain areas (largely in two National Forests and the Santa Monica Mountains), through urbanized foothill and valley areas, high density residential and industrial coastal areas, and terminate at highly utilized recreational beaches and harbors. Uncontrolled pollutants from nonpoint sources are believed to be the greatest threats to rivers and streams within the Region.

- *Ventura River Watershed:* The Ventura River is the northern-most river system in southern California (south of Point Conception) that supports a large number of sensitive aquatic species, several of which are currently, or proposed to be, endangered or threatened. Water quality in the upper reaches is good but quality in the lower reaches is impacted by a combination of municipal water discharges and agricultural, urban and oil industry nonpoint sources.

- *Santa Clara River Watershed:* The Santa Clara River is the largest river system in southern California that remains in a relatively natural state. Extensive patches of high quality riparian habitat are present along the length of the river and its tributaries. Stream flows are diverted, usually during high flow, for "out-of-stream" beneficial uses. Threats to water quality include increasing development in floodplain areas, necessitating flood control measures such as channelization that results in increased flows, erosion, and loss of habitat.

- *Calleguas Creek Watershed:* Calleguas Creek drains a predominantly agricultural area on the Oxnard Plain and empties into Mugu Lagoon, one of southern California's few remaining large wetlands. While natural flows in the past were intermittent, discharges of municipal, agricultural, and urban wastewaters have increased surface flow in the watershed resulting in increased sedimentation in the lagoon. The general instability of the streambanks, continual destruction of riparian vegetation, and other land use practices have accelerated erosion in this watershed. Erosion problems are intensified in areas where residential development is occurring on steeply sloping upland areas. Should sedimentation continue at the present rate, the lagoon is projected to fill with sediment in about 50 years. Additional problems are produced by irrigation return-flows which add nutrients, pesticides, and other dissolved constituents to the creek and its tributaries.

- *Malibu Creek Watershed:* This watershed has changed rapidly in the last 20 years from a predominantly rural area to a steadily developing area that has doubled in population to nearly 80,000 residents. Increased flows (from imported waters needed to support the growing population base) and channelization of several tributaries to Malibu Creek have caused an imbalance in the natural flow regime in the watershed. Pollutants of concern, many of which are discharged from nonpoint sources, include excess nutrients, sediment, and bacteria.

- *Ballona Creek Watershed:* Pollutants from industrial and municipal effluent as well as urban runoff degrade the quality of Ballona Creek. Specific pollutants include high levels of dissolved solids (chlorides, sulfates, heavy metals) and bacteria. Untreated sewage overflows discharged into Ballona Creek during the rainy season cause beach closures along Santa Monica Bay. In addition, high concentrations of DDT in sediments at the mouth of the creek and in Marina Del Rey provide evidence of past discharges that have resulted in long-term water quality problems.

- *Los Angeles River Watershed:* The Los Angeles River is highly modified, having been lined with concrete along most of its length by the U.S. Army Corps of Engineers from the

1930s to the 1960s. One seven-mile reach in the narrows area (in the middle portion of the river system), where ground water rises into the streambed, is mostly unlined along the stream bottom and provides natural habitat for fish and other wildlife in an otherwise concrete conveyance. The upper reaches of the river carry urban runoff and flood flows from the San Fernando Valley. Below the Sepulveda Basin, flows are dominated by tertiary-treated effluent from several municipal wastewater treatment plants. Because the watershed is highly urbanized, urban runoff and illegal dumping are major contributors to impaired water quality in the Los Angeles River and tributaries.

- *San Gabriel River Watershed:* While the upper San Gabriel River and its tributaries remain in a relatively pristine state, intensive recreational use of this area for picnicking, off road vehicle use, fishing, and hiking threaten water quality and aquatic and riparian habitats. Further problems in the upper San Gabriel River occur as vast amounts of naturally eroding sediment from the rugged San Gabriel Mountains settle into reservoirs behind flood control dams. Improper sediment sluicing operations from these reservoirs can impact aquatic habitats and groundwater recharge areas. In the San Gabriel Valley, the middle reaches of the river have been extensively modified in order to control flood and debris flows and to recharge ground water. Extensive sand and gravel operations are found along these stretches of the river. The lower San Gabriel River (i.e., those stretches flowing through the Los Angeles Coastal Plain) also has been extensively modified and is lined with concrete from approximately Firestone Boulevard to the estuary. Flow in these lower reaches is dominated by effluent from several municipal wastewater treatment facilities and urban runoff. Beneficial uses have been impaired in these lower reaches of the San Gabriel River, as evidenced by ambient toxicity and bioaccumulation of metals in fish tissue.

Other more generalized surface water problems in the Region include:

- Poor mineral quality in some areas due to a variety of reasons including geology, agricultural runoff, discharge of highly mineralized ground water, and poor quality of some imported waters
- Bioaccumulation of toxic compounds in fish and other aquatic life
- Impacts from increased development and recreational uses
- In-stream toxicity from point and nonpoint sources
- Diversion of flows necessary for the propagation of fish and wildlife populations
- Channelization, dredging, and other losses of habitat
- Impacts from transient camps located along creeks and lagoons
- Illegal dumping
- Introduction of non-native plants which are of little value to the biota and clog the streams
- Impacts from sand and gravel mining operations
- Natural oil seeps
- Eutrophication and the accumulation of toxic pollutants in lakes

Ground Waters

Ground water accounts for most of the Region's local (i.e., non-imported) supply of fresh water. Major groundwater basins in the Region are shown in Figure 1-9.

The general quality of ground water in the Region has degraded substantially from background levels. Much of the degradation reflects land uses. For example, fertilizers and pesticides, typically used on agricultural lands, can degrade ground water when irrigation-return waters containing such substances seep into the subsurface. In areas that are unsewered, nitrogen and pathogenic bacteria from overloaded or improperly sited septic tanks can seep into ground water and result in health risks to those who rely on ground water for domestic supply. In areas with industrial or commercial activities, aboveground and underground storage tanks contain vast quantities of hazardous substances. Thousands of these tanks in the Region have leaked or are leaking, discharging petroleum fuels, solvents, and other hazardous substances into the subsurface. These leaks as well as otherdischarges

Reference:
RWQCB, 2015

Well Report

TRACT 349 MUTUAL WATER CO. (CUDAHY)
WELL 03
FX-9 Wells [redacted]
(Show This Well on Map)

State Well #: 1910160-003
Well Source: Groundwater
Well Status: Active Raw

Detailed Well Information | DPH Water Quality Data

Plot Selected Chemicals | Reset Boxes **Note: You may select up to 6 chemicals.**

(ALL DATA) | (MOST RECENT) | (MAXIMUM CONCENTRATIONS)

DATE	PARAMETER	QUALIFIER	RESULT	UNITS	MCL	Plot
5/12/2006	1,1,1,2-TETRACHLOROETHANE	<	0.5	UG/L	NA	
10/24/2013	1,1,1-TRICHLOROETHANE	<	0.5	UG/L	200	
10/24/2013	1,1,2,2-TETRACHLOROETHANE	<	0.5	UG/L	1	
10/24/2013	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<	10	UG/L	1200	
10/24/2013	1,1,2-TRICHLOROETHANE	<	0.5	UG/L	5	
10/14/2010	1,1-DICHLOROETHANE	<	1	UG/L	5	
10/24/2013	1,1-DICHLOROETHYLENE	<	0.5	UG/L	6	
5/12/2006	1,1-DICHLOROPROPENE	<	0.5	UG/L	NA	
5/12/2006	1,2,3-TRICHLOROBENZENE	<	0.5	UG/L	NA	
5/12/2006	1,2,3-TRICHLOROPROPANE	<	0.5	UG/L	NA	
10/24/2013	1,2,4-TRICHLOROBENZENE	<	0.5	UG/L	5	
5/12/2006	1,2,4-TRIMETHYLBENZENE	<	0.5	UG/L	NA	
10/24/2013	1,2-DICHLOROBENZENE	<	0.5	UG/L	600	
10/24/2013	1,2-DICHLOROETHANE	<	0.5	UG/L	0.5	
10/24/2013	1,2-DICHLOROPROPANE	<	0.5	UG/L	5	
5/12/2006	1,3,5-TRIMETHYLBENZENE	<	0.5	UG/L	NA	
5/12/2006	1,3-DICHLOROBENZENE	<	0.5	UG/L	NA	
5/12/2006	1,3-DICHLOROPROPANE	<	0.5	UG/L	NA	
10/24/2013	1,3-DICHLOROPROPENE (TOTAL)	<	0.5	UG/L	0.5	
10/24/2013	1,4-DICHLOROBENZENE	<	0.5	UG/L	5	
4/23/2014	1,4-DIOXANE	.	5.3	UG/L	NA	
5/12/2006	1-PHENYLPROPANE (N-PROPYLBENZENE)	<	0.5	UG/L	NA	
5/12/2006	2,2-DICHLOROPROPANE	<	0.5	UG/L	NA	
5/5/2003	2,3,7,8-TCDD (DIOXIN)		0	PG/L	30	
6/7/1989	2,4,5-TP (SILVEX)	<	1	UG/L	50	
6/7/1989	2,4-D	<	10	UG/L	70	
9/7/2004	2-CHLOROETHYLVINYL ETHER	<	1	UG/L	NA	
5/12/2006	2-CHLOROTOLUENE	<	0.5	UG/L	NA	
5/5/2003	3-HYDROXYCARBOFURAN	<	2	UG/L	NA	
5/12/2006	4-CHLOROTOLUENE	<	0.5	UG/L	NA	
5/4/2007	AGGRSSIVE INDEX (CORROSIVITY)		13		NA	
5/5/2003	ALACHLOR	<	1	UG/L	2	
5/5/2003	ALDICARB	<	2	UG/L	NA	
5/5/2003	ALDICARB SULFONE	<	2	UG/L	NA	
5/5/2003	ALDICARB SULFOXIDE	<	2	UG/L	NA	
5/5/2003	ALDRIN	<	0.075	UG/L	NA	
6/7/1989	ALKALINITY (TOTAL) AS CACO3		178.9	MG/L	NA	
5/26/1992	ALUMINUM	<	100	UG/L	1000	
4/23/2013	ANTIMONY	<	6	UG/L	6	
6/7/1989	ARSENIC	<	10	UG/L	10	
5/5/2003	ASBESTOS	<	0.2	MFL	7	
7/10/1989	ATRAZINE	<	1	UG/L	1	
5/4/2007	BARIUM		190	UG/L	1000	
5/5/2003	BENTAZON	<	2	UG/L	18	
10/24/2013	BENZENE	<	0.5	UG/L	1	
5/5/2003	BENZO (A) PYRENE	<	0.1	UG/L	0.2	
4/23/2013	BERYLLIUM	<	1	UG/L	4	
6/7/1989	BICARBONATE ALKALINITY		218.3	MG/L	NA	
7/17/2001	BIS (2-CHLOROETHYL) ETHER		0	UG/L	NA	

10/1/2001	BORON		150	UG/L	NA	
5/5/2003	BROMACIL	<	10	UG/L	NA	
5/12/2006	BROMOBENZENE	<	0.5	UG/L	NA	
5/12/2006	BROMOCHLOROMETHANE	<	0.5	UG/L	NA	
10/24/2013	BROMODICHLORMETHANE (THM)	<	1	UG/L	NA	
8/5/2002	BROMOFORM (THM)		1.6	UG/L	NA	
5/12/2006	BROMOMETHANE	<	0.5	UG/L	NA	
5/5/2003	BUTACHLOR	<	0.38	UG/L	NA	
4/23/2013	CADMIUM	<	1	UG/L	5	
6/7/1989	CALCIUM		70.3	MG/L	NA	
5/5/2003	CARBARYL	<	2	UG/L	NA	
5/5/2003	CARBOFURAN	<	5	UG/L	18	
5/12/2006	CARBON DISULFIDE	<	0.5	UG/L	NA	
10/24/2013	CARBON TETRACHLORIDE	<	0.5	UG/L	0.5	
4/23/2013	CARBONATE ALKALINITY	<	2.4	MG/L	NA	
5/5/2003	CHLORDANE	<	0.1	UG/L	0.1	
5/7/2010	CHLORIDE		54	MG/L	500	
5/12/2006	CHLOROETHANE	<	0.5	UG/L	NA	
10/24/2013	CHLOROFORM (THM)	<	1	UG/L	NA	
5/12/2006	CHLOROMETHANE	<	0.5	UG/L	NA	
5/5/2003	CHLOROTHALONIL	<	5	UG/L	NA	
9/7/2004	CHROMIUM (TOTAL CR-CRVI SCREEN)	<	0.5	UG/L	NA	
4/23/2013	CHROMIUM (TOTAL)	<	10	UG/L	50	
10/24/2013	CIS-1,2-DICHLOROETHYLENE	<	0.5	UG/L	6	
10/22/2012	CIS-1,3-DICHLOROPROPENE	<	0.5	UG/L	0.5	
5/3/2004	COLOR	<	3	UNITS	15	
4/23/2013	COPPER	<	50	UG/L	1000	
4/23/2013	CYANIDE	<	100	UG/L	150	
5/5/2003	DACTHAL	<	0.1	UG/L	NA	
5/5/2003	DALAPON	<	0.5	UG/L	200	
5/5/2003	DI(2-ETHYLHEXYL)ADIPATE	<	5	UG/L	400	
7/12/2012	DI(2-ETHYLHEXYL)PHTHALATE	<	3	UG/L	4	
5/5/2003	DIAZINON	<	0.25	UG/L	NA	
10/24/2013	DIBROMOCHLOROMETHANE (THM)	<	1	UG/L	NA	
2/16/2006	DIBROMOCHLOROPROPANE (DBCP)	<	0.5	UG/L	0.2	
5/12/2006	DIBROMOMETHANE	<	0.5	UG/L	NA	
5/5/2003	DICAMBA	<	0.6	UG/L	NA	
11/13/2007	DICHLORODIFLUOROMETHANE (FREON 12)	<	0.5	UG/L	NA	
10/24/2013	DICHLOROMETHANE	<	0.5	UG/L	5	
5/5/2003	DIELDRIN	<	0.02	UG/L	NA	
5/12/2006	DIISOPROPYL ETHER	<	3	UG/L	NA	
5/5/2003	DIMETHOATE	<	1	UG/L	NA	
5/5/2003	DINOSEB	<	0.5	UG/L	7	
5/5/2003	DIQUAT	<	4	UG/L	20	
6/7/1995	DIURON		0	UG/L	NA	
5/5/2003	ENDOTHALL	<	45	UG/L	100	
5/5/2003	ENDRIN	<	0.1	UG/L	2	
11/13/2007	ETHYL-TERT-BUTYL ETHER	<	3	UG/L	NA	
10/24/2013	ETHYLBENZENE	<	0.5	UG/L	300	
2/16/2006	ETHYLENE DIBROMIDE (EDB)	<	0.5	UG/L	0.05	
5/7/2010	FLUORIDE (F) (NATURAL-SOURCE)		0.33	MG/L	2	
4/23/2013	FOAMING AGENTS (MBAS)	<	0.1	MG/L	0.5	
5/5/2003	GLYPHOSATE	<	6	UG/L	700	
7/17/2001	GROSS ALPHA		4.37	PCI/L	15	
7/17/2001	GROSS ALPHA COUNTING ERROR		1.92	PCI/L	NA	
6/7/1989	HARDNESS (TOTAL) AS CACO3		220.8	MG/L	NA	
5/5/2003	HEPTACHLOR	<	0.01	UG/L	0.01	
5/5/2003	HEPTACHLOR EPOXIDE	<	0.01	UG/L	0.01	
5/5/2003	HEXACHLOROBENZENE	<	0.5	UG/L	1	
5/12/2006	HEXACHLOROBUTADIENE	<	0.5	UG/L	NA	
5/5/2003	HEXACHLOROCYCLOPENTADIENE	<	1	UG/L	50	
5/12/2006	HEXACHLOROETHANE	<	1	UG/L	NA	

5/7/2010	HYDROXIDE ALKALINITY	<	2	MG/L	NA	
4/23/2013	IRON	<	100	UG/L	300	
5/12/2006	ISOPROPYLBENZENE	<	0.5	UG/L	NA	
5/26/1992	LANGELIER INDEX AT SOURCE TEMP.		0.8		NA	
6/7/1989	LEAD	<	10	UG/L	NA	
6/7/1989	LINDANE	<	0.4	UG/L	0.2	
10/24/2013	M,P-XYLENE	<	0.5	UG/L	NA	
8/5/2002	M-XYLENE		0	UG/L	NA	
5/26/1992	MAGNESIUM		14	MG/L	NA	
9/1/1998	MANGANESE		75.2	UG/L	50	
4/23/2013	MERCURY	<	1	UG/L	2	
12/17/1987	METHOD 601 NEGATIVE - NO 602 REPORTED		0		NA	
12/17/1987	METHOD 602 NEGATIVE - NO 601 REPORTED		0		NA	
5/5/2003	METHOMYL	<	2	UG/L	NA	
5/5/2003	METHOXYCHLOR	<	10	UG/L	30	
5/12/2006	METHYL ETHYL KETONE	<	5	UG/L	NA	
5/12/2006	METHYL ISOBUTYL KETONE	<	5	UG/L	NA	
10/24/2013	METHYL-TERT-BUTYL-ETHER (MTBE)	<	3	UG/L	13	
5/5/2003	METOLACHLOR	<	0.5	UG/L	NA	
5/5/2003	METRIBUZIN	<	0.5	UG/L	NA	
7/10/1989	MOLINATE	<	2	UG/L	20	
10/24/2013	MONOCHLOROBENZENE	<	0.5	UG/L	70	
5/12/2006	N-BUTYLBENZENE	<	0.5	UG/L	NA	
5/12/2006	NAPHTHALENE	<	0.5	UG/L	NA	
4/23/2013	NICKEL	<	10	UG/L	100	
6/7/1989	NITRATE (AS NO3)		4.6	MG/L	45	
5/4/2007	NITRATE + NITRITE (AS N)		510	UG/L	10000	
5/4/2007	NITRATE NITROGEN (NO3-N)		510	UG/L	10000	
11/13/2007	NITRITE (AS N)		460	UG/L	1000	
10/24/2013	O-XYLENE	<	0.5	UG/L	NA	
5/26/1992	ODOR THRESHOLD @ 60 C		3	TON	3	
5/5/2003	OXAMYL	<	2	UG/L	50	
5/12/2006	P-ISOPROPYLTOLUENE	<	0.5	UG/L	NA	
8/5/2002	P-XYLENE		0	UG/L	NA	
5/5/2003	PCB-1016 (AS DECACHLOROBIPHENYL (DCB))	<	0.1	UG/L	NA	
5/5/2003	PCB-1221 (AS DCB)	<	0.1	UG/L	NA	
5/5/2003	PCB-1232 (AS DCB)	<	0.1	UG/L	NA	
5/5/2003	PCB-1242 (AS DCB)	<	0.1	UG/L	NA	
5/5/2003	PCB-1248 (AS DCB)	<	0.1	UG/L	NA	
5/5/2003	PCB-1254 (AS DCB)	<	0.1	UG/L	NA	
5/5/2003	PCB-1260 (AS DCB)	<	0.1	UG/L	NA	
5/5/2003	PENTACHLOROPHENOL	<	0.2	UG/L	1	
7/11/2013	PERCHLORATE	<	4	UG/L	6	
5/26/1992	PH, LABORATORY		8.2		NA	
5/5/2003	PICLORAM	<	1	UG/L	500	
5/26/1992	POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB		0	UG/L	0.5	
5/3/2004	POTASSIUM		3.8	MG/L	NA	
5/5/2003	PROMETRYN	<	0.5	UG/L	NA	
5/5/2003	PROPACHLOR	<	0.5	UG/L	NA	
10/19/2007	RADIUM 226		0.15	PCI/L	NA	
10/19/2007	RADIUM 226 COUNTING ERROR		0.11	PCI/L	NA	
11/17/2005	RADIUM 228	<	1	PCI/L	NA	
11/23/2009	RADIUM 228 COUNTING ERROR		0.28	PCI/L	NA	
5/12/2006	SEC-BUTYLBENZENE	<	0.5	UG/L	NA	
4/23/2013	SELENIUM	<	5	UG/L	50	
4/23/2013	SILVER	<	10	UG/L	100	
5/12/2006	SIMAZINE	<	1	UG/L	4	
6/7/1989	SODIUM		65	MG/L	NA	
5/7/2010	SOURCE TEMPERATURE C		22	C	NA	
6/7/1989	SPECIFIC CONDUCTANCE		720	US	1600	
10/24/2013	STYRENE	<	0.5	UG/L	100	
6/7/1995	SULFATE		111.5	MG/L	600	

11/13/2007	TERT-AMYL-METHYL ETHER	<	3	UG/L	NA	
5/12/2006	TERT-BUTYL ALCOHOL		3.9	UG/L	NA	
5/12/2006	TERT-BUTYLBENZENE	<	0.5	UG/L	NA	
10/24/2013	TETRACHLOROETHYLENE	<	0.5	UG/L	5	
4/23/2013	THALLIUM	<	1	UG/L	2	
7/12/2012	THIOBENCARB	<	1	UG/L	70	
10/24/2013	TOLUENE	<	0.5	UG/L	150	
4/13/1998	TOTAL DISSOLVED SOLIDS		424	MG/L	1000	
8/5/2002	TOTAL TRIHALOMETHANES		2.11	UG/L	80	
5/5/2003	TOXAPHENE	<	1	UG/L	3	
10/24/2013	TRANS-1,2-DICHLOROETHYLENE	<	0.5	UG/L	10	
10/22/2012	TRANS-1,3-DICHLOROPROPENE	<	0.5	UG/L	NA	
10/24/2013	TRICHLOROETHYLENE	<	0.5	UG/L	5	
10/24/2013	TRICHLOROFLUOROMETHANE	<	5	UG/L	150	
5/7/2010	TURBIDITY, LABORATORY		0.48	NTU	5	
10/19/2007	URANIUM (PCI/L)	<	1	PCI/L	20	
7/17/2001	URANIUM COUNTING ERROR		0.456	PCI/L	NA	
10/1/2001	VANADIUM		0	UG/L	NA	
10/24/2013	VINYL CHLORIDE	<	0.5	UG/L	0.5	
10/24/2013	XYLENES (TOTAL)	<	1	UG/L	1750	
4/23/2013	ZINC	<	50	UG/L	5000	

Well Report

HUNTINGTON PARK-CITY, WATER DEPT. (HUNTINGTON PARK)
WELL 12
FX-9 Wells [redacted]
(Show This Well on Map)

State Well #: 1910049-004
Well Source: Groundwater
Well Status: Active Raw

Detailed Well Information | DPH Water Quality Data

Plot Selected Chemicals | Reset Boxes | **Note: You may select up to 6 chemicals.**

(ALL DATA) | (MOST RECENT) | (MAXIMUM CONCENTRATIONS)

DATE	PARAMETER	QUALIFIER	RESULT	UNITS	MCL	Plot
4/1/2014	1,1,1,2-TETRACHLOROETHANE	<	0.5	UG/L	NA	
4/1/2014	1,1,1-TRICHLOROETHANE	<	0.5	UG/L	200	
4/1/2014	1,1,2,2-TETRACHLOROETHANE	<	0.5	UG/L	1	
4/1/2014	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	<	10	UG/L	1200	
4/1/2014	1,1,2-TRICHLOROETHANE	<	0.5	UG/L	5	
5/11/2010	1,1-DICHLOROETHANE	<	1	UG/L	5	
4/1/2014	1,1-DICHLOROETHYLENE	<	0.5	UG/L	6	
4/1/2014	1,1-DICHLOROPROPENE	<	0.5	UG/L	NA	
4/1/2014	1,2,3-TRICHLOROBENZENE	<	0.5	UG/L	NA	
8/5/2005	1,2,3-TRICHLOROPROPANE	<	0.5	UG/L	NA	
4/1/2014	1,2,4-TRICHLOROBENZENE	<	0.5	UG/L	5	
4/1/2014	1,2,4-TRIMETHYLBENZENE	<	0.5	UG/L	NA	
4/1/2014	1,2-DICHLOROBENZENE	<	0.5	UG/L	600	
4/1/2014	1,2-DICHLOROETHANE	<	0.5	UG/L	0.5	
4/1/2014	1,2-DICHLOROPROPANE	<	0.5	UG/L	5	
4/1/2014	1,3,5-TRIMETHYLBENZENE	<	0.5	UG/L	NA	
4/1/2014	1,3-DICHLOROBENZENE	<	0.5	UG/L	NA	
4/1/2014	1,3-DICHLOROPROPANE	<	0.5	UG/L	NA	
4/1/2014	1,3-DICHLOROPROPENE (TOTAL)	<	0.5	UG/L	0.5	
4/1/2014	1,4-DICHLOROBENZENE	<	0.5	UG/L	5	
7/1/2014	1,4-DIOXANE	.	3.1	UG/L	NA	
4/1/2014	1-PHENYLPROPANE (N-PROPYLBENZENE)	<	0.5	UG/L	NA	
4/1/2014	2,2-DICHLOROPROPANE	<	0.5	UG/L	NA	
9/21/1988	2,4,5-TP (SILVEX)	<	0.2	UG/L	50	
9/21/1988	2,4-D	<	2	UG/L	70	
8/17/2004	2-CHLOROETHYLVINYL ETHER	<	1	UG/L	NA	
4/1/2014	2-CHLOROTOLUENE	<	0.5	UG/L	NA	
4/1/2014	4-CHLOROTOLUENE	<	0.5	UG/L	NA	
4/18/2013	AGGRSSIVE INDEX (CORROSIVITY)		13		NA	
11/20/1995	ALACHLOR		0	UG/L	2	
7/31/2000	ALKALINITY (TOTAL) AS CACO3		180	MG/L	NA	
4/18/2013	ALUMINUM	<	50	UG/L	1000	
4/18/2013	ANTIMONY	<	6	UG/L	6	
9/21/1988	ARSENIC	<	10	UG/L	10	
8/21/2006	ASBESTOS	<	0.2	MFL	7	
2/8/2007	ATRAZINE	<	0.5	UG/L	1	
5/7/2007	BARIUM		150	UG/L	1000	
4/1/2014	BENZENE	<	0.5	UG/L	1	
4/18/2013	BERYLLIUM	<	1	UG/L	4	
7/31/2000	BICARBONATE ALKALINITY		220	MG/L	NA	
7/20/2001	BIS (2-CHLOROETHYL) ETHER		0	UG/L	NA	
12/3/2001	BORON		140	UG/L	NA	
11/20/1995	BROMACIL		0	UG/L	NA	
4/1/2014	BROMOBENZENE	<	0.5	UG/L	NA	
4/1/2014	BROMOCHLOROMETHANE	<	0.5	UG/L	NA	
4/1/2014	BROMODICHLORMETHANE (THM)	<	1	UG/L	NA	
4/10/1992	BROMOFORM (THM)		2.4	UG/L	NA	
4/1/2014	BROMOMETHANE	<	0.5	UG/L	NA	
4/18/2013	CADMIUM	<	1	UG/L	5	

8/4/2003	CALCIUM		72	MG/L	NA
8/10/1995	CARBARYL		0	UG/L	NA
8/5/2005	CARBON DISULFIDE	<	0.5	UG/L	NA
4/1/2014	CARBON TETRACHLORIDE	<	0.5	UG/L	0.5
4/18/2013	CARBONATE ALKALINITY	<	2.4	MG/L	NA
2/19/1998	CHLORDANE		0	UG/L	0.1
8/4/2003	CHLORIDE		48	MG/L	500
4/1/2014	CHLOROETHANE	<	0.5	UG/L	NA
4/1/2014	CHLOROFORM (THM)	<	1	UG/L	NA
4/1/2014	CHLOROMETHANE	<	0.5	UG/L	NA
8/17/2004	CHROMIUM (TOTAL CR-CRVI SCREEN)	<	0.5	UG/L	NA
4/18/2013	CHROMIUM (TOTAL)	<	10	UG/L	50
2/7/2001	CHROMIUM, HEXAVALENT		0	UG/L	10
4/1/2014	CIS-1,2-DICHLOROETHYLENE	<	0.5	UG/L	6
4/18/2013	CIS-1,3-DICHLOROPROPENE	<	0.5	UG/L	0.5
5/7/2007	COLOR		10	UNITS	15
12/10/2007	COMBINED RA 226 + RA 228		0.75	PCI/L	5
12/10/2007	COMBINED RA 226 + RA 228 COUNTING ERROR		0.29	PCI/L	NA
4/18/2013	COPPER	<	50	UG/L	1000
4/18/2013	CYANIDE	<	100	UG/L	150
7/27/2012	DI(2-ETHYLHEXYL)PHTHALATE	<	3	UG/L	4
11/20/1995	DIAZINON		0	UG/L	NA
4/1/2014	DIBROMOCHLOROMETHANE (THM)	<	1	UG/L	NA
8/5/2005	DIBROMOCHLOROPROPANE (DBCP)	<	0.5	UG/L	0.2
4/1/2014	DIBROMOMETHANE	<	0.5	UG/L	NA
4/1/2014	DICHLORODIFLUOROMETHANE (FREON 12)	<	0.5	UG/L	NA
4/1/2014	DICHLOROMETHANE	<	0.5	UG/L	5
4/1/2014	DIISOPROPYL ETHER	<	3	UG/L	NA
1/29/1992	DIMETHOATE		0	UG/L	NA
2/19/1998	DIQUAT		0	UG/L	20
11/20/1995	DIURON		0	UG/L	NA
9/21/1988	ENDRIN	<	0.01	UG/L	2
4/1/2014	ETHYL-TERT-BUTYL ETHER	<	3	UG/L	NA
4/1/2014	ETHYLBENZENE	<	0.5	UG/L	300
8/5/2005	ETHYLENE DIBROMIDE (EDB)	<	0.5	UG/L	0.05
8/4/2003	FLUORIDE (F) (NATURAL-SOURCE)		0.48	MG/L	2
4/18/2013	FOAMING AGENTS (MBAS)	<	0.1	MG/L	0.5
2/19/1998	GLYPHOSATE		0	UG/L	700
3/22/2007	GROSS ALPHA		10.2	PCI/L	15
9/14/2007	GROSS ALPHA COUNTING ERROR		1.9	PCI/L	NA
10/22/2013	GROSS ALPHA MDA95		1.24	PCI/L	NA
8/4/2003	HARDNESS (TOTAL) AS CACO3		250	MG/L	NA
4/1/2014	HEXACHLOROBUTADIENE	<	0.5	UG/L	NA
8/5/2005	HEXACHLOROETHANE	<	1	UG/L	NA
5/11/2010	HYDROXIDE ALKALINITY	<	2	MG/L	NA
5/7/2007	IRON		130	UG/L	300
4/1/2014	ISOPROPYLBENZENE	<	0.5	UG/L	NA
2/8/1999	LANGELIER INDEX AT SOURCE TEMP.		0.34		NA
9/21/1988	LEAD	<	10	UG/L	NA
9/21/1988	LINDANE	<	0.1	UG/L	0.2
4/1/2014	M,P-XYLENE	<	0.5	UG/L	NA
8/21/2002	M-XYLENE		0	UG/L	NA
8/4/2003	MAGNESIUM		17	MG/L	NA
5/11/2010	MANGANESE		50	UG/L	50
4/18/2013	MERCURY	<	1	UG/L	2
9/21/1988	METHOXYCHLOR	<	1	UG/L	30
4/1/2014	METHYL ETHYL KETONE	<	5	UG/L	NA
4/1/2014	METHYL ISOBUTYL KETONE	<	5	UG/L	NA
4/1/2014	METHYL-TERT-BUTYL-ETHER (MTBE)	<	3	UG/L	13
11/20/1995	MOLINATE		0	UG/L	20
4/1/2014	MONOCHLOROBENZENE	<	0.5	UG/L	70
4/1/2014	N-BUTYLBENZENE	<	0.5	UG/L	NA

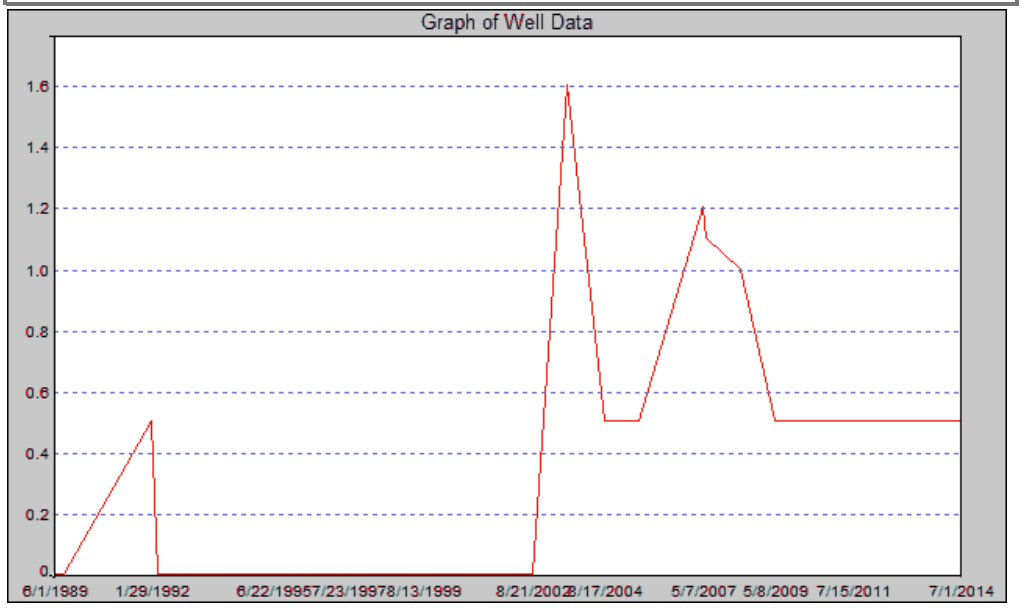
4/1/2014	NAPHTHALENE	<	0.5	UG/L	NA	
4/18/2013	NICKEL	<	10	UG/L	100	
6/22/1995	NITRATE (AS NO3)		11.4	MG/L	45	
5/7/2007	NITRATE + NITRITE (AS N)		1100	UG/L	10000	
5/7/2007	NITRATE NITROGEN (NO3-N)		1100	UG/L	10000	
4/18/2013	NITRITE (AS N)	<	400	UG/L	1000	
4/1/2014	O-XYLENE	<	0.5	UG/L	NA	
9/21/1988	ODOR THRESHOLD @ 60 C		2	TON	3	
8/5/2005	P-ISOPROPYLTOLUENE	<	0.5	UG/L	NA	
8/21/2002	P-XYLENE		0	UG/L	NA	
10/18/2012	PERCHLORATE	<	4	UG/L	6	
4/18/2013	PH, LABORATORY		8.29		NA	
7/31/2000	POTASSIUM		3.4	MG/L	NA	
1/29/1992	PROMETRYN		0	UG/L	NA	
3/22/2007	RADIUM 226	<	1	PCI/L	NA	
3/22/2007	RADIUM 226 COUNTING ERROR		0.192	PCI/L	NA	
3/22/2007	RADIUM 228	<	1	PCI/L	NA	
10/12/2004	RADIUM 228 COUNTING ERROR		0.495	PCI/L	NA	
4/1/2014	SEC-BUTYLBENZENE	<	0.5	UG/L	NA	
4/18/2013	SELENIUM	<	5	UG/L	50	
4/18/2013	SILVER	<	10	UG/L	100	
2/8/2007	SIMAZINE	<	1	UG/L	4	
8/15/1994	SODIUM		58.3	MG/L	NA	
4/18/2013	SOURCE TEMPERATURE C		25.8	C	NA	
5/7/2007	SPECIFIC CONDUCTANCE		710	US	1600	
4/1/2014	STYRENE	<	0.5	UG/L	100	
8/4/2003	SULFATE		110	MG/L	600	
4/1/2014	TERT-AMYL-METHYL ETHER	<	3	UG/L	NA	
6/15/2007	TERT-BUTYL ALCOHOL		2.5	UG/L	NA	
4/1/2014	TERT-BUTYLBENZENE	<	0.5	UG/L	NA	
4/1/2014	TETRACHLOROETHYLENE	<	0.5	UG/L	5	
4/18/2013	THALLIUM	<	1	UG/L	2	
7/27/2012	THIOBENCARB	<	1	UG/L	70	
4/1/2014	TOLUENE	<	0.5	UG/L	150	
5/7/2007	TOTAL DISSOLVED SOLIDS		410	MG/L	1000	
4/10/1992	TOTAL TRIHALOMETHANES		3.4	UG/L	80	
9/21/1988	TOXAPHENE	<	2	UG/L	3	
4/1/2014	TRANS-1,2-DICHLOROETHYLENE	<	0.5	UG/L	10	
4/18/2013	TRANS-1,3-DICHLOROPROPENE	<	0.5	UG/L	NA	
8/4/2003	TRICHLOROETHYLENE		1.6	UG/L	5	
4/1/2014	TRICHLOROFLUOROMETHANE	<	5	UG/L	150	
5/7/2007	TURBIDITY, LABORATORY		1.7	NTU	5	
6/15/2007	URANIUM (PCI/L)		2.4	PCI/L	20	
12/3/2001	VANADIUM		0	UG/L	NA	
4/1/2014	VINYL CHLORIDE	<	0.5	UG/L	0.5	
4/18/2013	XYLENES (TOTAL)	<	1	UG/L	1750	
4/18/2013	ZINC	<	50	UG/L	5000	

Well Report

HUNTINGTON PARK-CITY, WATER DEPT. (HUNTINGTON PARK)
WELL 12
FX-9 Wells [redacted]
(Show This Well on Map)

State Well #: 1910049-004
Well Source: Groundwater
Well Status: Active Raw

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
7/1/2014	TRICHLOROETHYLENE	< 0.5	UG/L	5
4/1/2014	TRICHLOROETHYLENE	< 0.5	UG/L	5
1/9/2014	TRICHLOROETHYLENE	< 0.5	UG/L	5
10/22/2013	TRICHLOROETHYLENE	< 0.5	UG/L	5
7/18/2013	TRICHLOROETHYLENE	< 0.5	UG/L	5
4/18/2013	TRICHLOROETHYLENE	< 0.5	UG/L	5
1/21/2013	TRICHLOROETHYLENE	< 0.5	UG/L	5
10/18/2012	TRICHLOROETHYLENE	< 0.5	UG/L	5
7/27/2012	TRICHLOROETHYLENE	< 0.5	UG/L	5
4/24/2012	TRICHLOROETHYLENE	< 0.5	UG/L	5
1/12/2012	TRICHLOROETHYLENE	< 0.5	UG/L	5
10/20/2011	TRICHLOROETHYLENE	< 0.5	UG/L	5
7/15/2011	TRICHLOROETHYLENE	< 0.5	UG/L	5
4/12/2011	TRICHLOROETHYLENE	< 0.5	UG/L	5
1/10/2011	TRICHLOROETHYLENE	< 0.5	UG/L	5
10/14/2010	TRICHLOROETHYLENE	< 0.5	UG/L	5
7/8/2010	TRICHLOROETHYLENE	< 0.5	UG/L	5
5/11/2010	TRICHLOROETHYLENE	< 0.5	UG/L	5
2/19/2010	TRICHLOROETHYLENE	< 0.5	UG/L	5
5/8/2009	TRICHLOROETHYLENE	< 0.5	UG/L	5
5/22/2008	TRICHLOROETHYLENE	1	UG/L	5
6/15/2007	TRICHLOROETHYLENE	1.1	UG/L	5
5/7/2007	TRICHLOROETHYLENE	1.2	UG/L	5
8/5/2005	TRICHLOROETHYLENE	< 0.5	UG/L	5
8/17/2004	TRICHLOROETHYLENE	< 0.5	UG/L	5
8/4/2003	TRICHLOROETHYLENE	1.6	UG/L	5
8/21/2002	TRICHLOROETHYLENE	0	UG/L	5
7/20/2001	TRICHLOROETHYLENE	0	UG/L	5
7/31/2000	TRICHLOROETHYLENE	0	UG/L	5
8/13/1999	TRICHLOROETHYLENE	0	UG/L	5
7/20/1998	TRICHLOROETHYLENE	0	UG/L	5
7/23/1997	TRICHLOROETHYLENE	0	UG/L	5
8/15/1996	TRICHLOROETHYLENE	0	UG/L	5
8/10/1995	TRICHLOROETHYLENE	0	UG/L	5
6/22/1995	TRICHLOROETHYLENE	0	UG/L	5
4/10/1992	TRICHLOROETHYLENE	0	UG/L	5
1/29/1992	TRICHLOROETHYLENE	0.5	UG/L	5
8/30/1989	TRICHLOROETHYLENE	0	UG/L	5
6/1/1989	TRICHLOROETHYLENE	0	UG/L	5

FROM DATE: **TO DATE:** **GRAPH SIZE** Small **NORMALIZED** Redraw

Well Report

SOUTH GATE-CITY, WATER DEPT. (SOUTH GATE)
WELL 07 - DESTROYED
8650 CALIFORNIA AVE.
SOUTH GATE , CA 90280280
(Show This Well on Map)

State Well #: 1910152-002
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data

Plot Selected Chemicals | Reset Boxes **Note: You may select up to 6 chemicals.**

(ALL DATA) | (MOST RECENT) | (MAXIMUM CONCENTRATIONS)

DATE	PARAMETER	QUALIFIER	RESULT	UNITS	MCL	Plot
10/1/2001	1,1,1,2-TETRACHLOROETHANE		0	UG/L	NA	
3/16/1989	1,1,1-TRICHLOROETHANE	<	0.5	UG/L	200	
9/23/1987	1,1,2,2-TETRACHLOROETHANE	<	0.5	UG/L	1	
10/1/2001	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		0	UG/L	1200	
10/10/1985	1,1,2-TRICHLOROETHANE	<	0.5	UG/L	5	
10/10/1985	1,1-DICHLOROETHANE	<	0.5	UG/L	5	
10/11/1999	1,1-DICHLOROETHYLENE		2	UG/L	6	
10/1/2001	1,1-DICHLOROPROPENE		0	UG/L	NA	
10/1/2001	1,2,3-TRICHLOROBENZENE		0	UG/L	NA	
10/1/2001	1,2,3-TRICHLOROPROPANE		0	UG/L	NA	
10/10/1985	1,2,4-TRICHLOROBENZENE	<	5	UG/L	5	
10/1/2001	1,2,4-TRIMETHYLBENZENE		0	UG/L	NA	
10/10/1985	1,2-DICHLOROBENZENE	<	0.5	UG/L	600	
10/10/1985	1,2-DICHLOROETHANE	<	0.5	UG/L	0.5	
10/10/1985	1,2-DICHLOROPROPANE	<	0.5	UG/L	5	
10/1/2001	1,3,5-TRIMETHYLBENZENE		0	UG/L	NA	
10/10/1985	1,3-DICHLOROBENZENE	<	0.5	UG/L	NA	
10/1/2001	1,3-DICHLOROPROPANE		0	UG/L	NA	
10/1/2001	1,3-DICHLOROPROPENE (TOTAL)		0	UG/L	0.5	
10/10/1985	1,4-DICHLOROBENZENE	<	0.5	UG/L	5	
10/1/2001	1-PHENYLPROPANE (N-PROPYLBENZENE)		0	UG/L	NA	
10/1/2001	2,2-DICHLOROPROPANE		0	UG/L	NA	
8/27/1987	2,4,5-TP (SILVEX)	<	0.2	UG/L	50	
10/10/1985	2,4,6-TRICHLOROPHENOL	<	5	UG/L	NA	
8/27/1987	2,4-D	<	2	UG/L	70	
10/10/1985	2,4-DICHLOROPHENOL	<	5	UG/L	NA	
10/10/1985	2,4-DIMETHYLPHENOL	<	5	UG/L	NA	
10/10/1985	2,4-DINITROPHENOL	<	5	UG/L	NA	
10/10/1985	2,4-DINITROTOLUENE	<	5	UG/L	NA	
10/10/1985	2,6-DINITROTOLUENE	<	5	UG/L	NA	
10/10/1985	2-CHLOROETHYLVINYL ETHER	<	0.5	UG/L	NA	
10/10/1985	2-CHLORONAPHTHALENE	<	5	UG/L	NA	
10/10/1985	2-CHLOROPHENOL	<	5	UG/L	NA	
10/1/2001	2-CHLOROTOLUENE		0	UG/L	NA	
10/10/1985	2-METHYL-4,6-DINITROPHENOL	<	5	UG/L	NA	
10/10/1985	2-NITROPHENOL	<	5	UG/L	NA	

10/10/1985	3,3-DICHLOROBENZIDINE	<	20	UG/L	NA	
10/10/1985	4,4-DDD	<	0.02	UG/L	NA	
10/10/1985	4,4-DDE	<	0.01	UG/L	NA	
10/10/1985	4,4-DDT	<	0.02	UG/L	NA	
10/10/1985	4-BROMOPHENYL PHENYL ETHER	<	5	UG/L	NA	
10/10/1985	4-CHLORO-3-METHYLPHENOL	<	5	UG/L	NA	
10/10/1985	4-CHLOROPHENYL PHENYL ETHER	<	5	UG/L	NA	
10/1/2001	4-CHLOROTOLUENE		0	UG/L	NA	
10/10/1985	4-NITROPHENOL	<	5	UG/L	NA	
10/10/1985	ACENAPHTHENE	<	5	UG/L	NA	
10/10/1985	ACENAPHTHYLENE	<	5	UG/L	NA	
10/10/1985	ALACHLOR	<	0.2	UG/L	2	
10/10/1985	ALDRIN	<	0.01	UG/L	NA	
8/13/1992	ALKALINITY (TOTAL) AS CACO3		213.6	MG/L	NA	
10/10/1985	ALPHA-BHC	<	0.01	UG/L	NA	
11/15/2000	ALUMINUM		51	UG/L	1000	
6/4/1990	ALUMINUM, DISSOLVED	<	0.1	UG/L	NA	
12/13/1994	AMMONIA (NH3-N)		0.24	MG/L	NA	
10/10/1985	ANTHRACENE	<	5	UG/L	NA	
11/15/2000	ANTIMONY		0	UG/L	6	
8/27/1987	ARSENIC	<	20	UG/L	10	
8/30/1989	ATRAZINE	<	1	UG/L	1	
11/15/2000	BARIUM	<	100	UG/L	1000	
10/10/1985	BENFLURALIN	<	1	UG/L	NA	
12/13/1994	BENTAZON		0	UG/L	18	
10/10/1985	BENZENE	<	0.5	UG/L	1	
10/10/1985	BENZIDINE	<	5	UG/L	NA	
10/10/1985	BENZO (A) ANTHRACENE	<	10	UG/L	NA	
10/10/1985	BENZO (A) PYRENE	<	10	UG/L	0.2	
10/10/1985	BENZO (B) FLUORANTHENE	<	10	UG/L	NA	
10/10/1985	BENZO (GHI) PERYLENE	<	10	UG/L	NA	
10/10/1985	BENZO (K) FLUORANTHENE	<	10	UG/L	NA	
10/10/1985	BENZYL BUTYL PHTHALATE	<	10	UG/L	NA	
11/15/2000	BERYLLIUM		0	UG/L	4	
10/10/1985	BETA-BHC	<	0.05	UG/L	NA	
8/13/1992	BICARBONATE ALKALINITY		260.6	MG/L	NA	
10/10/1985	BIS (2-CHLOROETHOXY) METHANE	<	5	UG/L	NA	
10/1/2001	BIS (2-CHLOROETHYL) ETHER		0	UG/L	NA	
10/10/1985	BIS (2-CHLOROISOPROPYL) ETHER	<	5	UG/L	NA	
6/12/1995	BORON		170	UG/L	NA	
10/10/1985	BROMACIL	<	10	UG/L	NA	
10/1/2001	BROMOBENZENE		0	UG/L	NA	
10/1/2001	BROMOCHLOROMETHANE		0	UG/L	NA	
10/10/1985	BROMODICHLORMETHANE (THM)	<	0.5	UG/L	NA	
10/10/1985	BROMOFORM (THM)	<	0.5	UG/L	NA	
10/10/1985	BROMOMETHANE	<	2	UG/L	NA	
12/13/1994	BUTACHLOR		0	UG/L	NA	
8/27/1987	CADMIUM	<	5	UG/L	5	
8/27/1987	CALCIUM		98.2	MG/L	NA	
10/10/1985	CAPTAN	<	1	UG/L	NA	

10/10/1985	CARBARYL	<	1	UG/L	NA	
10/10/1985	CARBON TETRACHLORIDE	<	0.5	UG/L	0.5	
8/31/1992	CARBONATE ALKALINITY	<	1	MG/L	NA	
10/10/1985	CHLORDANE	<	0.05	UG/L	0.1	
10/10/1985	CHLORDIMEFORM	<	1	UG/L	NA	
11/15/2000	CHLORIDE		63	MG/L	500	
10/10/1985	CHLOROETHANE	<	0.5	UG/L	NA	
10/4/1988	CHLOROFORM (THM)		2.3	UG/L	NA	
10/10/1985	CHLOROMETHANE	<	0.5	UG/L	NA	
10/10/1985	CHLOROPICRIN	<	1	UG/L	NA	
10/10/1985	CHLOROPROPHAM	<	10	UG/L	NA	
10/10/1985	CHLOROTHALONIL	<	5	UG/L	NA	
8/28/2000	CHROMIUM (TOTAL)		86	UG/L	50	
8/6/2001	CHROMIUM, HEXAVALENT		75	UG/L	10	
10/10/1985	CHRYSENE	<	5	UG/L	NA	
10/1/2001	CIS-1,2-DICHLOROETHYLENE		0	UG/L	6	
10/10/1985	CIS-1,3-DICHLOROPROPENE	<	0.5	UG/L	0.5	
10/10/1985	CIS-PERMETHRIN	<	1	UG/L	NA	
8/27/1987	COLOR	<	5	UNITS	15	
12/2/1997	COPPER		74.5	UG/L	1000	
11/5/1985	CYANAZINE	<	150	UG/L	NA	
6/12/1995	CYANIDE		0	UG/L	150	
10/10/1985	DACTHAL	<	0.1	UG/L	NA	
6/12/1995	DALAPON		0	UG/L	200	
10/10/1985	DELTA-BHC	<	0.05	UG/L	NA	
6/12/1995	DI(2-ETHYLHEXYL)ADIPATE		0	UG/L	400	
10/10/1985	DI(2-ETHYLHEXYL)PHTHALATE	<	5	UG/L	4	
10/10/1985	DI-N-BUTYLPHTHALATE	<	5	UG/L	NA	
10/10/1985	DI-N-OCTYLPHTHALATE	<	5	UG/L	NA	
4/27/1995	DIAZINON		0	UG/L	NA	
10/10/1985	DIBENZO (A,H) ANTHRACENE	<	5	UG/L	NA	
10/10/1985	DIBROMOCHLOROMETHANE (THM)	<	0.5	UG/L	NA	
8/30/1989	DIBROMOCHLOROPROPANE (DBCP)	<	0.01	UG/L	0.2	
10/1/2001	DIBROMOMETHANE		0	UG/L	NA	
12/13/1994	DICAMBA		0	UG/L	NA	
10/10/1985	DICHLORODIFLUOROMETHANE (FREON 12)	<	0.5	UG/L	NA	
10/10/1985	DICHLOROMETHANE	<	0.5	UG/L	5	
10/10/1985	DICOFOL	<	0.1	UG/L	NA	
10/10/1985	DIELDRIN	<	0.05	UG/L	NA	
10/10/1985	DIETHYL PHTHALATE	<	5	UG/L	NA	
2/5/1992	DIMETHOATE		0	UG/L	NA	
10/10/1985	DIMETHYL PHTHALATE	<	5	UG/L	NA	
10/10/1985	DINOSEB	<	100	UG/L	7	
10/10/1985	DIPHENAMIDE	<	10.1	UG/L	NA	
11/4/1998	DIQUAT		0	UG/L	20	
10/10/1985	DIURON	<	1	UG/L	NA	
10/10/1985	DNOC	<	100	UG/L	NA	
10/10/1985	ENDOSULFAN I	<	0.01	UG/L	NA	
10/10/1985	ENDOSULFAN II	<	0.05	UG/L	NA	
10/10/1985	ENDOSULFAN SULFATE	<	0.05	UG/L	NA	

10/10/1985	ENDOTHALL	<	100	UG/L	100	
8/27/1987	ENDRIN	<	0.1	UG/L	2	
10/10/1985	ENDRIN ALDEHYDE	<	0.05	UG/L	NA	
10/10/1985	EPTC	<	10	UG/L	NA	
10/1/2001	ETHYL-TERT-BUTYL ETHER		0	UG/L	NA	
10/10/1985	ETHYLBENZENE	<	0.5	UG/L	300	
8/30/1989	ETHYLENE DIBROMIDE (EDB)	<	0.02	UG/L	0.05	
10/10/1985	FLUCHLORALIN	<	1	UG/L	NA	
10/10/1985	FLUORANTHENE	<	5	UG/L	NA	
10/10/1985	FLUORENE	<	5	UG/L	NA	
8/31/1992	FLUORIDE (F) (NATURAL-SOURCE)		0.5	MG/L	2	
8/31/1992	FOAMING AGENTS (MBAS)	<	0.02	MG/L	0.5	
11/4/1998	GLYPHOSATE		0	UG/L	700	
4/13/1998	GROSS ALPHA		5.7	PCI/L	15	
4/13/1998	GROSS ALPHA COUNTING ERROR		2.7	PCI/L	NA	
12/13/1994	GROSS BETA		7.73	PCI/L	50	
6/12/1995	GROSS BETA COUNTING ERROR		3.4	PCI/L	NA	
11/15/2000	HARDNESS (TOTAL) AS CACO3		300	MG/L	NA	
10/10/1985	HEPTACHLOR	<	0.02	UG/L	0.01	
10/10/1985	HEPTACHLOR EPOXIDE	<	0.1	UG/L	0.01	
10/10/1985	HEXACHLOROBENZENE	<	5	UG/L	1	
10/10/1985	HEXACHLOROBUTADIENE	<	5	UG/L	NA	
10/10/1985	HEXACHLOROCYCLOPENTADIENE	<	20	UG/L	50	
10/10/1985	HEXACHLOROETHANE	<	5	UG/L	NA	
8/31/1992	HYDROXIDE ALKALINITY	<	1	MG/L	NA	
10/10/1985	INDENO (1,2,3-CD) PYRENE	<	10	UG/L	NA	
6/3/1998	IRON		3430	UG/L	300	
10/10/1985	ISOPHORONE	<	10	UG/L	NA	
10/1/2001	ISOPROPYLBENZENE		0	UG/L	NA	
10/10/1985	KEROSENE	<	1	UG/L	NA	
11/4/1998	LANGELIER INDEX AT SOURCE TEMP.		0.293		NA	
12/2/1997	LEAD		10.1	UG/L	NA	
8/27/1987	LINDANE	<	0.1	UG/L	0.2	
10/1/2001	M,P-XYLENE		0	UG/L	NA	
10/1/2001	M-XYLENE		0	UG/L	NA	
8/13/1992	MAGNESIUM		27.1	MG/L	NA	
12/2/1997	MANGANESE		121	UG/L	50	
6/4/1990	MERCURY	<	1	UG/L	2	
10/10/1985	MERPHOS	<	1	UG/L	NA	
10/10/1985	METHOMYL	<	10	UG/L	NA	
8/27/1987	METHOXYCHLOR	<	1	UG/L	30	
10/10/1985	METHYL ETHYL KETONE	<	1	UG/L	NA	
10/10/1985	METHYL ISOBUTYL KETONE	<	1	UG/L	NA	
10/1/2001	METHYL-TERT-BUTYL-ETHER (MTBE)		0	UG/L	13	
8/30/1989	MOLINATE	<	2	UG/L	20	
10/10/1985	MONOCHLOROBENZENE	<	0.5	UG/L	70	
10/1/2001	N-BUTYLBENZENE		0	UG/L	NA	
10/10/1985	N-NITROSODI-N-PROPYLAMINE (NDPA)	<	5	UG/L	NA	
10/10/1985	N-NITROSODIMETHYLAMINE (NDMA)	<	5	UG/L	NA	
10/10/1985	N-NITROSODIPHENYLAMINE	<	5	UG/L	NA	

10/10/1985	NAPHTHALENE	<	5	UG/L	NA	
10/10/1985	NAPROPAMIDE	<	5	UG/L	NA	
11/15/2000	NICKEL		0	UG/L	100	
8/6/2001	NITRATE (AS NO3)		18	MG/L	45	
6/12/1995	NITRATE + NITRITE (AS N)		2800	UG/L	10000	
12/13/1994	NITRATE NITROGEN (NO3-N)		2800	UG/L	10000	
2/2/1995	NITRITE (AS N)	<	400	UG/L	1000	
10/10/1985	NITROBENZENE	<	5	UG/L	NA	
10/1/2001	O-XYLENE		0	UG/L	NA	
11/15/2000	ODOR THRESHOLD @ 60 C		1	TON	3	
10/10/1985	ORYZALIN	<	1	UG/L	NA	
10/10/1985	OXAMYL	<	10	UG/L	50	
10/1/2001	P-ISOPROPYLTOLUENE		0	UG/L	NA	
10/1/2001	P-XYLENE		0	UG/L	NA	
10/10/1985	PCB-1016 (AS DECACHLOROBIPHENYL (DCB))	<	0.2	UG/L	NA	
10/10/1985	PCB-1221 (AS DCB)	<	0.2	UG/L	NA	
10/10/1985	PCB-1232 (AS DCB)	<	0.2	UG/L	NA	
10/10/1985	PCB-1242 (AS DCB)	<	0.2	UG/L	NA	
10/10/1985	PCB-1248 (AS DCB)	<	0.2	UG/L	NA	
10/10/1985	PCB-1254 (AS DCB)	<	0.2	UG/L	NA	
10/10/1985	PCB-1260 (AS DCB)	<	0.2	UG/L	NA	
10/10/1985	PENTACHLOROPHENOL	<	0.5	UG/L	1	
5/2/2000	PERCHLORATE		0	UG/L	6	
6/12/1995	PH, FIELD		7.5		NA	
8/27/1987	PH, LABORATORY		8.08		NA	
10/10/1985	PHENANTHRENE	<	5	UG/L	NA	
10/10/1985	PHENOL	<	5	UG/L	NA	
6/12/1995	PICLORAM		0	UG/L	500	
6/12/1995	POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB		0	UG/L	0.5	
8/27/1987	POTASSIUM		3.9	MG/L	NA	
11/5/1985	PROMETRYN	<	0.5	UG/L	NA	
10/10/1985	PROPAMIDE	<	1	UG/L	NA	
10/10/1985	PROPARGITE	<	1	MG/L	NA	
10/10/1985	PROPHAM	<	10	UG/L	NA	
10/10/1985	PYRENE	<	5	UG/L	NA	
3/27/2000	RADON 222		270	PCI/L	NA	
8/1/2000	RADON 222 COUNTING ERROR		26	PCI/L	NA	
10/1/2001	SEC-BUTYLBENZENE		0	UG/L	NA	
6/4/1990	SELENIUM	<	5	UG/L	50	
6/4/1990	SILVER	<	10	UG/L	100	
8/30/1989	SIMAZINE	<	1	UG/L	4	
8/13/1992	SODIUM		53.5	MG/L	NA	
6/12/1995	SOURCE TEMPERATURE C		66	C	NA	
11/15/2000	SPECIFIC CONDUCTANCE		850	US	1600	
6/12/1995	STRONTIUM-90	-	0.06	PCI/L	8	
6/12/1995	STRONTIUM-90 COUNTING ERROR		1.35	PCI/L	NA	
10/1/2001	STYRENE		0	UG/L	100	
11/15/2000	SULFATE		120	MG/L	600	
10/1/2001	TERT-AMYL-METHYL ETHER		0	UG/L	NA	
8/6/2001	TERT-BUTYL ALCOHOL		0	UG/L	NA	

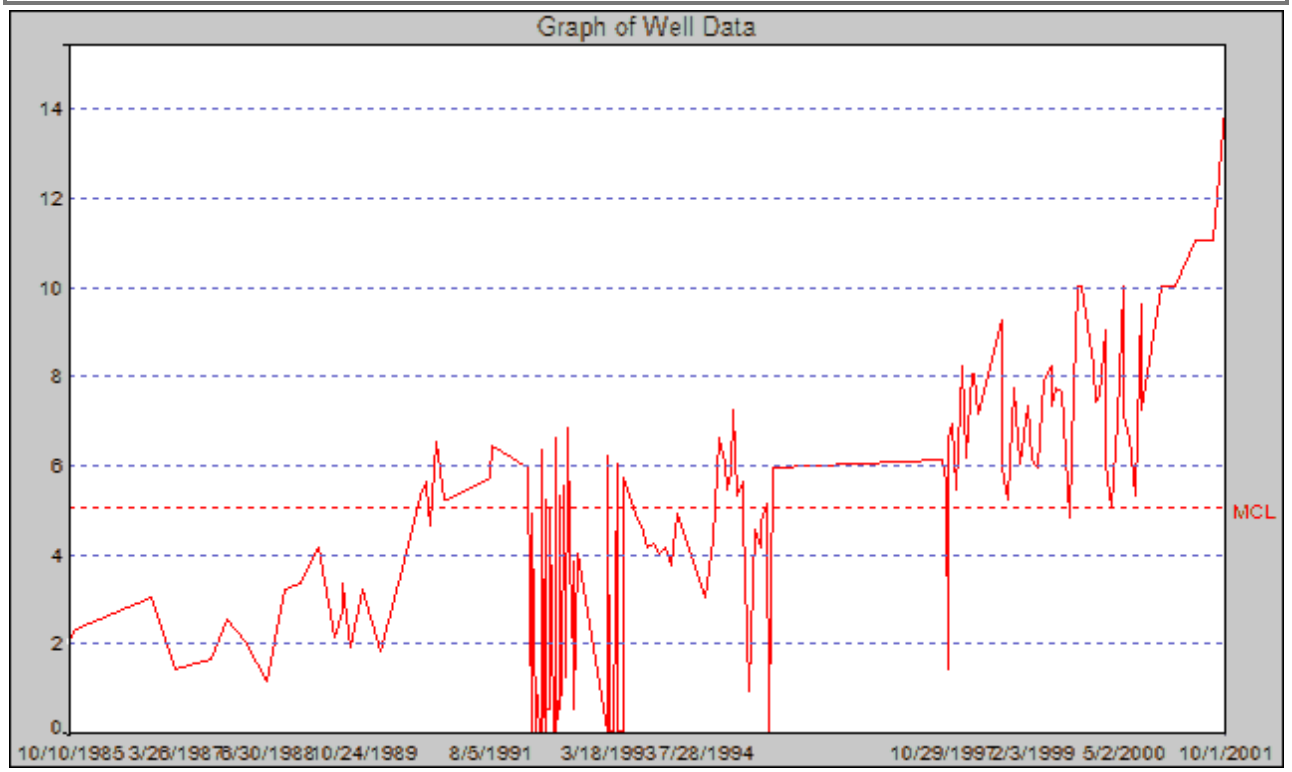
10/1/2001	TERT-BUTYLBENZENE		0	UG/L	NA	
10/1/2001	TETRACHLOROETHYLENE		3.8	UG/L	5	
11/15/2000	THALLIUM		0	UG/L	2	
8/30/1989	THIOBENCARB	<	0.8	UG/L	70	
11/5/1990	TOLUENE		0.7	UG/L	150	
8/27/1987	TOTAL DISSOLVED SOLIDS		545.2	MG/L	1000	
10/1/2001	TOTAL TRIHALOMETHANES		0	UG/L	80	
8/27/1987	TOXAPHENE	<	2	UG/L	3	
10/10/1985	TRANS-1,2-DICHLOROETHYLENE	<	0.5	UG/L	10	
10/10/1985	TRANS-1,3-DICHLOROPROPENE	<	0.5	UG/L	NA	
10/10/1985	TRANS-PERMETHRIN	<	1	UG/L	NA	
10/1/2001	TRICHLOROETHYLENE		14	UG/L	5	
10/10/1985	TRICHLOROFLUOROMETHANE	<	0.5	UG/L	150	
6/12/1995	TRITIUM		17.2	PCI/L	20000	
12/13/1994	TRITIUM COUNTING ERROR		199.7	PCI/L	NA	
12/2/1997	TURBIDITY, LABORATORY		1.45	NTU	5	
4/13/1998	URANIUM (PCI/L)		2.4	PCI/L	20	
12/2/1997	URANIUM COUNTING ERROR		0.85	PCI/L	NA	
10/1/2001	VANADIUM		0	UG/L	NA	
10/10/1985	VINYL CHLORIDE	<	0.5	UG/L	0.5	
10/10/1985	XYLENES (TOTAL)	<	0.5	UG/L	1750	
8/31/1992	ZINC	<	50	UG/L	5000	

Well Report

SOUTH GATE-CITY, WATER DEPT. (SOUTH GATE)
WELL 07 - DESTROYED
8650 CALIFORNIA AVE.
SOUTH GATE , CA 90280280
(Show This Well on Map)

State Well #: 1910152-002
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
10/1/2001	TRICHLOROETHYLENE	14	UG/L	5
8/6/2001	TRICHLOROETHYLENE	11	UG/L	5
5/2/2001	TRICHLOROETHYLENE	11	UG/L	5
1/22/2001	TRICHLOROETHYLENE	10	UG/L	5
11/15/2000	TRICHLOROETHYLENE	10	UG/L	5
8/3/2000	TRICHLOROETHYLENE	7.2	UG/L	5
8/1/2000	TRICHLOROETHYLENE	9.6	UG/L	5
7/6/2000	TRICHLOROETHYLENE	5.3	UG/L	5
6/1/2000	TRICHLOROETHYLENE	6.6	UG/L	5
5/4/2000	TRICHLOROETHYLENE	7.1	UG/L	5
5/2/2000	TRICHLOROETHYLENE	10	UG/L	5
4/6/2000	TRICHLOROETHYLENE	7	UG/L	5
3/2/2000	TRICHLOROETHYLENE	5	UG/L	5
2/3/2000	TRICHLOROETHYLENE	6	UG/L	5
2/1/2000	TRICHLOROETHYLENE	9	UG/L	5
1/6/2000	TRICHLOROETHYLENE	7.5	UG/L	5
12/22/1999	TRICHLOROETHYLENE	7.4	UG/L	5
12/9/1999	TRICHLOROETHYLENE	8.2	UG/L	5
10/11/1999	TRICHLOROETHYLENE	10	UG/L	5
9/15/1999	TRICHLOROETHYLENE	10	UG/L	5
9/2/1999	TRICHLOROETHYLENE	7.7	UG/L	5
8/5/1999	TRICHLOROETHYLENE	4.8	UG/L	5
7/1/1999	TRICHLOROETHYLENE	7.6	UG/L	5
6/3/1999	TRICHLOROETHYLENE	7.7	UG/L	5
5/6/1999	TRICHLOROETHYLENE	7.3	UG/L	5

5/5/1999	TRICHLOROETHYLENE	8.2	UG/L	5
4/1/1999	TRICHLOROETHYLENE	7.9	UG/L	5
3/4/1999	TRICHLOROETHYLENE	5.9	UG/L	5
2/3/1999	TRICHLOROETHYLENE	6.1	UG/L	5
1/7/1999	TRICHLOROETHYLENE	7.3	UG/L	5
12/3/1998	TRICHLOROETHYLENE	6	UG/L	5
11/4/1998	TRICHLOROETHYLENE	7.7	UG/L	5
10/1/1998	TRICHLOROETHYLENE	5.2	UG/L	5
9/3/1998	TRICHLOROETHYLENE	5.9	UG/L	5
9/1/1998	TRICHLOROETHYLENE	9.2	UG/L	5
5/7/1998	TRICHLOROETHYLENE	7.1	UG/L	5
4/13/1998	TRICHLOROETHYLENE	8	UG/L	5
4/2/1998	TRICHLOROETHYLENE	8	UG/L	5
3/5/1998	TRICHLOROETHYLENE	6.13	UG/L	5
2/12/1998	TRICHLOROETHYLENE	8.2	UG/L	5
1/8/1998	TRICHLOROETHYLENE	5.4	UG/L	5
12/18/1997	TRICHLOROETHYLENE	6.9	UG/L	5
12/4/1997	TRICHLOROETHYLENE	6.6	UG/L	5
12/2/1997	TRICHLOROETHYLENE	1.4	UG/L	5
11/20/1997	TRICHLOROETHYLENE	5.6	UG/L	5
10/29/1997	TRICHLOROETHYLENE	6.1	UG/L	5
7/6/1995	TRICHLOROETHYLENE	5.9	UG/L	5
6/12/1995	TRICHLOROETHYLENE	0	UG/L	5
6/1/1995	TRICHLOROETHYLENE	5.1	UG/L	5
5/4/1995	TRICHLOROETHYLENE	4.7	UG/L	5
4/27/1995	TRICHLOROETHYLENE	4.1	UG/L	5
4/6/1995	TRICHLOROETHYLENE	4.5	UG/L	5
3/2/1995	TRICHLOROETHYLENE	0.9	UG/L	5
2/2/1995	TRICHLOROETHYLENE	4.8	UG/L	5
2/2/1995	TRICHLOROETHYLENE	5.6	UG/L	5
1/5/1995	TRICHLOROETHYLENE	5.3	UG/L	5
12/13/1994	TRICHLOROETHYLENE	7.2	UG/L	5
12/1/1994	TRICHLOROETHYLENE	5.8	UG/L	5
11/7/1994	TRICHLOROETHYLENE	5.4	UG/L	5
11/2/1994	TRICHLOROETHYLENE	6	UG/L	5
10/6/1994	TRICHLOROETHYLENE	6.6	UG/L	5
9/1/1994	TRICHLOROETHYLENE	4.3	UG/L	5
7/28/1994	TRICHLOROETHYLENE	3	UG/L	5
3/3/1994	TRICHLOROETHYLENE	4.9	UG/L	5
2/3/1994	TRICHLOROETHYLENE	3.7	UG/L	5
2/1/1994	TRICHLOROETHYLENE	3.7	UG/L	5
1/6/1994	TRICHLOROETHYLENE	4.1	UG/L	5
12/2/1993	TRICHLOROETHYLENE	4	UG/L	5
11/2/1993	TRICHLOROETHYLENE	4.2	UG/L	5
10/7/1993	TRICHLOROETHYLENE	4.1	UG/L	5
9/2/1993	TRICHLOROETHYLENE	4.6	UG/L	5
8/10/1993	TRICHLOROETHYLENE	4.9	UG/L	5
6/3/1993	TRICHLOROETHYLENE	0	UG/L	5
6/3/1993	TRICHLOROETHYLENE	5.7	UG/L	5
5/6/1993	TRICHLOROETHYLENE	6	UG/L	5
5/6/1993	TRICHLOROETHYLENE	0	UG/L	5
4/15/1993	TRICHLOROETHYLENE	0	UG/L	5
4/1/1993	TRICHLOROETHYLENE	0	UG/L	5
3/22/1993	TRICHLOROETHYLENE	6.2	UG/L	5
3/18/1993	TRICHLOROETHYLENE	0	UG/L	5
10/19/1992	TRICHLOROETHYLENE	4	UG/L	5
10/1/1992	TRICHLOROETHYLENE	0.5	UG/L	5
10/1/1992	TRICHLOROETHYLENE	0.8	UG/L	5
10/1/1992	TRICHLOROETHYLENE	1.1	UG/L	5
10/1/1992	TRICHLOROETHYLENE	3.8	UG/L	5
9/17/1992	TRICHLOROETHYLENE	2.1	UG/L	5
9/3/1992	TRICHLOROETHYLENE	6.8	UG/L	5
8/20/1992	TRICHLOROETHYLENE	1.2	UG/L	5
8/6/1992	TRICHLOROETHYLENE	5.5	UG/L	5

7/30/1992	TRICHLOROETHYLENE	0.8	UG/L	5
7/17/1992	TRICHLOROETHYLENE	5.3	UG/L	5
7/16/1992	TRICHLOROETHYLENE	0.5	UG/L	5
7/16/1992	TRICHLOROETHYLENE	0.9	UG/L	5
7/2/1992	TRICHLOROETHYLENE	0	UG/L	5
7/2/1992	TRICHLOROETHYLENE	6.6	UG/L	5
7/2/1992	TRICHLOROETHYLENE	0.5	UG/L	5
7/2/1992	TRICHLOROETHYLENE	0.5	UG/L	5
6/25/1992	TRICHLOROETHYLENE	0.5	UG/L	5
6/18/1992	TRICHLOROETHYLENE	0	UG/L	5
6/4/1992	TRICHLOROETHYLENE	5	UG/L	5
5/28/1992	TRICHLOROETHYLENE	0.5	UG/L	5
5/14/1992	TRICHLOROETHYLENE	0.5	UG/L	5
5/14/1992	TRICHLOROETHYLENE	0	UG/L	5
5/7/1992	TRICHLOROETHYLENE	5.2	UG/L	5
5/7/1992	TRICHLOROETHYLENE	0.7	UG/L	5
5/7/1992	TRICHLOROETHYLENE	0.8	UG/L	5
5/7/1992	TRICHLOROETHYLENE	0	UG/L	5
4/30/1992	TRICHLOROETHYLENE	0.6	UG/L	5
4/17/1992	TRICHLOROETHYLENE	6.3	UG/L	5
4/16/1992	TRICHLOROETHYLENE	0	UG/L	5
4/16/1992	TRICHLOROETHYLENE	0	UG/L	5
4/9/1992	TRICHLOROETHYLENE	0	UG/L	5
4/2/1992	TRICHLOROETHYLENE	0.8	UG/L	5
4/2/1992	TRICHLOROETHYLENE	0.6	UG/L	5
3/19/1992	TRICHLOROETHYLENE	0	UG/L	5
3/5/1992	TRICHLOROETHYLENE	0	UG/L	5
3/5/1992	TRICHLOROETHYLENE	0	UG/L	5
3/5/1992	TRICHLOROETHYLENE	4.9	UG/L	5
2/5/1992	TRICHLOROETHYLENE	5.9	UG/L	5
8/14/1991	TRICHLOROETHYLENE	6.4	UG/L	5
8/5/1991	TRICHLOROETHYLENE	5.7	UG/L	5
1/2/1991	TRICHLOROETHYLENE	5.2	UG/L	5
12/11/1990	TRICHLOROETHYLENE	5.2	UG/L	5
11/5/1990	TRICHLOROETHYLENE	6.5	UG/L	5
10/9/1990	TRICHLOROETHYLENE	4.6	UG/L	5
9/12/1990	TRICHLOROETHYLENE	5.6	UG/L	5
9/12/1990	TRICHLOROETHYLENE	5.5	UG/L	5
8/17/1990	TRICHLOROETHYLENE	5.3	UG/L	5
6/4/1990	TRICHLOROETHYLENE	4	UG/L	5
1/24/1990	TRICHLOROETHYLENE	1.8	UG/L	5
10/24/1989	TRICHLOROETHYLENE	3.2	UG/L	5
8/31/1989	TRICHLOROETHYLENE	1.9	UG/L	5
7/19/1989	TRICHLOROETHYLENE	3.3	UG/L	5
7/19/1989	TRICHLOROETHYLENE	2.7	UG/L	5
6/6/1989	TRICHLOROETHYLENE	2.1	UG/L	5
3/16/1989	TRICHLOROETHYLENE	4.1	UG/L	5
12/15/1988	TRICHLOROETHYLENE	3.3	UG/L	5
10/4/1988	TRICHLOROETHYLENE	3.2	UG/L	5
6/30/1988	TRICHLOROETHYLENE	1.1	UG/L	5
6/30/1988	TRICHLOROETHYLENE	1.1	UG/L	5
3/17/1988	TRICHLOROETHYLENE	2	UG/L	5
12/17/1987	TRICHLOROETHYLENE	2.5	UG/L	5
9/23/1987	TRICHLOROETHYLENE	1.6	UG/L	5
3/26/1987	TRICHLOROETHYLENE	1.4	UG/L	5
12/1/1986	TRICHLOROETHYLENE	3	UG/L	5
11/5/1985	TRICHLOROETHYLENE	2.3	UG/L	5
10/10/1985	TRICHLOROETHYLENE	2	UG/L	5

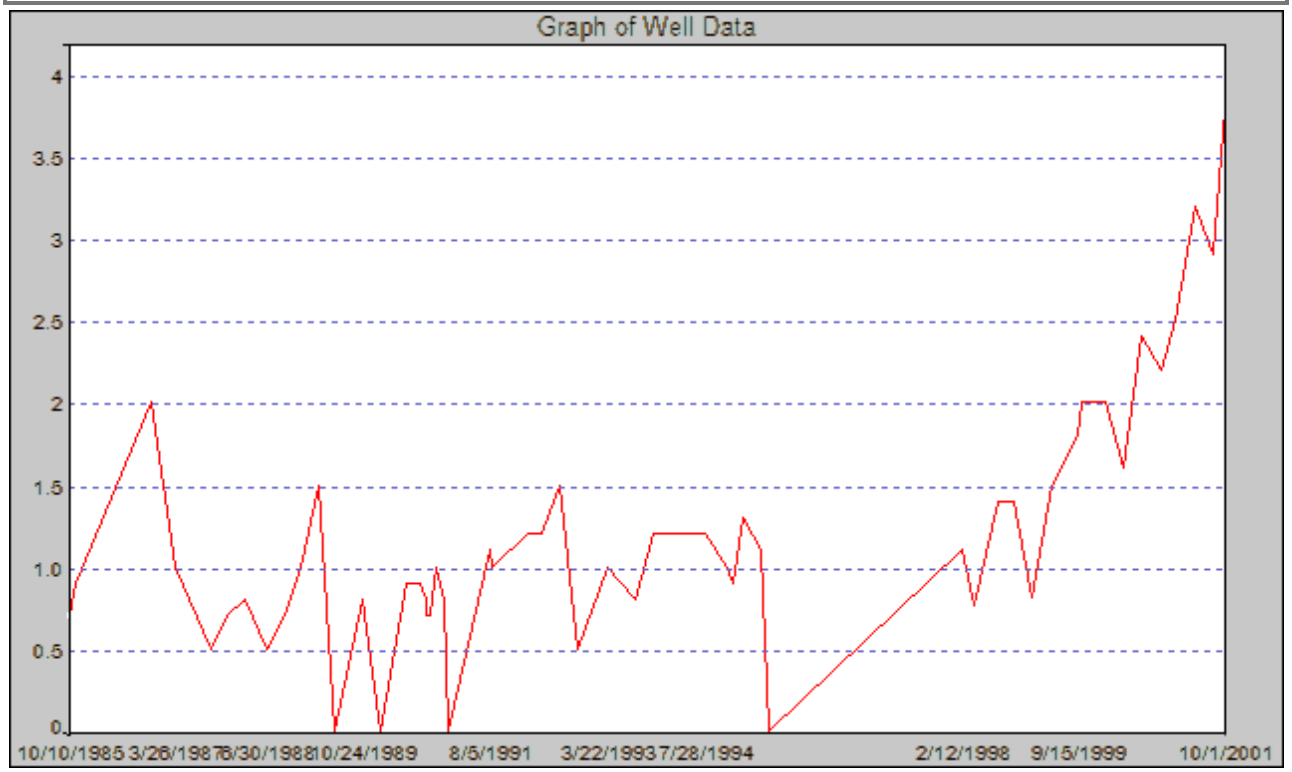
FROM DATE: **TO DATE:** **GRAPH SIZE** Small **NORMALIZED** Redraw

Well Report

SOUTH GATE-CITY, WATER DEPT. (SOUTH GATE)
WELL 07 - DESTROYED
8650 CALIFORNIA AVE.
SOUTH GATE , CA 90280280
(Show This Well on Map)

State Well #: 1910152-002
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
10/1/2001	TETRACHLOROETHYLENE	3.8	UG/L	5
8/6/2001	TETRACHLOROETHYLENE	2.9	UG/L	5
5/2/2001	TETRACHLOROETHYLENE	3.2	UG/L	5
1/22/2001	TETRACHLOROETHYLENE	2.5	UG/L	5
11/15/2000	TETRACHLOROETHYLENE	2.2	UG/L	5
8/1/2000	TETRACHLOROETHYLENE	2.4	UG/L	5
5/2/2000	TETRACHLOROETHYLENE	1.6	UG/L	5
2/1/2000	TETRACHLOROETHYLENE	2	UG/L	5
10/11/1999	TETRACHLOROETHYLENE	2	UG/L	5
9/15/1999	TETRACHLOROETHYLENE	1.8	UG/L	5
5/5/1999	TETRACHLOROETHYLENE	1.5	UG/L	5
2/3/1999	TETRACHLOROETHYLENE	0.81	UG/L	5
11/4/1998	TETRACHLOROETHYLENE	1.4	UG/L	5
9/1/1998	TETRACHLOROETHYLENE	1.4	UG/L	5
8/13/1998	TETRACHLOROETHYLENE	1.4	UG/L	5
4/13/1998	TETRACHLOROETHYLENE	0.76	UG/L	5
2/12/1998	TETRACHLOROETHYLENE	1.1	UG/L	5
6/12/1995	TETRACHLOROETHYLENE	0	UG/L	5
4/27/1995	TETRACHLOROETHYLENE	1.1	UG/L	5
2/2/1995	TETRACHLOROETHYLENE	1.3	UG/L	5
12/13/1994	TETRACHLOROETHYLENE	0.9	UG/L	5
11/7/1994	TETRACHLOROETHYLENE	1	UG/L	5
7/28/1994	TETRACHLOROETHYLENE	1.2	UG/L	5
11/2/1993	TETRACHLOROETHYLENE	1.2	UG/L	5
8/10/1993	TETRACHLOROETHYLENE	0.8	UG/L	5

3/22/1993	TETRACHLOROETHYLENE	1	UG/L	5
10/19/1992	TETRACHLOROETHYLENE	0.5	UG/L	5
7/17/1992	TETRACHLOROETHYLENE	1.5	UG/L	5
4/17/1992	TETRACHLOROETHYLENE	1.2	UG/L	5
2/5/1992	TETRACHLOROETHYLENE	1.2	UG/L	5
8/14/1991	TETRACHLOROETHYLENE	1	UG/L	5
8/5/1991	TETRACHLOROETHYLENE	1.1	UG/L	5
1/2/1991	TETRACHLOROETHYLENE	0	UG/L	5
12/11/1990	TETRACHLOROETHYLENE	0.8	UG/L	5
11/5/1990	TETRACHLOROETHYLENE	1	UG/L	5
10/9/1990	TETRACHLOROETHYLENE	0.7	UG/L	5
9/12/1990	TETRACHLOROETHYLENE	0.8	UG/L	5
9/12/1990	TETRACHLOROETHYLENE	0.7	UG/L	5
8/17/1990	TETRACHLOROETHYLENE	0.9	UG/L	5
6/4/1990	TETRACHLOROETHYLENE	0.9	UG/L	5
1/24/1990	TETRACHLOROETHYLENE	0	UG/L	5
10/24/1989	TETRACHLOROETHYLENE	0.8	UG/L	5
6/6/1989	TETRACHLOROETHYLENE	0	UG/L	5
3/16/1989	TETRACHLOROETHYLENE	1.5	UG/L	5
12/15/1988	TETRACHLOROETHYLENE	1	UG/L	5
10/4/1988	TETRACHLOROETHYLENE	0.7	UG/L	5
6/30/1988	TETRACHLOROETHYLENE	< 0.5	UG/L	5
6/30/1988	TETRACHLOROETHYLENE	< 0.5	UG/L	5
3/17/1988	TETRACHLOROETHYLENE	0.8	UG/L	5
12/17/1987	TETRACHLOROETHYLENE	0.7	UG/L	5
9/23/1987	TETRACHLOROETHYLENE	< 0.5	UG/L	5
3/26/1987	TETRACHLOROETHYLENE	1	UG/L	5
3/26/1987	TETRACHLOROETHYLENE	1	UG/L	5
12/1/1986	TETRACHLOROETHYLENE	2	UG/L	5
11/5/1985	TETRACHLOROETHYLENE	0.9	UG/L	5
10/10/1985	TETRACHLOROETHYLENE	0.7	UG/L	5

FROM DATE: **TO DATE:** **GRAPH SIZE** **NORMALIZED**

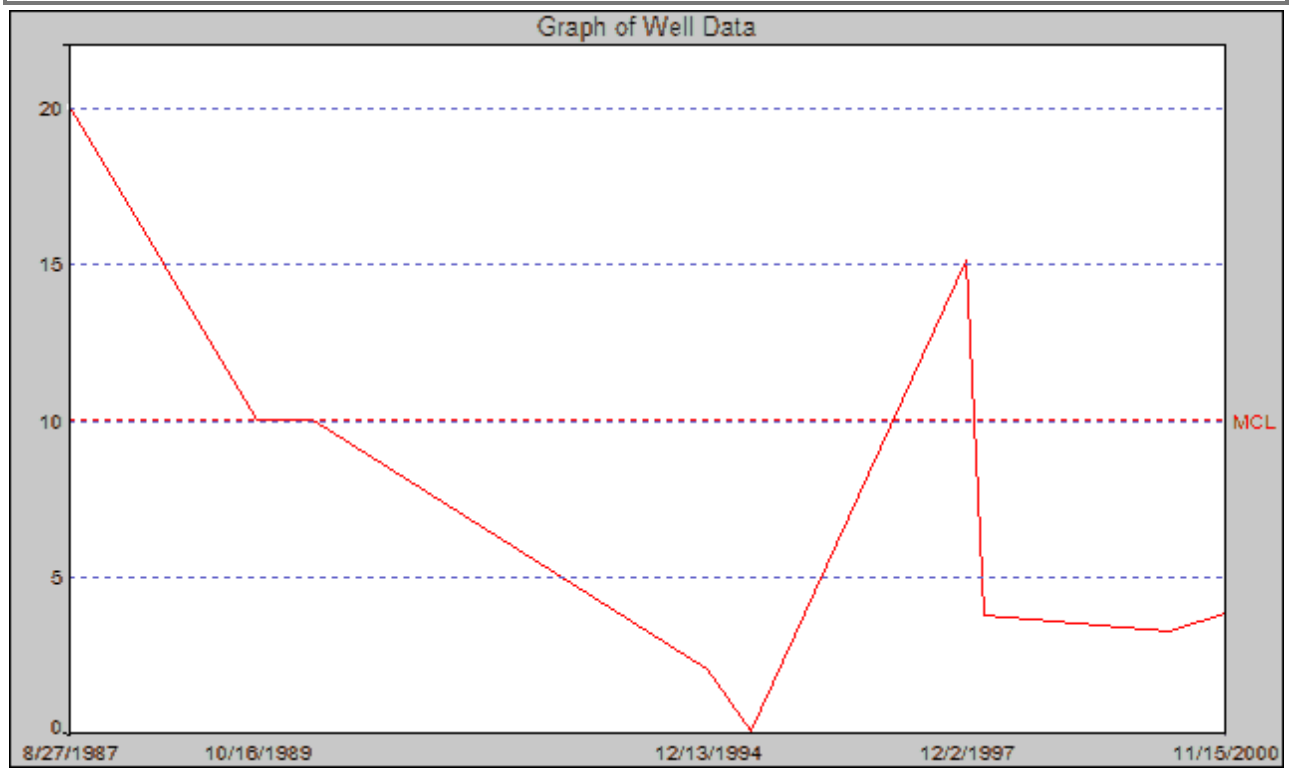
Small Redraw

Well Report

SOUTH GATE-CITY, WATER DEPT. (SOUTH GATE)
WELL 07 - DESTROYED
8650 CALIFORNIA AVE.
SOUTH GATE , CA 90280280
(Show This Well on Map)

State Well #: 1910152-002
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
11/15/2000	ARSENIC	3.8	UG/L	10
3/27/2000	ARSENIC	3.2	UG/L	10
2/12/1998	ARSENIC	3.72	UG/L	10
12/2/1997	ARSENIC	15.1	UG/L	10
6/12/1995	ARSENIC	0	UG/L	10
12/13/1994	ARSENIC	2	UG/L	10
6/4/1990	ARSENIC	< 10	UG/L	10
10/16/1989	ARSENIC	< 10	UG/L	10
8/27/1987	ARSENIC	< 20	UG/L	10
8/27/1987	ARSENIC	< 20	UG/L	10

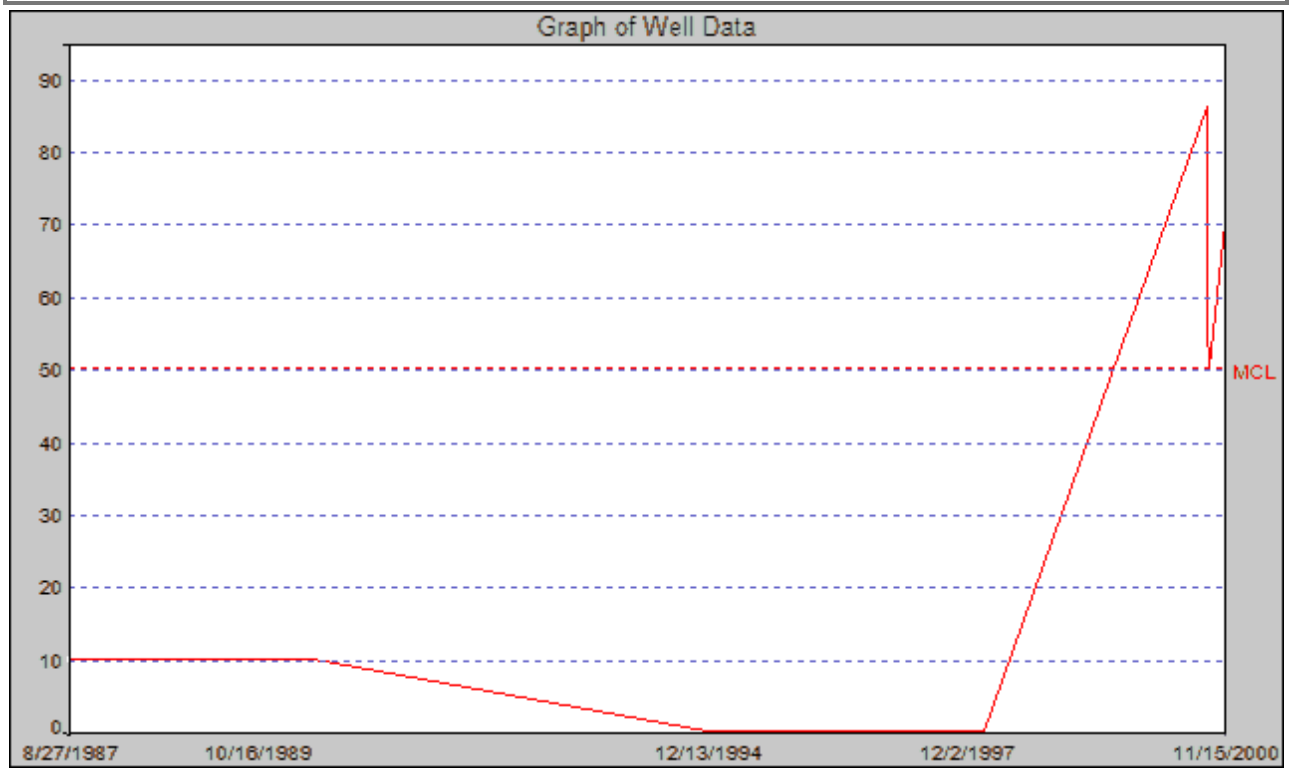
FROM DATE: TO DATE: GRAPH SIZE Small NORMALIZED Redraw

Well Report

SOUTH GATE-CITY, WATER DEPT. (SOUTH GATE)
WELL 07 - DESTROYED
8650 CALIFORNIA AVE.
SOUTH GATE , CA 90280280
(Show This Well on Map)

State Well #: 1910152-002
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
11/15/2000	CHROMIUM (TOTAL)	70	UG/L	50
9/7/2000	CHROMIUM (TOTAL)	50	UG/L	50
9/5/2000	CHROMIUM (TOTAL)	56	UG/L	50
8/31/2000	CHROMIUM (TOTAL)	54	UG/L	50
8/28/2000	CHROMIUM (TOTAL)	86	UG/L	50
2/12/1998	CHROMIUM (TOTAL)	0	UG/L	50
12/2/1997	CHROMIUM (TOTAL)	0	UG/L	50
6/12/1995	CHROMIUM (TOTAL)	0	UG/L	50
12/13/1994	CHROMIUM (TOTAL)	0	UG/L	50
6/4/1990	CHROMIUM (TOTAL)	< 10	UG/L	50
10/16/1989	CHROMIUM (TOTAL)	< 10	UG/L	50
8/27/1987	CHROMIUM (TOTAL)	< 10	UG/L	50
8/27/1987	CHROMIUM (TOTAL)	< 10	UG/L	50

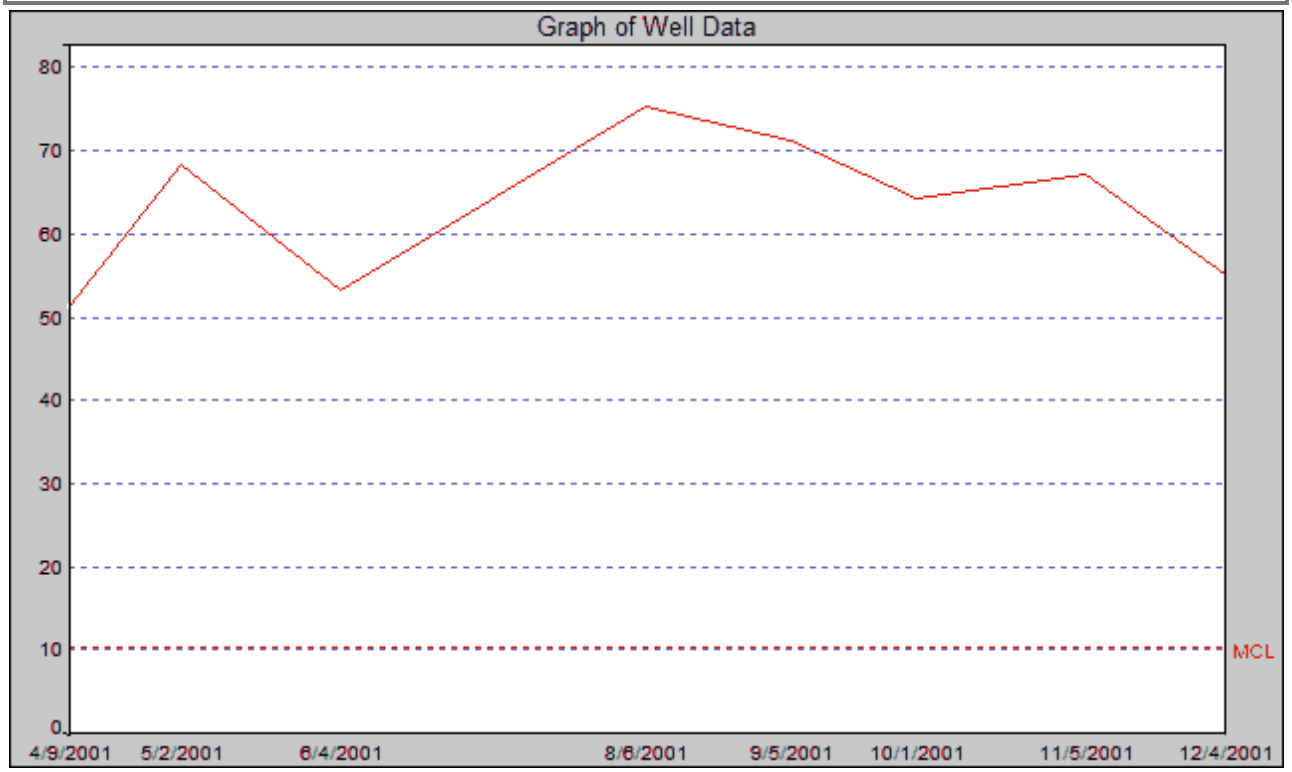
FROM DATE: TO DATE: GRAPH SIZE Small NORMALIZED Redraw

Well Report

SOUTH GATE-CITY, WATER DEPT. (SOUTH GATE)
WELL 07 - DESTROYED
8650 CALIFORNIA AVE.
SOUTH GATE , CA 90280280
(Show This Well on Map)

State Well #: 1910152-002
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
12/4/2001	CHROMIUM, HEXAVALENT	55	UG/L	10
11/5/2001	CHROMIUM, HEXAVALENT	67	UG/L	10
10/1/2001	CHROMIUM, HEXAVALENT	64	UG/L	10
9/5/2001	CHROMIUM, HEXAVALENT	71	UG/L	10
8/6/2001	CHROMIUM, HEXAVALENT	75	UG/L	10
6/4/2001	CHROMIUM, HEXAVALENT	53	UG/L	10
5/2/2001	CHROMIUM, HEXAVALENT	68	UG/L	10
4/9/2001	CHROMIUM, HEXAVALENT	51	UG/L	10

FROM DATE: TO DATE: GRAPH SIZE: Small NORMALIZED: Redraw

Well Report

GSWC - BELL, BELL GARDENS (SANTA FE SPRINGS)
HOFFMAN WELL 02 - DESTROYED 10/26/07
12035 Burke Street, #1
SANTA FE SPRINGS , CA 90670670
(Show This Well on Map)

State Well #: 1910011-008
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data

Plot Selected Chemicals | Reset Boxes **Note: You may select up to 6 chemicals.**

(ALL DATA) | (MOST RECENT) | (MAXIMUM CONCENTRATIONS)

DATE	PARAMETER	QUALIFIER	RESULT	UNITS	MCL	Plot
11/28/2000	1,1,1,2-TETRACHLOROETHANE		0	UG/L	NA	
3/22/1989	1,1,1-TRICHLOROETHANE	<	0.5	UG/L	200	
10/22/1985	1,1,2,2-TETRACHLOROETHANE	<	0.5	UG/L	1	
11/28/2000	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		0	UG/L	1200	
6/17/1987	1,1,2-TRICHLOROETHANE	<	0.5	UG/L	5	
10/22/1985	1,1-DICHLOROETHANE	<	0.5	UG/L	5	
7/24/1997	1,1-DICHLOROETHYLENE		3.9	UG/L	6	
11/28/2000	1,1-DICHLOROPROPENE		0	UG/L	NA	
11/28/2000	1,2,3-TRICHLOROBENZENE		0	UG/L	NA	
11/28/2000	1,2,3-TRICHLOROPROPANE		0	UG/L	NA	
10/3/1985	1,2,4-TRICHLOROBENZENE	<	5	UG/L	5	
11/28/2000	1,2,4-TRIMETHYLBENZENE		0	UG/L	NA	
10/22/1985	1,2-DICHLOROBENZENE	<	0.5	UG/L	600	
10/22/1985	1,2-DICHLOROETHANE	<	0.5	UG/L	0.5	
10/22/1985	1,2-DICHLOROPROPANE	<	0.5	UG/L	5	
11/28/2000	1,3,5-TRIMETHYLBENZENE		0	UG/L	NA	
10/22/1985	1,3-DICHLOROBENZENE	<	0.5	UG/L	NA	
11/28/2000	1,3-DICHLOROPROPANE		0	UG/L	NA	
11/28/2000	1,3-DICHLOROPROPENE (TOTAL)		0	UG/L	0.5	
10/22/1985	1,4-DICHLOROBENZENE	<	0.5	UG/L	5	
11/28/2000	1-PHENYLPROPANE (N-PROPYLBENZENE)		0	UG/L	NA	
11/28/2000	2,2-DICHLOROPROPANE		0	UG/L	NA	
6/13/1989	2,4,5-TP (SILVEX)	<	1	UG/L	50	
10/3/1985	2,4,6-TRICHLOROPHENOL	<	5	UG/L	NA	
6/13/1989	2,4-D	<	10	UG/L	70	
10/3/1985	2,4-DICHLOROPHENOL	<	5	UG/L	NA	
10/3/1985	2,4-DIMETHYLPHENOL	<	5	UG/L	NA	
10/3/1985	2,4-DINITROPHENOL	<	5	UG/L	NA	
10/3/1985	2,4-DINITROTOLUENE	<	5	UG/L	NA	
10/3/1985	2,6-DINITROTOLUENE	<	5	UG/L	NA	
10/22/1985	2-CHLOROETHYLVINYL ETHER	<	0.5	UG/L	NA	
10/3/1985	2-CHLORONAPHTHALENE	<	5	UG/L	NA	
10/3/1985	2-CHLOROPHENOL	<	5	UG/L	NA	
11/28/2000	2-CHLOROTOLUENE		0	UG/L	NA	
10/3/1985	2-METHYL-4,6-DINITROPHENOL	<	5	UG/L	NA	
10/3/1985	2-NITROPHENOL	<	5	UG/L	NA	

10/3/1985	3,3-DICHLOROBENZIDINE	<	20	UG/L	NA	
10/3/1985	4,4-DDD	<	0.02	UG/L	NA	
10/3/1985	4,4-DDE	<	0.01	UG/L	NA	
10/3/1985	4,4-DDT	<	0.02	UG/L	NA	
10/3/1985	4-BROMOPHENYL PHENYL ETHER	<	5	UG/L	NA	
10/3/1985	4-CHLORO-3-METHYLPHENOL	<	5	UG/L	NA	
10/3/1985	4-CHLOROPHENYL PHENYL ETHER	<	5	UG/L	NA	
11/28/2000	4-CHLOROTOLUENE		0	UG/L	NA	
10/3/1985	4-NITROPHENOL	<	5	UG/L	NA	
10/3/1985	ACENAPHTHENE	<	5	UG/L	NA	
10/3/1985	ACENAPHTHYLENE	<	5	UG/L	NA	
10/3/1985	ALACHLOR	<	0.2	UG/L	2	
10/3/1985	ALDRIN	<	0.01	UG/L	NA	
11/28/2000	ALKALINITY (TOTAL) AS CACO3		237	MG/L	NA	
10/3/1985	ALPHA-BHC	<	0.01	UG/L	NA	
7/22/1991	ALUMINUM	<	200	UG/L	1000	
6/13/1989	ALUMINUM, DISSOLVED		0.13	UG/L	NA	
10/3/1985	ANTHRACENE	<	5	UG/L	NA	
11/28/2000	ANTIMONY	<	6	UG/L	6	
6/13/1989	ARSENIC	<	10	UG/L	10	
9/29/1989	ATRAZINE	<	1	UG/L	1	
11/28/2000	BARIUM	<	100	UG/L	1000	
10/3/1985	BENFLURALIN	<	1	UG/L	NA	
10/22/1985	BENZENE	<	0.5	UG/L	1	
10/3/1985	BENZIDINE	<	5	UG/L	NA	
10/3/1985	BENZO (A) ANTHRACENE	<	10	UG/L	NA	
10/3/1985	BENZO (A) PYRENE	<	10	UG/L	0.2	
10/3/1985	BENZO (B) FLUORANTHENE	<	10	UG/L	NA	
10/3/1985	BENZO (GHI) PERYLENE	<	10	UG/L	NA	
10/3/1985	BENZO (K) FLUORANTHENE	<	10	UG/L	NA	
10/3/1985	BENZYL BUTYL PHTHALATE	<	10	UG/L	NA	
11/28/2000	BERYLLIUM	<	1	UG/L	4	
10/3/1985	BETA-BHC	<	0.05	UG/L	NA	
11/28/2000	BICARBONATE ALKALINITY		289	MG/L	NA	
10/3/1985	BIS (2-CHLOROETHOXY) METHANE	<	5	UG/L	NA	
11/4/1998	BIS (2-CHLOROETHYL) ETHER		0	UG/L	NA	
10/3/1985	BIS (2-CHLOROISOPROPYL) ETHER	<	5	UG/L	NA	
10/3/1985	BROMACIL	<	10	UG/L	NA	
11/28/2000	BROMOBENZENE		0	UG/L	NA	
11/28/2000	BROMOCHLOROMETHANE		0	UG/L	NA	
10/22/1985	BROMODICHLORMETHANE (THM)	<	0.5	UG/L	NA	
10/22/1985	BROMOFORM (THM)	<	0.5	UG/L	NA	
10/3/1985	BROMOMETHANE	<	2	UG/L	NA	
11/28/2000	CADMIUM	<	1	UG/L	5	
11/28/2000	CALCIUM		144	MG/L	NA	
10/3/1985	CAPTAN	<	1	UG/L	NA	
10/3/1985	CARBARYL	<	1	UG/L	NA	
10/22/1985	CARBON TETRACHLORIDE	<	0.5	UG/L	0.5	
7/22/1991	CARBONATE ALKALINITY		1.53	MG/L	NA	
10/3/1985	CHLORDANE	<	0.05	UG/L	0.1	

10/3/1985	CHLORDIMEFORM	<	1	UG/L	NA	
11/28/2000	CHLORIDE		78.2	MG/L	500	
10/22/1985	CHLOROETHANE	<	0.5	UG/L	NA	
8/19/1991	CHLOROFORM (THM)		8.1	UG/L	NA	
10/22/1985	CHLOROMETHANE	<	0.5	UG/L	NA	
10/3/1985	CHLOROPICRIN	<	1	UG/L	NA	
10/3/1985	CHLOROPROPHAM	<	10	UG/L	NA	
10/3/1985	CHLOROTHALONIL	<	5	UG/L	NA	
11/28/2000	CHROMIUM (TOTAL)		333	UG/L	50	
10/3/1985	CHRYSENE	<	5	UG/L	NA	
10/22/1985	CIS-1,2-DICHLOROETHYLENE	<	0.5	UG/L	6	
10/22/1985	CIS-1,3-DICHLOROPROPENE	<	0.5	UG/L	0.5	
10/3/1985	CIS-PERMETHRIN	<	1	UG/L	NA	
11/28/2000	COLOR	<	3	UNITS	15	
7/22/1991	COPPER		350	UG/L	1000	
10/29/1985	CYANAZINE	<	150	UG/L	NA	
11/28/2000	CYANIDE	<	100	UG/L	150	
10/3/1985	DACTHAL	<	0.1	UG/L	NA	
6/9/1992	DALAPON		0	UG/L	200	
10/3/1985	DELTA-BHC	<	0.05	UG/L	NA	
10/3/1985	DI(2-ETHYLHEXYL)PHTHALATE	<	5	UG/L	4	
10/3/1985	DI-N-BUTYLPHTHALATE	<	5	UG/L	NA	
10/3/1985	DI-N-OCTYLPHTHALATE	<	5	UG/L	NA	
11/16/1995	DIAZINON		0	UG/L	NA	
10/3/1985	DIBENZO (A,H) ANTHRACENE	<	5	UG/L	NA	
10/22/1985	DIBROMOCHLOROMETHANE (THM)	<	0.5	UG/L	NA	
9/29/1989	DIBROMOCHLOROPROPANE (DBCP)	<	0.01	UG/L	0.2	
11/28/2000	DIBROMOMETHANE		0	UG/L	NA	
10/22/1985	DICHLORODIFLUOROMETHANE (FREON 12)	<	0.5	UG/L	NA	
4/4/1997	DICHLOROMETHANE	<	0.5	UG/L	5	
10/3/1985	DICOFOL	<	0.1	UG/L	NA	
10/3/1985	DIELDRIN	<	0.05	UG/L	NA	
10/3/1985	DIETHYL PHTHALATE	<	5	UG/L	NA	
10/3/1985	DIMETHYL PHTHALATE	<	5	UG/L	NA	
10/3/1985	DINOSEB	<	100	UG/L	7	
10/3/1985	DIPHENAMIDE	<	10.1	UG/L	NA	
11/4/1998	DIQUAT		0	UG/L	20	
10/3/1985	DIURON	<	1	UG/L	NA	
10/3/1985	DNOC	<	100	UG/L	NA	
10/3/1985	ENDOSULFAN I	<	0.01	UG/L	NA	
10/3/1985	ENDOSULFAN II	<	0.05	UG/L	NA	
10/3/1985	ENDOSULFAN SULFATE	<	0.05	UG/L	NA	
10/3/1985	ENDOTHALL	<	100	UG/L	100	
6/13/1989	ENDRIN	<	0.01	UG/L	2	
10/3/1985	ENDRIN ALDEHYDE	<	0.05	UG/L	NA	
11/28/2000	ETHYL-TERT-BUTYL ETHER		0	UG/L	NA	
10/22/1985	ETHYLBENZENE	<	0.5	UG/L	300	
9/29/1989	ETHYLENE DIBROMIDE (EDB)	<	0.02	UG/L	0.05	
10/3/1985	FLUCHLORALIN	<	1	UG/L	NA	
10/3/1985	FLUORANTHENE	<	5	UG/L	NA	

10/3/1985	FLUORENE	<	5	UG/L	NA	
7/26/1994	FLUORIDE (F) (NATURAL-SOURCE)		0.7	MG/L	2	
7/22/1991	FOAMING AGENTS (MBAS)	<	0.05	MG/L	0.5	
11/4/1998	GLYPHOSATE		0	UG/L	700	
4/20/1993	GROSS ALPHA		4.9	PCI/L	15	
3/2/1990	GROSS ALPHA COUNTING ERROR		2.4	PCI/L	NA	
11/28/2000	HARDNESS (TOTAL) AS CACO3		372	MG/L	NA	
10/3/1985	HEPTACHLOR	<	0.02	UG/L	0.01	
10/3/1985	HEPTACHLOR EPOXIDE	<	0.1	UG/L	0.01	
10/3/1985	HEXACHLOROBENZENE	<	5	UG/L	1	
10/3/1985	HEXACHLOROBUTADIENE	<	5	UG/L	NA	
10/3/1985	HEXACHLOROCYCLOPENTADIENE	<	20	UG/L	50	
10/3/1985	HEXACHLOROETHANE	<	5	UG/L	NA	
11/28/2000	HYDROXIDE ALKALINITY	<	1	MG/L	NA	
10/3/1985	INDENO (1,2,3-CD) PYRENE	<	10	UG/L	NA	
11/28/2000	IRON	<	100	UG/L	300	
10/3/1985	ISOPHORONE	<	10	UG/L	NA	
11/28/2000	ISOPROPYLBENZENE		0	UG/L	NA	
10/3/1985	KEROSENE	<	1	UG/L	NA	
7/22/1991	LANGELIER INDEX @ 60 C		0.7		NA	
11/4/1998	LANGELIER INDEX AT SOURCE TEMP.		0.273		NA	
6/13/1989	LEAD	<	10	UG/L	NA	
6/13/1989	LINDANE	<	0.4	UG/L	0.2	
11/28/2000	M,P-XYLENE		0	UG/L	NA	
7/22/1991	MAGNESIUM		26	MG/L	NA	
7/26/1994	MANGANESE	<	30	UG/L	50	
11/28/2000	MERCURY	<	1	UG/L	2	
10/3/1985	MERPHOS	<	1	UG/L	NA	
10/3/1985	METHOMYL	<	10	UG/L	NA	
6/13/1989	METHOXYCHLOR	<	10	UG/L	30	
10/22/1985	METHYL ETHYL KETONE	<	1	UG/L	NA	
10/22/1985	METHYL ISOBUTYL KETONE	<	1	UG/L	NA	
11/28/2000	METHYL-TERT-BUTYL-ETHER (MTBE)		0	UG/L	13	
9/29/1989	MOLINATE	<	2	UG/L	20	
10/22/1985	MONOCHLOROBENZENE	<	0.5	UG/L	70	
11/28/2000	N-BUTYLBENZENE		0	UG/L	NA	
10/3/1985	N-NITROSODI-N-PROPYLAMINE (NDPA)	<	5	UG/L	NA	
10/3/1985	N-NITROSODIMETHYLAMINE (NDMA)	<	5	UG/L	NA	
10/3/1985	N-NITROSODIPHENYLAMINE	<	5	UG/L	NA	
10/3/1985	NAPHTHALENE	<	5	UG/L	NA	
10/3/1985	NAPROPAMIDE	<	5	UG/L	NA	
11/28/2000	NICKEL	<	10	UG/L	100	
11/28/2000	NITRATE (AS NO3)		32.6	MG/L	45	
11/28/2000	NITRATE + NITRITE (AS N)		7360	UG/L	10000	
11/28/2000	NITRITE (AS N)	<	400	UG/L	1000	
10/3/1985	NITROBENZENE	<	5	UG/L	NA	
11/28/2000	O-XYLENE		0	UG/L	NA	
11/28/2000	ODOR THRESHOLD @ 60 C		1	TON	3	
10/3/1985	ORYZALIN	<	1	UG/L	NA	
10/3/1985	OXAMYL	<	10	UG/L	50	

11/28/2000	P-ISOPROPYLTOLUENE		0	UG/L	NA
10/3/1985	PCB-1016 (AS DECACHLOROBIPHENYL (DCB))	<	0.2	UG/L	NA
10/3/1985	PCB-1221 (AS DCB)	<	0.2	UG/L	NA
10/3/1985	PCB-1232 (AS DCB)	<	0.2	UG/L	NA
10/3/1985	PCB-1242 (AS DCB)	<	0.2	UG/L	NA
10/3/1985	PCB-1248 (AS DCB)	<	0.2	UG/L	NA
10/3/1985	PCB-1254 (AS DCB)	<	0.2	UG/L	NA
10/3/1985	PCB-1260 (AS DCB)	<	0.2	UG/L	NA
10/3/1985	PENTACHLOROPHENOL	<	0.5	UG/L	1
11/28/2000	PERCHLORATE	<	5	UG/L	6
7/22/1991	PH, LABORATORY		7.9		NA
10/3/1985	PHENANTHRENE	<	5	UG/L	NA
10/3/1985	PHENOL	<	5	UG/L	NA
6/9/1992	PICLORAM		0	UG/L	500
6/9/1992	POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB		0	UG/L	0.5
11/28/2000	POTASSIUM		3.5	MG/L	NA
10/29/1985	PROMETRYN	<	0.5	UG/L	NA
10/3/1985	PROPAMIDE	<	1	UG/L	NA
10/3/1985	PROPARGITE	<	1	MG/L	NA
10/3/1985	PYRENE	<	5	UG/L	NA
11/28/2000	RADON 222		293	PCI/L	NA
11/28/2000	RADON 222 COUNTING ERROR		7	PCI/L	NA
10/3/1985	S,S,S-TRIBUTYLPHOSPHOROTRITHIOATE	<	1	UG/L	NA
11/28/2000	SEC-BUTYLBENZENE		0	UG/L	NA
11/28/2000	SELENIUM	<	5	UG/L	50
11/28/2000	SILVER	<	10	UG/L	100
9/29/1989	SIMAZINE	<	1	UG/L	4
11/28/2000	SODIUM		68	MG/L	NA
11/28/2000	SOURCE TEMPERATURE C		19.4	C	NA
11/28/2000	SPECIFIC CONDUCTANCE		955	US	1600
11/28/2000	STYRENE		0	UG/L	100
11/28/2000	SULFATE		140	MG/L	600
11/28/2000	TERT-AMYL-METHYL ETHER		0	UG/L	NA
11/28/2000	TERT-BUTYLBENZENE		0	UG/L	NA
11/28/2000	TETRACHLOROETHYLENE		5.7	UG/L	5
11/28/2000	THALLIUM	<	1	UG/L	2
9/29/1989	THIOBENCARB	<	0.8	UG/L	70
10/22/1985	TOLUENE	<	0.5	UG/L	150
11/28/2000	TOTAL DISSOLVED SOLIDS		611	MG/L	1000
8/19/1991	TOTAL TRIHALOMETHANES		8	UG/L	80
6/13/1989	TOXAPHENE	<	0.5	UG/L	3
10/22/1985	TRANS-1,2-DICHLOROETHYLENE	<	0.5	UG/L	10
10/22/1985	TRANS-1,3-DICHLOROPROPENE	<	0.5	UG/L	NA
10/3/1985	TRANS-PERMETHRIN	<	1	UG/L	NA
11/1/1996	TRICHLOROETHYLENE		15.3	UG/L	5
10/22/1985	TRICHLOROFLUOROMETHANE	<	0.5	UG/L	150
7/26/1994	TURBIDITY, LABORATORY		0.6	NTU	5
10/19/1993	URANIUM (PCI/L)		5	PCI/L	20
2/10/1998	URANIUM COUNTING ERROR		0.87	PCI/L	NA
10/22/1985	VINYL CHLORIDE	<	0.5	UG/L	0.5

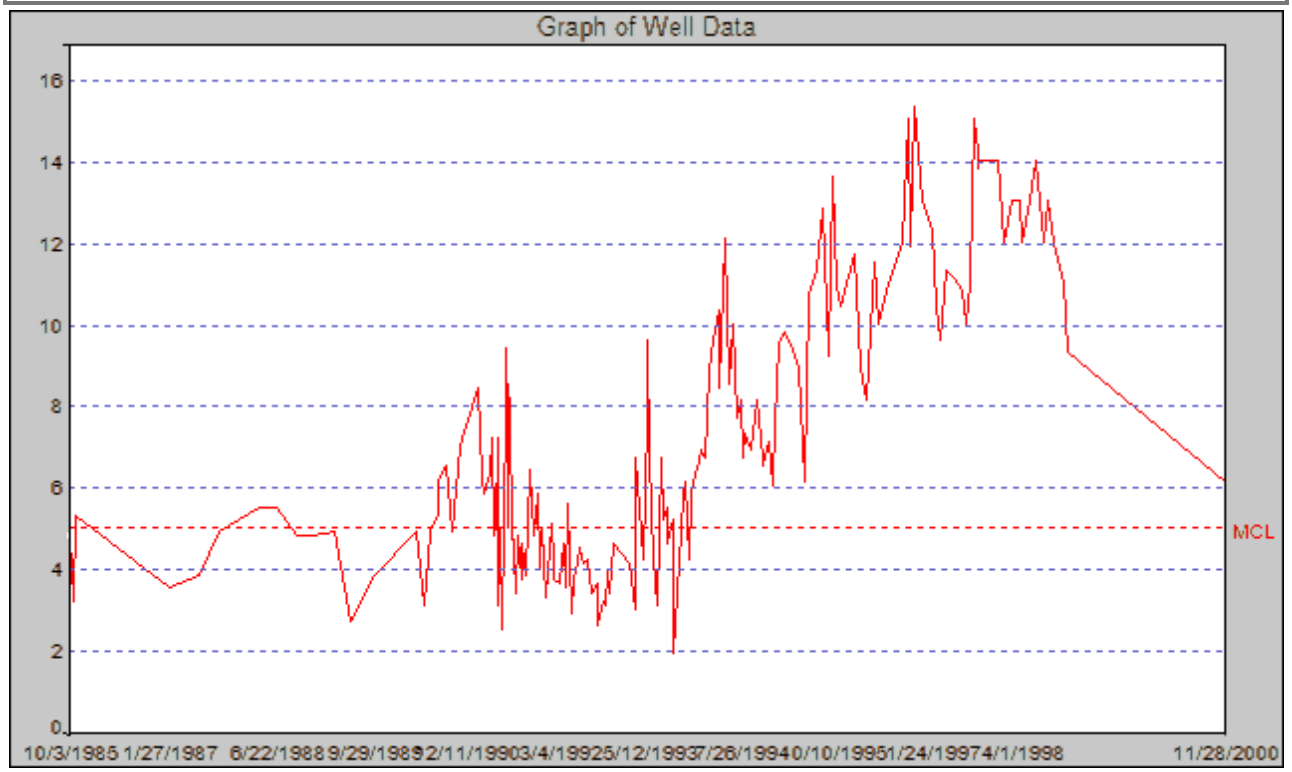
10/22/1985	XYLENES (TOTAL)	<	0.5	UG/L	1750
11/28/2000	ZINC	<	50	UG/L	5000

Well Report

GSWC - BELL, BELL GARDENS (SANTA FE SPRINGS)
HOFFMAN WELL 02 - DESTROYED 10/26/07
12035 Burke Street, #1
SANTA FE SPRINGS , CA 90670670
(Show This Well on Map)

State Well #: 1910011-008
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
11/28/2000	TRICHLOROETHYLENE	6.1	UG/L	5
11/4/1998	TRICHLOROETHYLENE	9.3	UG/L	5
10/21/1998	TRICHLOROETHYLENE	11	UG/L	5
9/3/1998	TRICHLOROETHYLENE	12	UG/L	5
8/6/1998	TRICHLOROETHYLENE	13	UG/L	5
7/9/1998	TRICHLOROETHYLENE	12	UG/L	5
6/4/1998	TRICHLOROETHYLENE	14	UG/L	5
5/7/1998	TRICHLOROETHYLENE	13	UG/L	5
4/1/1998	TRICHLOROETHYLENE	12	UG/L	5
3/23/1998	TRICHLOROETHYLENE	13	UG/L	5
2/10/1998	TRICHLOROETHYLENE	13	UG/L	5
1/7/1998	TRICHLOROETHYLENE	12	UG/L	5
12/3/1997	TRICHLOROETHYLENE	14	UG/L	5
9/5/1997	TRICHLOROETHYLENE	14	UG/L	5
8/28/1997	TRICHLOROETHYLENE	13.8	UG/L	5
8/28/1997	TRICHLOROETHYLENE	14.2	UG/L	5
8/28/1997	TRICHLOROETHYLENE	13.8	UG/L	5
8/14/1997	TRICHLOROETHYLENE	15	UG/L	5
7/24/1997	TRICHLOROETHYLENE	11	UG/L	5
7/11/1997	TRICHLOROETHYLENE	10	UG/L	5
6/13/1997	TRICHLOROETHYLENE	10.8	UG/L	5
5/9/1997	TRICHLOROETHYLENE	11.1	UG/L	5
4/4/1997	TRICHLOROETHYLENE	11.3	UG/L	5
3/5/1997	TRICHLOROETHYLENE	9.6	UG/L	5
2/18/1997	TRICHLOROETHYLENE	10.4	UG/L	5

1/24/1997	TRICHLOROETHYLENE	12.3	UG/L	5
12/6/1996	TRICHLOROETHYLENE	13	UG/L	5
11/1/1996	TRICHLOROETHYLENE	15.3	UG/L	5
10/16/1996	TRICHLOROETHYLENE	11.9	UG/L	5
9/30/1996	TRICHLOROETHYLENE	15	UG/L	5
9/3/1996	TRICHLOROETHYLENE	12	UG/L	5
6/19/1996	TRICHLOROETHYLENE	10.8	UG/L	5
5/16/1996	TRICHLOROETHYLENE	10	UG/L	5
4/19/1996	TRICHLOROETHYLENE	11.5	UG/L	5
3/14/1996	TRICHLOROETHYLENE	8.1	UG/L	5
2/16/1996	TRICHLOROETHYLENE	8.9	UG/L	5
1/19/1996	TRICHLOROETHYLENE	11.7	UG/L	5
11/16/1995	TRICHLOROETHYLENE	10.4	UG/L	5
11/15/1995	TRICHLOROETHYLENE	10.4	UG/L	5
10/26/1995	TRICHLOROETHYLENE	10.9	UG/L	5
10/10/1995	TRICHLOROETHYLENE	13.6	UG/L	5
9/20/1995	TRICHLOROETHYLENE	9.2	UG/L	5
8/15/1995	TRICHLOROETHYLENE	12.8	UG/L	5
7/26/1995	TRICHLOROETHYLENE	11.3	UG/L	5
6/13/1995	TRICHLOROETHYLENE	10.7	UG/L	5
5/26/1995	TRICHLOROETHYLENE	6.1	UG/L	5
4/26/1995	TRICHLOROETHYLENE	8.9	UG/L	5
3/24/1995	TRICHLOROETHYLENE	9.5	UG/L	5
2/15/1995	TRICHLOROETHYLENE	9.8	UG/L	5
1/19/1995	TRICHLOROETHYLENE	9.5	UG/L	5
1/4/1995	TRICHLOROETHYLENE	7.6	UG/L	5
12/20/1994	TRICHLOROETHYLENE	6	UG/L	5
12/7/1994	TRICHLOROETHYLENE	7.1	UG/L	5
11/9/1994	TRICHLOROETHYLENE	6.5	UG/L	5
11/3/1994	TRICHLOROETHYLENE	6.7	UG/L	5
10/5/1994	TRICHLOROETHYLENE	8.1	UG/L	5
9/7/1994	TRICHLOROETHYLENE	6.9	UG/L	5
8/9/1994	TRICHLOROETHYLENE	7.3	UG/L	5
8/3/1994	TRICHLOROETHYLENE	6.7	UG/L	5
7/26/1994	TRICHLOROETHYLENE	8.1	UG/L	5
7/6/1994	TRICHLOROETHYLENE	7.7	UG/L	5
6/16/1994	TRICHLOROETHYLENE	10	UG/L	5
6/1/1994	TRICHLOROETHYLENE	8.5	UG/L	5
5/4/1994	TRICHLOROETHYLENE	12.1	UG/L	5
4/14/1994	TRICHLOROETHYLENE	8.4	UG/L	5
4/6/1994	TRICHLOROETHYLENE	10.3	UG/L	5
3/10/1994	TRICHLOROETHYLENE	9.6	UG/L	5
3/2/1994	TRICHLOROETHYLENE	9.2	UG/L	5
2/24/1994	TRICHLOROETHYLENE	8.8	UG/L	5
2/2/1994	TRICHLOROETHYLENE	6.7	UG/L	5
1/18/1994	TRICHLOROETHYLENE	6.9	UG/L	5
1/5/1994	TRICHLOROETHYLENE	6.6	UG/L	5
12/14/1993	TRICHLOROETHYLENE	6.3	UG/L	5
12/1/1993	TRICHLOROETHYLENE	5.8	UG/L	5
11/18/1993	TRICHLOROETHYLENE	4.2	UG/L	5
11/3/1993	TRICHLOROETHYLENE	6.1	UG/L	5
10/19/1993	TRICHLOROETHYLENE	5.8	UG/L	5
10/6/1993	TRICHLOROETHYLENE	4.9	UG/L	5
9/2/1993	TRICHLOROETHYLENE	1.9	UG/L	5
9/1/1993	TRICHLOROETHYLENE	5.2	UG/L	5
8/4/1993	TRICHLOROETHYLENE	4.6	UG/L	5
8/3/1993	TRICHLOROETHYLENE	5.5	UG/L	5
7/20/1993	TRICHLOROETHYLENE	5.2	UG/L	5
7/7/1993	TRICHLOROETHYLENE	6.7	UG/L	5
6/17/1993	TRICHLOROETHYLENE	3.1	UG/L	5
6/2/1993	TRICHLOROETHYLENE	4.2	UG/L	5
5/12/1993	TRICHLOROETHYLENE	6.7	UG/L	5
5/5/1993	TRICHLOROETHYLENE	9.6	UG/L	5
4/28/1993	TRICHLOROETHYLENE	7.7	UG/L	5

4/14/1993	TRICHLOROETHYLENE	4.2	UG/L	5
3/9/1993	TRICHLOROETHYLENE	6.7	UG/L	5
3/3/1993	TRICHLOROETHYLENE	3	UG/L	5
2/3/1993	TRICHLOROETHYLENE	4.1	UG/L	5
11/16/1992	TRICHLOROETHYLENE	4.6	UG/L	5
11/4/1992	TRICHLOROETHYLENE	3.4	UG/L	5
10/20/1992	TRICHLOROETHYLENE	3.9	UG/L	5
10/14/1992	TRICHLOROETHYLENE	3.1	UG/L	5
10/7/1992	TRICHLOROETHYLENE	3.2	UG/L	5
9/3/1992	TRICHLOROETHYLENE	2.6	UG/L	5
9/2/1992	TRICHLOROETHYLENE	3.6	UG/L	5
8/5/1992	TRICHLOROETHYLENE	3.4	UG/L	5
7/21/1992	TRICHLOROETHYLENE	4.2	UG/L	5
7/1/1992	TRICHLOROETHYLENE	4.1	UG/L	5
6/9/1992	TRICHLOROETHYLENE	4.5	UG/L	5
6/3/1992	TRICHLOROETHYLENE	4.1	UG/L	5
5/18/1992	TRICHLOROETHYLENE	3.7	UG/L	5
5/6/1992	TRICHLOROETHYLENE	2.9	UG/L	5
4/13/1992	TRICHLOROETHYLENE	5.6	UG/L	5
4/1/1992	TRICHLOROETHYLENE	3.5	UG/L	5
3/23/1992	TRICHLOROETHYLENE	4.6	UG/L	5
3/4/1992	TRICHLOROETHYLENE	3.6	UG/L	5
2/11/1992	TRICHLOROETHYLENE	3.7	UG/L	5
2/5/1992	TRICHLOROETHYLENE	4.2	UG/L	5
1/27/1992	TRICHLOROETHYLENE	5.1	UG/L	5
1/2/1992	TRICHLOROETHYLENE	3.3	UG/L	5
12/17/1991	TRICHLOROETHYLENE	5	UG/L	5
12/4/1991	TRICHLOROETHYLENE	4	UG/L	5
11/22/1991	TRICHLOROETHYLENE	5.8	UG/L	5
11/6/1991	TRICHLOROETHYLENE	4.8	UG/L	5
10/17/1991	TRICHLOROETHYLENE	6.4	UG/L	5
10/2/1991	TRICHLOROETHYLENE	3.8	UG/L	5
9/12/1991	TRICHLOROETHYLENE	4.6	UG/L	5
9/4/1991	TRICHLOROETHYLENE	3.7	UG/L	5
8/19/1991	TRICHLOROETHYLENE	4.8	UG/L	5
8/7/1991	TRICHLOROETHYLENE	3.4	UG/L	5
7/24/1991	TRICHLOROETHYLENE	5.2	UG/L	5
7/22/1991	TRICHLOROETHYLENE	4.7	UG/L	5
7/10/1991	TRICHLOROETHYLENE	7.9	UG/L	5
7/2/1991	TRICHLOROETHYLENE	5	UG/L	5
7/2/1991	TRICHLOROETHYLENE	8.5	UG/L	5
6/26/1991	TRICHLOROETHYLENE	9.4	UG/L	5
6/25/1991	TRICHLOROETHYLENE	8.6	UG/L	5
6/19/1991	TRICHLOROETHYLENE	4.5	UG/L	5
6/12/1991	TRICHLOROETHYLENE	5.1	UG/L	5
6/5/1991	TRICHLOROETHYLENE	2.49	UG/L	5
5/29/1991	TRICHLOROETHYLENE	4.7	UG/L	5
5/28/1991	TRICHLOROETHYLENE	4.1	UG/L	5
5/22/1991	TRICHLOROETHYLENE	5	UG/L	5
5/15/1991	TRICHLOROETHYLENE	3.1	UG/L	5
5/15/1991	TRICHLOROETHYLENE	7.2	UG/L	5
5/8/1991	TRICHLOROETHYLENE	5	UG/L	5
4/24/1991	TRICHLOROETHYLENE	4.8	UG/L	5
4/17/1991	TRICHLOROETHYLENE	7.2	UG/L	5
4/10/1991	TRICHLOROETHYLENE	6.3	UG/L	5
3/13/1991	TRICHLOROETHYLENE	5.8	UG/L	5
3/4/1991	TRICHLOROETHYLENE	6.2	UG/L	5
2/11/1991	TRICHLOROETHYLENE	8.4	UG/L	5
12/11/1990	TRICHLOROETHYLENE	7.5	UG/L	5
11/19/1990	TRICHLOROETHYLENE	7	UG/L	5
10/9/1990	TRICHLOROETHYLENE	4.9	UG/L	5
9/10/1990	TRICHLOROETHYLENE	6.5	UG/L	5
8/6/1990	TRICHLOROETHYLENE	6.1	UG/L	5
7/30/1990	TRICHLOROETHYLENE	5.3	UG/L	5

6/26/1990	TRICHLOROETHYLENE		4.9	UG/L	5
5/30/1990	TRICHLOROETHYLENE		3.1	UG/L	5
4/19/1990	TRICHLOROETHYLENE		4.9	UG/L	5
9/29/1989	TRICHLOROETHYLENE		3.8	UG/L	5
9/29/1989	TRICHLOROETHYLENE		3.8	UG/L	5
6/13/1989	TRICHLOROETHYLENE		2.7	UG/L	5
3/22/1989	TRICHLOROETHYLENE		4.9	UG/L	5
12/13/1988	TRICHLOROETHYLENE		4.8	UG/L	5
9/27/1988	TRICHLOROETHYLENE		4.8	UG/L	5
6/22/1988	TRICHLOROETHYLENE		5.5	UG/L	5
3/23/1988	TRICHLOROETHYLENE		5.5	UG/L	5
9/23/1987	TRICHLOROETHYLENE		4.9	UG/L	5
6/17/1987	TRICHLOROETHYLENE		3.8	UG/L	5
1/27/1987	TRICHLOROETHYLENE		3.5	UG/L	5
10/29/1985	TRICHLOROETHYLENE		5.3	UG/L	5
10/22/1985	TRICHLOROETHYLENE		3.2	UG/L	5
10/3/1985	TRICHLOROETHYLENE		4.8	UG/L	5

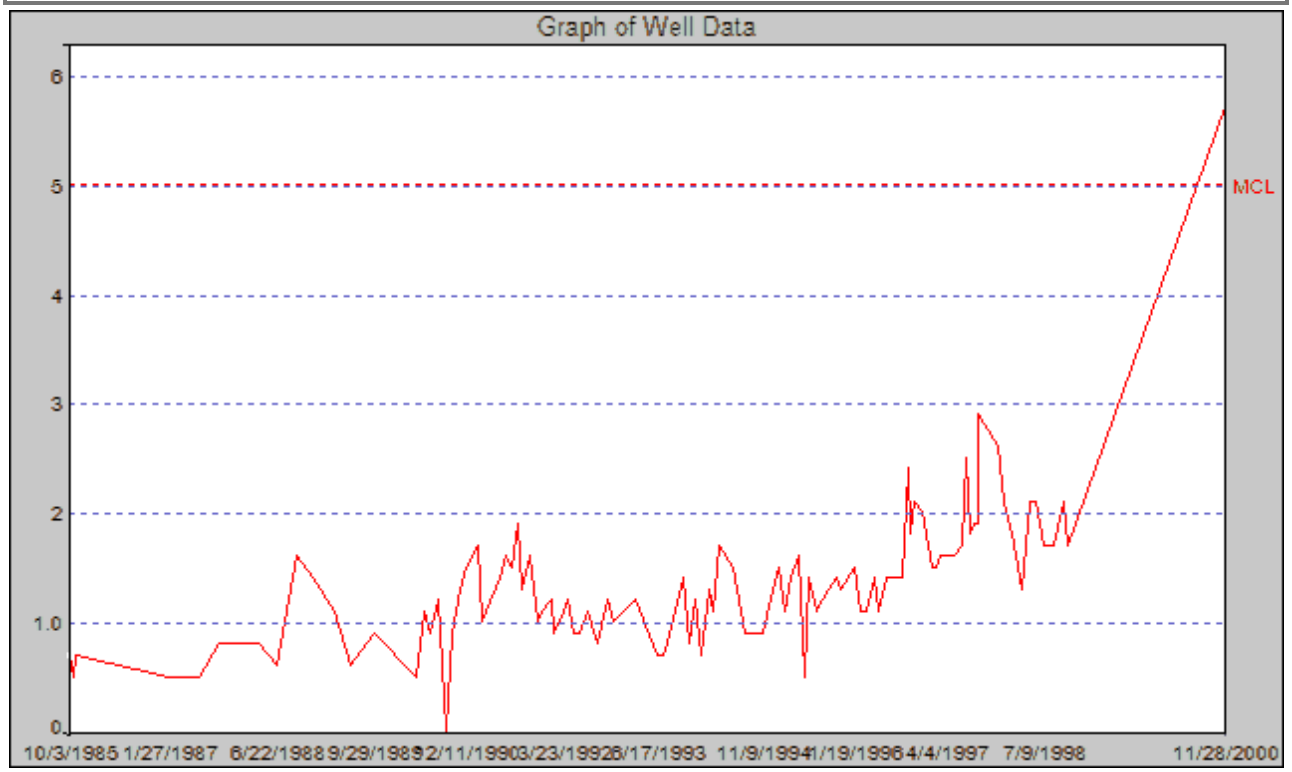
FROM DATE: **TO DATE:** **GRAPH SIZE** Small **NORMALIZED** Redraw

Well Report

GSWC - BELL, BELL GARDENS (SANTA FE SPRINGS)
HOFFMAN WELL 02 - DESTROYED 10/26/07
12035 Burke Street, #1
SANTA FE SPRINGS , CA 90670670
(Show This Well on Map)

State Well #: 1910011-008
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
11/28/2000	TETRACHLOROETHYLENE	5.7	UG/L	5
11/4/1998	TETRACHLOROETHYLENE	1.7	UG/L	5
10/21/1998	TETRACHLOROETHYLENE	2.1	UG/L	5
9/3/1998	TETRACHLOROETHYLENE	1.7	UG/L	5
8/6/1998	TETRACHLOROETHYLENE	1.7	UG/L	5
7/9/1998	TETRACHLOROETHYLENE	1.7	UG/L	5
6/4/1998	TETRACHLOROETHYLENE	2.1	UG/L	5
5/7/1998	TETRACHLOROETHYLENE	2.1	UG/L	5
4/1/1998	TETRACHLOROETHYLENE	1.3	UG/L	5
3/23/1998	TETRACHLOROETHYLENE	1.4	UG/L	5
2/10/1998	TETRACHLOROETHYLENE	1.8	UG/L	5
1/7/1998	TETRACHLOROETHYLENE	2.1	UG/L	5
12/3/1997	TETRACHLOROETHYLENE	2.6	UG/L	5
9/5/1997	TETRACHLOROETHYLENE	2.9	UG/L	5
8/28/1997	TETRACHLOROETHYLENE	1.9	UG/L	5
8/28/1997	TETRACHLOROETHYLENE	2	UG/L	5
8/28/1997	TETRACHLOROETHYLENE	2.2	UG/L	5
8/14/1997	TETRACHLOROETHYLENE	1.9	UG/L	5
7/24/1997	TETRACHLOROETHYLENE	1.8	UG/L	5
7/11/1997	TETRACHLOROETHYLENE	2.5	UG/L	5
6/13/1997	TETRACHLOROETHYLENE	1.7	UG/L	5
5/9/1997	TETRACHLOROETHYLENE	1.6	UG/L	5
4/4/1997	TETRACHLOROETHYLENE	1.6	UG/L	5
3/5/1997	TETRACHLOROETHYLENE	1.6	UG/L	5
2/18/1997	TETRACHLOROETHYLENE	1.5	UG/L	5

1/24/1997	TETRACHLOROETHYLENE	1.5	UG/L	5
12/6/1996	TETRACHLOROETHYLENE	2	UG/L	5
11/1/1996	TETRACHLOROETHYLENE	2.1	UG/L	5
10/16/1996	TETRACHLOROETHYLENE	1.8	UG/L	5
9/30/1996	TETRACHLOROETHYLENE	2.4	UG/L	5
9/3/1996	TETRACHLOROETHYLENE	1.4	UG/L	5
6/19/1996	TETRACHLOROETHYLENE	1.4	UG/L	5
5/16/1996	TETRACHLOROETHYLENE	1.1	UG/L	5
4/19/1996	TETRACHLOROETHYLENE	1.4	UG/L	5
3/14/1996	TETRACHLOROETHYLENE	1.1	UG/L	5
2/16/1996	TETRACHLOROETHYLENE	1.1	UG/L	5
1/19/1996	TETRACHLOROETHYLENE	1.5	UG/L	5
11/16/1995	TETRACHLOROETHYLENE	1.3	UG/L	5
10/26/1995	TETRACHLOROETHYLENE	1.4	UG/L	5
9/20/1995	TETRACHLOROETHYLENE	1.3	UG/L	5
8/15/1995	TETRACHLOROETHYLENE	1.2	UG/L	5
7/26/1995	TETRACHLOROETHYLENE	1.1	UG/L	5
6/13/1995	TETRACHLOROETHYLENE	1.4	UG/L	5
5/26/1995	TETRACHLOROETHYLENE	0.5	UG/L	5
4/26/1995	TETRACHLOROETHYLENE	1.6	UG/L	5
3/24/1995	TETRACHLOROETHYLENE	1.4	UG/L	5
2/15/1995	TETRACHLOROETHYLENE	1.1	UG/L	5
1/19/1995	TETRACHLOROETHYLENE	1.5	UG/L	5
12/20/1994	TETRACHLOROETHYLENE	1.3	UG/L	5
11/9/1994	TETRACHLOROETHYLENE	0.9	UG/L	5
8/9/1994	TETRACHLOROETHYLENE	0.9	UG/L	5
7/26/1994	TETRACHLOROETHYLENE	1.1	UG/L	5
6/16/1994	TETRACHLOROETHYLENE	1.5	UG/L	5
4/14/1994	TETRACHLOROETHYLENE	1.7	UG/L	5
3/10/1994	TETRACHLOROETHYLENE	1.1	UG/L	5
2/24/1994	TETRACHLOROETHYLENE	1.3	UG/L	5
1/18/1994	TETRACHLOROETHYLENE	0.7	UG/L	5
12/14/1993	TETRACHLOROETHYLENE	1.2	UG/L	5
11/18/1993	TETRACHLOROETHYLENE	0.8	UG/L	5
10/19/1993	TETRACHLOROETHYLENE	1.4	UG/L	5
8/3/1993	TETRACHLOROETHYLENE	0.8	UG/L	5
7/20/1993	TETRACHLOROETHYLENE	0.7	UG/L	5
6/17/1993	TETRACHLOROETHYLENE	0.7	UG/L	5
3/9/1993	TETRACHLOROETHYLENE	1.2	UG/L	5
11/16/1992	TETRACHLOROETHYLENE	1	UG/L	5
10/20/1992	TETRACHLOROETHYLENE	1.2	UG/L	5
9/3/1992	TETRACHLOROETHYLENE	0.8	UG/L	5
7/21/1992	TETRACHLOROETHYLENE	1.1	UG/L	5
6/9/1992	TETRACHLOROETHYLENE	0.9	UG/L	5
5/18/1992	TETRACHLOROETHYLENE	0.9	UG/L	5
4/13/1992	TETRACHLOROETHYLENE	1.2	UG/L	5
3/23/1992	TETRACHLOROETHYLENE	1.1	UG/L	5
2/11/1992	TETRACHLOROETHYLENE	0.9	UG/L	5
1/27/1992	TETRACHLOROETHYLENE	1.2	UG/L	5
12/17/1991	TETRACHLOROETHYLENE	1.1	UG/L	5
11/22/1991	TETRACHLOROETHYLENE	1	UG/L	5
10/17/1991	TETRACHLOROETHYLENE	1.6	UG/L	5
9/12/1991	TETRACHLOROETHYLENE	1.3	UG/L	5
8/19/1991	TETRACHLOROETHYLENE	1.9	UG/L	5
7/22/1991	TETRACHLOROETHYLENE	1.5	UG/L	5
6/25/1991	TETRACHLOROETHYLENE	1.6	UG/L	5
5/28/1991	TETRACHLOROETHYLENE	1.4	UG/L	5
3/4/1991	TETRACHLOROETHYLENE	1	UG/L	5
2/11/1991	TETRACHLOROETHYLENE	1.7	UG/L	5
12/11/1990	TETRACHLOROETHYLENE	1.5	UG/L	5
11/19/1990	TETRACHLOROETHYLENE	1.3	UG/L	5
10/9/1990	TETRACHLOROETHYLENE	0.9	UG/L	5
9/10/1990	TETRACHLOROETHYLENE	0	UG/L	5
8/6/1990	TETRACHLOROETHYLENE	1.2	UG/L	5

7/30/1990	TETRACHLOROETHYLENE		1.2	UG/L	5
6/26/1990	TETRACHLOROETHYLENE		0.9	UG/L	5
5/30/1990	TETRACHLOROETHYLENE		1.1	UG/L	5
4/19/1990	TETRACHLOROETHYLENE		0.5	UG/L	5
9/29/1989	TETRACHLOROETHYLENE		0.9	UG/L	5
9/29/1989	TETRACHLOROETHYLENE		0.9	UG/L	5
6/13/1989	TETRACHLOROETHYLENE		0.6	UG/L	5
3/22/1989	TETRACHLOROETHYLENE		1.1	UG/L	5
12/13/1988	TETRACHLOROETHYLENE		1.4	UG/L	5
9/27/1988	TETRACHLOROETHYLENE		1.6	UG/L	5
6/22/1988	TETRACHLOROETHYLENE		0.6	UG/L	5
3/23/1988	TETRACHLOROETHYLENE		0.8	UG/L	5
9/23/1987	TETRACHLOROETHYLENE		< 0.8	UG/L	5
6/17/1987	TETRACHLOROETHYLENE		0.5	UG/L	5
1/27/1987	TETRACHLOROETHYLENE		0.5	UG/L	5
10/29/1985	TETRACHLOROETHYLENE		0.7	UG/L	5
10/22/1985	TETRACHLOROETHYLENE		< 0.5	UG/L	5
10/3/1985	TETRACHLOROETHYLENE		0.7	UG/L	5

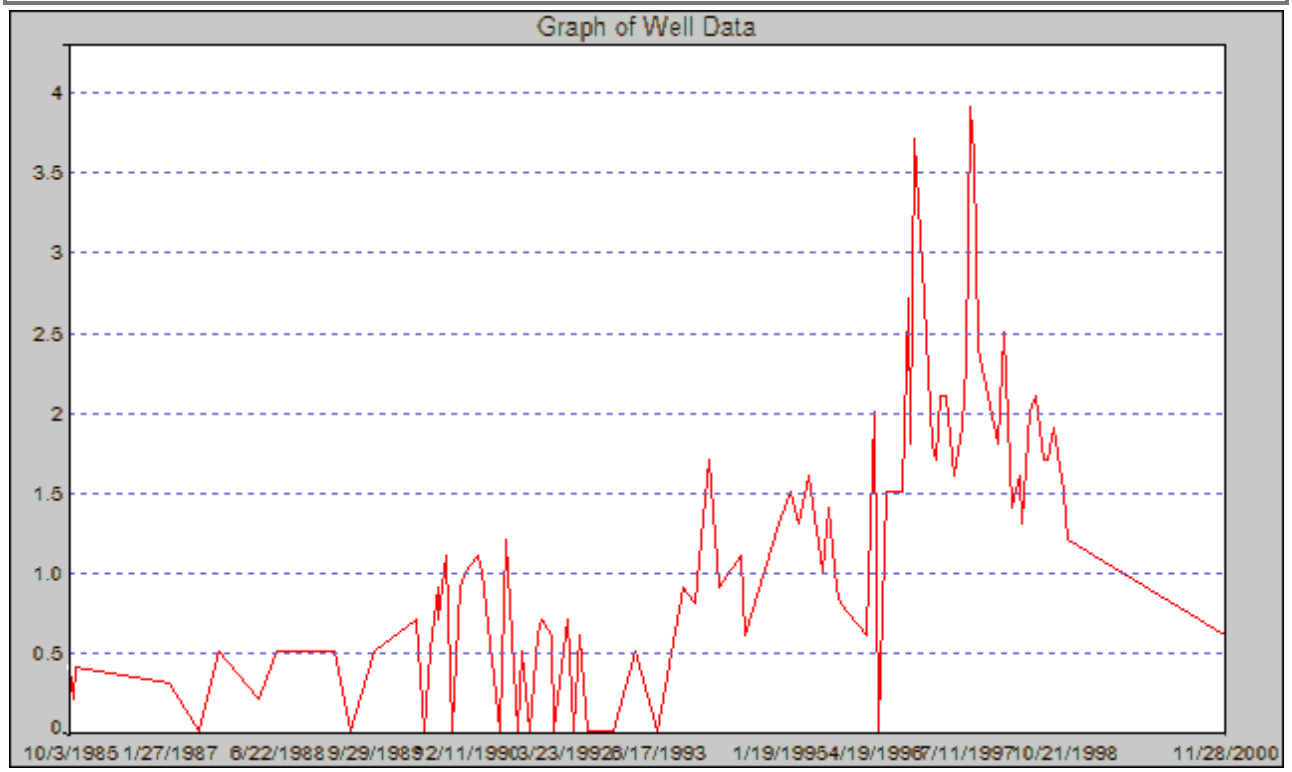
FROM DATE: **TO DATE:** **GRAPH SIZE** Small **NORMALIZED** Redraw

Well Report

GSWC - BELL, BELL GARDENS (SANTA FE SPRINGS)
HOFFMAN WELL 02 - DESTROYED 10/26/07
12035 Burke Street, #1
SANTA FE SPRINGS , CA 90670670
(Show This Well on Map)

State Well #: 1910011-008
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
11/28/2000	1,1-DICHLOROETHYLENE	0.6	UG/L	6
11/4/1998	1,1-DICHLOROETHYLENE	1.2	UG/L	6
10/21/1998	1,1-DICHLOROETHYLENE	1.5	UG/L	6
9/3/1998	1,1-DICHLOROETHYLENE	1.9	UG/L	6
8/6/1998	1,1-DICHLOROETHYLENE	1.7	UG/L	6
7/9/1998	1,1-DICHLOROETHYLENE	1.7	UG/L	6
6/4/1998	1,1-DICHLOROETHYLENE	2.1	UG/L	6
5/7/1998	1,1-DICHLOROETHYLENE	2	UG/L	6
4/1/1998	1,1-DICHLOROETHYLENE	1.3	UG/L	6
3/23/1998	1,1-DICHLOROETHYLENE	1.6	UG/L	6
2/10/1998	1,1-DICHLOROETHYLENE	1.4	UG/L	6
1/7/1998	1,1-DICHLOROETHYLENE	2.5	UG/L	6
12/3/1997	1,1-DICHLOROETHYLENE	1.8	UG/L	6
9/5/1997	1,1-DICHLOROETHYLENE	2.4	UG/L	6
8/14/1997	1,1-DICHLOROETHYLENE	3.6	UG/L	6
7/24/1997	1,1-DICHLOROETHYLENE	3.9	UG/L	6
7/11/1997	1,1-DICHLOROETHYLENE	2.3	UG/L	6
6/13/1997	1,1-DICHLOROETHYLENE	1.9	UG/L	6
5/9/1997	1,1-DICHLOROETHYLENE	1.6	UG/L	6
4/4/1997	1,1-DICHLOROETHYLENE	2.1	UG/L	6
3/5/1997	1,1-DICHLOROETHYLENE	2.1	UG/L	6
2/18/1997	1,1-DICHLOROETHYLENE	1.7	UG/L	6
1/24/1997	1,1-DICHLOROETHYLENE	1.8	UG/L	6
12/6/1996	1,1-DICHLOROETHYLENE	2.9	UG/L	6
11/1/1996	1,1-DICHLOROETHYLENE	3.7	UG/L	6

10/16/1996	1,1-DICHLOROETHYLENE	1.8	UG/L	6
9/30/1996	1,1-DICHLOROETHYLENE	2.7	UG/L	6
9/3/1996	1,1-DICHLOROETHYLENE	1.5	UG/L	6
6/19/1996	1,1-DICHLOROETHYLENE	1.5	UG/L	6
5/16/1996	1,1-DICHLOROETHYLENE	0	UG/L	6
4/19/1996	1,1-DICHLOROETHYLENE	2	UG/L	6
3/14/1996	1,1-DICHLOROETHYLENE	0.6	UG/L	6
11/16/1995	1,1-DICHLOROETHYLENE	0.8	UG/L	6
10/26/1995	1,1-DICHLOROETHYLENE	0.9	UG/L	6
9/20/1995	1,1-DICHLOROETHYLENE	1.4	UG/L	6
8/15/1995	1,1-DICHLOROETHYLENE	1	UG/L	6
6/13/1995	1,1-DICHLOROETHYLENE	1.6	UG/L	6
4/26/1995	1,1-DICHLOROETHYLENE	1.3	UG/L	6
3/24/1995	1,1-DICHLOROETHYLENE	1.5	UG/L	6
1/19/1995	1,1-DICHLOROETHYLENE	1.3	UG/L	6
8/9/1994	1,1-DICHLOROETHYLENE	0.6	UG/L	6
7/26/1994	1,1-DICHLOROETHYLENE	1.1	UG/L	6
4/14/1994	1,1-DICHLOROETHYLENE	0.9	UG/L	6
2/24/1994	1,1-DICHLOROETHYLENE	1.7	UG/L	6
1/18/1994	1,1-DICHLOROETHYLENE	1.2	UG/L	6
12/14/1993	1,1-DICHLOROETHYLENE	0.8	UG/L	6
10/19/1993	1,1-DICHLOROETHYLENE	0.9	UG/L	6
6/17/1993	1,1-DICHLOROETHYLENE	0	UG/L	6
3/9/1993	1,1-DICHLOROETHYLENE	0.5	UG/L	6
11/16/1992	1,1-DICHLOROETHYLENE	0	UG/L	6
10/20/1992	1,1-DICHLOROETHYLENE	0	UG/L	6
9/3/1992	1,1-DICHLOROETHYLENE	0	UG/L	6
7/21/1992	1,1-DICHLOROETHYLENE	0	UG/L	6
6/9/1992	1,1-DICHLOROETHYLENE	0.6	UG/L	6
5/18/1992	1,1-DICHLOROETHYLENE	0	UG/L	6
4/13/1992	1,1-DICHLOROETHYLENE	0.7	UG/L	6
3/23/1992	1,1-DICHLOROETHYLENE	0.5	UG/L	6
2/11/1992	1,1-DICHLOROETHYLENE	0	UG/L	6
1/27/1992	1,1-DICHLOROETHYLENE	0.6	UG/L	6
12/17/1991	1,1-DICHLOROETHYLENE	0.7	UG/L	6
11/22/1991	1,1-DICHLOROETHYLENE	0.6	UG/L	6
10/17/1991	1,1-DICHLOROETHYLENE	0	UG/L	6
9/12/1991	1,1-DICHLOROETHYLENE	0.5	UG/L	6
8/19/1991	1,1-DICHLOROETHYLENE	0	UG/L	6
7/22/1991	1,1-DICHLOROETHYLENE	0.6	UG/L	6
6/25/1991	1,1-DICHLOROETHYLENE	1.2	UG/L	6
5/28/1991	1,1-DICHLOROETHYLENE	0	UG/L	6
3/4/1991	1,1-DICHLOROETHYLENE	1	UG/L	6
2/11/1991	1,1-DICHLOROETHYLENE	1.1	UG/L	6
12/11/1990	1,1-DICHLOROETHYLENE	1	UG/L	6
11/19/1990	1,1-DICHLOROETHYLENE	0.9	UG/L	6
10/9/1990	1,1-DICHLOROETHYLENE	0	UG/L	6
9/10/1990	1,1-DICHLOROETHYLENE	1.1	UG/L	6
8/6/1990	1,1-DICHLOROETHYLENE	0.7	UG/L	6
7/30/1990	1,1-DICHLOROETHYLENE	0.9	UG/L	6
6/26/1990	1,1-DICHLOROETHYLENE	0.5	UG/L	6
5/30/1990	1,1-DICHLOROETHYLENE	0	UG/L	6
4/19/1990	1,1-DICHLOROETHYLENE	0.7	UG/L	6
9/29/1989	1,1-DICHLOROETHYLENE	0.5	UG/L	6
9/29/1989	1,1-DICHLOROETHYLENE	0.5	UG/L	6
6/13/1989	1,1-DICHLOROETHYLENE	0	UG/L	6
3/22/1989	1,1-DICHLOROETHYLENE	< 0.5	UG/L	6
12/13/1988	1,1-DICHLOROETHYLENE	< 0.5	UG/L	6
9/27/1988	1,1-DICHLOROETHYLENE	< 0.5	UG/L	6
6/22/1988	1,1-DICHLOROETHYLENE	< 0.5	UG/L	6
3/23/1988	1,1-DICHLOROETHYLENE	< 0.2	UG/L	6
9/23/1987	1,1-DICHLOROETHYLENE	< 0.5	UG/L	6
6/17/1987	1,1-DICHLOROETHYLENE	0	UG/L	6
1/27/1987	1,1-DICHLOROETHYLENE	0.3	UG/L	6

10/29/1985	1,1-DICHLOROETHYLENE		0.4	UG/L	6
10/22/1985	1,1-DICHLOROETHYLENE		< 0.2	UG/L	6
10/3/1985	1,1-DICHLOROETHYLENE		0.4	UG/L	6

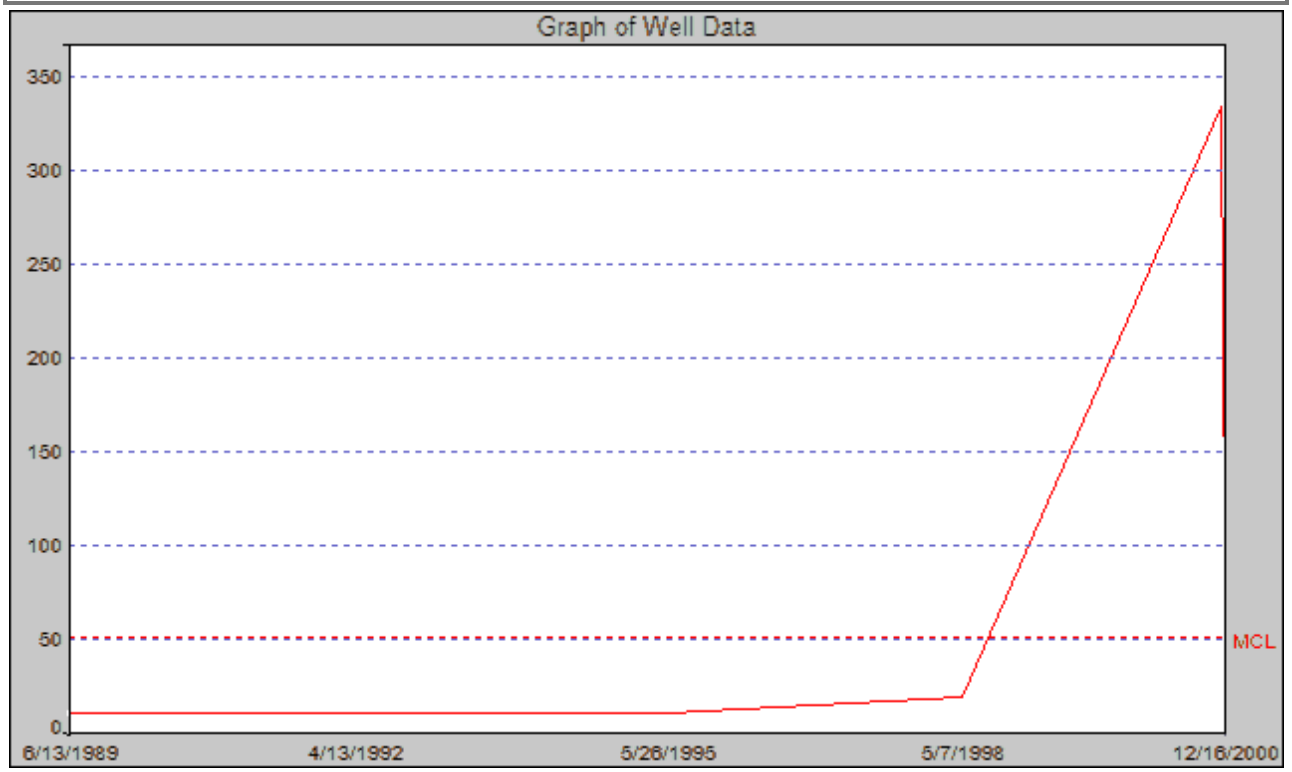
FROM DATE: **TO DATE:** **GRAPH SIZE** Small **NORMALIZED** Redraw

Well Report

GSWC - BELL, BELL GARDENS (SANTA FE SPRINGS)
HOFFMAN WELL 02 - DESTROYED 10/26/07
12035 Burke Street, #1
SANTA FE SPRINGS , CA 90670670
(Show This Well on Map)

State Well #: 1910011-008
Well Source: Groundwater
Well Status: Destroyed

Detailed Well Information | DPH Water Quality Data



DATE	PARAMETER	RESULT	UNITS	MCL
12/16/2000	CHROMIUM (TOTAL)	98.9	UG/L	50
11/28/2000	CHROMIUM (TOTAL)	333	UG/L	50
5/7/1998	CHROMIUM (TOTAL)	17.7	UG/L	50
5/26/1995	CHROMIUM (TOTAL)	< 10	UG/L	50
4/13/1992	CHROMIUM (TOTAL)	< 10	UG/L	50
6/13/1989	CHROMIUM (TOTAL)	< 10	UG/L	50

FROM DATE: TO DATE: GRAPH SIZE Small NORMALIZED Redraw

Reference:
RWQCB, 2017

STATE WATER RESOURCES CONTROL BOARD
GEOTRACKER

Tools Reports UST Case Closures Information

CASE SUMMARY

REPORT DATE
7/26/1989

HAZARDOUS MATERIAL INCIDENT REPORT FILED WITH OES?

I. REPORTED BY -
UNKNOWN

CREATED BY
UNKNOWN

III. SITE LOCATION

FACILITY NAME
RHONE-POULENC CHEMICALS CO

FACILITY ID

FACILITY ADDRESS
4570 ARDINE ST
SOUTH GATE, CA 90280
LOS ANGELES COUNTY

ORIENTATION OF SITE TO STREET

CROSS STREET
PACIFIC AVE

V. SUBSTANCES RELEASED / CONTAMINANT(S) OF CONCERN
GASOLINE

VI. DISCOVERY/ABATEMENT

DATE DISCHARGE BEGAN

DATE DISCOVERED	HOW DISCOVERED	DESCRIPTION
7/26/1989	Tank Closure	

DATE STOPPED	STOP METHOD	DESCRIPTION
6/6/1989		

VII. SOURCE/CAUSE

SOURCE OF DISCHARGE
Other

CAUSE OF DISCHARGE
Unknown

DISCHARGE DESCRIPTION

VIII. CASE TYPE

CASE TYPE
Soil

IX. REMEDIAL ACTION
NO REMEDIAL ACTIONS ENTERED

X. GENERAL COMMENTS

XI. CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION REPORTED HEREIN IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

XII. REGULATORY USE ONLY

LOCAL AGENCY CASE NUMBER

REGIONAL BOARD CASE NUMBER
I-00524

LOCAL AGENCY

CONTACT NAME	INITIALS	ORGANIZATION NAME	EMAIL ADDRESS
JOHN AWUJO	JOA	LOS ANGELES COUNTY	jawujo@dpw.lacounty.gov

ADDRESS
900 S FREMONT AVE
ALHAMBRA, CA 91803

CONTACT DESCRIPTION

PHONE TYPE	PHONE NUMBER	EXTENSION
PHONE	(626)-458-3507	

REGIONAL BOARD

CONTACT NAME	INITIALS	ORGANIZATION NAME	EMAIL ADDRESS
YUE RONG	YR	LOS ANGELES RWQCB (REGION 4)	yrong@waterboards.ca.gov

ADDRESS
320 W. 4TH ST., SUITE 200
Los Angeles, CA 90013

CONTACT DESCRIPTION

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Reference:
SAA, 2011

2010

City of Lynwood
Urban Water Management Plan

July, 2011

2010

URBAN WATER MANAGEMENT PLAN

City of Lynwood

JULY 2011

Prepared by:

SA ASSOCIATES

CONSULTING ENGINEERS
1130 W. Huntington Drive
Unit 12
Arcadia, CA 91007
(626) 821-3456

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SECTION 1: INTRODUCTION

1.1 PURPOSE AND SUMMARY

This is the 2010 Urban Water Management Plan ("UWMP" or "Plan") for the City of Lynwood ("City"). This plan has been prepared in compliance with the Urban Water Management Planning Act ("Act"), which has been codified at California Water Code sections 10610 through 10657 and can be found in Appendix B to this 2010 Plan.

The legislature declared that waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

The Act requires "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt, in accordance with prescribed requirements, an urban water management plan." Urban water suppliers must file these plans with the California Department of Water Resources (DWR) every five years describing and evaluating reasonable and practical efficient water uses, reclamation, and conservation activities. (*See generally* Wat. Code § 10631.)

The Act has been amended on several occasions since its initial passage in 1983. New requirements of the Act due to SBx7-7 state that per capita water use within an urban water supplier's service area must decrease by 20% by the year 2020 in order to receive grants or loans administered by DWR or other state agencies. The legislation sets an overall goal of reducing per capita urban water use by 20% by December 31, 2020. The state shall make incremental progress towards this goal by reducing per capita water use by at least 10% by December 31, 2015. Each urban retail water supplier shall develop water use targets and an interim water use target by July 1, 2011. Effective 2016, urban retail water suppliers who do not meet the water conservation requirements established by this bill are not eligible for state water grants or loans.

An urban retail water supplier shall include in its water management plan due July 2011 the baseline daily per capita water use, water use target, interim water use target, and compliance daily per capita water use. The Department of Water Resources, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part. These new requirements are included in **Section 4: Water Demands**

1.2 COORDINATION

In preparing this 2010 Plan, the City has encouraged broad community participation. Copies of the draft Plan were made available for public review at City Hall and the local

public libraries in the City. The City noticed a public meeting. The notice of the public hearing was published in the local press and mailed to City Clerk. On June 8, 2011, the City held a noticed public forum to review and accept comments on the draft plan. Notice of the public forum was published in the local press. On June 21, 2011, the City held a public hearing to adopt the Plan. Following the consideration of public comments received prior to and at the public hearing, the City adopted the 2010 Plan on June 21, 2011. A copy of the City Council resolution approving the 2010 Plan is included in **Appendix D**.

As required by the Act, this Plan is provided by the City to the California Department of Water Resources, the California State Library, the local City Library, the City Clerk, and the Public Works Department and is available to the public.

Table 1.1
Coordination and Public Involvement

Entity	Participated in Plan Preparation	Contacted for Assistance	Made Comments on Draft	Notified of Public Hearing	Attended Public Hearing
City Public Works Dept/Utilities Division	x	x	x	x	x
City Manager's Dept		x		x	x
Lynwood City Clerk		x		x	x
Lynwood Public Library		x		x	
Lynwood City Mayor		x		x	x
Lynwood City Pro Tem		x		x	x
Lynwood City Council Members		x		x	x
Metropolitan Water District		x		x	
Dept of Water Resources (Glendale Office)		x		x	
Los Angeles Department of Water and Power		x		x	
LA County Board of Supervisors		x		x	
LA County Dept of Public Works		x		x	
Sanitation Districts of LA County		x		x	
Central Basin Municipal Water District		x		x	
LA Regional Water Quality Control Board		x		x	
Water Replenishment District		x		x	
CA State Public Health Dept (Glendale Office)		x		x	
City of Compton		x		x	
City of Paramount		x		x	
City of South Gate		x		x	
Golden State Water Company		x		x	
Park Water Company		x		x	
Interested General Public		x	x	x	x

1.3 FORMAT OF THE PLAN

The chapters in this 2010 Plan correspond to the items presented in the Act and are as follows:

Section 1 - Introduction

This chapter describes the UWMP Act background, new amendments to the Act, City's planning and coordination process, the history of the development of the City's water supply system, a description of its existing service area, the local climate, population served and the City's water distribution system.

Section 2 - Water Sources & Supplies

This chapter describes the existing water supplies available to the City, including imported water purchased from the Central Basin Municipal Water District (CBMWD), local groundwater extracted from the Central Groundwater Basin, and recycled water provided by CBMWD. In addition, this chapter discusses potential future water supplies, including transfers and exchanges, recycled water, and desalinated water.

Section 3 – Water Quality

This chapter discuss water quality issues with the City's imported and groundwater sources and the effect of water quality on management strategies and supply reliability.

Section 4 – Water Demands

This chapter describes past, current and projected water usage within the City's service area prior to the implementation of future demand management measures.

Section 5 – Reliability Planning

This chapter presents an assessment of the reliability of the City's water supplies by comparing projected water demands with expected water supplies under three different hydrologic conditions: a normal year; a single dry year; and multiple dry years. This 2010 Plan concludes that if projected imported and local supplies are available as anticipated, no water shortages are anticipated in the City's service area during the planning period.

Section 6 – Demand Management

This chapter addresses the City's implementation of the current Best Management Practices (BMPs). The BMPs correspond to the 14 Demand Management Measures (DMMs) listed in the UWMP Act and are described in this section.

Section 7 – Contingency Planning

This chapter describes the City's current conservation activities, as well as those efforts that will be utilized in the event of a water supply interruption, such as drought. The City's water shortage contingency plan was developed in consultation and coordination with other MWD member agencies. In addition, MWD's Water Surplus and Drought Management Plan (WSDM) is also described.

Appendices

The appendices contain references and specific documents for the data used to prepare this 2010 Plan.

1.4 WATER SYSTEM HISTORY

The City of Lynwood was founded in the early 1800s by Don Antonio Lugo. The Lugo family later deeded the land. The land was eventually developed and opened as a suburban home site in 1913. To sustain the development of the land, the City's water system began to take shape. The City was later incorporated in 1921, and the City began to drill wells for groundwater production. Well No. 5, drilled in 1932, has remained in operation to this day. As the City continued to grow as a residential and industrial community, the City realized the need to supplement its water sources and began to receive imported water between 1960-1970. The City is located in the Central Basin Municipal Water District (CBMWD) which is a member agency of the Metropolitan Water District (MWD). MWD was originally founded in 1928 to build the Colorado River Aqueduct to supplement the water supplies of the original founding members. In 1972, MWD augmented its supplies to include deliveries from the State Water Project via the California Aqueduct. Today the City continues to receive imported water on an as-needed basis.

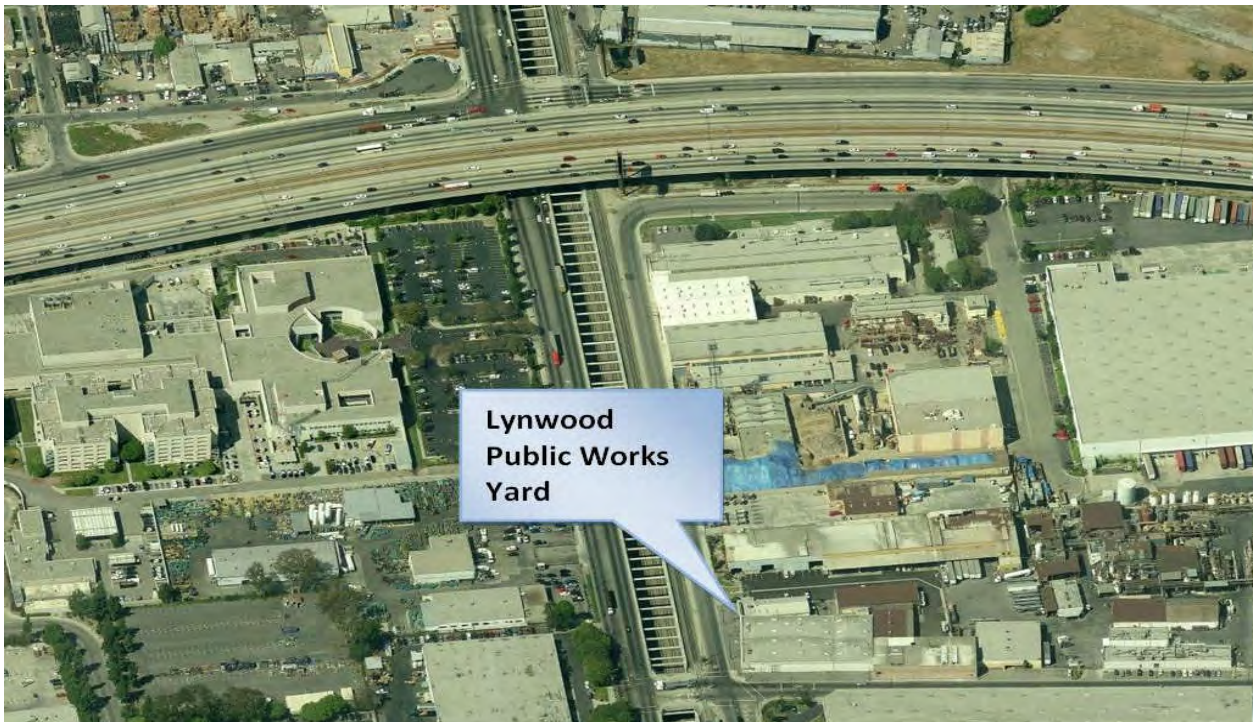

Figure 1.1: Lynwood Public Works Yard (Water Utility)

1.5 CITY WATER SERVICE AREA

The City of Lynwood is approximately 4.7 square miles in size and its water system serves about 90 percent of the land within City limits. The Park Water Company provides water service to the remaining 10% in the southeast section of the City.

Figure 1.3 shows the City's water service area. Topographically, the City is bounded on the North by the City of South Gate, on the East by the City of Paramount, on the South by the City of Compton, and on the West by the City of Los Angeles and the

unincorporated County of Los Angeles (Florence/Willowbrook area).

Land use within the service area is principally composed of single and multi-family residences, business and commercial districts, and some institutional and industrial areas. Since the area is in a built-out condition, additional growth may result from re-development of existing lots.

1.6 CLIMATE

The City has a Mediterranean climate with moderate, dry summers with an average temperature of about 70°F and cool, wet winters with an average temperature of 58°F. The average rainfall for the region is approximately 14 inches. Evapotranspiration (ETo) in the region averages 49.7 inches annually. **Table 1.1** lists the average ETo, and rainfall for the City.

Table 1.1
Lynwood Climate Characteristics

Month	Temp (F)	Rainfall (in)	ETo (in)
Jan	55.9	2.6	1.9
Feb	57.0	2.9	2.2
Mar	58.3	2.2	3.4
Apr	60.8	1.1	4.8
May	63.3	0.2	5.6
Jun	66.7	0.1	6.3
Jul	70.9	0.0	6.5
Aug	71.8	0.1	6.2
Sep	70.5	0.3	4.8
Oct	66.7	0.4	3.7
Nov	62.1	1.6	2.4
Dec	57.6	2.4	1.9
Totals:	**63.5**	**14.0**	**49.7**

Overall, the City's service area climate characteristics are comparable to other cities within the region.

1.7 POPULATION

According to the most recent population figures from the California Department of Finance, the current 2010 resident population of the City is approximately 73,295 persons. Since the City's service area accounts for about 90% of the City's total residents, the total current resident population served by the City's water system is approximately 65,965 persons. Population growth over the past 10 years is approximately 0.48%. Population projections in accordance with an annual growth rate of 0.48% over the next 25 years are shown in **Table 1.2**:

Table 1.2
Population Projections

Year	Service Area Population	Citywide Population
2015	67,580	75,089
2020	69,234	76,927
2025	70,929	78,810
2030	72,665	80,739
2035	74,444	82,715

Since the City is a not a major commercial center for the region, daytime populations estimates are not significantly higher than the City's resident population.

1.8 WATER SYSTEM

The City's Public Works Department manages the City's infrastructure and natural resources, including the City's Public Water Utility. The Public Water Utility consists of efforts from various Public Works sections: Water Utility Division, CIP Division, and Engineering Division. The

Water Utility Division is responsible for providing high quality drinking water through the operation and maintenance of water production, distribution treatment, and storage facilities. The CIP Division is responsible for the Capital Improvement Program which consists of the development and replacement of water system infrastructure. The Utility Division, along with management, is responsible for acting as the liaison with outside agencies, most notable the State and County Health Departments, water districts and other regulatory agencies. In addition, the Engineering Division, along with management functions as an advisor to the City Council. Additional Administrative Services responsibilities include developing and monitoring the Operations budget; monitoring the Capital Improvement budget and water rates; and providing customer service.

Water Supply & Operations

The City of Lynwood has five active groundwater wells (Well Nos. 5, 8, 9, 11, and 19) located throughout the City for groundwater production. The wells range in capacity from 550 to 2,000 gallons per minute (gpm) with a total pumping capacity of 5,650 gpm. The City is also scheduled to complete equipping of its Well No. 22 (capacity of 2,500 gpm) later this year.

The City also receives imported water from its connection to CBMWD, with a 12 CFS connection capacity of 5,376 gpm. Although the City previously used its imported connection to supplement its groundwater supply, the City has recently decided to use imported water only on an as-needed basis. Over the past six years, groundwater has accounted for the majority of the City water supply, providing about 90% of the City's total water supply.

In addition to imported water and groundwater, recycled water is also used in the City by Caltrans to irrigate landscapes along the Interstate 105 and State 710 freeways, and by the City to irrigate 9-acre Burke-Ham Park. Recycled water, however, is not conveyed as part of the City's distribution system infrastructure.

Figure 1.2: Lynwood Well No. 8

The City's day-to-day water operations and maintenance are conducted in its Public Works Yard Building, which houses the Engineering, Street Maintenance, Building Maintenance, Grounds Maintenance, and Water Operations staff along with equipment and vehicles necessary to perform its services. The Public Works Yard is located on the western side of the City at 11750 Alameda Street as shown in **Figure 1.1**.

Distribution System

The City distributes its water to approximately 9,000 service customers through a 90 mile network of distribution mains with pipelines sizes ranging from 4-inches to 16-inches. The water system consists of one (1) pressure zone that provide sufficient water pressure to customers. The City also maintains a booster pump station consisting of 3 pumps that can deliver up to 3,600 gpm. The City of Lynwood water service area map is shown in **Figures 1.3** on the following page:

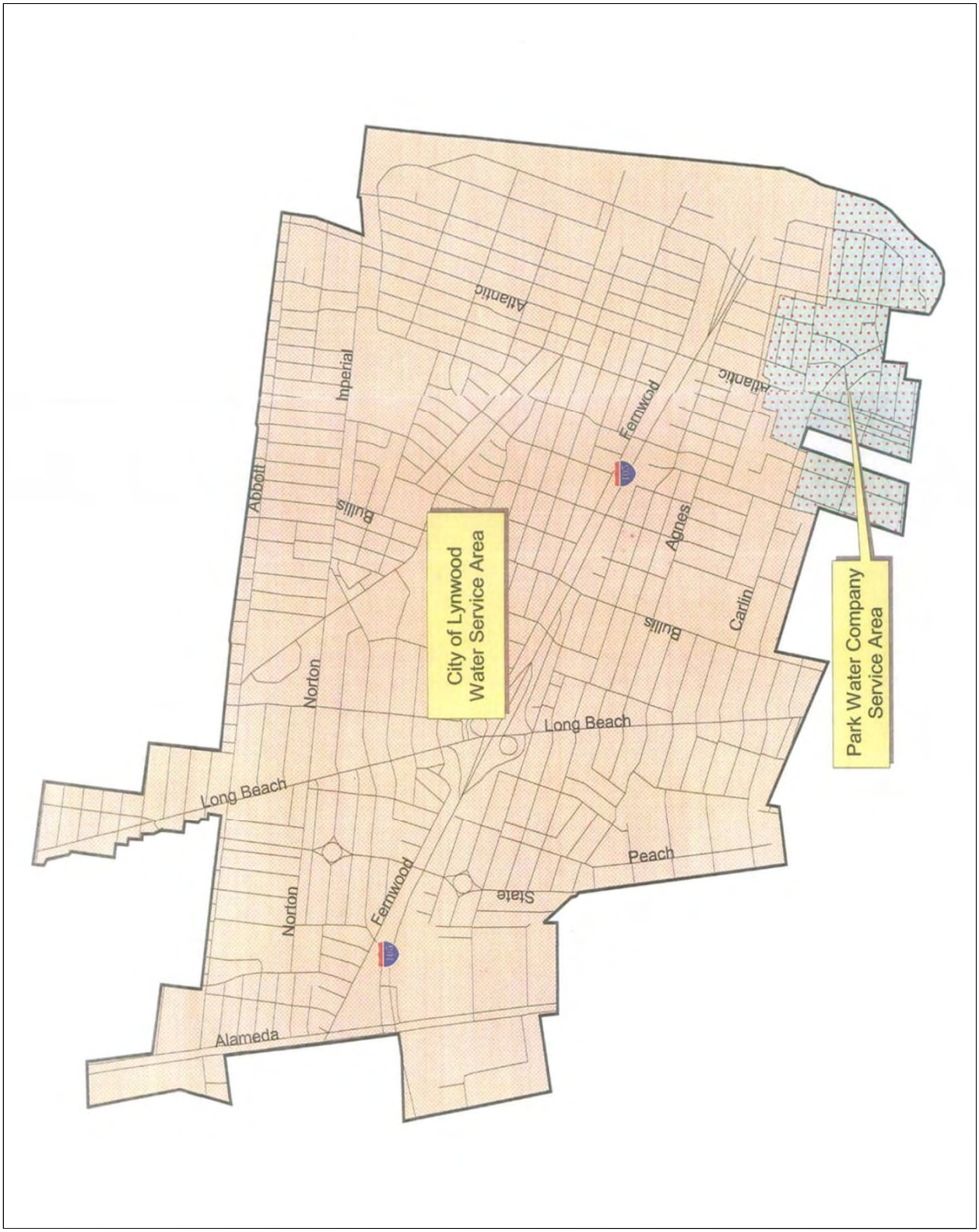

FIGURE 1.3: City Water Service Area Map

Water Storage

For storage and fire flow needs, the City maintains one water storage reservoir with a capacity of 3 million gallons (MG). The reservoir is partially underground and is located adjacent to the City's Well No. 8 and booster pump station just West of City Hall along Bullis Road. The reservoir is shown below in **Figure 1.4**:

Figure 1.4: 3.0 MG City Reservoir

Emergency Interconnections

In addition to imported water and groundwater, the City's water supply system also includes four 8-inch emergency interconnections with the City of Compton and one 8-inch connection with the City of South Gate. The four connections with the City of Compton are manual, two-way connections capable of transferring water for the mutual benefit of both agencies. The one connection with the City of South Gate is an automatic, two-way connection capable of transferring water for the mutual benefit of both agencies. The connections to the Cities of Compton and South Gate are located on the Southerly and Northerly portions of the City's limits, respectively.

SECTION 2: WATER SOURCES & SUPPLIES

2.1 INTRODUCTION

The City's water supply sources consist of imported water from the Metropolitan Water District (MWD) via the Central Basin Municipal Water District (CBMWD), and groundwater produced from the Central Ground Water Basin.

2.2 WATER SUPPLY SOURCES

Imported Water

The City has access to imported water from the Colorado River and the Sacramento-San Joaquin River Delta in Northern California. These two water systems provide Southern California with over 2 million acre-feet (MAF) of water annually for urban uses.

The Colorado River supplies California with 4.4 MAF annually for agricultural and urban uses with approximately 3.85 MAF used for agriculture in Imperial and Riverside Counties. The remaining unused portion (600,000 - 800,000 AF) is used for urban purposes in MWD's service area.

Figure 2.1: Parker Dam at Colorado River

In addition to the Colorado River, the Sacramento-San Joaquin River Delta provides a significant amount of supply annually to Southern California. The Delta is located at the confluence of the Sacramento and San Joaquin Rivers east of the San Francisco Bay and is the West Coast's largest estuary. The Delta supplies Southern California with over 1 MAF of water annually.

Figure 2.2: Sacramento-San Joaquin Delta

The use of water from the Colorado River and the Sacramento-San Joaquin Delta continues to be a critical issue. In particular, Colorado River water allotments have been debated among the seven basin states and various regional water agencies at both the federal and state levels. The use of Delta water has been debated as competing uses for water supply and ecological habitat have jeopardized the Delta's ability to meet either need and have threatened the estuary's ecosystem.

In order to provide Southern California with imported water, MWD utilizes two separate aqueduct systems (one for each source of supply) to obtain its supplies. These two aqueduct systems convey water from each source into two separate reservoirs whereupon MWD pumps the water to one of its five treatment facilities. One of these

aqueduct systems is known as the Colorado River Aqueduct (CRA). The CRA was constructed as a first order of business shortly after MWD's incorporation in 1928. The CRA is 242 miles long and carries water from the Colorado River to Lake Matthews and is managed by MWD.

Figure 2.3: Colorado River Aqueduct

In addition to the CRA, MWD receives water from northern California via the California Aqueduct. Also known as the State Water Project, the California Aqueduct is 444 miles long and carries water from the Delta to Southern California and is operated by the Department of Water Resources.

Figure 2.4: California Aqueduct

The previously mentioned aqueducts supply Southern California with a significant amount of its water and are crucial to its sustainability. In addition to these two water systems, there are also several other aqueducts that are vital to the State. The major aqueducts in California are shown in **Figure 2.5** on page 2-3.

Imported Water Purchases

As a wholesale agency, MWD distributes imported water to 26 member agencies throughout Southern California as shown in **Figure 2.6** on Page 2-4. CBMWD is one of 11 wholesale agencies served by MWD. CBMWD distributes water to its retail agencies, including the City of Lynwood, as shown in **Figure 2.7**. The City has an imported connection to CBMWD with a 12 CFS capacity of 5,376 gpm (about 8,670 AFY). The interconnection supplements the City's groundwater supplies as necessary.

Table 2.1 presents the City's six-year historic imported water purchases from 2005 to 2010:

Table 2.1
Imported Water Supply 2005-2010
(Purchases from CBMWD)

Year	Purchases (AF)
2010	262
2009	584
2008	614
2007	564
2006	1,449
2005	1,076
Average:	**758**

Although the City's imported connection capacity is 8,670 AFY, the amount of imported water available to the City is dependent on CBMWD's supplies from MWD. In 2005, CBMWD's Tier 1 limit from MWD was 72,360 AFY and in 2010 the limit was 72,361 AFY.

Figure 2.5: Aqueduct Systems in California

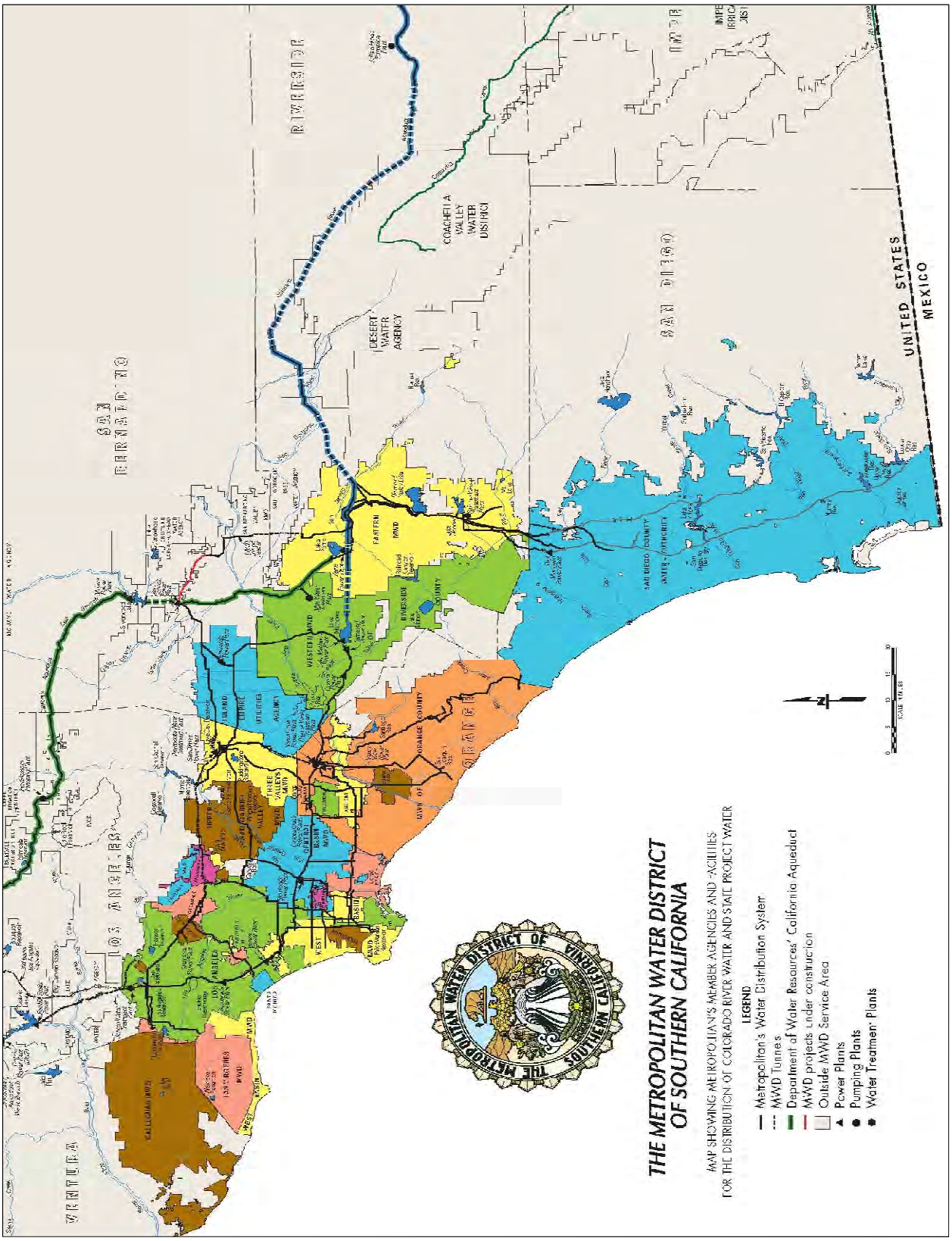

Figure 2.6: MWD Service Area Map

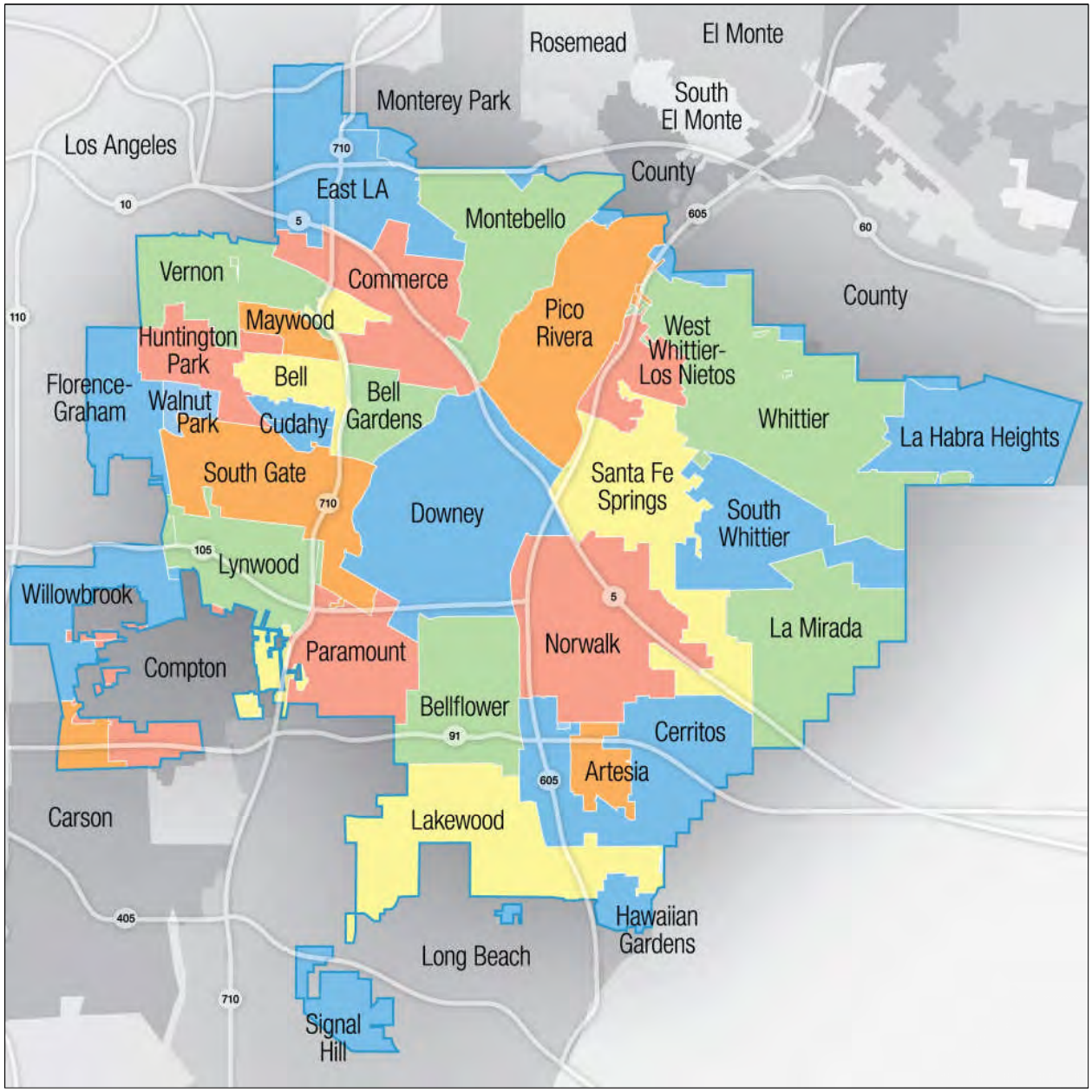

Figure 2.7: CBMWD Service Area Map

Groundwater

The City obtains its groundwater supply from the Central Groundwater Basin. The basin is located in central Los Angeles County and underlies the entire City of Lynwood, and parts of the service areas of West Basin MWD and CBMWD. The Basin has a surface area of 277 square miles of mostly flat to mildly hilly terrain. The basin is bounded by the Elysian, Repetto, Merced, and Puente Hills to the North, the Coyote Creek to the Southeast, and the Newport-Inglewood fault to the Southwest. Adjacent groundwater basins include the Hollywood, Santa Monica, West Coast, Orange County, and Main San Gabriel Basins as shown in **Figure 2.8** below.

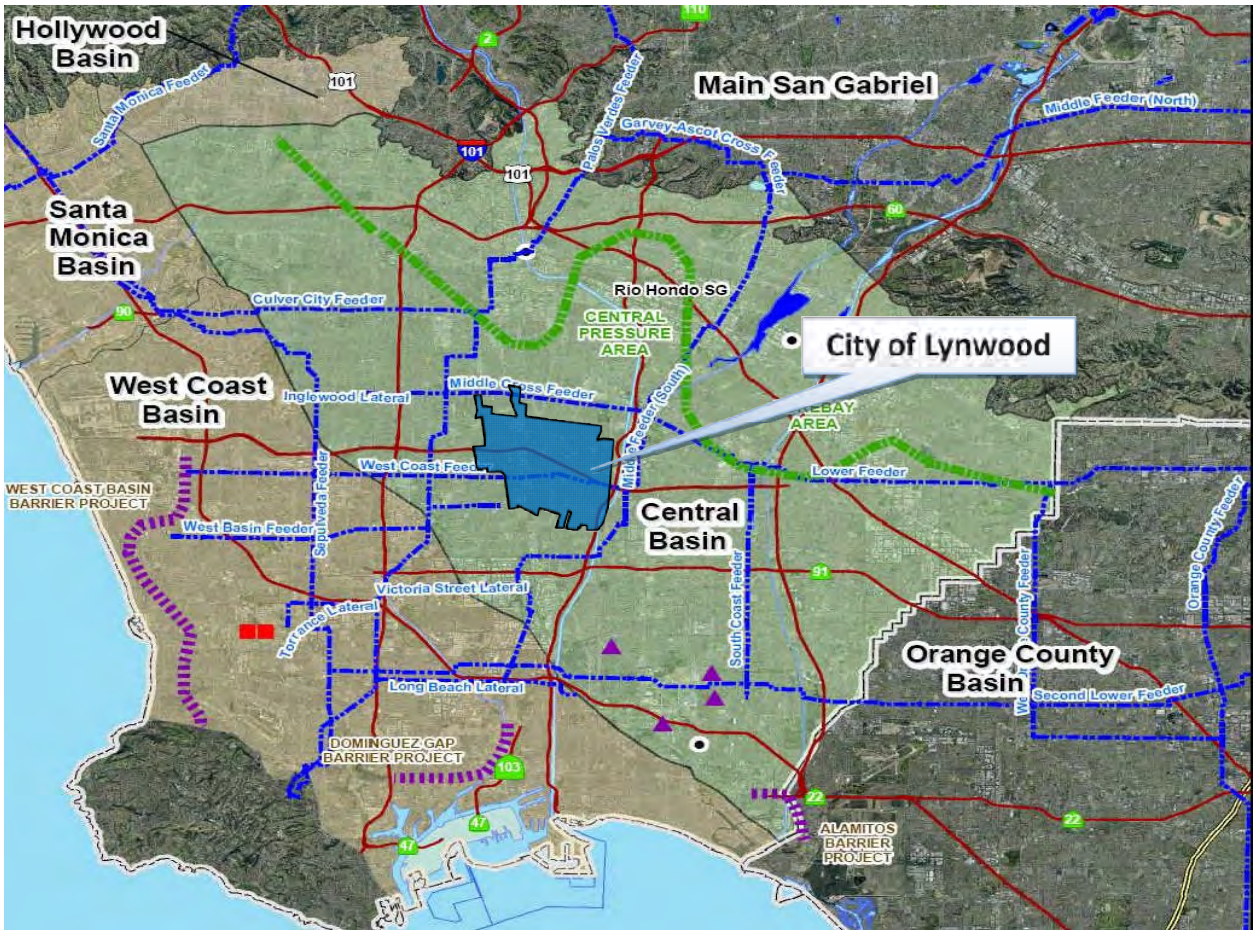

Figure 2.8: Central Groundwater Basin

Water-bearing deposits of the Central Basin include unconsolidated and semi-consolidated marine and alluvial sediments deposited over time. Key production aquifers include the deeper aquifers of the San Pedro Formation (i.e. Lynwood, Silverado, and Sunnyside). These aquifers produce large volumes of groundwater. The shallower aquifers of the Lakewood formation (i.e. Gaspur, Exposition, Hollydale) produce smaller volumes of water. In the area of the Basin known as the pressure area (see **Figure 2.8** above), the aquifers are separated by thick aquitards, which create confined aquifer conditions and protection from surface contamination.

Groundwater in the Basin is replenished naturally by percolation from precipitation, (receiving about 14 inches of rain annually), by subsurface inflows from the San Gabriel Basin through the Whittier Narrows, and by surface flows from local rivers and streams. Since the basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels, natural replenishment to the basin's water-bearing formations is limited to only a small portion of basin soils. However, the Basin receives additional replenishment from the San Gabriel and Rio Hondo Spreading Basins, which receive a blend of storm water runoff, imported water and recycled water.

Groundwater in the Basin naturally and historically flows from the recharge areas in the Northeast (through the Whittier Narrows) towards the West Coast Basin and into Pacific Ocean in the Southwest. The Newport Inglewood fault provides a restrictive barrier on the flow of groundwater in the Basin.

Figure 2.9: Rio Hondo Spreading Grounds

The total storage in the basin is estimated to be approximately 13.8 MAF. Unused storage is estimated to be about 1.1 MAF. The natural safe yield of the Basin (natural replenishment only) is estimated to be about 125,805 AFY. As a result of artificial recharge activities, however, the allowable pumping allocation exceeds this amount.

Groundwater levels in the basin are generally at or above mean sea level (MSL), although low water levels in portions of aquifers adjacent to the Pacific Ocean allow for seawater intrusion to occur. When water levels are low, seawater seeps into the West Coast Basin and into the Central Basin near the Long Beach area of the West Coast Basin.

Figure 2.10: Whittier Narrows

Due to past seawater intrusion, the Water Replenishment District (WRD) maintains the Alamitos Seawater Barrier Project to prevent seawater intrusion and to protect the Basin's groundwater supplies. The Alamitos Barrier consists of 43 injection wells and 239 observation wells over a 2.2 mile course. The injection wells inject a blend of imported and recycled water to build up water pressure in the aquifers below and block seawater intrusion In 2008, the Alamitos Barrier Project injected approximately 6,000 AF into the Basin's aquifers.

The Central Basin is an adjudicated basin and the management of water resources and operations in the basin is provided by DWR, WRD, the LA County Department of Public Works, the Sanitation Districts of LA County, and the Regional Water Quality Control Board. The DWR serves as Watermaster. The California Department of Health Services provides additional

oversight of the Basin's groundwater quality and help monitor contaminant levels. The adjudicated pumping rights of 267,000 AFY are shared among basin agencies at a not-to-exceed allowable pumping allocation (APA) of 217,367 AFY.

The key characteristics of the Central Basin are summarized below in **Table 2.2**:

Table 2.2
Central Basin
Summary of Characteristics

Item	Amount
Max. Depth to Groundwater	2,200 ft.
Thickness of Groundwater Table	180-800 ft.
Storage	13.8 MAF
Natural Safe Yield	125,805 AFY
Adjudicated Rights	267,900 AFY
Allowable Pumping Allocation	217,367 AFY
Spreading Basins (Total)	3
Seawater Intrusion Barriers	1

Groundwater Production

As of April 2011, the City maintains a total of five active wells (Well Nos. 5, 8, 9, 11, and 19) for groundwater extraction. Prior to 2005, the City previously extracted groundwater from its Well No. 15. Since 2005, however, Well No. 15 has been deactivated and is no longer in service.

The City's existing groundwater wells have capacities ranging from 550 gallons per minute (gpm) to 2,000 gpm with a combined production capacity of 5,650 gpm (9,600 AFY). The City's groundwater production well characteristics are displayed in **Table 2.3** below:

Table 2.3
City Groundwater Wells

Well No.	Capacity (gpm)
5	550
8	1,100
9	1,200
11	800
19	2,000
Total Capacity:	**5,650**

The City has adjudicated rights to the Central Basin and has an allowable pumping allocation of 5,337 AFY. In addition, the City recently leased 700 AFY of groundwater rights from another pumper in the Basin for five years. Thus, the City's current combined pumping rights stand at 6,037 AFY.

Figure 2.11: Well No. 9

As a result of increasing costs of imported water, the City intends to achieve 100% sustainability from local groundwater sources. Due to this goal, the City is pursuing additional wells to maximize its groundwater potential and to provide additional reliability of its groundwater well

system. The City is currently in the process of developing an additional well (Well No. 22) at the City's Lynwood Park site. Well No. 22 has recently been drilled and the construction documents for the well facility and connection to the City's distribution system are currently being prepared. Well No. 22 is anticipated to be completed later this year. Once complete, Well No. 22 will have a capacity of 2,500 gpm The location of Well No. 22 is shown below in **Figure 2.12**.

Figure 2.12: Well No. 22 Site

To monitor the City's groundwater extraction, each of the City's wells are equipped with flowmeters to measure well production. Well production is recorded monthly by City water staff and reported annually to the Department of Water Resources (DWR). The City completes DWR's Form No. 38 (Public Water System Statistics) on an annual basis as part of their reporting and documentation efforts. Data records from the past six years indicates that Well No. 19 (capacity of 2,000 gpm) has been the most productive well for the City. Well No. 19 is located in the Western portion of the City just southwest of the Public Works Yard. Well No. 19 was drilled in 1971 by primary reverse circulation (a modern drilling technique) and has a total depth of about 1,000 ft. In 2008, Well No. 19 was measured to have a pumping rate of

about 2,000 gpm. Well No. 5, on the other hand is the City's least productive well with a recently measured pumping rate of 550 gpm. Well No. 5 was drilled in 1932 by the conventional (cable tool) method and has a total depth of 751 ft.

The total groundwater production since 2005 is shown below in **Table 2.4**:.

Table 2.4
Groundwater Production (2005-2010)
(Well Nos. 5, 8, 9, 11, and 19)

Year	Production (AF)
2010	5,559
2009	5,371
2008	5,982
2007	5,570
2006	4,675
2005	5,366
Average:	**5,421**

The groundwater production totals shown in **Table 2.4** represent the majority of the City's water supply since 2005. Overall, groundwater has accounted for about 90% of the City's total water supply for the past six years (an increase of nearly 10% from 2000-2005).

2.3 WATER SUPPLY SUMMARY

Over the past six years, the City's water supply has consisted of imported water and groundwater. In 2005, imported water accounted for 17% of the City's water supply. In 2010, imported water accounted for only 2% of the City's water supply (the lowest total in the City's water history). Imported water purchases have declined from previous years (prior to 2005) due to increases in groundwater pumping. The City's pursuit of groundwater not only has added to its supply reliability (as groundwater is considered to be drought-proof over the short term), but has also offset some of the recent and future economic burdens of purchasing imported water at ever-increasing rates.

2.4 PROJECTED SUPPLY OUTLOOK

As population and land-use densities increase, the City understands the need to discover and support local water supply projects to augment imported supplies. As part of this process, the City intends to continue to upgrade its existing groundwater supply facilities and also intends to pursue the addition of new wells to add to or replace existing wells in the City. Continued upgrades will help the City's groundwater capacity to be maintained at or near their combined pumping rights of 6,037 AFY. As a result of these improvements, the City expects to reduce their dependency on imported water to an as-needed basis, although the City expects both MWD and CBMWD to raise imported water rates in the near future. Through conservation efforts, the use of groundwater is expected to meet all or most of future demands for the next five years.

Overall, the City's supply reliability is expected to increase through the implementation of planned improvements to its groundwater facilities and through continued access to imported water, and through the potential uses of alternative water supplies as discussed in the following section. The City will also continue to benefit indirectly from regional conservation efforts and also through MWD's efforts to augment its supplies and improve storage capacities. **Section 5: Reliability Planning**

discusses reliability issues and compares the City's projected water supplies to projected demands for normal, dry, and multiple dry years through the year 2035.

2.5 ALTERNATE WATER SOURCES

This section provides an overview of alternative water sources (non-potable supplemental supplies) and their potential uses. Alternative water sources including recycled water, recycled stormwater, graywater, and desalinated water.

Recycled Water

Although the City does not currently have the capability to construct a wastewater recycling facility within its limits, the City currently benefits from the use of recycled water in the CBMWD region, including the use of recycled water by the City at Burke-Ham Park and by Caltrans along the Interstate 105 and 710 freeways in the City limits. If the City were to expand its use of recycled water, the City would receive additional benefit.

Figure 2.13: Clarifier Treating Wastewater

Wastewater Collection & Treatment System

The City of Lynwood maintains a local sewer system that collects wastewater. The local sewer mains transfer sewage to County Sanitation District of Los Angeles County (CSD) trunk lines where the sewage is received at the Joint Water Pollution Control Plant (JWPCP) in the City of Carson for treatment. Treated effluent is then discharged into the Ocean. The JWPCP does not produce recycled water. Recycled water is produced at the Los Coyotes Water Reclamation Plant in Cerritos and provided to the City via CBMWD.

Recycled Water Use

Currently the City benefits from the use of groundwater, imported water, and recycled

water at the Burke-Ham Park including landscaped areas and dual-plumbed buildings. Caltrans also used recycled water for irrigation along the Interstate 105 and 710 freeways in the City limits.

Potential Uses of Recycled Water

Since the City uses recycled water, the City has identified potential recycled water users. Typical recycled water uses in the City would include landscape irrigation, dual-plumbing in buildings, and industrial uses. If the City were to expand its use of recycled water, the City could benefit as a number of parks, schools, medians, and dual-plumbed buildings could use recycled water. The City, however, currently lacks the infrastructure required to serve additional potential customers.

Future Plans for Recycled Wastewater

The City expects the use of recycled water in the CBMWD service area to increase. Additionally, recycled water use by Caltrans for irrigation purposes is expected to continue. The City does not have any formal plans in place to expand recycled water use, but expects to increase recycled water use in the near future.

Graywater

Graywater systems have been used in California to provide a source of water supply for subsurface irrigation and also as a means to reduce overall water use. Graywater consists of water discharged from sinks, bathtubs, dishwashers, and clotheswashers. Graywater systems consist of an underground tank and pumping system. Graywater is currently legal for subsurface irrigation in the State of California. However, strict regulations and high installation costs have impeded installation of professional graywater systems and has the unintended consequence of undocumented and noncompliant use of graywater.

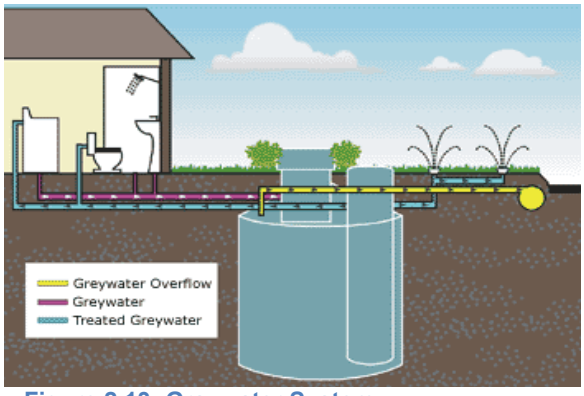

Figure 2.13: Graywater System

The promotion of graywater systems as a means to reduce the City's overall water use is not recommended since the use of graywater is currently limited to subsurface irrigation and therefore the overall Citywide reduction in water use (in AF) would be minimal at best. With the recent passage of SB 1258, however, graywater use is expected to be expanded to include use for toilet flushing, and may have its place as a potential water supply.

Desalinated Seawater

Seawater desalination is a process whereby seawater is treated to remove salts and other contents to develop both potable and non-potable supplies. There are over 10,000 desalination facilities worldwide that produce over 13 million AFY. Desalinated water can add to Southern California's supply reliability by diversifying its water supply sources and mitigating against potential supply reductions. With its Seawater Desalination Program (SDP), the MWD facilitates progress and provides financial incentives for the development of seawater desalination facilities within its service area.

A total of five member agencies submitted projects totaling 142,000 AFY. In 2004, MWD adopted an Integrated IRP update which included a desalination goal of 150,000 AFY by the year 2025. Currently, the five member agency projects are in various levels of development.

Figure 2.3: Seawater Desalination Plant

Since the City is not located adjacent to the ocean, there are no plans to incorporate desalinated seawater into its supply sources.

2.6 TRANSFERS OR EXCHANGES

The City owns rights to extract 5,337 AF of groundwater annually. Due to a lease from another pumper in the region, the City currently maintains an allowable pumping allocation of 6,037 AFY. This current agreement will last for five years and highlights the ability of the sharing of water rights among pumpers in the Central Basin. The City may, at any period when its pumping capacity is reduced due to aging infrastructure or changes in water quality standards, lease a portion of its water rights to another pumper in the region to offset some of the economic burdens of purchasing imported water.

The City also maintains five emergency inter-connections to adjacent water purveyor systems. These connections have the ability to transfer water into the City's distribution system during an emergency. There are four 8-inch connections to the City of Compton, and one 8-inch connection to the City of South Gate. Each has a two-way interconnection, allowing water transfers to and from the City, depending on the emergency situation.

2.7 PLANNED SUPPLY PROJECTS

The City continually reviews practices that will provide its customers with adequate and reliable supplies. Trained staff continues to ensure the water quality is safe and the water supply will meet present and future needs in an environmentally and economically responsible manner. The City's water demand within its service area could remain relatively constant over the next 20 years due to minimal growth combined with water use efficiency measures and the potential use of recycled water. Any new water supply sources will be to replace or upgrade insufficient wells rather than to support population growth and new development. Once the City completes its Well No. 22, the City intends to construct another well (Well No. 23) at a site to be determined. The City will also identify specific means of achieving their sustainability goals from local sources which will likely include the drilling of additional wells, alternative water supply projects, and additional leasing of groundwater rights to meet demand.

Reference:
SEI, 2012

CITY OF DOWNEY

2010
Urban Water Management Plan

January 2012

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SECTION 2
SYSTEM DESCRIPTION

2.1 BACKGROUND

2.1.1 CITY OF DOWNEY

The City of Downey is located in an urbanized community approximately 12 miles southeast of downtown Los Angeles (Figures 2-1 and 2-2). The City was incorporated in 1956 as a general law city and became a charter city in 1964. The City of Downey is bounded by the San Gabriel River to the east, Telegraph Road to the north, the Rio Hondo River to the west, and Gardendale Street and Foster Road to the south.

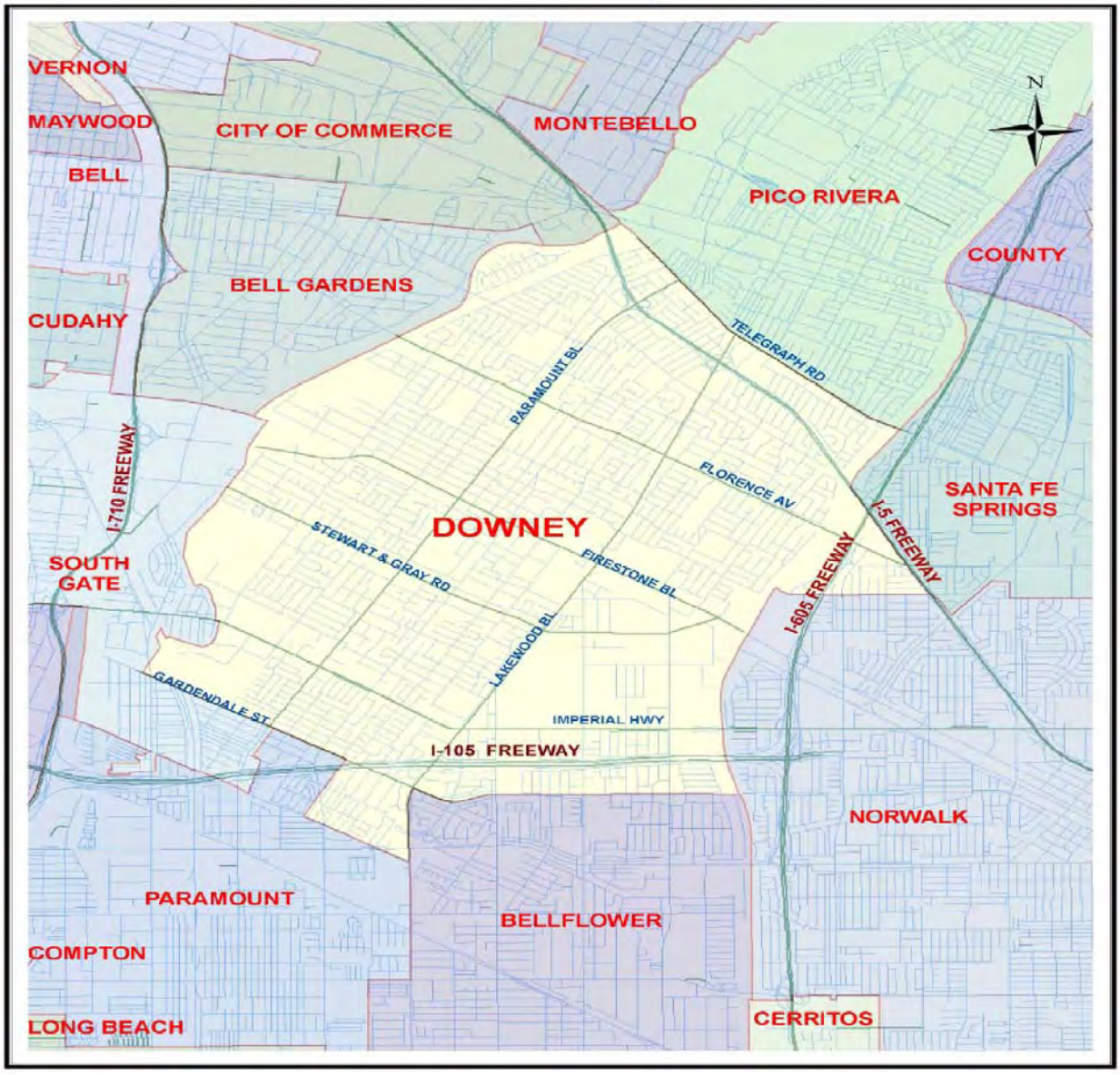
The City of Downey encompasses approximately 12.8 square miles of land and its topography is relatively level. Ground surface elevations range from approximately 85 feet above mean sea level in the southerly portion to 140 feet in the northerly most portion of the City.

Based on the City's General Plan, land use within the City of Downey has been designated as follows: 61 percent residential, 3 percent office, 8 percent commercial, 7 percent industrial, 5 percent mixed use, 8 percent public (including schools), and 8 percent open space.

The City's water system currently serves a population of approximately 110,457 (or approximately 98.8 percent of the City of Downey) through approximately 22,600 service connections. The remaining portions of the City of Downey, including the area that lies east of the San Gabriel River, south of the Interstate-5 Freeway, and north of Cecilia Avenue, are currently served by other water purveyors.

Figure 2-1 City of Downey Regional Map

Figure 2-2 City of Downey Location Map



2.1.2 WATER SYSTEM

The City overlies the Central Basin. Groundwater from the Central Basin is pumped from wells located within the City's boundaries and provides the City with its principal source of potable water.

The groundwater available to the City is of good quality and is currently extracted and pumped directly into the water transmission and distribution systems without disinfection or treatment of any kind. As a result of the use of this high quality groundwater, the City enjoys one of the least expensive water rates in the area.

Until fiscal year (FY) 2000-01, the City purchased small amounts of treated imported water from CBMWD when needed to augment the City's annual potable water supplies. Beginning in FY 2000-01, groundwater became the sole source of drinking water for the City. Due to the high cost of the imported CBMWD water, the City intends to rely solely on its groundwater wells to meet the potable water demands of its customers into the future. However, the City will continue to maintain its imported water connections with CBMWD by paying readiness–to-serve and capacity charges to CBMWD in the event this water is ever needed for emergency purposes.

Emergency interconnections (See Section 2.1.2.4) with adjacent water agencies are also maintained and serve as supplemental sources of water in the event of an emergency.

The City also purchases recycled water from CBMWD and re-sells the recycled water to its customers at a discount of 15 percent from the current rate for domestic water to help promote this potable water conservation measure. Recycled water is presently used for irrigation of landscaping and in several park ponds within the City of Downey (See Section 2.1.2.7) and makes up approximately 4 percent of the City's overall water demand.

2.1.2.1 GROUNDWATER WELLS

There are a total of 31 wells in the City's water system of which 20 are active and available to produce groundwater. These 20 wells have a combined production capacity of approximately 53,200 acre-feet per year (AFY) (theoretical capacity based

on continuous operations) and serve as the City's principle source of potable water. Of the remaining eleven wells, seven are abandoned (destroyed) and four are inactive. The four inactive wells have low production capacities and are considered to be susceptible to groundwater contamination as they are screened in shallow aquifers. The City plans to abandon (destroy) these four wells in accordance with DWR standards in the near future. Table 2-1 provides a summary of the City's 20 active wells and associated capacities. As previously expressed, each of the active wells pumps directly into the water transmission/distribution system without disinfection or treatment of any kind.

Table 2-1 Groundwater Production Wells

City Well No.	Operational Status	Capacity (gpm)[2]	Capacity (AFY)[3]	Well Depth (feet)	Casing Diameter (inches)
2	Active	1,940	3,129	674	16
4	Active	4,567	7,367	1,160	18
5	Active	720	1,161	520	12
7	Active	934	1,507	686	14
8	Active	1,800	2,903	592	16
9	Active	1,095	1,766	594	16
10[1]	Active	1,700	2,742	650	16
11[1]	Active	4,500	7,259	980	20
12	Active	1,800	2,903	444	16
14	Active	866	1,397	572	16
15	Active	1,262	2,036	878	16
16[1]	Active	1,600	2,581	866	16
17	Active	868	1,400	454	16
18[1]	Active	1,863	3,005	674	16
19	Active	1,015	1,637	551	16
23	Active	1,200	1,936	646	16
24[1]	Active	1,759	2,837	544	16
25	Active	1,200	1,936	438	16
29	Active	1,100	1,774	642	16
30	Active	1,200	1,936	662	16
Active Capacity		**32,989**	**53,211**		

Notes:
[1] Equipped with Variable Frequency Drives (VFDs)
[2] gpm = gallons per minute
[3] Capacity is based on continuous operations

The City's water system operates as a closed system within one pressure zone and there are no elevated storage tanks to control the hydraulic grade line. The number of wells that are operational at any given time is based on the system demand.

A 450 megahertz Ultra High Frequency radio system, with peer-to-peer technology, allows the wells to communicate with the central control unit and each other. The City also utilizes Supervisory Control and Data Acquisition (SCADA) software. The SCADA system utilizes a pressure transducer located at the Utilities Yard office to monitor system pressure. A predetermined pump/well sequence control strategy is used to stage pumps on/off based on a pressure-operating band. A system pressure of 60 to 70 pounds per square inch (psi) is desired. When the pressure drops below the pre-determined set point of 60 psi, an additional well is turned on. If the pressure returns to a pre-determined set point of 70 psi, the well is turned off. If the pressure continues to drop, one or more wells, based on the predetermined sequence, are turned on. Once pressure returns to 70 psi, wells are turned off in the reverse sequence of when they were turned on until the pressure remains steady between 60 and 70 psi.

In addition to the centralized pressure transducer located at the Utilities Yard, pressure transducers and associated wiring have also been installed by the City at each of the 20 active groundwater wells. SCADA logic was recently updated to allow such wells to operate based upon localized pressure readings at each well in the event communication with the Master Remote Terminal Unit and associated centralized pressure control is lost.

The wells can also be controlled from Mercoid switches at individual wells and respond to local pressure, by time clocks from the SCADA system or well sites, or manually from switches from the SCADA system or the well sites.

2.1.2.2 IMPORTED WATER MANAGEMENT

If necessary, groundwater can be supplemented with imported water delivered through CBMWD. CBMWD is a member agency of the Metropolitan Water District of Southern California (MWD) which supplies treated, imported water to CBMWD. There are a total of 27 MWD member agencies. MWD provides imported water to much of the southern California coastal plain, including portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties. The imported water originates from the State Water Project (SWP) in northern California and the Colorado River Aqueduct. Imported water delivered by MWD has been treated by MWD and is of good quality.

Imported water is actively managed by MWD through the activities described in its Plan, as well as its Integrated Resources Plan (IRP) and Water Surplus and Drought Management Plan (WSDM). MWD's rights to Colorado River water are governed by the provisions of the 1931 Seven-Party Agreement, 1964 U.S. Supreme Court Decree in Arizona v. California, and the present perfected rights possessed by certain Indian reservations and other users in California. SWP deliveries are determined by DWR based on the availability of the water (i.e., precipitation, snowpack of the present and past years) and the effect of SWP operations on biological resources. Estimates of deliveries are based on the amount of water in SWP storage reservoirs, a conservative projection of runoff for the remainder of the year, contractor requests, and SWP operational constraints. These estimates are updated periodically through the spring and summer. Both SWP and Colorado River Aqueduct water are subject to curtailment in dry years. MWD is working to improve the reliability of these sources.

2.1.2.3 PURCHASED WATER CONNECTIONS

The City maintains three connections with CBMWD, designated CENB-18, CENB-20, and CENB-21. Due to the high cost associated with water purchased from CBMWD, these connections are only utilized for emergencies in the event system

demand exceeds the production capacity of the City's groundwater wells. Water purchased from CBMWD is delivered to the City through the MWD Lower Feeder, which runs through the middle of Downey in an east-west direction.

CENB-18 must be opened manually if system demand requires use of this connection. CENB-20 and CENB-21 are set to operate when system pressure decreases to predetermined minimum pressures of 38 and 40 psi, respectively, which are lower than the minimum system pressure of 60 psi established for the groundwater wells. Both of these connections are set to shut down when the system pressure increases to a predetermined maximum pressure of 65 psi. Due to the ease of the pressure-regulated operation, CENB-20 and CENB-21 are always turned on prior to CENB-18 when system demand exceeds the production capacity of the City's groundwater wells. Table 2-2 provides a summary of the City's imported water connections with CBMWD.

Table 2-2 Purchased Water Connections

Purchased Water Connection	Capacity (gpm)[1]	Capacity (AFY)[2]	Diameter (inches)	Operational Status
CENB-18	6,732	10,859	12	Emergency
CENB-20	8,976	14,478	20	Emergency
CENB-21	8,976	14,478	20	Emergency
Total	**24,684**	**39,815**		

Notes:
[1] gpm = gallons per minute
[2] Based on continuous operation

2.1.2.4 EMERGENCY INTERCONNECTIONS

The City maintains five emergency interconnections with adjacent water agencies. Two of the interconnections are equipped with two-way valves, which have the ability of providing water both to and from the City. Of the remaining three interconnections, one has the ability of providing water to the City and the other two are equipped with one-way valves which presently have the ability of providing City water to

the corresponding agencies. The total capacity of the three emergency connections which are able to provide the City with water is approximately 8,000 gallons per minute.

Four of the interconnections are presently in standby mode, with valves on either side of each interconnection closed. In addition, two (Bellflower-Somerset and Santa Fe Springs) of these interconnections lack working meters. Meters would have to be installed prior to use of the Bellflower-Somerset or Santa Fe Springs standby interconnections. Operations personnel from both the City and the respective agency would be required to arrive at the location to open the respective valves and flush the systems prior to full operation of any standby interconnection. The fifth interconnection is set to open and provide water to Bellflower Municipal Water System should pressures in their system drop below a predetermined pressure. This connection is maintained for emergency purposes for Bellflower Municipal Water System and is rarely activated. Table 2-3 provides a summary of the City's emergency interconnections.

Table 2-3 Emergency Interconnections

Agency	Capacity (gpm)[2]	Capacity (AFY)	Diameter (inches)	Operational Status
Bellflower-Somerset Mutual Water Co.	2,000	3,226	8	One-way, no meter, standby (Bellflower Somerset to City)
City of Santa Fe Springs	4,000	6,452	12	Two-way, no meter, standby
City of South Gate	2,000	3,226	8	Two-way, metered, standby
Golden State Water Co.	1,000	1,613	6	One-way, metered, standby (City to Golden State Water)
Bellflower Municipal Water System	750	1,210	4	One-way, metered, automatic (City to Bellflower Municipal)
Total (to City)[1]	**8,000**	**12,904**		

Notes:
[1] Present capacity of emergency interconnections (metered and non-metered) to the City only
[2] gpm = gallons per minute

2.1.2.5 TRANSMISSION AND DISTRIBUTION SYSTEM

The City has approximately 22,600 service connections located throughout the City's service area. All groundwater wells, purchased water connections, and

emergency interconnections pump directly into the City's water transmission/distribution system to be delivered throughout the City's service area. The system consists of large (12 to 24-inch) ductile iron transmission mains along the City's major arterials: Paramount Boulevard, Lakewood Boulevard, Woodruff Avenue, Imperial Highway, Stewart and Gray Road, Firestone Boulevard, and Telegraph Road. These transmission mains act as conduits for moving large volumes of water throughout the City's service area into distribution mains (4 to 10-inch) for delivery to the City's customers. The transmission/distribution system contains approximately 270 miles of intersecting, looped piping. The piping is primarily composed of ductile iron or cast iron (98 percent), and ranges in diameter from 4 to 24 inches with the majority (92 percent) of the piping in the 4 to 8 inch range.

2.1.2.6 WATER STORAGE AND BOOSTER PUMP STATIONS

A circular, 165-foot (diameter) by 30-foot (height), 5 million gallon (MG), pre-stressed concrete reservoir is located at the City Utilities Yard. This reservoir, which was used in the past to help balance system pressure and as a surge tank, has not been used for over twenty years due to the installation of the computerized SCADA system that controls the operation of the wells.

The reservoir is equipped with a booster station. The booster station consists of two, 2,000 gallon per minute (gpm), vertical, turbine pumps capable of transferring water back into the transmission/distribution system through a 20-inch cast iron transmission main running from the booster station down Stewart and Gray Road. This booster station has been out of service since the reservoir was taken out of service.

The City recently rehabilitated the reservoir booster pumps, valves, and other appurtenances allowing for quick reinstatement of this water supply facility should it ever be needed in an effort to increase the reliability of the City's water system.

2.1.2.7 RECYCLED WATER SUPPLY AND DISTRIBUTION

The City receives its recycled water supply from CBMWD as part of the Central Basin Recycled Water Project (CBRWP). CBMWD purchases and resells tertiary-treated recycled water produced at CSDLAC's Los Coyotes and San Jose Creek Water Reclamation Plants (WRPs). Recycled water received by the City is generated from CSDLAC's Los Coyotes WRP.

2.2 SERVICE AREA PHYSICAL DESCRIPTION

Section 10631.

A plan shall be adopted in accordance with this chapter and shall do the following:

a) Describe the service area of the supplier; including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

2.2.1 SERVICE AREA

The City of Downey is located in an urbanized community approximately 12 miles southeast of downtown Los Angeles (Figure 2-1). The City of Downey is bounded by the San Gabriel River to the east, Telegraph Road to the north, the Rio Hondo to the west, and Gardendale Street and Foster Road to the south (Figure 2-2).

The City of Downey contains approximately 12.8 square miles of land and its topography is relatively level. Its elevations range from approximately 85 feet above sea level in the southern portion to 140 feet in the northern-most portion. The average elevation is 113 feet above sea level.

Based on the City's General Plan, land use within the City of Downey has been designated as follows: 61 percent residential, 3 percent office, 8 percent commercial, 7

percent industrial, 5 percent mixed use, 8 percent public (including schools), and 8 percent open space.

The City's water system serves a population of approximately 110,457 (or approximately 98.8 percent of the City of Downey) through about 22,600 service connections. The remaining portions of the City of Downey, including the area that lies east of the San Gabriel River, south of the Interstate-5 Freeway, and north of Cecilia Avenue, are currently served by other water purveyors.

2.2.2 CLIMATE

The City has a typical southern California climate comprised of warm-dry summers, and wet-cool winters. Historical average annual rainfall is approximately 14.3 inches per year as shown in Table 2-4. Table 2-5 provides average monthly rainfall, average monthly temperature and monthly evapotranspiration. Although changes in climatic conditions would have an impact on the City's water system, the projected water supplies and demands for the City will be based on average year, single dry year, and multiple-dry year data.

Table 2-4 Historical Rainfall

Water Year	Rainfall (inches)	Water Year	Rainfall (inches)	Water Year	Rainfall (inches)	Water Year	Rainfall (inches)
1925-26	12.63	1950-51	8.27	1975-76	9.55	2000-01	15.60
1926-27	17.33	1951-52	24.68	1976-77	11.23	2001-02	2.80
1927-28	12.12	1952-53	10.53	1977-78	33.85	2002-03	16.93
1928-29	11.48	1953-54	12.33	1978-79	18.68	2003-04	9.37
1929-30	10.84	1954-55	11.84	1979-80	28.29	2004-05	24.86
1930-31	10.15	1955-56	13.97	1980-81	8.74	2005-06	11.36
1931-32	14.37	1956-57	9.89	1981-82	13.41	2006-07	2.85
1932-33	10.02	1957-58	24.65	1982-83	30.30	2007-08	17.11
1933-34	11.10	1958-59	6.68	1983-84	11.96	2008-09	9.49
1934-35	21.94	1959-60	9.84	1984-85	11.96	2009-10	13.02
1935-36	9.65	1960-61	4.30	1985-86	19.47		
1936-37	22.11	1961-62	18.46	1986-87	6.49		
1937-38	21.75	1962-63	10.90	1987-88	11.47		
1938-39	18.69	1963-64	6.86	1988-89	7.82		
1939-40	12.81	1964-65	13.27	1989-90	7.87		
1940-41	34.21	1965-66	17.02	1990-91	12.22		
1941-42	14.66	1966-67	17.78	1991-92	16.07		
1942-43	17.91	1967-68	11.46	1992-93	26.55		
1943-44	17.89	1968-69	22.33	1993-94	9.26		
1944-45	11.25	1969-70	7.52	1994-95	26.82		
1945-46	10.31	1970-71	11.45	1995-96	10.68		
1946-47	15.24	1971-72	6.40	1996-97	13.95		
1947-48	8.62	1972-73	18.57	1997-98	32.72		
1948-49	9.04	1973-74	14.51	1998-99	7.29		
1949-50	10.14	1974-75	15.01	1999-00	9.21		
85-Year Average 14.28							

Source: County of Los Angeles, Department of Public Works – City of Downey Fire Department, Station 107D

Table 2-5 Climate

	Jan	Feb	Mar	Apr	May	Jun
Evapotranspiration (in.)[1]	1.65	2.15	3.59	4.77	5.12	5.71
Average Rainfall (in.)[2]	2.99	3.45	2.26	1.04	0.18	0.06
Average Temperature (F)[3]	58.6	60.0	61.7	65.3	68.2	72.3
Maximum Average Temperature (F)[3]	64.4	65.0	66.4	69.9	74.1	76.8
Minimum Average Temperature (F)[3]	54.9	56.1	57.3	61.2	63.8	67.2

	Jul	Aug	Sep	Oct	Nov	Dec	Total
Evapotranspiration (in.)[1]	5.93	5.91	4.39	3.22	2.18	1.68	46.3
Average Rainfall (in.)[2]	0.02	0.07	0.22	0.44	1.33	2.22	14.28
Average Temperature (F)[3]	76.4	77.4	75.8	70.4	63.4	59.0	67.0
Maximum Average Temperature (F)[3]	79.9	80.7	82.4	75.0	66.4	62.2	68.0
Minimum Average Temperature (F)[3]	72.2	74.4	69.8	66.9	59.5	54.7	66.0

Notes:

[1] Evapotranspiration data from California Irrigation Management Information System (Long Beach Station)

[2] Rainfall data from County of Los Angeles, Department of Public Works – City of Downey Fire Department, Station 107D

[3] Temperature data from Western Regional Climate Center and National Oceanic and Atmospheric Administration (Montebello Station)

2.3 SERVICE AREA POPULATION

Section 10631.

A plan shall be adopted in accordance with this chapter and shall do the following:

a) Describe the service area of the supplier; including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

2.3.1 POPULATION

Present and projected populations served water by the City are provided in Table 2-6. Population estimates for 2010 are based upon data collected from the US Census Bureau and the State of California Department of Finance (DOF). Population projections through FY 2029-30 were developed based upon projected percent increases in the City's population, as determined by the Southern California Association of Governments (SCAG). The SCAG data incorporates demographic trends, existing

land use, general plan land use policies, and input and projections from the DOF and US Census Bureau.

Table 2-6 Service Area Population – Current and Projected
(DWR Guidebook Table 2)

Table 2
Population — current and projected

	2010	2015	2020	2025	2030	2035 - optional	Data source[2]
Service area population[1]	110,457	113,606	116,872	118,960	121,084	--	US Census, DOF, SCAG

[1] Service area population is defined as the population served by the City's water supply and distribution system, i.e., 98.8 percent of the total population of the City of Downey.

[2] DOF = California Department of Finance. SCAG = Southern California Association of Governments.

2.3.2 OTHER DEMOGRAPHIC FACTORS

There are no other demographic factors affecting the City's water management planning.

SECTION 3
SYSTEM DEMANDS

3.1 WATER DEMANDS

3.1.1 PAST, CURRENT, AND PROJECTED WATER DEMAND

Section 10631(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

The City's water supply sources include groundwater pumped from the Central Basin, connections with CBMWD for delivery of treated water imported from the Colorado River and the State Water Project, and recycled water. The City's main source of water is groundwater pumped from the Central Basin. The City provides water service to the following water use sectors:

- Residential (Single-Family and Multi-Family)
- Commercial
- Industrial
- Government/Institutional
- Landscape Irrigation.

Table 3-1 and Table 3-2 show the past and current water use, among water use sectors, within the City's service area. Projected water use is calculated based on the urban per capita water use target developed per SBX7-7 (see Section 3.2 below) and population projections. Based on these projections, the City anticipates it will be able to meet future water demands.

Table 3-1 Water Deliveries – Actual, 2005
(DWR Guidebook Table 3)

Table 3 Water deliveries — actual, 2005					
	2005				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	18,637	9,516			9,516
Multi-family	1,935	3,376			3,376
Commercial	1,249	1,820			1,820
Industrial	39	1,007			1,007
Institutional/governmental	241	679			679
Landscape	111	179			179
Agriculture					0
Fire hydrant/service/construction	301	83			83
Operation and maintenance			0	33	33
Total	22,514	16,660	0	33	16,693
Units are in acre-feet per year.					

Table 3-2 Water Deliveries – Actual, 2010
(DWR Guidebook Table 4)

Table 4 Water deliveries — actual, 2010					
	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	18,663	8,493			8,493
Multi-family	1,940	3,248			3,248
Commercial	1,252	1,819			1,819
Industrial	39	964			964
Institutional/governmental	241	611			611
Landscape	111	234			234
Agriculture					0
Fire hydrant/service/construction	302	21			21
Operation and maintenance			0	29	29
Total	22,548	15,390	0	29	15,419
Units are in acre-feet per year.					

3.2 BASELINES AND TARGETS

Section 10608.20 (e)

An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the basis for determining those estimates, including references to supporting data.

Methodologies for calculating baseline and compliance urban per capita water use consistent with the Water Conservation Act of 2009 (SBX7-7) were published by DWR in its October 2010 guidance document.[3] DWR's guidance document was used by the City to determine the required water use parameters which are discussed below.

The City is a member of the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (Gateway Authority). The Gateway Authority prepared a Regional Water Conservation Alliance Report in June 2011 which included regional baselines and targets. The regional 2015 and 2020 targets calculated by the Gateway Authority were 110.7 gallons per capita day and 105.4 gallons per capita day, respectively. Although the City participated in the Regional Alliance, the City has developed its baselines and targets independently, as described below.

3.2.1 BASELINE DAILY PER CAPITA WATER USE

Baseline Daily Per Capita Water Use is defined as the average water use, expressed in gallons per capita per day (GPCD), for a continuous, multi-year baseline period. There are two different baseline periods for calculating Baseline Daily Per Capita Water Use, as follows (CWC Sections 10608.20 and 10608.22):

[3] California Department of Water Resources, Division of Statewide Integrated Water Management, Water Use and Efficiency Branch. *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. October 1, 2010.

- *The first baseline period is a continuous 10 to 15-year period, and is used to calculate Baseline Daily Per Capita Water Use per CWC Section 10608.20. The first baseline period is determined as follows:*

    - *If recycled water makes up less than 10 percent of 2008 retail water delivery, use a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*
    - *If recycled water makes up 10 percent or more of 2008 retail water delivery, use a continuous 10 to 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*

The City's recycled water use is less than 10 percent of its FY 2007-08 retail water delivery as shown in Table 3-3. (Note: The City's water use data are reported on a fiscal year basis. Therefore, fiscal year 2007-08 data is used instead of calendar year 2008, as stated in the CWC.) Consequently, the first baseline period for the City consists of a continuous 10-year period, FY 1999-00 to FY 2008-09, between the 15-year range allotted (FY 1995-96 and FY 2009-10) (see Table 3-3).

Table 3-3 Base Period Ranges
(DWR Guidebook Table 13)

Table 13
Base period ranges

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	18,402	*acre-feet*
	2008 total volume of delivered recycled water	742	*acre-feet*
	2008 recycled water as a percent of total deliveries	4%	percent
	Number of years in base period[1]	10	years
	Year beginning base period range	1999-00	
	Year ending base period range[2]	2008-09	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003-04	
	Year ending base period range[3]	2007-08	

Units are in acre-feet per year.

[1] If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.

[2] The ending year must be between December 31, 2004 and December 31, 2010.

[3] The ending year must be between December 31, 2007 and December 31, 2010.

- *The second baseline period is a continuous 5-year period, and is used to determine whether the 2020 per capita water use target meets the legislation's minimum water use reduction per CWC Section 10608.22. The continuous 5-year period shall end no earlier than December 31, 2007, and no later than December 31, 2010.*

  Since the City's water use data are reported on a fiscal year basis, the second baseline period consists of a continuous 5-year period, FY 2003-04 to FY 2007-08, between the 7-year range allotted (FY 2003-04 and FY 2009-10).

Unless the urban water retailer's 5-year Baseline Daily Per Capita Water Use, as calculated above per CWC Section 10608.12(b)(3), is 100 GPCD or less, Baseline Daily Per Capita Water Use must be calculated for both baseline periods, See Section 3.2.4.

The calculation of the Baseline Daily Per Capita Water Use entails the following four steps:

Step 1 *Calculate gross water use for each year in the baseline period using Methodology 1 in DWR's guidance document. According to Methodology 1, gross water use is a measure of water supplied to the distribution system over 12 months and adjusted for changes in distribution system storage and deliveries to other water suppliers that pass through the distribution system. Recycled water deliveries are to be excluded from the calculation of gross water use. Water delivered through the distribution system for agricultural use may be deducted from the calculation of gross water use. Under certain conditions, industrial process water use also may be deducted from gross water use.*

The City's groundwater production and amount of imported water purchased from CBMWD between FY 1995-96 and FY 2009-10 are shown in Table 3-4.

Table 3-4 Historical Potable Water Demands

Fiscal Year	Groundwater Production (Acre-Feet)	Purchased Water (Acre-Feet)	Total Potable Water Demand (Acre-Feet)	Total Potable Water Demand (MGD)
1995-96	16,788	1	16,789	15.0
1996-97	16,914	2	16,916	15.1
1997-98	15,069	20	15,089	13.5
1998-99	16,045	0	16,045	14.3
1999-00	17,340	18	17,358	15.5
2000-01	17,645	1	17,646	15.8
2001-02	17,642	0	17,642	15.7
2002-03	16,976	0	16,976	15.2
2003-04	18,237	0	18,237	16.3
2004-05	16,955	0	16,955	15.1
2005-06	17,434	0	17,434	15.6
2006-07	18,490	0	18,490	16.5
2007-08	17,660	0	17,660	15.8
2008-09	17,221	0	17,221	15.4
2009-10	16,209	0	16,209	14.5

The calculated gross water use, based on recorded groundwater production and purchased water use, excluding recycled water, for each year in the first baseline period (10-year) is shown in Table 3-5.

Table 3-5 Base Daily Per Capita Water Use – 10 to 15-Year Range
(DWR Guidebook Table 14)

Table 14 Base daily per capita water use — 10- to 15-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2000	106,073	15.5	146.1
Year 2	2001	106,511	15.8	147.9
Year 3	2002	106,950	15.7	147.3
Year 4	2003	107,388	15.2	141.1
Year 5	2004	107,827	16.3	151.0
Year 6	2005	108,265	15.1	139.8
Year 7	2006	108,703	15.6	143.2
Year 8	2007	109,142	16.5	151.2
Year 9	2008	109,580	15.8	143.9
Year 10	2009	110,019	15.4	139.7
Year 11				
Year 12				
Year 13				
Year 14				
Year 15				
			Base Daily Per Capita Water Use[1]	145.1

[1] *Add the values in the column and divid by the number of rows.*

Step 2 *Estimate service area population for each year in the baseline period using Methodology 2 in DWR's guidance document. To obtain an accurate estimate of GPCD, water suppliers must estimate population of the areas that they actually serve, which may or may not coincide with either their jurisdictional boundaries or with the boundaries of cities. According to Methodology 2, data published by the California Department of Finance (DOF) or the U.S. Census Bureau must serve as the foundational building block for population estimates. In some instances, data published by these two sources may be directly applicable. In other instances, additional refinements may be necessary. For example, to account for distribution areas that do not match city boundaries, customers with private sources of supply, or other unique local circumstances, water suppliers may have to supplement the above sources of data with additional local data sources such as county assessor data, building permits data, and traffic analysis zone data. These refinements are acceptable as long as they are consistently applied*

over time, and as long as they build upon population data sources of the DOF or the U.S Census Bureau.

The City's service area population for each year in the first baseline period (10-year) is based on US Census Bureau data (see Table 3-5).

Step 3 *Calculate daily per capita water use for each year in the baseline period. Divide gross water use (determined in Step 1) by service area population (determined in Step 2).*

The calculated daily per capita water use for each year in the first baseline period (10-year) is shown in Table 3-5.

Step 4 *Calculate Baseline Daily Per Capita Water Use. Calculate average per capita water use by summing the values calculated in Step 3 and dividing by the number of years in the baseline period. The result is Baseline Daily Per Capita Water Use for the selected baseline period.*

The average per capita water use calculated for a continuous 10-year baseline period (first baseline period) is shown in Table 3-5.

This average per capita water use, also known as Baseline Daily Per Capita Water Use, for the City was determined to be **145.1 GPCD**, based on the highest value calculated for a continuous 10-year period (first baseline period) between FY 1995-96 and FY 2009-10 (see Table 3-5).

3.2.2 URBAN WATER USE TARGET

Section 10608.20 (b)
An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):
(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:
(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.
(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.
(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.
(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.
(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:
(A) Consider climatic differences within the state.
(B) Consider population density differences within the state.
(C) Provide flexibility to communities and regions in meeting the targets.
(D) Consider different levels of per capita water use according to plant water needs in different regions.
(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.
(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

The Urban Water Use Target is determined using one of the following methods:

Method 1: Eighty percent of the urban retail water supplier's Baseline Daily Per Capita Water Use.

Using this method, the Urban Water Use Target for the City was calculated as 116.1 GPCD, based on the City's Baseline Daily Per Capita Water Use of 145.1 GPCD.

Method 2: *Estimate using the sum of the specified three performance standards.*

Although this method was reviewed, this method was not considered due to insufficient data.

Method 3: *Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's 20x2020 Water Conservation Plan.*[4]

Based on the 20x2020 Water Conservation Plan, the City's service area lies in DWR Hydrologic Region 4 (South Coast), with an established Baseline Daily Per Capita Water Use of 180 GPCD and a Target Per Capita Daily Water Use of 149 GPCD. Using this method, the Urban Water Use Target for the City was calculated as 142 GPCD.

Method 4: *Water Savings.*

Although this method was reviewed, this method was not considered due to insufficient data.

The City's Urban Water Use Target was determined to be 142 GPCD for 2020, based on Method 3 above (note: this value is required to meet the legislation's minimum water use reduction requirement discussed in Section 3.2.4 below).

3.2.3 COMPLIANCE DAILY PER CAPITA WATER USE

Compliance Daily Per Capita Water Use is defined as the Gross Water Use in GPCD during the final year of the reporting period. The Compliance Daily Per Capita

[4] California Department of Water Resources, State Water Resources Control Board, California Bay-Delta Authority, California Energy Commission, California Department of Public Health, California Public Utilities Commission, and California Air Resources Board. *20x2020 Water Conservation Plan*. February 2010.

Water Use will be reported in the City's 2015 Plan (interim compliance) and 2020 Plan (final compliance).

3.2.4 MINIMUM WATER USE REDUCTION REQUIREMENT

Section10608.22

Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

The following calculation was made because the 5-year Baseline Daily Per Capita Water Use per CWC Section 10608.12(b)(3) is greater than 100 GPCD. The calculation is used to determine whether the water supplier's 2015 and 2020 per capita water use targets meet the legislation's minimum water use reduction requirement per CWC Section 10608.22. The calculation entails three steps:

Step 1: *Calculate Baseline Daily Per Capita Water Use using a continuous 5-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.*

This value was calculated as 145.8 GPCD (see Table 3-6).

Table 3-6 Base Daily Per Capita Water Use – 5-Year Range
(DWR Guidebook Table 15)

Table 15 Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2004	107,827	16.3	151.0
Year 2	2005	108,265	15.1	139.8
Year 3	2006	108,703	15.6	143.2
Year 4	2007	109,142	16.5	151.2
Year 5	2008	109,580	15.8	143.9
			Base Daily Per Capita Water Use[1]	145.8

[1] *Add the values in the column and divid by the number of rows.*

Step 2: *Multiply the result from Step 1 by 0.95. The 2020 per capita water use target cannot exceed this value (unless the water supplier's five-year Baseline Per Capita Water Use is 100 GPCD or less). If the 2020 target is greater than this value, reduce the target to this value.*

This value was calculated as 138.5 GPCD. The City's 2020 Urban Water Use Target using Method 3 in Section 3.2.2 was determined to be 142 GPCD, which is higher than the value calculated in this step. Therefore, the City's 2020 Urban Water Use Target was reduced to 138.5 GPCD.

Step 3: *Set the 2015 target to the mid-point between the 10 or 15-year Baseline Daily Per Capita Water Use (Section 3.2.1) and the 2020 target determined in Step 2 above.*

The City's 2015 Interim Urban Water Use Target is therefore set at 141.8 GPCD.

Therefore, in order to meet the legislation's minimum water use reduction requirement per CWC Section 10608.22, the City's 2020 Urban Water Use Target was reduced to **138.5 GPCD** and the 2015 Interim Urban Water Use Target was set at **141.8 GPCD**.

3.2.5 PROJECTED WATER DEMANDS

Undeveloped residentially zoned land in the City of Downey is almost non-existent. In an effort to help meet SCAG Residential Housing Needs Assessment recommendations for Downey, the City's housing element and zoning ordinances were recently updated to allow for Second Unit Development of single family residential parcels greater than 7,500 square feet in size. Such developments would require installation of separate service lines and meters for each unit resulting in a modest increase in the number of single family residential accounts over the next 20 years as identified in Tables 3-8 through 3-9. Modest increases in commercial accounts are also anticipated as a result of the City's redevelopment of the Downtown and Tierra Luna project areas. Little to no increases in industrial and institutional accounts are anticipated over the next 20 years and potable water usage for landscape irrigation at parks and in street medians is likely to decrease somewhat as the City's recycled water system is expanded.

The City's projected water demands (see Table 3-7) were calculated based on the urban per capita water use target developed per SBX7-7 (see Section 3.2 above) and population projections (see Section 2.3.1, Table 2-6). Using this methodology results in conservatively high projected water demands as the City anticipates reducing its water use beyond its urban water use targets. The projected water use and the number of service connections by customer type estimated to FY 2029-30 are shown in Tables 3-8 through 3-10.

Table 3-7 Projected Water Demands

Fiscal Year	Projected Population[1]	Urban Water Use Target (GPCD)[2]	Projected Water Demand (AF)[3] [4]
2014-15	113,606	141.8	18,048
2019-20	116,872	138.5	18,135
2024-25	118,960	138.5	18,459
2029-30	121,084	138.5	18,789

Notes:
[1] Projected service area population, See Section 2.3.1, Table 2-6
[2] See Section 3.2 for urban water use target; GPCD = gallons per capita per day
[3] Projected water demands based on total groundwater produced and purchased water
[4] (Projected population) x (Urban Water Use Target)

Table 3-8 Water Deliveries – Projected, 2015
(DWR Guidebook Table 5)

Table 5
Water deliveries — projected, 2015

	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	18,688	9,188			9,188
Multi-family	1,945	3,514			3,514
Commercial	1,287	1,969			1,969
Industrial	39	964			964
Institutional/governmental	241	611			611
Landscape	116	253			253
Agriculture					0
Fire hydrant/service/construction	322	28			28
Operation and maintenance			0	30	30
Total	22,638	16,527	0	30	16,557

Units are in acre-feet per year.

Table 3-9 Water Deliveries – Projected, 2020
(DWR Guidebook Table 6)

Table 6
Water deliveries — projected, 2020

	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	18,713	9,208			9,208
Multi-family	1,950	3,521			3,521
Commercial	1,322	1,972			1,972
Industrial	39	964			964
Institutional/governmental	241	611			611
Landscape	121	253			253
Agriculture					0
Fire hydrant/service/construction	342	28			28
Operation and maintenance			0	30	30
Total	22,728	16,557	0	30	16,587

Units are in acre-feet per year.

Table 3-10 Water Deliveries – Projected, 2025 and 2030
(DWR Guidebook Table 7)

Table 7 Water deliveries — projected 2025, 2030, and 2035						
	2025		2030		2035 - optional	
	metered		metered		metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Single family	18,738	9,359	18,763	9,540	--	--
Multi-family	1,955	3,579	1,960	3,648	--	--
Commercial	1,357	2,005	1,392	2,044	--	--
Industrial	39	964	39	964	--	--
Institutional/governmental	241	611	241	611	--	--
Landscape	126	257	131	262	--	--
Agriculture					--	--
Fire hydrant/service/construction	362	28	382	29	--	--
Total (Metered)	22,818	16,803	22,908	17,098	0	0
Operation and maintenance (Not metered)	0	31	0	31		
Units are in acre-feet per year.						

The City does not have a practice of selling water to other agencies. However, the City can provide water for emergency purposes through four of its five emergency interconnections with adjacent water agencies (see Section 2.1.2.4, Table 2-3) if necessary. As these interconnections are maintained for emergency purposes only and are rarely if ever used, the City's projected water sales to other agencies are considered to be zero as provided in Table 3-11.

Table 3-11 Sales to Other Water Agencies

(DWR Guidebook Table 9)

Table 9 Sales to other water agencies							
Water distributed	2005	2010	2015	2020	2025	2030	2035 - opt
Bellflower-Somerset Mutual Water Co. (emergency use)	0	0	0	0	0	0	--
City of Santa Fe Springs (emergency use)	0	0	0	0	0	0	--
City of South Gate (emergency use)	0	0	0	0	0	0	--
Golden State Water Co. (emergency use)	0	0	0	0	0	0	--
Bellflower Municipal Water System (emergency use)	0	0	0	0	0	0	--
Total	0	0	0	0	0	0	0
Units are in acre-feet per year.							

The City's past, current, and projected recycled water use and unaccounted for system losses are shown in Table 3-12.

Table 3-12 Additional Water Uses and Losses

(DWR Guidebook Table 10)

Table 10 Additional water uses and losses							
Water use[1]	2005	2010	2015	2020	2025	2030	2035 -opt
Saline barriers	0	0	0	0	0	0	--
Groundwater recharge	0	0	0	0	0	0	--
Conjunctive use	0	0	0	0	0	0	--
Raw water	0	0	0	0	0	0	--
Recycled water	617	742	787	841	905	927	--
System losses	261	790	704	707	720	733	--
Other (define)	0	0	0	0	0	0	--
Total	878	1,532	1,491	1,548	1,625	1,660	

Units are in acre-feet per year.
[1] *Any water accounted for in Tables 3 through 7 are not included in this table.*

The City's past, current, and projected total water use is summarized in Table 3-13.

Table 3-13 Total Water Use

(DWR Guidebook Table 11)

Table 11 Total water use							
Water Use	2005	2010	2015	2020	2025	2030	2035 - opt
Total water deliveries (from Tables 3 to 7)	16,694	15,419	16,557	16,587	16,834	17,129	--
Sales to other water agencies (from Table 9)	0	0	0	0	0	0	--
Additional water uses and losses (from Table 10)	878	1,532	1,491	1,548	1,625	1,660	--
Total	17,572	16,951	18,048	18,135	18,459	18,789	0

Units are in acre-feet per year.

3.2.6 PROJECTED WATER DEMAND FOR LOWER INCOME HOUSEHOLDS

Section 10631.1(a)

The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

Based on information from the City's 2008 Housing Element and the US Census, City staff has indicated that approximately 37 percent of the City's total current (as of 2010) occupied households are classified as lower income households. Based on a 37 percent use factor of total residential water demands, the projected water demand for

lower income households is about 4,880 acre-feet per year by FY 2029-30, as shown in Table 3-14.

Table 3-14 Low-Income Projected Water Demands

(DWR Guidebook Table 8)

Table 8 Low-income projected water demands					
Low Income Water Demands[1]	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Single-family residential	3,400	3,407	3,463	3,530	
Multi-family residential	1,300	1,303	1,324	1,350	
Total	4,700	4,710	4,787	4,880	

Units are in acre-feet per year.

[1] *Provide demands either as directly estimated values or as a percent of demand.*

3.2.7 PROGRESS REPORT

10608.40.

Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

The City will report to DWR in future Plans on its progress in meeting its urban water use targets, using a standardized form to be developed by DWR, when the form becomes available.

3.3 WHOLESALE WATER DEMAND PROJECTIONS

Section 10631(k)

Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

The City does not rely upon a wholesale agency for its water supply. However, it does maintain three imported water connections with CBMWD (see Table 2-2) for emergency purposes. Therefore, the City does not project using any imported water from CBMWD, as provided in Table 3-15, unless an emergency arises which requires its use. The City notified CBMWD of the development of its 2010 Plan and made a copy of the draft Plan available to CBMWD. CBMWD in turn provided the City with a copy of their 2010 Plan, which is incorporated by reference in the City's Plan.

Table 3-15 Retail Agency Demand Projections Provided to Wholesale Suppliers

(DWR Guidebook Table 12)

Table 12 Retail agency demand projections provided to wholesale suppliers							
Wholesaler	**Contracted Volume**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 -opt**
Central Basin Municipal Water District	0	0	0	0	0	0	--
(emergency use)							

3.4 WATER USE REDUCTION PLAN

10608.36.

Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

The City is not an urban wholesale water supplier. Therefore, the requirement for an urban wholesale water supplier to provide an assessment of its present and proposed future measures, programs, and policies to help achieve the water use reductions required is not applicable to the City.

SECTION 4
SYSTEM SUPPLIES

4.1 WATER SOURCES

Section 10631
A plan shall be adopted in accordance with this chapter and shall do the following:
b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

The City's water supply sources include groundwater pumped from the Central Basin, supplemental imported water that can be purchased from CBMWD for emergencies in the event that system demand exceeds the production capacity of the City's groundwater wells, and recycled water from CBMWD. The City's current and projected water supplies are shown in Table 4-1. As provided in Table 4-1, the City meets 100 percent of its potable water demands with groundwater pumped from the Central Basin.

Table 4-1 Water Supplies – Current and Projected

(DWR Guidebook Table 16)

Table 16 Water supplies — current and projected							
Water Supply Sources		2010	2015	2020	2025	2030	2035 - opt
Water purchased from[1]:	Wholesaler supplied volume (yes/no)						
Central Basin Municipal Water District	no	0	0	0	0	0	--
(Not applicable)							--
(Not applicable)							--
Supplier-produced groundwater[2]		16,209	17,261	17,294	17,554	17,862	--
Supplier-produced surface water		0	0	0	0	0	--
Transfers in		0	0	0	0	0	--
Exchanges In		0	0	0	0	0	--
Recycled Water		742	787	841	905	927	--
Desalinated Water		0	0	0	0	0	--
Other		--	--	--	--	--	--
Other		--	--	--	--	--	--
Total		16,951	18,048	18,135	18,459	18,789	

Units are in acre-feet per year.
[1] *Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.*
[2] *Volumes shown here should be consistent with Tables 17 and 18.*

Groundwater

In the Central Basin Judgment of 1965 (Judgment), the Superior Court fixed allowable withdrawals from the Central Basin at a level which was greater than the amount of water returned to the basin through natural replenishment. With a total allowed pumping limit of 217,000 AFY, approximately 80,000 AFY must be artificially replenished in order to maintain a safe yield of 137,000 AFY in the basin. The adjudication allocated the portion of the 217,000 AFY each pumper could extract on an annual basis.

The limit to the amount of groundwater that each pumper is allowed to extract from the basin on an annual basis is referred to as the "Allowed Pumping Allocation" (APA), which corresponds to 80 percent of the party's total water rights. The Judgment contains provisions for exceedence of the APA in the event of an emergency. It also allows for a carryover of any unused allowed pumping allocation, not to exceed 20 percent of the purveyor's APA. A purveyor may also extract an additional 10 percent of its APA, with the understanding that this additional amount will be deducted from its APA for the upcoming year.

The California DWR, Southern Division was appointed Watermaster of the Central Basin. As such, DWR has the responsibility for ensuring that parties adhere to the terms and conditions stipulated by the Judgment as expressed above.

In addition to DWR's role as Watermaster, the Water Replenishment District of Southern California (WRD) and Los Angeles County Department of Public Works (LACDPW) have some responsibilities for groundwater management in the Central Basin. WRD is responsible for purchasing groundwater replenishment water and may address water quality issues in the Central Basin. In order to fund the expense of purchasing imported and recycled water and associated administrative costs, WRD

charges a replenishment assessment on each acre-foot of water extracted from the basin. Groundwater replenishment operations are provided by LACDPW and replenishment water is paid for through revenues raised by WRD.

The City was one of the original parties to the Judgment and has acquired additional water rights since that time resulting in a current (FY 2009-10) APA of 16,554 AFY. The City has 20 active wells which it uses to pump groundwater from the Central Basin. These wells are located throughout the City and have a combined production capacity of approximately 53,211 AFY (based on continuous operations).

Treated Imported Surface Water

As discussed in Section 2.1.2.3, the City maintains three connections with CBMWD, designated CENB-18, CENB-20, and CENB-21. Due to the high cost associated with treated imported water, these connections are only utilized for emergencies in the event that system demand exceeds the production capacity of the City's groundwater wells. It is important to note that the combined capacity of these three purchased water connections with CBMWD is 39,815 AFY, which is more than enough to meet the City's annual water demands. However, since these connections are maintained for emergencies only, the City does not intend to utilize this water source unless absolutely necessary as summarized in Table 4-2 below.

Table 4-2 Wholesale Supplies – Existing and Planned Sources of Water

(DWR Guidebook Table 17)

Table 17
Wholesale supplies — existing and planned sources of water

Wholesale sources[1,2]	Contracted Volume[3]	2015	2020	2025	2030	2035 - opt
Central Basin Municipal Water District	0	0	0	0	0	--
(Not applicable)						
(Not applicable)						

Units are in acre-feet per year.

[1] *Water volumes presented here should be accounted for in Table 16.*

[2] *If the water supplier is a wholesaler, indicate all customers (excluding individual retail customers) to which water is sold. If the water supplier is a retailer, indicate each wholesale supplier, if more than one.*

[3] *Indicate the full amount of water*

Recycled Water

The City receives its recycled water from CBMWD as part of the Central Basin Recycled Water Project. CBMWD purchases and resells tertiary-treated recycled water produced at CSDLAC's Los Coyotes and San Jose Creek Water Reclamation Plants. Once purchased from CBMWD, recycled water is re-sold by the City of Downey to its customers at a discount of 15 percent off of the current rate for potable water. Since FY 1992-93, the City has purchased an average of 608 AFY of recycled water from CBMWD. Since FY 2000-01, the average amount of recycled water used by the City is 703 AFY, which reflects the general increase in recycled water use in the City over the past several years. Recycled water within the City's service area is currently being used in several parks and golf course ponds and for irrigation of greenbelt areas, landscape medians, golf courses, plant nurseries, and schools. Use of recycled water allows the City to reduce the amount of groundwater production required from the Central Basin and to maintain imported water as an emergency supply.

Additional discussion of recycled water use within the City's service area is provided in Section 4.5.

Total Water Supplies

The City's current and projected water supplies from groundwater, imported surface water, and recycled water are shown in Table 4-1. Tables 5-15 and 5-16 provide the City's projected water supplies during future single and multiple dry year conditions (See Section 5.4.5).

4.2 GROUNDWATER

Section 10631(b)
If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

As indicated in Section 2.1.2.1, the City currently has 20 active wells located in the Central Basin. These 20 wells have a combined production capacity of approximately 53,211 AFY (based on continuous operations) and serve as the City's principle source of potable water.

4.2.1 GROUNDWATER MANAGEMENT

Section 10631(b)
If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

4.2.1.1 CENTRAL BASIN GROUNDWATER MANAGEMENT

CENTRAL BASIN GROUNDWATER MANAGEMENT PLAN

Total groundwater production in the Central Basin is restricted to adjudicated rights fixed by the Central Basin Judgment and subsequent amendments, and managed by DWR, the court-appointed Watermaster. The City was a party to the Central Basin Judgment[5] and is therefore held to the groundwater production requirements provided within. The following section provides a historical overview of groundwater in the Central Basin based on the Central Basin Watermaster Annual Report.

5 Central and West Basin Water Replenishment District, etc, vs. Charles E. Adams etc, Los Angeles County Case No. 786,656, Judgment entered in 1965.

CENTRAL BASIN JUDGMENT

Dramatic increases in groundwater extractions over a long period of time resulted in an overdraft of the Central Basin, creating critical water supply shortages in the late 1940's. Because the groundwater basin is not geologically protected from the sea at its edges, over-pumping also resulted in extensive seawater intrusion into the basin, contaminating wells and reducing the quantity of potable water available to surrounding jurisdictions.

In 1952, the CBMWD was formed and became a member agency of MWD. By doing so, CBMWD was now able to purchase supplemental imported water from MWD and wholesale it to local water retailers. Upon establishing a reliable source of supplemental water, water associations focused on reducing the amount of groundwater pumped by formal adjudication of the rights in the Basin.

On January 2, 1962, the Central and West Basin Water Replenishment District (now WRD), which was formed to replenish the Central Basin, filed Case No. 786,656 in the Superior Court, County of Los Angeles, naming more than 700 parties as defendants. It sought to adjudicate groundwater rights in order to regulate pumping from the Central Basin. By September 1962, a proposed interim agreement was drafted by the Central Basin Water Association and approved by a sufficient number of water producers (producers owning over 75 percent of the Assumed Relative Rights within the Central Basin) to guarantee control over groundwater pumping in the Central Basin. On September 28, 1962, the Court signed the “Order Pursuant to Stipulation and Interim Agreement and Petition for Order” and appointed DWR as Watermaster.

Following the interim agreement, a stipulated judgment was drafted. Approval was received by public water utility companies and other producers representing well over 200,000 acre-feet, or 75 percent, of the total rights within the Central Basin. This was a prerequisite to filing the stipulated judgment with the Court. On May 17, 1965,

the case went to trial before Judge Edmund M. Moor. Following testimony on engineering, geology, hydrology, and safe yield of the Central Basin and arguments on water right entitlement, the case was continued to August 25, 1965. Shortly thereafter, Judge Moor appointed DWR as Watermaster. The final Judgment was signed on October 11, 1965 and became affective on October 1, 1966.[5] A copy of the Central Basin Judgment is provided in Appendix F.

The Judgment was amended on March 21, 1980, to provide for a transition in the administrative year from a water year (October 1 to September 30) to a fiscal year (July 1 to June 30) basis. Under the Judgment, this transition resulted in a "short" administrative year of nine months (October 1, 1980 to June 30, 1981) in order to transition into a fiscal year basis beginning July 1, 1981.

The Judgment was again amended on July 9, 1985, modifying the annual budget ($20 minimum assessment) and exchange pool provisions. The amended Judgment of May 6, 1991 modified the carryover and overproduction provisions (from 10 percent of APA or 10 acre-feet, to 20 percent of APA or 20 acre-feet, whichever is greater), defined drought carryover, and provided for exemptions for those parties extracting contaminated groundwater.

Under the Judgment, water rights are fixed and do not vary from year to year. Water producers can carry over any unused APA, but cannot carry over more than 20 percent or 20 acre-feet, whichever is greater, of their APA for use in the following year. A water producer may also extract an additional 10 percent of its APA, with the understanding that this additional amount will be deducted from its APA for the upcoming year.

4.2.2 DESCRIPTION OF GROUNDWATER BASIN

Section 10631(b)(2)
A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated

the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

DESCRIPTION OF THE CENTRAL GROUNDWATER BASIN

The Central Basin is located in Los Angeles County approximately 20 miles southeasterly of downtown Los Angeles. To the north, the Central Basin is partially bounded by the Hollywood Basin, the boundary of which runs through the City of Los Angeles. The remainder of the northern boundary of the Central Basin extends along the Merced Hills, across the Whittier Narrows, and then along Puente Hills. The northern boundary terminates at the Orange County line, which also forms the eastern boundary of the Central Basin. This boundary is a political and not geologic one, as the aquifers in this area reach into the East Coastal Plane area of Orange County. The south-southwest boundary of the Central Basin is known as the Newport-Inglewood Uplift (NIU), separating Central and West Basins from Long Beach up to the Baldwin Hills just north of the City of Inglewood. DWR Bulletin 118 does not identify the Central Basin as currently being in overdraft.

GEOLOGY

The Central Basin is one of two groundwater basins in the Coastal Plain of Los Angeles County. It is comprised of Quaternary-age sediments (less than 1.8 million years old) of gravel, sand, silt, and clay that were deposited from the erosion of nearby hills and mountains, and from historical beaches and shallow ocean floors that covered the area in the past. Underlying these Quarternary sediments are basement rocks such as the Pliocene Pico Formation that generally do not provide sufficient quantities of groundwater for pumping. Separating the Central Basin from the West Coast Basin is

the NIU, a series of discontinuous faults and folds that form a prominent line of northwest trending hills including the Baldwin Hills, Dominguez Hills, and Signal Hill.

Central Basin covers approximately 270 square miles and is bounded on the north by the Hollywood Basin and the Elysian, Repetto, Merced, and Puente Hills, to the east by the Los Angeles County/Orange County line, and to the south and west by the NIU. The Central Basin is commonly divided into four sections; the Los Angeles Forebay, the Montebello Forebay, the Whittier Area, and the Central Basin Pressure Area.

The two forebays represent areas of unconfined aquifers that allow percolation of surface water down into the deeper aquifers to replenish the basins. The Whittier Area and Central Basin Pressure Area are confined aquifer systems that receive relatively minimal recharge from surface water. They are replenished primarily from the up-gradient forebay areas.

HYDROGEOLOGY

The main surface and subsurface flow into the Basin is through the Los Angeles and Whittier Narrows from the groundwater basins in the interior valleys. The water originates as rainfall in the San Gabriel Mountains, the runoff from which is conveyed to the Los Angeles River, the Rio Hondo, and the San Gabriel River. The Los Angeles River enters Central Basin through the Los Angeles Narrows, crosses the Los Angeles Forebay Area, and proceeds south across the Central Basin, exiting the Central Basin through the Dominguez Gap in the West Basin. The Rio Hondo, enters the Central Basin at the Whittier Narrows parallel to the San Gabriel River, proceeds southwesterly across the Montebello Forebay Area and joins the Los Angeles River midway across the Basin. The San Gabriel River also enters the Central Basin through the Whittier Narrows, crosses the Montebello Forebay, and runs south to the Pacific Ocean near Long Beach at the Orange County line.

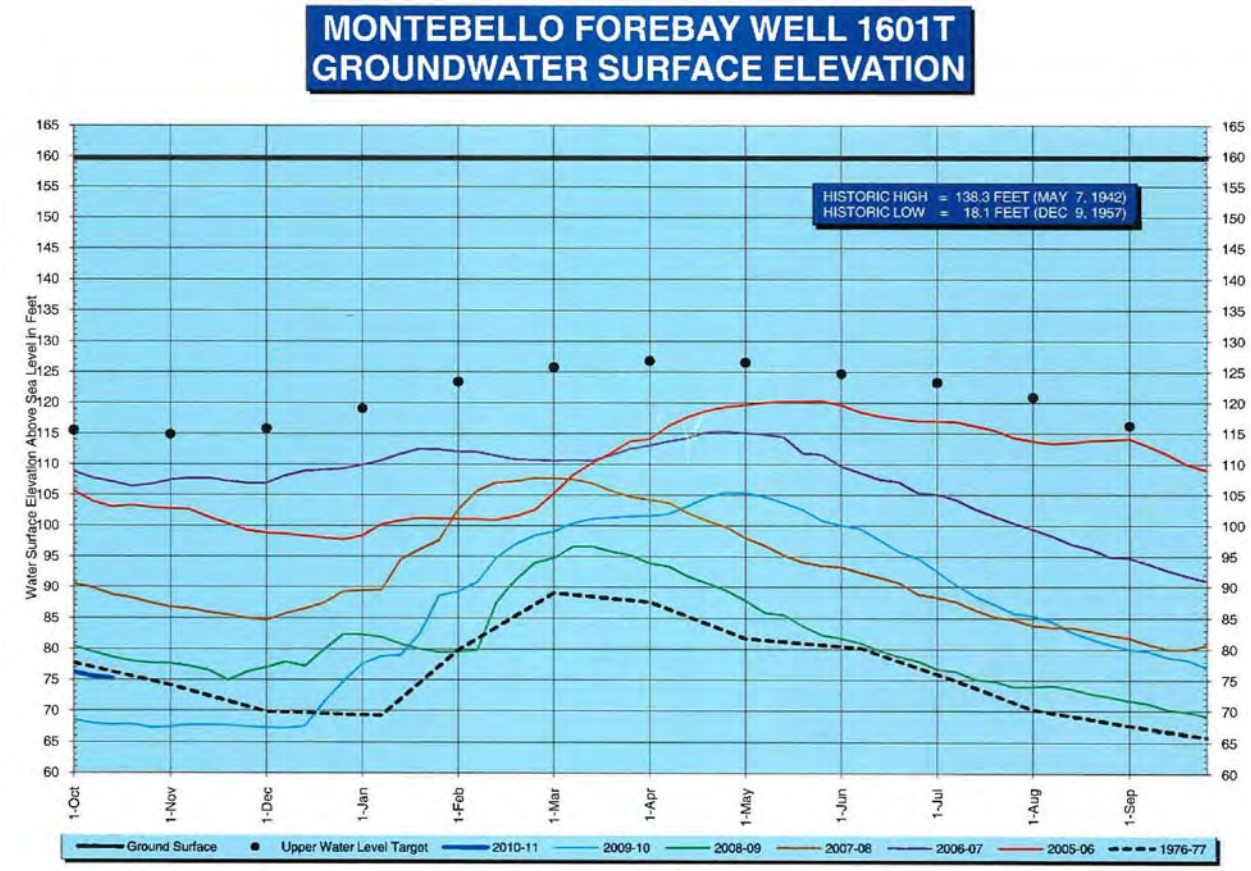
As the Rio Hondo and San Gabriel Rivers flow through the Upper San Gabriel Valley toward the Whittier Narrows, much of their flow percolates into the Main San Gabriel Basin (Main Basin). This water crosses the Whittier Narrows and enters the Central Basin as subsurface flow into the aquifers of the Central Basin. At the same time, the surface flows of the Rio Hondo and the San Gabriel River percolate downward into the aquifers of the Central Basin in the Montebello Forebay. In the Montebello Forebay, the underground aquifers merge and are unconfined, and thus are capable of receiving large quantities of water from percolation through the sand and gravel surface of the forebay area.

The Los Angeles Forebay area is also favorably situated for percolation from the flows of the Los Angeles River, but the Los Angeles Forebay has been largely eliminated as a source of water replenishment to the Central Basin, due to lining of the Los Angeles River channel and the paving over of the forebay area. In the Montebello Forebay area, by contrast, flood flows have been largely controlled through the construction of the Whittier Narrows Dam, and the river channels have not been lined in the area, so percolation still occurs.

Groundwater in the Central Basin provides a substantial portion of the water supply needed by residents and industries in the overlying area. Groundwater exists and flows via the pore spaces of the sediments in the basin. The major aquifers identified in Central Basin include the following, from shallowest to deepest: a) the Gaspur and semi-perched aquifers of the Holocene Alluvium Formation; b) the Exposition, Artesia, Gage, and Gardena aquifers of the Upper Pleistocene Lakewood Formation; c) the Hollydale, Jefferson, Lynwood, and Silverado aquifers of the Lower Pleistocene Upper San Pedro Formation; and d) the Sunnyside Aquifer of the Lower Pleistocene Lower San Pedro Formation. Water levels have exhibited a general recovery since the mid-1970s, as shown in Figure 4-1. Aquifer depths can reach more

than 2,000 feet in the Central Basin although production wells generally do not need to be drilled this deep to tap sufficient water.

Figure 4-1 Central Basin Groundwater Levels



4.2.3 LOCATION, AMOUNT, AND SUFFICIENCY OF GROUNDWATER PUMPED FOR THE PAST FIVE YEARS

Section 10631(b)(3)

> *A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

The City produces groundwater from the Central Basin via its 20 active wells as discussed in Section 4.1. The City has an active water well capacity of 53,211 AFY,

which far exceeds its average annual water requirements, but is limited by its current (FY 2009-10) APA of 16,554 AFY and stipulations provided in the Central Basin Judgment. The City's annual water demands regularly exceed its APA. However, the Central Basin Judgment allows for a carryover of any unused allowed pumping allocation, not to exceed 20% of the purveyor's APA. The City typically leases water from other Central Basin purveyors on an annual basis in order to maintain carryover for flexibility in case of drought or other emergency and to ensure the difference between water demand and APA is met. From FY 2000-01 to FY 2009-10, the City has maintained an average carryover of approximately 2,900 AFY and has leased an average of approximately 1,002 AFY. The City's groundwater production in the Central Basin over the past 15 years is provided in Section 3.2.1, Table 3-4. Over the past 5-years (FY 2005-06 to FY 2009-10) the City has produced an average of 17,403 AFY of groundwater from the Central Basin. Groundwater production in each of the last 5-years is provided in Table 4-3 below.

Table 4-3 Groundwater – Volume Pumped

(DWR Guidebook Table 18)

Table 18
Groundwater — volume pumped

Basin name(s)	Metered or Unmetered[1]	2006	2007	2008	2009	2010
Central Basin	Metered	17,434	18,490	17,660	17,221	16,209
Total groundwater pumped		17,434	18,490	17,660	17,221	16,209
Groundwater as a percent of total water supply		**96.6%**	**95.7%**	**96.0%**	**95.8%**	**95.6%**

Units are in acre-feet per year.
[1] *Indicate whether volume is based on volumeteric meter data or another method*

LACDPW owns, operates and maintains the spreading grounds that are utilized to recharge the Central Basin. The recharge occurs in the spreading grounds adjacent to the Rio Hondo and the San Gabriel River, within the unlined portion of the San Gabriel River, and behind the Whittier Narrows Dam in the Whittier Narrows Reservoir. Sources of spreading water include imported untreated MWD water, recycled water, and local runoff. Approximately 122,000 acre-feet of water was recharged into the Central Basin during FY 2009-10.

The successful management of Central Basin groundwater supplies by DWR via the Central Basin Judgment, combined with the recharge/replenishment program in the spreading grounds and the guaranteed minimum inflow from the Main Basin (see Sections 4.2.2 and 4.2.3), have resulted in the recovery of water levels in wells throughout the Central Basin over the past several decades. As shown on Figure 4-1, water levels have remained steady since the mid-1970s despite several drought periods. Therefore, based on the historical and on-going management practices, the City will be able to rely on the Central Basin for adequate groundwater supplies over the next 20 years under single year and multiple dry year scenarios.

4.2.4 LOCATION AND AMOUNT OF GROUNDWATER PROJECTED TO BE PUMPED

Section 10631(b)(4)

A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

The City of Downey overlies the Central Basin. Groundwater from this basin, pumped from 20 active wells located within the City's boundaries, constitutes the City's principal source of potable water. As previously expressed, successful management of Central Basin groundwater supplies by DWR via the Central Basin Judgment, combined with the recharge/replenishment program and the guaranteed minimum inflow from the Main Basin (see Sections 4.2.2 and 4.2.3), have resulted in the stabilization and reliability of water levels in wells throughout the Central Basin. A summary of the City's current and projected groundwater production from the Central Basin is provided in Table 4-4.

Table 4-4 Groundwater – Volume Projected to be Pumped

(DWR Guidebook Table 19)

Table 19 Groundwater — volume projected to be pumped					
Basin name(s)	**2015**	**2020**	**2025**	**2030**	**2035-opt**
Central Basin	17,261	17,329	17,590	17,899	--
Total groundwater pumped	17,261	17,329	17,590	17,899	--
Percent of total water supply	**95.6%**	**95.4%**	**95.1%**	**95.1%**	**--**
Units are in acre-feet per year. *Include future planned expansion*					

4.3 TRANSFER OPPORTUNITIES

Section 10631(d)

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The City's water transfer opportunities are described below and are summarized in Table 4-5.

Table 4-5 Transfer and Exchange Opportunities

(DWR Guidebook Table 20)

Table 20 Transfer and exchange opportunities			
Transfer agency	**Transfer or exchange**	**Short term or long term**	**Proposed Volume**
Bellflower-Somerset Mutual Water Co.	Transfer	Short Term	0
City of Santa Fe Springs	Transfer	Short Term	0
City of South Gate	Transfer	Short Term	0
Central Basin Producers	Transfer	Long Term	1,002
County Sanitation Districts of Los Angeles County	Transfer	Long Term	7,281
Total			8,283
Units are in acre-feet per year.			

4.3.1 SHORT-TERM

As discussed in Section 2.1.2.4, the City maintains emergency interconnections with adjacent water agencies. Two of the interconnections (City of Santa Fe Springs and City of South Gate) are equipped with two-way valves, which have the ability of providing water both to and from the City. An additional interconnection (Bellflower-Somerset Mutual Water Company) has the ability of providing water to the City. The total capacity available to the City from these three interconnections in the event of an emergency is 8,000 gpm.

4.3.2 LONG-TERM

As discussed in Section 4.2.3, the City typically leases water from other Central Basin purveyors on an annual basis in order to maintain carryover for flexibility in the case of drought or other emergency and to ensure the difference between water demand and APA is met. Leasing is the City's most common form of transfer and has averaged approximately 1,002 AFY from FY 2000-01 to FY 2009-10. In addition to annual leases, the City pursues purchases of additional water rights as they become available.

The City continues to look for opportunities to supplement its current groundwater Allowed Pumping Allocation, through storage of groundwater within the Central Basin. Potential opportunities include:

- Purchase of surplus, untreated imported water from CBMWD during years when there is excess available water. This is projected to occur three years out of every ten years.
- Purchase Kern County Water Bank water, and other available water from sources outside of the area, and utilize MWD facilities to wheel the untreated waters to the spreading grounds.

- Purchase excess water for spreading purposes from adjacent groundwater basin producers as it becomes available.
- Enter into a contract with LACDPW to spread imported water as it becomes available

The City is considering a 6.5 million gallon per day (MGD) (5 MGD effluent product water) Downey Regional Water Reclamation and Groundwater Augmentation Project (DRWRGAP) consisting of an advanced recycled water treatment facility in which the City would purchase tertiary treated recycled water from CSDLAC, treat it through a new, City-owned advanced treatment facility, and inject into the Central Basin to increase its supply. For this type of storage project, the City would have to initiate an agreement with CSDLAC and the City of Cerritos. The City would pay CSDLAC for tertiary treated recycled water and pay the City of Cerritos to pump the water to the City's boundary. The City would then further treat the recycled water with advanced technologies and inject or recharge it into the Central Basin via aquifer storage and recovery (ASR) wells. The City would have to enter into an agreement with LACDPW if it decided it wanted to incorporate this recharge into one of LACDPW's existing recharge facilities.

CBMWD also describes transfer opportunities within its 2010 Plan, which is incorporated by reference.

4.4 DESALINATED WATER OPPORTUNITIES

Section 10631(i)

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

The average total dissolved solids (TDS) concentrations for Central Basin groundwater are less than the recommended secondary Maximum Contaminant Level (MCL) of 500 milligrams per liter for TDS, based on the most recent available data published by DWR for the period 2001-02 through 2005-06 in its annual Central Basin

Watermaster reports (data not available in the annual reports from 2006-07 through 2009-10). Therefore, groundwater produced from the Central Basin does not require desalination. However, there may be opportunities for use of desalinated ocean water as a future potential water supply source, if needed, by partnering with other agencies that develop ocean desalination programs.

4.5 RECYCLED WATER OPPORTUNITIES

4.5.1 RECYCLED WATER AND POTENTIAL FOR USE

Section 10633

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

The City recognizes the importance of using recycled water as a means of reducing reliance on other water sources (i.e. imported water, groundwater) both regionally and within the City. Demand for recycled water within the City has increased since the City's customers began receiving and using recycled water in 1992. As population within the City continues to grow, the City looks to promote the expansion of recycled water infrastructure and use of this water source where feasible. Table 4-6 summarizes the names and roles of the agencies primarily responsible for the initial development as well as the continued and future use of this water source within the City of Downey and surrounding areas. These roles along with a description of past, current and future recycled water use within the City are explained in more detail below.

Table 4-6 Recycled Water Participating Agencies

Participating Agencies	Role in Plan Development
MWD	Recycled water usage incentives for member agencies (i.e. CBMWD)
CBMWD	Development of Master Plan; Recycled water distribution; Provider of recycled water to City of Downey
CSDLAC	Operation and maintenance of water reclamation plants; Producer of recycled water; Recycled water distribution
City of Downey	Recycled water usage incentives to City customers; Usage requirements for new developments; Recycled water distribution

CBMWD purchases and resells tertiary treated recycled water produced by CSDLAC to the City. Since FY 2000-01, the City has purchased and used an average of 703 AFY of recycled water from CBMWD. Recycled water is primarily used for irrigation of landscaping within the City of Downey. It is also used for lakes and ponds at locations such as the Rio Hondo Golf Course and Wilderness Park. The use of recycled water has gained support in the community, and there are more potential customers who would like to begin using recycled water to meet some of their water demands.

4.5.2 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

Section 10633

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

Wastewater produced within the City of Downey is composed primarily of effluent water generated from the City's various customers (i.e. residential, commercial,

industrial). The quantity of wastewater generated is related to the population and the water use within the corresponding service area. Upon generation, wastewater is transferred, by way of service connections (i.e. laterals) and collection mains, to trunk sewers and interceptors. Sewer connections (laterals) are privately owned, operated, and maintained, while collection mains and trunk sewers are owned, operated, and maintained by the City and CSDLAC respectively.

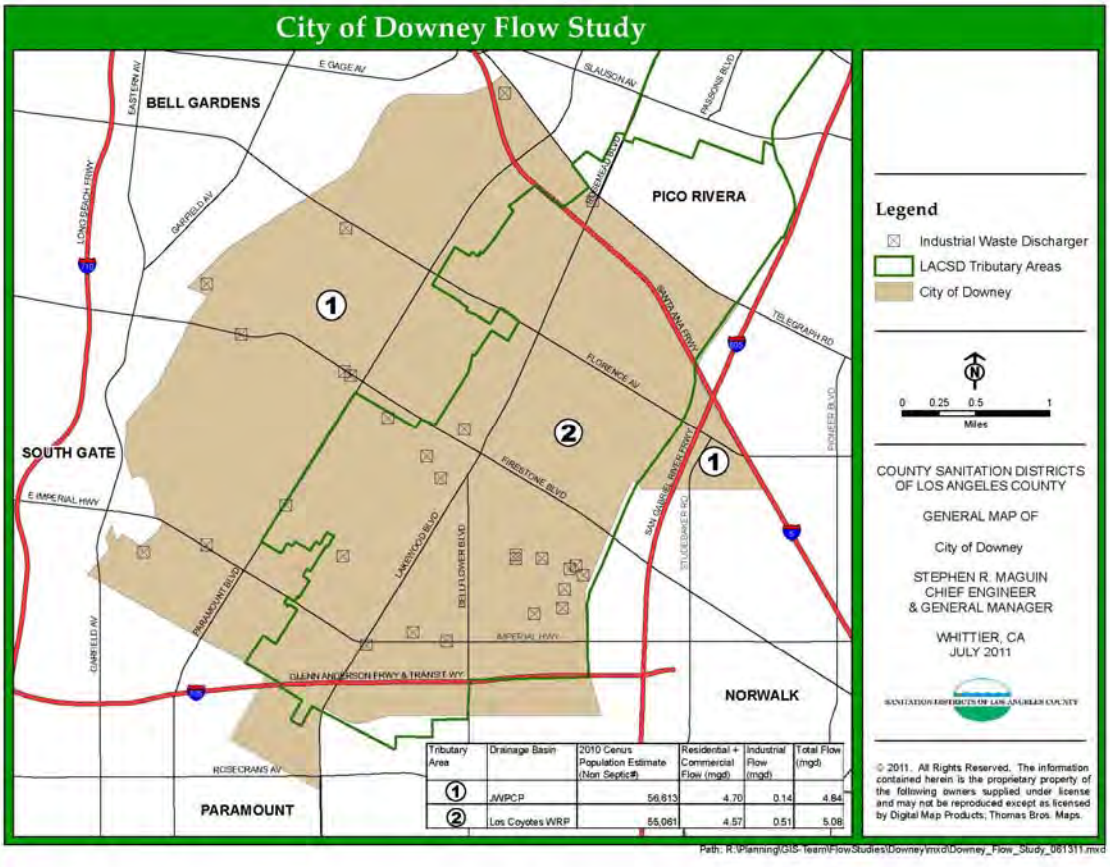
The City's Sanitary Sewer System is comprised of approximately 200 miles of sewer collection mains, 4,300 manholes, 2 lift stations, and other associated facilities. The piping is primarily composed of vitrified clay, and ranges in diameter from 6-inches to 21-inches with the majority (90 percent) of the piping 8-inches. CSDLAC owns, operates, and maintains a network of approximately 27 miles of trunk sewers within the City of Downey that range in size from 10-inches to 78-inches in diameter.

In addition to providing sewage conveyance via trunk sewers and interceptors, CSDLAC also provides treatment services for the City. CSDLAC owns and operates a total of ten water reclamation plants (WRPs) and a main processing plant, that form an interconnected network known as the Joint Outfall System (JOS). Sewer systems within the JOS convey wastewater to WRPs for water reclamation and hydraulic relief, or flow directly to the main processing facility, the Joint Water Pollution Control Plant (JWPCP), for secondary treatment and solids processing. Wastewater generated within the City of Downey is ultimately sent to either the Los Coyotes WRP or the JWPCP depending on the location of the site producing the waste.

In preparation of the 2010 Plan, CSDLAC performed a 2010 wastewater flow analysis for Downey. A 2010 US Census Bureau population estimate of 111,772 was used by the CSDLAC to conduct the 2010 analysis for Downey. A sewage generation rate of 83 GPCD was applied to the population estimate in order to derive the amount of wastewater generated by residential and commercial areas. This rate was based on the historical average number of persons served within the JOS divided by the total flow

received at all plants. Industrial water discharges were ultimately added to the estimate in order to account for flows generated by warehouses and manufacturing within the City. CSDLAC's Geographic Information System (GIS) was then used to determine what portion of Downey's flow is tributary to the Los Coyotes WRP versus the JWPCP. Population estimates were redistributed to only those portions of Downey that contained residential or commercial land use. The total industrial flows were determined by adding the permitted discharges located within each drainage area. Figure 4-2, provided by CSDLAC, illustrates the results of the analysis including a breakdown of how much of the wastewater generated in Downey flows to the JWPCP and how much flows to the Los Coyotes WRP.

Figure 4-2 City of Downey Wastewater Flow Analysis



The Los Coyotes WRP, which began operation in 1970, has a treatment capacity of about 37.5 MGD and provides disinfected tertiary treated effluent. The Los Coyotes WRP serves a total regional population of approximately 370,000 people and produced an average of 24.16 MGD (27,059 AFY) of disinfected tertiary treated recycled water during FY 2009-10. The total volume of wastewater collected and treated at the Los Coyotes WRP, as well as the amount available for re-use as recycled water, are shown in Table 4-7. An average of 5.23 MGD (5,855 AFY), or 21.6 percent of the recycled water produced during FY 2009-10 at the Los Coyotes WRP was re-used for landscape irrigation, industrial applications, and groundwater replenishment. The level of treatment necessary for wastewater to be re-used as recycled water is approved by the California Department of Public Health (CDPH). These requirements are contained in Title 22 of the California Code of Regulations along with a list of approved recycled water uses. Extensive monitoring is conducted by CSDLAC to ensure compliance with all applicable local, state, and federal water quality regulations. Any recycled water generated from the Los Coyotes WRP that is not reused is dechlorinated and discharged to the ocean via the San Gabriel River (see Table 4-8). Discharge water meets all applicable local, state, and federal water quality standards for discharge water including National Pollutant Discharge Elimination System (NPDES) requirements. Waste solids generated from the treatment processes at the Los Coyotes WRP are transferred via trunk sewers to the JWPCP for solids processing.

Table 4-7 Recycled Water – Wastewater Collection and Treatment

(DWR Guidebook Table 21)

Table 21
Recycled water — wastewater collection and treatment

Type of Wastewater	2005	2010	2015	2020	2025	2030	2035 - opt
Wastewater collected & treated in service area	399,000	338,000	373,300	408,600	443,900	479,000	--
Los Coyotes Water Reclamation Plant	37,000	24,000	28,500	33,000	37,500	42,000	--
Joint Water Pollution Control Plant	362,000	314,000	344,800	375,600	406,400	437,000	--
Volume that meets recycled water standard[1]	37,000	24,000	28,500	33,000	37,500	42,000	--

Units are in acre-feet per year.

[1] *Based on flow from the Los Coyotes Water Reclamation Plant*

Table 4-8 Non-Recycled Wastewater Disposal

(DWR Guidebook Table 22)

Table 22 Recycled water — non-recycled wastewater disposal							
Method of disposal	**Treatment Level**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
San Gabriel River (Los Coyotes WRP)	Tertiary	21,000	23,250	25,500	27,750	30,000	--
	Total	21,000	23,250	25,500	27,750	30,000	
Units are in acre-feet per year.							

The JWPCP, which began operation in 1928, currently provides treatment for approximately 300 MGD of wastewater. The facility provides primary and secondary treatment with disinfection. The JWPCP serves a population of approximately 3.5 million people throughout LA County. In FY 2009-10, the JWPCP produced 280.47 MGD (314,284 AFY) of disinfected secondary water. The total volume of treated wastewater discharged from the JWPCP is shown in Table 4-8. Solids collected in primary and secondary treatment are processed in anaerobic digestion tanks where bacteria break down organic material and produce methane gas. Following digestion, the solids are dewatered and hauled off-site for use in composting, land application, or combined with municipal solid waste for co-disposal. The methane gas generated in the anaerobic digestion process is used to produce power and digester heating steam in a combined cycle power plant that utilizes gas turbines and waste-heat recovery steam generators. Due to the onsite generation of power, the JWPCP is self-sufficient with respect to energy requirements. Treated wastewater is ultimately disinfected prior to being sent to the Pacific Ocean through a network of outfalls. The outfalls extend two miles off the coast of Southern California into the Palos Verdes Peninsula to a depth of 200 ft. Though highly treated, effluent from the JWPCP does not meet recycled water standards and is therefore not re-used for such purposes. However, all water discharged to the ocean is monitored to ensure compliance with applicable local, state, and federal standards for discharge water.

4.5.3 CURRENT RECYCLED WATER USE

Section 10633

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use

The City of Downey receives its recycled water from CBMWD as part of the Central Basin Recycled Water Project (CBRWP). CBMWD purchases and resells tertiary-treated recycled water produced at CSDLAC's Los Coyotes and San Jose Creek WRPs. The CBRWP is comprised of two separate projects: E. Thornton Ibbetson Century (Ibbetson Century Project) and Esteban E. Torres Rio Hondo (Torres Project) Recycled Water Projects. CBMWD authorized design of the Ibbetson Century Project in 1990. By 1992, transmission mains, distribution mains, pump stations, and associated facilities were constructed, and the project had begun delivering recycled water from the Los Coyotes WRP to recycled water users within the City of Downey and surrounding jurisdictions. In 1994, the Ibbetson Century Project was expanded to include the northern portion of CBMWD's service area. The expansion, referred to as the Esteban E. Torres Rio Hondo Recycled Water Project, delivers recycled water from the San Jose Creek WRP to cities outside of the Ibbetson Century Project service area.

As a follow-up to the Ibbetson Century and Torres Projects, CBMWD is currently expanding its distribution of recycled water by looping the two systems under the Southeast Water Reliability Project (SWRP). The SWRP is expected to increase the number of recycled water use sites as well as increase pressure and flow to many existing customers through connection of the two distribution systems emanating from the Los Coyotes and San Jose Creek WRPs. Though such benefits are not expected to have a large impact on the City of Downey, the anticipated increase in water demand from the San Jose Creek WRP may help free additional pumping capacity at the Los Coyotes WRP.

Once purchased from CBMWD, recycled water is re-sold by the City of Downey to its customers at a discount of 15 percent off the current rate for potable water. Since FY 1992-93, the City has purchased an average of 608 AFY of recycled water from CBMWD. Since FY 2000-01, the average amount of recycled water used by the City is 703 AFY, which reflects the general increase in recycled water use in the City over the

past several years. Table 4-9 summarizes the City's current recycled water users, location, and corresponding annual usage. Table 4-10 compares recycled water use projections for FY 2009-10 from the City's 2005 Plan to actual FY 2009-10 recycled water use.

Table 4-9 FY 2009-10 Recycled Water Usage Summary

Site	User	Location Information	Meter Size	Usage (AF)
1	Downey Unified School District	Columbus School	4"	**18.75**
2	Palm Growers Nursery	East City Limits @ Foster Rd.	2"	**0.00**
3	Humedo Nursery	South Side of Imperial @ East City Limits	3"	**7.15**
4	Downey Unified School District	Lewis School	3"	**4.48**
5	Caltrans	105 Freeway & Bellflower	3"	**21.23**
6	City of Downey	Foster Rd @ Premier Ave	2"	**0.89**
7	Downey Unified School District	Carpenter Elementary School	4"	**9.16**
8	City of Downey	Downey Cemetery	3"	**26.19**
9	Caltrans	S/S 105 Freeway & E/S Lakewood	2"	**1.51**
10	Caltrans	S/S 105 Freeway & E/S Lakewood	2'	**7.14**
12	Caltrans	N/S 105 Freeway & W/S Lakewood	3"	**4.43**
13	Caltrans	N/S 105 Freeway & W/S Lakewood	1-1/2"	**0.04**
14	Caltrans	S/S 105 Freeway & W/S Lakewood	1-1/2"	**0.07**
16	Downey Unified School District	South Middle School	3"	**13.43**
17	City of Downey	Independence Park	3"	**15.79**
18	Downey Unified School District	Gauldin Elementary School	3"	**6.46**
19	City of Downey	Rio San Gabriel Park	4"	**41.53**
20	Downey Unified School District	Rio San Gabriel Elementary School	3"	**13.71**
21	Downey Unified School District	East Middle School	4"	**20.62**
22	City of Downey	Wilderness Park	6"	**103.94**
23	LA County Dept. of Public Works	Rio Hondo Channel S/O Florence	2"	**0.27**
24	City of Downey	Rio Hondo Golf Course South Lake #6	8"	**65.85**
25	City of Downey	Rio Hondo Golf Course North Lake #3	8"	**194.95**
26	City of Downey	Crawford Park	3"	**7.91**

27	City of Downey	Temple Park	1-1/2"	**1.36**
28	Downey Unified School District	West Middle School	4"	**15.87**
29	City of Downey	S/S Steve Horn Way E/O Bellflower	3"	**1.51**
30	Kaiser	Kaiser Admin. Building @ Bellflower/Steve Horn	3"	**3.60**
31	Downey Studios	Film Studios Back Lot off of Bellflower	2"	**5.61**
32	City of Downey	W/S Bellflower N/O Steve Horn Way	2"	**11.06**
33	City of Downey	W/S Bellflower S/O Stewart & Gray Rd.	2"	**2.48**
34	Downey Unified School District (Vacant)	Downey High School - S/S Fifth @ Lakewood	4"	**0.00**
35	City of Downey	E/S Lakewood Between 3rd & 5th	2"	**0.67**
36	Big Lots Stores	9020 Firestone Lakewood Side/Back of Carls Jr.	2"	**3.53**
37	City of Downey	W/S Lakewood S/O 11215 Lakewood	2"	**0.75**
38	City of Downey	Rose @ E/S Lakewood For Triangle Park	2"	**1.23**
39	IRG (Vacant)	E/S Lakewood @ Alameda	2"	**0.00**
40	Downey Landing	E/S Lakewood N/O Landing Mid Entrance	2"	**4.82**
41	City of Downey	E/S Lakewood N/O Hall Rd	3"	**2.95**
42	Coca Cola	W/S Lakewood S/O bellflower	2"	**10.08**
43	City of Downey	E/S Lakewood Between 2 S Landing Entrance	2"	**3.66**
44	Downey Landing	W/S Bellflower @ Entrance to Landing	2"	**4.64**
45	Downey Landing	S/S Stewart & Gray Behind Chile's Restaurant	2"	**5.06**
46	City of Downey	S/S S&G for N Pkwy Vultee to Corrigan	2"	**1.31**
47	Desert Reign Church	S/E Corner Of Lakewood & Hall Rd.	2"	**3.50**
48	City of Downey	E/S Lakewood @ S/O Rose	2"	**4.75**
49	Cornerstone Commerce Center	N/S of Stewart & Gary across from Utilities Yard	2"	**5.28**
50	City of Downey (Vacant)	S/S Stewart & Gary in front of Utilities Yard	2"	**0.00**
51	Space Learning Center/Park	N/S of park on Steven Horn Way	4"	**34.38**
52	City of Downey	E/O Lakewood @ 9002 Imperial Hwy	2"	**0.31**
53	City of Downey	N. Steve Horn Pkwy at 2nd Kaiser Dr from East	3"	**10.43**
54	Kaiser Hospital	S. Steve Horn Pkwy W/O E Kaiser Driveway	4"	**12.94**
55	SCE Sub Station Landscape	S. Steve Horn Pkwy W/O Driveway	2"	**0.90**
56	City of Downey	SW Corner of Lakewood/Imperial	1"	**0.74**
57	Vacant	S of Imperial/W of Lakewood @ 12631 Lkwd	2"	**0.00**
58	Downey Unified School District (Vacant)	Ward Elementary School; Sidewalk between 12731 & 12725 Lakewood	3"	**0.00**

59	City of Downey	E/S of Lakewood next to cemetery	2"	**0.33**
60	City of Downey	E/S Lakewood across from #12209/15	2"	**2.15**
61	City of Downey	8740 Firestone S/W Corner of Firestone & Nash	2"	**0.50**
62	CitiBank	8764 Firestone S/S Firestone; W/O Drive Way	1"	**0.44**
	Total User Sites: 60		**Total Usage (AF):**	**742.35**

Notes:

Sites 11 and 15 are no longer active

Table 4-10 2005 UWMP Use Projection Compared to 2010 Actual

(DWR Guidebook Table 24)

Table 24
Recycled water — 2005 UWMP use projection compared to 2010 actual

Use type	2010 actual use	2005 Projection for 2010[1]
Agricultural irrigation	--	--
Landscape irrigation/Ponds[2]	417	1,035
Commercial irrigation[3]	64	--
Golf course irrigation/Ponds	261	--
Wildlife habitat	--	--
Wetlands	--	--
Industrial reuse	--	--
Groundwater recharge	--	--
Seawater barrier	--	--
Getothermal/Energy	--	--
Indirect potable reuse	--	--
Other (user type)	--	--
Other (user type)	--	--
Total	742	1,035

Units are in acre-feet per year.

[1] From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing catagories or modified to the new catagories, at the discretion of the water supplier.

[2] Includes parks, schools, cemeteries, churches, residential, or other public facilities)

[3] Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Recycled water is currently being used in several park and golf course ponds and for irrigation of greenbelt areas, landscape medians, parks, golf courses, plant nurseries, and schools. As recycled water is primarily used for irrigation of landscaping within the City of Downey, such demand in any particular year is highly dependent on precipitation. This is particularly evident in the reduction of recycled water demand in FY 2004-05 for example, which was characterized by larger than average annual precipitation. Regardless of the yearly fluctuations resulting from varying rainfall totals, the overall trend of recycled water demand is expected to increase along with the City's population and development over the next 20 years.

4.5.4 POTENTIAL USES OF RECYCLED WATER

Section 10633

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

CBMWD has established itself as one of the leaders in the marketing of recycled water, since the establishment of its recycled water distribution system in the early 1990's. CBMWD views the use of recycled water as a key component of its efforts to augment potable water supplies and reduce dependence on imported water.

In 2008, CBMWD prepared a Recycled Water Master Plan, which identified and prioritized areas within Central Basin's service area where recycled water has the potential to expand. As part of this study, a database was prepared to locate and identify future customers. CBMWD's 2008 Recycled Water Master Plan estimated a total potential recycled water demand of approximately 1,700 AFY within the City's service area. Although CBMWD's 2008 Recycled Water Master Plan is currently being updated, CBMWD's goal is to maximize the potential usage of recycled water throughout its service area.

In addition to actions being implemented by CBMWD to identify new recycled water customers, the City has taken an aggressive approach to the idea of expanding the use of recycled water throughout its service area. In an effort to lower CBMWD's cost of expanding its recycled water distribution system, the City has taken the lead on the construction of recycled water facilities through several of its capital improvement projects over the last eight years allowing for the extension of recycled water mains on several major streets including Lakewood Blvd., Independence Park/Bellflower Blvd., Stewart and Gray Rd., and Congressman Steve Horn Way. The City will continue to coordinate with CBMWD and take advantage of such opportunities to expand recycled

water facilities throughout its borders to allow for optimization of recycled water use within the City.

The City has identified potential non-irrigation applications for use of recycled water such as installation of dual plumbing for use in toilets and cooling systems at proposed future developments. However, the primary potential recycled water application moving forward will still be irrigation of landscaping at schools and future developments adjacent to recently constructed mains as well as irrigation of landscaping at schools, parks, medians, freeway abutments, and developments which would require further extension of the recycled water distribution system to accommodate connection of the irrigation systems to this source of water.

As discussed previously, the City is also considering a 6.5 MGD Downey Regional Water Reclamation and Groundwater Augmentation Project consisting of an advanced recycled water treatment facility in which the City would purchase tertiary treated recycled water from CSDLAC, treat it through a new, City-owned advanced treatment facility, and inject into the Central Basin via ASR wells to increase its supply. The City has estimated a potential product water capacity of 5 MGD or 5,601 AFY after treatment.

The City's potential recycled water usage over the next 20-years is summarized in Table 4-11 and is based on existing uses and potential landscape irrigation, dual plumbing (toilets, cooling), and groundwater recharge applications identified by the City, CBMWD's Master Plan, and CSDLAC's Status Report on Recycled Water, along with projected recycled water usage resulting from recent and ongoing improvements to the recycled water distribution facilities within the City.

Table 4-11 Recycled Water – Potential Future Use

(DWR Guidebook Table 23)

Table 23
Recycled water — potential future use

User type	Description	Feasibility[1]	2015	2020	2025	2030	2035 - opt
Agricultural irrigation			0	0	0	0	--
Landscape irrigation/Ponds[2]	Existing and potential sites	Feasible	427	532	760	840	--
Commercial irrigation[3]	Landscpe/dual plumbing/cooling	Feasible / Cost	199	245	268	293	--
Golf course irrigation/Ponds	Existing Site	NA- Existing	261	261	261	261	--
Wildlife habitat			0	0	0	0	--
Wetlands			0	0	0	0	--
Industrial reuse			0	0	0	0	--
Groundwater recharge	DRWRGAP	Cost	0	0	0	7,281	--
Seawater barrier			0	0	0	0	--
Getothermal/Energy			0	0	0	0	--
Indirect potable reuse			0	0	0	0	--
Other (user type)			0	0	0	0	--
Other (user type)			0	0	0	0	--
Total		0	887	1,038	1,289	8,675	0

Units are in acre-feet per year.
[1] *Technical and economic feasibility.*
[2] *Includes parks, schools, cemeteries, churches, residential, or other public facilities)*
[3] *Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)*

4.5.5 PROJECTED RECYCLED WATER USE

Section 10633

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15 and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision

Despite the availability of recycled water from the Los Coyotes WRP and the potential use identified in Table 4-11, the implementation of recycled water use at a particular site is primarily dependent upon the cost of the capital improvements necessary to meet the pressure and flow requirements of the proposed customer versus the amount of recycled water projected to be used by that customer. In some cases the costs to construct facilities necessary to provide recycled water to the new customer exceed the benefits associated with the increased use of recycled water. The recycled water use projections provided in this section focus primarily on potential use sites that appear to be the most economically feasible based on proximity to existing, recently-constructed, or planned distribution facilities. Based on economically feasible projects, the City's recycled water demands are projected to increase from 742 AFY in FY 2009-10 to approximately 927 AFY by FY 2029-30. The City's projected recycled water demands are provided in Table 4-1.

Table 4-10 (See Section 4.5.3) compares recycled water use projections for FY 2009-10 from the City's 2005 Plan to actual FY 2009-10 recycled water use.

4.5.6 ENCOURAGING USE OF RECYCLED WATER

Section 10633

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

The City has recognized the use of recycled water as a means by which to reduce the City's reliability on groundwater and imported water sources. To help promote the use of recycled water, the City buys recycled water from CBMWD and sells it to customers within the City at 85 percent of the potable water rate.

Under recycled water projects managed by the City, potential customers are also often given the option of allowing the City to oversee the extension of service laterals thereby eliminating what would otherwise be an overhead cost for the proposed customer.

In addition, CBMWD may offer customers, lacking financial capability, advanced funds to cover the costs of onsite plumbing retrofits required as a result of using recycled water. The plumbing retrofit costs can be amortized over a period of up to 10 years at CBMWD's cost of funds. Repayment is ultimately provided through charges seen on the customer's water bill. The rate charged on the customer's bill is determined by the differential between the potable and recycled water rates to ensure that the customer is never charged in excess of the current potable water rate. Upon repayment of the loan, the rate would revert back to the current recycled water rates.

CBMWD promotes the use of recycled water within its system as a more reliable water source than imported water. To help promote its use, MWD offers CBMWD an incentive payment for every AF of recycled water delivered by CBMWD up to 10,500

AFY through FY 2019. According to CBMWD (2010 UWMP), efforts are currently focused on maximizing the recycled water usage potential of the original regional system, in order to take advantage of MWD's incentive program.

Both CBMWD and the City pursue different sources of funding to help subsidize new recycled water distribution facilities by submitting applications for grant funds when available. Use of such funds, when approved, help increase the economic feasibility of constructing distribution system improvements necessary to reach new customers.

The above methods implemented to encourage the use of recycled water and the recycled water use projections resulting from these actions are summarized in Table 4-12.

Table 4-12 Methods to Encourage Recycled Water Use

(DWR Guidebook Table 25)

Table 25 Methods to encourage recycled water use						
Actions	Projected Results					
	2010	2015	2020	2025	2030	2035 - opt
Financial incentives						
CBMWD, MWD, and City Financial Incentives	742	787	841	905	927	--
Total	742	787	841	905	927	--
Units are in acre-feet per year.						

4.5.7 PLAN FOR OPTIMIZING USE OF RECYCLED WATER

Section 10633

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

CBMWD is updating its Recycled Water Master Plan (Master Plan) in an effort to take advantage of the unused capacity of recycled water at both the Los Coyotes and San Jose Creek WRPs. The focus of the Master Plan will be to capture changes in the industrial and commercial customer base and identify existing and emerging

applications for recycled water use. The process will result in an updated identification and prioritization of potential recycled water customers within CBMWD's service area including the City of Downey.

CBMWD plans to interface with agencies in its service area, including the City of Downey, during the development of the Master Plan update. Downey hopes to have the opportunity at such time to provide input regarding potential recycled water use within City limits and the expansion of recycled water facilities to serve potential customers.

In addition to actions being implemented by CBMWD to identify new recycled water customers, the City of Downey has taken an aggressive approach to the idea of expanding the use of recycled water throughout its service area. In an effort to lower CBMWD's cost of expanding its recycled water distribution system, the City has taken the lead on the construction of recycled water facilities through several of its recent capital improvement projects allowing for the extension of recycled water mains on several major streets including Lakewood Blvd., Independence Park/Bellflower Blvd., Stewart and Gray Rd., and Congressman Steve Horn Way. The City will continue to coordinate with CBMWD and take advantage of such opportunities to expand recycled water facilities throughout its borders to allow for optimization of recycled water use within Downey.

To help ensure the use of the recycled water upon expansion of facilities, the City also requires developments to provide and use recycled water for landscape irrigation and other non-potable water needs, if approved, in cases where recycled water facilities are located in the vicinity of the developments. Such requirements coupled with the City's efforts to expand the recycled water distribution system, and customer cost incentives previously discussed, help promote the increased use of recycled water within the City. Increasing the use of recycled water within the City will help offset increases in potable water demand anticipated as a result of an expanding population

and future development, thus helping to ensure the reliability of future potable water supplies for the City's growing customer base.

4.6 FUTURE WATER PROJECTS

Section 10631

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water uses as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

The City's future water supply projects are summarized in Table 4-13 and include the following:

- New Groundwater Wells – The City plans to construct three new groundwater wells with generators and associated water main improvements over the next 15 years. The proposed wells are anticipated to have a capacity of 3,000 gpm each and would be used to provide redundancy to allow for abandonment of old, low capacity wells.
- Groundwater Well Refurbishment – The City plans to increase the frequency of existing groundwater well and associated infrastructure refurbishment (pump, motor, etc.) to a 5-year schedule to ensure delivery of high quality groundwater. This will help restore capacity of the City's wells and allow for greater redundancy in meeting water demands.
- Purchase of Water Rights and/or Conservation Projects – Based on the recently adopted water rate structure, the City will have the ability to purchase additional groundwater rights in the Central Basin over the next 15 years to meet future water demand needs and/or implement water conservation (i.e. recycled water, other) projects to help offset increases in potable water demands.

- Water Distribution Rehabilitation and Replacement – The City will continue to replace aging water meters, fire hydrants, water mains, and associated facilities to help minimize water loss.
- Downey Regional Water Reclamation and Groundwater Augmentation Project - As discussed in Section 4.3.2, the City is considering an advanced recycled water treatment facility in which the City would purchase tertiary treated recycled water from CSDLAC, treat it through a new, City-owned advanced treatment facility, and inject into the Central Basin via ASR wells to increase its supply.

Table 4-13 Future Water Supply Projects

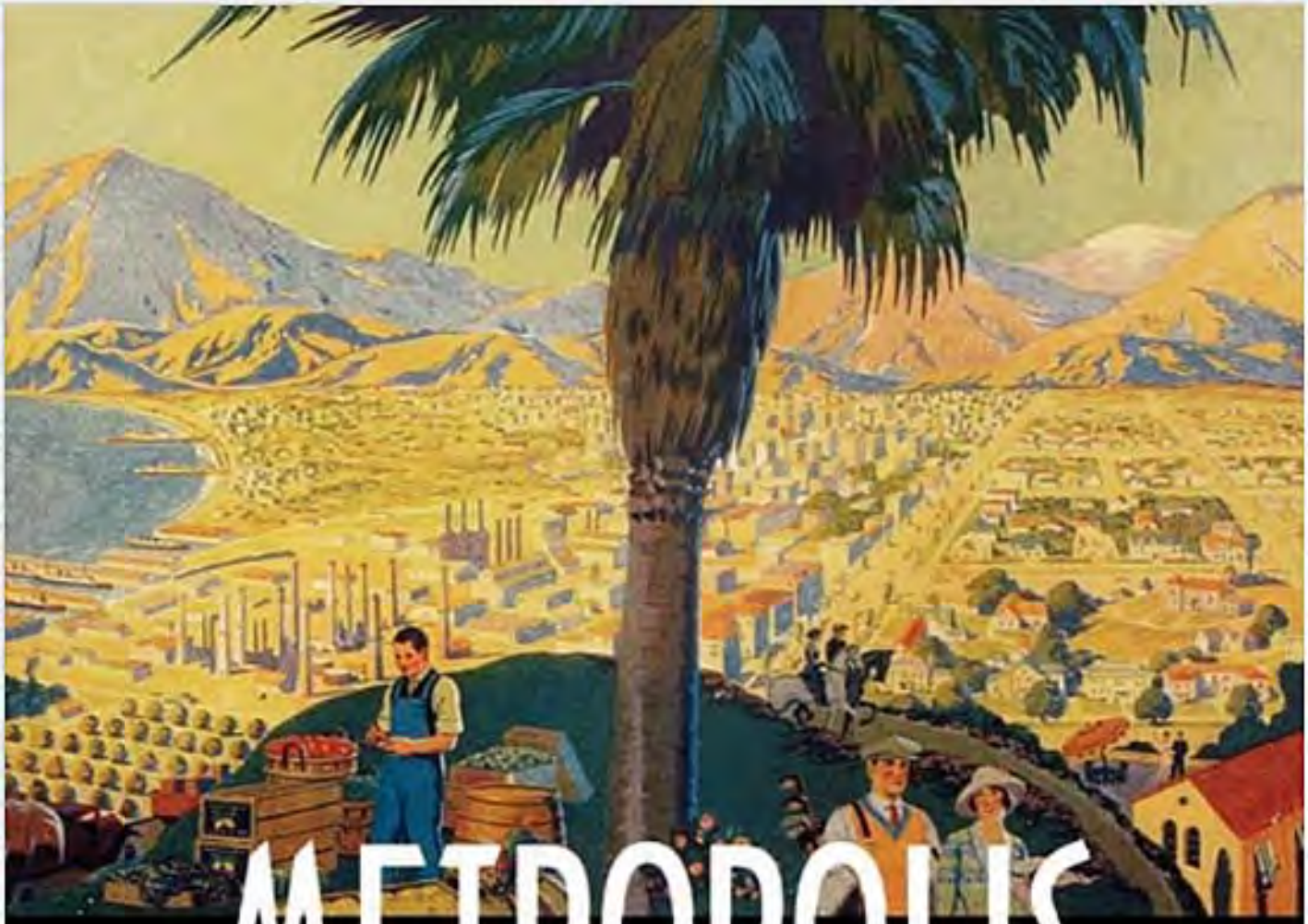
(DWR Guidebook Table 26)

Table 26
Future water supply projects

Project name[1]	Projected start date	Projected completion date	Potential project constraints[2]	Normal-year supply[3]	Single-dry year supply[3]	Multiple-dry year first year supply[3]	Multiple-dry year second year supply[3]	Multiple-dry year third year supply[3]
Purchase of Water Rights / Conservation	Current	2025	Availability	2,340	2,340	2,340	2,340	2,340
Water Rights Leases	Current	On-going	Availability	1,308	2,546	2,546	2,809	2,884
Additional Groundwater Wells (3)	2012	2025	--	--	--	--	--	--
Groundwater Well Refurbishment	Current	On-going	--	--	--	--	--	
DRWRGAP	NA	NA	Cost	7,281	7,281	7,281	7,281	7,281
		Total		10,929	12,167	12,167	12,430	12,505

Units are in acre-feet per year.
[1] *Water volumes presented here should be accounted for in Table 16.*
[2] *Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.*
[3] *Provide estimated supply benefits, if available.*

Reference:
Sitton, 2001



METROPOLIS IN THE MAKING

LOS ANGELES IN THE 1920s

Edited by Tom Sitton and William Deverell

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ing efforts by local merchants to develop the infrastructure of South Gate—and thus raise taxes. A commitment against taxation ultimately became a key element in the political self-identity of local residents, who were struggling hard to maintain their foothold in suburbia.[19]

A fifth trait was that industries were situated either in or directly adjacent to the suburb. From the outset, the subdividers envisioned industry as critical to South Gate's prosperity. As early as 1924, city promoters spoke enthusiastically of a $4 million "industrial program" of plant construction for South Gate, destined to make it "one of the most important [communities] in Southern California." In their efforts to attract industry, city leaders emphasized convenient access to transportation, a dependable labor supply, low rates for water, electricity, and gas, and cheap land and tax rates, particularly in the unincorporated areas just outside the suburb's borders. Industries responded to the call almost immediately. In 1922, Bell Foundry became the first plant to locate in South Gate, followed two years later by the A. R. Maas Chemical Company, which produced chemicals for the film industry. In 1928, South Gate scored a major coup with the arrival of Firestone Tire and Rubber, which soon became one of the largest employers in the area. By the late 1920s, 14 major industries had established plants in and adjacent to South Gate, producing such goods as iron products and castings, concrete pipes, paper goods, and electric products. In 1928, the value of manufactured products in South Gate topped $24 million, with $4.7 million paid in wages.[20]

Perhaps more than any other quality, the presence of industry set South Gate apart from the typical middle-class "bedroom" suburb. Residents often had to cope with noxious odors, noise, and other nuisances caused by local factories, which were sometimes nestled among the homes. By 1930, for example, three blocks of Otis Street in northeast South Gate housed Weiser Manufacturing, Long Beach Steel Foundry, and the National Paper Products Company. Western State Chemical had had a plant there a few years earlier. Along the same three blocks were 32 houses. In some cases, homes were actually next door to the plants. On other streets, factories sat adjacent to backyards, separated only by a narrow alley. Because the poorer homes were at the back of their lots, it was not uncommon for them to sit right up against a factory. This proximity sometimes caused friction. In 1927, Otis Street residents complained to City Hall about the "parking of cars and litter thrown on the streets" by workers at the National Paper Products Company. The following year, 43 householders on San Vicente Street signed a petition complaining about the noise caused by a trip-hammer or riveting machine at a local boiler works. The very framework of a working-class suburb like South Gate, which mixed residences and industries, virtually ensured that problems like this would arise from time to time.[21]

Reference:
Stauffer, 1984

Stauffer Chemical Company
Westport, Connecticut 06881 / Tel. (203) 222-3000 / Cable "Staufchem"

May 14, 1984

RECEIVED

Ms. Suzanne Chaewsky
Ecology and Environment, Inc.
120 Howard Street, Suite 640
San Francisco, California 94105

Re: Stauffer Chemical Company
South Gate Plant
South Gate, California

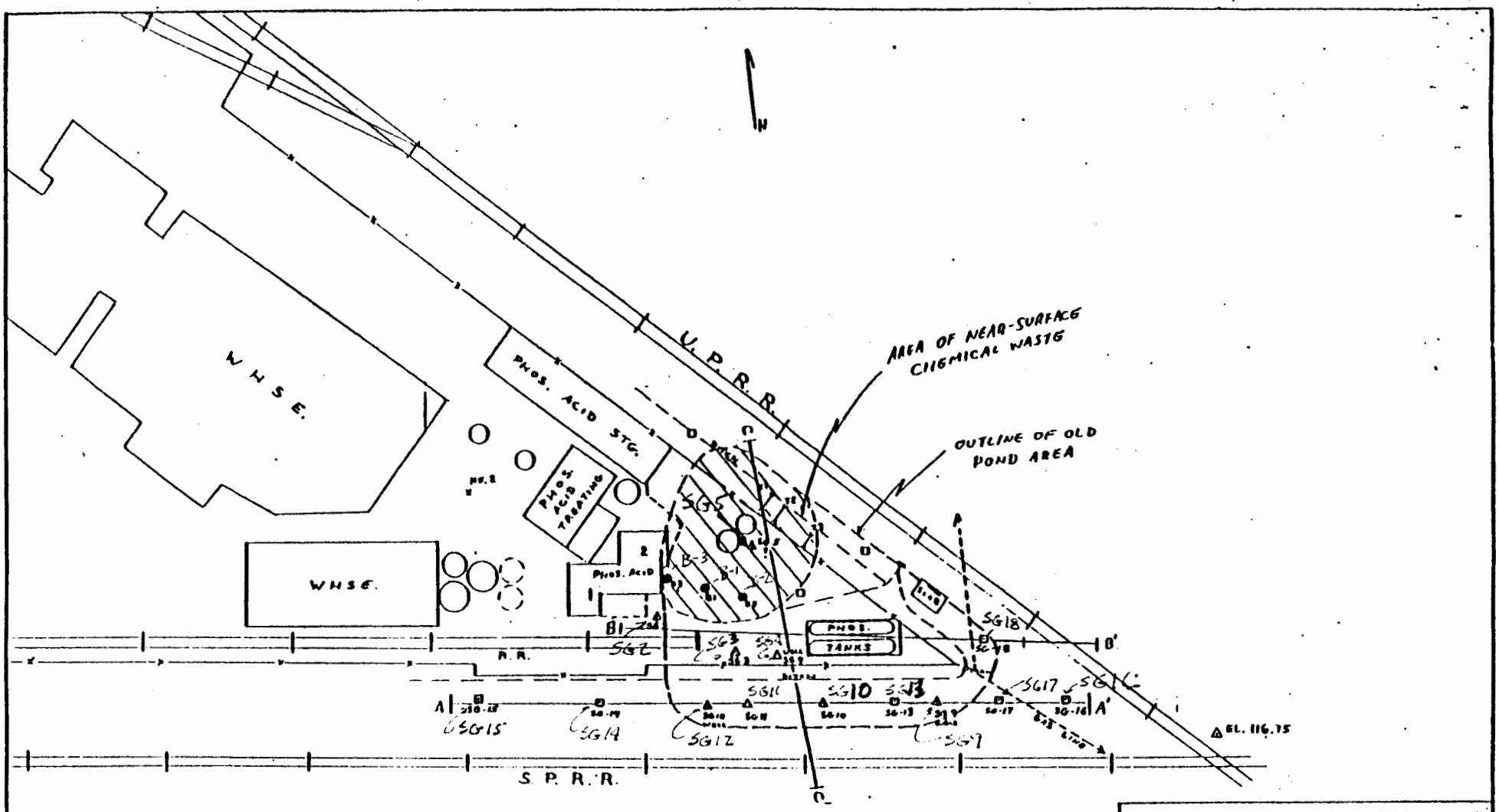
Dear Ms. Chaewsky:

This letter report is presented in response to your April 9, 1984 letter requesting information on the subject site. As discussed during your April 4, 1984 site visit at the South Gate plant, phosphoric acid was generated and treated with H_2S and filtered with diatomite to remove arsenic impurities as sulfides. This waste material, primarily arsenic trisulfide (As_2S_3) was disposed of in an on-site pond adjacent to the plant from about 1940 to 1960. Dimensions of the pond reportedly were approximately 180 feet long, 130 feet wide, and 25 feet deep. The approximated pond boundaries are shown on (Fig. 1). In the mid-1960's the pond was filled and the surface paved.

During the period from August, 1979 to August, 1982 a total of 17 soil borings were performed in the old pond area. The location of borings are shown on Figure 1. Initially in 1979 three borings (B-1 through B-3) were performed as part of a geotechnical investigation concerned with determining subsoil stability. Subsequently, in 1981 and 1982 an additional 14 borings (SG-2 through SG-5 and SG-9 through SG-18) were performed by Stauffer in an effort to determine the extent of the old pond area and the significance of buried wastes. Logs of all the borings including descriptions of the material encountered are attached.

Soil samples extracted from the SG series borings performed in 1981 were analyzed for several elements; arsenic, cadmium, chromium, lead, mercury and selenium. Those tested in 1982 were analyzed for arsenic only. The results of the analysis are presented on the attached laboratory reports by Certified Testing Laboratories, Inc. (1981 data) and Table 1 (1982 data). In addition, Figures 2 and 3 present subsurface cross-sections through the area investigated and illustrate the lateral and vertical extent of arsenic detection along with general soil types encountered.

The analytical results presented here represent totals for each individual element, and are not specific to a particular form (compound). However, based on the process operated, we believe that essentially all of the detected arsenic would be in the form of arsenic trisulfide. Since chromium was not used in the process, the detected chromium is less easily understood. However, the use of chromium as a cooling water treatment to



B1 ● WOODWARD-CLYDE BORING, 1979

T1 ⊢ WOODWARD-CLYDE TRENCH, 1979

SG △ STAUFFER BORING, 1981

SG □ STAUFFER BORING, 1982

□ PROPOSED BORING, NOT DRILLED

A ——— A' LINE OF CROSS-SECTION

BASED ON AERIAL LABS, INC. MAP
9/30/80

SCALE
50 0 50 100
FEET

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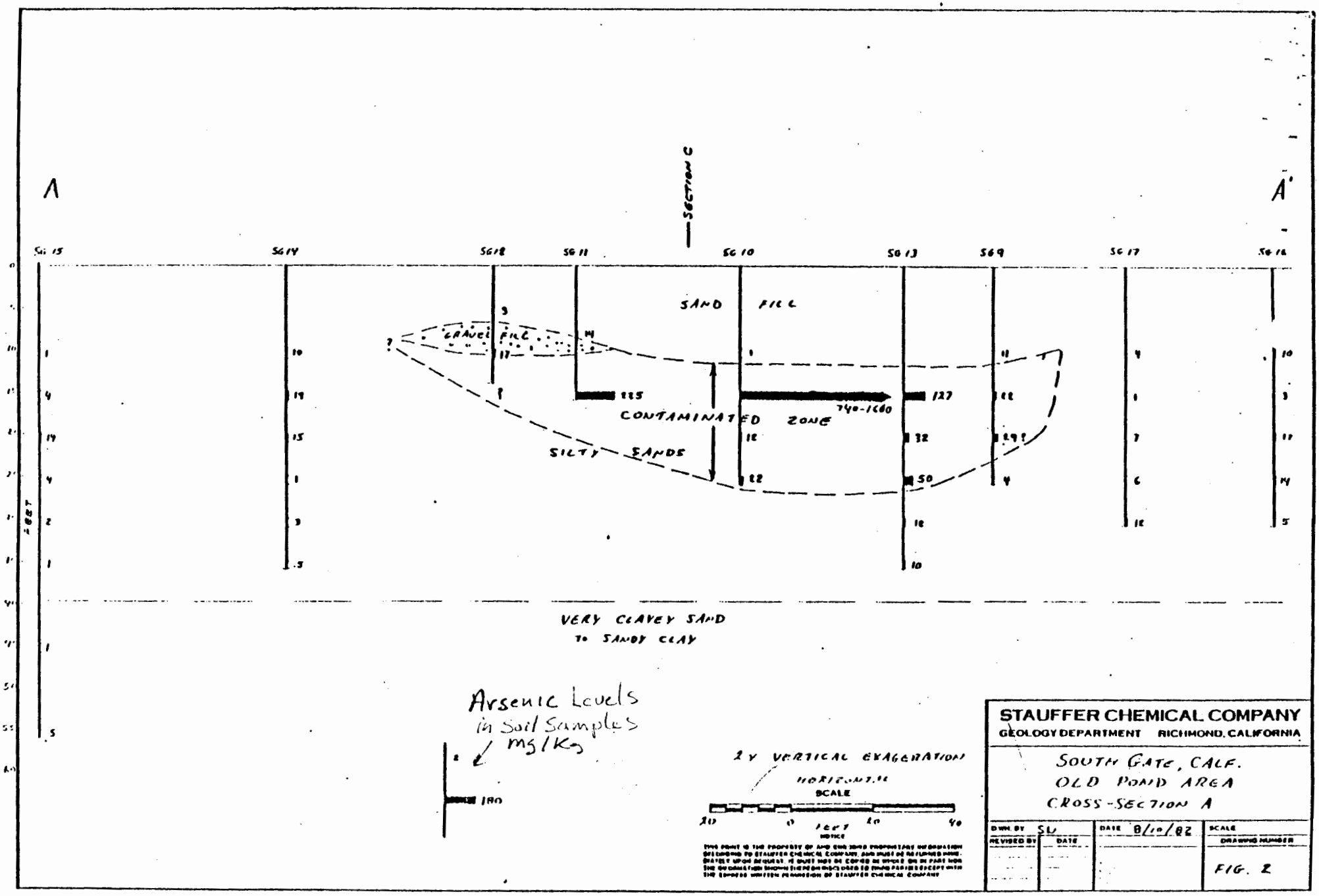
STAUFFER CHEMICAL COMPANY
GEOLOGY DEPARTMENT · RICHMOND, CALIFORNIA

SOUTH GATE, CALF.
OLD POND AREA

DWN BY SWL	DATE 7/6/82	SCALE 1" = 50'
REVISED BY SWL	DATE 7/12/82	DRAWING NUMBER
SWL	8/19/82	FIG. 1



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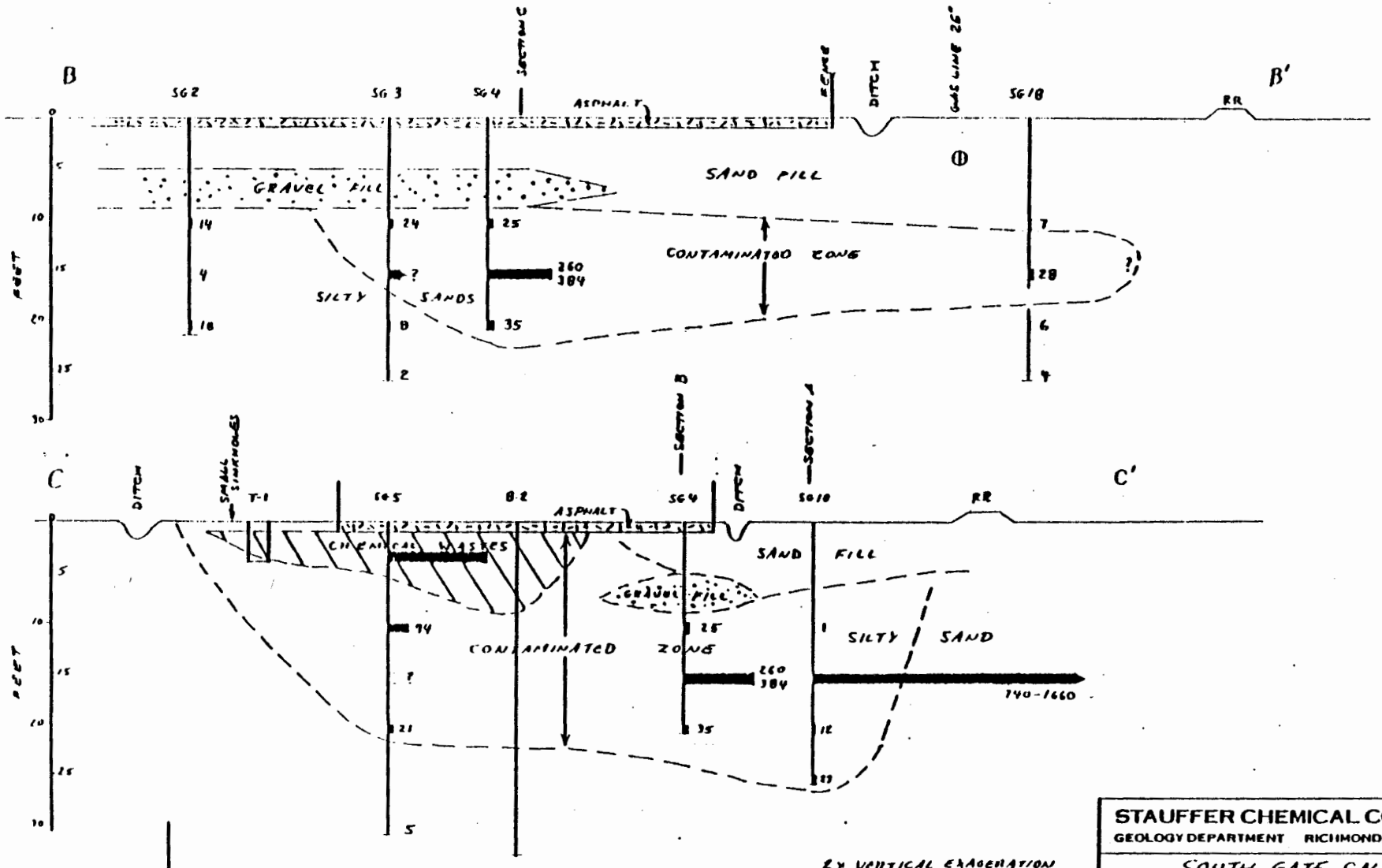
SOUTH GATE, CALF.
OLD POND AREA
CROSS-SECTION A

DWN. BY	SU	DATE	8/10/82	SCALE
REVISED BY	DATE			DRAWING NUMBER
				FIG. 2



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SOUTH GATE, CALF.
OLD POND AREA
CROSS-SECTIONS B & C

DWN BY SW	DATE 8/10/82	SCALE
REVISED BY	DATE	DRAWING NUMBER FIG. 3

prevent corrosion and bioaccumulation was a common practice at this type of facility. Such cooling water could have been periodically vented (blow down-water) to the sludge pond. Although it cannot be established that this in fact was done at South Gate, it was not an uncommon practice. Another theory is that the chromium could be attributable to the many stainless steel vessels and piping used at this plant. A third possibility is that the chromium detected in the soil is natural and was not part of the former waste disposal. Although by not having chromium analysis of soils outside the former pond area, a comparison to site background cannot be made. However, Stauffer has previously reviewed existing published data on background levels for heavy metals. This data shows that chromium levels detected at South Gate are within the range in levels reported for surfacial materials in the conterminous U.S. Attached with this report is a tabulation of this data (including a list of publications reviewed) entitled Heavy Metal Concentration in Soil, Sediment and Surface Waste.

As can be seen from the cross-sections, the higher arsenic levels are confined to the soils in the immediate area of the former pond. Since the pond has been closed and paved over with asphalt for 20 years, we believe that the potential for further migration has been, for the most part, eliminated.

Since 1979, Stauffer Chemical Company has conducted ground-water assessments at all of its facilities. Principally, this has included examination of existing published information on ground-water occurrence and use. In the area of the South Gate plant, based on review of such data and discussions with Los Angeles Flood Control personnel and Central and West Basin Water Replenishment District personnel, we have determined that ground-water occurs under shallow perched conditions as well as deep confined conditions. Presently, ground-water removal for agriculture, industrial and potable use is from the deep confined aquifers which occur several hundred feet below the existing ground surface. The shallow perched systems are not used because of low yield and generally poor water quality. The deeper used aquifers are separated from the perched system by aquitards which are reported to be individually as much as 100 feet thick.

Examination of the U.S. Gypsum Co. deep well log from an adjacent site property, which was provided to you at our April 4, 1984 meeting, confirms the occurrence of several clay aquitards beneath the site. The shallowest of these, a Blue Clay unit, is shown on the well log to exist from 40 to 70 feet below the ground surface and to have a seasonal perched water table above it. The deepest boring in the pond area, B-3, extended to 43 feet and was dry. Of the remaining 16 borings, varying degrees of partial soil saturation were noted on the logs, but standing water was only encountered in three; SG-9, SG-10 and SG-13. As noted on the logs, PVC piezometers were installed in three holes; SG-4, SG-9 and SG-12. SG-12 is reported to have been dry at the time of installation and never collected water, and both SG-12 and SG-9 piezometers were destroyed during improvements to the adjacent drainage ditch. The piezometer in SG-4 which you observed during your visit remains in place.

The observed intermittent occurrence of free water in the exploratory borings is not consistent with saturated zone (ground water) conditions. This leads to the conclusion that the encountered free water is not representative of a fully saturated or ground-water system, perched or otherwise, but probably represents isolated pockets of water which may become trapped in the relatively loose pond backfill soils.

As we have previously discussed, samples of the encountered free water were collected from SG-4 and SG-9 at the time of piezometer completion and analyzed. However, the piezometers are situated within the area of the former waste disposal and soils with high As detections. This raises the question of possible artificial contamination during drilling. Stauffer believes that these samples are not representative of area ground water, therefore, Stauffer has not included the data with this report.

In conclusion, it is Stauffer Chemical Company's assessment that the former waste disposal pond does not present an environmental risk based on the following:

1. The extent of high arsenic detections are limited to the immediate vicinity of the old pond area, which demonstrates a low migration potential.

2. Percolation of surface water is inhibited by existing asphalt cover.

3. The lack of a useable shallow aquifer beneath the site.

4. There is significant hydraulic separation of the deep (used) aquifers from the near surface (unused) perched water systems.

I hope the information provided here adequately addresses your request and is of assistance to you in completing your assessment. If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

STAUFFER CHEMICAL COMPANY

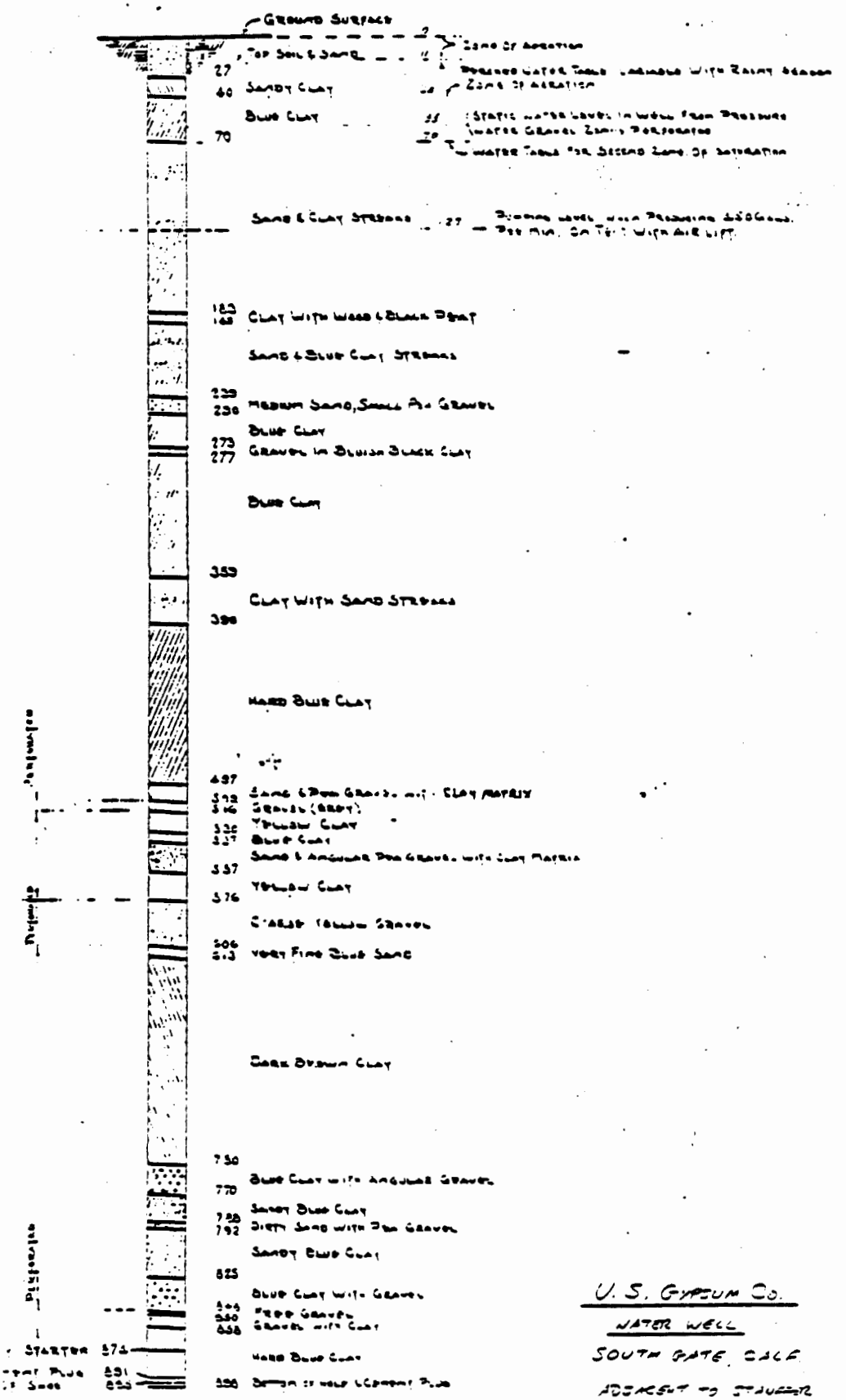
Bruce S. McClellan
Senior Hydrogeologist

BSM095:dm

Attachment

LIST OF ATTACHMENTS

1. Boring Logs for SG-2 to SG-5 and SG-9 to SG-18
2. Boring Logs for B-1 to B-3
3. Tabulation of Analytical Results for Soil Samples 1981 & 1982
4. Tabulation for Heavy Metal Concentration in Soil, Sediment and Surface Water



U. S. Gypsum Co.

Water Well

South Gate, Calif.

Adjacent to Strucker

4/23/37

FIGURE 4

BOREHOLE LOG / STAUFFER CHEMICAL CO. GEOLOGY DEPARTMENT

Project & Location South Gate Plant CA

Boring No. SG-2 Date Begun 7/8/81 Date Finished 7/8/81 Plant Coordinates NA Ground Surface Elev. ~ 15.2

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL Sample Type	SOIL SPT	SOIL USCS	ROCK Run No.	ROCK Recov.	ROCK RQD	Elevation & Ground Water
1	sand; whitish tan, medium fine grained, uniform, dry										
2											
3											
4											
5			HSA.								
6											
7	sand; white, coarse, gravelly, nonuniform damp										
8											
9											
10	sand, fine to medium grained, grading silty toward 21 feet. * Grey color from cement grout - compaction grouting of area carried out in 1979.			13.6 mg/kg As	split spoon	SG-2A					
11											
12											
13											
14				slight amount (~3 inches) of green chemical waste mixed with soil							

Field Engineer TA Bornister

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location South Gate Plant, CA

Boring No. SG-2 (cfd) Date Begun 7/8/81 Plant Coordinates NA

Date Finished 7/8/81 Ground Surface Elev. ~115.1

~PT	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation & Ground Water
16	(as above) SAND, Grout(?)		HSA	3.9 mg/kg As	split spoon	SG-2B					
17											
18											
19											
20	silt, v. dark gray green, clayey			17.7 mg/kg As	split spoon	SG-2C					▽ wet, but no water accumulation in hole
21				T.D.							
22											
23											
24											
25											

Field Engineer T. A. [illegible]

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location South Gate, Plant, CA

Boring No. SG-3 Date Begun 7/8/81 Date Finished 7/8/81 Plant Coordinates — Ground Surface Elev. ~115.7

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL Sample Type	SOIL SPT	SOIL USCS	ROCK Run No.	ROCK Recov.	ROCK RQD	Elevation & Ground Water
0–5	sand; brown, fine grained, uniform, dry, loose										
5–10	sand; white, coarse, gravely, nonuniform damp, med. dense										
10–15	sand; gray, medium grained, uniform, damp, med. dense			24.2 mg/kg As	SG-3A	34/1.5'					
15–22	silt; black, sandy wet with some → obviously black chemical process waste,			H_2S odor prominent 8.3 mg/kg As	SG-3B						▽ Wet but no water accumulation in hole
22–26	sand; black silty very wet			1.8 mg/kg As T.D.	SG-3C	25/1.5'					
26–30											

Field Engineer T.A. Bornister

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location South Gate Plant CA.

Boring No. SG-4 Date Begun 7-8-81 Plant Coordinates —

Date Finished 7-8-81 Ground Surface Elev. ~115.2

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation & Ground Water
0	sand & coarse gravel fill, brown, loose										
2	sand; brown, fine grained, uniform some silt, dry										
4											
6	sand; light tan, coarse, gravelly, nonuniform, damp										
8											
10	sand; dark grey, medium grained, uniform, damp to wet			25 mg/kg As	SG-4A	24/1.5'					
12				placed P.V.C. Piezometer 5" slots from 15'-20' deep -6' crse sand pack -2' bentonite							
14											
16	* yellow color streaks within soil — strong "rotten egg" odor				SG-4B	260	384 REJECT				▽ wet — no water in hole however
18											
20				34.8 mg/kg As T.D.	SG-4C						
22											
24											
26											
28											
30											

Field Engineer T.A. Cornelius

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location: South Gate Plant, CA

Boring No.: SG-5 | Date Begun: 7-8-81 | Date Finished: 7-8-81 | Plant Coordinates: — | Ground Surface Elev.: ~115.1

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation & Ground Water
2	sand; brown, fine grained, uniform, fill dry										
4	light green, red and black chemical waste, wet			502 mg/kg As (304 REPEAT)	SG-5A						
6	sand; black, medium grained, uniform loose, appears chemically altered. (grains overly rounded as if dissolving matrix is black and fine grained.										
8											
10				94	SG-5B						
12											
14											
16											
18	sand; black, silty, medium grained, wet										wet, but NO water in hole
20				21.4	SG-5C						
22											
24											
26	silty; black, sandy, wet, "soupy"										
28				5 (3.7 REPEAT) SG-5D							
30	clay; tan, silty, sandy, damp			T.D.							

Field Engineer: T.A. Bonnicksen

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location South Gate Plant, CA

Boring No. SG-9 Date Begun 7-7-81 Plant Coordinates —

Date Finished 7-7-81 Ground Surface Elev. ~115.5'

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation & Ground Water
0–10	sand; tan to gray, between fine and medium grained, well sorted, (micaceous) dry to slightly damp										
10–14	sand; white, coarse grained, poorly sorted, wet			11.3 mg/kg As	SG-9A						
14–20	sand; gray, medium grained, uniform, wet			P.V.C. piezometer set at 25'. 5' slots 10' caved, no crisa sand placed - 3' bentonite backfilled	SG-9B	22.3 mg/kg					▽
20–26	sand; v. dark gray, med. grained, silty thin layers of black chemical waste(?) (~3 inches thick) wet.			As?	SG-9C						
26–26.5	sand; gray tan, fine grained, silty becoming clayey at 26.5'			3.8 mg/kg As T.D.	SG-9D						
28–30											

Field Engineer [illegible]

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location South Gate Plant CA

Boring No. SG-10 Date Begun 7-7-81 Plant Coordinates —

Date Finished 7-7-81 Ground Surface Elev. ~11'

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation & Ground Water
0–10	sand; greenish tan, fine and medium grained										
10–20	sand; gray-green, fine grained			1.2 mg/kg As	SG-10A						
				740 mg/kg As (1660 REPEAT)	SG-10B						
20–24	sand; gray with yellow streaks and "rotten egg" odor; black silty chemical solid waste			12 mg/kg As	SG-10C						
24–26	sand; gray-green fine grained, silty, clayey			21.5 mg/kg As T.D.	SG-10D						
26–30											

Field Engineer TM Reynolds

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location South Gate plant CA

Boring No. SG-11 Date Begun 7-7-81 Plant Coordinates —

Date Finished 7-7-81 Ground Surface Elev. ~115.7

PTI	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation & Ground Water
2	sand; gray green, fine grained, well sorted										
4											
6											
8	sand; white, coarse, gravelly, loose			13.8 mg/kg As	SG-11A						
10	sand; green, fine grained, silty, v. damp to wet										
14											DRY?
16	sand, gray, medium grained, uniform			187 mg/kg As; T.D (225 REPEAT)	SG-11B						
18											
20											
22											
24											
26											
28											
30											

Field Engineer T.M. Dennis

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location South Gate California

Boring No. SG-12 Date Begun 7-3-81 Plant Coordinates —

Date Finished 7-8-81 Ground Surface Elev. ~ 115.6

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
4	grey green fine to medium well-sorted sand			WELL INSTALLED (DRY)								
5				3.3 mg/kg As	split-spoon	SG-12A						
6												
7	sand grading coarser-poorly sorted 0.5mm-3mm damp											
8												
9												
10												
11				16.5 mg/kg As	split spoon	SG-12B						
12	grey to green fine and medium sand grading siltier											
13												
14												
15	T.D.											

Field Engineer _____

BOREHOLE LOG / STAUFFER CHEMICAL CO. GEOLOGY DEPARTMENT

Project & Location: SOUTH GATE CALF

Boring No.: SG-13

Date Begun: 7/21/82

Date Finished: "

Plant Coordinates:

Ground Surface Elev.: ~116

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
2	SAND, BROWN-GRAY DAMP, MICACEOUS SILTY		HOLLOW-STEM AUGER									
4												
6												
8												
10				SG-13A	SS							
12												
14				ENCOUNTER GRND WATER								
				SG-13B 127 mg/Kg As	SS							
16	SAND, CLAYEY, GRAY WET, SLIGHTLY PLASTIC											
18												
				SG-13C 32	SS							WATER
	AS ABOVE, BUT DAMP ONLY											
				OUT OF WATER								
				SG-13D 50	SS							
28												
30	SAND, SILTY, GRAY-BROWN, DAMP			SG13E								

Geologist: S. WALKER

DREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

ct & Location SOUTH GATE CALF

ring No. SG-13 Date Begun 7/21 Plant Coordinates

Date Finished Ground Surface Elev.

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
32	SAND, SILTY, GRAY TO LIGHT BROWN, DAMP TO DRY		HSA	SG-13E 12.2	SS							
34				SG-13F 9.6	SS							
36	TD			PIEZOMETER INSTALLED: SLOTTED 18-13 FT, GRAVEL PACK, 1' BENTONITE								

Geologist J WALKER

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location: SOUTH GATE CALF.

Boring No.: SG-14 | Date Begun: 7/21/92 | Date Finished: | Plant Coordinates: | Ground Surface Elev.:

Depth	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
2	SAND, LT. BROWN DRY		HOLLOW-STEM AUGER	SG-14A	SS							NO FREE GROUNDWATER
4												
6												
8												
10	LIMESTONE? RUBBLE ? HARD, GRAY (POSS. OLD CEMENT GROUT)			SG-14B 10.4 mg/Kg As	SS							
12	SAND, GRAY, STIFF DAMP											
14				SG-14C 18.7	SS							
16												
18												
20	SILT, CLAYEY, DARK GRAY TO BLACK, DAMP SULFUROUS SMELL			SG-14D 15.1	SS							
22												
24												
26	SAND, CLAYEY, DARK GRAY DAMP			SG-14E 1.2	SS							
28												
30				SG-14F								

Geologist: J. WALKER

...EHOLE LOG / STAUFFER CHEMICAL CO.
GE ..LOGY DEPARTMEN

...t & Location SOUTH GATE CALF.

...ing No. SG-14 Date Begun 7/21/82 Plant Coordinates

Date Finished " Ground Surface Elev.

SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
SAND, CLAYEY, DK. GRAY		HSA	SG-14F 3.0	SS							NONE
32											
34 — — — — —											
SAND, TAN, DRY			SG-14G 0.53	SS							
36 TD											

Geologist S. WACKER

)PEHOLE LOG / STAUFFER CHEMICAL CO. GE)LOGY DEPARTMEN

:j ct & Location SOUTH GATE CALF.

:ing No. SG-15 Date Begun 7/21/82 Date Finished " Plant Coordinates Ground Surface Elev.

SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL Sample Type	SOIL SPT	SOIL USCS	ROCK Run No.	ROCK Recov.	ROCK RQD	Elevation	Ground Water
SAND, TAN, DRY		HOLLOW-STEM AUGER	SG-15A	SS							DAMP BUT NO FROE GRNDWATER
			SG-15B 0.77 mg/kg As	SS							
SAND, GRAY, DAMP.			SG-15C 4.3	SS							
SAND, BLACK TO DK. GRAY SILTY, CLAYEY, DAMP			SG-15D 13.7	SS							
SAND, GRAY-GREEN SILTY, DAMP			SG-15E 4.1	SS							
			SG-15F								

Geologist S. WALKER

OPEHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location SOUTH GATE CALF

Boring No. SG-15 (CONT) Date Begun 7/21/82 Plant Coordinates

Date Finished " Ground Surface Elev.

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
32	SAND, GRAY-GREEN SILTY, DAMP			SG-15F 1.6	SS							
34												
36	SAND, TAN TO GRAY, DRY. CLAY STREAK RUSTY			SG-15G 1.3	SS							
38												
40				SG-15H	SS							
42	SAND, VERY CLAYEY DARK GREY, DAMP PLASTIC											
44				SG-15I 1.2	SS							
46				SG-15J	SS							
48				SG-15K 0.53	SS							DAMP BUT NO FREE GROUNDWATER
50	TD											

Geologist S. WALKER

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location SOUTH GATE CALIF.

Boring No. SG-16 Date Begun 7/22/82 Plant Coordinates

Date Finished " Ground Surface Elev.

DEPTH	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
0	SAND, TAN, DAMP CLEAN		HOLLOW-STEM AUGER	SG-16A	1							NO FREE GROUNDWATER
6					SS							
8												
10				SG-16B 10.6 mg/kg - AS	SS							
12												
14				SG-16C 3.1								
16					SS							
	SAND, CLAYEY, DARK GRAY DAMP PLASTIC			SG-16D 17.0	SS							
	SAND, CLAYEY, GRAY-GREEN DAMP, NOT PLASTIC			SG-16E 14.4	SS							
30	SAND, GRAY-GREEN-BROWN DRY			SG-16F 4.6	SS							

31' TD

Geologist S. WACKER

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location SOUTH GATE, CALF.

Boring No. SG-17 Date Begun 7/22/82 Plant Coordinates

Date Finished " Ground Surface Elev.

Depth	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
2	SAND, TAN TO GRAY DAMP		HOLLOW-STEM AUGER	SG-17A	SS							NO GROUNDWATER
4												
6												
8												
10	SAND, GRAY-GREEN SILTY, DAMP			SG-17B 3.6 mg/kg	SS							
12												
14												
16	SAND, CLAYEY, DARK GRAY-GREEN, PLASTIC DAMP			SG-17C 1.2	SS							
18												
20				SG-17D 7.2	SS							
22												
24												
26	SAND, GRAY-GREEN SILTY, LESS CLAY DAMP			SG-17E 6.1	SS							
28												
30	SAND, GRAY-BROWN			SG-17F 12.3	SS							

31' TD

Geologist S. WALKER

BOREHOLE LOG / STAUFFER CHEMICAL CO.
GEOLOGY DEPARTMENT

Project & Location SOUTH GATE CALF.

Boring No. SG-18 Date Begun 7/22/82 Plant Coordinates

Date Finished " Ground Surface Elev.

Depth	SOIL/ROCK DESCRIPTION	Profile	Drilling Method	Remarks	SOIL: Sample Type	SOIL: SPT	SOIL: USCS	ROCK: Run No.	ROCK: Recov.	ROCK: RQD	Elevation	Ground Water
2	SAND, COARSE, TAN DRY		HOLLOW-STEM AUGER	SG-18A	SS							NO GROUNDWATER
4												
6												
8												
10	SAND, DARK GRAY, SILTY DAMP. BLACK & YELLOWISH STREAKS, CONTAMINATED			SG-18B 6.5 mg/Kg								
12												
14												
16	SAND, GRAY-GREEN SILTY, WET, PROB. CONTAMINATED			SG-18C 27.5								
18												
20				SG-18D 5.9								
22												
24												
26	SAND, GRAY-BROWN SLIGHTLY DAMP, CLEANER			SG-18E 3.5								

Geologist

DATE OF BORING 15 August 1979 WATER DEPTH 6.0 ft DATE MEASURED 15 August 1979

TYPE OF DRILL RIG Mobile B-61 Hollow Stem Auger HOLE DIAMETER 8"

WEIGHT OF HAMMER 140 lbs FALLING 30" SAMPLES 2" Dia. Modified California, SPT

DEPTH, FT.	SAMPLES	BLOWS/FOOT	DESCRIPTION	UNC. COMP. STRENGTH, ksf	MOISTURE CONTENT, %	DRY DENSITY pcf	OTHER TESTS
			SURFACE ELEVATION: 100.0				
	1	18	Loose, dry, gray, GRAVELLY fine SAND (SP/SM) with brick and concrete rubble Loose to medium dense, moist, fire brick and other rubble				
5			Soft, wet, dark gray and red, clay-like chemical process wastes, with loose, gray, CLAYEY fine SAND (SC)				
	2	9					
10	3	50/7"	Very dense, gray, fine SAND (SP), native soil ?				
			Medium dense				
15	4	11					
			Grading more dense				
20	5	20	Medium dense, green gray, SILTY fine SAND (SM) with lenses of CLAYEY SAND (SC) and black SANDY SILT (ML)				
25			Very dense, gray, fine SAND (SP)				
	6	51					
30			Bottom of Boring at 28.0 ft.				

Project: STAUFFER CHEMICAL - SOUTH GATE

Project No. 411911

LOG OF BORING 1

Fig. A-2

DATE OF BORING 15 August 1979 WATER DEPTH 10.9 ft DATE MEASURED 15 August 1979
TYPE OF DRILL RIG Mobile B-61 Hollow Stem Auger HOLE DIAMETER 8"
WEIGHT OF HAMMER 140 lbs FALLING 30" SAMPLES 2" Dia. Modified California

DEPTH, FT.	SAMPLES	BLOWS/FOOT	DESCRIPTION	UNC. COMP. STRENGTH, ksf	MOISTURE CONTENT, %	DRY DENSITY pcf	OTHER TESTS
			SURFACE ELEVATION: 101.8				
			Firm, moist, red brown, CLAY (CH), with fine GRAVEL, fill				
	1	7	Loose, chemical process wastes, fire brick and other rubble				
5			Soft to very soft, wet, black, chemical process wastes				
	2	½" NR					
10		▽	Very dense, wet, gray, SILTY fine SAND (SM), fill				
	3	54/6"					
			Firm, gray, SILT (ML) with very fine SAND, native ?				
15							
	4	11					
20							
			Medium dense, green gray, SILTY fine SAND (SM)				
	5	18					
25			↓ Grading cleaner and more dense				
	6	38	Medium dense, green gray, fine SAND (SP/SM), with a trace of SILT				
30			↓ Grading cleaner and more dense				

Project: STAUFFER CHEMICAL - SOUTH GATE
Project No. 411911

LOG OF BORING 2

Fig. A-3

DATE OF BORING 15 August 1979 WATER DEPTH _____ DATE MEASURED 15 August 1979

TYPE OF DRILL RIG Mobile B-61 Hollow Stem Auger HOLE DIAMETER 8"

WEIGHT OF HAMMER 140 lbs. FALLING 30" SAMPLES 2" Dia. Modified California

DEPTH, FT.	SAMPLES	BLOWS/FOOT	DESCRIPTION	UNC. COMP. STRENGTH, ksf	MOISTURE CONTENT, %	DRY DENSITY pcf	OTHER TESTS
			SURFACE ELEVATION:				
	7	62	Very dense, green gray, fine SAND (SP)				
			Bottom of Boring at 33.0 ft.				

35
40
45
50
55
60

Project: STAUFFER CHEMICAL - SOUTH GATE
Project No. 411911

CONT. LOG OF BORING 2

Fig. A-3a

DATE OF BORING 15 August 1979 WATER DEPTH Approx. 8 ft. DATE MEASURED 24 August 1979
TYPE OF DRILL RIG Mobile B-61 Hollow Stem Auger HOLE DIAMETER 8"
WEIGHT OF HAMMER 140 lbs FALLING 30" SAMPLES 2" Dia. Modified California

DEPTH, FT.	SAMPLES	BLOWS/FOOT	DESCRIPTION	UNC. COMP. STRENGTH, ksf	MOISTURE CONTENT, %	DRY DENSITY pcf	OTHER TESTS
			SURFACE ELEVATION: 100.9				
			Medium dense, chemical process wastes, fire brick and other rubble				
	1	16					
5							
			Very dense, moist, gray, SILTY fine SAND (SP/SM to SM), native ?				
	2	84					
			Scattered, thin cemented layers (¼" thick), increasing				
10							
	3	100/5"					
			Dense, gray, SILTY fine SAND (SM), with cemented nodules (¼" to ½")				
15							
	4	14	Very stiff, very dark brown, SILT (ML)				
			Medium dense, green gray, SILTY fine SAND (SM) to SANDY SILT (ML/SM)				
20							
	5	30	1.3 mg/kg As				
25							
			Medium dense to dense, green gray, fine SAND (SP to SP/SM)				
	6	44	1.7 mg/kg As				
30							

Project: STAUFFER CHEMICAL - SOUTH GATE
Project No. 411911

LOG OF BORING 3

Fig. A-4

WOODWARD-CLYDE CONSULTANTS

DATE OF BORING 15 August 1979 · WATER DEPTH _____ DATE MEASURED 24 August 1979

TYPE OF DRILL RIG Mobile B-61 Hollow Stem Auger HOLE DIAMETER 8"

WEIGHT OF HAMMER 140 lbs FALLING 30" SAMPLES 2" Dia. Modified California

DEPTH, FT.	SAMPLES	BLOWS/FOOT	DESCRIPTION	UNC. COMP. STRENGTH, ksf	MOISTURE CONTENT, %	DRY DENSITY pcf	OTHER TESTS
			SURFACE ELEVATION:				
35	7	29	Medium dense to dense, green gray, fine SAND (SP to SP/SM) 2.1 mg/kg As				
40	8	30					
	9	33					
45			Bottom of Boring at 43½ ft. No ground water encountered at time of drilling. ✓				
50							
55							
60							

Project: STAUFFER CHEMICAL - SOUTHGATE
Project No. 411911

CONT. LOG OF BORING 3

Fig. A-4a

Table 1

Soil Sample Arsenic Analyses
South Gate, California
July 1982

Sample No.	Depth	As	Sample No.	Depth	As
13B	25 ft	127 mg/Kg	16B	10 ft	10.6 mg/Kg
13C	20	32	16C	15	3.1
13D	25	50	16D	20	17.0
13E	30	12.2	16E	25	14.4
13F	35	9.6	16F	30	4.6
14B	10	10.4	17B	10	3.6
14C	15	18.7	17C	15	1.2
14D	20	15.1	17D	20	7.2
14E	25	1.2	17E	25	6.1
14F	30	3.0	17F	30	12.3
14G	35	0.53			
			18B	10	6.5
15B	10	0.77	18C	15	27.5
15C	15	4.3	18D	20	5.9
15D	20	13.7	18E	25	3.5
15E	25	4.1			
15F	30	1.6	B-3-5	23	1.3
15G	35	1.3	B-3-6	28	3.7
15I	45	1.2	B-3-7	33	2.1
15K	55	0.53			

certified testing laboratories, inc.
2905 EAST CENTURY BLVD. • SOUTH GATE, CALIF. 90280 • (213) 564-2541

LABORATORY NO. 70768
CLIENT Stauffer Chemical Company
4570 Ardine Street
South Gate, California 90280

REPORTED 8-3-81
SAMPLED
RECEIVED

SAMPLE Soil

MARKS Requisition #263033
BASED ON SAMPLE As Received

Results:

		Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium
SG-4G	7-8-81	260 mg/kg	<1 mg/kg	92 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-5C	7-8-81	21.4 mg/kg	<1 mg/kg	18 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-10B	7-8-81	739 mg/kg	<1 mg/kg	127 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-10D	7-8-81	21.5 mg/kg	<1 mg/kg	24 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-3A	7-8-81	24.2 mg/kg	<1 mg/kg	57 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-5B	7-8-81	94.0 mg/kg	<1 mg/kg	78 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-10A	7-8-81	1.2 mg/kg	<1 mg/kg	13 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-11B	7-8-81	187 mg/kg	17 mg/kg	188 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SPT	TAB						
SG-12A	7-8-81 TAB	3.3 mg/kg	<4 mg/kg	7 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-9A	7-8-81 TAB	11.3 mg/kg	<1 mg/kg	25 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-9B	7-8-81 TAB	22.3 mg/kg	<1 mg/kg	73 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-3C	7-8-81	1.8 mg/kg	<1 mg/kg	21 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg
SG-2B	7-8-81	3.9 mg/kg	<1 mg/kg	253 mg/kg	<10 mg/kg	<1 mg/kg	<1 mg/kg

Respectfully submitted,

CERTIFIED TESTING LABORATORIES, INC.

Stuart E. Salot, Ph.D.

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from these Laboratories.

certified testing laboratories, inc.
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LABORATORY NO. 70681
CLIENT Stauffer Chemical Company
4570 Ardine Street
South Gate, California 90280

REPORTED 7-10-81
SAMPLED
RECEIVED 7-7-81

SAMPLE Soil

MARKS 7-8-81
BASED ON SAMPLE As Received

Results:

		Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium
(A)	SG-9D TAB	3.8 mg/kg	<0.5 mg/kg	10 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(B)	SG-10C	12.0 mg/kg	<0.5 mg/kg	21 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(C)	SG-11A TAB	13.8 mg/kg	<0.5 mg/kg	13 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(D)	SG-11As	29.4 mg/kg	<0.5 mg/kg	19 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(E)	SG-12B TAB	16.5 mg/kg	<0.5 mg/kg	16 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg

Respectfully submitted,

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certified testing laboratories, inc.
2905 EAST CENTURY BLVD. • SOUTH GATE, CALIF. 90280 • (213) 564-2641

LABORATORY NO. 70694
CLIENT Stauffer Chemical Company
4570 Ardine Street
South Gate, California 90280
SAMPLE Soil

REPORTED 7-10-81
SAMPLED
RECEIVED 7-9-81

MARKS 7-8-81
BASED ON SAMPLE As Received

Results:

		Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium
(A)	SG-2A	13.6 mg/kg	<0.5 mg/kg	14 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(B)	SG-2C	17.7 mg/kg	<0.5 mg/kg	19 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(C)	SG-3B	8.3 mg/kg	<0.5 mg/kg	12 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(D)	SG-4A	25.0 mg/kg	<0.5 mg/kg	14 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(E)	SG-4C	34.8 mg/kg	<0.5 mg/kg	18 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(F)	SG-5A	4.90 mg/kg	<0.5 mg/kg	14 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg
(G)	SG-5D	502 mg/kg	8 mg/kg	33 mg/kg	<10 mg/kg	<0.5 mg/kg	<0.5 mg/kg

Respectfully submitted,

CERTIFIED TESTING LABORATORIES, INC.

Stuart E. Salot, Ph.D.

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certified testing laboratories, inc.
2905 EAST CENTURY BLVD. • SOUTH GATE, CALIF. 90280 • (213) 564-2541

LABORATORY NO. 71115
CLIENT Stauffer Chemicals
4570 Ardine Street
South Gate, California 90280

REPORTED 9-16-81
SAMPLED
RECEIVED 9-3-81

SAMPLE Soil

MARKS P.O. #179263098
BASED ON SAMPLE As received

Results:

	Arsenic	
SG-4B	384	mg/l
SG-5A	304	mg/l
SG-5D	3.70	mg/l
SG-10B	1659	mg/l
SG-11B	225	mg/l

Respectfully submitted,

CERTIFIED TESTING LABORATORIES, INC.

Stuart E. Salot, Ph.D.

his report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or milar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from these Laboratories.

Table A 5 HEAVY METAL CONCENTRATION IN SOIL, SEDIMENT AND SURFACE WATER - ave. (range) mean 2/8/83

	Soil PPM (µg/g)			Sediment PPM (µg/g)		Surface Water PPB (µg/l)		
Element	(8) U. S.	(9) Worldwide?	Other U. S.	U. S.	Contaminated U. S.	U. S. Fresh	(5) World Rivers	
Ag		.1 (.01-5)	(1) 13(<1-80)				(.01-3.5)	0.1
As		6 (.1-40)	(2) 7(.3-38)	(3) (0.1-306)	(3) (4470-66,700)	(3) (<1-1800)*	(<.4-230)	.4
Ba	554(15-5000)	500 (100-3000)				(6) (2-340) 3	(9-150)	54
Be	1(<1-7)	6 (.1-40)	(10) 0.6(<1-7)				(.1-1)	1
Cd		.06 (.01-.7)	(10) 1(<1-4)			(6) (1-20) 9.5		0.8
Cr	53(1-1500)	100 (5-3000)	(7) Urban(43-1450) (10) 36(1-100) (4) (<1-30,300)**	(4) (2-288)		(4) (1-112) 10	(.1-80)	
Cu	25(<1-300)	20 (2-100)	(10) 13(3-100)			(6) (1-280) 15	(.6-400)	
Hg		.03 (.01-.3)	(10) .096(.01-3.4)					0.8
Ni	20(<5-700)	40 (10-1000)	(10) 14(3-700)				(.2-20)	10
Pb	20(<10-700)	10 (2-200)	(5) residential 1636 commercial 2413 (7) Urban(2110-8300) (10) 14(<7-300)			(5) Major U.S. rivers 6.1 Main lakes & rivers 2.3 (.03-115)	(.6-120)	5
Sb		(2-107)						<20
Se		.2 (.01-2)	(10) .39(<.1-1.4)					.02
Tl	0.1						.05-22)	2.6
Zn	54 (<25-2000)	50(10-300)	(7) Urban(460-580)					

(1) The Chemistry & Phytotoxicity of Arsenic in Soil, Contaminated Field Soils. Woolson et al pg. 938-943. SOIL SCI. SOC. AMER. PROC. Vol. 35 1971
(2) Arsenic Distribution in Soils and Its Presence in Certain Plants USDA Tech. Bul #732, July 1940
(3) Arsenic, Natural Academy of Science, Wash. D.C. 1977
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(5) Lead, National Academy of Sciences, Wash. D.C. 1972
(6) Water Quality Criteria. A Report of the Committee on Water Quality Criteria, PB-236 199 U.S. Dep. of Commerce 1972
(7) Distribution of Metals in Streetsweepings, Stormwater Solids and Urban Aquatic Sediments, Wilber, et al, J. Water Poll. Cont. Fed. 1979, Vol. 51, #12, page 2810-2822
(8) Elemental Composition of Surficial Materials in the Conterminous U.S., Shacklette, et al, Geological Survey Professional Paper 574-D 1971)
(9) Trace Elements in Biochemistry, Bowen, H.J.M., Academic Press (1966)
(10) Background Geochemistry of some rocks, soils, plants and vegetables in the conterminous U.S. Connor, J.J., & Shacklette, H.T., U.S. Geol. Survey Professional paper 574-F, U.S. Gov. Printing Office, 1975 (Eastern U.S.) taken from EPA publication EPA-600/9-80-010 March 1980.

*Searles Lake, Calif. contains 198,000-243,000

**Everglades peat and Okeechobee muck

Reference:
SWRCB, 2017

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Water System Details

Water System No. :	CA1910160	**Federal Type :**	C
Water System Name :	TRACT 349 MUTUAL WATER CO.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	4630 SANTA ANA STREET CUDAHY,CA 90201	Business	323-560-1601	
Physical Location Contact	CA1910160-TRACT 349 MUTUAL WATER CO.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 07 - HOLLYWOOD	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	7500

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	7	ME	0
CM	90	ME	0
IN	44	ME	0
RS	764	ME	0

Sources of Water

Name	Type Code	Status
MWD CONN CB-8 THROUGH HUNTINGTON PARK	CC	A
WELL 02	WL	A
WELL 03	WL	A
WELL 01 - DESTROYED	WL	I
WELL 04 - PENDING	WL	P

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	004

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Water System Details

Water System No. :	CA1910049	**Federal Type :**	C
Water System Name :	HUNTINGTON PARK-CITY, WATER DEPT.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	6550 MILES AVE HUNTINGTON PARK,CA 90255	Business	323-584-6253	
Physical Location Contact	CA1910049-HUNTINGTON PARK-CITY, WATER DE			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	17246

Service Connections

Type	Count	Meter Type	Meter Size Measure
CM	886	ME	0
RS	4661	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION CB-8 - TREATED	CC	A
WELL 12	WL	A
WELL 14	WL	A
WELL 15	WL	A
WELL 16	WL	A
WELL 18	WL	A
WELL 09	WL	I
WELL 10	WL	I
WELL 11	WL	I
WELL 17	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	011

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Water System No. :	CA1910152	**Federal Type :**	C
Water System Name :	SOUTH GATE-CITY, WATER DEPT.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	8650 CALIFORNIA AVENUE SOUTH GATE,CA 90280	Business	323-563-5790	
Physical Location Contact	CA1910152-SOUTH GATE-CITY, WATER DEPT.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	96057

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	46	ME	0
CM	1352	ME	0
IN	75	ME	0
RS	12745	ME	0

Sources of Water

Name	Type Code	Status
MWD CONN. CB-11 - TREATED	CC	A
MWD CONN. CB-7 - TREATED	CC	A
WELL 13 - STANDBY	WL	A
WELL 14	WL	A
WELL 18	WL	A
WELL 19	WL	A
WELL 23 - STANDBY	WL	A
WELL 24	WL	A
WELL 25 - STANDBY	WL	A
WELL 26	WL	A
WELL 27	WL	A
WELL 28	WL	A
WELL 02 - DESTROYED	WL	I
WELL 07 - DESTROYED	WL	I
WELL 08 - DESTROYED	WL	I
WELL 09 - DESTROYED	WL	I
WELL 12 - DESTROYED	WL	I
WELL 20 - DESTROYED	WL	I
WELL 22-A - DESTROYED	WL	I
WELL 22-B - INACTIVE	WL	I
WELL 29 - PENDING	WL	P

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	025
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	023

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Water System No. :	CA1910159	**Federal Type :**	C
Water System Name :	TRACT 180 MUTUAL WATER CO.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	4544 Florence Avenue CUDAHY,CA 90201	Business	323-771-6682	
Physical Location Contact	CA1910159-TRACT 180 MUTUAL WATER CO.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 07 - HOLLYWOOD	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	14000

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	27	ME	0
CM	367	ME	0
IN	21	ME	0
RS	733	ME	0

Sources of Water

Name	Type Code	Status
WELL 05	WL	A
WELL 06	WL	A
WELL 02-02E - DESTROYED	WL	I
WELL 02E - DESTROYED	WL	I
WELL 04-01N - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.

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Water System Details

Water System No. :	CA1910011	**Federal Type :**	C
Water System Name :	GSWC - BELL, BELL GARDENS	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	03-22-1979

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	12035 Burke Street, Suite 1 SANTA FE SPRINGS,CA 90670			
Physical Location Contact	CA1910011-GSWC - BELL, BELL GARDENS	Business	562-907-9200	WWW.GSWATER.COM

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 15 - METROPOLITAN	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	58048

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	26	ME	0
CM	704	ME	0
IN	8	ME	0
RS	6578	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION CB3 - TREATED	CC	A
BISSELL WELL #3	WL	A
BISSELL WELL 02	WL	A
CLARA WELL 02	WL	A
GAGE WELL 02	WL	A
OTIS WELL 03	WL	A
WATSON WELL 01	WL	A
BISSELL WELL 01 - INACTIVE	WL	I
CHANSLOR WELL - INACTIVE	WL	I
CLARA WELL 01 - DESTROYED	WL	I
DARWELL 01 - DESTROYED	WL	I
FLORENCE WELL 01 - ABANDONED	WL	I
GAGE WELL 01 - INACTIVE 10/15/12	WL	I
HOFFMAN WELL 02 - DESTROYED 10/26/07	WL	I
OTIS WELL 01 - DESTROYED	WL	I
OTIS WELL 02 - DESTROYED	WL	I
PRIORY WELL 02 - INACTIVE 10/15/12	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	018

CA Drinking Water Watch

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County Map

Glossary

Water System No. :	CA1910086	**Federal Type :**	C
Water System Name :	MAYWOOD MUTUAL WATER CO. #3	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	03-22-1979

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	6151 HELIOTROPE AVENUE MAYWOOD,CA 90270	Business	323-560-3657	
Physical Location Contact	CA1910086-MAYWOOD MUTUAL WATER CO. #3			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 16 - CENTRAL	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	9500

Service Connections

Type	Count	Meter Type	Meter Size Measure
IN	60	ME	0
RS	1945	ME	0

Sources of Water

Name	Type Code	Status
MWD CONN. CB-31A-MIDDLE FEEDER/TREATED	CC	A
WELL 04	WL	A
WELL 07	WL	A
WELL 08	WL	A
57TH STREET WELL 03 - DESTROYED	WL	I
DISTRICT PLANT WELL 02 - ABANDONED	WL	I
PROSPECT WELL 01 - INACTIVE	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	005

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Water System No. :	CA1900679	**Federal Type :**	NTNC
Water System Name :	RANCHO LOS AMIGOS HOSPITAL	**State Type :**	NTNC
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	08-08-2016

Water System Contacts

Type	Address	Phone	Email - Web Address
Administrative Contact	7601 E IMPERIAL HWY DOWNEY,CA 90242-3456		

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
LPA49 - LA COUNTY	626-430-5420	waterquality@ph.lacounty.gov	5050 Commerce Drive BALDWIN PARK CA 91706

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	NT	8800

Service Connections

Type	Count	Meter Type	Meter Size Measure
CB	12	UN	0

Sources of Water

Name	Type Code	Status
WELL 01 (DAIRY WELL)	WL	A
WELL 02 (DAIRY WELL)	WL	A
WELL 03 (POWERHOUSE WELL)	WL	A

Service Areas

Code	Name
NT	MEDICAL FACILITY

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.

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Water System Details

Water System No. :	CA1910084	**Federal Type :**	C
Water System Name :	MAYWOOD MUTUAL WATER CO. #1	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	5953 GIFFORD AVENUE HUNTINGTON PARK,CA 90255	Business	323-560-2439	
Physical Location Contact	CA1910084-MAYWOOD MUTUAL WATER CO. #1			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 16 - CENTRAL	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	3619

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	8	ME	0
CM	177	ME	0
RS	978	ME	0

Sources of Water

Name	Type Code	Status
MWD CONN. - CB31-MIDDLE FEEDER/TREATED	CC	A
WELL 03	WL	A
WELL 04	WL	A
WELL 02 - ABANDONED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	004

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Water System Details

Water System No. :	CA1910034	**Federal Type :**	C
Water System Name :	DOWNEY - CITY, WATER DEPT.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	11111 Brookshire Ave. DOWNEY,CA 90241	Business	562-622-3578	
Physical Location Contact	CA1910034-DOWNEY - CITY, WATER DEPT.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 16 - CENTRAL	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	112585

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	126	ME	0
CM	1268	ME	0
IN	40	ME	0
RS	21616	ME	0

Sources of Water

Name	Type Code	Status
MWD CONN. CB-18 - LOWER FEEDER/TREATED	CC	A
MWD CONN. CB-20 - LOWER FEEDER/TREATED	CC	A
MWD CONN. CB-21 - LOWER FEEDER/TREATED	CC	A
WELL 02 (OLD WELL 08)	WL	A
WELL 04	WL	A
WELL 05 (STOAKES 13)	WL	A
WELL 07 (OLD WELL 302)	WL	A
WELL 08 (OLD WELL 05)	WL	A
WELL 09 (OLD WELL 04)	WL	A
WELL 10 (OLD PWC WELL 42C)	WL	A
WELL 11	WL	A
WELL 12 (OLD PWC WELL 42B)	WL	A
WELL 14 (OLD WELL 02)	WL	A
WELL 15 (OLD WELL 06)	WL	A
WELL 16 (OLD WELL 10)	WL	A
WELL 17 (OLD PWC WELL 05E)	WL	A
WELL 18 (OLD WELL 11)	WL	A
WELL 19 (OLD WELL 01)	WL	A
WELL 23 (OLD WELL 07)	WL	A
WELL 24 (OLD PWC WELL 08B)	WL	A
WELL 25 (OLD WELL 09)	WL	A
WELL 29 (OLD PWC WELL 01C)	WL	A
WELL 30 (OLD PWC WELL 01D)	WL	A
OLD PWC WELL 11-A - DESTROYED	WL	I
OLD PWC WELL 42A - DESTROYED	WL	I
ROSEMEAD WELL 11 - DESTROYED	WL	I
STOAKES WELL 12 - DESTROYED	WL	I
WELL 01 (OLD WELL 13) - INACTIVE	WL	I
WELL 03 (OLD WELL 12) - DESTROYED	WL	I
WELL 06 (OLD PWC WELL 02C) - DESTROYED	WL	I
WELL 13 (OLD PWC WELL 05D) - INACTIVE	WL	I
WELL 20 (OLD PWC WELL 11B) - INACTIVE	WL	I
WELL 21 (OLD GOLF COURSE WL) - DESTROYED	WL	I
WELL 26 (OLD RUNDELL WELL) - DESTROYED	WL	I
WELL 27 (OLD SPRINGER WELL) - DESTROYED	WL	I
WELL 301 - DESTROYED	WL	I
NEW WELL	WL	P

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	036
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	034
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	035

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Water System No. :	CA1910079	**Federal Type :**	C
Water System Name :	LYNWOOD-CITY, WATER DEPT.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	03-22-1979

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	11330 Bullis Road LYNWOOD,CA 90262	Business	310-603-0220 EXT. 500	
Physical Location Contact	CA1910079-LYNWOOD-CITY, WATER DEPT.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	65965

Service Connections

Type	Count	Meter Type	Meter Size Measure
CM	855	ME	0
RS	8214	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION - TREATED	CC	A
WELL 05 - ACTIVE	WL	A
WELL 08 - ACTIVE	WL	A
WELL 09 - ACTIVE	WL	A
WELL 11 - ACTIVE	WL	A
WELL 19 - ACTIVE	WL	A
WELL 01 - INACTIVE	WL	I
WELL 02 - DESTROYED	WL	I
WELL 03 - INACTIVE	WL	I
WELL 04 - INACTIVE	WL	I
WELL 06 - INACTIVE	WL	I
WELL 07 - INACTIVE	WL	I
WELL 10 - DESTROYED	WL	I
WELL 15A - INACTIVE	WL	I
WELL 17A - DESTROYED	WL	I
WELL 17B - DESTROYED	WL	I
WELL 18 - DESTROYED	WL	I
WELL 20 - INACTIVE	WL	I
WELL 22	WL	P

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	018

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Water System No. :	CA1910108	**Federal Type :**	C
Water System Name :	LIBERTY UTILITIES - BELL GARDENS	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	03-22-1979

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	9750 Washburn Road DOWNEY,CA 90241	Business Business	562-299-5124 310-710-8004	
Physical Location Contact	CA1910108-BELL GARDENS-CITY, WATER DEPT.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 15 - METROPOLITAN	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	11879

Service Connections

Type	Count	Meter Type	Meter Size Measure
CM	330	ME	0
RS	1303	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION CB-31 - TREATED	CC	A
WELL 01	WL	A
WELL 03-C - DESTROYED	WL	I
WELL 03-F	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	003

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Water System Details

Water System No. :	CA1910085	**Federal Type :**	C
Water System Name :	MAYWOOD MUTUAL WATER CO. #2	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	04-21-1978

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	3521 E SLAUSON AVE MAYWOOD,CA 90270	Business	323-581-5816	
Physical Location Contact	CA1910085-MAYWOOD MUTUAL WATER CO. #2			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 16 - CENTRAL	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	7118

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	5	ME	0
CM	22	ME	0
RS	1897	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION NO. CB-31A - TREATED	CC	A
52ND STREET WELL	WL	A
MAY AVENUE WELL	WL	A
52ND STREET WELL FE&MN SEQ-PHOSPHATE	WL	I
MAYWOOD AVE WELL - FE&MN SEQ - PHOSPHATE	WL	I
PAE WELL - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	006

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Water System Details

Water System No. :	CA1910169	**Federal Type :**	C
Water System Name :	WALNUT PARK MUTUAL WATER CO.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	2460 E. FLORENCE AVENUE HUNTINGTON PARK,CA 90255	Business	323-581-3226	
Physical Location Contact	CA1910169-WALNUT PARK MUTUAL WATER CO.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 07 - HOLLYWOOD	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	16180
1	1	12	31	W	35

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	1	UN	0
CM	10	UN	0
RS	2820	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION - TREATED	CC	A
WELL 10	WL	A
WELL 11	WL	A
WELL 12	WL	A
WELL 08 - DESTROYED	WL	I
WELL 09 - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	005

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Water System Details

Water System No. :	CA1910195	**Federal Type :**	C
Water System Name :	GSWC - HOLLYDALE	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	12035 Burke Street, Suite 1 SANTA FE SPRINGS,CA 90670	Business	562-907-9200 EXT. 404	
Physical Location Contact	CA1910195-GSWC - HOLLYDALE			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 15 - METROPOLITAN	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	7666

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	5	ME	0
CM	105	ME	0
IN	6	ME	0
RS	1540	ME	0

Sources of Water

Name	Type Code	Status
CENTURY WELL 01	WL	A
MCKINLEY WELL 03	WL	A
COOLIDGE WELL 02 - DESTROYED	WL	I
MCKINLEY WELL 02 - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.

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Water System Details

Water System No. :	CA1910167	**Federal Type :**	C
Water System Name :	VERNON-CITY, WATER DEPT.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	4305 SANTA FE AVE VERNON,CA 90058	Business	323-583-8811 EXT. 245	
Physical Location Contact	CA1910167-VERNON-CITY, WATER DEPT.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 15 - METROPOLITAN	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	45000

Service Connections

Type	Count	Meter Type	Meter Size Measure
CM	930	ME	0
IN	228	ME	0
RS	17	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION - TREATED	CC	A
WELL 11	WL	A
WELL 12	WL	A
WELL 14 - STANDBY	WL	A
WELL 15	WL	A
WELL 16	WL	A
WELL 17	WL	A
WELL 19	WL	A
WELL 20	WL	A
WELL 21	WL	A
WELL 05	WL	I
WELL 07 - DESTROYED	WL	I
WELL 09	WL	I
WELL 10	WL	I
WELL 13 - DESTROYED	WL	I
WELL 18 - DESTROYED	WL	I
SMURFIT WELL 10	WL	P

Service Areas

Code	Name
NT	INDUSTRIAL/AGRICULTURAL

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	015

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Water System No. :	CA1910077	**Federal Type :**	C
Water System Name :	GSWC - FLORENCE/GRAHAM	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	12035 Burke Street, Suite 1 SANTA FE SPRINGS,CA 90670			
Physical Location Contact	CA1910077-GSWC - FLORENCE/GRAHAM	Business	562-907-9200	WWW.GSWATER.COM

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 15 - METROPOLITAN	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	65182

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	21	ME	0
CM	848	ME	0
IN	42	ME	0
RS	8620	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION CB12 - TREATED	CC	A
MWD CONNECTION CB5 - TREATED	CC	A
MWD CONNECTION CB6 - TREATED	CC	A
CONVERSE WELL 01	WL	A
CONVERSE WELL 02 - ACTIVE 6/22/2010	WL	A
GOODYEAR WELL 04	WL	A
MIRAMONTE WELL 01	WL	A
MIRAMONTE WELL 02	WL	A
MIRAMONTE WELL 03	WL	A
NADEAU WELL 03	WL	A
HAMPSHIRE WELL 14 - DESTROYED 1/21/00	WL	I
NADEAU WELL 02 - INACTIVE 2/5/09	WL	I
ROSS WELL 03 - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	013
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	012
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	011

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Water System Details

Water System No. :	CA1910026	**Federal Type :**	C
Water System Name :	COMPTON-CITY, WATER DEPT.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	205 S WILLOWBROOK AVE. COMPTON,CA 90220	Business	310-605-5555	
Physical Location Contact	CA1910026-COMPTON-CITY, WATER DEPT.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	81963

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	4	ME	0
CM	1299	ME	0
IN	135	ME	0
RS	12815	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION CB-1 - TREATED	CC	A
MWD CONNECTION CB-3 - TREATED	CC	A
MWD CONNECTION CB-4 - TREATED	CC	A
WELL 11	WL	A
WELL 13	WL	A
WELL 15	WL	A
WELL 16	WL	A
WELL 17	WL	A
WELL 18	WL	A
WELL 19	WL	A
RICHLAND WELL 01 - ABANDONED	WL	I
RICHLAND WELL 02 - ABANDONED	WL	I
WELL 01 - DESTORYED	WL	I
WELL 02 - DESTORYED	WL	I
WELL 06 - ABANDONED	WL	I
WELL 08 - ABANDONED	WL	I
WELL 09 - DESTORYED	WL	I
WELL 10 - DESTORYED	WL	I
WELL 12 - ABANDONED	WL	I
WELL 14 - DESTROYED	WL	I
WELL 20 - PENDING	WL	P

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	018
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	016
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	017

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Water System No. :	CA1910050	**Federal Type :**	C
Water System Name :	COMMERCE-CITY, WATER DEPT.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	04-21-1978

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	1720 NORTH FIRST STREET SAN JOSE,CA 95112	Business	408-367-8593	
Physical Location Contact	CA1910050-COMMERCE-CITY, WATER DEPT.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	3828

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	13	ME	0
CM	429	ME	0
IN	209	ME	0
RS	395	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION - TREATED	CC	A
WELL 04L	WL	A
WELL 06-01-STANDBY	WL	A
WELL 07-01	WL	A
WELL 02 - DESTROYED	WL	I
WELL 03 - DESTROYED	WL	I
WELL 03D - DESTROYED	WL	I
WELL 03E - INACTIVE	WL	I
WELL 05 - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	009

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Water System Details

Water System No. :	CA1910081	**Federal Type :**	C
Water System Name :	LYNWOOD PARK MUTUAL WATER CO.	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	2644 E. 124TH STREET COMPTON,CA 90222	Business	310-631-2625	
Physical Location Contact	CA1910081-LYNWOOD PARK MUTUAL WATER CO.			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 16 - CENTRAL	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	2300

Service Connections

Type	Count	Meter Type	Meter Size Measure
RS	453	ME	0

Sources of Water

Name	Type Code	Status
WELL 01 - NW 25	WL	A
WELL 02 - SOUTH	WL	A
WELL 03 - MONA	WL	A

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.

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Water System Details

Water System No. :	CA1910036	**Federal Type :**	C
Water System Name :	CALIFORNIA WATER SERVICE CO. - ELA	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	1720 NORTH FIRST STREET SAN JOSE,CA 95112	Business	408-367-8593	
Physical Location Contact	CA1910036-CALIFORNIA WATER SERVICE CO. -			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	150729

Service Connections

Type	Count	Meter Type	Meter Size Measure
CM	4945	ME	0
IN	107	ME	0
RS	21032	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION ELA CB14 - TREATED	CC	A
MWD CONNECTION, CB 01 - TREATED	CC	A
MWD CONNECTION, CB 39 - TREATED	CC	A
WELL 07-02 - STANDBY	WL	A
WELL 10-03	WL	A
WELL 13-02	WL	A
WELL 22-01	WL	A
WELL 25-01	WL	A
WELL 38-02	WL	A
WELL 39-02	WL	A
WELL 43-01	WL	A
WELL 51-01 - STANDBY	WL	A
WELL 52-01 - STANDBY	WL	A
WELL 54-01	WL	A
WELL 63-01	WL	A
WELL 01-02 - ABANDONED	WL	I
WELL 06-02 - DESTROYED	WL	I
WELL 11-03 - ABANDONED	WL	I
WELL 15-02 - DESTROYED	WL	I
WELL 19-03 - INACTIVE	WL	I
WELL 19-04 - INACTIVE	WL	I
WELL 20-01 - INACTIVE	WL	I
WELL 26-01 - ABANDONED	WL	I
WELL 28-01 - DESTROYED	WL	I
WELL 29-01 - INACTIVE	WL	I
WELL 29-02 - DESTROYED	WL	I
WELL 32-01 - ABANDONED	WL	I
WELL 33-01 - INACTIVE	WL	I
WELL 34-01 - ABANDONED	WL	I
WELL 35-01 - ABANDONED	WL	I
WELL 37-01 - INACTIVE	WL	I
WELL 38-01 - ABANDONED	WL	I
WELL 39-01 - INACTIVE	WL	I
WELL 44-01 - ABANDONED	WL	I
WELL 46-01 - DESTROYED	WL	I
WELL 47-02 - ABANDONED	WL	I
WELL 49-01 - ABANDONED	WL	I
WELL 50-01 - ABANDONED	WL	I
WELL 53-01 - INACTIVE	WL	I
WELL 56-01 - INACTIVE	WL	I
WELL 53-02 - PENDING	WL	P
WELL 62-01 - PENDING	WL	P

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	038
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	036
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	037

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Water System Details

Water System No. :	CA1910072	**Federal Type :**	C
Water System Name :	GSWC - WILLOWBROOK	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	03-22-1979

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	12035 Burke Street, Suite 1 SANTA FE SPRINGS,CA 90670			
Physical Location Contact	CA1910072-GSWC - WILLOWBROOK	Business	562-907-9200	WWW.GSWATER.COM

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 15 - METROPOLITAN	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	10682

Service Connections

Type	Count	Meter Type	Meter Size Measure
AG	7	ME	0
CM	66	ME	0
RS	1327	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION CB51 - TREATED	CC	A
WELL 01	WL	A
WELL 03	WL	A
WELL 02 - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	004

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Water System Details

Water System No. :	CA1910021	**Federal Type :**	C
Water System Name :	LIBERTY UTILITIES - COMPTON	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	SWP
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	P.O.BOX 7002 DOWNEY,CA 90241-7002	Business	562-299-5123	
Physical Location Contact	CA1910021-LIBERTY UTILITIES - COMPTON			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	24698

Service Connections

Type	Count	Meter Type	Meter Size Measure
CM	75	ME	0
IN	2	ME	0
RS	6785	ME	0

Sources of Water

Name	Type Code	Status
MWD CONNECTION CB-50 - TREATED	CC	A
MWD CONNECTION CB-9 - TREATED	CC	A
WELL 19C	WL	A
WELL 09-A - DESTROYED	WL	I
WELL 09-C - DESTROYED	WL	I
WELL 12-A - DESTROYED	WL	I
WELL 12-B	WL	I
WELL 13-A - DESTROYED	WL	I
WELL 13-B - INACTIVE	WL	I
WELL 13-C	WL	I
WELL 18-A - DESTROYED	WL	I
WELL 19-A - DESTROYED	WL	I
WELL 31-A - DESTROYED	WL	I
WILLOWBROOK WELL 01 - DESTROYED	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	012
CA1910087	METROPOLITAN WATER DIST. OF SO. CAL.			CC	013

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Water System Details

Water System No. :	CA1910147	**Federal Type :**	C
Water System Name :	SATIVA-L.A. CWD	**State Type :**	C
Principal County Served :	LOS ANGELES	**Primary Source :**	GW
Status :	A	**Activity Date :**	01-01-1976

Water System Contacts

Type	Address	Phone		Email - Web Address
Administrative Contact	2015 EAST HATCHWAY STREET COMPTON,CA 90222	Business	310-631-8176	
Physical Location Contact	CA1910147-SATIVA-L.A. CWD F			

Division of Drinking Water District / County Health Dept. Info

Name	Phone	Email	Address
DISTRICT 22 - ANGELES	818-551-2004		500 N. Central Ave. Suite 500 GLENDALE CA 91203

Annual Operating Periods & Population Served

Start Month	Start Day	End Month	End Day	Population Type	Population Served
1	1	12	31	R	6837

Service Connections

Type	Count	Meter Type	Meter Size Measure
CM	1	UM	0
RS	1639	UM	0

Sources of Water

Name	Type Code	Status
WELL 02	WL	A
WELL 03	WL	A
WELL 05	WL	A
WELL 03-A - INACTIVE	WL	I
WELL 04 - INACTIVE	WL	I

Service Areas

Code	Name
R	RESIDENTIAL AREA

Water Purchases

Seller Water System No.	Water System Name	Seller Facility Type	Seller State Asgn ID No.	Buyer Facility Type	Buyer State Asgn ID No.

Reference:
Weston, 2015

Preliminary Assessment Report
Titan Terminal & Transport
South Gate, Los Angeles County, California

EPA ID No.: CAD008353211
USACE Contract Number: W91238-11-D-0001
Interagency Agreement No.: 95777001-0
Document Control Number: 20074.063.101.1004

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Prepared for:
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Region 9

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List of Acronyms

AST	aboveground storage tank
bgs	below ground surface
Brenntag	Brenntag Pacific, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DCE	dichloroethylene
DTSC	Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
ft^2	square-foot
GENIL	General Inspection Laboratories
GSWC	Golden State Water Company
HHMD	LA County Fire Department, Health Hazardous Materials Division
HRS	Hazard Ranking System
LADPW	Los Angeles County Department of Public Works
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
NPL	National Priorities List
PA	Preliminary Assessment
PCE	tetrachloroethylene
RCRIS	Resource Conservation and Recovery Information System
RSL	Regional Screening Level
RWQCB	Regional Water Quality Control Board
SEMS	Superfund Enterprise Management System
SSA	Site Screening Assessment
Stauffer	Stauffer Chemical Company
SVE	soil vapor extraction
Titan	Titan Terminal & Transport (site)
TCE	trichloroethylene
TRI	Toxics Release Inventory
TSP	trisodium phosphate
UST	underground storage tank
VOC	volatile organic compound
WESTON	Weston Solutions, Inc.
µg/L	microgram per liter

1.0 INTRODUCTION

1.1 Regulatory Background

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Weston Solutions, Inc. (WESTON®) has been tasked to conduct a Preliminary Assessment (PA) of the Titan Terminal & Transport (Titan) site in South Gate, Los Angeles County, California.

The purpose of a PA is to review existing information on a site with potential releases of a hazardous substance and its environs to assess the threats, if any, posed to public health, welfare, or the environment and to determine if further investigation under CERCLA is warranted. The scope of a PA generally includes review of existing information available from federal, state, and local agencies.

Using existing information sources, a site is then evaluated using the U.S. Environmental Protection Agency's (EPA) Hazard Ranking System (HRS) criteria to assess the relative threat associated with actual or potential releases of hazardous substances at the site. The HRS has been adopted by the EPA to help set priorities for further evaluation and eventual remedial action at hazardous substance sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL is a list compiled by EPA of uncontrolled hazardous substance releases in the United States that are priorities for long-term remedial evaluation and response. This report summarizes the findings of these preliminary investigative activities.

The Titan site was identified as a potential hazardous waste site and entered into the Superfund Enterprise Management System (SEMS) on November 1, 1979 (SEMS ID No.: CAD008353211). A Preliminary Assessment was completed for the site on March 1, 1984 and a Site Inspection was completed for the site on September 1, 1986. The SEMS information system is currently in the development phase and is expected to be fully implemented in April 2015 (EPA, 2014a).

More information about the Superfund program is available on the EPA web site at http://www.epa.gov/superfund/programs/npl_hrs/siteasmt.htm.

1.2 Apparent Problem

EPA determined that a PA was needed at the Titan site because of the following apparent problems:

- The site has been used for the manufacturing of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993 (ACS, 2014; BEI, 1994; DTSC, 2014b; OCI, 2014; Sitton, 2001; TMS, 1950).

- From approximately 1924 to 1960, an estimated 200 tons of arsenic-containing sludge waste was disposed of into an on-site unlined surface impoundment (BEI, 1994; DTSC, 2014b).

- Subsurface investigations conducted at the site in the early 1980s identified elevated concentrations of metals in on-site soil, groundwater, and/or surface impoundment materials including, but not limited to: arsenic, cadmium, and chromium (BEI, 1994; DTSC, 2014b).

- The site is situated upgradient with respect to the regional groundwater flow from several municipal supply wells that have been identified with elevated concentrations of volatile organic compounds (VOCs) and/or metals. The site is located approximately 0.26 mile northwest of the City of South Gate's Well 7, which was removed from service in approximately 2002 and destroyed in January 2011 due primarily to elevated concentrations of contaminants, including trichloroethylene (TCE), arsenic, and chromium. The site is also located approximately 0.47 mile west-southwest of the Golden State Water Company (GSWC) - Bell/Bell Gardens system's Hoffman Well 02, which was removed from service in approximately late 2000 and destroyed in approximately October 2007 due primarily to elevated concentrations of chromium (DTSC, 2014a; Google, 2014; RWQCB, 2015; Appendix C-2, C-3).

2.0 SITE DESCRIPTION

2.1 Location

The Titan site is located at 4570 Ardine Street in South Gate, California. Additional addresses associated with the site property include 4610 Ardine Street. The geographic coordinates for the site are 33° 57' 23.16" North latitude and 118° 11' 13.34" West longitude (Appendix A). The location of the site is shown in Figure 1.

2.2 Site Description

The Titan site occupies approximately 6.4 acres in an industrial and commercial area. The site is bordered to the north across Ardine Street by the Brenntag Pacific, Inc. (Brenntag) chemical storage and distribution facility (EPA ID No.: CAD008287732). The site is bordered to the east, across the Union Pacific railroad tracks and Salt Lake Avenue, by the Mistras NDT non-destructive testing facility [General Inspection Laboratories (GENIL) site; EPA ID No.: CAD027897164], the Axel's Meat Co / Quality Meat Co Inc. food distribution facility, and the Roche Commercial Fueling Enterprise tractor-trailer fueling facility. The site is bordered to the south, across the Southern Pacific railroad tracks, by a large retail shopping center. The site is bordered to the west by the former United States Gypsum Company wallboard manufacturing facility (EPA ID No.: CAD008323073) (DTSC, 2014b; EPA, 2014d; EPA, 2014e; Google, 2014; LACA, 2014).

The Titan site is composed of three Los Angeles County Assessor parcels, which are identified as 6215-002-017, -018, and -019. As of April 2014, the site was occupied by a 6,600 square-foot (ft^2) office building located at the northwest portion, a 2,750 ft^2 storage building and a 11,220 ft^2 storage building located at the southwestern portion, and a 10,080 ft^2 warehouse building located at the southeastern portion. Railroad spurs with operating railcars were located at the central and southern portions of the site. At least 40 aboveground storage tanks (ASTs) were located on the site, primarily in the south-central and southwestern portions. The surface of the site appeared to be entirely covered in asphalt and/or concrete and the site appeared to be entirely enclosed behind a chain-link fence. Primary vehicle access to the facility was from Ardine Street. The current site layout is shown in Figure 2 (DTSC, 2014b; Google, 2014; LACA, 2014).

Historically, at least 15 storage and warehouse buildings, a Machine Shop, a chemical manufacturing plant, and a research lab occupied the site. At least five sumps were also located throughout the site and two underground storage tanks (USTs) were located adjacent to the former Machine Shop in the central portion of the site. The majority of these historical structures, which were associated with former chemical manufacturing operations, were demolished in approximately late 1994. An unlined surface impoundment was located in the southeast corner of the site on parcel 6215-002-019. The impoundment measured approximately 180 feet by 130 feet, and extended to a depth of approximately 25 feet. The historical site layout is shown in Figure 3 (BEI, 1994; DTSC, 2014b; Google, 2014).

2.3 Operational History

The Titan site is currently owned by two separate entities. Parcels 6215-002-017 and 6215-002-018 are currently owned by Kronos Properties, Inc., which has owned these properties since approximately 1993. Parcel 6215-002-019, which includes the historical surface impoundment, is owned by Poulenc, Inc. Prior to 1993, Poulenc, Inc., through its preceding acquired entities (i.e., A. R. Maas Chemical Company, Victor Chemical Company, Stauffer Chemical Company, Chesebrough-Pond's Manufacturing Company, Imperial Chemical Industries, and Rhone-Poulenc Basic Chemicals Company), owned the entirety of the site since it was first developed in approximately 1924 (ACS, 2014; BEI, 1994; OCI, 2014; Sitton, 2001; TMS, 1950; App. C-1).

Historical operations at the Titan site include the manufacturing of TSP, sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993. No manufacturing operations or generation of hazardous waste are currently conducted at the site (ACS, 2014; BEI, 1994; DTSC, 2014b; OCI, 2014; Sitton, 2001; TMS, 1950).

Operations at the site were initiated in approximately 1924 by the A. R. Maas Chemical Company and remained relatively unchanged through 1981. These operations primarily included the manufacturing of three products: TSP, sodium sulfide, and phosphoric acid. Phosphoric acid manufacturing reportedly ceased in approximately 1981, although the facility continued to manufacture TSP and sodium sulfide. The raw materials used to manufacture the products included, but were not limited to: soda ash, phosphorus, sulfuric acid, and sodium hydroxide. The on-site business operations and assets of A.R. Mass were acquired by the Victor Chemical Company in approximately 1949, which was in turn acquired by the Stauffer Chemical Company (Stauffer) in approximately 1960. In approximately 1985, the on-site assets of Stauffer were acquired by the Chesebrough-Pond's Manufacturing Company, which divested these assets to Imperial Chemical Industries in early 1987. Imperial Chemical sold the site assets later that year to the Rhone-Poulenc Basic Chemicals Company, which maintained on-site operations until the facility was shut down in approximately 1993 (ACS, 2014; BEI, 1994; DTSC, 2014b; OCI, 2014; Sitton, 2001; TMS, 1950).

Waste generated from TSP manufacturing activities at the site consisted of filtered solids, which were stored on site and subsequently removed by an outside waste hauler. In the sodium sulfide process, a sulfur-burning unit and scrubber were used to separate out the impurities. Wastes generated during sodium sulfide manufacturing activities were also stored on site and removed by an outside hauler. The phosphoric acid plant, which operated from approximately 1924 through 1981, generated an arsenic-containing sludge waste. This waste reportedly contained approximately 2.8 percent arsenic trisulfide and 2-3 percent phosphoric acid. From approximately 1924 to 1960, an estimated 200 tons of arsenic-containing sludge was disposed of into an unlined surface impoundment at the southeastern portion of the property. The surface impoundment was reportedly resurfaced with asphalt in approximately 1960, prior to the acquisition of the facility by Stauffer. Between approximately 1960 and 1981, the arsenic-

containing waste was stored in an on-site storage tank and subsequently disposed off-site by an outside waste hauler (ACS, 2014; BEI, 1994; DTSC, 2014b).

Since 1994, Titan Terminal & Transport has been operating at the site as a hazardous and non-hazardous materials distribution and bulk storage facility. Bulk materials; which include but are not limited to: acids, bases, agricultural feed, and food grain products; are typically stored on site for no more than 30 days. Dilution and/or blending of bulk liquids within on-site ASTs is also conducted at the site. Stored materials are occasionally repackaged and loaded into drums for transfer to various facilities. Operations do not include manufacturing, treatment, or disposal of hazardous materials (DTSC, 2014b; TTT, 2014).

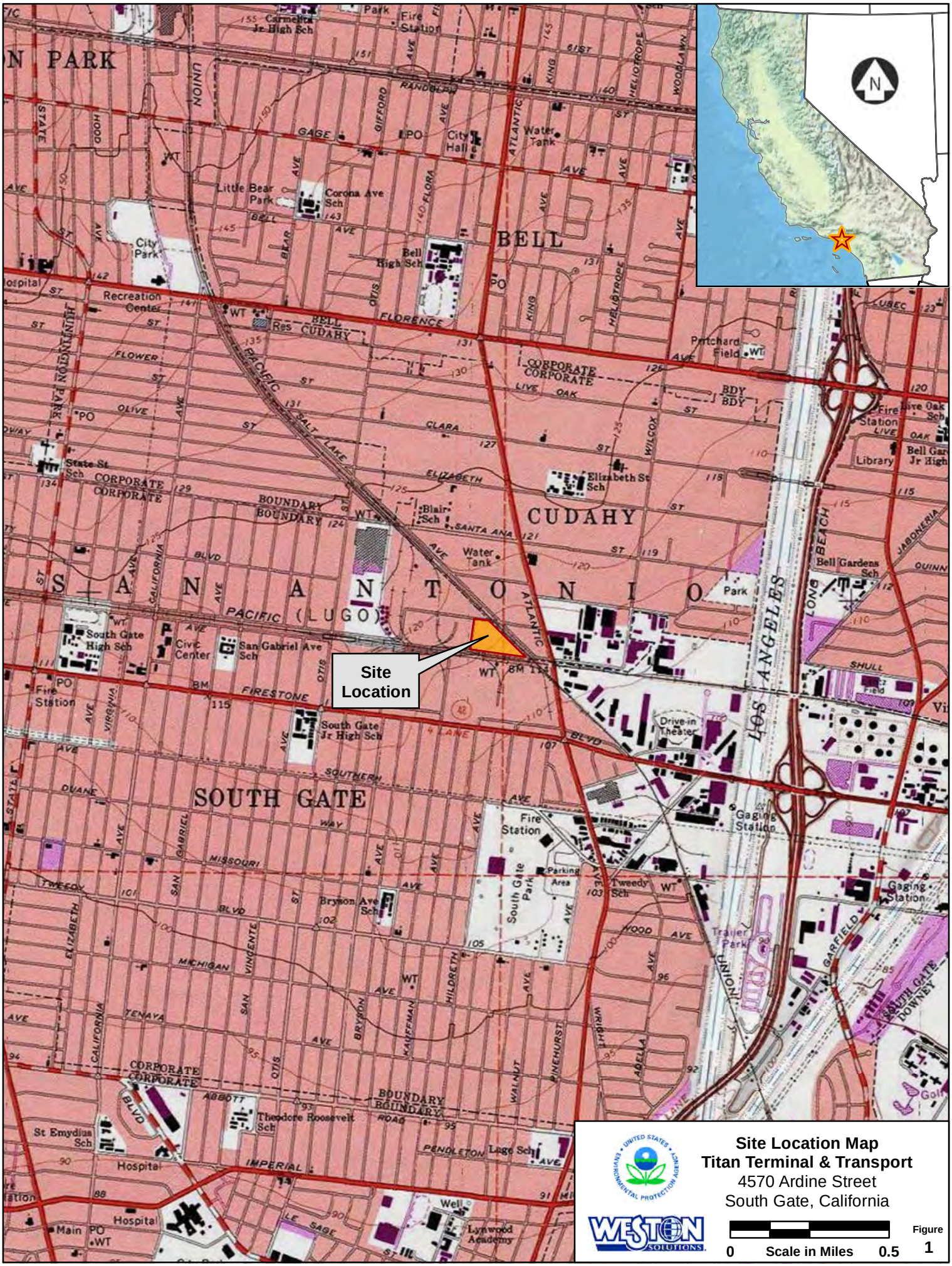
Table 1: Current and Historic On-site Operators

Location	Operator	Primary Operation(s)	Date
Entirety of Site (APNs: 6215-002-017; 6215-002-018; 6215-002-019)	A.R. Mass Chemical Company	Manufacture of TSP, NA_2S, and H_3PO_4	1924 - 1949
	Victor Chemical Company [1]	Manufacture of TSP, NA_2S, and H_3PO_4	1949 - 1960
	Stauffer Chemical Company [1]	Manufacture of TSP, NA_2S, and H_3PO_4	1960 – 1985 [2]
	Chesebrough-Pond's Manufacturing Co. [1]	Manufacture of TSP and NA_2S	1985 - 1987
	Imperial Chemical Industries [1]	Manufacture of TSP and NA_2S	1987
	Rhone-Poulenc Basic Chemicals Co. [1]	Manufacture of TSP and NA_2S	1987 - 1993
Northern Site Parcels (APNs: 6215-002-017; 6215-002-018)	Titan Terminal & Transport	Hazardous and non-hazardous materials distribution and bulk storage	1994 - Present
Southeast Site Parcel (APN: 6215-002-019)	Rhone-Poulenc Basic Chemicals Co. [1]	None	1994 - Present

APN = Assessor Parcel Number (Los Angeles County)
H_3PO_4 = phosphoric acid
NA_2S = sodium sulfide
TSP = trisodium phosphate

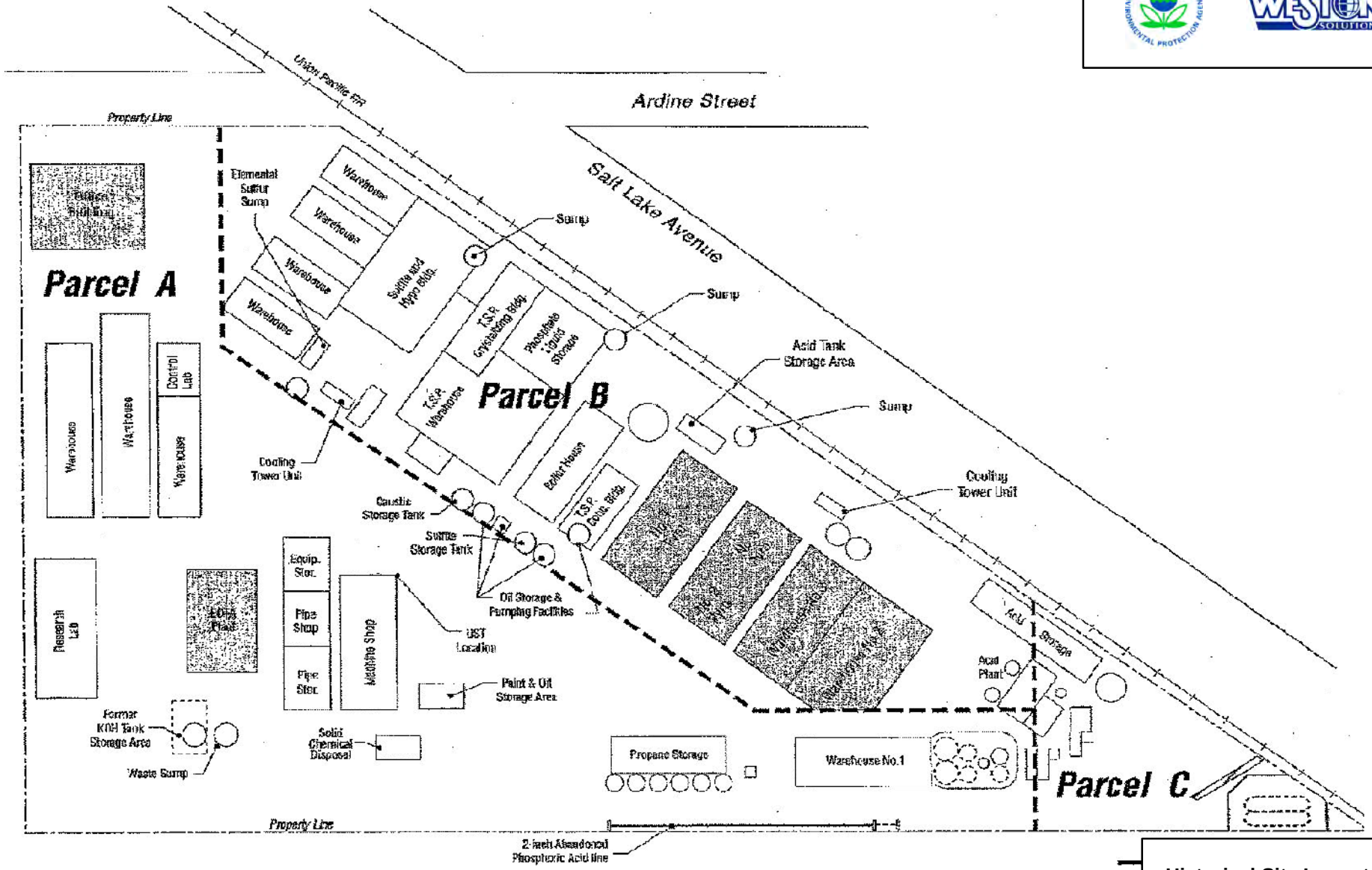
Footnotes:
1 = Includes the business operations and assets of previous operator
2 = On-site manufacturing of phosphoric acid reportedly ceased in approximately 1981

References: ACS, 2014; BEI, 1994; DTSC, 2014b; OCI, 2014; Sitton, 2001; TMS, 1950; TTT, 2014.


Site Location
BELL
CUDAHY
SOUTH GATE
LOS ANGELES
Site Location Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California
Figure 1
0
Scale in Miles
0.5

Current Site Layout Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California

Figure
2



0 Scale in Feet 200

Historical Site Layout Map
Titan Terminal & Transport
4570 Ardine Street
South Gate, California

Figure
3

2.4 Regulatory Involvement

2.4.1 U. S. Environmental Protection Agency

The Titan site is listed in the Resource Conservation and Recovery Information System (RCRIS) database as 'Rhone-Poulenc Basic Chemicals Co.' (Handler ID: CAD008353211); a Small Quantity Generator addressed at 4570 Ardine Street (EPA, 2014b).

The site is listed in the Toxics Release Inventory (TRI) database as 'Rhone-Poulenc Basic Chemicals Co.' (TRI ID: 90280STFFR4570A), addressed at 4570 Ardine Street. The most recent release information provided in the TRI database is from 1993 (EPA, 2014c).

2.4.2 California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

The Titan site is listed in California Department of Toxic Substances Control's (DTSC) EnviroStor database as Titan Terminal & Transport (Envirostor ID: 19280830), addressed at 4570 Ardine Street. The site is listed as an 'Evaluation' site that was referred to EPA as of June 6, 1995. DTSC completed a Site Screening Assessment (SSA) for the Titan site in June 2014. The SSA was prepared for EPA and has a final sign-off date of August 20, 2014 (DTSC, 2014b; DTSC, 2014c).

In 1981, the DTSC (formerly the California Department of Health Services, Toxic Substances Control Program) directed Stauffer to sample soils and materials in and around the on-site surface impoundment. Additional information regarding this investigation is provided in Section 3.0 (BEI, 1994).

2.4.3 California Environmental Protection Agency, Regional Water Quality Control Board (RWQCB)

The Titan site is listed in the Regional Water Quality Control Board's (RWQCB) GeoTracker database as Rhone-Poulenc Chemicals Company (GeoTracker ID: T0603702717; Case No.: I-00524), addressed at 4570 Ardine Street. The site is listed as a 'LUST Cleanup Site' with a cleanup status as 'Completed – Case Closed as of 8/26/1996.' The potential contaminant of concern is listed as 'gasoline' and the potential media affected is 'soil' (RWQCB, 2014).

2.4.4 Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD)

Reportedly, the Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD) has conducted oversight over the management of hazardous substances and waste at the Titan site. No additional information is known regarding specific HHMD activities related to the site or any notices of violation potentially issued to the facility by HHMD (DTSC, 2014b).

2.4.5 Los Angeles County Department of Public Works (LADPW)

Between at least 1989 and 1995, the Los Angeles County Department of Public Works (LADPW) conducted direction and oversight over a leaking UST case at the Titan site; which included soil matrix sampling, operation of a soil vapor extraction (SVE) system, and the maintenance and sampling of a limited groundwater monitoring well network. Presumably, the SVE system and monitoring well network were destroyed subsequent to the case closure in August 1996. The leaking USTs and associated investigations appear to be solely related to an unauthorized release of petroleum hydrocarbons to subsurface soils. Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA (DPW, 1989; DPW, 1995; RWQCB, 2014).

3.0 INVESTIGATIVE EFFORTS

In 1981, at the direction of the DTSC, soil matrix samples were collected on the Titan site to determine the extent of metals contamination. Soil borings were drilled in seven on-site locations at depths up to approximately 55 feet below ground surface (bgs). All seven of the borings were advanced in the southeastern portion of the site within and adjacent to the on-site surface impoundment. Sample analytical results identified elevated concentrations of metals including, but not limited to: arsenic [739 milligrams per kilogram (mg/kg)], cadmium (17 mg/kg), and chromium (253 mg/kg). In addition, samples collected from the materials within the on-site surface impoundment exhibited arsenic concentrations of up to 1,659 mg/kg. The Residential Regional Screening Levels (RSLs) for arsenic and cadmium are 0.67 mg/kg and 70 mg/kg, respectively. RSLs have not been established for total chromium in soils (BEI, 1994).

In 1982, at the direction of the DTSC, six additional soil matrix samples were collected in the vicinity of the on-site surface impoundment area and submitted for arsenic analysis. Samples exhibited concentrations of arsenic up to 127 mg/kg. A concurrently collected background sample exhibited an arsenic concentration of 3.7 mg/kg. Two groundwater samples were also reportedly collected during this investigation from a perched groundwater zone situated within the on-site surface impoundment. Elevated concentrations of arsenic were reportedly identified in the groundwater samples; however, the specific concentrations were not reported (BEI, 1994).

In approximately 1989, two gasoline USTs were excavated and removed from the Titan site. A 1,000-gallon tank was removed from a location adjacent to the northeast corner of the Machine Shop and a 280-gallon tank was removed from a location adjacent west to a pipe fitting area immediately west of the Machine Shop. During excavation activities, it was noted that the 1,000-gallon tank was corroded with small holes perforating portions of the tank. Soil matrix samples collected under the oversight and direction of the LADPW from beneath the tanks and associated fuel dispenser exhibited elevated concentrations of petroleum hydrocarbons. Subsequent investigations of the leaking USTs included the installation of an SVE system and a limited groundwater monitoring well network. The case was reported as closed by the RWQCB in August 1996. Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA (DPW, 1989; DPW, 1995; DTSC, 2014b; RWQCB, 2014).

In 2007, DTSC implemented a groundwater monitoring program on the adjacent north Brenntag site (EPA ID No.: CAD008287732), which included the installation of numerous groundwater monitoring wells over the course of several project phases. In March 2012, two of the wells associated with the monitoring program were installed on the northwestern portion of the Titan site. Samples collected from these wells in June 2012 exhibited elevated concentrations of VOCs including, but not limited to: TCE [10.6 micrograms per liter (µg/L)]; 1,1-dichloroethene (DCE) (1.1 µg/L); cis-1,2-DCE (60.1 µg/L); and trans-1,2-DCE (3.6 µg/L) (ARCADIS, 2013).

Table 2: Summary of Selected On-Site Soil and Groundwater Investigations

Site Location	Investigation	Maximum Results	
		Soil	Groundwater
On-site Surface Impoundment	1981 Impoundment Survey	arsenic = 739 mg/kg [1] cadmium = 17 mg/kg chromium = 253 mg/kg	--
	1982 Impoundment Survey	arsenic = 127 mg/kg	arsenic = 'elevated'
Northwest Portion of Site	2012 Quarterly Monitoring - Brenntag	--	TCE = 10.6 µg/L cis-1,2-DCE = 60.1 µg/L trans-1,2-DCE = 3.6 µg/L 1,1-DCE = 1.1 µg/L

DCE = dichloroethylene
mg/kg = milligrams per kilogram
TCE = trichloroethylene
µg/L = micrograms per liter
-- = media not sampled
'elevated' = specific results unavailable

Footnotes:
1 = a sample of the impound material exhibited an arsenic concentration of 1,659 mg/kg

References: BEI, 1994; ARCADIS, 2013

4.0 HAZARD RANKING SYSTEM FACTORS

4.1 Sources of Contamination

For HRS purposes, a source is defined as an area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance.

Potential hazardous substance sources associated with the Titan site include, but may not be limited to:

- An on-site surface impoundment that was historically used to dispose of arsenic-containing arsenic sludge waste and potentially additional hazardous substances (BEI, 1994).

- On-site soils contaminated with metals including, but not limited to: arsenic, cadmium, and chromium (BEI, 1994).

4.2 Groundwater Pathway

In determining a score for the groundwater migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to groundwater; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on the number of people who regularly obtain their drinking water from wells that are located within 4 miles of the site. The HRS emphasizes drinking water usage over other uses of groundwater (e.g., food crop irrigation and livestock watering), because, as a screening tool, it is designed to give the greatest weight to the most direct and extensively studied exposure routes.

4.2.1 Hydrogeological Setting

The Titan site lies within the Central Subbasin in the Coastal Plain of the Los Angeles Groundwater Basin. The Central Subbasin is generally bound to the north by the folded, uplifted and eroded Tertiary basement rocks of the La Brea High surface divide; to the northeast and east by the less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; to the southeast by the Coyote Creek flood control channel (approximate Los Angeles County/Orange County boundary); and to the southwest by the Newport Inglewood Uplift, a regional anticline associated with the Newport Inglewood fault system. The subbasin has historically been further divided into four areas; the Los Angeles Forebay at the northwest, the Montebello Forebay at the north, the Whittier Area at the northeast, and the Pressure Area at the central and southwest. The forebays are characterized by generally unconfined and relatively interconnected aquifer systems. The Montebello Forebay, as well as the Los Angeles Forebay to a lesser degree, serves

as the primary groundwater recharge area for both shallow and deep aquifers across the entirety of the subbasin. The Central Basin Pressure Area is characterized by generally confined aquifer systems separated by relatively impermeable clay layers, although semipermeable zones within these layers allow aquifers to be interconnected in some areas. The Los Angeles and San Gabriel rivers pass across the surface of the Central Basin, primarily by way of engineered concrete channels, on their way to the Pacific Ocean. The average net annual precipitation in the subbasin is approximately 12 inches (DWR, 1961; DWR, 2004).

The Titan site is located within the northern portion of the Central Basin Pressure Area with the Los Angeles Forebay to the northwest and the Montebello Forebay to the northeast. Throughout the Pressure Area, groundwater occurs in Holocene alluvium, the upper Pleistocene Lakewood Formation, and the lower Pleistocene San Pedro Formation. The aquifers underlying the site are, in descending order: the Gaspur, Exposition, Gage/Gardena, Jefferson, Lynwood, Silverado, and Sunnyside. Underlying the Recent alluvium, which includes the Gaspur aquifer, sediments of the upper Pleistocene Lakewood Formation, which includes the Exposition and Gage/Gardena aquifers, are present to a depth of approximately 300 to 400 feet bgs. Sediments of the lower Pleistocene San Pedro Formation, which includes the Lynwood through Sunnyside aquifers, unconformably underlie the Lakewood Formation and extend to a depth of approximately 1,300 feet bgs. The regional groundwater flow direction within the subbasin, which was calculated using data from wells screened within the upper San Pedro Formation (Lynwood through Silverado aquifers), is generally to the southwest with local and temporal variations from approximately west-southwest to southeast. Based upon data collected between 2007 and 2013, flow within these deeper aquifers in the vicinity of the site trended towards the southwest with temporal variations from west to south-southwest (DWR, 1961; DWR, 2004; WRD, 2014).

Throughout much of the subbasin, the Pleistocene-age aquifers are under confined conditions due to the presence of fine-grained, low-permeability interbedded sediments. Although these fine-grained sediments, or aquicludes, generally restrict the downward migration of groundwater from overlying aquifers, semipermeable zones within the aquicludes allow aquifers to be interconnected in some areas. In addition, hydrogeologic modeling of multi-aquifer systems similar to that found in the Central Basin Pressure Area, have concluded that groundwater wells screened across multiple aquifers (or wells with improperly constructed annular seals that cross multiple aquifers) can act as a direct pathway for the migration of significant volumes of shallow groundwater into deep confined aquifers when vertical hydraulic head variations create a downward hydraulic gradient. The process of this downward migration is increased in areas where the deeper aquifers have periods of high-volume pumping such as seasonal demand. Furthermore, additional studies have shown that liquids that are denser than water [i.e., dense non-aqueous phase liquids (DNAPLs), such as TCE and tetrachloroethylene (PCE)], can migrate downward through a multi-aquifer well even when vertical hydraulic head variations create an upward hydraulic gradient. As of the end of the 2012-2013 fiscal year, there were 537 known extraction wells (306 active and 231 inactive) within the subbasin (AwwaRF, 2006; DWR, 1961; DWR, 2013; Johnson et al., 2011).

Aquifer interconnection within two miles of the site has been documented between the Gaspur through Gage/Gardena and between the Jefferson through Silverado. Aquifer interconnection

between the Gage/Gardena and Jefferson, and between the Silverado and Sunnyside, has not been documented within two miles of the site. However, due to the relatively large number of older and poorly documented groundwater wells within the subbasin, including numerous wells that are screened across multiple aquifers and may be acting as conduits between these aquifers, interconnection between the Gage/Gardena and Jefferson, and between the Silverado and Sunnyside, is projected for HRS purposes (DWR, 1961; DWR, 2004; DWR, 2013).

The shallow groundwater flow direction in the vicinity of the Titan site is not known. During groundwater investigations conducted on the adjacent north Brenntag site (EPA ID No.: CAD008287732), the shallow groundwater flow direction has generally been calculated towards the southwest; however, during the sampling event conducted in November 2012, the flow direction was calculated towards the northwest. During the Brenntag groundwater investigations, the depth to first groundwater has been generally reported between approximately 55 and 60 feet bgs. In addition, the geologic materials encountered during these investigations were reported to be primarily composed of fine to medium sand to approximately 18 feet bgs; underlain by sand with interbedded layers of silty sand, sandy silt, silty clay, and clayey silt to approximately 50 feet bgs; underlain by predominately silt and clay with interbedded sand layers (ARCADIS, 2007; ARCADIS, 2013).

4.2.2 Groundwater Targets

The nearest active or maintained standby drinking water well to the Titan site is Well 03. This well is operated by the Tract 349 Mutual Water Company and is located approximately 0.2 mile north of the site. Routine water quality sampling of this well has not reported elevated concentrations of contaminants of concern including: TCE, PCE, arsenic, or chromium. Approximately 167 drinking water wells are located within 4 miles of the site. In addition, at least 85 former wells have been abandoned or destroyed within 4 miles of the site. Water purveyors operating within 4 miles of the site include, but are not limited to: Tract 349 Mutual Water Company, City of South Gate, Tract 180 Mutual Water Company, GSWC - Bell/Bell Gardens, City of Huntington Park, City of Lynwood, Maywood Mutual Water Company #3, Maywood Mutual Water Company #2, City of Vernon, and Walnut Park Mutual Water Company (DTSC, 2014a; DWR, 1961; Google, 2014; RWQCB, 2015).

The City of South Gate's Well 07 was a public supply well located approximately 0.26 mile southeast of the site, which was removed from service in approximately 2002 and destroyed in approximately 2011 due primarily to elevated concentrations of TCE, arsenic, and chromium (including hexavalent chromium). This well exhibited elevated TCE and PCE concentrations beginning in at least 1985. The maximum reported TCE concentration of 14 µg/L and PCE concentration of 3.8 µg/L were identified during the most recent recorded sampling in October 2001. The maximum reported arsenic concentration of 15.1 µg/L was identified in December 1997. The maximum reported chromium concentration (primarily of the hexavalent species) of 86 µg/L was identified in August 2000. The federal Maximum Contaminant Levels (MCL) for TCE, PCE, arsenic, and chromium are 5.0 µg/L, 5.0 µg/L, 10 µg/L, and 100 µg/L, respectively. This well reportedly had a single screening interval that extended from 500 feet bgs to 600 feet

bgs, which generally correlates to the reported depths for the Lynwood Aquifer (DWR, 1961; Google, 2014; RWQCB, 2015; App. C-2).

The City of Huntington Park's Well 12 is an active public supply well located approximately 0.44 mile northwest of the site. During routine water quality sampling, this well has exhibited non-detectable concentrations of TCE since May 2009. The maximum TCE concentration reported in this well was 1.6 µg/L, which was reported in 2003. Elevated TCE concentrations were also reported in 2007 and 2008. This well has not exhibited detectable concentrations of additional contaminants of concern including: PCE, arsenic, or chromium. The federal MCL for TCE is 5.0 µg/L (DWR, 1961; Google, 2014; RWQCB, 2015).

The GSWC - Bell/Bell Gardens system's Hoffman Well 02 was a public supply well located approximately 0.47 mile east-northeast of the site, which was removed from service in approximately late 2000 and subsequently destroyed in approximately October 2007 due primarily to elevated concentrations of chromium. This well exhibited elevated TCE concentrations beginning in at least 1985 and consistently exhibited detectable, but relatively low, concentrations of PCE beginning in at least 1985 with PCE concentrations gradually increasing after approximately 1990. The maximum reported TCE concentration of 15.3 µg/L was identified in November 1996. The maximum reported PCE concentration of 5.7 µg/L was identified in November 2000. The maximum reported 1,1-DCE concentration of 3.9 µg/L was identified in July 1997. The maximum reported chromium concentration of 333 µg/L was identified in November 2000. The federal MCLs for TCE, PCE, 1,1-DCE, and chromium are 5.0 µg/L, 5.0 µg/L, 7.0 µg/L, and 100 µg/L, respectively. This well reportedly had three screening intervals situated at 437-444 feet bgs, 454-476 feet bgs, and 477-494 feet bgs; which generally correlates to the reported depths of the upper portion of the Lynwood Aquifer (DWR, 1961; Google, 2014; RWQCB, 2015; App. C-3).

4.2.3 Groundwater Pathway Conclusion

Based on the analytical data presented in Section 3.0 of this report, there is evidence to indicate that a release of hazardous substances has occurred from one or more sources at the Titan site to shallow groundwater. The depth to shallow groundwater at the site is estimated to be approximately 55-60 feet bgs. The shallow groundwater flow direction at the site has not been adequately determined. Based upon recently collected data, flow within the deeper regional aquifers in the vicinity of the site trended towards the southwest with temporal variations from west to south-southwest. The geologic materials in the unsaturated zone between ground surface and the top of the aquifer are estimated to be predominantly composed of sands interbedded with silts and clays. At least 10 distinct water purveyors operate up to 167 municipal drinking water wells within 4 miles of the site. The nearest of these wells, Well 03, is an active well maintained by the Tract 349 Mutual Water Company and is located approximately 0.2 mile north of the site. The City of South Gate's Well 7 was located approximately 0.26 mile southeast of the site and was removed from service in approximately 2002 due to elevated concentrations of TCE, arsenic, and chromium. In addition, GSWC - Bell/Bell Gardens system's Hoffman Well 02 was located approximately 0.47 mile east-northeast of the site and was removed from service in

approximately 2000 due to elevated concentrations of chromium (BEI, 1994; ARCADIS, 2007; DTSC, 2014a; Google, 2014; RWQCB, 2015; WRD, 2014; App. C-2, C-3).

4.3 Surface Water Pathway

To determine the score for the surface water pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to surface water (e.g., streams, rivers, lakes, and oceans); 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, persistence, bioaccumulation potential, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on drinking water intakes, fisheries, and sensitive environments associated with surface water bodies within 15 miles downstream of the site.

Surface water runoff from the Titan site is expected to flow from the paved surfaces at the site into adjacent railroad easements and/or into curbside municipal stormwater drains along adjacent public roadways (i.e., Ardine St. and/or Salt Lake Ave.). The nearest surface water body to the site is the Los Angeles River, which is located approximately 0.7 mile east. The Los Angeles River is highly modified, having been lined with concrete along a majority of its length by the U.S. Army Corps of Engineers in the 1950s. Flows in the river are dominated by urban runoff and tertiary-treated effluent from several municipal wastewater treatment plants. The river empties into the Pacific Ocean at San Pedro Bay approximately 13.5 miles downstream of the site. There are no surface water intakes, fisheries, or sensitive environments associated with the Los Angeles River downstream of the site; however, there is a potential for fisheries and/or recreational areas to exist within San Pedro Bay (Google, 2014; RWQCB, 1994).

4.4 Soil Exposure and Air Migration Pathways

In determining the score for the soil exposure pathway, the HRS evaluates: 1) the likelihood that there is surficial contamination associated with the site (e.g., contaminated soil that is not covered by pavement or at least 2 feet of clean soil); 2) the characteristics of the hazardous substances in the surficial contamination (i.e., toxicity and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, exposed to the contamination. For the targets component of the evaluation, the HRS focuses on populations that are regularly and currently present on or within 200 feet of surficial contamination. The four populations that receive the most weight are residents, students, daycare attendees, and terrestrial sensitive environments.

In determining the score for the air migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to ambient outdoor air; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on regularly occupied residences, schools, and

workplaces within 4 miles of the site. Transient populations, such as customers and travelers passing through the area, are not counted.

As of April 2014, there were no residences, schools, or daycare facilities located on the Titan site. The nearest residential property to the site was located approximately 0.2 mile north. No sensitive environments were located on the site and the surface of the site appeared to be entirely covered with pavement or buildings. The site was entirely fenced and generally inaccessible to the public. The total number of employees working at the site is not known (DTSC, 2014b; Google, 2014).

5.0 REMOVAL EVALUATION CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415 (b) (2)] authorizes the EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reasons, a referral to Region 9's Emergency Response Office does/does not appear to be necessary:

- As of April 2014, there were no residences, schools, or daycare facilities located on the Titan site. In addition, no sensitive environments were located on the site, the surface of the site was entirely covered in pavement or buildings, and the site was generally inaccessible to the public (DTSC, 2014b; Google, 2014).

6.0 SUMMARY

The Titan Terminal & Transport (Titan) site is located at 4570 Ardine Street in South Gate, California. Additional addresses associated with the site property include 4610 Ardine Street The site is situated on three distinct Los Angeles County parcels and occupies approximately 6.4 acres in an industrial and commercial area.

Historical operations at the Titan site include the manufacturing of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid from approximately 1924 to 1993; and the distribution and storage of both hazardous and non-hazardous materials since 1993. No manufacturing operations or generation of hazardous waste are currently conducted at the site.

Wastes generated from chemical manufacturing activities at the site were generally stored on site and subsequently removed by an outside waste hauler. The phosphoric acid plant, which operated from approximately 1924 through 1981, generated an arsenic-containing sludge waste. From approximately 1924 to 1960, an estimated 200 tons of arsenic-containing sludge material was disposed of into an unlined surface impoundment that at the southeastern portion of the site. The surface impoundment was reportedly resurfaced with asphalt in approximately 1960.

Since 1994, Titan Terminal & Transport has been operating at the site as a hazardous and non-hazardous materials distribution and bulk storage facility. Bulk materials are typically stored on site for no more than 30 days. Dilution and/or blending of bulk liquids within on-site ASTs is also conducted at the site. Stored materials are occasionally repackaged and loaded into drums for transfer to various facilities.

The site is listed as a Small Generator in the RCRIS database and is identified as ‘Rhone-Poulenc Basic Chemicals Co.’ (CAD008353211). The site is also listed in the TRI database (90280STFFR4570A). EPA completed a PA for the site in March 1984 followed by an SI in 1986.

In the early 1980s, under the direction and oversight of the DTSC, subsurface investigations were conducted in the vicinity of the on-site surface impoundment. During these investigations soil matrix, groundwater, and/or surface impoundment materials were identified as containing elevated concentrations of metals including, but not limited to: arsenic, cadmium, and chromium. A solid surface impoundment sample was identified with an arsenic concentration of 1,659 mg/kg. The Residential RSL for arsenic is 0.67 mg/kg. Specific groundwater data were not properly reported.

Between approximately 1989 and 1995, several subsurface investigations were conducted under the oversight of the Los Angeles County Department of Public Works (LADPW) due to the discovery of two leaking USTs, which were historically used to store petroleum products. These investigation included the installation of a SVE system and a limited groundwater monitoring well network. The case was reported as closed by the RWQCB in August 1996.

Groundwater beneath the site has been identified as containing elevated concentrations of VOCs including, but not limited to: TCE; 1,1-DCE; cis-1,2-DCE; and trans-1,2-DCE. No documentation was found indicated the historical use and/or storage of VOCs at the site.

The following pertinent Hazard Ranking System factors are associated with the site:

- Based on the analytical data collected during on-site subsurface soil, solid surface impoundment material, and groundwater investigations; there is evidence to indicate that a release of hazardous substances has occurred from one or more sources at the site to shallow groundwater.

- The depth to groundwater is estimated to be approximately 55-60 feet bgs. The shallow groundwater flow direction at the site has not been adequately determined. The regional groundwater flow direction within the deeper aquifers in the vicinity of the site generally trends towards the southwest with temporal fluctuations from west to south-southwest. Geologic materials in the unsaturated zone between ground surface and the top of the aquifer are primarily composed of sands interbedded with silts and clays. The average net annual precipitation is approximately 12 inches.

- The nearest drinking water well is Tract 349 Mutual Water Company's Well 03, which is located approximately 0.2 mile north. At least 10 distinct water purveyors operate up to 167 municipal drinking water wells within 4 miles of the site. The City of South Gate's Well 7 was located approximately 0.26 mile southeast of the site and was removed from service in approximately 2002 due primarily to elevated concentrations of TCE, arsenic, and chromium. In addition, GSWC - Bell/Bell Gardens system's Hoffman Well 02 was located approximately 0.47 mile east-northeast of the site and was removed from service in approximately 2000 due primarily to elevated concentrations of chromium.

- Surface water runoff is expected to flow from the paved surfaces at the site to adjacent railroad easements and/or into curb municipal stormwater drains along adjacent public roadways. The nearest surface water body to the site is the Los Angeles River, which is located approximately 0.7 mile east. No drinking water intakes are located within 15 miles downstream; however, there is the potential for fisheries and/or recreation areas to exist within this distance.

- As of April 2014, there were no residences, schools, or daycare facilities located on the site. No sensitive environments were located on the site and the surface of the site appeared to be entirely covered with pavement or buildings. The site appeared entirely fenced and generally inaccessible to the public. The total number of employees working at the site is not known.

7.0 REFERENCES

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RWQCB, 2015 Regional Water Quality Control Board; Geotracker Database – Regulator Access, DPH Public Supply Well Search Results; *Tract 349 Mutual Water Company Well 03, City of Huntington Park Water Department Well 12, City of South Gate Water Department Well 07, GSWC-Bell/Bell Gardens Hoffman Well 02*; data extracted 08 January 2015 and 06 February 2015.

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Appendix A:
Latitude and Longitude Calculations Worksheet

Latitude and Longitude Calculation Worksheet (7.5' quads)
Using an Engineer's Scale (1/50)

Site Name Titan Terminal & Transport **CERCLIS #** CAD008353211

AKA

Address 4570 and 4610 Ardine Street

City South Gate **State** CA **ZIP** 90280

Site Reference Point Aerial – geometric center of site

USGS Quad Name **Scale**

Township **Range** **Section** 3 3 3

Map Datum ☐ 1927 ☐ 1983 **(Check one)** **Meridian**

Map coordinates at southeast corner of 7.5' quadrangle (attach photocopy)

Latitude E > AN **Longitude** E > AW

Map coordinates at southeast corner of 2.5' grid cell

Latitude E > AN **Longitude** E > AW

Calculations

LATITUDE(x)

A) Number of ruler graduations between 2.5' (150") grid lines **(a)**

B) Number of ruler graduations between south grid line and the site reference point **(b)**

C) Therefore, a/150 = b/x, where **x= Latitude in decimal seconds, north of the south grid line**

Expressed as minutes and seconds (1' = 60") = E > AN

Add to grid cell latitude = E > AN + E > AN

Site latitude = 33 º 57 ' 23 " N

LONGITUDE(y)

A) Number of ruler graduations between 2.5' (150") grid lines **(a)**

B) Number of ruler graduations between south grid line and the site reference point **(b)**

C) Therefore, a/150 = b/x, where **x= Longitude in decimal seconds, west of the east grid line**

Expressed as minutes and seconds (1" = 60") = E > AW

Add to grid cell longitude = E > AN + E > AN

Site longitude = 118 º 11 ' 13 " W

Appendix B:
Site Reconnaissance Interview and Observation Report/ Photographic Documentation

SITE RECONNAISSANCE INTERVIEW AND OBSERVATIONS REPORT/PHOTOGRAPHIC DOCUMENTATION

Date: **April 2015**
Site Name: **Titan Terminal & Transport**
EPA ID No.: **CAD008353211**

****

(Note: No Site Reconnaissance Interview and Observations Report/Photographic Documentation was required for the completion of this report)

Appendix C:
Contact Log
and
Contact Reports

CONTACT LOG

SITE: Titan Terminal & Transport
EPA ID: CAD008353211

NAME	AFFILIATION	PHONE	DATE	INFORMATION
Robert Collar	Golden State Water Company, Central District	(714) 535-7711 ext. 355	03/31/2015	See Contact Report 3
Ron Hernandez	City of South Gate, Public Works	(323) 563-5796	03/31/2015	See Contact Report 2
Susan	Los Angeles County, Office of the Assessor	(818) 901-3455	03/19/2014	See Contact Report 1

CONTACT REPORT 1

AGENCY/AFFILIATION: County of Los Angeles		
DEPARTMENT: Office of the Assessor		
ADDRESS/CITY: 14340 Sylvan Street, Van Nuys		
COUNTY/STATE/ZIP: Los Angeles, California, 91401		
CONTACT(S)	TITLE	PHONE
Susan	Assessment Clerk	(818) 901-3455
PERSON MAKING CONTACT: Brian P. Reilly		DATE: 28 October 2014
SUBJECT: Parcel Ownership Information		
SITE NAME: Titan Terminal & Transport		EPA ID#: CAD008353211

The current owner and recorded owner address of the three parcels associated with the Titan Terminal & Transport site as indicated by the Assessor's Office are:

6215-002-017: KRONOS PROPERTIES INC
1198 PACIFIC COAST HWY #D520 SEAL BEACH CA 90740

6215-002-018: KRONOS PROPERTIES INC
1198 PACIFIC COAST HWY #D520 SEAL BEACH CA 90740

6215-002-019: POULENC INC.
CN 7500 CRANBURY NJ 08512

CONTACT REPORT 2

AGENCY/AFFILIATION: City of South Gate		
DEPARTMENT: Public Works		
ADDRESS/CITY: 4244 Santa Ana Street, South Gate		
COUNTY/STATE/ZIP: Los Angeles, California, 90280		
CONTACT(S)	TITLE	PHONE
Ron Hernandez	Water Operations Foreman	(323) 563-5796
PERSON MAKING CONTACT: Anitra B. Rice		DATE: 04 January 2011
PERSON MAKING CONTACT: Amanda K.C. Reilly		DATE: 22 June 2011
PERSON MAKING CONTACT: Brian P. Reilly		DATE: 31 March 2015
SUBJECT: Public Water Distribution System Information		
SITE NAME: Titan Terminal & Transport		EPA ID#: CAD008353211

Mr. Hernandez indicated that the City of South Gate operates a drinking water supply system that serves approximately 95,115 customers. The blended system consists of six active drinking water wells (Wells 14, 18, 19, 24, 26, and 28), four stand-by wells (Wells 13, 23, 25, and 27), one inactive well (Well 22-B), and seven destroyed wells (Wells 7, 8, 9, 12, 20, and 22-A). The six active groundwater wells provide 100 percent of the drinking water. No single well provides more than 40 percent of the total demand at any given time. The City of South Gate does not sell or purchase water to other water systems and/or water users.

Wells 13, 14, 18, and 19 are treated at the wellhead due to elevated concentrations of tetrachloroethylene (PCE). Well 25 was put into standby status due to high manganese concentrations.

Well 25 partially collapsed in June 2009 during the El Centro earthquake. The well was relined to a Total Depth of 395 feet in May 2010. The collapse was at about 415 feet below ground surface (ft-bgs). From that interval to about 385 ft-bgs, gravel was placed as a filtering media in the existing 16-inch casing. The liner that was placed to a depth of 395 ft-bgs is telescopic with the new wire wrap screen and casing.

Well 27 partially collapsed during rehabilitation work and was relined to a depth of 920’ with a stainless steel wired wrapped liner in August 2001.

Well 7 was destroyed by cementing via tremmie pipe and shooting the well with explosive charges with ball bearings in January 2011 due to the well age and multiple contaminants, specifically trichloroethylene (TCE) and hexavalent chromium.

Well 12 was destroyed in September 1984 by cementing in the well. The well was destroyed due to: the well having been 60 years old at that point; small rocks and casing materials had to be

bailed out and the casing was determined to have failed at 30 ft-bgs and 40 ft-bgs; the pump was operating at only 48% efficiency; perforations were found to have been enlarged at 540'; compression breaks were identified at 164 ft-bgs and 304' ft-bgs; well was out of round, egg-shaped, at 396, 416, 530 and 536 ft-bgs; sand covering one foot of the bottom perforations, so 18 feet of 19 feet of total perforations were deemed usable.

Mr. Hernandez also confirmed the accuracy of the information in the following table:

WELL NAME	WELL STATUS	YEAR DESTROYED	WELL DEPTH (feet)	SCREENING INTERVAL(S) (ft-bgs)
Well 7	Destroyed	2011	830	500 - 600
Well 8	Destroyed	?	?	?
Well 9	Destroyed	?	813	?
Well 12	Destroyed	1984	617	535-554
Well 13	Standby	--	810	600-628; 640-684; 706-762;
Well 14	Active	--	813	615-745; 767-775;
Well 18	Active	--	790	620-630; 640-690; 706-762;
Well 19	Active	--	794	610-620; 626-666; 678-746;
Well 20	Destroyed	?	?	?
Well 22-A	Destroyed	?	?	?
Well 22B	Inactive	--	578	495-545
Well 23	Standby	--	856	530-624; 662-692; 772-798;
Well 24	Active	--	1290	650-710; 730-860; 880-920; 930-940; 950-966; 980-1040; 1050-1110; 1126-1174; 1184-1210; 1220-1246
Well 25	Standby	--	1331	565-620; 640-660; 670-700; 720-850; 860-900; 915-1026; 1040-1160; 1120-1230; 1250-1280; 1290-1310
Well 26	Active	--	1350	634-638; 641-644; 660-689; 700-710; 734-744; 1150-1154; 1188-1192; 1204-1206
Well 27	Standby	--	1200	500-520; 674-701; 716-725; 840-1180
Well 28	Active	--	1277	610-650; 660-690; 730-750; 770-785; 825-890; 930-960; 1030-1075;

CONTACT REPORT 3

AGENCY/AFFILIATION: Golden State Water Company		
DEPARTMENT: Central District		
ADDRESS/CITY: 12035 Burke Street, Suite 1, Santa Fe Springs		
COUNTY/STATE/ZIP: Los Angeles, California, 91773		
CONTACT(S)	TITLE	PHONE
Ana Chavez Robert Collar	Sr. Water Resources Analyst Sr. Hydrogeologist	(714) 535-7711 ext. 219 (714) 535-7711 ext. 355
PERSON MAKING CONTACT: Brian P. Reilly		DATE: 31 March 2015
SUBJECT: Public Water Distribution System Information		
SITE NAME: Titan Terminal & Transport		EPA ID#: CAD008353211

Bell/Bell Gardens System

According to Mr. Robert Collar, as of December 2014, the Bell/Bell Gardens System operates 7,481 service connections. The system consists of five active wells (Bissell #3, Clara #2, Gage #2, Otis #3, and Watson #1), one active/offline well (Bissell #2), two standby/inactive wells (Gage 1 and Priory 2); which supply 99 percent of the water in the system. In addition, the system formerly included four now-destroyed wells (Otis #1, Otis #2, Chanslor #1, and Hoffman #2). Bissell #2 has been offline since June 2012 due to sand issues. Gage 1 and Priory 2 are both standby/inactive, since July 2003 and March 2008, respectively, also due to sand issues. The remaining one percent of the water within the system is provided by the Central Basin Municipal Water District (CBMWD), who obtains its imported water from the Metropolitan Water District of Southern California (MWD). No individual well supplies more than 40 percent of the total supply. Watson #1 water is being treated to remove TCE and PCE.

Otis #1 and #2 were old wells and past their useful life, so they were destroyed and replaced by Otis #3 in 2007.

Chanslor #1 was destroyed in 2007 primarily due to its condition and mechanical problems. Note that VOCs had been detected in groundwater produced from this well, but it's not clear at this point what role, if any, VOCs played in the decision to destroy the well.

Hoffman #2 was destroyed because the need to treat groundwater from this well to remove hexavalent chromium made continued operation of this well uneconomical. Note that VOCs had also been detected in groundwater produced from this well, but it's not clear at this point what role, if any, VOCs played in the decision to destroy the well.

Mr. Collar also confirmed the accuracy of the information in the following table (next page) and verified that all information provided in this contact report is permissible to be presented in a publically-available document.

GSWC – Bell/Bell Gardens System				
Well Name	**Well Address (CONFIDENTIAL)**	**Screen Depths (feet below ground surface)**	**Percent Contribute to Drinking Water [1]**	**Avg. Gallons Per Minute [2]**
Bissell #2		575-1,275	0%	0
Bissell #3		595-615, 680-690, 705-730, 805-820, 900-925, 955-970, 1,005-1,025, 1,050-1,110	100%	1,695
Otis #3		520-530, 570-590, 900-940, 1,220-1,270, 1,400-1,570,	100%	665
Watson #1		243-249, 330-348, 420-427, 442-456	100%	845
Gage #1		282-301, 312-320, 428-434, 488-514	0%	0
Gage #2		290-320, 434-436, 499-502, 555-564, 569-573	100%	640
Priory #2		368-376, 380-400, 422-426, 561-581, 593-613	0%	0
Clara #2		330-350, 360-410, 420-470, 520-560, 610-640, 770-830, 960-970	100%	945
Chanslor #1		415-425	(Destroyed 2007)	N/A
Hoffman #2		437-444, 454-476, 477-494	(Destroyed 2007)	N/A
Otis #1		556-568, 578-596, 910-970, 1,280-1,330	(Destroyed 2004)	N/A
Otis #2		204-272, 285-341, 364-577, 586-906	(Destroyed 2004)	N/A

[1]Zero percent (0%) indicates that this well did not contribute drinking water to the system in 2014, whereas 100% indicates that this well did supply drinking water. Because of the way the system is operated, a fixed percentage of drinking water contributed to the system be each well cannot be defined. In other words, each well may contribute anywhere from 0 to 100% of the water in the system at any time throughout the year.

[2]Pumping rate of each well is an average for calendar year 2014, based on daily average pumping rates.

Appendix D:
Transmittal List

TRANSMITTAL LIST

Date: **April 2015**
Site Name: **Titan Terminal & Transport**
EPA ID No.: **CAD008353211**

****

A copy of the Preliminary Assessment (PA) report for the above-referenced site should be sent to the following recipients:

David Miller, President
Site Owner Representative
Kronos Properties, Inc.
1198 Pacific Coast Highway, #D520
Seal Beach, CA 90740

Jeffrey S. Lang, Esq.
Senior Health, Safety, & Environment Counsel
Site Owner Representative
Solvay USA, Inc.
8 Cedar Brook Drive
Cranbury, NJ 08512

Barry Love, President
Site Operator Representative
Titan Terminal & Transport
4570 Ardine Street
South Gate, CA 90280

Patrick Movlay
California Environmental Protection Agency
Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, CA 91311-6505

U.S. Environmental Protection Agency, Superfund Records Center
c/o Matt Mitguard
USEPA - Superfund Division
75 Hawthorne Street, SFD-6-1
San Francisco, CA 94105

Appendix E:
References

Reference:
Weston, 2016

This document is confidential and is included in the confidential information packet

Reference:
Weston, 2017a

Site Inspection Report
Brenntag Pacific Inc.
South Gate, Los Angeles County, California

EPA ID No.: CAD008287732
USACE Contract Number: W912P7-16-D-0001
Document Control Number: 20074.063.107.1009

August 2017

Prepared for:
U.S. Environmental Protection Agency
Region 9

Prepared by:
Weston Solutions, Inc.
1340 Treat Blvd., Suite 210
Walnut Creek, CA 94597

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List of Acronyms

amsl	above mean sea level
AS	air sparging
AOC	analyte of concern
APN	Assessor's Parcel Number
AST	aboveground storage tank
bgs	below ground surface
Brenntag	Brenntag Pacific, Inc.
CA MCL	California Maximum Contaminant Level
CA 2nd MCL	California Secondary Maximum Contaminant Level
CA NL	California Notification Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CLPAS	Contract Laboratory Program Analytical Services
CPT	Cone Penetration Testing
DCA	dichloroethane
DCB	dichlorobenzene
DCE	dichloroethylene
DCP	dichloropropane
DP	direct push
DTSC	Department of Toxic Substances Control
DWP	Department of Water and Power
ELA	East Los Angeles
EPA	United States Environmental Protection Agency
ESI	Expanded Site Inspection
Fed MCL	Federal Maximum Contaminant Level
Fed 2nd MCL	Federal Secondary Maximum Contaminant Level
ft	foot
ft^2	square foot
GSWC	Golden State Water Company
HHMD	LA County Fire Department, Health Hazardous Materials Division
HRS	Hazard Ranking System
LA Chemical	Los Angeles Chemical Company
LACSD	Los Angeles County, Department of Sanitation
MCL	Maximum Contaminant Level
MDL	method detection limit
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
MIBK	methyl isobutyl ketone
MWC	Mutual Water Company
NE710	North East 710 Study Area
NPL	National Priorities List

List of Acronyms (Continued)

PA	Preliminary Assessment
PCE	tetrachloroethylene
PWC	Park Water Company
QC	Quality Control
RAP	Remedial Action Plan
RCRIS	Resource Conservation and Recovery Information System
RI	Remedial Investigation
RSL	Regional Screening Level
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SEMS	Superfund Enterprise Management System
SEP	soil exposure pathway
SI	Site Inspection
SQL	sample quantitation limit
SSL	soil screening level
SVE	soil vapor extraction
Titan	Titan Terminal & Transport
TCB	trichlorobenzene
TCE	trichloroethylene
TCP	trichloropropane
TDL	target distance limit
TOC	Top of Casing
TRI	Toxics Release Inventory
UST	underground storage tank
VCA	Voluntary Cleanup Agreement
VOC	volatile organic compound
WESTON®	Weston Solutions, Inc.
µg/kg	microgram per kilogram
µg/L	microgram per liter

EXECUTIVE SUMMARY

The Brenntag Pacific Inc. (Brenntag) site is officially located at 4545 Ardine St., South Gate, Los Angeles County, California. Multiple additional addresses are associated with the site. The 11-acre site was formerly known as Los Angeles Chemical and is located in a primarily urban industrial area. The site is located less than one-quarter mile from residential properties.

For the purposes of this Site Inspection (SI), three distinct source zones were designated within the site boundaries. The Former UST & Transloading Area is situated on the northeast-central portion of the site, the Warehouse No. 3 & Clarifier Area is situated on the south-central portion of the site, and the West Parcels Area includes the entirety of the western portion of the site.

The Los Angeles Chemical Company (LA Chemical) operated at the site from approximately 1928 to 2006, at which time the business assets and operations were acquired by the Brenntag Group. However, the property itself was not included in the acquisition and the on-site operations remained relatively consistent. Current and historical structures that have occupied the site include a former solvent drum storage area, an existing six-stage clarifier, and a former fertilizer manufacturing plant. Historically, numerous aboveground storage tanks, underground storage tanks (USTs), and chemical storage areas were also located throughout the facility.

Historical operations at the site include the blending, packaging, storage, and distribution of hazardous and non-hazardous materials. Potentially hazardous materials historically stored at the site include fertilizers, fumigants, flammables, industrial chemicals, food ingredients, acids, caustics, insecticides, mineral oils, latex, glycols, surfactants, plasticizers, paper resin, bleach, lead arsenate, and diesel fuel. Interior operations at the facility were primarily conducted within one of the six on-site warehouses. Specific hazardous substances stored at the site include arsenic, lead, tetrachloroethylene (PCE), and trichloroethylene (TCE).

Prior to the 2015 Preliminary Assessment (PA), the U.S. Environmental Protection Agency (EPA) completed a combined PA/SI in 1995, an Expanded Site Inspection (ESI) in 1996, and Site Reassessments in 2002 and 2006.

Since 1985, multiple soil vapor, soil matrix, and groundwater investigations have been conducted at the site by both the California Regional Water Quality Control Board (RWQCB) and California Department of Toxic Substances Control (DTSC). These investigations identified elevated concentrations of metals and volatile organic compounds (VOCs) in soil and groundwater beneath the site. Between approximately 1997 and 2004, LA Chemical operated a soil and groundwater remediation system on site. In 2008, DTSC entered into a Voluntary Cleanup Agreement (VCA) with Brenntag and is in the process of initiating a Remedial Investigation (RI) and Feasibility Study (FS) at the site.

In November 2015, Weston Solutions, Inc. (WESTON), on behalf of EPA, conducted the SI at the site. During the SI, WESTON collected soil matrix samples at depths up to 15 feet (ft) below ground surface (bgs) from eight on-site borings; collected groundwater release samples at depths up to 134 ft bgs from one background boring, one on-site boring, and ten existing monitoring

wells; and collected secondary objective groundwater samples from three off-site borings and four existing monitoring wells.

On-site soil samples collected during the SI investigation exhibited concentrations of metals and VOCs that exceeded action levels. The most elevated concentrations were identified in the Former UST & Transloading Area. Maximum soil concentrations include arsenic at 93,300 milligrams per kilogram (mg/kg); lead at 96,200 mg/kg; cis-1,2-dichloroethylene (DCE) at 950,000 micrograms per kilogram (µg/kg); PCE at 20,000 µg/kg; and TCE at 180,000 µg/kg. The site-specific action levels for arsenic and lead are 7.8 mg/kg and 25 µmg/kg, respectively. The site-specific action levels for cis-1,2-DCE; PCE; and TCE are all 5.1 µg/kg.

Groundwater samples collected during the investigation also exhibited elevated concentrations of metals and VOCs. Maximum groundwater concentrations include arsenic at 768 micrograms per liter (µg/L); lead at 55 µg/L; cis-1,2-DCE at 2,800 µg/L; PCE at 33 µg/L; and TCE at 67 µg/L. The federal Maximum Contaminant Levels (MCLs) for arsenic, lead, and cis-1,2-DCE are 10 µg/L, 15 µg/L, and 70 µg/L, respectively. The federal MCL for both PCE and TCE is 5.0 µg/L.

The results of this SI, which were generally consistent with the results of previous investigations conducted under state oversight, have identified hazardous substance source areas on site. Metals and VOCs were identified at elevated concentrations in subsurface soils and are likely the result of historical on-site activities. Furthermore, the results indicate that a release of hazardous substances from the site to the underlying shallow groundwater has occurred and there is a potential for these substances to migrate into the deeper drinking water aquifers. The Exposition aquifer, which is the shallowest drinking water aquifer in the area, has already been impacted by contaminants associated with the site. Of note, the City of South Gate's Well 7, which was located approximately one-half mile southeast of the site, was closed in 2002 due to elevated concentrations of contaminants, including arsenic and TCE. The site is located within the North East 710 Study Area, which is an area where drinking water wells have historically been impacted by elevated levels of metals and VOCs.

1.0 INTRODUCTION

1.1 Regulatory Background

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Weston Solutions, Inc. (WESTON®) has been tasked to conduct a Site Inspection (SI) of the Brenntag Pacific Inc. (Brenntag) site in South Gate, Los Angeles County, California.

The Brenntag site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Public Access Database on May 13, 1993 (CAD008287732). CERCLIS has since been retired and its data transitioned into the Superfund Enterprise Management System (SEMS). The site is listed in SEMS as "Los Angeles Chemical (Former)." A Preliminary Assessment (PA) was completed for the U.S. Environmental Protection Agency (EPA) by WESTON on April 29, 2015. The purpose of a PA is to review existing information on a site with potential releases of a hazardous substance and its environs to assess the threats, if any, posed to public health, welfare, or the environment and to determine if further investigation under CERCLA is warranted. Prior to the 2015 WESTON PA, a combined PA and SI was completed in June 1995, an Expanded Site Inspection (ESI) was completed in September 1996, and Site Reassessments were completed in May 2002 and May 2006. Additionally, EPA completed a Site Screening in May 2014 (BEI, 1995; BEI, 1996; DTSC, 2002; DTSC, 2014; EPA, 2017a; Weston, 2015).

After reviewing the 2015 PA, EPA decided that further investigation of the Brenntag site would be necessary to more completely evaluate the site using the EPA Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances at the site. The HRS has been adopted by EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which EPA may conduct remedial response actions. This report summarizes the results of the SI for the Brenntag site (EPA, 2015).

More information about the Superfund program is available on the EPA website at http://www.epa.gov/superfund.

1.2 Apparent Problem

EPA determined that a Site Inspection (SI) was needed at the Brenntag site because of the following apparent problems:

- The site has been used for the blending, packaging, storage, and distribution of hazardous and non-hazardous materials since approximately 1928. Hazardous substances historically stored at the site include, but are not limited to, arsenic, lead, tetrachloroethylene (PCE), and trichloroethylene (TCE). Operations included the use of numerous underground

storage tanks (USTs), aboveground storage tanks (ASTs), and a subgrade clarifier (ARCADIS, 2007; Weston, 2015).

- Subsurface soil vapor and soil matrix investigations conducted at the site between 1985 and 2012 have identified elevated concentrations of contaminants in on-site soils including, but not limited to, arsenic, lead, cis-1,2-dichloroethylene (DCE), PCE, and TCE (ARCADIS, 2007; ARCADIS, 2012; ARCADIS, 2013; Weston, 2015).

- Groundwater investigations conducted at the site between 1985 and 2016 have identified elevated concentrations of contaminants in groundwater including, but not limited to, arsenic, lead, nickel, cis-1,2-DCE, PCE, and TCE (ARCADIS, 2007; ARCADIS, 2012; ARCADIS, 2017; Weston, 2015).

- The site is located within the North East 710 Study Area (NE710). Drinking water wells in the NE710 have historically been impacted by elevated levels of metals and volatile organic compounds (VOCs). The area is under investigation in order to identify the primary sources of this contamination and facilitate further investigation and remediation at those sources under the auspices of either EPA or the State of California. The site is located approximately one-half mile northwest of the City of South Gate's Well 7, which was closed in 2002 and historically reported elevated concentrations of arsenic, chromium, and TCE (Google, 2017; RWQCB, 2015; Weston, 2016).

2.0 SITE DESCRIPTION

2.1 Location *(See Figure 1)*

The Brenntag site is located at 4545 Ardine St., South Gate, California. Additional addresses associated with the site include 4445 and 4525 Ardine St. The geographic coordinates for the site are 33° 57' 30.2" North latitude and 118° 11' 23.2" West longitude (Appendix A). The location of the site is shown in Figure 1.

2.2 Site Description *(See Figures 2 & 3)*

The Brenntag site occupies approximately 10.7 acres in an urban industrial and commercial area. The site is bordered to the northeast, across the Union Pacific Railway line and Salt Lake Avenue, by various industrial facilities including Myers Engineering, GE Core Co., Leal Brothers Cabinets, and Art on Glass. The site is bordered to the south across Ardine Street by the Titan Terminal & Transport (Titan) chemical distribution and storage facility (EPA ID No.: CAD008353211) and the former United States Gypsum Company wallboard manufacturing facility. The site is bordered to the west by a Sanitation Districts of Los Angeles County (LACSD) solid waste facility, identified as the South Gate Transfer Station (Google, 2017; Weston, 2017b; Appendix B).

The site is composed of five Los Angeles County Assessor parcels, which are identified by Assessor Parcel Numbers (APNs) 6215-002-007, -008, -014, -021, and -022. As of October 2016, the site was predominantly occupied by six warehouse buildings, which ranged in size from approximately 8,000 square feet (ft^2) to 39,000 ft^2. In addition, the site included an approximately 9,500 ft^2 office building at the southeastern corner, an approximately 2,500 ft^2 laboratory/workshop building at the south-central portion, numerous drum storage areas, two railroad spurs with accompanying offloading areas, and various vehicle parking areas. Both rail spurs, one running along the northeastern edge of the site and the other transecting the west-central portion of the site, had active railcars and connected to the northeast-adjacent Union Pacific Railway line. The surface of the site was entirely covered in asphalt and/or concrete. With the exception of the small parking area at the southeast corner, the site was entirely enclosed behind a chain-link fence. Primary vehicle access to the site was from Ardine Street via Gate 3, which was located at the southwestern portion of the site; however, at least three additional gates that might permit vehicle access were also located on Ardine Street. A parcel layout map and site layout map are presented in Figure 2 and Figure 3, respectively (ARCADIS, 2007; Google, 2017; LACA, 2017; Appendix B).

The site was first developed in approximately the mid-1920s with the construction of the Warehouse No. 4 complex on the central portion and continued to expand across the site through the mid-1990s. Most of the existing warehouse buildings were constructed between the 1930s and 1950s. The Warehouse No. 5 building was constructed in the mid-1990s on the southwestern corner of the site, which was historically occupied by a scrap metal storage yard, an ink production plant, and a gasoline filling shed. Historically, additional structures on the site included, but are not limited to, a solvent drum storage area located approximately 80 feet (ft) north of Warehouse No. 2, a six-stage clarifier that has been converted from a historical loading pit located

south-adjacent to Warehouse No. 3, and a fertilizer manufacturing plant located near the Warehouse No. 6 building. Historically, numerous ASTs and chemical storage areas, as well as at least eight USTs, were also located throughout the facility. At least six of these USTs were formerly located on the northeastern edge of the property, north-adjacent to the Warehouse No. 1 building. In addition, the City of South Gate's Well 12 was located on the southwestern corner of the site from approximately 1923 until it was decommissioned as a result of age and casing failures. This well was reportedly used for industrial water supply, had a single perforation interval that extended from 535 to 554 ft below ground surface (bgs), and had a total depth of 617 ft bgs (ARCADIS, 2007; Google, 2017; Weston, 2015; Appendix C-1).

For the purposes of this SI, three distinct source zones were designated within the site boundaries. These zones are intended to generally delineate areas with a higher potential for subsurface impacts from similar historical on-site operations and are subject to modification if additional information becomes available. The source zones are presented in Figure 3 and are as follows:

- The Former UST & Transloading Area is delineated as an approximately 6,500 ft^2 area on the northeast-central portion of the site.

- The Warehouse No. 3 & Clarifier Area is delineated as an approximately 14,000 ft^2 area on the south-central portion of the site.

- The West Parcels Area is delineated as an approximately 190,000 ft^2 area that includes the entirety of the western portion of the site.

2.3 Operational History

(See Tables 1 through 3)

The Brenntag site is currently owned by four distinct corporate entities as summarized in Table 1. However, corporate records indicate that the four entities are directly related, specifically they share officers and/or agents. Historical ownership information is not known (LACA, 2017; Weston, 2015; Appendix C-2).

Historical operations at the site include the blending, packaging, storage, and distribution of hazardous and non-hazardous materials since approximately 1928. The Los Angeles Chemical Company (LA Chemical) operated at the site from first development in 1928 to March 2006, at which time the business assets and operations of LA Chemical were acquired by the Brenntag Group, although the on-site operations remained relatively consistent and the property itself was not included in the acquisition. A site operator chronology is presented in Table 2 (ARCADIS, 2007; Weston, 2015).

LA Chemical was founded in 1914 as a local chemical distributor and relocated to the eastern portion of the site in approximately 1928. Potentially hazardous materials historically stored at the site include, but are not limited to, fertilizers, fumigants, flammables and combustibles, industrial chemicals, food ingredients, acids, caustics, insecticides, mineral oils, latex, glycols, surfactants, plasticizers, paper resin, bleach, lead arsenate, and diesel fuel. These substances were typically stored in on-site warehouses, USTs, and ASTs. The ASTs at the site ranged in size from 1,000 to

50,000 gallons. Interior operations at the site were primarily conducted within one of the six on-site warehouses. Specific hazardous substances stored at the site include, but are not limited to, arsenic, lead, PCE, and TCE. A summary of the on-site warehouses and their associated activities is presented in Table 3 (ARCADIS, 2007; Weston, 2015).

The Brenntag Group currently repackages, stores, and transports numerous chemicals, including, but not limited to, acids, ammonia, halogenated solvents, borax, caustic liquids and solids, formaldehyde, hydrogen peroxide, alcohols, mineral spirits, methanol, methyl ethyl ketone, nickel sulfate solution, salts, and surfactants. These chemicals are part of the company's overall operations and are not necessarily present at the South Gate facility (ARCADIS, 2007).

2.4 Regulatory Involvement

2.4.1 U. S. Environmental Protection Agency

The Brenntag site is listed in the Resource Conservation and Recovery Information System (RCRIS) database as *Brenntag Pacific Inc* (Handler ID: CAD008287732), a Large Quantity Generator with an address of 4545 Ardine St. (EPA, 2017b).

The site is listed in the Toxics Release Inventory (TRI) database as *Brenntag Pacific Inc* (TRI ID: 90280LSNGL4545A), with an address of 4545 Ardine St. The most recent release information provided in the TRI database is from 2015. Listed chemical categories include certain glycol ethers, copper, copper compounds, diethanolamine, ethylene glycol, formic acid, hydrogen fluoride, manganese compounds, methanol, nitrate compounds, nitric acid, phosphoric acid, sodium nitrite, sulfuric acid, toluene, and zinc compounds. The site is also listed in the database as *Diatec Environmental* (TRI ID: 90280DTCNV4445A), with an address of 4445 Ardine St. The most recent release information provided in this database listing is from 2000. Listed chemical categories include acrylamide, dimethylamine, dimethyl sulfate, formaldehyde, and sulfuric acid (EPA, 2017c).

2.4.2 California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

The site is listed in the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) EnviroStor database as *Brenntag* (Envirostor ID: 60001972), with an address of 4545 Ardine St. The case is listed as an *Evaluation* site that was *Active* as of December 2015. The site is also listed in the database as *Los Angeles Chemical Company* (Envirostor ID: 60000330), with an address of 4545 Ardine St. This case is listed as a *Voluntary Cleanup* site that was *Active* as of May 2006 (DTSC, 2017).

In December 2008, the Brenntag Group entered into a Voluntary Cleanup Agreement with DTSC, Chatsworth Region. Extensive site-wide soil vapor, soil matrix, and groundwater sampling has been conducted under DTSC oversight as part of the ongoing process of investigating the nature and extent of contamination. Twenty-eight groundwater monitoring wells have been installed on and near the site and are currently sampled on a semiannual basis. A Remedial Investigation (RI)

report, which is scheduled to be completed in 2018, will include a summary of all prior soil and groundwater characterization conducted at the site. After the submittal of the RI, DTSC will direct that a Feasibility Study, which is to include a Human Health Risk Assessment, be completed for the site. Additional details on DTSC-directed investigations are provided in section 3.1 (DTSC, 2008; DTSC, 2014; DTSC, 2017; Appendix C-3).

2.4.3 California Environmental Protection Agency, Regional Water Quality Control Board (RWQCB)

The site is listed in the Regional Water Quality Control Board (RWQCB) GeoTracker database as *Los Angeles Chemical* (GeoTracker ID: SL204671639; Case No.: 0405), with an address of 4545 Ardine St. The site is listed as a *Cleanup Program Site* with a cleanup status as *Open – Inactive as of 1/29/2015*. The potential contaminants of concern are listed as *aviation* and *volatile organic compounds* (RWQCB, 2017).

The RWQCB, Los Angeles Region, has been involved with the site since at least 1985. Initially, RWQCB became involved with the site as part of a UST removal plan. Subsequent investigations have included soil vapor sampling, soil matrix sampling, discrete-depth groundwater sampling, the installation of a combined soil vapor extraction (SVE) and air sparging (AS) system, and the installation of a groundwater monitoring well network. The most recently known RWQCB involvement with the site was in 2004, at which time RWQCB directed the site operator to prepare a Remedial Action Plan (RAP). It is not known if this RAP was ever completed. Additional details on the investigations at the site conducted under the direction and oversight of the RWQCB are presented in section 3.1 (ARCADIS, 2007; BEI, 1995; DTSC, 2014).

2.4.4 Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD)

The Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD) (formerly the Los Angeles County, Department of Health Services, Hazardous Waste Control Program) investigated the site in 1986. HHMD charged the operator with the illegal disposal of hazardous waste after identifying an on-site pipe that was allegedly used for that purpose. In 1990, a court proceeding found the operator not guilty of the charges. No additional information is known regarding HHMD activities related to the site (BEI, 1995).

3.0 INVESTIGATIVE EFFORTS

3.1 Previous Sampling *(See Tables 4 through 6)*

Numerous soil vapor, soil matrix, and groundwater investigations have been conducted at the Brenntag site, primarily by the site owner under the oversight of state agencies. A summary of the most significant of these investigations is provided in sections 3.1.1 and 3.1.2 below. A summary of select results from these investigations is presented in Tables 4 through 6.

1985: Preliminary UST Abandonment Assessment

In 1985, the first known environmental investigation activities were completed at the site, under the oversight of RWQCB. LA Chemical conducted this preliminary investigation in conjunction with the proposed abandonment of six USTs located within the Former UST & Transloading Area at the northeastern portion of the site. The activities included the installation of a single monitoring well. The results of this investigation indicated that a leaking xylene-containing UST had impacted soil to a depth of at least 20 ft bgs, but groundwater did not appear to have been impacted. Based on these results, RWQCB directed LA chemical to conduct an additional assessment of the area and required the installation of additional groundwater monitoring wells adjacent to the former USTs. Specific analytical results were not available (ARCADIS, 2007; BEI, 1995).

1986: Additional Monitoring Well Installation

In February 1986, under the oversight of RWQCB, LA Chemical installed three additional groundwater monitoring wells at the Former UST & Transloading Area. Soil matrix samples collected during the well installation exhibited detectable concentrations of VOCs including, but not limited to, 1,2-dichloroethane (DCA) (130 micrograms per kilogram [µg/kg]) and TCE (7.0 µg/kg). VOC impacts to soil extended from approximately 10 ft bgs to first groundwater, which was identified as being between approximately 51 and 60 ft bgs. Groundwater samples collected from all three of the newly-installed wells exhibited elevated concentrations of VOCs including, but not limited to, 1,1-DCE (77 micrograms per liter [µg/L]), cis-1,2-DCE (300 µg/L), PCE (91 µg/L), trans-1,2-DCE (31 µg/L), and TCE (130 µg/L). The complete analytical results were not available (ARCADIS, 2007; BEI, 1995).

1988: Additional Monitoring Well Installation

In September and October 1988, under the oversight of RWQCB, LA Chemical installed three pairs of nested groundwater monitoring wells near the Former UST & Transloading Area and Warehouse No. 3 & Clarifier Area. In addition, LA Chemical installed a single well next to the initial 1985 well to provide further assessment of the lower portion of the Gaspur aquifer (ARCADIS, 2007).

At the Former UST & Transloading Area, LA Chemical collected soil matrix samples from approximately 10 to 50 ft bgs during well installation activities. These samples exhibited

detectable concentrations of VOCs including, but not limited to, 1,2-DCA (240 µg/kg), PCE (3,000 µg/kg), trans-1,2-DCE (22,000 µg/kg), and TCE (16,000 µg/kg) (ARCADIS, 2007).

At the Warehouse No. 3 & Clarifier Area, LA Chemical collected soil matrix samples from approximately 10 to 50 ft bgs during well installation activities. These samples exhibited detectable concentrations of VOCs including, but not limited to, 1,2-DCA (190 µg/kg), PCE (19 µg/kg), and TCE (350 µg/kg) (ARCADIS, 2007).

Elevated VOC concentrations in site groundwater were also identified in all of the newly-installed wells during the initial sampling event. In December 1988, a subsequent sampling event identified similar concentrations of contaminants. The complete analytical results were not available (ARCADIS, 2007).

1990: Additional Well Installation

In November 1990, LA Chemical installed three additional groundwater monitoring wells in the estimated downgradient direction (with respect to the Exposition aquifer) from both the Former UST & Transloading Area and the Warehouse No. 3 & Clarifier Area. Soil samples collected during the installation of the wells exhibited detectable concentrations of VOCs including, but not limited to, 1,2-dichlorobenzene (DCB), 1,4-DCB, PCE, and TCE. Initial groundwater samples collected from the wells exhibited elevated concentrations of VOCs including, but not limited to, 1,1-DCE (26 µg/L) and TCE (25 µg/L) (ARCADIS, 2007).

1996: UST Removal Action

In April 1996, LA Chemical excavated and removed seven 4,000-gallon USTs that were formerly located near the eastern site boundary and were, reportedly, the last remaining on-site USTs. It is not known if these seven are inclusive of the six USTs discussed above in the *1985: Preliminary UST Abandonment Assessment* section. Reportedly, soil matrix samples collected from beneath the USTs exhibited elevated concentrations of VOCs to a depth of approximately 20 ft bgs; however, specific analytical results were not available (ARCADIS, 2007).

1996: Remedial Investigation

Between April and June 1996, LA Chemical performed a remedial investigation at the site to evaluate the feasibility of remedial technologies and to identify additional potential source areas. The investigation, which was primarily focused on the eastern portion of the site near the Former UST & Transloading Area, included a 14-point soil vapor survey as well as the installation of SVE and AS wells. During the investigation, VOCs were identified in soil vapor samples at elevated concentrations across most of the sampled area. Based on these results, six pairs of colocated SVE and AS wells were installed at the Former UST & Transloading Area to total depths that ranged from 65 to 90 ft bgs. Soil matrix samples collected during the installation of the wells exhibited concentrations of VOCs including, but not limited to, TCE (0.34 µg/kg). Reportedly, the VOC concentrations were relatively low; however, the complete analytical results were not available.

An SVE test performed after the well installations indicated that SVE remediation would be a suitable option for the removal of VOCs in site soils (ARCADIS, 2007).

1997-2004: Soil Vapor Extraction (SVE) / Air Sparging (AS) Remediation

In April 1997, LA Chemical initiated the installation and operation of an SVE/AS system at the Former UST & Transloading Area. The SVE/AS system included the use of SVE wells for vadose zone remediation, combined with the AS system that injected air deeper into the saturated zone to oxygenate the aquifer and enhance biologic activity. The operation of the combined SVE/AS system was reported to be efficient in increasing the VOC removal rate from the groundwater. In January 1998, it was determined that petroleum hydrocarbon concentrations had been significantly reduced and the system was converted to activated carbon to more efficiently treat extracted VOCs. From January 1998 through October 2000, inlet vapor concentrations were significantly reduced. By the end of 2000, VOC recovery rates significantly decreased and AS operations were discontinued. The SVE system continued to operate after the AS system was shut down (ARCADIS, 2007).

In 2002, LA Chemical installed an additional SVE well in the Warehouse No. 3 & Clarifier Area due to an apparent increase in PCE concentrations. During the installation of the well, a soil matrix sample collected from 22 ft bgs exhibited elevated concentrations of VOCs including, but not limited to, PCE (68 µg/kg) and TCE (200 µg/kg) (ARCADIS, 2007).

In April 2004, RWQCB approved the shutdown of the remediation system based on asymptotic levels of VOC recovery. Pre-remediation and post-remediation VOC concentrations, when available, are presented in Table 4 and Table 5; however, the complete analytical results were not available (ARCADIS, 2007).

2002: Additional Monitoring Well Installation

In May 2002, LA Chemical installed one additional groundwater monitoring well along the western site boundary in response to the increased PCE concentrations identified near the Warehouse No. 3 & Clarifier Area. Soil matrix samples collected during the installation of this well exhibited non-detectable concentrations of VOCs (ARCADIS, 2007).

2005: Additional Site Assessment

In December 2005, LA Chemical conducted an additional assessment that included the collection of soil matrix and groundwater samples at 56 locations across the site. VOCs were detected in 5 of the 21 shallow soil samples analyzed; however, the complete analytical results were not available. Reportedly, none of the identified VOC concentrations exceeded EPA Region 9 Regional Screening Levels (RSLs) for industrial soil. Groundwater samples collected during the investigation exhibited concentrations of 14 analytes that exceeded their corresponding Maximum Contaminant Level (MCL) (ARCADIS, 2007; ARCADIS, 2012).

At the Former UST & Transloading Area, elevated concentrations of arsenic (34,900 milligrams per kilogram [mg/kg]) and lead (44,000 mg/kg) were identified. Detected VOCs in samples collected from this area included, but were not limited to, PCE (13 µg/kg) and TCE (110 µg/kg). Groundwater samples collected from this area also exhibited elevated concentrations of VOCs including, but not limited to, 1,2-DCA (100 µg/L), cis-1,2-DCE (300 µg/L), PCE (29 µg/L), and TCE (820 µg/L) (ARCADIS, 2007; ARCADIS, 2012).

At the Warehouse No. 3 & Clarifier Area, detected VOCs in soil matrix samples included, but were not limited to, PCE (94 µg/kg) and TCE (81 µg/kg). Groundwater samples collected in this area also exhibited elevated concentrations of VOCs including, but not limited to, 1,2-DCA (340 µg/L), cis-1,2-DCE (79 µg/L), PCE (33 µg/L), and TCE (490 µg/L) (ARCADIS, 2007; ARCADIS, 2012).

At the West Parcels Area, elevated concentrations of lead (6,700 mg/kg) were identified in soil matrix samples. Significant concentrations of VOCs were not identified in either soil matrix or groundwater samples collected from this area (ARCADIS, 2007; ARCADIS, 2012).

2007-2008: Additional Site Assessments

In at least 2007 and 2008, Brenntag conducted additional environmental assessments of the site; however, the specific details of these investigations are not known and the complete analytical results were not available. Reportedly, substantially elevated concentrations of arsenic were identified in soil at the Former UST & Transloading Area (6,490 mg/kg), the Warehouse No. 3 & Clarifier Area (12,900 mg/kg), and the West Parcels Area (1,520 mg/kg). In addition, substantially elevated concentrations of lead were identified in soil at the Former UST & Transloading Area (1,090 mg/kg), the Warehouse No. 3 & Clarifier Area (21,600 mg/kg), and the West Parcels Area (1,340 mg/kg) (ARCADIS, 2012).

2011-2012: Subsurface Investigations

In at least January 2011 and March 2012, under the oversight of DTSC, Brenntag conducted on-site subsurface investigations to provide additional information on the lateral and vertical extent of lead, arsenic, and VOC impacts to shallow soil, as well as to further define the downgradient lateral and vertical extent of VOC impacts to groundwater. The investigations included the collection of soil vapor, soil matrix, and groundwater samples, as well as the installation of one on-site and three off-site groundwater monitoring wells. All of the groundwater samples collected during these investigations were obtained from depths consistent with the Exposition aquifer (i.e., greater than 77 ft bgs). See section 4.2.1 of this SI for a description of the aquifers underlying the site (ARCADIS, 2012).

At the Former UST & Transloading Area, soil vapor samples exhibited substantially elevated concentrations of TCE. Soil matrix samples collected from this area exhibited elevated concentrations of metals; including, but not limited to, arsenic (9,510 mg/kg) and lead (2,160 mg/kg); and VOCs; including, but not limited to, cis-1,2-DCE (46,500 µg/kg), PCE (7,870 µg/kg), and TCE (8,590 µg/kg). Grab groundwater samples exhibited elevated

concentrations of VOCs including, but not limited to, cis-1,2-DCE (12 µg/L) and TCE (3.0 µg/L) (ARCADIS, 2012).

At the Warehouse No. 3 & Clarifier Area, soil vapor samples exhibited substantially elevated concentrations of PCE and TCE. Soil matrix samples collected from this area exhibited elevated concentrations of metals; including, but not limited to, arsenic (1,030 mg/kg) and lead (1,320 mg/kg); and VOCs; including, but not limited to, cis-1,2-DCE (4,880 µg/kg), PCE (8,950 µg/kg), and TCE (8,170 µg/kg). Grab groundwater samples exhibited elevated concentrations of VOCs including, but not limited to, cis-1,2-DCE (24 µg/L), PCE (1.2 µg/L), and TCE (6.0 µg/L) (ARCADIS, 2012).

At the West Parcels Area, no soil vapor or groundwater samples were collected. Soil matrix samples exhibited elevated concentrations of metals including, but not limited to, arsenic (454 mg/kg), cadmium (7.5 mg/kg), and lead (38 mg/kg). Soil matrix samples were not analyzed for VOCs (ARCADIS, 2012).

2013: Subsurface Investigation

In February and March 2013, under the oversight of DTSC, Brenntag conducted an additional investigation of the site to further delineate the distribution of VOCs and 1,4-dioxane in groundwater. The investigation included the advancement of eight Cone Penetration Testing (CPT) borings, which extended to a maximum depth of 162 ft bgs. One of the eight borings was advanced at the northeast portion of the site, approximately 150 ft north of the former UST area. The remaining seven borings were advanced at off-site locations including two to the northeast on Cecilia Street, one to the southeast on Ardine Street, one to the south on Ardine Street, one at a location approximately 500 ft south of the site, and two to the southwest along Independence Avenue. At each location, discrete-depth groundwater samples were collected from multiple targeted depths that ranged from 63 to 139 ft bgs. All samples were submitted for VOC and 1,4-dioxane analysis only. The highest VOC concentrations were identified in the samples collected from the off-site locations to the south and southwest of the site (ARCADIS, 2013).

2015: Additional Monitoring Well Installation

In September 2015, under the oversight of DTSC, Brenntag installed an additional off-site and upgradient (with respect to the Exposition aquifer) monitoring well cluster to the northeast of the site. This well cluster, which was designated as MW-17A-B-C, was installed on Cecilia Street approximately 400 ft east of the intersection with Salt Lake Avenue and approximately 375 ft northeast of the Former UST & Transloading Area. This well was subsequently included in the site semiannual monitoring program (ARCADIS, 2015).

2005-2016: Semiannual Groundwater Monitoring

Since at least December 2005 and under DTSC oversight, Brenntag has conducted ongoing groundwater monitoring on a semiannual basis. The monitoring program currently includes the collection of groundwater samples from 17 on- and off-site wells, primarily using Hydrasleeve™

technology. Of the 17 wells, 5 are dual-nested (i.e., two well casings situated within the same borehole) and 3 are triple-nested resulting in a frequent citation of 28 wells in the monitoring program. Samples are typically analyzed for VOCs, metals, petroleum hydrocarbons, and 1,4-dioxane (ARCADIS, 2017).

Groundwater samples collected from the Former UST & Transloading Area during the most recently reported monitoring event (October 2016) indicated elevated groundwater concentrations of metals including, but not limited to, arsenic (1,100 µg/L) and lead (29 µg/L). The groundwater samples also indicated elevated groundwater concentrations of VOCs, including, but not limited to, cis-1,2-DCE (1,020 µg/L); PCE (6.7 µg/L); and TCE (57 µg/L). The maximum concentrations of these analytes reported during previous monitoring events are arsenic (21,200 µg/L); lead (131 µg/L); cis-1,2-DCE (4,800 µg/L); PCE (120 µg/L); and TCE (460 µg/L) (ARCADIS, 2017).

Groundwater samples collected from the Warehouse No. 3 & Clarifier Area during the most recently reported monitoring event (October 2016) indicated elevated groundwater concentrations of metals including, but not limited to, arsenic (5,400 µg/L); and VOCs including, but not limited to, cis-1,2-DCE (34 µg/L); PCE (76 µg/L); and TCE (174 µg/L). The maximum concentrations of these analytes reported during previous monitoring events are: arsenic (7,200 µg/L); cis-1,2-DCE (200 µg/L); PCE (150 µg/L); and TCE (1,900 µg/L) (ARCADIS, 2017).

Groundwater samples collected from the West Parcels Area during the most recently reported monitoring event (October 2016) did not indicate substantially elevated groundwater concentrations of either VOCs or metals (ARCADIS, 2017).

Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA.

3.2 Site Investigation (SI) Sampling *(See Figures 4 through 9; Tables 7 through 16)*

In November 2015, WESTON, on behalf of EPA, conducted the SI sampling event at the Brenntag site. The event included soil matrix source sampling, groundwater release sampling, and secondary objective groundwater sampling. The primary objective of the investigation was to document information to be used in the HRS characterization process including additional source areas and levels of contamination in site soils and groundwater. The secondary objective of the investigation was to identify subsurface lithology and levels of contamination within various water-bearing zones, both on and near the site. This information will be utilized in the development of a more comprehensive understanding of the hydrogeologic conditions that exist within the greater NE710 Study Area as well as the greater subbasin.

Sampling methodology, locations, analyses, and analytical results are summarized below. The Sampling and Analysis Plan (SAP), which was approved by EPA in September 2015, is provided in Appendix F.

Based on the historical use of the site, the elevated concentrations of contaminants in nearby municipal drinking water wells, and the previous sampling events described in section 3.1, specific analytes of concern (AOCs) at the site were identified as: metals, specifically arsenic and lead; and VOCs, specifically 1,1-DCE; 1,2-DCA; PCE; TCE; and related transformation products (e.g., cis-1,2-DCE; trans-1,2-DCE; vinyl chloride). In addition, based on the analytical results of the SI investigation, additional AOCs were identified including, but not limited to: antimony; cadmium; chromium; copper; nickel; zinc; 1,1-DCA; 1,2,3-trichloropropane (TCP); 1,2,4-TCP; 1,2-DCB; 1,2-dichloropropane (DCP); and 1,4-DCB.

All samples were submitted under the EPA Contract Laboratory Program to Shealy Environmental Services, Inc. for metal analysis by EPA Contract Laboratory Program Analytical Services (CLPAS) ISM02.2 or Chemtech Consulting Group for VOC analysis by EPA CLPAS SOM02.2. The data were validated by the EPA Region 9 Quality Assurance Office. The complete validated analytical results are presented in Appendix H. The sample locations are shown in Figure 4.

3.2.1 Action Levels

In accordance with the HRS, the action levels to establish an observed release to groundwater, as well as to establish an on-site source of contaminated soil, are "significantly above background" concentrations. "Significantly above background" is defined as three times the background concentration for all media. When a background concentration is not detected at or above the method detection limit (MDL), the assigned background concentration is the sample quantitation limit (SQL); "significantly above background" for this scenario is defined as a concentration at or above the SQL.

Soil matrix samples collected from Boring TTT-DP-9, which is located approximately 500 ft south-southeast of the site and was advanced during the concurrently-conducted SI investigation at the Titan site (EPA ID No. CAD008353211), are designated as background soil samples for HRS purposes. The assigned background concentration for each analyte was determined by amalgamating the concentration data from each of the four discrete-depth soil samples. For any analyte with a reported MDL exceedance in the dataset, the background concentration was conservatively assigned as the arithmetic mean plus three times the standard deviation. For any analyte without an MDL exceedance, the background concentration was conservatively assigned as the maximum SQL value within the dataset. The assigned soil-matrix action levels for select metals are presented in Table 7 and for select VOCs in Table 10.

Although the selected background location is situated within current and historical operational areas of the adjacent Titan site (EPA ID No. CAD008353211), the exhibited concentrations were deemed to be generally consistent with published background levels for native soils in the region and appear unlikely to have been significantly impacted by hazardous substances associated with that site. VOCs were not reported at concentrations above their respective MDLs in any of the four discrete-depth background soil samples. Select discrete-depth analytical results for the assigned soil matrix background samples for metals are presented in Table 7 and for VOCs in Table 10; the complete analytical results are provided in Appendix H (Weston, 2017b).

As a result of local variations and uncertainties in the groundwater flow direction within the Gaspur aquifer underlying the site, a Gaspur background (i.e., upgradient) sample location was not assigned. A perched aquifer background sample was not assigned due to the tendency of perched water at the site to be laterally discontinuous over relatively short distances. The groundwater flow direction within the Exposition aquifer at the site is estimated to be towards the southwest. See section 4.2.1 for a description of the shallow aquifers underlying the site. For the purposes of this SI, the Exposition aquifer is defined as any groundwater situated between 77 ft bgs and 217 ft bgs. Based on this information, Boring BPI-CPT-1 was selected as the most appropriate Exposition background location for all groundwater release samples collected during the investigation.

Boring BPI-CPT-1 is located approximately 125 ft northeast of the Former UST & Transloading Area and approximately 250 ft northeast of the Warehouse No. 3 & Clarifier Area. Discrete depth samples were collected from this boring at 68 ft bgs, 96 ft bgs, and 123 ft bgs. The assigned Exposition aquifer background concentration for each analyte was determined by amalgamating concentration data from the two deeper samples using the same methodology as described above for the soil matrix background samples. Detectable concentrations of both metals and VOCs were identified in one or both of these samples. The assigned groundwater action levels and discrete depth analytical results are presented in Table 13 for select metals and in Table 15 for select VOCs. The complete analytical results are provided in Appendix H.

3.2.2 Source Sampling *(See Figures 4 through 8; Tables 7 through 12)*

To establish hazardous substance source areas at the site, WESTON collected subsurface soil matrix samples using direct push (DP) technology from eight selectively-biased on-site boring locations, designated as BPI-DP-1 through BPI-DP-8. Three of the locations were situated within the Former UST & Transloading Area, two of the locations were situated within the Warehouse No. 3 & Clarifier Area, and three of the locations were situated within the West Parcels area. Source sample locations are presented in Figure 4.

3.2.2.1 Former UST & Transloading Area

Source samples were collected from three borings within the Former UST & Transloading Area, designated as BPI-DP-1, BPI-DP-2, and BPI-DP-4. At each location, subsurface lithology was logged to the total depth of the boring at 15 ft bgs and soil matrix samples were collected from depths of 2, 5, 10, and 15 ft bgs. The soil lithologies from each boring were relatively consistent with soils composed primarily of moist dark brown fine sands and silty sands with interbedded lenses of dark brown to black clays from approximately 2 to 7 ft bgs underlain by dry light brown fine to medium sands. Strong chemical odors were noted at approximately 5 ft bgs during the advancements of both BPI-DP-1 and BPI-DP-2. Field observations and subsurface soil descriptions are provided in Appendix I.

<u>Metal Results:</u> *(See Figure 5; Table 7)*

Metals identified at concentrations at or above their corresponding action level in soil matrix samples collected from the Former UST & Transloading Area include antimony, arsenic, barium,

beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc. The most elevated metal concentrations were generally identified in the samples collected from between 2 and 5 ft bgs at borings BPI-DP-1 and BPI-DP-2 and at 2 ft bgs at Boring BPI-DP-4. Metals identified at concentrations greater than 500 times their corresponding action level include arsenic, copper, and lead. Action levels were assigned per the methodology described in section 3.2.1.

The assigned arsenic action level of 7.8 mg/kg was exceeded by all 12 samples with a maximum concentration of 93,300 mg/kg (qualified as estimated). The assigned copper action level of 56 mg/kg was exceeded by 9 of the 12 samples with a maximum concentration of 306,000 mg/kg (qualified as estimated). The assigned lead action level of 25 mg/kg was exceeded by 8 of the 12 samples with a maximum concentration of 96,200 mg/kg. Select analytical results and assigned action levels are presented in Figure 5 and Table 7.

Volatile Organic Compound (VOC) Results: *(See Figure 6; Table 10)*

VOCs identified at concentrations at or above their corresponding MDL in soil matrix samples collected from the Former UST & Transloading Area include 1,1-DCA; 1,1-DCE; 1,2,3-trichlorobenzene (TCB); 1,2,4-TCB; 1,2-DCB; 1,2-DCP; 1,3-DCB; 1,4-DCB; 2-butanone (i.e., methyl ethyl ketone [MEK]); acetone; benzene; carbon disulfide; chlorobenzene; cis-1,2-DCE; cyclohexane; ethylbenzene; isopropylbenzene; m,p-xylene; methylcyclohexane; o-xylene; PCE; toluene; trans-1,2-DCE; TCE; and vinyl chloride.

VOCs identified at concentrations at or above their corresponding action level include 1,2,3-TCB; 1,2,4-TCB; 1,2-DCB; 1,2-DCP; 1,3-DCB; 1,4-DCB; 2-butanone (i.e., MEK); acetone; benzene; chlorobenzene; cis-1,2-DCE; cyclohexane; ethylbenzene; isopropylbenzene; m,p-xylene; methylcyclohexane; o-xylene; PCE; toluene; trans-1,2-DCE; and TCE. The most elevated VOC concentrations were generally identified in the samples collected from 2 ft bgs and 5 ft bgs at Boring BPI-DP-2 and from 10 ft bgs at Boring BPI-DP-1. VOCs identified at concentrations greater than 500 times their corresponding action level include 1,2,3-TCB; 1,2,4-TCB; 1,2-DCB; 1,2-DCP; 1,3-DCB; 1,4-DCB; benzene; cis-1,2-DCE; cyclohexane; ethylbenzene; isopropylbenzene; m,p-xylene; methylcyclohexane; o-xylene; PCE; toluene; and TCE. Since no VOC analytes were identified in the background soil matrix samples at concentrations exceeding their corresponding MDL, the reported SQLs of the background samples were assigned as the VOC action levels (see section 3.2.1).

The assigned 1,4-DCB action level of 5.1 µg/kg was exceeded by 3 of the 12 samples with a maximum concentration of 350,000 µg/kg. The assigned cis-1,2-DCE action level of 5.1 µg/kg was exceeded by 4 of the 12 samples with a maximum concentration of 950,000 µg/kg. The assigned PCE action level of 5.1 µg/kg was exceeded by 4 of the 12 samples with a maximum concentration of 20,000 µg/kg (qualified as estimated). The assigned TCE action level of 5.1 µg/kg was exceeded by 4 of the 12 samples with a maximum concentration of 180,000 µg/kg. Select analytical results and assigned action levels are presented in Figure 6 and Table 10.

3.2.2.2 Warehouse No. 3 & Clarifier Area

Source samples were collected from two borings within the Warehouse No. 3 & Clarifier Area. Boring BPI-DP-3 was advanced west-adjacent to the clarifier structure and Boring BPI-DP-8 was advanced by use of a limited access drill rig within the interior of Warehouse No. 3. At each location, subsurface lithology was logged to the total depth of the boring at 15 ft bgs and soil matrix samples were collected from depths of 2, 5, 10, and 15 ft bgs. The soil lithologies from each boring were relatively consistent with soils composed primarily of moist dark brown fine sands to clayey sands with interbedded lenses of dark brown to black clays from approximately 2 to 7 ft bgs underlain by slightly moist light brown silty sands to fine sands with interbedded lenses of dark brown silts. Field observations and subsurface soil descriptions are provided in Appendix I.

Metal Results: *(See Figure 7; Table 8)*

Metals identified at concentrations at or above their corresponding action level in soil matrix samples collected from the Warehouse No. 3 & Clarifier Area include arsenic, lead, and zinc. The most elevated arsenic concentrations were identified in the samples collected from between 10 and 15 ft bgs at each boring. The most elevated lead and zinc concentrations were identified in the 2 ft bgs sample collected from Boring BPI-DP-8. Action levels were assigned per the methodology described in section 3.2.1.

The assigned arsenic action level of 7.8 mg/kg was exceeded by all 8 samples with a maximum concentration of 171 mg/kg. The assigned lead action level of 25 mg/kg was exceeded by 2 of the 8 samples with a maximum concentration of 57 mg/kg. The assigned zinc action level of 225 mg/kg was exceeded by 1 of the 12 samples with a concentration of 454 mg/kg. Select analytical results and assigned action levels are presented in Figure 7 and Table 8.

Volatile Organic Compound (VOC) Results: *(See Figure 7; Table 11)*

VOCs identified at concentrations at or above their corresponding MDL in soil matrix samples collected from the Warehouse No. 3 & Clarifier Area include 1,2-DCB, acetone, methyl acetate, PCE, and TCE. VOCs identified at concentrations at or above their corresponding action level include acetone, PCE, and TCE. The most elevated VOC concentrations were generally identified in the samples collected from 2 ft bgs and 15 ft bgs at each boring. Since no VOC analytes were identified in the background soil matrix samples at concentrations exceeding their corresponding MDL, the reported SQLs of the background samples were assigned as the VOC action levels (see section 3.2.1).

The assigned acetone action level of 10 µg/kg was exceeded by 4 of the 8 samples with a maximum concentration of 33 µg/kg. However, acetone is a common laboratory contaminant and the reported detections may not be indicative of actual conditions in the sampled medium. The assigned PCE action level of 5.1 µg/kg was exceeded by 3 of the 8 samples with a maximum concentration of 16 µg/kg. The assigned TCE action level of 5.1 µg/kg was exceeded by 1 of the 8 samples with a concentration of 5.2 µg/kg (qualified as estimated). Select analytical results and assigned action levels are presented in Figure 7 and Table 11.

3.2.2.3 West Parcels Area

Source samples were collected from three borings within the West Parcels Area. Boring BPI-DP-5 was advanced west-adjacent to the rail spur transecting the central portion of the site, Boring BPI-DP-7 was advanced east-adjacent to the central portion of Warehouse No. 7, and Boring BPI-DP-6 was advanced northwest-adjacent to Warehouse No. 6. At each location, subsurface lithology was logged to the total depth of the boring at 15 ft bgs and soil matrix samples were collected from depths of 2, 5, 10, and 15 ft bgs. The soil lithologies from each boring were relatively consistent with soils composed primarily of slightly moist dark brown fine sands to silty sands from approximately 2 to 7 ft bgs, underlain by dry dark brown sandy silts to approximately 10 ft bgs, underlain by dry light brown to yellow fine sands. Field observations and subsurface soil descriptions are provided in Appendix I.

Metal Results: *(See Figure 8; Table 9)*

Metals identified at concentrations at or above their corresponding action level in soil matrix samples collected from the West Parcels Area include antimony, arsenic, cadmium, copper, lead, silver, and zinc. Metals identified at concentrations greater than 100 times their corresponding action level include arsenic, lead, and zinc. The most elevated concentrations of arsenic and lead were generally exhibited in the samples collected from 2 ft bgs at each location; however, the samples collected from 5 and 10 ft bgs at BPI-DP-7 also exhibited relatively high concentrations of arsenic. The maximum zinc concentrations were exhibited in the 10 and 15 ft bgs samples collected from BPI-DP-5. Action levels were assigned per the methodology described in section 3.2.1.

The assigned arsenic action level of 7.8 mg/kg was exceeded by 8 of the 12 samples with a maximum concentration of 412 mg/kg. The assigned lead action level of 25 mg/kg was exceeded by 5 of the 8 samples with a maximum concentration of 1,500 mg/kg. The assigned zinc action level of 225 mg/kg was exceeded by 2 of the 12 samples with a concentration of 4,860 mg/kg. Select analytical results and assigned action levels are presented in Figure 8 and Table 9.

Volatile Organic Compound (VOC) Results: *(See Figure 8; Table 12)*

VOCs identified at concentrations at or above their corresponding MDL in soil matrix samples collected from the West Parcels Area include acetone, methyl acetate, and PCE. None of the samples collected from the West Parcels area exhibited concentrations of VOCs that exceeded their corresponding action level. Since no VOC analytes were identified in the background soil matrix samples at concentrations exceeding their corresponding MDL, the reported SQLs of the background samples were assigned as the VOC action levels (see section 3.2.1). Select analytical results and assigned action levels are presented in Figure 8 and Table 12.

3.2.3 Release Sampling *(See Figures 4 through 8; Tables 13 & 15)*

To establish a release of one or more hazardous substances from on-site source areas to groundwater beneath the site, WESTON collected discrete-depth groundwater samples from the

Gaspur and Exposition aquifers. See section 4.2.1 for a description of the shallow aquifers underlying the site. As part of the investigation, groundwater samples were collected from one selectively-biased on-site location using direct push technology, from nine on-site locations using existing monitoring wells, and from one off-site and immediately downgradient location (with respect to the Exposition aquifer) using an existing monitoring well. Four of the 11 release sample locations were situated within the Former UST & Transloading Area. Three of the locations were situated within the Warehouse No. 3 & Clarifier Area, which is immediately downgradient (with respect to the Exposition aquifer) from the Former UST & Transloading Area. Three of the locations were situated between approximately 60 and 300 ft downgradient (with respect to the Exposition aquifer) of the Warehouse No. 3 & Clarifier Area. One location was situated within the West Parcels Area.

For HRS purposes, no action levels are assigned for contaminants identified within the Gaspur aquifer beneath the site. For reporting purposes, analyte concentrations identified within this aquifer are referenced against documented federal and state regulatory benchmarks. Action levels for contaminants identified within the Exposition aquifers are assigned based on the concentrations exhibited in samples collected from background location, BPI-CPT-1. The methodology for assigning site-specific groundwater action levels is described in section 3.2.1. Release sample locations are presented in Figure 4.

3.2.3.1 Former UST & Transloading Area

Four release samples were collected from the Former UST & Transloading Area. All four of these samples were collected from existing monitoring wells and included two samples from the Gaspur aquifer, BPI-MW-1 and BPI-MW-6S, and two samples from the Exposition aquifer, BPI-MW-6D and BPI-MW-8.

Metal Results: *(See Figure 5; Table 13)*

Metals identified at concentrations at or above their corresponding SQL in groundwater samples associated with the Former UST & Transloading Area include arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL, but above their MDL, include antimony, selenium, and silver.

Metals identified in the samples with exceedances of assigned action levels (Exposition aquifer samples) or documented federal and state regulatory benchmarks (Gaspur aquifer samples) include antimony (one instance), arsenic (four instances), cadmium (one instance), copper (one instance), lead (one instance), manganese (two instances), nickel (two instances), and zinc (one instance). Action levels for Exposition aquifer samples were assigned per the methodology described in section 3.2.1.

Exceedances of antimony, cadmium, copper, and zinc were identified in the 84 ft bgs (Exposition) sample collected from BPI-MW-6D at concentrations of 1.6 µg/L (qualified as estimated), 1.6 µg/L, 23 µg/L, and 134 µg/L, respectively. The sole lead exceedance of 55 µg/L, the maximum

manganese exceedance of 1,380 µg/L, and the maximum nickel exceedance of 412 µg/L were identified in the 68 ft bgs (Gaspur) sample collected from BPI-MW-1. The maximum arsenic exceedances of 768 µg/L and 677 µg/L were identified in the 67 ft bgs (Gaspur) sample collected from BPI-MW-6S and the 68 ft bgs (Gaspur) sample collected from BPI-MW-1, respectively. Select analytical results, assigned action levels, and benchmarks are presented in Figure 5 and Table 13.

Volatile Organic Compound (VOC) Results: *(See Figure 6; Table 15)*

VOCs identified at concentrations at or above their corresponding SQL in groundwater samples associated with the Former UST & Transloading Area include 1,2-DCP; chloroform; cis-1,2-DCE; PCE; trans-1,2-DCE; and TCE. Additional VOC analytes identified at concentrations below their SQL but above their MDL include 1,1,2-trichloroethane; 1,1-DCA; and acetone.

VOCs identified in the samples with exceedances of assigned action levels (Exposition aquifer samples) or documented federal and state regulatory benchmarks (Gaspur aquifer samples) include 1,2-DCP (one instance); chloroform (one instance); cis-1,2-DCE (four instances); PCE (two instances); trans-1,2-DCE (one instance); and TCE (three instances). Action levels for Exposition aquifer samples were assigned per the methodology described in section 3.2.1. Because of the high concentration of one or more VOC analytes in some samples, it was necessary for the laboratory to dilute these samples to stay within equipment calibration limits. Consequently, the SQLs for the diluted samples were also increased, in some cases to levels that exceed regulatory benchmarks.

The 1,2-DCP; chloroform; and trans-1,2-DCE exceedances were identified in the 84 ft bgs (Exposition) sample collected from BPI-MW-6D at concentrations of 8.2 µg/L, 0.54 µg/L, and 1.5 µg/L, respectively. The maximum cis-1,2-DCE exceedance of 2,800 µg/L was identified in the 68 ft bgs (Gaspur) sample collected from BPI-MW-1. The maximum PCE exceedance of 19 µg/L (qualified as estimated) and TCE exceedance of 51 µg/L were identified in the 92 ft bgs (Exposition) sample collected from BPI-MW-8. Select analytical results, assigned action levels, and benchmarks are presented in Figure 6 and Table 15.

3.2.3.2 Warehouse No. 3 & Clarifier Area

Three release samples were collected from the Warehouse No. 3 & Clarifier Area and three release samples were collected downgradient (with respect to the Exposition aquifer) of the area. The Warehouse No. 3 & Clarifier Area is situated immediately southwest of the Former UST & Transloading Area. Thus, Exposition aquifer samples discussed in this section may also be properly considered as release samples associated with sources situated within the Former UST & Transloading Area. All six of these samples were collected from existing monitoring wells and included three samples from the Gaspur aquifer; BPI-MW-7S, BPI-MW-9, and BPI-MW-10, and three samples from the Exposition aquifer; BPI-MW-7D, BPI-MW-14C, and BPI-MW-16C.

Metal Results: *(See Figure 7; Table 13)*

Metals identified at concentrations at or above their corresponding SQL in groundwater samples associated with the Warehouse No. 3 & Clarifier Area include arsenic, barium, cadmium, cobalt, copper, lead, manganese, nickel, selenium, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include antimony and chromium.

Metals identified in the samples with exceedances of assigned action levels (Exposition aquifer samples) or documented federal and state regulatory benchmarks (Gaspur aquifer samples) include arsenic (two instances), cadmium (one instance), cobalt (one instance), copper (one instance), manganese (two instances), nickel (two instances), and selenium (one instance). Action levels for Exposition aquifer samples were assigned per the methodology described in section 3.2.1.

The cadmium, cobalt, copper, and selenium exceedances were identified in the 89 ft bgs (Exposition) sample collected from BPI-MW-7D at concentrations of 2.8 µg/L, 6.4 µg/L, 60 µg/L, and 3.6 µg/L (qualified as estimated), respectively. This sample also exhibited the maximum concentrations of arsenic at 117 µg/L. The maximum manganese exceedance of 339 µg/L was identified in the 71 ft bgs (Gaspur) sample collected from BPI-MW-7S. The nickel exceedances were identified in the 71 ft bgs (Gaspur) sample collected from BPI-MW-7S and the 89 ft bgs (Exposition) sample collected from BPI-MW-7D at concentrations of 207 µg/L and 203 µg/L, respectively. Select analytical results, assigned action levels, and benchmarks are presented in Figure 7 and Table 13.

Volatile Organic Compound (VOC) Results: *(See Figure 7; Table 15)*

VOCs identified at concentrations at or above their corresponding SQL in groundwater samples associated with the Warehouse No. 3 & Clarifier Area include 1,1-DCA; 1,1-DCE; 1,2-DCB; 1,2-DCA; 1,2-DCP; 1,4-DCB; acetone; benzene; chlorobenzene; chloroform; chloromethane; cis-1,2-DCE; PCE; toluene; trans-1,2-DCE; TCE; and vinyl chloride. No additional VOC analytes were identified at concentrations below their SQL but above their MDL.

VOCs identified in the samples with exceedances of assigned action levels (Exposition aquifer samples) or documented federal and state regulatory benchmarks (Gaspur aquifer samples) include 1,1-DCA (three instances); 1,2-DCB (one instance); 1,2-DCA (two instances); 1,2-DCP (one instance); 1,4-DCB (one instance); chlorobenzene (one instance); chloromethane (one instance); cis-1,2-DCE (two instances); PCE (two instances); trans-1,2-DCE (one instance); and TCE (five instances). Action levels for Exposition aquifer samples were assigned per the methodology described in section 3.2.1. Because of the high concentration of one or more VOC analytes in some samples, it was necessary for the laboratory to dilute these samples to stay within equipment calibration limits. Consequently, the SQLs for the diluted samples were also increased, in some cases to levels that exceed regulatory benchmarks.

The 1,2-DCB, 1,4-DCB, and chlorobenzene exceedances were identified in the 89 ft bgs (Exposition) sample collected from BPI-MW-7D at concentrations of 180 µg/L, 20 µg/L, and

4.5 µg/L (qualified as estimated), respectively. This sample also exhibited the maximum exceedances of 1,2-DCA at 29 µg/L, cis-1,2-DCE at 40 µg/L, PCE at 110 µg/L, and TCE at 480 µg/L. The 1,2-DCP and trans-1,2-DCE exceedances were identified in the 134 ft bgs (Exposition) sample collected from BPI-MW-16C at concentrations of 1.8 µg/L and 2.5 µg/L, respectively. The chloromethane exceedance was identified in the 125 ft bgs (Exposition) sample collected from BPI-MW-14C at a concentration of 2.7 µg/L. The maximum 1,1-DCE exceedance of 15 µg/L was identified in the 77 ft bgs (Gaspur) sample collected from BPI-MW-10. Select analytical results, assigned action levels, and benchmarks are presented in Figure 7 and Table 15.

3.2.3.3 West Parcels Area

One release sample was collected from the West Parcels Area. This sample was collected from a depth of 66 ft bgs (Gaspur Aquifer) at Boring BPI-DP-5 and was submitted for VOC analysis only.

Volatile Organic Compound (VOC) Results: *(See Figure 8; Table 15)*

No VOCs were identified at concentrations at or above their corresponding SQL in the single groundwater sample associated with the West Parcels Area. VOC analytes identified at concentrations below their SQL but above their MDL include acetone, cis-1,2-DCE, and TCE. Select analytical results and benchmarks are presented in Figure 8 and Table 15.

3.2.4 Secondary Objective Groundwater Sampling and Lithological Profiling
(See Figures 4 & 9; Tables 14 & 16)

In accordance with the SI's secondary objective (see section 3.2), WESTON collected lithological profiling data from three off-site locations and discrete-depth groundwater samples from seven off-site locations. These locations included three borings that were advanced using DP/CPT technology designated as BPI-CPT-2, BPI-CPT-4, and BPI-CPT-5, and four existing monitoring wells designated as BPI-MW-5S, BPI-MW-13C, BPI-MW-15A, and BPI-MW-15B. Boring BPI-CPT-2 and well BPI-MW-5S are located northeast of the site. Boring BPI-CPT-4, Boring BPI-CPT-5 and well BPI-MW-13C are located between approximately one-tenth and one-quarter mile southwest of the site. Wells BPI-MW-15A, and BPI-MW-15B are colocated approximately 150 ft south of the site on the adjacent Titan site (EPA ID No. CAD008353211) (Weston, 2017b).

A total of 13 secondary objective groundwater samples were collected from the off-site borings and monitoring wells. At each boring location, samples were collected from three distinct depths, which generally corresponded to the Gaspur aquifer and two zones within the Exposition aquifer. See section 4.2.1 for a description of the shallow aquifers underlying the site. The specific sampling depths were determined in the field by targeting coarser-grained sediments as interpreted in the location-specific CPT lithological profile report (Appendix E). Samples corresponding to the Gaspur aquifer were collected from wells BPI-MW-5S and BPI-MW-15A. Samples corresponding to the Exposition aquifer were collected from wells BPI-MW-13C and BPI-MW-15B. Since HRS action levels are not applicable to the secondary objective samples,

analyte concentrations were compared to documented federal and state regulatory benchmarks for reporting purposes. Secondary objective sample locations are presented in Figure 4.

Metal Results: *(See Figure 9; Table 14)*

Metals identified at concentrations at or above their corresponding SQL in secondary objective groundwater samples include antimony, arsenic, barium, chromium, cobalt, copper, manganese, nickel, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include cadmium, lead, and selenium.

Metals identified in the samples with exceedances of documented federal and state regulatory benchmarks include antimony (one instance), arsenic (three instances), and manganese (12 instances). The antimony exceedance was identified in the 124 ft bgs (Exposition) sample collected from BPI-CPT-2 at a concentration of 27 µg/L. This sample also exhibited the highest exceedance of arsenic at 28 µg/L (qualified as estimated - biased high). The maximum manganese exceedance of 1,610 µg/L was identified in the 69 ft bgs (Gaspur) sample collected from BPI-MW-5S. Select analytical results and benchmarks are presented in Figure 9 and Table 14.

Volatile Organic Compound (VOC) Results: *(See Figure 9; Table 16)*

VOCs identified at concentrations at or above their corresponding SQL in secondary objective groundwater samples include 1,1-DCA; 1,1-DCE; 1,2-DCB; 1,2-DCA; 1,4-DCB; acetone; cis-1,2-DCE; dichlorodifluoromethane (i.e., Freon®-12); trans-1,2-DCE; TCE; and vinyl chloride. Additional VOC analytes identified at concentrations below their SQL but above their MDL include 1,2-DCP; 2-butanone (i.e., MEK); 4-methyl-2-pentanone (i.e., methyl isobutyl ketone [MIBK]); benzene; carbon disulfide; cyclohexane; methyl tertiary butyl ether; and toluene.

VOCs identified in the samples with exceedances of documented federal and state regulatory benchmarks include 1,2-DCA (one instance); 1,2-DCP (one instance); cis-1,2-DCE (one instance); and TCE (10 instances). The 1,2-DCA; 1,2-DCP; and cis-1,2-DCE exceedances were identified in the 136 ft bgs (Exposition) sample collected from BPI-CPT-4 at concentrations of 130 µg/L, 23 µg/L (qualified as estimated), and 270 µg/L, respectively. This sample also exhibited the second highest exceedance of TCE at 63 µg/L. The maximum TCE exceedance of 600 µg/L was identified in the 84 ft bgs (Exposition) sample collected from BPI-CPT-5. Select analytical results and benchmarks are presented in Figure 9 and Table 16.

3.2.5 Deviations from the SAP

Deviations from the September 2015 Brenntag SAP (Appendix F) occurred during the field work. The significant deviations approved in the field by the EPA Site Assessment Manager include:

- Only four of the proposed six CPT borings were advanced. Proposed borings BPI-CPT-3 and BPI-CPT-6 were not advanced due to scheduling constraints.

- Groundwater release samples from the perched aquifer were not collected at direct push borings BPI-DP-5, BPI-DP-7, and BPI-DP-8 because a water-bearing unit had not been identified within the proposed sampling interval.

- A groundwater release sample from the Gaspur aquifer was not collected at direct push boring BPI-DP-7 because insufficient water was available within the set screening interval (64-68 ft bgs) for sampling.

- The groundwater release sample collected from the Gaspur aquifer at direct push boring BPI-DP-5 was submitted for VOC analysis only due to insufficient water available within the set screening interval (64 to 68 ft bgs) for sampling.

- Direct push boring BPI-DP-8 was advanced to a total depth of 15 ft bgs and a groundwater release sample was not collected due to scheduling constraints.

- Direct push boring BPI-DP-1 was relocated approximately 17 ft east of its proposed location due to one or more apparent subsurface structures located within 1 ft of ground surface.

- CPT boring BPI-CPT-4 was relocated approximately 30 ft west and CPT boring BPI-CPT-5 was relocated approximately 60 ft west of their proposed locations due to subsurface utility conflicts.

- "Special Designation" samples (e.g., Laboratory Quality Control [QC], duplicates, blanks) were reassigned in the field based on actual number and location of collected samples. Final designations are presented in the Sample Nos. – CLP Nos. Correlation Tables (Appendix G).

4.0 HAZARD RANKING SYSTEM FACTORS

4.1 Sources of Contamination *(See Figures 5 through 8; Tables 7 through 11)*

For HRS purposes, a source is defined as an area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance.

Potential hazardous substance sources associated with the Brenntag site include, but may not be limited to:

- Contaminated soils in the Former UST & Transloading Area, which are likely a result of historical on-site operations; however, the specific operations responsible for the impacted soils are not known. Metals, including, but not limited to, antimony, arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc, were present in site soils at concentrations significantly above background (see Figure 5 and Table 7). In addition, VOCs, including, but not limited to, 1,2,3-TCB; 1,2,4-TCB; 1,2-DCB; 1,2-DCP; 1,4-DCB; cis-1,2-DCE; PCE; trans-1,2-DCE; and TCE, were present in site soils at concentrations significantly above background.

- Contaminated soils in the Warehouse No. 3 and Clarifier Area, which are likely a result of historical on-site operations; however, the specific operations responsible for the impacted soils are not known. Metals; including but not limited to, arsenic, lead, and zinc; were present in site soils at concentrations significantly above background (see Figure 7 and Table 8). In addition, VOCs; including but not limited to, PCE and TCE; were present in site soils at concentrations significantly above background.

- Contaminated soils in the West Parcels Area, which are likely a result of historical on-site operations; however, the specific operations responsible for the impacted soils are not known. Metals; including but not limited to, antimony, arsenic, cadmium, copper, lead, and zinc; were present in site soils at concentrations significantly above background.

4.2 Groundwater Pathway

In determining a score for the groundwater migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to groundwater; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on the number of people who regularly obtain their drinking water from wells that are located within 4 miles of the site. The HRS emphasizes drinking water usage over other uses of groundwater (e.g., food crop irrigation and livestock watering), because, as a screening tool, it is designed to give the greatest weight to the most direct and extensively studied exposure routes.

4.2.1 Hydrogeological Setting *(See Tables 17 & 18)*

The site lies within the Central Subbasin in the Coastal Plain of the Los Angeles Groundwater Basin. The Central Subbasin is generally bound to the north by the folded, uplifted, and eroded Tertiary basement rocks of the La Brea High surface divide; to the northeast and east by the less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; to the southeast by the Coyote Creek flood control channel (approximate Los Angeles County/Orange County boundary); and to the southwest by the Newport Inglewood Uplift, a regional anticline associated with the Newport Inglewood fault system. Geologic units typically found beneath the subbasin include Holocene-age alluvium, the upper Pleistocene Lakewood Formation, and the lower Pleistocene San Pedro Formation. The Los Angeles and San Gabriel rivers pass across the surface of the subbasin, primarily by way of engineered concrete channels, on their way to the Pacific Ocean. The average net annual precipitation in the subbasin is approximately 12 inches (DWR, 1961; DWR, 2004).

The Central Subbasin has historically been divided into four areas; the Los Angeles Forebay at the northwest, the Montebello Forebay at the north, the Whittier Area at the northeast, and the Central Basin Pressure Area at the central and southwest. However, these areal distinctions are appropriate for geographical purposes only and do not accurately represent hydrogeologic conditions within the areas. The hydrogeologic forebays, which are generally characterized by unconfined and relatively interconnected aquifer systems, are limited to small regions within the greater Forebay areas. The Montebello Forebay, as well as the Los Angeles Forebay to a lesser degree, serve as the primary groundwater recharge areas for both shallow and deep aquifers across the entirety of the subbasin. The Central Basin Pressure Area is generally characterized by confined aquifer systems separated by relatively impermeable clay layers, although semipermeable zones within these layers allow aquifers to be interconnected in some areas. These semipermeable zones gradually decrease in frequency and magnitude with increasing distance from the forebays (DWR, 1961; DWR, 2004).

The site is located within the northern portion of the Central Basin Pressure Area geographical area, with the Los Angeles Forebay to the northwest and the Montebello Forebay to the northeast. Groundwater beneath the site is typically found within the coarser-grained sediments of the Holocene alluvium (Gaspur aquifer), the upper Pleistocene Lakewood Formation (Exposition and Gage aquifers), and the lower Pleistocene San Pedro Formation (Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside aquifers). The estimated elevations and depths of the aquifers underlying the site are presented in Table 17. Irregular patches of a perched, or semiperched, aquifer are also present within the Holocene alluvium throughout much of the subbasin. Although significant amounts of water can be found within these perched water-bearing zones, they are often discontinuous over relatively short distances and have historically had only minimal economic benefit. Thus, the perched aquifer does not meet the criteria of an “aquifer” for HRS purposes. These perched zones are typically found between approximately 25 and 45 ft bgs (i.e., between the surface and the top of the Gaspur aquifer) (DWR, 1961; DWR, 2004).

For the purposes of this SI, the Gaspur aquifer beneath the site is defined as being between 55 and 77 ft bgs. Water-bearing units identified at shallower depths are defined as being associated with

one or more perched (or semiperched) aquifers. The Exposition aquifer is defined as being between 77 and 217 ft bgs; however, the base of this aquifer is considered approximate because no information was found regarding site-specific lithology below approximately 160 ft bgs. These designations were assigned primarily based on CPT lithological profile reports that were developed both during and prior to the completion of the SI investigation. A more comprehensive study of the lithological sediments in the 75 to 100 ft bgs zone beneath the site would be required to ascertain whether the water-bearing zones in this range are most appropriately associated with the hydrogeologic conditions of the Gaspur or Exposition aquifers. The CPT Lithological Profile Reports developed during the Brenntag SI investigation are presented in Appendix E (ARCADIS, 2012; ARCADIS, 2013).

Throughout much of the subbasin, the Pleistocene-age aquifers are under confined conditions due to the presence of fine-grained, low-permeability interbedded sediments. Although these fine-grained sediments, or aquicludes, generally restrict the downward migration of groundwater from overlying aquifers, semipermeable zones within the aquicludes allow aquifers to be interconnected in some areas. In addition, hydrogeologic modeling of multi-aquifer systems similar to those found in the Central Basin Pressure Area, indicates that groundwater wells screened across multiple aquifers (or wells with improperly constructed annular seals that cross multiple aquifers) can act as a direct pathway for the migration of significant volumes of shallow groundwater into deep confined aquifers when vertical hydraulic head variations create a downward hydraulic gradient. The process of this downward migration is increased in areas where the deeper aquifers have periods of high-volume pumping such as seasonal demand. Furthermore, additional studies have shown that liquids that are denser than water (i.e., dense non-aqueous phase liquids such as TCE and PCE) can migrate downward through a multi-aquifer well even when vertical hydraulic head variations create an upward hydraulic gradient. As of the end of the 2012-2013 fiscal year, there were 537 known extraction wells (306 active and 231 inactive) within the subbasin (AwwaRF, 2006; DWR, 1961; DWR, 2013; Johnson et al., 2011).

The State of California, Department of Water Resources' Bulletin No. 104 (*Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County*) – Appendix A presents "idealized" geologic cross-sections transecting the Central Subbasin. These cross-sections indicate apparent areas of merged aquifers near the site, including approximately 700 ft south-southwest (Gaspur-Exposition), approximately 0.3 mile southeast (Exposition-Gage), and approximately 1.1 miles east-southeast (Lynwood-Silverado). Aquifer interconnection within 2 miles of the site has been documented between the Gaspur through Gage and between the Lynwood through Silverado. Aquifer interconnections within 2 miles of the site have been established neither between the Gage through Jefferson, the Jefferson and Lynwood, nor the Silverado and Sunnyside (DWR, 1961).

The regional groundwater flow direction within the subbasin, which was calculated using data from wells screened within the upper San Pedro Formation (Lynwood and Silverado aquifers), is generally to the southwest with local and temporal variations from approximately west-southwest to southeast. Based upon data collected between 2007 and 2016, flow within these deeper aquifers near the site trended towards the west-southwest with temporal variations from west to south-southwest (WRD, 2017).

Groundwater flow directions within the perched aquifer at the site are not known. Because of the highly irregular and discontinuous nature of these perched water-bearing zones, the flow direction is estimated to be highly variable and the calculation of a meaningful flow direction would likely require a separate and specialized investigation.

The groundwater flow direction within the Gaspur aquifer at the site is also not known. During the SI investigation, depth-to-water measurements were collected from wells screened within this zone from the site's existing monitoring well network. In addition, during a concurrently-conducted SI investigation at the nearby General Inspection Laboratories site (EPA ID No. CAD027897164), water level measurements were collected from its existing monitoring well network. Calculations based on these measurements were generally inconsistent and often resulted in conflicting flow directions. Based on this information, the flow directions within the Gaspur aquifer at the site are expected to be variable, which is potentially a result of a heavily channelized depositional environment or unidentified lithologic condition. The groundwater elevation data collected during the SI investigation are provided in Table 18 (ARCADIS, 2017; Weston, 2017a).

The groundwater flow direction within the Exposition aquifer at the site is estimated to be towards the southwest. This estimated flow direction is based on monitoring well depth-to-water measurements collected from wells screened within this aquifer zone during the SI investigation, as well as from groundwater data collected by the site operator during semiannual monitoring events conducted at the site between 2010 and 2016. The groundwater elevation data collected during the SI investigation are provided in Table 18 (ARCADIS, 2017).

During the SI investigation, the subsurface geology at the site was logged to a depth of 15 ft bgs, the base of continuous coring. Subsurface materials primarily consisted of light- to dark-brown, fine- to medium-grained sands with interbedded lenses (typically less than 12 inches) of silty sands, sandy silts, silts, and clays, which generally increased in frequency and decreased in grain size moving eastward across the site. The lithological identifications are described in the sample log book (Appendix I). Additionally, during the SI investigation, CPT technology was used to estimate the subsurface lithology to a total depth of approximately 145 ft bgs. The interpreted Soil Behavior Type generated from the CPT generally indicated sand units from 5 to 15 ft bgs, 22 to 38 ft bgs, 62 to 88 ft bgs, 114 to 124 ft bgs, and 136 to 145 (total depth) ft bgs. Between these sand units, the soils were generally composed of silts and clays with thin (i.e., less than 2 ft) interbedded lens of coarser-grained materials. The CPT Lithological Profile Reports are presented in Appendix E.

4.2.2 Groundwater Targets *(See Table 19)*

The nearest HRS-eligible drinking water well to the site is Well 03. This well is operated by the Tract 349 Mutual Water Company (MWC) and is located approximately 0.17 mile to the northeast of the site. Routine water quality sampling of this well has not reported elevated concentrations of AOCs, including TCE, PCE, arsenic, or chromium. Well 03 is a multi-aquifer well with six distinct screening intervals that correlate to the estimated depths of the Silverado and Sunnyside aquifers (BBD, 1948; DWR, 1961; RWQCB, 2015; Weston, 2016).

The City of South Gate's Well 7 was a public supply well located approximately 0.44 mile southeast of the site, which was removed from service in approximately 2002 and destroyed in approximately 2011 due primarily to elevated concentrations of arsenic, chromium (including hexavalent chromium), and TCE. The maximum reported arsenic concentration of 15.1 µg/L was identified in December 1997. The maximum reported chromium concentration (primarily of the hexavalent species) of 86 µg/L was identified in August 2000. This well had exhibited elevated PCE and TCE concentrations since at least 1985. The maximum reported PCE concentration of 3.8 µg/L and TCE concentration of 14 µg/L were both identified during the most recent recorded sampling in October 2001. Well 7 was a single-aquifer well with a sole screening interval that correlated to the estimated depths of the Lynwood aquifer (DWR, 1948b; DWR, 1961; RWQCB, 2015; Weston, 2016; Appendix C-1).

The City of Huntington Park's Well 12 is an active public supply well located approximately 0.20 mile northwest of the site. During routine water quality sampling, this well has exhibited non-detectable concentrations of TCE since May 2009. The maximum TCE concentration reported in this well was 1.6 µg/L, which was identified in 2003. Elevated TCE concentrations were also reported in 2007 and 2008. This well has not exhibited detectable concentrations of arsenic, chromium, or PCE. Well 12 is a multi-aquifer well with a sole screening interval that correlates to the estimated depths of the Lynwood through Sunnyside aquifers (DWR, 1948a; DWR, 1961; RWQCB, 2015; Weston, 2016).

The Golden State Water Company (GSWC) - Bell/Bell Gardens system's Hoffman Well 02 was a public supply well located approximately 0.58 mile east of the site, which was removed from service in approximately 2000 and subsequently destroyed in approximately 2007 due primarily to elevated concentrations of chromium. The maximum reported chromium concentration of 333 µg/L was identified in November 2000. This well had consistently exhibited detectable, but relatively low, concentrations of PCE since at least 1985 and had exhibited elevated TCE concentrations since at least 1985. PCE concentrations gradually began increasing in approximately 1990. The maximum reported PCE concentration of 5.7 µg/L was identified in November 2000. The maximum reported TCE concentration of 15.3 µg/L was identified in November 1996. Hoffman Well 02 was a single-aquifer well with three distinct screening intervals (437 to 444, 454 to 476, and 477 to 494 ft bgs) that correlated to the estimated depths of the Lynwood aquifer (DWR, 1961; RWQCB, 2015; Weston, 2016; Appendix C-4).

The federal MCL for arsenic is 10 µg/L, for chromium is 100 µg/L, for PCE is 5.0 µg/L, and for TCE is 5.0 µg/L.

There are 89 known active drinking water wells, 5 known maintained-standby wells, and 38 known inactive (i.e., inactive, destroyed, abandoned) wells located within the target distance limit (TDL) (i.e., 4 miles of established on-site sources). Water purveyors known to operate wells within the TDL include Tract 349 MWC, City of Huntington Park, City of South Gate, Tract 180 MWC, GSWC - Bell, Bell Gardens, Maywood MWC No. 3, Rancho Los Amigos Hospital, Maywood MWC No. 1, City of Downey, City of Lynwood, City of Bell Gardens, Maywood MWC No. 2, Walnut Park MWC, GSWC – Hollydale, City of Vernon, GSWC – Florence/Graham, City of Compton, City of Commerce, Lynwood Park MWC, CalWater Service – East Los Angeles (ELA),

GSWC – Willowbrook, Park Water Company (Liberty) – Compton/Willowbrook, Sativa Los Angeles County Water District, and Los Angeles Department of Water and Power (DWP). Additional service information for these purveyors is presented in Table 19 (Weston, 2016).

4.2.3 Groundwater Pathway Conclusion *(See Figures 5 through 9; Tables 13 through 19)*

A release of hazardous substances from the site to groundwater within the Exposition aquifer has been established based on the results of the SI investigation. See section 4.2.1 for a description of the aquifers underlying the site. For HRS purposes, a release to groundwater is established when a hazardous substance is detected in a hydraulically downgradient well at a concentration significantly above background levels, and some portion of the release is attributable to the site. A hazardous substance is considered to be present at a concentration significantly above background levels when one of the following two criteria is met: (1) the hazardous substance is detected in the contaminated (i.e., release) sample, when not detected in the background samples or (2) the hazardous substance is detected in the release sample at a concentration equal to or greater than three times the maximum background level, when detected in the background samples.

Based on the results of the SI investigation, an observed release from the site to groundwater within the Exposition aquifer has been established. Sampling location BPI-CPT-1 is located northeast and upgradient of release sample locations within the Former UST & Transloading Area and the Warehouse No. 3 & Clarifier Area. The groundwater flow direction within the Exposition aquifer at the site is estimated to be towards the southwest (see section 4.2.1). Groundwater samples were analyzed for metals and VOCs. Metals; including, but not limited to, arsenic; cadmium; copper; nickel; and zinc; and VOCs; including, but not limited to, 1,2-DCP; 1,4-DCB; cis-1,2-DCE; PCE; trans-1,2-DCE; and TCE, were reported in downgradient release samples collected from the Exposition aquifer at concentrations significantly above background (see Table 13 and Table 15). This release is attributable, at least in part, to the Brenntag site because these analytes have been detected at elevated concentrations in samples collected from site soils (see section 4.1).

A release of hazardous substances from the site to groundwater within the Gaspur aquifer has not been established based on the results of the SI investigation. Results from the investigation documented concentrations of AOCs in Gaspur aquifer groundwater at the site that exceeded federal and state regulatory benchmarks (see Table 13 and Table 15). However, because the hydraulic gradient of this aquifer beneath the site has not been adequately defined, an appropriate background concentration could not be assigned; therefore, an observed release to the Gaspur aquifer cannot be established. Release samples collected from this aquifer within, and adjacent to, the Former UST & Transloading Area and the Warehouse No. 3 & Clarifier area exhibited AOC concentrations that exceeded regulatory benchmarks for metals including, but not limited to, arsenic, lead, manganese, and nickel, and VOCs including, but not limited to, cis-1,2-DCE and TCE. These analytes have also been detected at elevated concentrations in samples collected from site soils, which may indicate that these Gaspur aquifer regulatory exceedances are attributable, at least in part, to the site (see section 4.1).

The geologic materials between the ground surface at the site and the top of the deepest identified aquifer, the Sunnyside, are generally characterized by confined aquifer systems, which are

composed of relatively permeable sands through gravels and are separated by relatively impermeable clay through silt layers; although semipermeable zones within these layers allow one or more aquifers to be interconnected in some areas. The estimated elevations and depths of the aquifers underlying the site are presented in Table 17. There are 89 known active drinking water wells within 4 miles of the site. These wells, which are operated by 24 distinct water purveyors, serve an apportioned population of approximately 619,000 (CTE, 2011; CWS, 2016; DWR, 1961; KJC, 2016a; KJC, 2016b; MWM, 2016; RMP, 2011; SAA, 2011; SEI, 2012; SWRCB, 2017; Weston, 2016).

4.3 Surface Water Pathway

To determine the score for the surface water pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to surface water (e.g., streams, rivers, lakes, and oceans); 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, persistence, bioaccumulation potential, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on drinking water intakes, fisheries, and sensitive environments associated with surface water bodies within 15 miles downstream of the site.

Surface water runoff from the Brenntag site is expected to flow from the paved surfaces at the site via engineered concrete troughs and facility stormwater drains into the adjacent municipal stormwater system. The nearest surface water body to the site is the Los Angeles River, which is located approximately 0.85 mile east. The Los Angeles River is highly modified, having been lined with concrete along most of its length by the U.S. Army Corps of Engineers in the 1950s. Flows in the river are dominated by urban runoff and tertiary-treated effluent from several municipal wastewater treatment plants. The river empties into the Pacific Ocean at San Pedro Bay approximately 13.5 miles downstream of the site. There are no surface water intakes, fisheries, or sensitive environments associated with the Los Angeles River downstream of the site; however, there is a potential for fisheries and/or recreational areas to exist within San Pedro Bay (Google, 2017; RWQCB, 1994; Appendix B).

4.4 Soil Exposure and Air Migration Pathways

In determining the score for the soil exposure pathway, the HRS evaluates: 1) the likelihood that there is surficial contamination associated with the site (e.g., contaminated soil that is not covered by pavement or at least 2 feet of clean soil); 2) the characteristics of the hazardous substances in the surficial contamination (i.e., toxicity and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, exposed to the contamination. For the targets component of the evaluation, the HRS focuses on populations that are regularly and currently present on or within 200 feet of surficial contamination. The four populations that receive the most weight are residents, students, daycare attendees, and terrestrial sensitive environments.

In determining the score for the air migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to

ambient outdoor air; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on regularly occupied residences, schools, and workplaces within 4 miles of the site. Transient populations, such as customers and travelers passing through the area, are not counted.

There are no known residences, schools, daycare facilities, or sensitive environments on site. In addition, the site is fenced and, with the exception of a few minor landscaped areas, its surface is covered with pavement or buildings. The nearest identified residential property to the site was located approximately 125 ft northeast. There are regularly occupied workplaces on site; however, the total number of employees is not known (Google, 2017; Appendix B).

4.5 Hazard Ranking System Summary *(See Figures 5 through 9; Tables 13 through 19)*

On-site soil-matrix samples collected during the 2015 SI investigation exhibited concentrations of metals and VOCs that exceeded assigned site-specific action levels. Specific metal analytes include, but are not limited to, antimony, arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. Specific VOC analytes include, but are not limited to, 1,2,3-TCB; 1,2,4-TCB; 1,2-DCB; 1,2-DCP; 1,4-DCB; cis-1,2-DCE; PCE; trans-1,2-DCE; and TCE.

Groundwater release samples collected from the Exposition aquifer during the investigation also exhibited concentrations of metals and VOCs that exceeded assigned site-specific action levels. Specific metal analytes include, but are not limited to, arsenic, cadmium, copper, nickel, and zinc. Specific VOC analytes include, but are not limited to, 1,2-DCP; 1,4-DCB; cis-1,2-DCE; PCE; trans-1,2-DCE; and TCE.

Groundwater release samples collected from the Gaspur aquifer during the investigation exhibited concentrations of metals and VOCs that exceeded documented federal and/or state regulatory benchmarks. Specific metal analytes include, but are not limited to, arsenic, lead, manganese, and nickel. Specific VOC analytes include, but are not limited to, 1,1-DCA; cis-1,2-DCE; and TCE. For HRS purposes, action levels were not assigned for groundwater samples collected from the Gaspur aquifer (see section 3.2.1).

The following primary HRS factors are associated with the site:

- Hazardous substance sources at the site have been documented, consisting of soils contaminated during historical operations. Substances include arsenic; lead; nickel; cis-1,2-DCE; PCE; and TCE, which were present in site soils at concentrations significantly above background.

- A release of hazardous substances from the site to the Exposition aquifer has been established based on the results of the 2015 SI sampling effort. Substances include, but are not limited to, arsenic; nickel; cis-1,2-DCE; PCE; and TCE.

- Aquifer interconnection within 2 miles of the site has not been adequately documented between the Exposition through Silverado aquifers.

- The geologic materials between the site surface and the top of the Silverado aquifer are generally characterized by approximately 600 feet of relatively permeable sands and gravels and approximately 550 feet of less permeable clays and silts.

- The nearest drinking water well is located less than one-quarter mile from the site.

- Drinking water wells within 4 miles of the site serve an apportioned population of approximately 619,000.

The following secondary HRS factors are associated with the site:

- No drinking water intakes are associated with surface water within 15 miles downstream of the site. However, there is the potential for fisheries and/or sensitive environments associated with the Pacific Ocean to exist within this target distance limit.

- There are no known residences, schools, daycare centers, or sensitive environments on site. The nearest identified residential property to the site is located approximately 125 ft northeast.

- There are regularly occupied workplaces on site; however, the total number of employees is not known.

- The site is fenced and generally inaccessible to the public.

- With the exception of minor landscaped areas, the surface of the site is covered with pavement or buildings.

5.0 REMOVAL EVALUATION CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415 (b) (2)] authorizes EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reasons, a referral to Region 9's Emergency Response Office does not appear to be necessary (Google, 2017; Appendix B):

- The site is fenced and inaccessible to the public.

- With the exception of a few minor landscaped areas, the surface of the site is covered with pavement or buildings.

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RWQCB, 2015: Regional Water Quality Control Board; Geotracker Database – Regulator Access, DPH Public Supply Well Search Results; *Tract 349 Mutual Water Company Well 03, City of Huntington Park Water Department Well 12, City of South Gate Water Department Well 07, GSWC-Bell/Bell Gardens Hoffman Well 02*; data extracted 08 January 2015 and 06 February 2015.

RWQCB, 2017: Regional Water Quality Control Board; Geotracker Database, Search Results, *Los Angeles Chemical Company*; http://geotracker.waterboards.ca.gov/search.asp; data extracted 19 April 2017.

SAA, 2011: SA Associates; *City of Lynwood, 2010 Urban Water Management Plan*; July 2011.

SEI, 2012: Stetson Engineers, Inc.; *City of Downey, 2010 Urban Water Management Plan*; January 2012.

SWRCB, 2017: State Water Resources Control Board, State of California; Safe Drinking Water Information System; California Public Water Supply Systems query results: *TRACT 349 MUTUAL WATER CO., HUNTINGTON PARK-CITY WATER DEPT., SOUTH GATE-CITY WATER DEPT., TRACT 180 MUTUAL WATER CO., GSWC - BELL, BELL GARDENS, MAYWOOD MUTUAL WATER CO. #3, RANCHO LOS AMIGOS HOSPITAL, MAYWOOD MUTUAL WATER CO. #1, DOWNEY - CITY WATER DEPT., LYNWOOD-CITY WATER DEPT., LIBERTY UTILITIES - BELL GARDENS, MAYWOOD MUTUAL WATER CO. #2, WALNUT PARK MUTUAL WATER CO., GSWC - HOLLYDALE, VERNON-CITY WATER DEPT., GSWC - FLORENCE/GRAHAM, COMPTON-CITY WATER DEPT., COMMERCE-CITY WATER DEPT., LYNWOOD PARK MUTUAL WATER CO., CALIFORNIA WATER SERVICE CO. - ELA, GSWC - WILLOWBROOK, LIBERTY UTILITIES - COMPTON, SATIVA-L.A. CWD;* https://sdwis.waterboards.ca.gov/PDWW/; data extracted 13 April 2017.

Weston, 2015: Weston Solutions, Inc.; Preliminary Assessment Report, *Brenntag Pacific Inc. (EPA ID No.: CAD008287732);* April 2015.

Weston, 2016: Weston Solutions, Inc.; Drinking Water Wells - GIS Report, *Brenntag Pacific Inc.*; December 2016.

Note: This document is confidential and is included in the confidential information packet.

Weston, 2017a: Weston Solutions, Inc.; Site Inspection Report, *General Inspection Laboratories (EPA ID No.: CAD027897164)*; August 2017.

Weston, 2017b: Weston Solutions, Inc.; Site Inspection Report, *Titan Terminal & Transport. (EPA ID No.: CAD008353211)*; August 2017.

WRD, 2017: Water Replenishment District of Southern California; *Engineering Survey and Report*; 02 March 2017.

Tables

Table 1: Current Property Owners

LA County Parcel	Associated Address	Owner
6215-002-007	4445 Ardine Street	Herndon, Inc
6215-002-008	4525 Ardine Street	Chan HWA Trading Corp.
6215-002-014	None	Herndon, Inc.
6215-002-021	4545 Ardine Street	Lynchburg LP
6215-002-022	4545 Ardine Street	Vicksburg LP

References: LACA, 2017; Weston, 2015; Appendix C-2.

Table 2: Site Operator Chronology

Location	Operator	Primary Operation(s)	Date
Central and Eastern Site Parcels (APN: 6215-002-021, 6215-002-022)	Los Angeles Chemical Company	Chemical blending, storage, distribution	~1928 - 2006
	The Brenntag Group	Chemical blending, storage, distribution	2006 - Present
Southwest Site Parcel - Large (APN: 6215-002-008)	*Unknown*	Fuel Storage and Distribution	~1927 ~ 1955
	Los Angeles Chemical Company	None	~1955 - 2006
	The Brenntag Group	None	2006 - Present
Southwest Site Parcel - Small (APN: 6215-002-014)	City of South Gate Water Department	Industrial Water Supply Well	~1923 - 1984
	Los Angeles Chemical Company	None	1984 - 2006
	The Brenntag Group	None	2006 - Present
Northwest Site Parcel (APN: 6215-002-007)	*Unknown*	*Unidentified Industrial*	~1933 ~ 1943
	Southwestern Supply Co. (Wilbur Ellis)	Fertilizer Manufacturing	~1943 ~ 1966
	Unknown	*Unidentified Industrial*	~1966 ~ 1985
	Diatec Environmental	Water Treatment Chemical Mfg.	~1985 ~ 1995
	Los Angeles Chemical Company	None	~1995 - 2006
	The Brenntag Group	None	2006 - Present

Definitions:
APN = Assessor Parcel Number

References:
ARCADIS, 2007; Weston, 2015; Appendix C-1

Table 3: On-Site Warehouse Descriptions

Warehouse ID	Warehouse Description
Warehouse No. 1	Office space and storage, loading and packaging of non-flammable chemicals. Historically used to store solvents.
Warehouse No. 2	Storage of dry chemicals in 50-pound bags. A small workshop/laboratory is also located adjacent to the west of the warehouse. Historically used to store solvents.
Warehouse No. 3	Used for chemical storage, including solvents stored in drums, and insecticides. Aboveground Storage Tanks (ASTs) are located along the north side of the warehouse. In addition, a six-stage in-ground clarifier is located south-adjacent to the warehouse.
Warehouse No. 4	Primarily used for dry chemical storage, although some blending occurs in the warehouse as well. Numerous ASTs are located adjacent to the warehouse. A drum wash area with two sumps is located in the northeast corner of the warehouse. The sumps are emptied by a sump pump to drainage lines that lead to the clarifier located south-adjacent to Warehouse No. 3.
Warehouse No. 5	Chemical storage and loading. A loading dock is located along the east side of the warehouse and a truck scale is located to the north.
Warehouse No. 6	Lime Room, which is used to store dry lime products. Historically used to store solvents.

Reference: ARCADIS, 2007

Table 4: Summary of Select On-Site Soil and Groundwater Investigations – Former UST & Transloading Area

Investigation	Maximum Results			
	Soil Matrix	rRSL	Groundwater	MCL
	(µg/kg for VOCs; mg/kg for metals)		(µg/L)	
1986 Additional Well Installation	TCE = 7.0 1,2-DCA = 130	940 460	TCE = 1,700 PCE = 91 1,1-DCE = 77 cis-1,2-DCE = 300 trans-1,2-DCE = 31	5.0 5.0 7.0 70 100
1988 Additional Well Installation	TCE = 16,000 PCE = 3,000 1,2-DCA = 240 trans-1,2-DCE = 22,000	940 24,000 460 1,600,000	TCE = 'elevated' 1,2-DCA = 'elevated'	5.0 5.0
1996 Remedial Investigation	TCE = 0.34	940	--	
1997-2000 SVE/AS Remediation	--		TCE = 4,100 (1) PCE = 120 (1) DCA = 1,700 (1)	5.0 5.0 5.0
2000-2004 SVE Remediation	--		TCE = 1,700 (2) PCE = 62 (2) DCA = 121 (2)	5.0 5.0 5.0
2005 Additional Site Assessment	TCE = 110 PCE = 13 arsenic = 34,900 lead = 46,000	940 24,000 0.67 400	TCE = 820 PCE = 29 1,2-DCA = 100 cis-1,2-DCE = 300	5.0 5.0 5.0 70
2007-2008 Additional Site Assessment(s)	arsenic = 6,490 lead = 1,090	0.67 400	Results Unavailable	
2011-2012 Subsurface Investigation	TCE = 8,590 PCE = 7,870 cis-1,2-DCE = 46,500 arsenic = 9,510 lead = 2,160	940 24,000 160,000 0.67 400	TCE = 3.0 (3) PCE = 'non-detect' (3) cis-1,2-DCE = 12 (3) vinyl chloride = 'non-detect' (3)	5.0 5.0 70 2.0
2005-2016 Semiannual Groundwater Monitoring	--		TCE = 460 PCE = 120 cis-1,2-DCE = 4,800 arsenic = 22,400 lead = 131	5 5 70 10 15
2016 2nd Semiannual Groundwater Monitoring	--		TCE = 57 PCE = 6.7 cis-1,2-DCE = 1,020 arsenic = 1,100 lead = 29	5.0 5.0 70 10 15

DCE = dichloroethylene
DCA = dichloroethane
MCL = Maximum Contaminant Level
mg/kg = milligrams per kilogram
PCE = tetrachloroethylene
rRSL = USEPA residential Regional Screening Level

TCE = trichloroethylene
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
-- = media not sampled
'elevated' = specific results unavailable
'non-detect' = not detected above laboratory reporting limit

Footnotes: 1 = pre-remediation concentration
2 = post-remediation concentration
3 = sample collected from Exposition aquifer and is not representative of concentrations within the shallower aquifers (see section 4.2.1)

References: ARCADIS, 2007; ARCADIS, 2012; ARCADIS, 2013; ARCADIS, 2017

Table 5: Summary of Select On-Site Soil and Groundwater Investigations – Warehouse No. 3 & Clarifier Area

Investigation	Maximum Results			
	Soil	rRSL	Groundwater	MCL
	(µg/kg for VOCs; mg/kg for metals)		(µg/L)	
1988 Additional Well Installation	TCE = 350 PCE = 19 1,2-DCA = 190	940 24,000 460	TCE = 'elevated' 1,2-DCA = 'elevated'	5.0 5.0
2002-2004 SVE Remediation	TCE = 200 (1) PCE = 68 (1)	940 24,000	TCE = 6,800 (1) / 310 (2) PCE = 1,300 (1) / 54 (2) DCA = 117 (1) / 18 (2)	5.0 5.0 5.0
2005 Additional Site Assessment	TCE = 81 PCE = 94 arsenic = 459 lead = 9.9	940 24,000 0.67 400	TCE = 490 PCE = 33 1,2-DCA = 340 cis-1,2-DCE = 79	5.0 5.0 5.0 70
2007-2008 Additional Site Assessment(s)	arsenic = 12,900 lead = 21,600	0.67 400	Results Unavailable	
2011-2012 Subsurface Investigation	TCE = 8,170 PCE = 8,950 cis-1,2-DCE = 4,880 arsenic = 1,030 lead = 1,320	940 24,000 160,000 0.67 400	TCE = 6.0 (3) PCE = 1.2 (3) cis-1,2-DCE = 24 (3) vinyl chloride = 2.0 (3)	5.0 5.0 70 2.0
2006-2016 Semiannual Groundwater Monitoring	--		TCE = 1,900 PCE = 150 cis-1,2-DCE = 200 arsenic = 7,200 lead = 'non-detect'	5.0 5.0 70 10 15
2016 2nd Semiannual Groundwater Monitoring	--		TCE = 174 PCE = 76 cis-1,2-DCE = 34 arsenic = 5,400 lead = 'non-detect'	5.0 5.0 70 10 15

DCE = dichloroethylene
DCA = dichloroethane
MCL = Maximum Contaminant Level
mg/kg = milligrams per kilogram
PCE = tetrachloroethylene
rRSL = USEPA residential Regional Screening Level
TCE = trichloroethylene
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
-- = media not sampled
'elevated' = specific results unavailable
'non-detect' = not detected above laboratory reporting limit

Footnotes: 1 = pre-remediation concentration
2 = post-remediation concentration
3 = sample collected from Exposition aquifer and is not representative of concentrations within the shallower aquifers (see section 4.2.1)

References: ARCADIS, 2007; ARCADIS, 2012; ARCADIS, 2013; ARCADIS, 2017

Table 6: Summary of Select On-Site Soil and Groundwater Investigations – West Parcels Area

Investigation	Maximum Results			
	Soil	rRSL	Groundwater	MCL
	(µg/kg for VOCs; mg/kg for metals)		(µg/L)	
2005 Additional Site Assessment	TCE = 'non-detect' PCE = 'non-detect' arsenic = 43 lead = 6,700	940 24,000 0.67 400	TCE = 'non-detect' PCE = 'non-detect' 1,2-DCA = 'non-detect' cis-1,2-DCE = 'non-detect'	5.0 5.0 5.0 70
2007 Additional Site Assessment	TCE = 'non-detect' PCE = 'non-detect' arsenic = 1,520 lead = 1,340	940 24,000 0.67 400	TCE = 'non-detect' PCE = 'non-detect'	5.0 5.0
2011-2012 Subsurface Investigation	TCE = Not Analyzed PCE = Not Analyzed arsenic = 454 lead = 38	0.67 400	--	
2005-2016 Semiannual Groundwater Monitoring	--		TCE = 1.6 PCE = 'non-detect' cis-1,2-DCE = 11 arsenic = 14 lead = 'non-detect'	5 5 70 10 15
2016 2nd Semiannual Groundwater Monitoring	--		TCE = 0.60 J PCE = 'non-detect' cis-1,2-DCE = 2.9 arsenic = 'non-detect' lead = 'non-detect'	5.0 5.0 70 10 15

DCE = dichloroethylene
DCA = dichloroethane
MCL = Maximum Contaminant Level
mg/kg = milligrams per kilogram
PCE = tetrachloroethylene
rRSL = USEPA residential Regional Screening Level
TCE = trichloroethylene
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
-- = media not sampled
'elevated' = specific results unavailable
'non-detect' = not detected above laboratory reporting limit

Qualifiers:
J = qualified as estimated

References: ARCADIS, 2007; ARCADIS, 2012; ARCADIS, 2013; ARCADIS, 2017

Table 7: Former UST & Transloading Area – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc
Benchmarks and Action Levels										
Residential RSL		31	0.68	71	--	3,100	400	1,500	390	23,000
MCL-based SSL		0.27	0.29	--	180,000	46	14	--	--	--
HRS SEP Benchmark		30	0.77	30	200	3,000	--	1,000	300	20,000
Action Level (1)		**1.0**	**7.8**	**0.27**	**63**	**56**	**25**	**64**	**0.51**	**225**
Background Samples										
TTT-DP-9 (2)	2	0.93 UJ	1.7 J	0.46 U	7.8	9.9 J-	4.7	9.1 J-	0.46 U	33
	5	0.89 UJ	1.1 J-	0.09 J	15	9.9 J	4.2 J+	14	0.44 U	56
	10	0.91 UJ	0.64 J	0.46 U	5.9	2.7 J-	1.4	4.0 J-	0.46 U	27
	15	1.0 UJ	0.53 J	0.51 U	9.0	2.9 J-	1.5	5.6 J-	0.51 U	36
Source Samples										
BPI-DP-1	2	**16 J-**	**3,630 J**	**4.2**	**130**	**1,890 J**	**4,750**	24	0.27 J	**1,600 J-**
	5 (3,4)	**416 J-**	**87,800**	**69**	**414**	**42,700 J**	**96,200**	**98**	**8.4**	**4,590 J-**
	10	**1.7 J-**	**1,350 J**	**0.73 J**	18	**261 J**	**754**	9.1	0.10 J	**337 J-**
	15	**2.8 J-**	**177 J**	**0.59**	5.6	3.8 J	3.3	4.0	0.45 U	117 J-
BPI-DP-2	2	**131 J-**	**49,200 J**	**26**	**1,360**	**306,000 J**	**52,500**	141	**9.0**	**5,360 J-**
	5 (3)	**225 J-**	**93,300 J**	**89**	**29,600**	**73,200 J**	**68,600**	**60**	**5.5**	**58,400 J-**
	10	0.77 J-	**976 J**	0.19 J	**183**	**329 J**	**57**	4.6	0.02 J	222 J-
	15	**1.7 J-**	**879 J**	**0.85**	15	**119 J**	**64**	4.7	0.45 U	122 J-
BPI-DP-4	2	**32 J-**	**11,300 J**	**51**	**229**	**117,000 J**	**9,010**	**213**	**5.1**	**1,380 J-**
	5	**1.4 J-**	**204 J**	**0.50 J**	17	**178 J**	11	14	0.02 J	69 J-
	10	1.0 J-	**437 J**	**0.53**	5.7	16 J	1.9	3.8	0.03 J	52 J-
	15	**1.1 J-**	**169 J**	0.13 J	5.0	11 J	2.0	4.4	0.39 U	**312 J-**

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented
4 = A reporting error incorrectly identified the duplicate sample collected from 5 ft bgs at BPI-DP-1 as associated with the 10 ft bgs field sample

Definitions:
MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 8: Warehouse No. 3 & Clarifier Area – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc
Benchmarks and Action Levels										
Residential RSL		31	0.68	71	--	3,100	400	1,500	390	23,000
MCL-based SSL		0.27	0.29	--	180,000	46	14	--	--	--
HRS SEP Benchmark		30	0.77	30	200	3,000	--	1,000	300	20,000
Action Level (1)		**1.0**	**7.8**	**0.27**	**63**	**56**	**25**	**64**	**0.51**	**225**
Background Samples										
TTT-DP-9 (2)	2	0.93 UJ	1.7 J	0.46 U	7.8	9.9 J-	4.7	9.1 J-	0.46 U	33
	5	0.89 UJ	1.1 J-	0.09 J	15	9.9 J	4.2 J+	14	0.44 U	56
	10	0.91 UJ	0.64 J	0.46 U	5.9	2.7 J-	1.4	4.0 J-	0.46 U	27
	15	1.0 UJ	0.53 J	0.51 U	9.0	2.9 J-	1.5	5.6 J-	0.51 U	36
Source Samples										
BPI-DP-3	2	0.14 J-	**21 J**	0.12 J	17	19 J	14	10	0.02 J	45 J-
	5 (3)	0.08 J-	**11**	0.11 J	18	26	11	14	0.05 J	73
	10	0.07 J-	**31**	0.09 J	8.3	23	10	5.0	0.03 J	31
	15	R	**34**	0.03 J	5.9	5.8	1.5	4.1	0.03 J	29
BPI-DP-8	2	0.06 J-	**10**	0.98 U	15	52	**57**	31	0.06 J	**454**
	5	0.07 J-	**9.8**	0.14 J	5.4	12	**26**	5.1	0.05 J	45
	10	R	**112**	0.93 U	15	17	3.4	12	0.04 J	60
	15	0.07 J-	**171**	1.1 U	13	17	13	9.5	0.05 J	57

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 9: West Parcels Area – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc
Benchmarks and Action Levels										
Residential RSL		31	0.68	71	--	3,100	400	1,500	390	23,000
MCL-based SSL		0.27	0.29	--	180,000	46	14	--	--	--
HRS SEP Benchmark		30	0.77	30	200	3,000	--	1,000	300	20,000
Action Level (1)		**1.0**	**7.8**	**0.27**	**63**	**56**	**25**	**64**	**0.51**	**225**
Background Samples										
TTT-DP-9 (2)	2	0.93 UJ	1.7 J	0.46 U	7.8	9.9 J-	4.7	9.1 J-	0.46 U	33
	5	0.89 UJ	1.1 J-	0.09 J	15	9.9 J	4.2 J+	14	0.44 U	56
	10	0.91 UJ	0.64 J	0.46 U	5.9	2.7 J-	1.4	4.0 J-	0.46 U	27
	15	1.0 UJ	0.53 J	0.51 U	9.0	2.9 J-	1.5	5.6 J-	0.51 U	36
Source Samples										
BPI-DP-5	2	R	**412**	0.85 U	28	**219**	**1,340**	14	0.16 J	**239**
	5	R	2.1	0.45 UJ	17 J	**275**	12	13 J-	0.11 J	**353**
	10	R	1.6	**1.4**	11	12	3.0	14	0.50 U	**4,860**
	15	R	**20**	0.96 U	13	13	3.3	12	0.48 U	**2,260**
BPI-DP-6	2	R	**221**	**1.5**	23	**64**	**1,500**	16	0.51	**639**
	5 (3)	0.26 J-	**12**	1.0 U	17	20	**32**	13	0.05 J	100
	10	0.07 J-	1.4	0.05 J	6.7	8.2	2.9	5.3	0.02 J	31
	15	R	1.8	0.05 J	8.2	8.7	8.1	6.6	0.02 J	40
BPI-DP-7	2	**10 J-**	**377 J**	**0.33 J**	28	**134 J**	**231**	32	0.24 J	72 J-
	5	0.36 J-	**86 J**	**0.97**	17	**343 J**	**94**	13	0.04 J	142 J-
	10	R	**162 J**	0.09 J	9.3	9.6 J	2.6	7.2	0.02 J	31 J-
	15	R	**72 J**	0.49 U	4.6	4.1 J	1.3	3.8	0.49 U	22 J-

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL)
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 10: Former UST & Transloading Area – Source Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,2,3-Trichloro-benzene	1,2,4-Trichloro-benzene	1,2-Dichloro-benzene	1,2-Dichloro-propane	1,4-Dichloro-benzene	cis-1,2-Dichloro-ethylene	Tetrachloro-ethylene	trans-1,2-Dichloro-ethylene	Trichloro-ethylene
		1,2,3-TCB	**1,2,4-TCB**	**1,2-DCB**	**1,2-DCP**	**1,4-DCB**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**
Benchmarks and Action Levels										
Residential RSL		63,000	24,000	1,800,000	1,000	2,600	160,000	24,000	1,600,000	940
MCL-based SSL		--	200	580	1.7	72	21	2.3	31	1.8
HRS SEP Benchmark		--	23,000	--	19,000	120,000	100,000	330,000	1,000,000	8,800
Action Level (1)		**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
Background Samples										
TTT-DP-9 (2)	2	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	5	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Source Samples										
BPI-DP-1	2	7.2 UJ	**13 J+**	**8.0 J+**	7.2 U	**12 J+**	7.2 U	7.2 U	7.2 U	7.2 U
	5 (3,4)	**23**	**27**	**20**	**12 J**	15 U	**84**	**63**	**11 J**	**89**
	10	**500**	**1,100**	**30,000**	4.8 U	**430**	**89 J**	**3,000**	4.8 U	**260 J**
	15	5.8 U	5.8 U	**4.4 J**	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U
BPI-DP-2	2	**6,300**	**25,000**	**11,000**	**51**	**1,800**	**4,200**	**320 J**	**18**	**1,600**
	5 (3)	**57,000**	**230,000**	**1,900,000**	**17,000 J**	**350,000**	**950,000**	**20,000 J**	30,000 U	**180,000**
	10	**40**	**48**	**150**	5.6 U	**50**	5.6 U	5.6 U	5.6 U	5.6 U
	15	**27**	**54**	**52**	6.6 U	**26**	6.6 U	6.6 U	6.6 U	6.6 U
BPI-DP-4	2	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	5.9 U	**4.8 J**	5.9 U	**3.3 J**
	5	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U
	10	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
	15	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in micrograms per kilogram (µg/kg)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented
4 = A reporting error incorrectly identified the duplicate sample collected from 5 ft bgs at BPI-DP-1 as associated with the 10 ft bgs field sample

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 11: Warehouse No. 3 & Clarifier Area – Source Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,2,3-Trichloro-benzene	1,2,4-Trichloro-benzene	1,2-Dichloro-benzene	1,2-Dichloro-propane	1,4-Dichloro-benzene	cis-1,2-Dichloro-ethylene	Tetrachloro-ethylene	trans-1,2-Dichloro-ethylene	Trichloro-ethylene
		1,2,3-TCB	**1,2,4-TCB**	**1,2-DCB**	**1,2-DCP**	**1,4-DCB**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**
Benchmarks and Action Levels										
Residential RSL		63,000	24,000	1,800,000	1,000	2,600	160,000	24,000	1,600,000	940
MCL-based SSL		--	200	580	1.7	72	21	2.3	31	1.8
HRS SEP Benchmark		--	23,000	--	19,000	120,000	100,000	330,000	1,000,000	8,800
Action Level (1)		**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
Background Samples										
TTT-DP-9 (2)	2	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	5	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Source Samples										
BPI-DP-3	2	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.7 J	5.0 U	5.0 U
	5 (3)	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
	10	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U
	15	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	**11**	5.8 U	2.4 J
BPI-DP-8	2	5.8 U	5.8 U	2.6 J	5.8 U	5.8 U	5.8 U	**13**	5.8 U	**5.2 J**
	5	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U
	10	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
	15	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	**16**	5.3 U	3.8 J

Notes: Values in Bold exceed Action Level
All results reported in micrograms per kilogram (µg/kg)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 12: West Parcels Area – Source Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,2,3-Trichloro-benzene	1,2,4-Trichloro-benzene	1,2-Dichloro-benzene	1,2-Dichloro-propane	1,4-Dichloro-benzene	cis-1,2-Dichloro-ethylene	Tetrachloro-ethylene	trans-1,2-Dichloro-ethylene	Trichloro-ethylene
		1,2,3-TCB	**1,2,4-TCB**	**1,2-DCB**	**1,2-DCP**	**1,4-DCB**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**
Benchmarks and Action Levels										
Residential RSL		63,000	24,000	1,800,000	1,000	2,600	160,000	24,000	1,600,000	940
MCL-based SSL		--	200	580	1.7	72	21	2.3	31	1.8
HRS SEP Benchmark		--	23,000	--	19,000	120,000	100,000	330,000	1,000,000	8,800
Action Level (1)		**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
Background Samples										
TTT-DP-9 (2)	2	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	5	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Source Samples										
BPI-DP-5	2	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
	5	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U
	10	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U
	15	9.1 U	9.1 U	9.1 U	9.1 U	9.1 U	9.1 U	9.1 U	9.1 U	9.1 U
BPI-DP-6	2	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
	5 (3)	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
	10	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U
	15	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
BPI-DP-7	2	6.5 UJ	6.5 UJ	6.5 UJ	6.5 U	6.5 UJ	6.5 U	3.1 J	6.5 U	6.5 U
	5	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
	10	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U
	15	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U

Notes: Values in Bold exceed Action Level
All results reported in micrograms per kilogram (µg/kg)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 13: Release Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Assigned Aquifer	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Manganese (Mn)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Vanadium (V)	Zinc (Zn)
Benchmark			6.0	10	2,000	5.0	100	1,300	15	50 (3)	100	50	100	50	5,000
Benchmark Source			Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	CA 2nd MCL	CA MCL	Fed MCL	Fed 2nd MCL	CA NL	CA 2nd MCL
Action Level (1)		E	**1.5**	**4.9**	**629**	**1.0**	**65**	**23**	**4.5**	**3,927**	**31**	**2.9**	**1.0**	**34**	**72**
Background Samples															
BPI-CPT-1	68	G	0.66 J	0.59 J+	70	0.14 J	0.34 J	3.5	1.0 U	142 J+	9.2 J	1.2 J	1.0 U	2.1 J	5.3
	96	E	0.47 J	1.3 J+	166	1.0 U	11	5.7	1.0 U	607 J+	9.4 J	0.68 J	1.0 U	6.3	15
	123	E	0.45 J	1.1 J+	139	1.0 U	4.2	4.5	1.5 J+	174 J+	9.7 J	0.79 J	1.0 U	3.2 J	9.2
Former UST & Transloading Area															
BPI-MW-1	68(2)	G	1.8 J	**677**	81 J-	4.1	24	244	**55**	**1,380**	**412**	2.2 J	0.22 J	11	428
BPI-MW-6S	67	G	2.0 U	**768**	12 J-	1.0 U	1.7 J	0.95 J	1.0 U	**863**	**137**	1.3 J	1.0 U	1.9 J	15
BPI-MW-6D	84	E	**1.6 J**	**51**	47 J-	**1.6**	0.45 J	**23**	1.0 U	120	16	5.0 U	1.0 U	2.0 J	**134**
BPI-MW-8	92	E	2.0 U	**22**	76 J-	0.13 J	0.37 J	3.4	1.0 U	135	1.8	5.0 U	1.0 U	0.59 J	18.7
Warehouse No. 3 & Clarifier Area															
BPI-MW-7S	71(2)	G	0.35 J	1.5	20 J-	4.9	2.0 U	150	1.3	339	**207**	5.3	1.0 U	15	4.5
BPI-MW-7D	89	E	0.67 J	**117**	20 J-	**2.8**	2.0 U	**60**	1.5	816	**203**	**3.6 J**	1.0 U	4.3 J	9.6
BPI-MW-9	74	G	0.26 J	3.2	37 J-	0.27 J	2.0 U	4.5	1.0 U	268	16	0.95 J	1.0 U	14	2.8
BPI-MW-10	77	G	2.0	0.82	33	0.24	2.0	2.7	1.0	37	45	0.89	1.0	4.5	2.6
BPI-MW-14C	125	E	1.1 J	1.7	4.9 J-	0.09 J	1.8 J	1.4 J	1.0 U	9.2	3.7	1.2 J	1.0 U	5.0 U	4.7
BPI-MW-16C	134	E	2.0 U	**11**	124 J-	1.0 U	2.0 U	0.92 J	1.0 U	178	4.7	1.1 J	1.0 U	0.37 J	5.8

Notes: Values in Bold exceed Action Level for "E" aquifer samples or listed Benchmark for "G" aquifer samples
Values in Shaded cells exceed ten times Action Level for "E" aquifer samples or listed Benchmark for "G" aquifer samples
All results reported in micrograms per liter (µg/L)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an observed release to groundwater is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Duplicate Sample collected; greater result is presented
3 = Manganese exceedances (i.e., bold/shade) are presented as 10 times benchmark

Definitions:
CA MCL = California Maximum Contaminant Level
CA 2nd MCL = California Secondary Maximum Contaminant Level
CA NL = California Notification Level
E = Sample collected from Exposition Aquifer (see section 4.2.1)
Fed MCL = Federal Maximum Contaminant Level
Fed 2nd MCL = Federal Secondary Maximum Contaminant Level
ft bgs = feet below ground surface
G = Sample collected from Gaspur Aquifer (see section 4.2.1)

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 14: Secondary Objective Groundwater Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Manganese (Mn)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Vanadium (V)	Zinc (Zn)
Benchmark		6.0	10	2,000	5.0	100	1,300	15	50 (1)	100	50	100	50	5,000
Benchmark Source		Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	CA 2nd MCL	CA MCL	Fed MCL	Fed 2nd MCL	CA NL	CA 2nd MCL
CPT Locations														
BPI-CPT-2	68	0.33 J	0.77 J+	60	1.0 U	0.64 J	1.4 J	0.39 J	98 J+	3.8 J	5.0 U	1.0 U	2.5 J	4.7
	88	0.21 J	0.60 J+	352	1.0 U	1.3 J	2.7	0.28 J	**751 J+**	6.5 J	1.1 J	1.0 U	11	8.3
	124	**27**	**28 J+**	264	1.0 U	3.0	2.9	0.86 J	90 J+	5.2 J	1.4 J	1.0 U	21	10
BPI-CPT-4	68	1.2 J	1.0 J+	96	0.09 J	1.7 J	2.5	1.0 U	195 J+	5.0 J	1.6 J	1.0 U	7.1	8.6
	92	0.56 J	1.5 J+	114	1.0 U	1.2 J	2.2	1.0 U	345 J+	16 J	2.9 J	1.0 U	3.2 J	14
	136	0.76 J	0.86 J+	76	0.32 J	0.14 J	2.7	1.0 U	441 J+	49 J	1.8 J	1.0 U	1.3 J	17
BPI-CPT-5	68	1.5 J	2.8 J+	91	1.0 U	0.56 J	1.7 J	1.0 U	95 J+	2.4 J	3.6 J	1.0 U	13	3.5
	84	0.59 J	1.4 J+	80	1.0 U	0.6 J	0.79 J	1.0 U	101 J+	5.0 J	1.6 J	1.0 U	4.2 J	4.4
	115	0.53 J	0.64 J+	53	0.10 J	0.14 J	2.1	1.0 U	163 J+	12 J	2.6 J	1.0 U	2.2 J	6.7
Monitoring Well Locations														
BPI-MW-5S	69	2.0 U	**10**	21 J-	1.0 U	2.0 U	0.73 J	1.0 U	**1,610**	2.4	5.0 U	1.0 U	1.4 J	2.4
BPI-MW-13C	125	4.8	2.8	47 J-	1.0 U	1.7 J	13	1.0 U	5.0	12	2.0 J	1.0 U	12	29
BPI-MW-15A	66	2.0 U	**18**	44 J-	1.0 U	2.0 U	0.37 J	1.0 U	**881**	6.5	1.6 J	1.0 U	1.0 J	3.1
BPI-MW-15B	86	2.0 U	6.2	34 J-	1.0 U	2.0 U	0.46 J	1.0 U	**703**	15	1.3 J	1.0 U	0.79 J	2.9

Notes: Values in Bold exceed Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in October and November, 2015
1 = Manganese exceedances (i.e., bold/shade) are presented as 10 times benchmark

Definitions:
CA MCL = California Maximum Contaminant Level
CA 2nd MCL = California Secondary Maximum Contaminant Level
CA NL = California Notification Level
Fed MCL = Federal Maximum Contaminant Level
Fed 2nd MCL = Federal Secondary Maximum Contaminant Level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 15: Release Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	Assigned Aquifer	1,1-Dichloro-ethane	1,1-Dichloro-ethylene	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,4-Dichloro-benzene	cis-1,2-Dichloro-ethylene	Tetrachloro-ethylene	trans-1,2-Dichloro-ethene	Trichloro-ethylene
			1,1-DCA	**1,1-DCE**	**1,2-DCA**	**1,2-DCP**	**1,4-DCB**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**
Benchmark			5.0	7.0	5.0	5.0	75	70	5.0	100	5.0
Benchmark Source			CA MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL
Action Level (1)		E	**0.50**	**0.50**	**2.8**	**0.50**	**0.50**	**4.8**	**0.50**	**0.33**	**1.6**
Background Samples											
BPI-CPT-1	68	G	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3	0.12 J	0.20 J	4.6
	96	E	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	123	E	0.50 U	0.50 U	0.94	0.50 U	0.50 U	1.6	0.50 U	0.11 J	0.50
Former UST & Transloading Area											
BPI-MW-1	68(2)	G	100 U	100 U	100 U	100 U	100 U	**2,800**	100 U	100 U	100 U
BPI-MW-6S	67	G	25 U	25 U	25 U	25 U	25 U	**310**	25 U	25 U	**9.5 J**
BPI-MW-6D	84	E	0.43 J	0.50 U	0.50 U	**8.2**	0.50 U	**80**	**3.5**	**1.5**	**34**
BPI-MW-8	92	E	20 U	20 U	20 U	20 U	20 U	**160**	**19 J**	20 U	**51**
Warehouse No. 3 & Clarifier Area											
BPI-MW-7S	71(2)	G	**6.5**	2.6	0.44 J	0.50 U	1.6 J+	17	**33**	1.0	**67**
BPI-MW-7D	89	E	**6.8 J**	20 U	**29**	20 U	**20**	**40**	**110**	20 U	**480**
BPI-MW-9	74	G	2.0	1.2	0.50 U	0.50 U	2.0 J+	33	2.6	1.6	**13**
BPI-MW-10	77	G	**15**	3.8	0.50 U	0.50 U	0.50 U	52	0.50 U	3.0	**11**
BPI-MW-14C	125	E	0.20 J	0.50 U	0.47 J	0.50 U	0.50 U	0.45 J	0.19 J	0.50 U	0.99
BPI-MW-16C	134	E	0.18 J	0.50 UJ	**7.8**	**1.8**	0.50 U	**34**	0.50 U	**2.5 J-**	**3.2**
West Parcels Area											
BPI-DP-5	66	G	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.27 J	0.50 U	0.50 U	0.12 J

Notes: Values in Bold exceed Action Level for "E" aquifer samples or listed Benchmark for "G" aquifer samples
Values in Shaded cells exceed ten times Action Level for "E" aquifer samples or listed Benchmark for "G" aquifer samples
All results reported in micrograms per liter (µg/L)
Samples collected in October and November, 2015
1 = Per the HRS, the action level to establish an observed release to groundwater is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Duplicate Sample collected; greater result is presented

Definitions:
CA MCL = California Maximum Contaminant Level
E = Sample collected from Exposition Aquifer (see section 4.2.1)
Fed MCL = Federal Maximum Contaminant Level
ft bgs = feet below ground surface
G = Sample collected from Gaspur Aquifer (see section 4.2.1)

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 16: Secondary Objective Groundwater Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloro-ethane	1,1-Dichloro-ethylene	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,4-Dichloro-benzene	cis-1,2-Dichloro-ethylene	Tetrachloro-ethylene	trans-1,2-Dichloro-ethene	Trichloro-ethylene
		1,1-DCA	**1,1-DCE**	**1,2-DCA**	**1,2-DCP**	**1,4-DCB**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**
Benchmark		5.0	7.0	5.0	5.0	75	70	5.0	100	5.0
Benchmark Source		CA MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL
CPT Locations										
BPI-CPT-2	68	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	88	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	124	0.15 J	0.50 UJ	1.1	0.31 J	0.50 U	7.3 J-	0.50 U	0.50 J-	**6.7**
BPI-CPT-4	68	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.6	5.0 U	5.0 U	**61**
	92	0.27 J	0.50 U	0.50 U	0.50 U	0.50 U	2.4	0.50 U	0.32 J	**6.4**
	136	25 U	25 U	**130**	**23 J**	25 U	**270**	25 U	19 J	**63**
BPI-CPT-5	68	0.11 J	0.50 U	0.50 U	0.50 U	0.50 UJ	3.8	0.50 U	0.50 U	**6.1**
	84	0.50 U	1.1	0.50 U	0.50 U	0.50 U	34	0.50 U	2.5	**600**
	115	0.14 J	0.50 U	0.92	0.50 U	0.50 U	16	0.50 U	1.2	**45**
Monitoring Well Locations										
BPI-MW-5S	69	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	10	0.50 U	0.35 J	**9.5**
BPI-MW-13C	125	0.78	0.50 U	0.81	0.50 U	0.50 U	0.77	0.50 U	0.50 U	0.32 J
BPI-MW-15A	66	0.19 J	0.82	0.50 U	0.50 U	0.63	29	0.50 U	2.0	**5.7**
BPI-MW-15B	86	0.22 J	0.50 U	2.5	0.50 U	0.50 U	40	0.50 U	13	**11**

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in October and November, 2015

Definitions:
CA MCL = California Maximum Contaminant Level
Fed MCL = Federal Maximum Contaminant Level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 17: Bulletin 104 Aquifers Elevations near Site

Aquifer	Estimated Elevation (ft amsl)		Estimated Depth (ft bgs)	
	Top	Base	Top	Base
Gaspur	55	25	62	92
Exposition	15	-100	102	217
Gage	-120	-180	237	297
Hollydale	-230	-245	347	362
Jefferson	-305	-370	422	487
Lynwood	-390	-480	507	597
Silverado	-515	-750	632	867
Sunnyside	-1030	-1285	1147	1402

Definitions:
amsl = above mean sea level
bgs = below ground surface
ft = feet
References:
DWR, 1961

Table 18: Groundwater Monitoring Well Elevation Data – 2015 SI Investigation

Monitoring Well No.	Aquifer Zone (1)	Screen Interval (ft bgs)	Depth to Water (ft)	TOC (2) Elevation (ft amsl)	GW Elevation (ft amsl)	Northing (ft SPC)	Easting (ft SPC)
BPI-MW-1	Gaspur	65-75	64.44	121.21	56.77	1807245.25	6504343.19
BPI-MW-5S	Gaspur	53-73	63.11	120.26	57.15	1807191.56	6504639.07
BPI-MW-6S	Gaspur	51-71	63.88	121.17	57.29	1807251.00	6504383.84
BPI-MW-7S	Gaspur	53-73	65.00	122.21	57.21	1807143.24	6504207.75
BPI-MW-15A	Gaspur	55-70	59.83	117.79	57.96	1806769.73	6504663.45
BPI-MW-17A (3)	Gaspur	56-71	63.27	120.84	57.57	1807623.24	6504602.58
BPI-MW-6D	Exposition	81-91	64.34	121.21	56.87	1807251.00	6504383.84
BPI-MW-7D	Exposition	86-96	65.89	122.24	56.35	1807143.24	6504207.75
BPI-MW-8	Exposition	86-96	65.44	121.20	55.76	1807246.37	6504328.03
BPI-MW-15B	Exposition	80-90	61.52	117.88	56.36	1806769.73	6504663.45
BPI-MW-17B (3)	Exposition	80-90	63.35	120.90	57.55	1807625.08	6504591.06
BPI-MW-13C	Exposition	120-130	76.82	121.81	44.99	1806700.36	6503435.12
BPI-MW-14C	Exposition	119-129	79.32	121.62	42.30	1806844.54	6503974.59
BPI-MW-16C	Exposition	132-142	82.00	121.89	39.89	1807093.43	6504181.27
BPI-MW-17C (3)	Exposition	114-124	82.00	120.92	38.92	1807625.08	6504591.06

Definitions:
amsl = above mean sea level
bgs = below ground surface
ft = feet
SPC = State Plane Coordinate
TOC = Top of Casing

References:
ARCADIS, 2017; Google, 2017

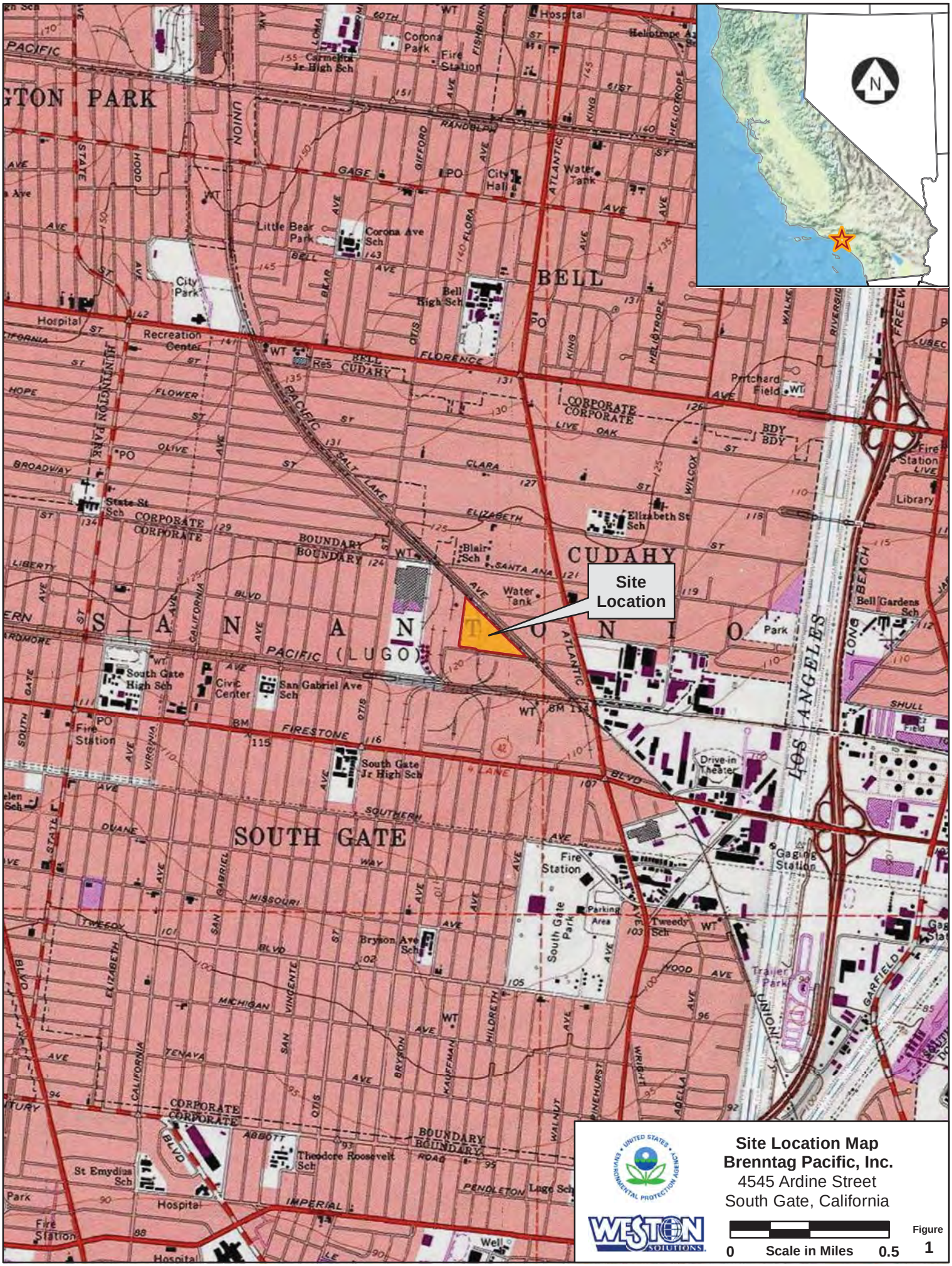
Footnotes:
1 = Samples collected from 55-77 ft bgs are designated as Gaspur and 77+ ft bgs are designated as Exposition (see section 4.2.1)
2 = TOC Elevations are based on historical documentation
3 = No sample was collected from well

Table 19: Water Purveyors Operating Active Wells Within the Target Distance Limit

Water Company Name	No. of Wells in System[1]	Total Population Served	Percent Groundwater	No. of Wells Within 4 Miles[1]	Direction from site (approx.)
Tract 349 MWC	2	7,500	99%	2	N-NW
City of Huntington Park	5	17,246	72%	5	NW
City of South Gate	7	96,057	99%	7	W-SW-S-SE
Tract 180 MWC	2	14,000	100%	2	N
GSWC - Bell, Bell Gardens	5	58,048	97%	5	NW-N-NE
Maywood MWC #3	2	9,500	92%	2	N
Rancho Los Amigos Hospital	3	8,800	100%	3	SE
Maywood MWC #1	2	3,619	95%	2	NNW
City of Downey	20	112,585	100%	12	E-ESE
City of Lynwood	5	65,965	98%	5	S-SSW
City of Bell Gardens	1	11,879	100%	1	ENE
Maywood MWC #2	2	6,700	80%	2	N-NNW
Walnut Park MWC	3	16,180	73%	3	WNW
GSWC – Hollydale	2	7,666	100%	2	SSE
City of Vernon	7	45,000	84%	7	NNW
GSWC – Florence/Graham	7	65,182	82%	6	WNW
City of Compton	7	81,965	71%	3	SSW
City of Commerce	2	3,828	100%	2	NE
Lynwood Park MWC	3	2,300	100%	3	SW
CalWater Service – ELA	9	150,729	63%	7	NNE-NE
GSWC – Willowbrook	2	10,682	> 60%	2	SW
PWC – Compton/Willowbrook	1	24,698	64	1	SW
Sativa LA CWD	3	6,837	100%	1	SW
Los Angeles DWP	75	3,987,622	12%	4	WSW

Footnotes:
1 = Does not include standby wells
References:
CTE, 2011; CWS, 2016; KJC, 2016a; KJC, 2016b; MWM, 2016; RMP, 2011; SAA, 2011; SEI, 2012; SWRCB, 2017; Weston, 2016

Figures



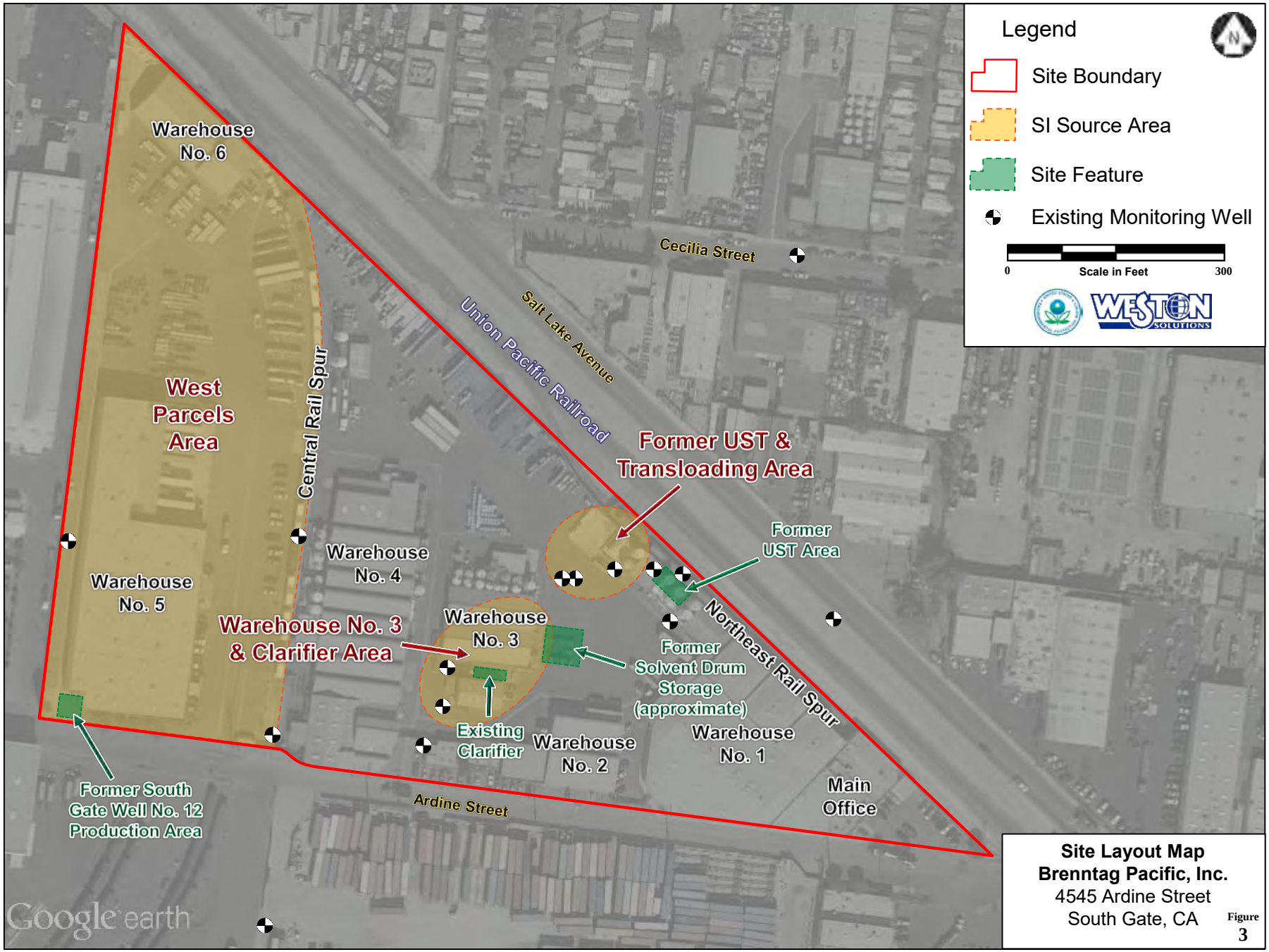
Site Location Map
Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, California

0 Scale in Miles 0.5

Figure 1

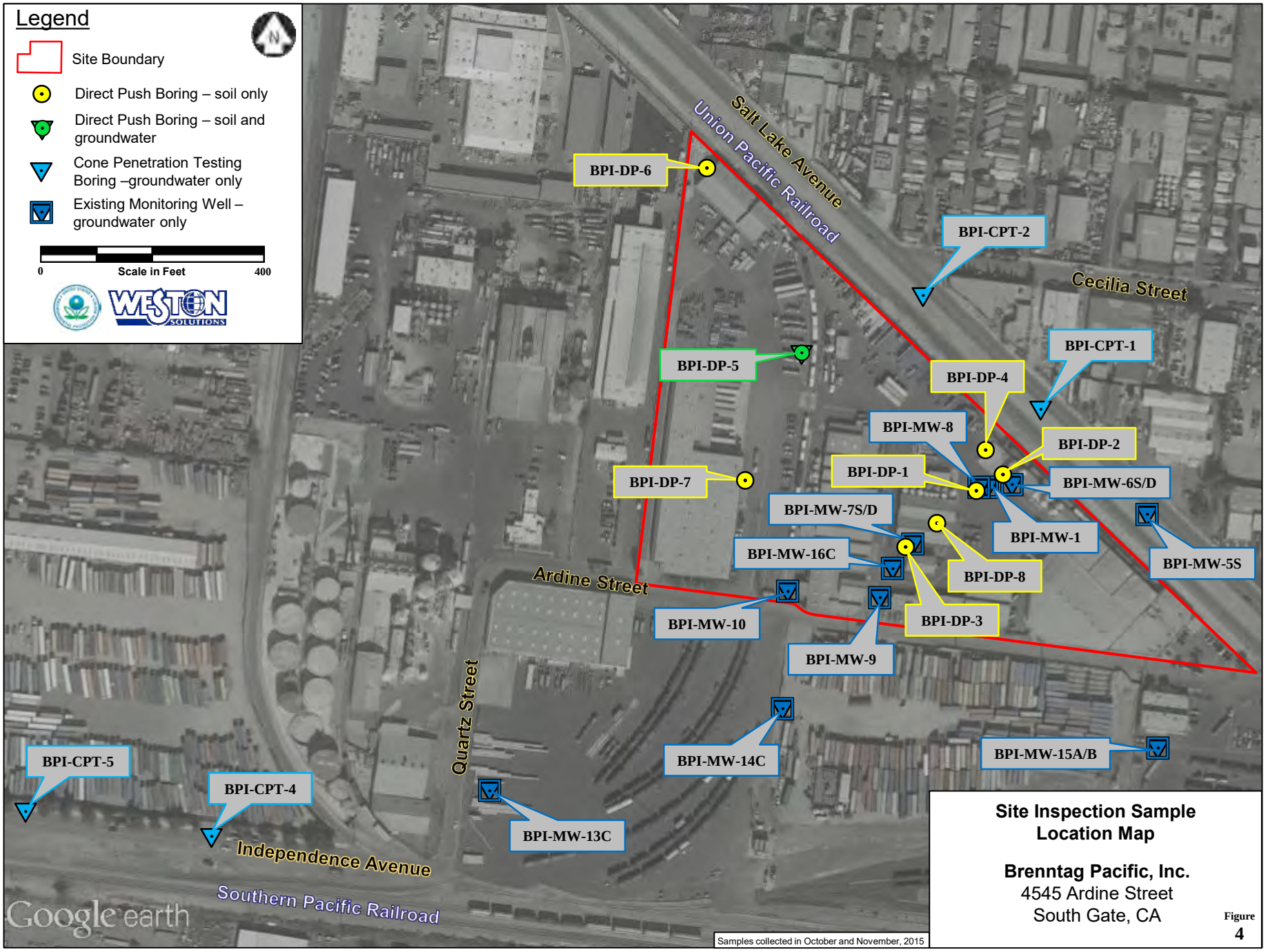
Site Parcel Layout Map
Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, California

Figure
2



Site Layout Map
Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, CA

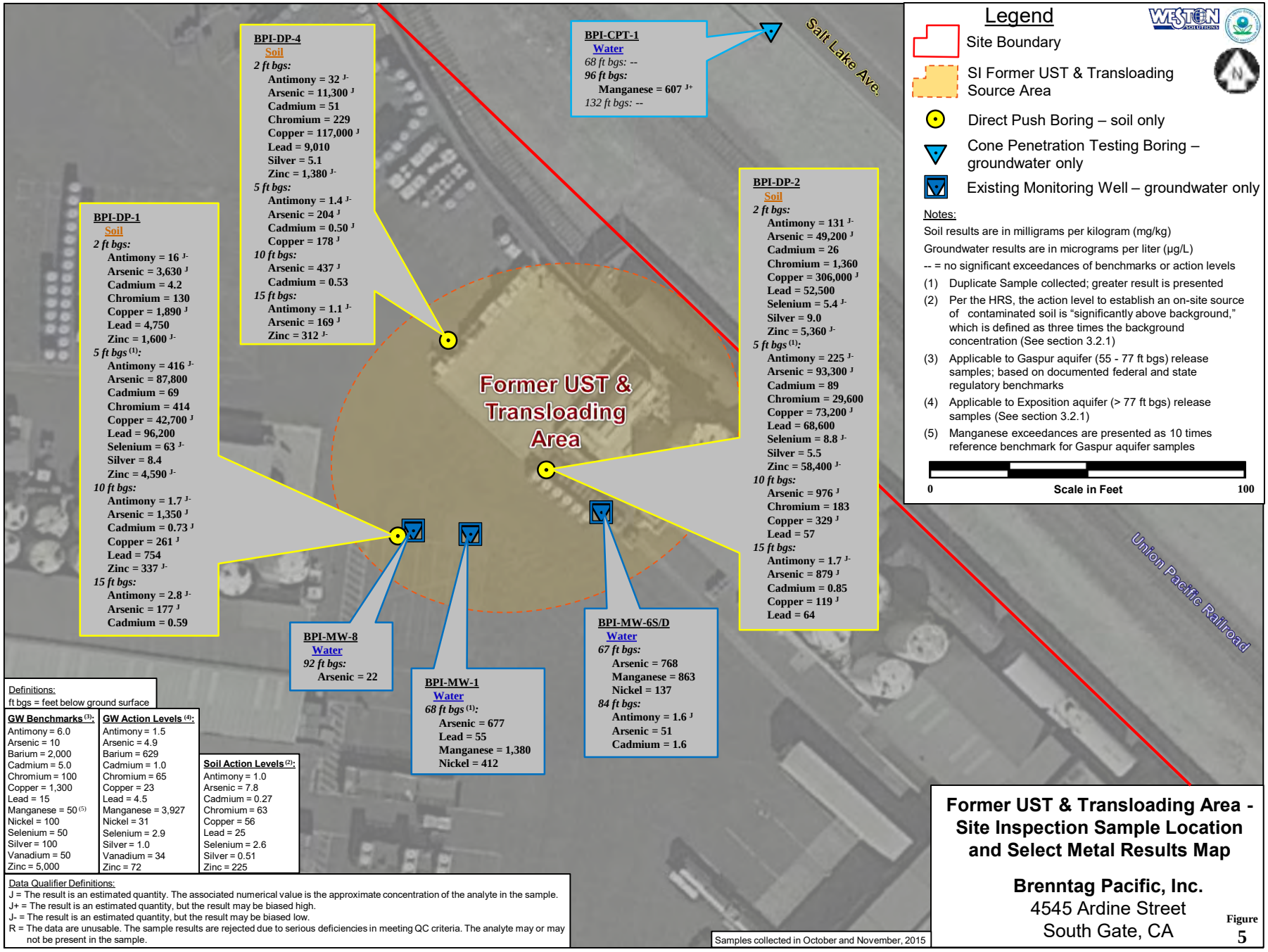
Figure
3

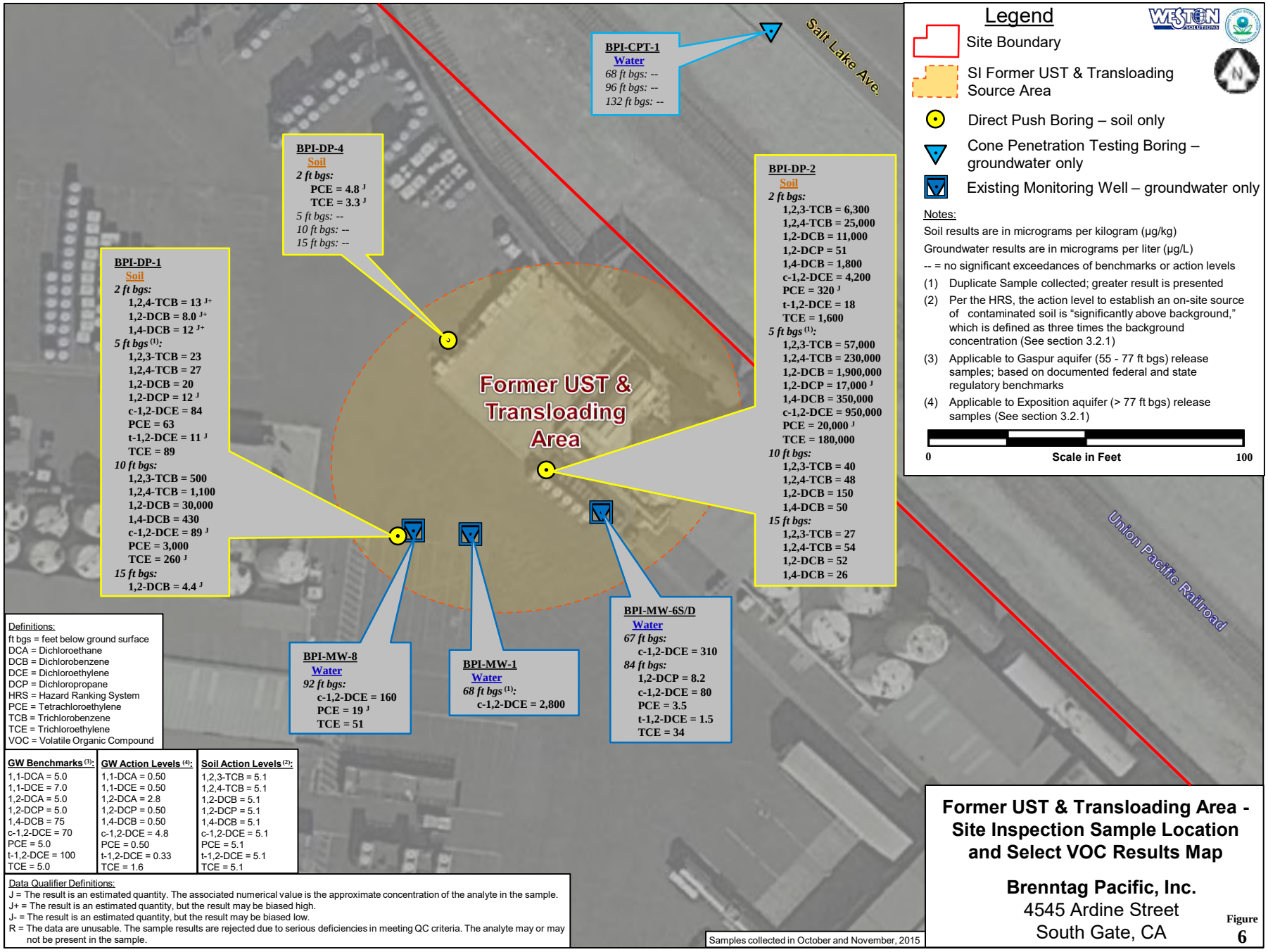


Site Inspection Sample Location Map

Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, CA

Figure 4


Salt Lake Ave.
Union Pacific Railroad
Former UST & Transloading Area
BPI-DP-4
Soil
2 ft bgs:
Antimony = 32 J-
Arsenic = 11,300 J
Cadmium = 51
Chromium = 229
Copper = 117,000 J
Lead = 9,010
Silver = 5.1
Zinc = 1,380 J-
5 ft bgs:
Antimony = 1.4 J-
Arsenic = 204 J
Cadmium = 0.50 J
Copper = 178 J
10 ft bgs:
Arsenic = 437 J
Cadmium = 0.53
15 ft bgs:
Antimony = 1.1 J-
Arsenic = 169 J
Zinc = 312 J-
BPI-CPT-1
Water
68 ft bgs: --
96 ft bgs:
Manganese = 607 J+
132 ft bgs: --
BPI-DP-1
Soil
2 ft bgs:
Antimony = 16 J-
Arsenic = 3,630 J
Cadmium = 4.2
Chromium = 130
Copper = 1,890 J
Lead = 4,750
Zinc = 1,600 J-
5 ft bgs (1):
Antimony = 416 J-
Arsenic = 87,800
Cadmium = 69
Chromium = 414
Copper = 42,700 J
Lead = 96,200
Selenium = 63 J-
Silver = 8.4
Zinc = 4,590 J-
10 ft bgs:
Antimony = 1.7 J-
Arsenic = 1,350 J
Cadmium = 0.73 J
Copper = 261 J
Lead = 754
Zinc = 337 J-
15 ft bgs:
Antimony = 2.8 J-
Arsenic = 177 J
Cadmium = 0.59
BPI-DP-2
Soil
2 ft bgs:
Antimony = 131 J-
Arsenic = 49,200 J
Cadmium = 26
Chromium = 1,360
Copper = 306,000 J
Lead = 52,500
Selenium = 5.4 J-
Silver = 9.0
Zinc = 5,360 J-
5 ft bgs (1):
Antimony = 225 J-
Arsenic = 93,300 J
Cadmium = 89
Chromium = 29,600
Copper = 73,200 J
Lead = 68,600
Selenium = 8.8 J-
Silver = 5.5
Zinc = 58,400 J-
10 ft bgs:
Arsenic = 976 J
Chromium = 183
Copper = 329 J
Lead = 57
15 ft bgs:
Antimony = 1.7 J-
Arsenic = 879 J
Cadmium = 0.85
Copper = 119 J
Lead = 64
BPI-MW-8
Water
92 ft bgs:
Arsenic = 22
BPI-MW-1
Water
68 ft bgs (1):
Arsenic = 677
Lead = 55
Manganese = 1,380
Nickel = 412
BPI-MW-6S/D
Water
67 ft bgs:
Arsenic = 768
Manganese = 863
Nickel = 137
84 ft bgs:
Antimony = 1.6 J
Arsenic = 51
Cadmium = 1.6
Legend
Site Boundary
SI Former UST & Transloading Source Area
Direct Push Boring – soil only
Cone Penetration Testing Boring – groundwater only
Existing Monitoring Well – groundwater only
Notes:
Soil results are in milligrams per kilogram (mg/kg)
Groundwater results are in micrograms per liter (µg/L)
-- = no significant exceedances of benchmarks or action levels
(1) Duplicate Sample collected; greater result is presented
(2) Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
(3) Applicable to Gaspur aquifer (55 - 77 ft bgs) release samples; based on documented federal and state regulatory benchmarks
(4) Applicable to Exposition aquifer (> 77 ft bgs) release samples (See section 3.2.1)
(5) Manganese exceedances are presented as 10 times reference benchmark for Gaspur aquifer samples
0
Scale in Feet
100
Definitions:
ft bgs = feet below ground surface
GW Benchmarks (3):
Antimony = 6.0
Arsenic = 10
Barium = 2,000
Cadmium = 5.0
Chromium = 100
Copper = 1,300
Lead = 15
Manganese = 50 (5)
Nickel = 100
Selenium = 50
Silver = 100
Vanadium = 50
Zinc = 5,000
GW Action Levels (4):
Antimony = 1.5
Arsenic = 4.9
Barium = 629
Cadmium = 1.0
Chromium = 65
Copper = 23
Lead = 4.5
Manganese = 3,927
Nickel = 31
Selenium = 2.9
Silver = 1.0
Vanadium = 34
Zinc = 72
Soil Action Levels (2):
Antimony = 1.0
Arsenic = 7.8
Cadmium = 0.27
Chromium = 63
Copper = 56
Lead = 25
Selenium = 2.6
Silver = 0.51
Zinc = 225
Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
Samples collected in October and November, 2015
Former UST & Transloading Area - Site Inspection Sample Location and Select Metal Results Map
Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, CA
Figure
5



Legend

- Site Boundary
- SI Former UST & Transloading Source Area
- Direct Push Boring – soil only
- Cone Penetration Testing Boring – groundwater only
- Existing Monitoring Well – groundwater only

Notes:

Soil results are in micrograms per kilogram (µg/kg)

Groundwater results are in micrograms per liter (µg/L)

-- = no significant exceedances of benchmarks or action levels

(1) Duplicate Sample collected; greater result is presented

(2) Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)

(3) Applicable to Gaspur aquifer (55 - 77 ft bgs) release samples; based on documented federal and state regulatory benchmarks

(4) Applicable to Exposition aquifer (> 77 ft bgs) release samples (See section 3.2.1)

0 Scale in Feet 100

Definitions:
ft bgs = feet below ground surface
DCA = Dichloroethane
DCB = Dichlorobenzene
DCE = Dichloroethylene
DCP = Dichloropropane
HRS = Hazard Ranking System
PCE = Tetrachloroethylene
TCB = Trichlorobenzene
TCE = Trichloroethylene
VOC = Volatile Organic Compound

GW Benchmarks (3):	GW Action Levels (4):	Soil Action Levels (2):
1,1-DCA = 5.0	1,1-DCA = 0.50	1,2,3-TCB = 5.1
1,1-DCE = 7.0	1,1-DCE = 0.50	1,2,4-TCB = 5.1
1,2-DCA = 5.0	1,2-DCA = 2.8	1,2-DCB = 5.1
1,2-DCP = 5.0	1,2-DCP = 0.50	1,2-DCP = 5.1
1,4-DCB = 75	1,4-DCB = 0.50	1,4-DCB = 5.1
c-1,2-DCE = 70	c-1,2-DCE = 4.8	c-1,2-DCE = 5.1
PCE = 5.0	PCE = 0.50	PCE = 5.1
t-1,2-DCE = 100	t-1,2-DCE = 0.33	t-1,2-DCE = 5.1
TCE = 5.0	TCE = 1.6	TCE = 5.1

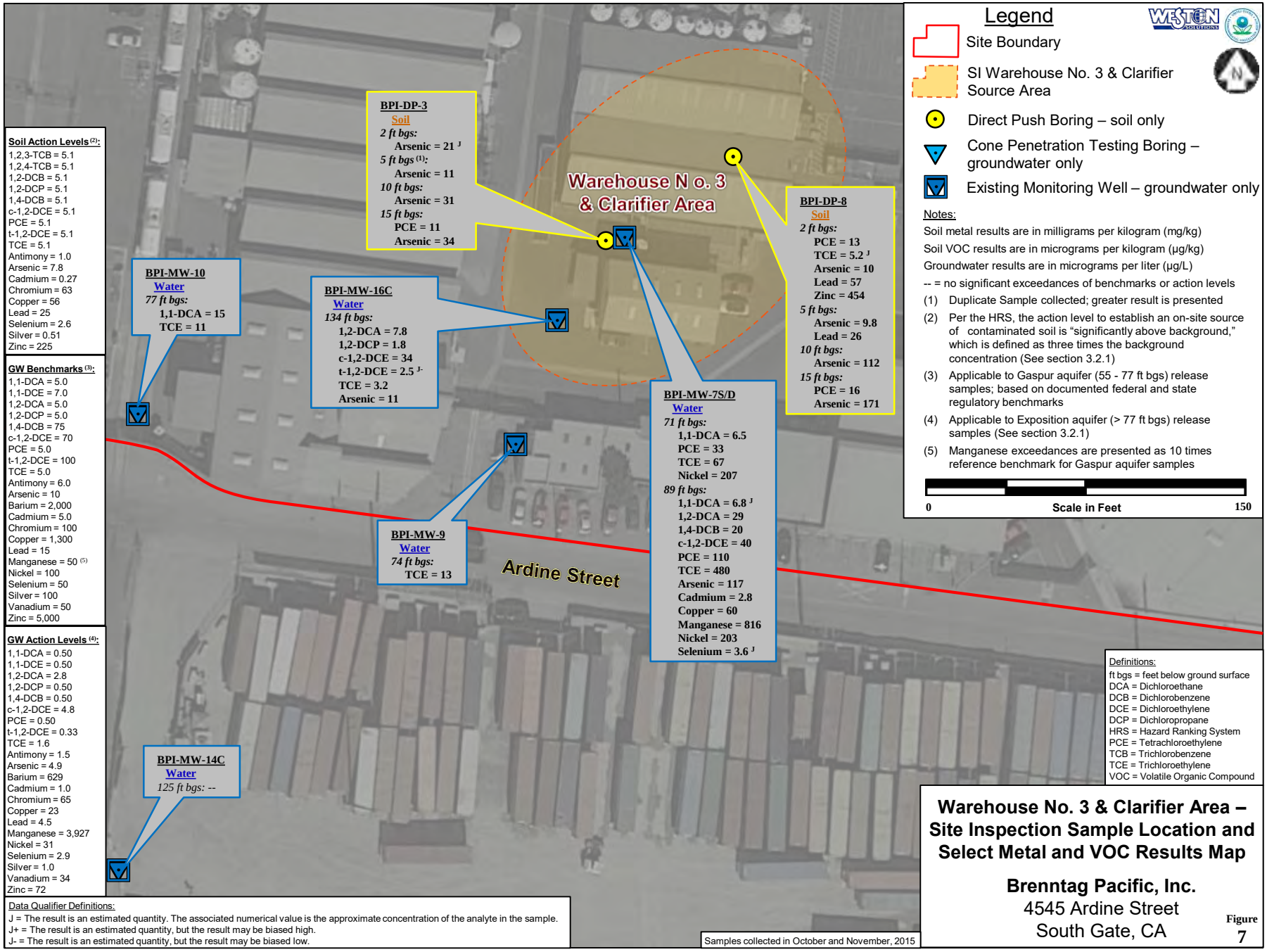
Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Samples collected in October and November, 2015

Former UST & Transloading Area - Site Inspection Sample Location and Select VOC Results Map

Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, CA

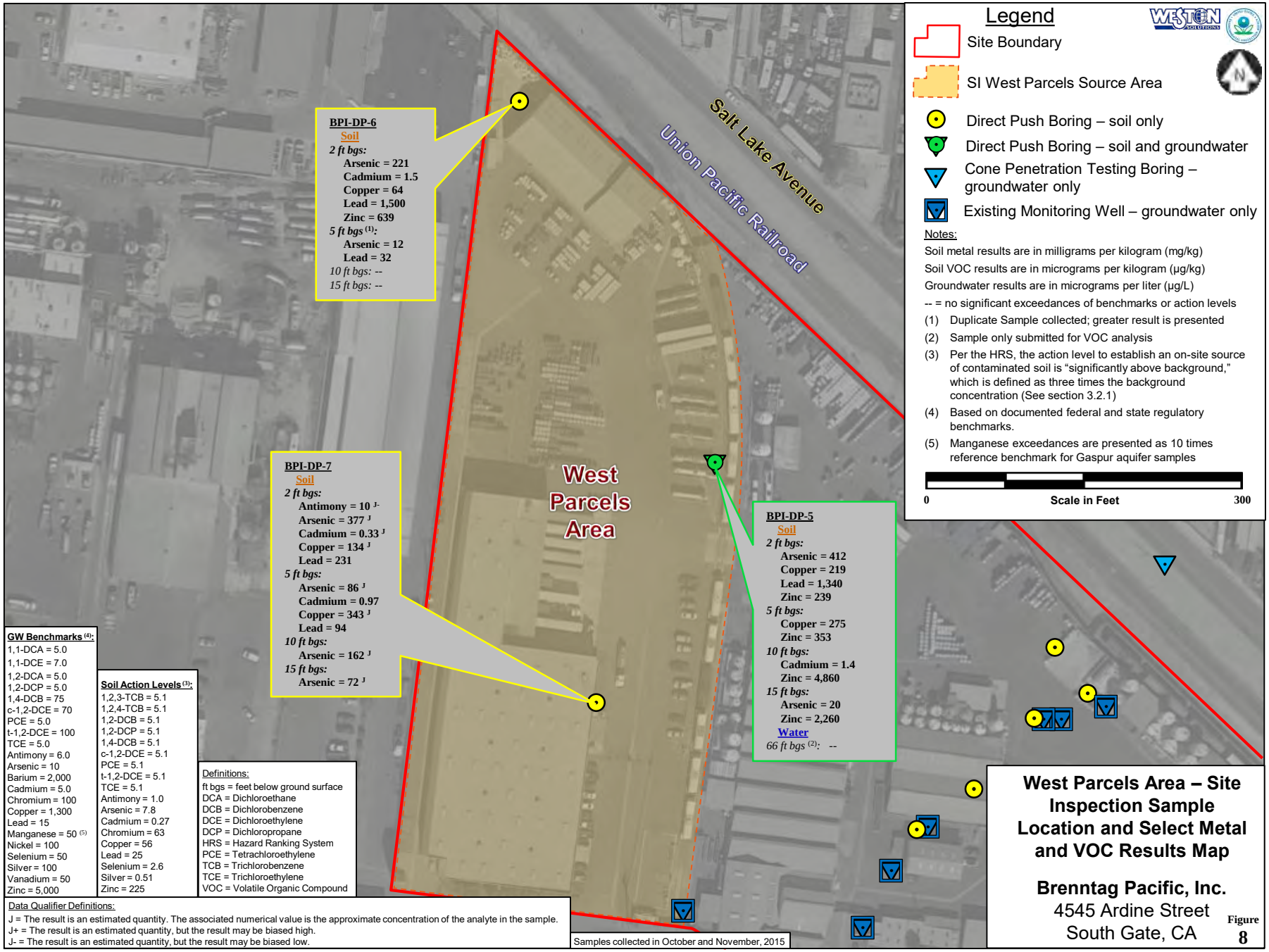
Figure 6

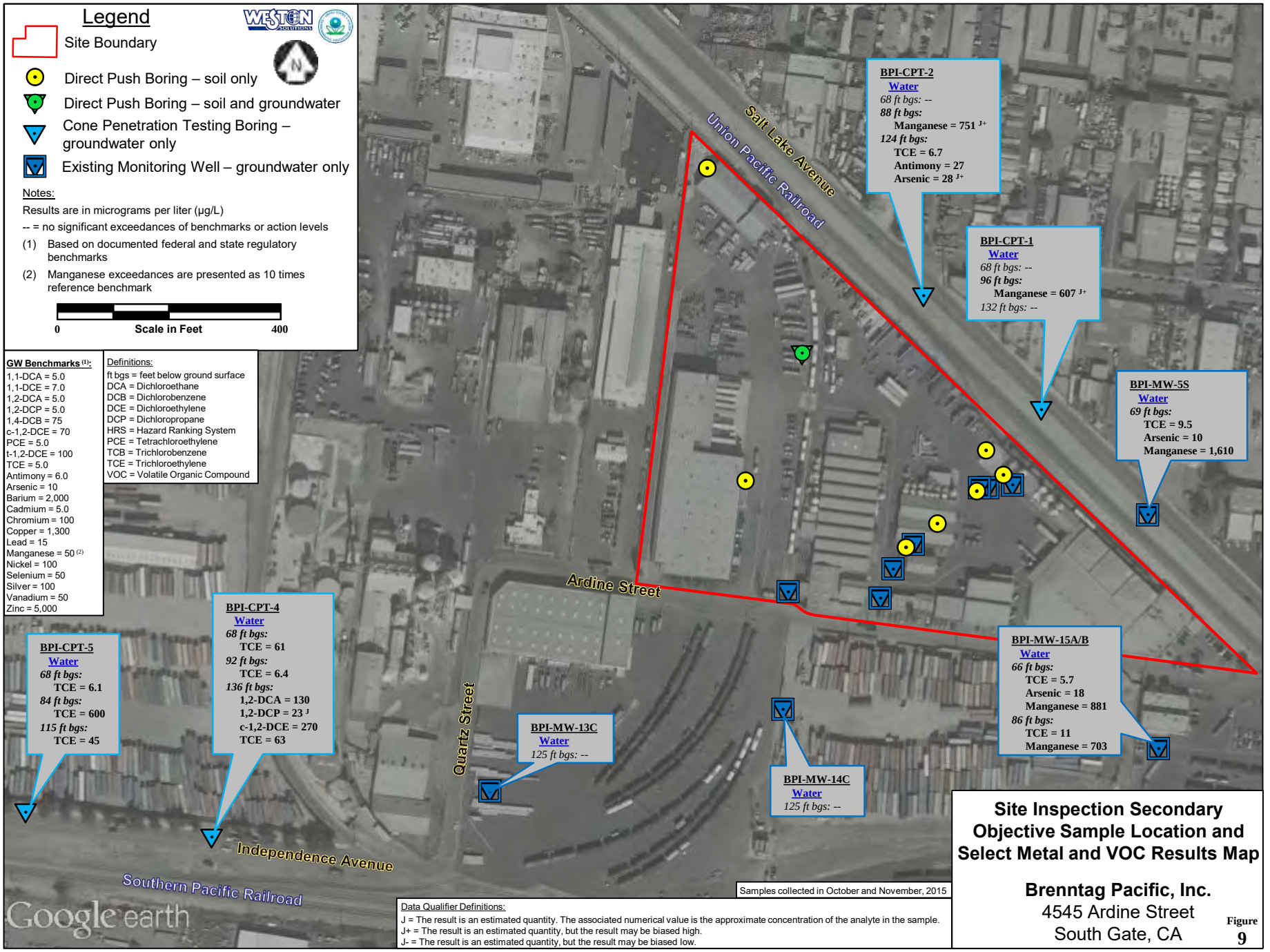


Warehouse No. 3 & Clarifier Area – Site Inspection Sample Location and Select Metal and VOC Results Map

Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, CA

Figure 7


Salt Lake Avenue
Union Pacific Railroad
West Parcels Area
BPI-DP-6
Soil
2 ft bgs:
Arsenic = 221
Cadmium = 1.5
Copper = 64
Lead = 1,500
Zinc = 639
5 ft bgs (1):
Arsenic = 12
Lead = 32
10 ft bgs: --
15 ft bgs: --
BPI-DP-7
Soil
2 ft bgs:
Antimony = 10 J-
Arsenic = 377 J
Cadmium = 0.33 J
Copper = 134 J
Lead = 231
5 ft bgs:
Arsenic = 86 J
Cadmium = 0.97
Copper = 343 J
Lead = 94
10 ft bgs:
Arsenic = 162 J
15 ft bgs:
Arsenic = 72 J
BPI-DP-5
Soil
2 ft bgs:
Arsenic = 412
Copper = 219
Lead = 1,340
Zinc = 239
5 ft bgs:
Copper = 275
Zinc = 353
10 ft bgs:
Cadmium = 1.4
Zinc = 4,860
15 ft bgs:
Arsenic = 20
Zinc = 2,260
Water
66 ft bgs (2): --
Legend
Site Boundary
SI West Parcels Source Area
Direct Push Boring – soil only
Direct Push Boring – soil and groundwater
Cone Penetration Testing Boring – groundwater only
Existing Monitoring Well – groundwater only
Notes:
Soil metal results are in milligrams per kilogram (mg/kg)
Soil VOC results are in micrograms per kilogram (µg/kg)
Groundwater results are in micrograms per liter (µg/L)
-- = no significant exceedances of benchmarks or action levels
(1) Duplicate Sample collected; greater result is presented
(2) Sample only submitted for VOC analysis
(3) Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
(4) Based on documented federal and state regulatory benchmarks.
(5) Manganese exceedances are presented as 10 times reference benchmark for Gaspur aquifer samples
0
Scale in Feet
300
GW Benchmarks (4):
1,1-DCA = 5.0
1,1-DCE = 7.0
1,2-DCA = 5.0
1,2-DCP = 5.0
1,4-DCB = 75
c-1,2-DCE = 70
PCE = 5.0
t-1,2-DCE = 100
TCE = 5.0
Antimony = 6.0
Arsenic = 10
Barium = 2,000
Cadmium = 5.0
Chromium = 100
Copper = 1,300
Lead = 15
Manganese = 50 (5)
Nickel = 100
Selenium = 50
Silver = 100
Vanadium = 50
Zinc = 5,000
Soil Action Levels (3):
1,2,3-TCB = 5.1
1,2,4-TCB = 5.1
1,2-DCB = 5.1
1,2-DCP = 5.1
1,4-DCB = 5.1
c-1,2-DCE = 5.1
PCE = 5.1
t-1,2-DCE = 5.1
TCE = 5.1
Antimony = 1.0
Arsenic = 7.8
Cadmium = 0.27
Chromium = 63
Copper = 56
Lead = 25
Selenium = 2.6
Silver = 0.51
Zinc = 225
Definitions:
ft bgs = feet below ground surface
DCA = Dichloroethane
DCB = Dichlorobenzene
DCE = Dichloroethylene
DCP = Dichloropropane
HRS = Hazard Ranking System
PCE = Tetrachloroethylene
TCB = Trichlorobenzene
TCE = Trichloroethylene
VOC = Volatile Organic Compound
Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
Samples collected in October and November, 2015
West Parcels Area – Site Inspection Sample Location and Select Metal and VOC Results Map
Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, CA
Figure 8



Site Inspection Secondary Objective Sample Location and Select Metal and VOC Results Map

Brenntag Pacific, Inc.
4545 Ardine Street
South Gate, CA

Figure 9

Reference:
Weston, 2017b

Site Inspection Report
General Inspection Laboratories
Cudahy, Los Angeles County, California

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List of Acronyms

amsl	above mean sea level
AOC	analyte of concern
APN	Assessor's Parcel Number
bgs	below ground surface
Brenntag	Brenntag Pacific, Inc.
CA MCL	California Maximum Contaminant Level
CA 2nd MCL	California Secondary Maximum Contaminant Level
CA NL	California Notification Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLPAS	Contract Laboratory Program Analytical Services
CMP	Corrective Measures Proposal
CPT	Cone Penetration Testing
CUPA	Certified Unified Program Agency
CWD	County Water District
DCA	dichloroethane
DCE	dichloroethylene
DP	direct push
DTSC	Department of Toxic Substances Control
ELA	East Los Angeles
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
Fed MCL	Federal Maximum Contaminant Level
Fed 2nd MCL	Federal Secondary Maximum Contaminant Level
FI	Facility Investigation
ft	foot
ft^2	square foot
GENIL	General Inspection Laboratories
GSWC	Golden State Water Company
GTI	General Testing and Inspection
GW	groundwater
HHMD	LA County Fire Department, Health Hazardous Materials Division
HHRA	Human Health Risk Assessment
HRS	Hazard Ranking System
HWSA	hazardous waste storage area
LADPW	Los Angeles County Department of Public Works
LUR	Land Use Restriction
MCL	Maximum Contaminant Level
MDL	method detection limit
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
MWC	Mutual Water Company
NA	Not Analyzed
NE710	North East 710 Study Area

List of Acronyms (Continued)

NOV	notice of violation
NPL	National Priorities List
PA	Preliminary Assessment
PBR	Permit By Rule
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RSL	Regional Screening Level
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SCDM	Superfund Chemical Data Matrix
SEMS	Superfund Enterprise Management System
SEP	soil exposure pathway
SI	Site Inspection
SLIC	Spills, Leaks, Investigations, and Cleanups
SPC	State Plane Coordinate
SQL	sample quantitation limit
SSL	soil screening level
SVE	soil vapor extraction
SVOC	semivolatile organic compound
Titan	Titan Terminal & Transport
TCA	trichloroethane
TCE	trichloroethylene
TDL	target distance limit
TOC	Top of Casing
TRI	Toxics Release Inventory
VOC	volatile organic compound
VC	vinyl chloride
WESTON®	Weston Solutions, Inc.
WPA	wellhead protection area
µg/kg	microgram per kilogram
µg/L	microgram per liter

EXECUTIVE SUMMARY

The General Inspection Laboratories (GENIL) site is officially located at 8427 Atlantic Ave., Cudahy, Los Angeles County, California. Multiple additional addresses are associated with the site. The 2.6-acre site is comprised of two contiguous parcels, referred herein as the North Parcel and the South Parcel, in a primarily urban industrial area. The site is located less than one-quarter mile from residential properties.

By 1957, GENIL began operating on the North Parcel as a non-destructive materials testing and inspection provider for the aerospace and military industries. In 1970, GENIL relocated to the South Parcel. Since the mid-1990s, the business operations and assets of GENIL have been acquired and divested by multiple entities including Stellex Technologies, General Testing and Inspection (GTI), and the Mistras Group. The facility currently operates as Mistras NDT Services and has no association with the North Parcel.

Significant quantities of hazardous substances, including metals and volatile organic compounds (VOCs), are associated with GENIL operations. Historically, a vapor degreaser and two subgrade clarifiers were located on site. In addition, hazardous substances were stored on site without secondary containment. Hazardous substances identified as having been used and/or stored at the site include aqueous metal solutions containing chromium, lead, and nickel; silver; 1,1,1-trichloroethane (TCA); tetrachloroethylene (PCE); and trichloroethylene (TCE).

Multiple soil vapor, soil matrix, and groundwater investigations have been conducted at the site by various agencies; however, none of these investigations were conducted on both parcels simultaneously. The U.S. Environmental Protection Agency (EPA) chose to evaluate both parcels as a single site to gain a more comprehensive understanding of on-site sources and of the migration of contaminants into underlying groundwater. EPA has had no known historical involvement with the site.

In November 2015, Weston Solutions, Inc. (WESTON), on behalf of EPA, conducted the Site Inspection (SI) sampling event at the site. During the event, WESTON collected soil matrix source samples at depths up to 15 feet (ft) below ground surface (bgs) from ten on-site borings; collected groundwater release samples at depths up to 134 ft bgs from four on-site borings, two off-site borings, and seven existing monitoring wells; and collected secondary objective groundwater samples from two off-site borings. In addition, the existing on-site monitoring wells on both the North Parcel and the South Parcel were resurveyed as part of the SI investigation to verify top of casing elevations.

On-site soil samples collected during the SI investigation exhibited concentrations of metals and VOCs that exceeded action levels. Maximum soil concentrations include lead at 165 milligrams per kilogram (mg/kg) and TCE at 76 micrograms per kilogram (µg/kg). The assigned site-specific action levels for lead and TCE are 25 mg/kg and 5.1 µg/kg, respectively.

Groundwater samples collected during the investigation also exhibited elevated concentrations of metals and VOCs. Maximum groundwater concentrations include arsenic at 120 micrograms per

liter (µg/L); cis-1,2-dichloroethylene (DCE) at 450 µg/L; and TCE at 1,600 µg/L. The federal Maximum Contaminant Levels (MCLs) for arsenic, cis-1,2-DCE, and TCE are 10 µg/L, 70 µg/L, and 5.0 µg/L, respectively.

The results of this SI, which were generally consistent with the results of previous investigations conducted under state oversight, have identified hazardous substance source areas on site and suggest that one or more additional VOC source areas exist on site. Metals and VOCs were identified at elevated concentrations in subsurface soils and are likely the result of historical on-site activities. The distribution of contaminants in the aquifer underlying the site suggests that TCE originating from the site has impacted shallow groundwater and has the potential to migrate into the deeper drinking water aquifers. Of note, the City of South Gate's Well 7, which was located approximately one-quarter mile southeast of the site, was closed in 2002 due to elevated concentrations of contaminants, including TCE. The site is located within the North East 710 Study Area, which is an area where drinking water wells have historically been impacted by elevated levels of metals and VOCs.

1.0 INTRODUCTION

1.1 Regulatory Background

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Weston Solutions, Inc. (WESTON®) has been tasked to conduct a Site Inspection (SI) of the General Inspection Laboratories (GENIL) site in Cudahy, Los Angeles County, California.

The GENIL site was identified as a potential hazardous waste site and entered into the Superfund Enterprise Management System (SEMS) on June 29, 2014 (CAD027897164). A Preliminary Assessment (PA) was completed for the U.S. Environmental Protection Agency (EPA) by WESTON on April 29, 2015. The purpose of a PA is to review existing information on a site with potential releases of a hazardous substance and its environs to assess the threats, if any, posed to public health, welfare, or the environment and to determine if further investigation under CERCLA is warranted. Prior to the 2015 WESTON PA, EPA completed a Site Screening in August 2014 (DTSC, 2014; EPA, 2017a; Weston, 2015).

After reviewing the 2015 PA, EPA decided that further investigation of the GENIL site would be necessary to more completely evaluate the site using the EPA Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances at the site. The HRS has been adopted by EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which EPA may conduct remedial response actions. This report summarizes the results of the SI for the GENIL site (EPA, 2015).

More information about the Superfund program is available on the EPA website at http://www.epa.gov/superfund.

1.2 Apparent Problem

EPA determined that a Site Inspection (SI) was needed at the GENIL site because of the following apparent problems:

- The site has been used for non-destructive testing and inspection activities since at least 1955. Hazardous substances documented as having been used and/or stored on the site as part of these activities include, but are not limited to, 1,1,1-trichloroethane (TCA), tetrachloroethylene (PCE), trichloroethylene (TCE), and aqueous metal solutions that contained chromium, lead, and nickel (AEI, 2002; AEGI, 2010; DTSC, 2017b; ETI, 2006).

- Process wastewaters generated during on-site activities were historically treated using subgrade clarifier systems and, more recently, an aboveground three-stage treatment system. Historically, hazardous substances and waste products were not adequately stored to prevent an accidental release (AEGI, 2010; ETI, 2006).

- Subsurface soil vapor and soil matrix investigations conducted between 1996 and 2010 have identified elevated concentrations of contaminants in on-site soils including, but not limited to, lead, 1,1,1-TCA, cis-1,2-dichloroethylene (DCE), PCE, and TCE (AEI, 2002; AEGI, 2010; D&M, 1996; ENV, 2004; ETI, 2006; N&M, 2003; N&M, 2005).

- Groundwater investigations conducted between 2004 and 2011 have identified substantially elevated concentrations of contaminants in groundwater beneath the site including, but not limited to, cis-1,2-DCE, and TCE (AEGI, 2010; AEGI, 2012; ENV, 2004; ETI, 2006; N&M, 2005).

- The site is located within the North East 710 Study Area (NE710). Drinking water wells in the NE710 have historically been impacted by elevated levels of metals and volatile organic compounds (VOCs). The area is under investigation in order to identify the primary sources of this contamination and facilitate further investigation and remediation at those sources under the auspices of either EPA or the State of California. The site is located approximately one-quarter mile northwest of the City of South Gate's Well 7, which was closed in 2002 and historically reported elevated concentrations of arsenic, chromium, and TCE (Google, 2017; RWQCB, 2015; Weston, 2016).

2.0 SITE DESCRIPTION

2.1 Location *(See Figure 1)*

The GENIL site is located at 8427 Atlantic Ave., Cudahy, California. Additional addresses associated with the site include 4650 Ardine St. and 8407, 8411, and 8415 Atlantic Ave. The geographic coordinates for the site are 33° 57' 23.5" North latitude and 118° 11' 6.1" West longitude (Appendix A). The location of the site is shown in Figure 1.

2.2 Site Description *(See Figures 2 through 4)*

The GENIL site occupies approximately 2.6 acres in an urban industrial and commercial area. The site is bordered to the north by a steel bed frame manufacturing facility, to the northwest by a food distribution facility, and to the south by a tractor-trailer fueling facility. The site is bordered to the east, across Atlantic Avenue, by the former M. Stephens Manufacturing property (EPA ID No.: CAN000909569) and to the southwest, across Salt Lake Avenue and the Union Pacific Railway line, by the Titan Terminal & Transport (Titan) chemical distribution and storage facility (EPA ID No.: CAD008353211) (Google, 2017; Appendix B).

The site is composed of two Los Angeles County Assessor parcels, which are identified by Assessor Parcel Numbers (APNs) 6224-036-002 and 6224-036-005. Parcel 6224-036-005, henceforth referred to as the North Parcel, occupies the northern approximately 1.2 acres of the site and parcel 6224-036-002, henceforth referred to as the South Parcel, occupies the southern approximately 1.5 acres. A parcel layout map is presented in Figure 2 (LACA, 2017).

As of October 2016, the North Parcel was occupied by two buildings including an approximately 12,000 square foot (ft^2) warehouse and manufacturing building at the northwest corner of the parcel, henceforth referred to as the Quality Padilla Building; and an approximately 19,000 ft^2 warehouse and commercial building at the eastern side of the parcel, henceforth referred to as the 8411-15 Building. The Quality Padilla Building, which was addressed as 4650 Ardine St., included a large central warehousing and manufacturing area surrounded by small office areas. The 8411-15 Building was split into two distinct warehouse and commercial spaces, both of which include retail storefronts on the street-facing (i.e., east) side. The northern portion of the building was addressed as 8411 Atlantic Ave. and the southern portion of the building was addressed as 8415 Atlantic Ave. The remaining portions of the parcel were occupied by asphalt- and concrete-paved surfaces. The southeastern portion of the parcel was occupied by an exterior mattress storage area. With the exception of the street-facing side of the 8411-15 Building, the parcel was enclosed behind a chain link fence. A site layout map is presented in Figure 3 (Google, 2017; Appendix B).

As of October 2016, the South Parcel was occupied by a two-story, approximately 32,000 ft^2 manufacturing and office building at the central and eastern portions of the parcel, henceforth referred to as the Mistras Building, and an approximately 1,700 ft^2 warehouse building at the northwestern corner of the parcel, henceforth referred to as the Materials Storage Warehouse. The central portion of the Mistras Building was subdivided into several operational areas and dual-level office spaces were situated at the west and east sides of the building. An asphalt-paved employee

parking lot was located east-adjacent to the Mistras Building and an asphalt- and concrete-paved equipment yard was located west-adjacent to the building. A partially-covered hazardous waste storage area (HWSA) was located at the northwestern corner of the equipment yard, west-adjacent to the Materials Storage Warehouse, and included secondary containment structures. The parcel was enclosed behind a chain link fence (Google, 2017; LACA, 2017; Appendix B).

North Parcel:

The North Parcel was first developed prior to 1923, at which time it was occupied by several apparent shed/shop buildings. By 1928, most of the structures at the parcel had been removed and a small automotive repair shop building had been constructed at the southeast corner fronting Atlantic Avenue. In approximately 1936, a warehouse structure was constructed adjacent and west of the automotive repair building and a shed was constructed at the northwest portion of the parcel. In 1947, most of the parcel was occupied by what appears to be piping materials and by 1955 all of the previous structures had been removed and the existing Quality Padilla and 8411-15 Buildings had been constructed. In 1957, a clarifier was installed adjacent and west of the central portion of the 8411-15 Building. The clarifier reportedly measured approximately 7 feet (ft) by 4 ft and extended to a depth of approximately 3 ft below ground surface (bgs) (AEGI, 2010; Google, 2017; LACA, 2017; N&M, 2003; Weston, 2015).

South Parcel:

The South Parcel was first developed prior to 1923, at which time it was occupied by several single-family residential dwellings. By 1938, several additional and relatively small residential buildings had been constructed at the north-central portion of the parcel, immediately west of the original residential buildings. By 1947, additional single and multi-unit dwellings had been constructed at the central and eastern portions of the parcel and that area had been converted to a trailer and auto court. In approximately 1970, the residential dwellings were removed, the existing Mistras Building was constructed, and the remaining portions of the parcel were resurfaced with asphalt and/or concrete. In mid-2006, the Materials Storage Warehouse was constructed (Google, 2017; LACA, 2017; Weston, 2015).

A three-stage clarifier was formerly located within the interior of the Mistras Building, adjacent and west of the eastern offices. A network of concrete-lined trenches connected the clarifier to the various processing areas of the facility. The clarifier and trench system were installed as part of the original construction in approximately 1970 and were abandoned in-place in 1989, concurrent with the installation of an aboveground wastewater treatment unit at the southwest corner of the building. Additional processing areas within the building's interior included, but were not limited to, X-ray rooms at the north-central portion of the building; a Dark Room at the northeast corner of the building; Penetrant rooms, an Ultrasonic Testing Area, and a Pressure Test Pool Tank at the central portion of the building; and an Etch Room (installed in 1980), Grinding Room, Magnetic Particle Inspection Room, and Machining Room at the south and southeast portions of the building. In addition, one or more vapor degreasers were reported to have been located adjacent to the grinding room from approximately 1970 to 2002. Since 1989, the HWSA has been situated at its current location. Prior to 1989, there was reportedly no designated waste storage area but

temporary areas were set up within the northwestern interior of the building. The historical layout of the Mistras Building is presented in Figure 4 (AEI, 2002; D&M, 1996; ETI, 2006; ETI, 2007b; Weston, 2015).

2.3 Operational History *(See Tables 1 & 2)*

The GENIL site is currently owned by two separate entities. The North Parcel, 6224-036-005, is owned by the corporate entity On Atlantic LLC, which has owned this parcel since at least 2002. The South Parcel, 6224-036-002, is owned by "Julie A Beverly A. Barber Decd Dykstra Tr Trust" (i.e., Julie A. Dykstra). Julie Dykstra and Beverly Barber are identified as co-owners of the parcel from 2003 through 2011, while Beverly Barber is identified as the sole owner of the parcel from 1999 through 2001. No additional historical ownership information is known (TR, 2014; Appendix C-1).

Historical operations at the site include, but may not be limited to, residential activities from first development to approximately 1970, non-destructive testing and inspection activities from approximately 1955 to the present, and various materials warehousing and retail activities from approximately 1955 to the present. Additional operations that have been reported at the site include, but are not limited to, paper box manufacturing, plastics manufacturing, pharmaceutical distribution, mattress repair, and book sales. The identified current and historical operators at the site are provided in Table 1 and Table 2 (AEGI, 2010; ETI, 2006; Weston, 2015).

North Parcel:

The earliest known non-residential operations to be conducted at the North Parcel were automotive service activities, which occurred from approximately 1928 through 1933. Between approximately the mid-1930s and 1950, operations at the parcel included metal fabrication, primarily associated with steel pipe cutting. Between approximately 1955 and 1970, GENIL utilized the parcel for non-destructive testing and inspection activities, which primarily occurred in the existing Quality Padilla Building and the northern half of the 8411-15 Building. Significant quantities of hazardous substances, including acids and VOCs, are associated with these early GENIL operations; however, specific activities associated with the GENIL operations at the North Parcel are not well documented. Aqueous waste streams generated during these operations were directed into a subgrade clarifier, which was formerly located west and adjacent of the 8411-15 Building and, subsequently, into the municipal sewer system. The clarifier was removed under the oversight of the Los Angeles County Department of Public Works (LADPW) in 2002. Additional details on the clarifier removal and subsequent confirmation sampling are presented in section 3.1 (AEGI, 2010; ETI, 2006; N&M, 2003; Weston, 2015).

Additional operations that are reported to have occurred within the southern half of the 8411-15 Building since 1955, as well as within the remaining portions of the parcel since 1970, include, but are not be limited to, paper box manufacturing by the Coast Paper Box Company and Affiliated/Key/Sentinel Container Corporation, plastics manufacturing and distribution by Phoenix Plastics, watercraft repair and sales by Eliminator Boats, pharmaceutical distribution by Brunswig Drug Company, automotive parts warehousing by Pronto System, mattress repair and

distribution by Quality Padilla, fitness equipment sales by USA Fitness/Extreme Training Equipment, metal materials warehousing by Santa Fe Metals, used tire warehousing and sales by Azteca International/Sandbagger Tires, durable goods warehousing and sales by OP Bag and Supply, and religious book sales by Libreria Nueva Jerusalem (AEGI, 2010; ETI, 2006; Weston, 2015).

South Parcel:

The earliest known non-residential operations to be conducted at the South Parcel were non-destructive testing and inspection activities, which were conducted by GENIL. These operations were initially conducted at the North Parcel, but were relocated to the South Parcel in approximately 1970. The western quarter of the Mistras Building was used for metal supply warehousing activities by Taywood Steel between approximately 1970 and 1974, at which time GENIL expanded into the full facility. Reportedly, Taywood did not conduct any manufacturing at the site. Prior to 1970, the parcel had been used as an automobile and trailer court since approximately the late 1940s; however it is not known whether this facility was used to service permanent or transient populations (ETI, 2006; Weston, 2015).

GENIL was founded in approximately 1955, primarily as a materials testing and inspection service provider for the aerospace and military industries. GENIL was acquired by Kleinert Industries at an unknown date. In approximately 1997, Kleinert Industries was acquired by Stellex Aerospace, a subsidiary of Stellex Technologies, Inc. In December 2004, as part of Stellex's Chapter 11 reorganization plan, the entirety of GENIL business operations and assets were divested and acquired by General Testing and Inspection (GTI). In October 2010, GTI was acquired by the Mistras Group and currently operates as Mistras NDT Services. Henceforth in this SI, GENIL is used to denote the original company as well as any additional entities that subsequently acquired the GENIL business operations and assets (i.e., GTS, Mistras NDT Services) (ETI, 2007b; Weston, 2015).

Since approximately 1970, operations at the South Parcel have included, but are not limited to, ultrasonic testing, dye penetrant inspection, and pressure testing at the central portion of the building; X-ray testing at the northern portion of the building; magnetic particle inspection, grinding/machining, metal treatment (etching) (since approximately 1980), and vapor degreasing (ceased in approximately 2002) at the south-central portion of the building; photograph processing/development at the northwest corner of the building; and administrative activities at the east-central and west-central portions of the building. Wastewater generated within the various processing areas of the building was historically routed through floor drains and open trench lines to a subgrade clarifier that was formerly located at the west-central portion of the building. Treated wastewater was subsequently discharged under permit from the clarifier to the sanitary sewer system. Hazardous wastes were reported to historically have been drummed and stored within the northwest corner of the building awaiting pickup by a waste hauler. Bulk PCE and TCE were stored adjacent to the vapor degreaser. In approximately 1989, the clarifier system was replaced with the existing aboveground wastewater treatment system, which is located at the southeast corner of the building. This treatment system includes aboveground feeder lines, a three-stage treatment tank, and a sloped clarifier that releases effluent to the sanitary sewer system. Also in

approximately 1989, on-site hazardous waste storage was relocated to the existing containment area at the northeast corner of the parcel (ETI, 2006).

Hazardous substances identified as having been used and/or stored at the South Parcel include, but are not limited to: various caustic liquids and acids (e.g., hydrochloric, hydrofluoric, and nitric acids) used in metal treatment activities; aqueous metal solutions generated during metal treatment activities that contained total chromium, hexavalent chromium, lead, and nickel; naphtha-based bulk penetrant dye used in penetrant testing; vapor degreasing solution used in parts cleaning activities and that contained 1,1,1-TCA, 2-butanone (i.e., methyl ethyl ketone [MEK]), acetone, PCE, and TCE; kerosene-based inspection fluid used in magnetic particle inspections; and photographic processing chemicals that contained silver-based compounds (AEI, 2002; DTSC, 1992-1999; DTSC, 2017b; ETI, 2006).

Unaltered petroleum products, as well as any substances that are purposefully added to the indigenous petroleum product during the refining process, are excluded from consideration under CERCLA.

2.4 Regulatory Involvement

2.4.1 U. S. Environmental Protection Agency

The GENIL site is listed in the Resource Conservation and Recovery Information System (RCRIS) database as *Mistras Group (Services)* (Handler ID: CAD027897164), a Large Quantity Generator with an address of 8427 Atlantic Ave. (EPA, 2017b).

The site was not listed in the Toxics Release Inventory (TRI) database as of May 2017 (EPA, 2017c).

In February 2011, EPA conducted an investigation of the GENIL facility in coordination with the Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD) due to an environmental incident that occurred on the South Parcel. During preparation for off-site disposal of aqueous-phase hazardous waste, an unauthorized release of the waste occurred at the facility, which had the potential to form a toxic vapor cloud. No human or property damage was reportedly caused by the incident and no additional details on the specific type or quantities of substances are known. In early 2012, EPA instigated a criminal investigation of the facility in connection with potential violations of the Resource Conservation and Recovery Act (RCRA) specifically related to the improper storage and labelling of hazardous waste. The current status of this investigation is not known (Weston, 2015).

2.4.2 California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

The site is listed in the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) EnviroStor database as *General Inspection Laboratories, Inc.*

(Envirostor ID: 71002336), with an address of 8427 Atlantic Ave. The case is listed as an *Evaluation* site that was *Active* as of May 2014 (DTSC, 2017a).

North Parcel:

DTSC has had no known involvement with the North Parcel.

South Parcel:

Since approximately 1986, DTSC (formerly the California Department of Health Services, Toxic Substances Control Program) has conducted regulatory oversight of hazardous waste generation at the South Parcel. Between 1993 and 2000, DTSC annually authorized and oversaw the use of an on-site Permit By Rule (PBR) fixed treatment unit (i.e., wastewater treatment system). In 2000, PBR renewals and oversight were transferred to HHMD, the local Certified Unified Program Agency (CUPA) (DTSC, 1986; Weston, 2015).

In early 2004, the Los Angeles Regional Water Quality Control Board's (RWQCB) Spills, Leaks, Investigations, and Cleanups (SLIC) Program transferred their open GENIL case to DTSC. Subsequently, DTSC issued a Corrective Action Consent Agreement (Docket Number SRPD 03/04 SCC-4316), which was finalized in September 2004 and required GENIL to prepare a Facility Investigation (FI) Report. The FI sampling event was implemented by GENIL in 2006 and included the collection of on- and off-site soil matrix and groundwater samples. Based on the recommendations outlined in the subsequent FI Report, DTSC approved the excavation and removal of approximately 70 tons of metal-impacted concrete and soil from the parcel. This removal action was detailed in the May 2007 Excavation Report. In accordance with the requirements of the consent agreement, GENIL prepared a Revised Human Health Risk Assessment (HHRA) Report in September 2007 and a Revised Supplemental HHRA Report in October 2008. In April 2008, DTSC requested that GENIL submit a Corrective Measures Proposal (CMP) to evaluate corrective measure alternatives. The CMP was submitted to DTSC in November 2008 with a preferred alternative of issuing institutional controls that would include the implementation of Land Use Restrictions (LURs) for the parcel. DTSC approved the CMP and subsequently prepared the LUR documentation; however, GENIL reportedly would not finalize the LUR procedures. Additional details on investigative efforts at the parcel are presented in section 3.1 (DTSC, 2004; ENV, 2005; ETI, 2006; ETI, 2008; Weston, 2015).

2.4.3 California Environmental Protection Agency, Regional Water Quality Control Board (RWQCB)

The site is listed in the RWQCB GeoTracker database as *On Atlantic, LLC* (GeoTracker ID: SL0603783105; Case No.: 1148), with an address of 8411 Atlantic Blvd. The site is listed as a *Cleanup Program Site* with a cleanup status as *Open – Site Assessment as of 9/29/*2004. The potential contaminants of concern are listed as PCE and TCE. The site is also listed in the database as *General Inspection Laboratories* (GeoTracker ID: SL0603749673; Case No.: 71002336), with an address of 8427 Atlantic Ave. The site is listed as a *Cleanup Program Site* with a cleanup status

as *Open – Inactive as of 1/30/*2015. The potential contaminants of concern are listed as *None Specified* (RWQCB, 2017).

North Parcel:

The North Parcel was referred to RWQCB by LADPW in 2003 after elevated concentrations of TCE were discovered in subsurface soils beneath the former clarifier at the central portion of the parcel. Under the oversight of RWQCB, the site owner installed a multi-purpose groundwater/vapor well adjacent to the former clarifier and subsequently completed a vapor extraction pilot study. Substantially elevated concentrations of TCE were identified in groundwater beneath the former clarifier. In mid-2005, at the direction of RWQCB, a more comprehensive soil vapor extraction (SVE) system was initiated in the existing well. In addition, two more groundwater monitoring wells were installed at this time. The SVE system operated between April and August 2005, at which time TCE concentrations reportedly reached asymptotic conditions. Substantially elevated TCE concentrations were identified in three on-site wells in quarterly monitoring conducted between 2004 and 2007. In 2010, three additional monitoring wells were installed and three confirmation borings were advanced to assess residual TCE concentrations in the subsurface soil. Groundwater monitoring was recommenced in 2010 and continued through 2011. In 2013, RWQCB granted the site owner's request to suspend all groundwater monitoring so that efforts could be made to coordinate future monitoring events with the owners of the South Parcel using a new and unified set of surveyed well elevations. Additional details on investigative efforts at the parcel are presented in section 3.1 (AEGI, 2010; AEGI, 2012; N&M, 2006; RWQCB, 2013; RWQCB, 2017).

South Parcel:

RWQCB has been involved with the South Parcel since at least 2002. The case, initially identified as Case No. 1142, was transferred to DTSC oversight in early 2004. Soil matrix and soil vapor investigations conducted between 1996 and 2002 identified elevated PCE concentrations in soils near the former vapor degreaser unit at the south-central portion of the Mistras Building and elevated TCE concentrations in soils near the former drum storage area at the northwestern corner of the building. Additional details on investigative efforts at the parcel are presented in section 3.1 (AEI, 2002; DTSC, 2004).

2.4.4 Los Angeles County Fire Department, Health Hazardous Materials Division (HHMD)

North Parcel:

HHMD has had no known involvement with the North Parcel.

South Parcel:

HHMD became involved with the South Parcel in 1986 pursuant to a complaint investigation by the California District Attorney's Office. HHMD subsequently conducted an inspection of the GENIL facility and issued a notice of violation (NOV) due to numerous drums of unlabeled

hazardous waste being stored on site, as well as waste having been stored on site for greater than 90 days. HHMD conducted additional inspections in at least 1994, 1995, 1999, 2004, 2006, 2009, 2010, and 2011. Several NOVs were issued to the facility by HHMD during these inspections, primarily due to improperly labelled waste and failure to provide proper hazardous waste training and manifest documentation. All practices identified in the NOVs appeared to have been brought into compliance shortly after the NOVs were issued (HHMD, 2012; Weston, 2015).

In February 2011, HHMD conducted an investigation of the GENIL facility in coordination with EPA due to an environmental incident that occurred on the South Parcel. In April 2011, HHMD issued the facility a fine for violations of the California Health and Safety Code. Additional details on the incident are presented in section 2.4.1 (Weston, 2015).

2.4.5 Los Angeles County Department of Public Works (LADPW)

North Parcel:

In early 2002, LADPW requested that the site owners of the North Parcel remove the on-site clarifier. In November 2002, the site owner obtained a closure permit with LADPW and the clarifier was subsequently removed. Under the oversight and direction of LADPW, a confirmation soil sample was collected from the subsurface soils at the location of the former clarifier. This sample exhibited elevated concentrations of petroleum hydrocarbons, VOCs, and lead. Based on this information, the case was referred to RWQCB in April 2003. Additional details on investigative efforts at the parcel are presented in section 3.1 (N&M, 2003; N&M, 2006).

South Parcel:

LADPW has had no known involvement with the South Parcel.

3.0 INVESTIGATIVE EFFORTS

3.1 Previous Sampling *(See Tables 3 & 4)*

Numerous soil vapor, soil matrix, and groundwater investigations have been conducted at the GENIL site by several entities under the oversight of multiple state and local agencies. All of these investigations were conducted in association with either the North Parcel or the South Parcel but not both parcels simultaneously. A summary of the most significant of these investigations is provided in sections 3.1.1 and 3.1.2 below. A summary of select results from these investigations is presented in Tables 3 and 4 (Weston, 2015).

3.1.1 North Parcel Investigative Efforts *(See Table 3)*

1996-2002 Investigations

Between approximately 1996 and 2002, several environmental investigations were conducted at the North Parcel including, but not limited to, two Phase I Environmental Site Assessments (ESAs) (June and September 1996), a Phase II ESA (March 1997), and a subsurface investigation (April 2002). One or more of these investigations included the sampling of subsurface media at the parcel; however, these reports were not available for review and no additional information is known regarding sampled media, sample locations, analytical results, or which entities conducted the investigations (N&M, 2003).

2003 Clarifier Closure Report

In March 2003, the North Parcel owner completed a Clarifier Closure Report under the direction and oversight of LADPW. In January 2002, approximately 400 gallons of liquids were removed from the clarifier and disposed of off site under manifest. In November 2002, the clarifier structure was removed and the connection with the sanitary sewer system was sealed. Subsequently, one soil matrix sample was collected from beneath the former clarifier at a depth of approximately 5.5 ft bgs, which was approximately 2.5 ft below the base of the clarifier. An additional soil matrix sample was collected from approximately 1.0 ft bgs north-adjacent to the Quality Padilla Building to be used as a representative background sample. The samples were analyzed for petroleum hydrocarbons, VOCs, metals, pH, and cyanide. Following the completion of sampling, the excavated location was backfilled with imported soil and resurfaced with concrete. Analytical results of the on-site soil sample indicated elevated concentrations of petroleum hydrocarbons, VOCs, and metals. Specific hazardous substance concentrations identified in the sample include, but are not limited to: 2,400 milligrams per kilogram (mg/kg) of lead; 8 micrograms per kilogram (µg/kg) of cis-1,2-DCE; 47 µg/kg of PCE; and 19,000 µg/kg of TCE (N&M, 2003).

2004-2005 Multi-purpose Monitoring Well Installation and Soil Vapor Extraction

In April 2003, LADPW transferred regulatory oversight of the North Parcel to RWQCB. In August 2004, under the oversight and direction of RWQCB, the site owner installed a multi-purpose groundwater and vapor monitoring well west-adjacent to the former clarifier. Four borings were

also advanced to a total depth of approximately 55 ft bgs to assess the lateral extent of TCE impacts to subsurface soils. Soil matrix samples were collected from these borings at approximately 10-ft intervals and submitted for VOC analysis. VOCs identified at elevated concentrations in one or more of the samples include, but are not limited to, cis-1,2-DCE and TCE. The maximum TCE concentration of 3,300 µg/kg was identified in the 45 ft bgs sample collected from the boring that was advanced adjacent to the former clarifier (AEGI, 2010; N&M, 2005).

In August 2004, the site owner collected a groundwater sample from the existing multi-purpose monitoring well that exhibited elevated concentrations of VOCs including, but not limited to, 99 micrograms per liter (µg/L) of cis-1,2-DCE, 1.8 µg/L of PCE, and 2,300 µg/L of TCE. Between April and August 2005, an SVE system was attached to the well and operated under an extended pilot study. Initial soil vapor samples exhibited detectable concentrations of VOCs including, but not limited to, cis-1,2-DCE, PCE, and TCE. PCE and TCE concentrations decreased significantly over the initial month of SVE remediation, whereas concentrations of cis-1,2-DCE remained consistently low. VOC concentrations remained relatively consistent over 3 additional months of operation and, subsequently, all SVE remediation at the parcel was terminated (AEGI, 2010; N&M, 2005).

In mid-2005, the site owner advanced six additional borings on the parcel to reassess the lateral and vertical extents of TCE-impacted soils. The borings were advanced to a total depth of approximately 40 ft bgs with soil matrix samples collected at 10-ft intervals and submitted for VOC analysis. VOCs identified at elevated concentrations in one or more of the samples include, but are not limited to, cis-1,2-DCE and TCE. The maximum TCE concentration of 550 µg/kg was identified in the sample collected at 40 ft bgs from the boring that was advanced approximately 20 ft west of the former clarifier (AEGI, 2010).

2004-2007 Groundwater Monitoring

Between August 2004 and March 2005, the site owners of the North Parcel conducted quarterly sampling of the initial monitoring well, which was located adjacent to the former clarifier at the central portion of the parcel. In July 2005, at the direction of RWQCB, two additional groundwater monitoring wells were installed on the parcel and added to the monitoring program. These wells were installed approximately 60 ft south and 70 ft northwest of the former clarifier. All three wells were sampled quarterly between July 2005 and December 2007; samples were submitted for VOC analysis only. Subsequent to the December 2007 monitoring event, routine monitoring reportedly ceased due to a lack of regulatory direction. Numerous VOCs were identified at elevated concentrations in at least one of the three wells during the events including, but not limited to, 1,1-DCE; cis-1,2-DCE; TCE; and vinyl chloride (VC). Substantially elevated concentrations of TCE, which were routinely observed in all three wells, ranged from 1,700 to 4,000 µg/L. Elevated concentrations of cis-1,2-DCE were also observed in all three wells during the events that ranged from 12 to 450 µg/L. The maximum identified concentrations of 1,1-DCE and VC in one or more of the wells were 9.0 µg/L and 2.2 µg/L, respectively. With the exception of the August 2004 monitoring event, PCE was not detected above the laboratory reporting limit in any of the wells during the nine rounds of sampling. The monitoring well locations are shown in Figure 3 (AEGI, 2010).

2010 Groundwater Well Installation and Confirmation Soil Boring Report

In July 2010, the site owner, under the oversight and direction of RWQCB, completed a Groundwater Well Installation and Confirmation Soil Boring report for the North Parcel. The investigative work was reportedly conducted in accordance with an August 2006 Work Plan that had not been approved by RWQCB until January 2010. In May 2010, three additional monitoring wells were installed at one on-site location and two off-site locations. One well was installed at the southeast corner of the parcel, north-adjacent to the Materials Storage Warehouse on the South Parcel. The remaining two wells were both installed within the northbound lanes of Atlantic Avenue, with one well installed east-adjacent to the parcel and the other to the northeast of the parcel. The three wells were installed to a total depth of approximately 70 ft bgs with perforated screens installed between approximately 45 and 70 feet bgs. During well installation, soil matrix samples were collected at approximately 10-ft intervals from each location and submitted for VOC analysis. VOCs identified at elevated concentrations in one or more of the samples include, but are not limited to, cis-1,2-DCE and TCE. The maximum VOC concentrations, which included 72 µg/kg of cis-1,2-DCE and 130 µg/kg of TCE, were identified in samples collected from 45 ft bgs. In general, samples collected from 45 ft bgs consistently exhibited elevated concentrations of VOCs while samples collected from shallower samples exhibited non-detectable to low concentrations. (AEGI, 2010).

In June 2010, the site owner advanced three confirmation borings at the North Parcel, approximately adjacent to the existing three monitoring wells. Each boring was advanced to a total depth of approximately 50 ft bgs with samples collected at 10-ft intervals and submitted for VOC analysis. VOCs identified at elevated concentrations in one or more of the soil samples include, but are not limited to, cis-1,2-DCE and TCE. With the exception of the samples collected from approximately 50 ft bgs, the only VOC identified at detectable concentrations was TCE, which was identified at concentrations up to 94 µg/kg. In general, samples collected from 50 ft bgs consistently exhibited elevated concentrations of VOCs, which included up to 140 µg/kg of cis-1,2-DCE and up to 4,200 µg/kg of TCE (AEGI, 2010).

In June 2010, the site owner collected groundwater samples from all six monitoring wells and submitted the samples for VOC analysis. All six of the samples exhibited detectable concentrations of VOCs including, but not limited to, 1,1-DCE; 1,2-dichloroethane (DCA); cis-1,2-DCE; trans-1,2-DCE; TCE; and/or VC. The four on-site wells exhibited concentrations of cis-1,2-DCE that ranged between 59 and 180 µg/L and concentrations of TCE that ranged between 560 and 1,200 µg/L. In addition, the well at the southwest corner of the parcel exhibited 13 µg/L of 1,1-DCE and 9.4 µg/L of 1,2-DCA. The two off-site wells exhibited concentrations of cis-1,2-DCE that ranged between 20 and 69 µg/L and concentrations of TCE that ranged between 20 and 140 µg/L. The monitoring well locations are shown in Figure 3 (AEGI, 2010).

2010-2011 Groundwater Monitoring

Between September 2010 and December 2011, the site owners conducted four additional rounds of groundwater monitoring associated with the North Parcel. The four on-site wells exhibited concentrations of cis-1,2-DCE that ranged between 61 and 280 µg/L and concentrations of TCE

that ranged between 810 and 1,800 µg/L. The well at the southwest corner of the parcel exhibited concentrations of 1,1-DCE that ranged between 12 and 18 µg/L and concentrations of 1,2-DCA that ranged between 8.1 and 12 µg/L. The two off-site wells exhibited concentrations of cis-1,2-DCE that ranged between 13 and 82 µg/L and concentrations of TCE that ranged between 12 and 220 µg/L (AEGI, 2012).

In January 2012, the site owner made a request to RWQCB that all groundwater monitoring associated with the North Parcel be suspended until coordination could be established with the sampling of a separate monitoring well network that existed on the South Parcel. RWQCB subsequently consented to the request and no additional routine monitoring has been conducted at the parcel (AEGI, 2012; RWQCB, 2013).

3.1.2 South Parcel Investigative Efforts *(See Table* 4*)*

1996 Phase I and Limited Phase II Environmental Site Assessment

In October 1996, the South Parcel site operator completed a Phase I ESA and Limited Phase II ESA for the South Parcel. The investigation included the advancement of ten borings to total depths between 2 and 8 ft bgs. All ten borings were in the eastern half of the Mistras Building and were generally associated with floor drains, sumps, or trenches that had historically routed wastewater from process areas to the former clarifier. One sample was collected from the total depth of each boring and submitted for petroleum hydrocarbon and VOC analysis. Four of the ten samples exhibited elevated concentrations of petroleum hydrocarbons. VOCs identified at detectable concentrations in one or more of the soil samples include, but are not limited to, 1,1,1-TCA, PCE, and TCE. The maximum PCE concentration of 800 µg/kg was identified in the sample collected from beneath the floor drain adjacent to the former vapor degreaser at the south-central portion of the building. The maximum 1,1,1-TCA concentration of 34 µg/kg and the maximum TCE concentration of 120 µg/kg were identified in the sample collected from beneath the floor drain located north-adjacent to the dye penetrant inspection area at the central portion of the building. No soil vapor or groundwater sampling was conducted during the ESAs (D&M, 1996).

2001 Limited Phase II Environmental Site Assessment

In May 2001, the site operator completed a Limited Phase II ESA for the South Parcel. The investigation included the advancement of ten borings to total depths between 5 and 10 ft bgs. Nine of the ten soil borings were in the central, south-central, and southwestern portions of the Mistras Building, whereas the remaining boring was located in the Dark Room at the northeast corner of the building. At each boring, soil matrix samples were typically collected from depths of 5 ft bgs and 10 ft bgs with all samples submitted for petroleum hydrocarbon and VOC analysis. VOCs identified at detectable concentrations in one or more of the soil samples include, but are not limited to, 1,1,1-TCA, PCE, and TCE. The maximum 1,1,1-TCA concentration of 22 µg/kg and the maximum PCE concentration of 640 µg/kg were identified in the sample collected at 5 ft bgs from soil adjacent to the trench running between the etch room and the pressure tank test area at the central portion of the building. The maximum TCE concentration of 340 µg/kg was

identified in the sample collected at 5 ft bgs from soil adjacent to the trench that was situated immediately north of the pressure tank test area at the central portion of the building (AEI, 2002; ENV, 2004; ETI, 2006).

The 2001 Limited Phase II ESA also included the installation of eight soil vapor probes. Four of the eight soil vapor probes were installed within the eastern half of the building whereas the remaining four located were installed near the HWSA at the northeast corner of the parcel. The soil vapor analytical results are not known. No groundwater sampling was conducted during the ESA (AEI, 2002; ENV, 2004; ETI, 2006).

2002 Phase II Environmental Site Assessment

In October 2002, the site operator completed a Phase II ESA for the South Parcel. This investigation included a soil vapor survey of the facility to identify areas of concentrated subsurface VOC contamination. The survey included the collection of soil vapor samples from approximately 5 ft bgs at 41 locations that had been laid out as a grid across the parcel. In addition, four soil matrix samples were collected during the investigation. The soil matrix samples were collected from two interior locations adjacent to the etch room, one exterior location west-adjacent to the northwest corner of the Mistras Building, and from one exterior location adjacent south to the HWSA. Soil matrix samples were submitted for metal analysis only (AEI, 2002; ENV, 2004).

Two distinct soil vapor plumes were identified during the investigation, which included an area of elevated PCE at the south-central portion of the building and an area of elevated TCE at the northwestern portion of the building. Additional VOCs identified at detectable concentrations during the soil vapor survey include 1,1,1-TCA and Freon 113, which were identified near areas historically used for solvent storage and the former vapor degreaser. Metals were not identified at elevated concentrations in the soil matrix and no groundwater samples were collected during the ESA (AEI, 2002; ENV, 2004).

2004 Site Investigation Report

In February 2004, the site operator completed a Site Investigation Report for the South Parcel. The investigation included the collection of soil vapor, soil matrix, and groundwater samples. Eleven on-site borings were advanced to total depths between 10 and 40 ft bgs using a combination of hand auger and direct push (DP) techniques. Soil matrix samples were typically collected at 2 ft bgs and at 5-ft intervals to the total depth of the boring. Six dual-nested soil vapor probes were installed on site at depths of 5 ft bgs and 15 ft bgs. Two borings were advanced on site using Cone Penetration Testing (CPT) technology with grab groundwater samples collected at depths ranging between 53 and 56 ft bgs. One CPT location was advanced within the central portion of the employee parking lot to the east of the Mistras Building, and the other was advanced within the southeastern portion of the equipment yard to the west of the building. All samples were submitted for VOC analysis only (ENV, 2004).

VOCs identified at detectable concentrations in one or more of the soil samples during the 2004 investigation include, but are not limited to, 1,1,1-TCA, cis-1,2-DCE, PCE, and TCE. The

maximum 1,1,1-TCA concentration of 12 µg/kg was identified in the sample collected at 2 ft bgs from northwest-adjacent to the pressure tank test area at the central portion of the building. The maximum cis-1,2-DCE concentration of 10 µg/kg was identified in the sample collected at 30 ft bgs from approximately 40 ft north of the pressure tank test area at the central portion of the building. The maximum PCE concentration of 164 µg/kg was identified in the sample collected at 2 ft bgs from approximately 50 ft northeast of the former vapor degreaser at the south-central portion of the building. The maximum TCE concentration of 281 µg/kg was identified in the sample collected at 2 ft bgs from southeast-adjacent to the pressure tank test area at the central portion of the building. In addition, soil samples collected from northwest-adjacent to the pressure tank test area and from approximately 40 ft north of the pressure tank test area also exhibited substantially elevated concentrations of TCE (ENV, 2004).

The maximum TCE concentrations identified in soil vapor samples collected during the investigation were exhibited in samples collected from the central portion of the Mistras Building; specifically, within approximately 20 ft to the north and northeast of the pressure tank test area. The maximum PCE concentrations identified in soil vapor samples were exhibited in samples collected from the magnetic particle testing area at the south-central portion of the building (ENV, 2004).

The groundwater sample collected from the employee parking lot exhibited detectable concentrations of VOCs including, but not limited to, 3.6 µg/L of cis-1,2-DCE and 19 µg/L of TCE. The groundwater sample collected from the equipment yard exhibited detectable concentrations of VOCs including, but not limited to, 720 µg/L of cis-1,2-DCE and 1,020 µg/L of TCE. Neither 1,1,1-TCA nor PCE was reported at detectable concentrations in either groundwater sample (ENV, 2004).

2004 Soil Vapor Survey

In November 2004, the site operator conducted an independent soil gas survey of the South Parcel, which was associated with the transfer of business assets as part of the divestment of GENIL from its parent company. The survey included the installation of vapor probes at seven selectively-biased locations on the parcel. These locations were selected primarily based on the areas identified during the previous February 2004 investigation as having elevated TCE and PCE subsurface concentrations. The specific results of the survey were not available; however, the results were reportedly similar to the concentrations identified during the previous investigation (ETI, 2008).

2006 Facility Investigation (FI) Report II

In October 2006, the site operator, under the direction and oversight of DTSC, completed a FI Report for the South Parcel. The investigation included the collection of soil matrix and groundwater samples from on- and off-site locations. Thirteen borings were advanced on the parcel to a total depth of 10 ft bgs with soil samples collected at 0.5, 5.0, and 10 ft bgs. In addition, three concrete samples were collected from the surface materials of the borings. Soil and concrete samples were submitted selectively for petroleum hydrocarbons, semivolatile organic compounds

(SVOCs), polychlorinated biphenyls (PCBs), and metal analysis. No soil samples were submitted for VOC analysis during the investigation. Three additional soil samples were collected from locations along Ardine Street, north-adjacent to the site, to be used as representative background and were submitted for metal analysis only. Grab groundwater samples were collected from 60 ft bgs at two on-site and seven off-site locations. The two on-site groundwater borings were located at the northern portion of the equipment yard to the west of the Mistras Building. Six of the seven off-site groundwater borings were located along Ardine Street to the north and northwest of the site, whereas the remaining boring was located approximately 500 ft south of the site. A grab groundwater sample was also collected from each of the three existing on-site monitoring wells, which had been previously installed in early 2005. All groundwater samples were submitted for VOC analysis only. The monitoring well locations are shown in Figure 3 (ENV, 2005; ETI, 2006).

During the 2006 investigation, lead was identified in soil samples at concentrations up to 115 mg/kg. Petroleum hydrocarbons were also identified at elevated concentrations in collected soil samples. Chromium was identified at a concentration of 298 mg/kg in the concrete sample collected from the etch room within the Mistras Building; however, the soil sample collected from 2.5 ft bgs beneath the concrete slab exhibited a chromium concentration consistent with background (ETI, 2006).

VOCs were identified at detectable concentrations in all of the groundwater samples collected during the 2006 investigation; the identified VOCs include, but are not limited to, 1,1-DCE; 1,2-DCA; cis-1,2-DCE; PCE; and TCE. The maximum VOC concentrations in on-site boring samples were exhibited in the sample collected from the northeastern corner of the equipment yard. VOC concentrations exhibited in this sample include, but are not limited to, 40 µg/L of 1,1-DCE, 497 µg/L of cis-1,2-DCE, and 2,000 µg/L of TCE. The other on-site groundwater sample exhibited similar, but slightly lower, concentrations of these analytes. The maximum VOC concentrations in off-site boring samples were exhibited in the sample collected from the western portion of Ardine Street. VOC concentrations exhibited in this sample include, but are not limited to, 30 µg/L of cis-1,2-DCE and 1,390 µg/L of TCE. The other six off-site groundwater samples exhibited significantly lower concentrations of these analytes. The maximum VOC concentrations in on-site monitoring well samples were exhibited in the sample collected from Well S-MW-2, which is located at the southeastern corner of the equipment yard. VOC concentrations exhibited in this sample include, but are not limited to, 795 µg/L of cis-1,2-DCE and 1,160 µg/L of TCE (ETI, 2006).

In May 2006, during subsurface utility work being conducted at the southeastern portion of the equipment yard, apparent metal slag material was discovered in the shallow subsurface soil. Two composite soil samples, which were collected from trench materials, exhibited elevated concentrations of copper. Approximately seven drums of impacted soils were excavated and removed from the site. As part of the 2006 FI, 14 additional borings were advanced adjacent to the utility trench to total depths between 1.0 and 3.0 ft bgs. Samples were collected from the base of each boring and analyzed for metals. In addition, two samples of the slag material were submitted for metal analysis. The slag material exhibited elevated concentrations of metals including antimony, arsenic, cadmium, chromium, cobalt, copper, lead, nickel, and vanadium. Elevated concentrations of metals were not identified in any of the collected soil samples (ETI, 2006).

In early 2007, a remedial action was conducted on the parcel based upon the findings of the 2006 FI. The event included the excavation of approximately 35 tons of potentially chromium-impacted concrete and soils from the etch room of the facility and 35 tons of soils mixed with "slag-like" materials from the southeastern portion of the rear parking lot (ETI, 2007a).

3.2 Site Investigation (SI) Sampling *(See Figures 5 through 7; Tables 5 through 14)*

In November 2015, WESTON, on behalf of EPA, conducted the SI sampling event at the GENIL site. The event included soil matrix source sampling, groundwater release sampling, and secondary objective groundwater sampling. The primary objective of the investigation was to document information to be used in the HRS characterization process, including additional source areas and levels of contamination in site soils and groundwater. The secondary objective of the investigation was to identify subsurface lithology and levels of contamination within various water-bearing zones, both on, and near, the site. This information will be utilized in the development of a more comprehensive understanding of the hydrogeologic conditions that exist within the greater NE710 Study Area as well as the subbasin as a whole.

Sampling methodology, locations, analyses, and analytical results are summarized below. The Sampling and Analysis Plan (SAP), which was approved by EPA in September 2015, is provided in Appendix F.

Based on the historical use of the site, the elevated concentrations of contaminants in nearby municipal drinking water wells, and the previous sampling events described in section 3.1, analytes of concern (AOCs) at the site were identified as: cadmium; chromium; lead; nickel; silver; 1,1,1-TCA; 1,1-DCA; 1,1-DCE; 1,2-DCA; 2-butanone (i.e., MEK); acetone; cis-1,2-DCE; PCE; trans-1,2-DCE; TCE; and VC. No additional AOCs were identified based on the results of the SI investigation.

All samples were submitted under the EPA Contract Laboratory Program to Shealy Environmental Services, Inc. for metal analysis by EPA Contract Laboratory Program Analytical Services (CLPAS) ISM02.2 or Chemtech Consulting Group for VOC analysis by EPA CLPAS SOM02.2. The data were validated by the EPA Region 9 Quality Assurance Office. The complete validated analytical results are presented in Appendix H. The sample locations are shown in Figure 5.

3.2.1 Action Levels

In accordance with the HRS, the action levels to establish an observed release to groundwater and to establish an on-site source of contaminated soil, are "significantly above background" concentrations. "Significantly above background" is defined as three times the background concentration for all media. When a background concentration is not detected at or above the method detection limit (MDL), the assigned background concentration is the sample quantitation limit (SQL); "significantly above background" for this scenario is defined as a concentration at or above the SQL.

Soil matrix samples collected from Boring TTT-DP-9, which is located approximately 700 ft west-southwest of the site and was advanced during the concurrently-conducted SI investigation at the Titan site (EPA ID No. CAD008353211), are designated as background soil samples for HRS purposes. The assigned background concentration for each analyte was determined by amalgamating the concentration data from each of the four discrete-depth soil samples. For any analyte with a reported MDL exceedance in the dataset, the background concentration was conservatively assigned as the arithmetic mean plus three times the standard deviation. For any analyte without an MDL exceedance, the background concentration was conservatively assigned as the maximum SQL value within the dataset. The assigned soil-matrix action levels for select metals are presented in Table 5 and for select VOCs in Table 8.

Although the selected background location is situated within current and historical operational areas of the Titan site (EPA ID No. CAD008353211), the exhibited concentrations were deemed to be generally consistent with published background levels for native soils in the region and appear unlikely to have been significantly impacted by hazardous substances associated with that site. VOCs were not reported at concentrations above their respective MDLs in any of the four discrete-depth background soil samples. During the GENIL SI investigation, soil matrix samples were also collected from four discrete depths at Boring GIL-CPT-6, which is located approximately 400 feet northwest of the site; however, due to a sample preparation error at the analytical laboratory all metal analytical data reported for this location were rejected during the data validation process. In addition, no VOCs were reported in any of the discrete-depth samples at concentrations exceeding their SQL. Based on this information, it was determined that Boring TTT-DP-9 was a more suitable background location and the soils analytical data from GIL-CPT-6 are not discussed further in this report. Select discrete-depth analytical results for the assigned soil matrix background samples for metals are presented in Table 5 and for VOCs in Table 8; the complete analytical results, including the soil data from Boring GIL-CPT-6, are provided in Appendix H (Weston, 2017b).

As a result of local variations and uncertainties in the groundwater flow direction within the Gaspur aquifer underlying the site, a Gaspur aquifer background (i.e., upgradient) sample location was not assigned. A perched aquifer background sample was not assigned since no samples were collected from this zone during the SI investigation. Furthermore, since upper Exposition aquifer groundwater samples collected during the investigation did not exhibit notably elevated concentrations of the AOCs identified in on-site source areas (as compared to documented federal and state regulatory benchmarks), it was deemed unnecessary for HRS purposes to assign an Exposition background sample location. See section 4.2.1 for a description of the shallow aquifers underlying the site.

3.2.2 Source Sampling *(See Figures 5 through 7; Tables 5 through 10)*

To establish hazardous substance source areas at the site, WESTON collected subsurface soil matrix samples using direct push technology from ten selectively-biased on-site boring locations, designated as GIL-DP-1 through GIL-DP-9 and GIL-DP-11. Two of the locations were situated on the North Parcel, whereas the remaining eight locations were situated on the South Parcel. Source sample locations are presented in Figure 5.

3.2.2.1 North Parcel

Source samples were collected from two borings on the North Parcel. Boring GIL-DP-1 was advanced at the central portion of the parcel west-adjacent to the 8411-15 Building and near the former North Parcel clarifier. Boring GIL-DP-11 was advanced using a limited-access drill rig within the western interior of the northern portion of the 8411-15 Building. At each location, subsurface lithology was logged to the total depth of the boring at 15 ft bgs and soil matrix samples were collected from depths of 2, 5, 10, and 15 ft bgs. The soil lithologies from each boring were relatively consistent with soils composed primarily of light brown to yellow brown silty sands with interbedded lenses of medium brown to dark brown clayey silts and sandy silts. Field observations and subsurface soil descriptions are provided in Appendix I.

Metal Results: *(See Figure 6; Table 5)*

No metals were identified at concentrations at or above their corresponding action level in the eight soil matrix samples collected from the North Parcel. Action levels were assigned per the methodology described in section 3.2.1. Select analytical results and assigned action levels are presented in Figure 6 and Table 5.

Volatile Organic Compound (VOC) Results: *(See Figure 7; Table 8)*

VOCs identified at concentrations at or above their corresponding MDL in soil matrix samples collected from the North Parcel include acetone and TCE. Acetone and TCE were both identified at concentrations at or above their corresponding action level. Since no VOC analytes were identified in the background soil matrix samples at concentrations exceeding their corresponding MDLs, the reported SQLs of the background samples were assigned as the VOC action levels (see section 3.2.1).

The assigned acetone action level of 10 µg/kg was exceeded in 1 of the 8 samples with a concentration of 11 µg/kg. However, acetone is a common laboratory contaminant and the reported detections may not be indicative of actual conditions in the sampled medium. The assigned TCE action level of 5.1 µg/kg was exceeded in 2 of the 8 samples with a maximum concentration of 76 µg/kg. Select analytical results and assigned action levels are presented in Figure 7 and Table 8.

3.2.2.2 South Parcel

Source samples were collected from eight borings on the South Parcel. Boring GIL-DP-2 was advanced at the northwest corner of the parcel south-adjacent to the HWSA. Boring GIL-DP-3 was advanced at the northeast corner of the equipment yard on the western side of the Mistras Building. Boring GIL-DP-4 was advanced at the southeast corner of the equipment yard. Borings GIL-DP-5 through GIL-DP-9 were all advanced within the interior of the Mistras Building using a limited access drill rig. Boring GIL-DP-5 was located near the location of the former vapor degreaser at the south-central portion of the building. Boring GIL-DP-6 was advanced at the east-central portion of the building adjacent to the former clarifier. Boring GIL-DP-7 was advanced at the northwest corner of the building in the approximate location of the former drum

storage area. Boring GIL-DP-8 was advanced at the west-central portion of the building adjacent to the Pressure Test Pool Tank. Boring GIL-DP-9 was advanced at the southwest corner of the building adjacent to the former metal treatment department.

At each location, subsurface lithology was logged to the total depth of the boring at 15 ft bgs and soil matrix samples were collected from depths of 2, 5, 10, and 15 ft bgs. The soil lithologies from each boring were relatively consistent with soils composed primarily of slightly moist dark brown silty sands underlain by dry light brown medium-grained sands underlain by slightly moist dark brown medium-grained sands. Subsurface soils at Boring GIL-DP-4 were noted to transition to a gray sand at approximately 8.5 ft bgs. Field observations and subsurface soil descriptions are provided in Appendix I.

Metal Results: *(See Figure 6; Tables 6 & 7)*

Metals identified at concentrations at or above their corresponding action level in soil matrix samples collected from the South Parcel include cadmium, lead, and silver. The most elevated metal concentrations were generally identified in the samples collected from 2 ft bgs at each boring. Action levels were assigned per the methodology described in section 3.2.1.

The assigned cadmium action level of 0.27 mg/kg was exceeded by 5 of the 32 samples with a maximum concentration of 1.3 mg/kg. The assigned lead action level of 25 mg/kg was exceeded by 5 of the 32 samples with a maximum concentration of 165 mg/kg. The assigned silver action level of 0.51 mg/kg was exceeded by 1 of the 32 samples with a concentration of 4.9 mg/kg. Select analytical results and assigned action levels are presented in Figure 6 and Tables 6 and 7.

Volatile Organic Compound (VOC) Results: *(See Figure 7; Tables 9 & 10)*

VOCs identified at concentrations at or above their corresponding MDL in soil matrix samples collected from the South Parcel include acetone, PCE, and TCE. The only VOC identified at a concentration at or above its corresponding action level was acetone. Since no VOC analytes were identified in the background soil matrix samples at concentrations exceeding their corresponding MDLs, the reported SQLs of the background samples were assigned as the VOC action levels (see section 3.2.1).

The assigned acetone action level of 10 µg/kg was exceeded in 3 of the 32 samples with a maximum concentration of 39 µg/kg. However, acetone is a common laboratory contaminant and the reported detections may not be indicative of actual conditions in the sampled medium.

Neither the PCE nor TCE action level of 5.1 µg/kg was exceeded in any of the soil matrix samples. However, PCE was identified in 4 of the 32 samples with a maximum concentration of 4.1 µg/kg (qualified as estimated) and TCE was identified in 2 of the 32 samples with a maximum concentration 3.6 µg/kg (qualified as estimated). Select analytical results and assigned action levels are presented in Figure 7 and Tables 9 and 10.

3.2.3 Release Sampling *(See Figures 5 through 7; Tables 11 & 13)*

To establish a release of one or more hazardous substances from on-site source areas to groundwater beneath the site, WESTON collected discrete-depth groundwater samples from the Gaspur and Exposition aquifers. See section 4.2.1 for a description of the shallow aquifers underlying the site. As part of the investigation, groundwater samples were collected from four selectively-biased on-site locations using direct push technology, from seven on-site locations using existing monitoring wells, and from two off-site and immediately downgradient locations (with respect to the Exposition aquifer) using CPT technology. Four of the thirteen release sample locations were situated on the North Parcel, seven of the locations were situated on the South Parcel, and two of the locations were situated on the southwestern side of Salt Lake Avenue, downgradient (with respect to the Exposition aquifer) of both the North Parcel and the South Parcel.

For HRS purposes, no action levels are assigned for contaminants identified within the Gaspur or Exposition aquifers beneath the site (see section 3.2.1). For reporting purposes, analyte concentrations are referenced against documented federal and state regulatory benchmarks. Release sample locations are presented in Figure 5.

3.2.3.1 North Parcel

Four release samples were collected from the North Parcel. All four of these samples were collected from existing monitoring wells that are screened at depths consistent with the Gaspur aquifer. Monitoring well N-MW-1 is located at the central portion of the parcel near the former North Parcel clarifier and adjacent to Boring GIL-DP-1. Well N-MW-2 is located at the south-central portion of the parcel, west-adjacent to the southern portion of the 8411-15 Building. Well N-MW-3 is located at the north-central portion of the parcel, east adjacent to the northern portion of the Quality Padilla Building. Well N-MW-4 is located at the southwest corner of the parcel, north-adjacent to the Materials Storage Warehouse.

<u>Metal Results:</u> *(See Figure 6; Table 11)*

Metals identified at concentrations at or above their corresponding SQL in groundwater samples associated with the North Parcel include arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, selenium, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include antimony, beryllium, cadmium, silver, and thallium.

Metals identified in the samples with exceedances of documented federal and state regulatory benchmarks include arsenic and manganese. The most elevated metal concentrations were generally identified in the Gaspur aquifer sample collected from the northwestern corner of the parcel.

The arsenic federal Maximum Contaminant Level (MCL) of 10 µg/L was exceeded by all 4 of the samples with a maximum concentration of 120 µg/L. The manganese California Secondary MCL

(CA 2nd MCL) of 50 µg/L was exceeded by all 4 of the samples with a maximum concentration of 950 µg/L. Select analytical results and benchmarks are presented in Figure 6 and Table 11.

Volatile Organic Compound (VOC) Results: *(See Figure 7; Table 13)*

VOCs identified at concentrations at or above their corresponding SQL in groundwater samples associated with the North Parcel include cis-1,2-DCE, trans-1,2-DCE; and TCE. Additional VOC analytes identified at concentrations below their SQL but above their MDL include 1,2-DCA. Because of the high concentration of one or more VOC analytes in some samples, it was necessary for the laboratory to dilute these samples to stay within equipment calibration limits. Consequently, the SQLs for the diluted samples were also increased, in some cases to levels that exceed regulatory benchmarks.

VOCs identified in the samples with exceedances of documented federal and state regulatory benchmarks include 1,2-DCA; cis-1,2-DCE; and TCE. The most elevated VOC concentrations were generally identified in the Gaspur aquifer sample collected from the southwestern corner of the parcel; however, the Gaspur aquifer samples collected from the central and southern portions of the parcel also exhibited relatively high concentrations.

The 1,2-DCA federal MCL (Fed MCL) of 5.0 µg/L was exceeded by 1 of the 4 samples with a concentration of 10 µg/L (qualified as estimated). The cis-1,2-DCE Fed MCL of 70 µg/L was exceeded by all 4 of the samples with a maximum concentration of 430 µg/L. The TCE Fed MCL of 5.0 µg/L was exceeded by all 4 of the samples with a maximum concentration of 1,100 µg/L. Select analytical results and benchmarks are presented in Figure 7 and Table 13.

3.2.3.2 South Parcel

Seven release samples were collected from the South Parcel and six release samples were collected from immediately downgradient (with respect to the Exposition aquifer) of the South Parcel, which is immediately downgradient of the North Parcel.

Four of the 13 samples were collected from on-site direct push borings that were advanced during the SI investigation and included borings GIL-DP-3 through GIL-DP-6. All four of these samples were collected from depths consistent with the Gaspur aquifer. Boring GIL-DP-3 was advanced at the northeast corner of the equipment yard on the western side of the Mistras Building. Boring GIL-DP-4 was advanced at the southeast corner of the of the equipment yard. Boring GIL-DP-5 was advanced near the location of the former vapor degreaser at the south-central portion of the building. Boring GIL-DP-6 was advanced at the east-central portion of the building adjacent to the former South Parcel clarifier. Three of the 13 samples were collected from existing on-site monitoring wells that are screened at depths consistent with the Gaspur aquifer. Monitoring well S-MW-1 is located at the western portion of the equipment yard, southeast-adjacent to the HWSA. Well S-MW-2 is located at the southeast corner of the equipment yard, directly adjacent to Boring GIL-DP-4. Well S-MW-3 is located in the employee parking lot east-adjacent to the Mistras Building.

As a result of poor recovery within the groundwater sampling devices at monitoring wells S-MW-1 and S-MW-2, the samples collected from these wells were submitted for VOC analysis only.

Six of the 13 samples were collected from two off-site CPT borings located immediately to the southwest of the site, across Salt Lake Avenue. Boring GIL-CPT-4 was advanced southwest of the HWSA and Boring GIL-CPT-5 was advanced southwest of the southwestern corner of the Mistras Building. During the advancement of each CPT boring, groundwater samples were collected from three distinct depths, which generally corresponded to the Gaspur aquifer and two zones within the Exposition aquifer. The specific sampling depths were determined in the field by targeting coarser-grained sediments as interpreted in the location-specific CPT lithological profile report (Appendix E).

Metal Results: *(See Figure 6; Table 11)*

Metals identified at concentrations at or above their corresponding SQL in groundwater samples associated with the South Parcel include arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include copper.

Metals identified in the samples with exceedances of documented federal and state regulatory benchmarks include arsenic, manganese, and vanadium. The most elevated metal concentrations were generally identified in the Gaspur aquifer samples collected from the eastern and southern portions of the parcel; however, the Gaspur aquifer sample collected from the central portion of the parcel also exhibited relatively high concentrations.

The arsenic Fed MCL of 10 µg/L was exceeded by 2 of the 13 samples with a maximum concentration of 60 µg/L. The manganese CA 2nd MCL of 50 µg/L was exceeded by 11 of the 13 samples with a maximum concentration of 1,800 µg/L. The vanadium California Notification Level (CA NL) of 50 µg/L was exceeded by 1 of the 13 samples with a concentration of 85 µg/L. Select analytical results and benchmarks are presented in Figure 6 and Table 11.

Volatile Organic Compound (VOC) Results: *(See Figure 7; Table 13)*

VOCs identified at concentrations at or above their corresponding SQL in groundwater samples associated with the South Parcel include 1,1-DCA; 1,1-DCE; 1,2-DCA; 2-butanone (i.e., MEK); acetone; benzene; carbon disulfide; cis-1,2-DCE; cyclohexane; m,p-xylene; methyl acetate; methylcyclohexane; methylene chloride; PCE; trans-1,2-DCE; TCE; and VC. Additional VOCs identified at concentrations below their SQL but above their MDL include 1,1,2-TCA, chloroform, and toluene. Because of the high concentration of one or more VOC analytes in some samples, it was necessary for the laboratory to dilute these samples to stay within equipment calibration limits. Consequently, the SQLs for the diluted samples were also increased, in some cases to levels that exceed regulatory benchmarks.

VOCs identified in the samples with exceedances of documented federal and state regulatory benchmarks include 1,1-DCA; 1,1-DCE; 1,2-DCA; cis-1,2-DCE; and TCE. The most elevated

VOC concentrations were generally identified in the Gaspur aquifer sample collected from the central portion of the parcel; however, the off-site Gaspur aquifer sample collected from southwest of the parcel also exhibited relatively high concentrations. None of the Exposition aquifer samples exhibited VOC concentrations that exceeded regulatory benchmarks.

The 1,1-DCA Fed MCL of 5.0 µg/L was exceeded by 3 of the 13 samples with a maximum concentration of 15 µg/L. The 1,1-DCE Fed MCL of 7.0 µg/L was exceeded by 1 of the 13 samples with a concentration of 20 µg/L (qualified as estimated – biased high). The 1,2-DCA Fed MCL of 5.0 µg/L was exceeded by 1 of the 13 samples with a maximum concentration of 14 µg/L. The cis-1,2-DCE Fed MCL of 70 µg/L was exceeded by 3 of the 13 samples with a maximum concentration of 450 µg/L. The TCE Fed MCL of 5.0 µg/L was exceeded by 8 of the 13 samples with a maximum concentration of 1,600 µg/L (qualified as estimated – biased low). Select analytical results and benchmarks are presented in Figure 7 and Table 13.

3.2.4 Secondary Objective Groundwater Sampling and Lithological Profiling
(See Figures 5 through 7; Tables 12 & 14)

In accordance with the SI's secondary objective (see section 3.2), WESTON collected lithological profiling data and discrete-depth groundwater samples from two off-site locations that were advanced using DP/CPT technology. Boring GIL-CPT-1 was advanced on the east-adjacent former M. Stephens Manufacturing property (EPA ID No. CAN000909569), approximately 100 ft east-northeast of the site. Boring GIL-CPT-6 was advanced on the southern side of Ardine Street, approximately 100 ft east of the intersection with Salt Lake Avenue and approximately 300 ft northwest of the site. At each location, samples were collected from three distinct depths, which generally corresponded to the Gaspur aquifer and two zones within the Exposition aquifer. See section 4.2.1 for a description of the shallow aquifers underlying the site. The specific sampling depths were determined in the field by targeting coarser-grained sediments as interpreted in the location-specific CPT lithological profile report (Appendix E). Since HRS action levels are not applicable to the secondary objective samples, analyte concentrations were compared to documented federal and state regulatory benchmarks for reporting purposes. Secondary objective sample locations are presented in Figure 5.

Metal Results: *(See Figure 6; Table 12)*

Metals identified at concentrations at or above their corresponding SQL in secondary objective groundwater samples collected during the GENIL SI investigation include arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc. Additional metal analytes identified at concentrations below their SQL but above their MDL include antimony and selenium.

The only metal identified in the samples with exceedances of documented federal and state regulatory benchmarks was manganese. The manganese CA 2nd MCL of 50 µg/L was exceeded by all 6 of the samples with a maximum concentration of 566 µg/L. Select analytical results and benchmarks are presented in Figure 6 and Table 12.

Volatile Organic Compound (VOC) Results: *(See Figure 7; Table 14)*

VOCs identified at concentrations at or above their corresponding SQL in secondary objective groundwater samples collected during the GENIL SI investigation include cis-1,2-DCE and TCE. Additional VOC analytes identified at concentrations below their SQL but above their MDL include 1,1-DCA; 1,2-DCA; acetone; benzene; carbon disulfide; dichlorodifluoromethane (i.e., Freon-12); and trans-1,2-DCE.

The only VOC identified in the samples with an exceedance of documented federal and state regulatory benchmarks was TCE. The TCE Fed MCL of 5.0 µg/L was exceeded by 1 of the 6 samples with a concentration of 14 µg/L. Select analytical results and benchmarks are presented in Figure 7 and Table 14.

3.2.5 Deviations from the SAP

Deviations from the September 2015 GENIL SAP (Appendix F) occurred during the field work. The significant deviations approved in the field by the EPA Site Assessment Manager include:

- Only four of the proposed six CPT borings were advanced. Proposed borings GIL-CPT-2 and GIL-CPT-3 were not advanced due to subsurface utility conflicts and the inability to identify suitable alternative locations within the available schedule.

- Only ten of the proposed eleven direct push borings were advanced. Proposed boring GIL-DP-10 was not advanced due to early refusal at approximately 1 ft bgs, which appeared to be related to a previously unidentified subsurface slab.

- A groundwater release sample from the perched aquifer was not collected at direct push Boring GIL-DP-3 because a water-bearing unit had not been identified within the proposed sampling interval.

- A groundwater release sample from the perched aquifer was not collected at direct push Boring GIL-DP-5 because insufficient water was available within the set screening interval (32 to 36 ft bgs) for sampling.

- The groundwater release samples collected from monitoring wells S-MW-1 and S-MW-2 were submitted for VOC analysis only due to insufficient water for metal analysis.

- An additional groundwater release sample from the Gaspur aquifer was collected at direct push boring GIL-DP-4 to compensate for the poor groundwater recovery in Well S-MW-2.

- A groundwater release sample from the Gaspur aquifer was collected at direct push boring GIL-DP-6 to provide additional data near the former South Parcel clarifier.

- The groundwater release sample collected from direct push Boring GIL-DP-3 was submitted to the laboratory unpreserved due to high silt content that reacted with the proposed preservative.

- Existing monitoring wells N-MW-5 and N-MW-6, which are both located within the travel lanes of Atlantic Avenue and were not proposed to be sampled during the investigation, were not included in the monitoring well survey due to logistical constraints.

- CPT Boring GIL-CPT-5 was relocated approximately 40 ft northwest due to subsurface utility conflicts.

- Soil matrix samples collected from Boring GIL-DP-6 were collected using the direct push drill rig due to logistical constraints with the CPT drill rig.

- "Special Designation" samples (e.g., Laboratory Quality Control [QC], duplicates, blanks) were reassigned in the field based on actual number and location of collected samples. Final designations are presented in the Sample Nos. – CLP Nos. Correlation Tables (Appendix G).

4.0 HAZARD RANKING SYSTEM FACTORS

4.1 Sources of Contamination *(See Figures 5 through 7; Tables 5 through 10)*

For HRS purposes, a source is defined as an area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance.

Potential hazardous substance sources associated with the GENIL site include, but may not be limited to:

- Contaminated soils on the South Parcel, which are likely a result of historical on-site operations; however, the specific operations responsible for the impacted soils are not known. Metals, specifically cadmium, lead, and silver; were present in site soils at concentrations significantly above background.

- Contaminated soils on the North Parcel, which are likely a result of historical on-site operations and were specifically located near the former clarifier. TCE was present in site soils at concentrations significantly above background.

- During the SI investigation, both PCE and TCE were identified at concentrations above their corresponding MDL, but below their assigned action level, in shallow subsurface soil samples collected from beneath the Mistras Building. Although a source cannot be documented based on these results, they suggest that an unidentified and more significant source of one or both of these VOCs may exist on the South Parcel.

4.2 Groundwater Pathway

In determining a score for the groundwater migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to groundwater; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on the number of people who regularly obtain their drinking water from wells that are located within 4 miles of the site. The HRS emphasizes drinking water usage over other uses of groundwater (e.g., food crop irrigation and livestock watering), because, as a screening tool, it is designed to give the greatest weight to the most direct and extensively studied exposure routes.

4.2.1 Hydrogeological Setting *(See Tables 15 & 16)*

The site lies within the Central Subbasin in the Coastal Plain of the Los Angeles Groundwater Basin. The Central Subbasin is generally bound to the north by the folded, uplifted, and eroded Tertiary basement rocks of the La Brea High surface divide; to the northeast and east by the less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; to the southeast by the Coyote Creek flood control channel (approximate Los Angeles County/Orange County

boundary); and to the southwest by the Newport Inglewood Uplift, a regional anticline associated with the Newport Inglewood fault system. Geologic units typically found beneath the subbasin include Holocene-age alluvium, the upper Pleistocene Lakewood Formation, and the lower Pleistocene San Pedro Formation. The Los Angeles and San Gabriel rivers pass across the surface of the subbasin, primarily by way of engineered concrete channels, on their way to the Pacific Ocean. The average net annual precipitation in the subbasin is approximately 12 inches (DWR, 1961; DWR, 2004).

The Central Subbasin has historically been divided into four areas: the Los Angeles Forebay at the northwest, the Montebello Forebay at the north, the Whittier Area at the northeast, and the Central Basin Pressure Area at the central and southwest. However, these areal distinctions are appropriate for geographical purposes only and do not accurately represent hydrogeologic conditions within the areas. The hydrogeologic forebays, which are generally characterized by unconfined and relatively interconnected aquifer systems, are limited to small regions within the greater Forebay areas. The Montebello Forebay, as well as the Los Angeles Forebay to a lesser degree, serve as the primary groundwater recharge areas for both shallow and deep aquifers across the entirety of the subbasin. The Central Basin Pressure Area is generally characterized by confined aquifer systems separated by relatively impermeable clay layers, although semipermeable zones within these layers allow aquifers to be interconnected in some areas. These semipermeable zones gradually decrease in frequency and magnitude with increasing distance from the forebays (DWR, 1961; DWR, 2004).

The site is located within the northern portion of the Central Basin Pressure Area geographical area, with the Los Angeles Forebay to the northwest and the Montebello Forebay to the northeast. Groundwater beneath the site is typically found within the coarser-grained sediments of the Holocene alluvium (Gaspur aquifer), the upper Pleistocene Lakewood Formation (Exposition and Gage aquifers), and the lower Pleistocene San Pedro Formation (Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside aquifers). The estimated elevations and depths of the aquifers underlying the site are presented in Table 15. Irregular patches of a perched, or semiperched, aquifer are also present within the Holocene alluvium throughout much of the subbasin. Although significant amounts of water can be found within these perched water-bearing zones, they are often discontinuous over relatively short distances and have historically had only minimal economic benefit. Thus, the perched aquifer does not meet the criteria of an "aquifer" for HRS purposes. These perched zones are typically found between approximately 25 and 45 ft bgs (i.e., between the surface and the top of the Gaspur aquifer) (DWR, 1961; DWR, 2004).

For the purposes of this SI, the Gaspur aquifer beneath the site is defined as being between 55 and 77 ft bgs. Water-bearing units identified at shallower depths are defined as being associated with one or more perched (or semiperched) aquifers. The Exposition aquifer is defined as being between 77 and 217 ft bgs; however, the base of this aquifer is considered approximate because no information was found regarding site-specific lithology below approximately 160 ft bgs. These designations were assigned primarily based on CPT lithological profile reports that were developed both during and prior to the completion of the SI investigation. A more comprehensive study of the lithological sediments in the 75 to 100 ft bgs zone beneath the site would be required to ascertain whether the water-bearing zones in this range are most appropriately associated with

the hydrogeologic conditions of the Gaspur or Exposition aquifers. The CPT Lithological Profile Reports developed during the GENIL SI investigation are presented in Appendix E (ARCADIS, 2013).

Throughout much of the subbasin, the Pleistocene-age aquifers are under confined conditions due to the presence of fine-grained, low-permeability interbedded sediments. Although these fine-grained sediments, or aquicludes, generally restrict the downward migration of groundwater from overlying aquifers, semipermeable zones within the aquicludes allow aquifers to be interconnected in some areas. In addition, hydrogeologic modeling of multi-aquifer systems similar to those found in the Central Basin Pressure Area, indicates that groundwater wells screened across multiple aquifers (or wells with improperly constructed annular seals that cross multiple aquifers) can act as a direct pathway for the migration of significant volumes of shallow groundwater into deep confined aquifers when vertical hydraulic head variations create a downward hydraulic gradient. The process of this downward migration is increased in areas where the deeper aquifers have periods of high-volume pumping such as seasonal demand. Furthermore, additional studies have shown that liquids that are denser than water (i.e., dense non-aqueous phase liquids such as TCE and PCE) can migrate downward through a multi-aquifer well even when vertical hydraulic head variations create an upward hydraulic gradient. As of the end of the 2012-2013 fiscal year, there were 537 known extraction wells (306 active and 231 inactive) within the subbasin (AwwaRF, 2006; DWR, 1961; DWR, 2013; Johnson et al., 2011).

The State of California, Department of Water Resources' Bulletin No. 104 (*Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County*) – Appendix A presents "idealized" geologic cross-sections transecting the Central Subbasin. These cross-sections indicate apparent areas of merged aquifers near the site, including approximately 0.4 mile west (Gaspur-Exposition), approximately 250 ft east-southeast (Exposition-Gage), and approximately 0.9 mile east-southeast (Lynwood-Silverado). Aquifer interconnection within 2 miles of the site has been documented between the Gaspur through Gage and between the Lynwood through Silverado. Aquifer interconnections within 2 miles of the site have been established neither between the Gage through Jefferson, the Jefferson and Lynwood, nor the Silverado and Sunnyside (DWR, 1961).

The regional groundwater flow direction within the subbasin, which was calculated using data from wells screened within the upper San Pedro Formation (Lynwood and Silverado aquifers), is generally to the southwest with local and temporal variations from approximately west-southwest to southeast. Based upon data collected between 2007 and 2016, flow within these deeper aquifers near the site trended towards the west-southwest with temporal variations from west to south-southwest (WRD, 2017).

The groundwater flow direction within the perched aquifer at the site is not known. Because of the highly irregular and discontinuous nature of these perched water-bearing zones, the flow direction is estimated to be highly variable and the calculation of a meaningful flow direction would likely require a separate and specialized investigation.

The groundwater flow direction within the Gaspur aquifer at the site is also not known. Historically, the flow direction on the North Parcel has been reported as trending to the north with slight variations towards the northeast and northwest and the flow direction on the South Parcel has been reported as trending to the south-southwest. All of the monitoring wells that are associated with the existing North Parcel monitoring well network and the existing South Parcel monitoring well network are screened within the Gaspur aquifer. During the SI investigation, depth-to-water measurements were collected from wells within both of the existing networks. In addition, both of these networks were resurveyed to confirm the top-of-casing elevations. Two existing wells, N-MW-5 and N-MW-6, were not included in either the surveying or sampling efforts. Calculations based on these measurements were generally inconsistent and often resulted in conflicting flow directions. Based on this information, the flow directions within the Gaspur aquifer at the site are expected to be variable, which is potentially a result of a heavily channelized depositional environment or unidentified lithologic condition. The groundwater elevation data collected during the SI investigation are provided in Table 16 and the well survey report is provided in Appendix J (AEGI, 2010; ETI, 2006).

The groundwater flow direction within the Exposition aquifer at the site is estimated to be towards the southwest. This estimated flow direction is based on monitoring well depth-to-water measurements collected from wells screened within this aquifer zone during the concurrently conducted Brenntag Pacific, Inc. (Brenntag) SI investigation (EPA ID No. CAD008287732), as well as from groundwater data collected by Brenntag during semiannual monitoring events of their monitoring network that were conducted between 2010 and 2016 (ARCADIS, 2017; Weston, 2017a).

During the GENIL SI investigation, the subsurface geology at the site was logged to a depth of 15 ft bgs, the base of continuous coring. Subsurface materials primarily consisted of light- to dark-brown silty sands with interbedded lenses (typically less than 24 inches) of medium-grained sands, clayey silts, and sandy silts, which generally increased in grain size moving southward across the site. The lithological identifications are described in the sample log book (Appendix I). Additionally, during the SI investigation, CPT technology was used to estimate the subsurface lithology to a total depth of approximately 145 ft bgs. The interpreted Soil Behavior Type generated from the CPT generally indicated sand units from 5 to 14 ft bgs, 31 to 37 ft bgs, 60 to 78 ft bgs, 83 to 90 ft bgs, 99 to 103 ft bgs, and 127 to 139 ft bgs. Between these sand units, the soils were generally composed of silts and clays with thin (i.e., less than 2 ft) interbedded lens of coarser-grained materials. The CPT Lithological Profile Reports are presented in Appendix E.

4.2.2 Groundwater Targets *(See Table 17)*

The nearest HRS-eligible drinking water well to the site is Well 03. This well is operated by the Tract 349 Mutual Water Company (MWC) and is located approximately 0.22 mile to the north-northwest of the site. Routine water quality sampling of this well has not reported elevated concentrations of AOCs, including TCE, PCE, arsenic, or chromium. Well 03 is a multi-aquifer well with six distinct screening intervals that correlate to the estimated depths of the Silverado and Sunnyside aquifers (BBD, 1948; DWR, 1961; RWQCB, 2015; Weston, 2016).

The City of South Gate's Well 7 was a public supply well located approximately 0.26 mile southeast of the site, which was removed from service in approximately 2002 and destroyed in approximately 2011 due primarily to elevated concentrations of arsenic, chromium (including hexavalent chromium), and TCE. The maximum reported arsenic concentration of 15.1 µg/L was identified in December 1997. The maximum reported chromium concentration (primarily of the hexavalent species) of 86 µg/L was identified in August 2000. This well had exhibited elevated PCE and TCE concentrations since at least 1985. The maximum reported PCE concentration of 3.8 µg/L and TCE concentration of 14 µg/L were both identified during the most recent recorded sampling in October 2001. Well 7 was a single-aquifer well with a sole screening interval that correlated to the estimated depths of the Lynwood aquifer (DWR, 1948b; DWR, 1961; RWQCB, 2015; Weston, 2016; Appendix C-2).

The City of Huntington Park's Well 12 is an active public supply well located approximately 0.58 mile northwest of the site. During routine water quality sampling, this well has exhibited non-detectable concentrations of TCE since May 2009. The maximum TCE concentration reported in this well was 1.6 µg/L, which was identified in 2003. Elevated TCE concentrations were also reported in 2007 and 2008. This well has not exhibited detectable concentrations of arsenic, chromium, or PCE. Well 12 is a multi-aquifer well with a sole screening interval that correlates to the estimated depths of the Lynwood through Sunnyside aquifers (DWR, 1948a; DWR, 1961; RWQCB, 2015; Weston, 2016).

The Golden State Water Company (GSWC) - Bell/Bell Gardens system's Hoffman Well 02 was a public supply well located approximately 0.41 mile east-northeast of the site, which was removed from service in approximately 2000 and subsequently destroyed in approximately 2007 due primarily to elevated concentrations of chromium. The maximum reported chromium concentration of 333 µg/L was identified in November 2000. This well had consistently exhibited detectable, but relatively low, concentrations of PCE since at least 1985 and had exhibited elevated TCE concentrations since at least 1985. PCE concentrations gradually began increasing in approximately 1990. The maximum reported PCE concentration of 5.7 µg/L was identified in November 2000. The maximum reported TCE concentration of 15.3 µg/L was identified in November 1996. Hoffman Well 02 was a single-aquifer well with three distinct screening intervals (437 to 444, 454 to 476, and 477 to 494 ft bgs) that correlated to the estimated depths of the Lynwood aquifer (DWR, 1961; RWQCB, 2015; Weston, 2016; Appendix C-3).

The Fed MCL for arsenic is 10 µg/L, for chromium is 100 µg/L, for PCE is 5.0 µg/L, and for TCE is 5.0 µg/L.

There are 84 known active drinking water wells, 4 known maintained-standby wells, and 30 known inactive (i.e., inactive, destroyed, or abandoned) wells located within the target distance limit (TDL) (i.e., 4 miles of established on-site sources). Water purveyors known to operate wells within the TDL include Tract 349 MWC, City of Huntington Park, City of South Gate, Tract 180 MWC, GSWC - Bell, Bell Gardens, Maywood MWC No. 3, Rancho Los Amigos Hospital, Maywood MWC No. 1, City of Downey, City of Lynwood, City of Bell Gardens, Maywood MWC No. 2, Walnut Park MWC, GSWC – Hollydale, City of Vernon, GSWC – Florence/Graham, City of Compton, City of Commerce, Lynwood Park MWC, CalWater Service – East Los Angeles (ELA),

GSWC – Willowbrook, Park Water Company (Liberty) – Compton/Willowbrook, and Sativa Los Angeles County Water District (CWD). Additional service information for these purveyors is presented in Table 17 (Weston, 2016).

4.2.3 Groundwater Pathway Conclusion *(See Figures 5 through 7; Tables 5 through 17)*

A release of hazardous substances from the site to groundwater has not been established. For HRS purposes, a release to groundwater is established when a hazardous substance is detected in a hydraulically downgradient well at a concentration significantly above background levels, and some portion of the release is attributable to the site. A hazardous substance is considered to be present at a concentration significantly above background levels when one of the following two criteria is met: (1) the hazardous substance is detected in the contaminated (i.e., release) sample, when not detected in the background samples or (2) the hazardous substance is detected in the release sample at a concentration equal to or greater than three times the maximum background level, when detected in the background samples.

Release samples collected during the GENIL SI sampling event from within the Gaspur aquifer exhibited concentrations of TCE that significantly exceeded the federal MCL. In addition, Gaspur aquifer release samples exhibited concentrations of chromium and lead that exceeded their corresponding SQLs but did not exceed federal MCLs. However, since the hydraulic gradient of the Gaspur aquifer beneath the site has not been adequately defined, appropriate background concentrations for these analytes could not be assigned and a release to the Gaspur aquifer cannot be established.

Release samples collected during the GENIL SI sampling event from within the Exposition aquifer exhibited concentrations of cadmium and lead that exceeded their corresponding SQL but did not exceed their federal MCL. However, since it was deemed unnecessary for HRS purposes to assign an Exposition aquifer background sample location (see section 3.2.1), a release to the Exposition aquifer cannot be established.

Although a release from the site to groundwater cannot be established for HRS purposes, the relatively high VOC concentrations, primarily of the cis-1,2-DCE and TCE analytes, identified in on-site Gaspur aquifer samples, in combination with the relatively low VOC concentrations identified in on-site source samples, suggests that one or more additional VOC source areas may exist on site.

The geologic materials between the ground surface at the site and the top of the deepest identified aquifer, the Sunnyside, are generally characterized by confined aquifer systems, which are composed of relatively permeable sands through gravels and are separated by relatively impermeable clay through silt layers; although semipermeable zones within these layers allow one or more aquifers to be interconnected in some areas. The estimated elevations and depths of the aquifers underlying the site are presented in Table 15. There are 84 known active drinking water wells within 4 miles of the site. These wells, which are operated by 23 distinct water purveyors, serve an apportioned population of approximately 578,000 (CTE, 2011; CWS, 2016; DWR, 1961;

KJC, 2016a; KJC, 2016b; MWM, 2016; RMP, 2011; SAA, 2011; SEI, 2012; SWRCB, 2017; Weston, 2016).

4.3 Surface Water Pathway

To determine the score for the surface water pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to surface water (e.g., streams, rivers, lakes, and oceans); 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, persistence, bioaccumulation potential, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on drinking water intakes, fisheries, and sensitive environments associated with surface water bodies within 15 miles downstream of the site.

Surface water runoff from the GENIL site is expected to flow from the paved surfaces to the municipal stormwater system via stormwater drains located along Salt Lake Avenue and Ardine Street. The nearest surface water body to the site is the Los Angeles River, which is located approximately 0.7 mile east. The Los Angeles River is highly modified, having been lined with concrete along most of its length by the U.S. Army Corps of Engineers in the 1950s. Flows in the river are dominated by urban runoff and tertiary-treated effluent from several municipal wastewater treatment plants. The river empties into the Pacific Ocean at San Pedro Bay approximately 13.5 miles downstream of the site. There are no surface water intakes, fisheries, or sensitive environments associated with the Los Angeles River downstream of the site; however, there is a potential for fisheries and/or recreational areas to exist within San Pedro Bay (Google, 2017; RWQCB, 1994; Appendix B).

4.4 Soil Exposure and Air Migration Pathways

In determining the score for the soil exposure pathway, the HRS evaluates: 1) the likelihood that there is surficial contamination associated with the site (e.g., contaminated soil that is not covered by pavement or at least 2 feet of clean soil); 2) the characteristics of the hazardous substances in the surficial contamination (i.e., toxicity and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, exposed to the contamination. For the targets component of the evaluation, the HRS focuses on populations that are regularly and currently present on or within 200 feet of surficial contamination. The four populations that receive the most weight are residents, students, daycare attendees, and terrestrial sensitive environments.

In determining the score for the air migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to ambient outdoor air; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on regularly occupied residences, schools, and workplaces within 4 miles of the site. Transient populations, such as customers and travelers passing through the area, are not counted.

There are no known residences, schools, daycare facilities, or sensitive environments on site. In addition, the site is fenced and its surface is covered with pavement or buildings. The nearest identified residential property to the site is located approximately 550 ft north. There are regularly occupied workplaces on site; however, the total number of employees is not known (Google, 2017; Appendix B).

4.5 Hazard Ranking System Summary *(See Figures 5 through 7; Tables 5 through 17)*

On-site soil-matrix samples collected during the 2015 SI investigation exhibited concentrations of metals and VOCs that exceeded assigned site-specific action levels. The assigned cadmium action level of 0.27 mg/kg was exceeded by 5 samples with a maximum concentration of 1.3 mg/kg. The assigned lead action level of 25 mg/kg was exceeded by 5 samples with a maximum concentration of 165 mg/kg. The assigned silver action level of 0.51 mg/kg was exceeded by 1 sample with a concentration of 4.9 mg/kg. The assigned TCE action level of 5.1 µg/kg was exceeded in 2 samples with a maximum concentration of 76 µg/kg.

Groundwater release samples collected during the investigation also exhibited concentrations of metals and VOCs that exceeded documented federal and/or state regulatory benchmarks. Specific substances include arsenic; manganese; vanadium; 1,1-DCA; 1,1-DCE; 1,2-DCA; cis-1,2-DCE, and TCE. None of the release samples collected from the Exposition aquifer exceeded regulatory benchmarks. Groundwater action levels were not assigned for HRS purposes (see section 3.2.1).

The following primary HRS factors are associated with the site:

- Hazardous substance sources at the site have been documented, consisting of soils contaminated during historical operations. Substances include cadmium, lead, silver, and TCE, which were present in site soils at concentrations significantly above background.

- A release of hazardous substances from on-site sources to groundwater cannot be established based on the results of the SI sampling effort since background groundwater concentrations were not assigned.

- Aquifer interconnection within 2 miles of the site has not been adequately documented between the Exposition through Silverado aquifers.

- The geologic materials between the site surface and the top of the Silverado aquifer are generally characterized by approximately 600 feet of relatively permeable sands and gravels and approximately 550 feet of less permeable clays and silts.

- The nearest drinking water well is located less than one-quarter mile from the site.

- Drinking water wells within 4 miles of the site serve an apportioned population of approximately 578,000.

The following secondary HRS factors are associated with the site:

- No drinking water intakes are associated with surface water within 15 miles downstream of the site. However, there is the potential for fisheries and/or sensitive environments associated with the Pacific Ocean to exist within this target distance limit.

- There are no known residences, schools, daycare centers, or sensitive environments on site. The nearest identified residential property to the site is located approximately 550 ft north.

- There are regularly occupied workplaces on site; however, the total number of employees is not known.

- The site is fenced and generally inaccessible to the public.

- The surface of the site is entirely covered with pavement or buildings.

5.0 REMOVAL EVALUATION CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415 (b) (2)] authorizes EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reasons, a referral to Region 9's Emergency Response Office does not appear to be necessary (Google, 2017; Appendix B):

- The site is fenced and generally inaccessible to the public.

- The surface of the site is covered with pavement or buildings.

6.0 REFERENCES

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Tables

Table 1: North Parcel - Current and Historical On-site Operators

Location	Operator	Primary Operations	Date
Entirety of APN: 6224-036-005 *(North Parcel)*	*Unknown*	Residential outbuildings	*(pre-1923)* ~ 1928
	Unknown	Automotive Repair Service	~1928 ~ 1933
	Unknown	Metal fabrication / steel pipe cutting	~1935 - 1950
Northwest portion of APN: 6224-036-005 *(North Parcel)*	General Inspection Laboratories	Non-destructive Testing & Inspection	~1955 - 1970
	Phoenix Plastics Inc.	Plastics Mfg. and/or Distribution	~1971
	Coast Paper Box Company	Paper Box Manufacturing	~1976 ~ 1990
	Quality Padilla	Mattress Repair and Distribution	~2000 - Present
Northeast portion of APN: 6224-036-005 *(North Parcel)*	Brunswig Drug Company	Pharmaceutical Distribution	~1971
	Pronto System, Inc.	Automotive Parts Warehousing	~2000
	Libreria Nueva Jerusalem	Religious Book Sales	~2013 - Present
Northeast portion of APN: 6224-036-005 *(North Parcel)*	Sentinel Container Corporation	Paper Box Manufacturing	~1958
	Key Container Company	Paper Box Manufacturing	~1962
	Affiliated Container Corporation	Paper Box Manufacturing	~1967 ~ 1990
	OP Bag and Supply	Durable Goods Warehousing & Sales	~2008
	Azteca International/ Sandbagger Tires	Used Tire Warehousing & Sales	~2006 ~ 2013
	Santa Fe Metals	Metal Materials Warehousing	~2013
	USA Fitness/Extreme Training Equipment	Fitness Equipment Retail	~2013 - Present
APN = Assessor Parcel Number (Los Angeles County) Mfg. = manufacturing		References: AEGI, 2010; ETI, 2006; Weston, 2015; Appendix B	

Table 2: South Parcel - Current and Historical On-site Operators

Location	Operator	Primary Operation(s)	Date
Entirety of APN: 6224-036-002 *(South Parcel)*	*Unknown*	Residential outbuildings	*(pre-1923)* ~ 1943
	Unknown	Trailer and Auto Court	~1943 ~ 1970
	Taywood Steel	Metal Supply Warehousing	1970 ~ 1974
	General Inspection Laboratories	Non-destructive Testing & Inspection	~1970 - 2004
	General Testing and Inspection	Non-destructive Testing & Inspection	2004 ~ 2010
	Mistras NDT Services	Non-destructive Testing & Inspection	~2010 - Present
APN = Assessor Parcel Number (Los Angeles County)		References: ETI, 2006; ETI, 2007b; Weston, 2015; Appendix B	

Table 3: North Parcel Previous Investigations - Select Analytical Results

Site Area	Previous Investigation	Analyte	Maximum Result	Federal Benchmark (1)
Soil Matrix Results (microgram per kilogram)				
Former Clarifier Area	2003 Clarifier Closure Report	Lead	2,400,000	400,000
		cis-1,2-DCE	8.0	160,000
		PCE	47	24,000
		TCE	19,000	940
	2004 Environmental Report	cis-1,2-DCE	20 (2)	160,000
		TCE	3,300 (2)	940
	2005 Environmental Report	cis-1,2-DCE	15 (2)	160,000
		TCE	550 (2)	940
	2010 Confirmation Soil Boring Report	cis-1,2-DCE	140 (2)	160,000
		TCE	4,200 (2)	940
Groundwater Results (micrograms per liter)				
North Parcel Groundwater	2004 – 2011 Quarterly Monitoring	1,1-DCA	5.2	5.0
		1,1-DCE	18	7.0
		1,2-DCA	12	5.0
		cis-1,2-DCE	450	70
		trans-1,2-DCE	24	100
		TCE	4,000	5.0
		VC	2.2	2.0

Definitions:
ESA = Environmental Site Assessment
DCA = dichloroethane
DCE = dichloroethylene
MCL = Federal Maximum Contaminant Level
PCE = tetrachloroethylene
RSL = USEPA Regional Screening Level
TCA = trichloroethane
TCE = trichloroethylene
VC = vinyl chloride

Footnotes:
1 = Reference benchmark is the Residential RSL for soil matrix samples and the federal MCL for groundwater samples
2 = Soil samples were collected from depths in near proximity to VOC-impacted groundwater.

References:
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Table 4: South Parcel Previous Investigations - Select Analytical Results

Site Area	Previous Investigation	Analyte	Maximum Result	Federal Benchmark (1)
Soil Matrix Results (microgram per kilogram)				
Central Mistras Building (Penetrant and Pressure Tank Test Areas)	1996 Limited Phase II ESA	1,1,1-TCA PCE TCE	34 24 120	8,100,000 24,000 940
	2001 Limited Phase II ESA	1,1,1-TCA PCE TCE	21 63 340	8,100,000 24,000 940
	2004 Site Investigation Report	1,1,1-TCA PCE TCE	12 58 281	8,100,000 24,000 940
South-Central Mistras Building (Etch Room, Grinding Room, Former Vapor Degreaser)	1996 Limited Phase II ESA	1,1,1-TCA PCE TCE	30 800 28	8,100,000 24,000 940
	2001 Limited Phase II ESA	1,1,1-TCA PCE TCE	22 640 170	8,100,000 24,000 940
	2004 Site Investigation Report	PCE TCE	164 55	24,000 940
Groundwater Results (micrograms per liter)				
South Parcel Groundwater	2004 Site Investigation Report	cis-1,2-DCE TCE	720 1,020	70 5.0
	2006 Facility Investigation Report	1,1-DCE cis-1,2-DCE TCE	40 497 2,000	7.0 70 5.0

Definitions:
ESA = Environmental Site Assessment
DCE = dichloroethylene
MCL = Federal Maximum Contaminant Level
PCE = tetrachloroethylene
rRSL = USEPA Regional Screening Level
TCA = trichloroethane
TCE = trichloroethylene

Footnote:
1 = Reference benchmark is the Residential RSL for soil matrix samples and the federal MCL for groundwater samples

References:
AEI, 2002; D&M, 1996; ENV, 2004; ETI, 2006; ETI, 2008

Table 5: North Parcel – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Silver	Vanadium
Benchmarks and Action Levels										
Residential RSL		31	0.68	71	--	400	1,800	1,500	390	390
MCL-based SSL		0.27	0.29	--	180,000	14	--	--	--	--
HRS SEP Benchmark		30	0.77	30	200	--	10,000	1,000	300	394
Action Level (1)		**1.0**	**7.8**	**0.27**	**63**	**25**	**1,675**	**64**	**0.51**	**137**
Background Samples										
TTT-DP-9 (2)	2	0.93 UJ	1.7 J	0.46 U	7.8	4.7	138	9.1 J-	0.46 U	14
	5	0.89 UJ	1.1 J-	0.09 J	15	4.2 J+	386	14	0.44 U	33
	10	0.91 UJ	0.64 J	0.46 U	5.9	1.4	167	4.0 J-	0.46 U	18
	15	1.0 UJ	0.53 J	0.51 U	9.0	1.5	182	5.6 J-	0.51 U	22
Source Samples										
GIL-DP-1	2	0.90 UJ	1.6	0.17 J	16	9.7	375	12	0.04 J	36
	5 (3)	0.84 UJ	0.95	0.04 J	7.7	2.6	188	5.8	0.42 U	22
	10	0.81 UJ	0.68	0.03 J	9.1	1.2	160	5.2	0.41 U	16
	15	0.99 UJ	1.6	0.07 J	15	3.4	299	11	0.03 J	34
GIL-DP-11	2	0.07	1.7	0.18	16	6.1	351	13	0.04	37
	5	R	R	R	R	R	R	R	R	R
	10	R	R	R	R	R	R	R	R	R
	15	R	R	R	R	R	R	R	R	R

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 6: South Parcel – Interior – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Silver	Vanadium
Benchmarks and Action Levels										
Residential RSL		31	0.68	71	--	400	1,800	1,500	390	390
MCL-based SSL		0.27	0.29	--	180,000	14	--	--	--	--
HRS SEP Benchmark		30	0.77	30	200	--	10,000	1,000	300	394
Action Level (1)		**1.0**	**7.8**	**0.27**	**63**	**25**	**1,675**	**64**	**0.51**	**137**
Background Samples										
TTT-DP-9 (2)	2	0.93 UJ	1.7 J	0.46 U	7.8	4.7	138	9.1 J-	0.46 U	14
	5	0.89 UJ	1.1 J-	0.09 J	15	4.2 J+	386	14	0.44 U	33
	10	0.91 UJ	0.64 J	0.46 U	5.9	1.4	167	4.0 J-	0.46 U	18
	15	1.0 UJ	0.53 J	0.51 U	9.0	1.5	182	5.6 J-	0.51 U	22
Source Samples										
GIL-DP-5	2	0.61 J-	3.1	**0.69 J**	15	**135**	299	17	0.48 U	30
	5 (3)	0.05 J-	0.92	0.09 J	12	3.1	321	9.4	0.41 U	29
	10	R	0.51	0.97 U	7.9	1.7	203	6.5	0.48 U	21
	15	R	1.2	1.1 U	12	2.8	251	9.1	0.02 J	30
GIL-DP-6	2	0.20 J-	3.9	**0.43 J**	17	**38**	366	17	0.40 U	36
	5	R	0.69	1.0 U	10	2.3	238	8.4	0.50 U	26
	10	R	0.51	0.97 U	7.9	1.7	203	6.5	0.48 U	21
	15	R	1.2	1.1 U	12	2.8	251	9.1	0.02 J	30
GIL-DP-7	2	0.15 J-	2.6	**0.52 J**	16	**29**	318	17	0.08 J	33
	5	1.0 UJ	0.96	0.08 J	12	2.6	262	9.6	0.02 J	31
	10	R	0.80	0.81 U	8.4	1.9	177	6.7	0.40 U	23
	15	R	1.7	0.86 U	9.7	2.9	241	7.9	0.02 J	25
GIL-DP-8	2	0.14 J-	1.7	0.23 J	13	22	307	11	0.05 J	30
	5	R	R	R	R	R	R	R	R	R
	10	R	0.61	0.88 U	9.7	1.9	207	7	0.44 U	21
	15	R	1.1	0.11 J	16	3.8	365	15	0.03 J	36
GIL-DP-9	2	0.46 J-	6.6	**1.3**	29	**165**	296	18	0.39 J	32
	5	0.10 J-	2.0	0.40 UJ	18 J	9.9	369 J	13 J	0.04 J	38 J
	10	1.1 UJ	1.1	0.10 J	11	3.8	209	8.2	0.02 J	25
	15	1.1 UJ	1.2	0.11 J	13	5.3	264	9.7	0.03 J	28

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 7: South Parcel – Exterior – Source Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Silver	Vanadium
Benchmarks and Action Levels										
Residential RSL		31	0.68	71	--	400	1,800	1,500	390	390
MCL-based SSL		0.27	0.29	--	180,000	14	--	--	--	--
HRS SEP Benchmark		30	0.77	30	200	--	10,000	1,000	300	394
Action Level (1)		**1.0**	**7.8**	**0.27**	**63**	**25**	**1,675**	**64**	**0.51**	**137**
Background Samples										
TTT-DP-9 (2)	2	0.93 UJ	1.7 J	0.46 U	7.8	4.7	138	9.1 J-	0.46 U	14
	5	0.89 UJ	1.1 J-	0.09 J	15	4.2 J+	386	14	0.44 U	33
	10	0.91 UJ	0.64 J	0.46 U	5.9	1.4	167	4.0 J-	0.46 U	18
	15	1.0 UJ	0.53 J	0.51 U	9.0	1.5	182	5.6 J-	0.51 U	22
Source Samples										
GIL-DP-2	2	0.97 UJ	2.4	0.17 J	21	8.6	339	13	0.05 J	39
	5 (3)	0.74 UJ	1.0	0.06 J	9.7	2.4	214	7.0	0.37 U	23
	10	1.2 UJ	3.2	0.60 U	11	1.3	161	5.7	0.60 U	21
	15	0.86 UJ	1.4	0.10 J	21	3.4	254	9.5	0.02 J	29
GIL-DP-3	2	0.14 J-	2.3	**0.72 J**	17	**33**	392	14	**4.9**	37
	5 (3)	0.75 UJ	0.94	0.05 J	8.8	2.2	174	7.1	0.03 J	23
	10	R	1.3	0.94 U	14	2.4	214	9.6	0.47 U	30
	15	R	0.42	0.80 U	7.0	1.4	179	4.8	0.40 U	17
GIL-DP-4	2	0.94 UJ	2.6	0.14 J	13	8.5	275	11	0.04 J	32
	5	1.0 UJ	0.95	0.08 J	12	2.5	264	9.1	0.51 U	31
	10	1.0 UJ	1.1	0.08 J	12	3.5	249	9.0	0.52 U	29
	15	1.1 UJ	2.7	0.15 J	17	4.5	301	13	0.04 J	40

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 8: North Parcel – Source Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloroethane	1,1-Dichloroethylene	1,2-Dichloroethane	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl Chloride
		1,1-DCA	**1,1-DCE**	**1,2-DCA**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**	**VC**
Benchmarks and Action Levels									
Residential RSL		3,600	230,000	460	160,000	24,000	1,600,000	940	59
MCL-based SSL		--	2.5	1.4	21	2.3	31	1.8	0.69
HRS SEP Benchmark		120,000	3,000,000	7,600	100,000	330,000	1,000,000	8,800	94
Action Level (1)		**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
Background Samples									
TTT-DP-9 (2)	2	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	5	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Source Samples									
GIL-DP-1	2	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	**76**	5.4 U
	5 (3)	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
	10	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U
	15	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	**17**	4.7 U
GIL-DP-11	2	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
	5	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
	10	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U
	15	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
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ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 9: South Parcel – Interior – Source Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloroethane	1,1-Dichloroethylene	1,2-Dichloroethane	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl Chloride
		1,1-DCA	**1,1-DCE**	**1,2-DCA**	**cis-1,2-DCE**	**PCE**	**trans-1,2-DCE**	**TCE**	**VC**
Benchmarks and Action Levels									
Residential RSL		3,600	230,000	460	160,000	24,000	1,600,000	940	59
MCL-based SSL		--	2.5	1.4	21	2.3	31	1.8	0.69
HRS SEP Benchmark		120,000	3,000,000	7,600	100,000	330,000	1,000,000	8,800	94
Action Level (1)		**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
Background Samples									
TTT-DP-9 (2)	2	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	5	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Source Samples									
GIL-DP-5	2	5.0 U	5.0 UJ	5.0 U	5.0 UJ	4.1 J	5.0 UJ	5.0 U	5.0 U
	5 (3)	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
	10	5.2 U	5.2 UJ	5.2 U	5.2 UJ	5.2 U	5.2 UJ	5.2 U	5.2 U
	15	5.7 U	5.7 UJ	5.7 UJ	5.7 UJ	5.7 U	5.7 UJ	5.7 U	5.7 U
GIL-DP-6	2	5.3 U	5.3 UJ	5.3 U	5.3 UJ	2.8 J	5.3 UJ	5.3 U	5.3 U
	5	5.3 U	5.3 UJ	5.3 U	5.3 UJ	5.3 U	5.3 UJ	5.3 U	5.3 U
	10	5.7 U	5.7 UJ	5.7 U	5.7 UJ	5.7 U	5.7 UJ	5.7 U	5.7 U
	15	5.0 U	5.0 UJ	5.0 U	5.0 UJ	5.0 U	5.0 UJ	5.0 U	5.0 U
GIL-DP-7	2	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
	5	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
	10	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U
	15	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U
GIL-DP-8	2	5.0 U	5.0 U	5.0 U	5.0 U	4.0 J	5.0 U	3.6 J	5.0 U
	5	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	2.9 J	4.7 U
GIL-DP-9	2	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U
	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
	10	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U
	15	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions:
MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 10: South Parcel – Exterior – Source Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloroethane	1,1-Dichloroethylene	1,2-Dichloroethane	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl Chloride
		1,1-DCA	**1,1-DCE**	**1,2-DCA**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**	**VC**
Benchmarks and Action Levels									
Residential RSL		3,600	230,000	460	160,000	24,000	1,600,000	940	59
MCL-based SSL		--	2.5	1.4	21	2.3	31	1.8	0.69
HRS SEP Benchmark		120,000	3,000,000	7,600	100,000	330,000	1,000,000	8,800	94
Action Level (1)		**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
Background Samples									
TTT-DP-9 (2)	2	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	5	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Source Samples									
GIL-DP-2	2	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
	5 (3)	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
	10	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
	15	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
GIL-DP-3	2	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U
	5 (3)	5.4 U	5.4 UJ	5.4 U	5.4 UJ	5.4 U	5.4 UJ	5.4 U	5.4 U
	10	6.2 U	6.2 UJ	6.2 U	6.2 UJ	6.2 U	6.2 UJ	6.2 U	6.2 U
	15	5.7 U	5.7 UJ	5.7 U	5.7 UJ	5.7 U	5.7 UJ	5.7 U	5.7 U
GIL-DP-4	2	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
	5	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U
	10	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
	15	5.3 U	5.3 U	5.3 U	5.3 U	2.5 J	5.3 U	5.3 U	5.3 U

Notes: Values in Bold exceed Action Level
Values in Shaded cells exceed ten times Action Level
All results reported in milligrams per kilogram (mg/kg)
Samples collected in November, 2015
1 = Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)
2 = Sample collected as part of Titan Terminal & Transport SI (Weston, 2017b)
3 = Duplicate Sample collected; greater result is presented

Definitions: MCL = Federal Maximum Contaminant Level
RSL = Regional Screening Level
HRS = Hazard Ranking System
SEP = Soil Exposure Pathway
SSL = Soil Screening level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 11: North Parcel & South Parcel – Release Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Silver	Vanadium
Benchmark		**6.0**	**10**	**5.0**	**100**	**15**	**50 (1)**	**100**	**100**	**50**
Benchmark Source		Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	CA 2nd MCL	CA MCL	Fed 2nd MCL	CA NL
Direct Push (DP) Locations										
GIL-DP-3	60	0.36 J	**24**	1.0 U	35	14	**1,490**	43	1.0 U	**85**
GIL-DP-4	62	0.45 J	4.2	1.0 U	4.4	1.0 U	**1,800**	37	1.0 U	7.4
GIL-DP-5	60	0.57 J	7.5	1.0 U	2.0 U	1.0 U	469	13	1.0 U	1.1 J
GIL-DP-6	64	1.7 J	5.1	1.0 U	2.0 U	1.0 U	399	9.2	1.0 U	4.5 J
Monitoring Well Locations										
N-MW-1	69 (2)	2.0 U	**53**	1.0 U	2.0 U	1.0 U	384	8.1	1.0 U	5.0 U
N-MW-2	65	0.41 J	**87**	1.0 U	6.9	2.5	**722**	8.9	1.0 U	14
N-MW-3	64	0.26 J	**120**	1.0 U	2.0 U	1.0 U	**950**	6.1	1.0 U	3.0 J
N-MW-4	63	2.0 U	**16**	0.14 J	2.0 U	1.0 U	**616**	12	1.0 U	1.2 J
S-MW-1	59	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-MW-2	59	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-MW-3	60 (2)	2.0 U	**60**	1.0 U	2.0 U	1.0 U	**1,750**	6.3	1.0 U	3.1 J
Cone Penetration Testing (CPT) Locations										
GIL-CPT-4	68	0.42 J	2.6	1.0 U	2.0 U	1.0 U	450	24	1.0 U	3.5 J
	88	0.17 J	0.92 J	1.0 U	2.0 U	1.0 U	361	6.2	1.0 U	1.8 J
	134	0.24 J	1.0	1.5	2.0 U	14	438	28	1.0 U	1.8 J
GIL-CPT-5	68 (2)	0.56 J	4.0	1.0 U	0.15 J	1.0 UJ	**1,080**	17	1.0 U	1.0 J
	88	0.18 J	2.0	1.0 U	2.0 U	1.0 UJ	364	2.8	1.0 U	4.1 J
	132	1.0 J	5.1	0.12 J	2.0 U	0.11 J-	378	9.8	1.0 U	1.1 J

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in November, 2015
1 = Manganese exceedances (i.e., bold/shade) are presented as 10 times benchmark
2 = Duplicate Sample collected; greater result is presented

Definitions:
CA MCL = California Maximum Contaminant Level
CA 2nd MCL = California Secondary Maximum Contaminant Level
CA NL = California Notification Level
Fed MCL = Federal Maximum Contaminant Level
Fed 2nd MCL = Federal Secondary Maximum Contaminant Level
ft bgs = feet below ground surface
NA = Not Analyzed

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 12: Secondary Objective Groundwater Sampling Results for Select Inorganics

Sample Location	Sample Depth (ft bgs)	Antimony	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Silver	Vanadium
Benchmark		**6.0**	**10**	**5.0**	**100**	**15**	**50 (1)**	**100**	**100**	**50**
Benchmark Source		Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	CA 2nd MCL	CA MCL	Fed 2nd MCL	CA NL
GIL-CPT-1	62	0.57 J	7.8	1.0 U	2.0 U	1.0 U	349	7.8	1.0 U	1.4 J
	88	0.40 J	1.7	1.0 U	2.0 U	1.0 U	298	4.3	1.0 U	4.9 J
	127	1.2 J	1.5	1.0 U	4.6	1.3	188	15	1.0 U	5.2
GIL-CPT-6	68 (2)	0.24 J	2.6	1.0 U	2.0 U	1.0 U	436	4.9	1.0 U	2.4 J
	88	0.64 J	2.6	1.0 U	2.0 U	1.0 U	**566**	4.3	1.0 U	8.7
	132	0.68 J	3.5	1.0 U	3.0	1.0 U	317	10	1.0 U	3.9 J

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in November, 2015
1 = Manganese exceedances (i.e., bold/shade) are presented as 10 times benchmark
2 = Duplicate Sample collected; greater result is presented

Definitions:
CA MCL = California Maximum Contaminant Level
CA 2nd MCL = California Secondary Maximum Contaminant Level
CA NL = California Notification Level
Fed MCL = Federal Maximum Contaminant Level
Fed 2nd MCL = Federal Secondary Maximum Contaminant Level
ft bgs = feet below ground surface
NA = Not Analyzed

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 13: North Parcel & South Parcel – Release Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloroethane	1,1-Dichloroethylene	1,2-Dichloroethane	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl Chloride
		1,1-DCA	**1,1-DCE**	**1,2-DCA**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**	**VC**
Benchmark		**5.0**	**7.0**	**5.0**	**70**	**5.0**	**100**	**5.0**	**2.0**
Benchmark Source		CA MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL
Direct Push (DP) Locations									
GIL-DP-3	60 (1)	3.2 J-	6.0 J-	0.54 J-	**420 J-**	R	13 J-	**1,600 J-**	R
GIL-DP-4	62 (2)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
GIL-DP-5	60	0.70 J-	1.5 J-	R	39 J-	0.59 J-	2.2 J-	**120 J-**	0.37 J-
GIL-DP-6	64	0.37 J	1.7	0.50 U	48	0.50 U	3.0	**200**	0.52
Monitoring Well Locations									
N-MW-1	69 (1)	25 U	25 U	25 U	**110**	25 U	6.0 J	**960**	25 U
N-MW-2	65	25 U	25 U	25 U	**87 J**	25 U	6.0 J	**1,100**	25 U
N-MW-3	64	25 U	25 U	25 U	**150**	25 U	25 U	**370**	25 U
N-MW-4	63	25 U	25 U	**10 J**	**430**	25 U	32	**1,100**	25 U
S-MW-1	59	**6.2**	0.50 U	0.50 U	13 J-	0.49 J	0.63	**17**	0.50 U
S-MW-2	59	**11 J**	13 UJ	13 U	**380 J-**	13 U	8.0 J-	**280**	13 U
S-MW-3	60 (1)	0.81	0.50 U	0.50 U	34	0.50 U	2.1	**69**	0.50 U
Cone Penetration Testing (CPT) Locations									
GIL-CPT-4	68	2.0	3.1	**14**	62	0.50 U	6.3	**21**	0.45 J+
	88	0.50 U	0.50 U	0.98	0.35 J	0.50 U	0.50 U	1.9	0.50 U
	134	0.50 U	0.50 U	0.22 J	1.0	0.50 U	0.50 U	0.53	0.50 U
GIL-CPT-5	68 (1)	**15**	**20 J+**	0.50 U	**450**	0.50 U	42 J	**670**	1.9
	88	0.50 U	0.50 U	1.3	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	132	0.50 U	0.50 U	0.20 J	0.29 J	0.50 U	0.50 U	0.33 J	0.50 U

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in November, 2015
1 = Duplicate Sample collected; greater result is presented
2 = Non-detect VOC concentrations in this sample are anomalous and may be a result of incorrect sample preparation or reporting

Definitions:
CA MCL = California Maximum Contaminant Level
Fed MCL = Federal Maximum Contaminant Level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 14: Secondary Objective Groundwater Sampling Results for Select Organics

Sample Location	Sample Depth (ft bgs)	1,1-Dichloroethane	1,1-Dichloroethylene	1,2-Dichloroethane	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl Chloride
		1,1-DCA	**1,1-DCE**	**1,2-DCA**	**c-1,2-DCE**	**PCE**	**t-1,2-DCE**	**TCE**	**VC**
Benchmark		**5.0**	**7.0**	**5.0**	**70**	**5.0**	**100**	**5.0**	**2.0**
Benchmark Source		CA MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL	Fed MCL
GIL-CPT-1	62	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	88	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	127	0.50 U	0.50 U	0.32 J	0.51	0.50 U	0.50 U	0.25 J	0.50 U
GIL-CPT-6	68 (1)	0.50 U	0.50 U	0.23 J	0.16 J	0.50 U	0.50 U	0.25 J	0.50 U
	88	0.10 J	0.50 U	0.20 J	2.8	0.50 U	0.21 J	**14**	0.50 U
	132	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

Notes: Values in Bold exceed Benchmark
Values in Shaded cells exceed ten times Benchmark
All results reported in micrograms per liter (µg/L)
Samples collected in November, 2015
1 = Duplicate Sample collected; greater result is presented

Definitions:
CA MCL = California Maximum Contaminant Level
Fed MCL = Federal Maximum Contaminant Level
ft bgs = feet below ground surface

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported Sample Quantitation Limit (SQL).
UJ = The analyte was analyzed for, but was not detected. The reported SQL is approximate and may be inaccurate or imprecise.

Complete analytical results are presented in Appendix H

Table 15: Bulletin 104 Aquifer Elevations near Site

Aquifer	Estimated Elevation (ft amsl)		Estimated Depth (ft bgs)	
	Top	Base	Top	Base
Gaspur	55	25	62	92
Exposition	15	-100	102	217
Gage	-120	-180	237	297
Hollydale	-230	-245	347	362
Jefferson	-305	-370	422	487
Lynwood	-390	-480	507	597
Silverado	-515	-750	632	867
Sunnyside	-1030	-1285	1147	1402

Definitions:
amsl = above mean sea level
bgs = below ground surface
ft = feet
References:
DWR, 1961

Table 16: Groundwater Monitoring Well Elevation Data – 2015 GENIL SI Investigation

Monitoring Well No.	Aquifer Zone	Screen Interval (ft bgs)	Depth to Water (ft)	TOC Elevation (ft amsl)	GW Elevation (ft amsl)	Northing (ft SPC)	Easting (ft SPC)
N-MW-1	Gaspur	10-80	58.44	116.25	57.81	1806703.38	6505577.55
N-MW-2	Gaspur	45-70	58.80	116.69	57.89	1806644.49	6505559.52
N-MW-3	Gaspur	45-70	59.35	116.52	57.17	1806773.13	6505534.15
N-MW-4	Gaspur	45-70	58.29	116.05	57.76	1806648.79	6505402.18
N-MW-5 (1)	Gaspur	45-70	--	--	--	--	--
N-MW-6 (1)	Gaspur	45-70	--	--	--	--	--
S-MW-1 (2)	Gaspur	50-60	58.71	116.81	58.10	1806591.49	6505354.34
S-MW-2 (2)	Gaspur	50-60	59.20	116.62	57.42	1806503.46	6505444.16
S-MW-3	Gaspur	50-60	57.50	115.75	58.25	1806527.10	6505733.59

Definitions:
amsl = above mean sea level
bgs = below ground surface
ft = feet
GW = groundwater
SPC = State Plane Coordinate
TOC = Top of Casing

Footnotes:
1 = Well not included in 2015 SI Investigation survey or sampling program
2 = Samples from well submitted for VOC analysis due to poor recovery

References:
AEGI, 2010; ENV, 2005; N&M, 2005

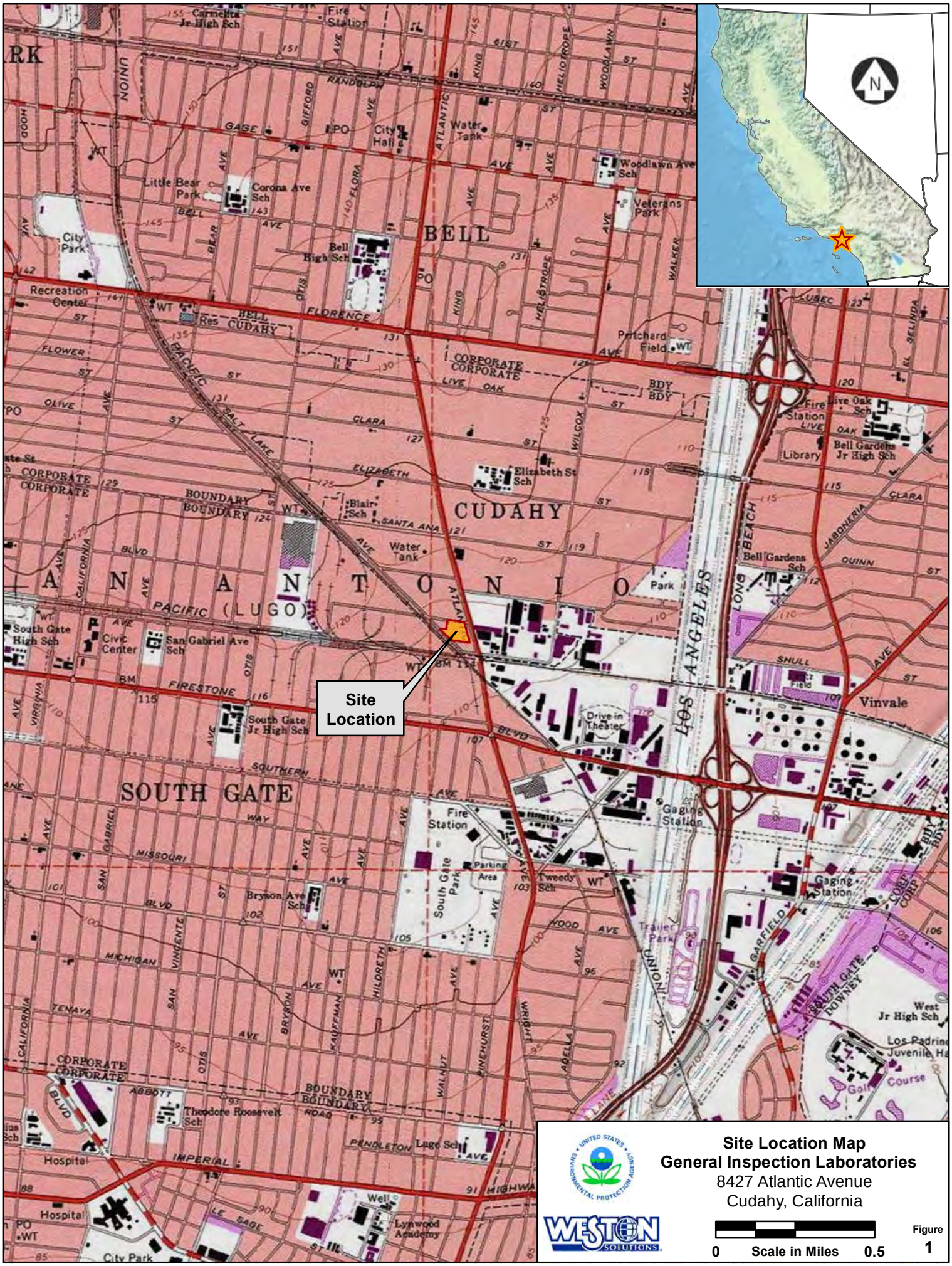
Well Survey Report is included in Appendix J

Table 17: Water Purveyors Operating Active Wells Within the Target Distance Limit

Water Company Name	No. of Wells in System[1]	Total Population Served	Percent Groundwater	No. of Wells Within 4 Miles[1]	Direction from site (approx.)
Tract 349 MWC	2	7,500	99%	2	NW
City of Huntington Park	5	17,246	72%	5	NW
City of South Gate	7	96,057	99%	7	W-SW-S-SE
Tract 180 MWC	2	14,000	100%	2	N
GSWC - Bell, Bell Gardens	5	58,048	97%	5	NW-N-NE
Maywood MWC #3	2	9,500	92%	2	NNE
Rancho Los Amigos Hospital	3	8,800	100%	3	SE
Maywood MWC #1	2	3,619	95%	2	NNW
City of Downey	20	112,585	100%	14	E-ESE
City of Lynwood	5	65,965	98%	5	SSW
City of Bell Gardens	1	11,879	100%	1	ENE
Maywood MWC #2	2	6,700	80%	2	NNW
Walnut Park MWC	3	16,180	73%	3	WNW
GSWC – Hollydale	2	7,666	100%	2	SSE
City of Vernon	7	45,000	84%	5	NNW
GSWC – Florence/Graham	7	65,182	82%	6	WNW
City of Compton	7	81,965	71%	3	SW
City of Commerce	2	3,828	100%	2	NE
Lynwood Park MWC	3	2,300	100%	3	SW
CalWater Service – ELA	9	150,729	63%	6	NNE-NE
GSWC – Willowbrook	2	10,682	> 60%	2	SW
PWC – Compton/Willowbrook	1	24,698	64	1	SW
Sativa LA CWD	3	6,837	100%	1	SW

Footnotes:
1 = Does not include standby wells
References:
CTE, 2011; CWS, 2016; KJC, 2016a; KJC, 2016b; MWM, 2016; RMP, 2011; SAA, 2011; SEI, 2012; SWRCB, 2017; Weston, 2016

Figures



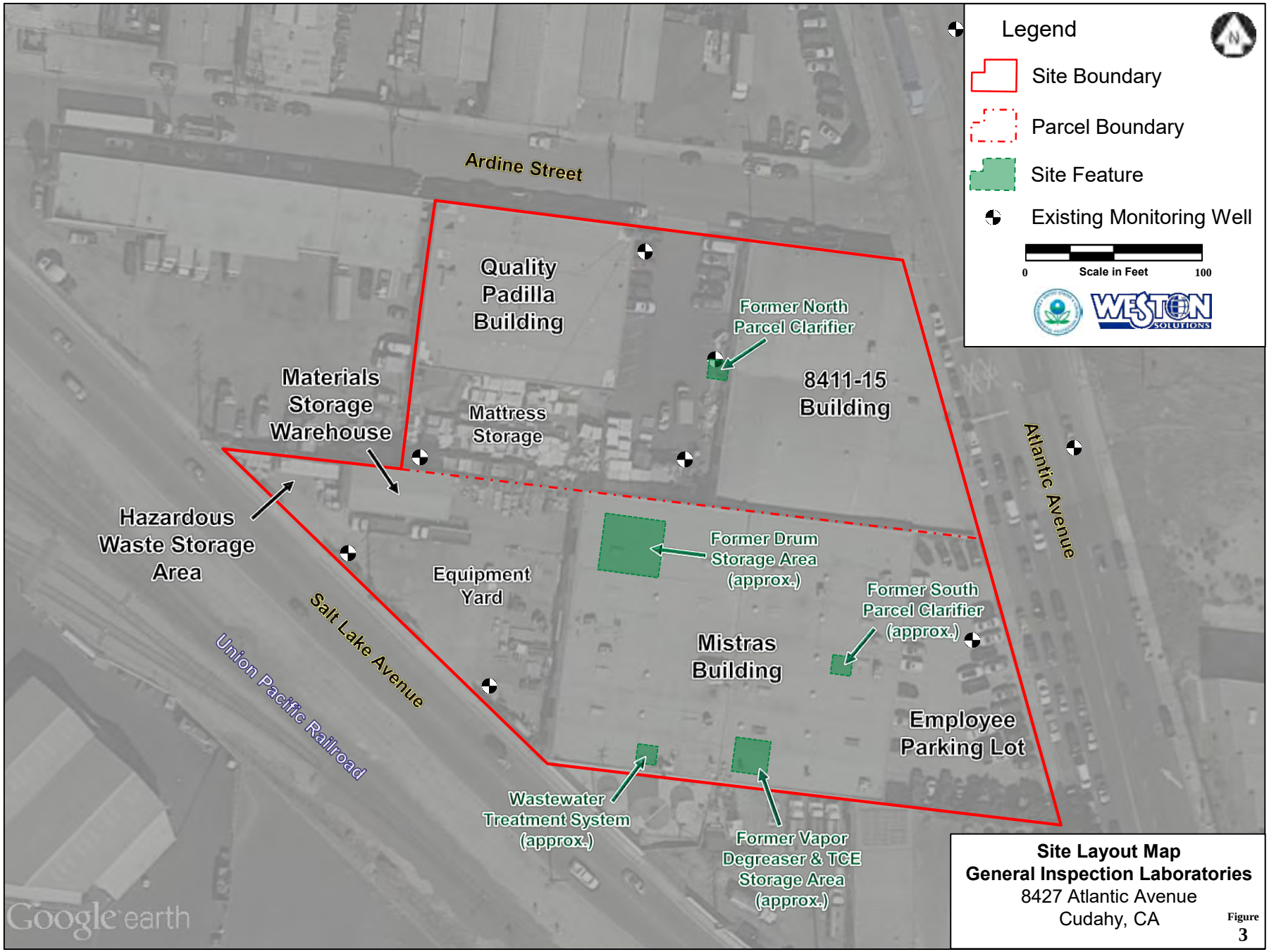
Site Location Map
General Inspection Laboratories
8427 Atlantic Avenue
Cudahy, California

0 Scale in Miles 0.5

Figure 1

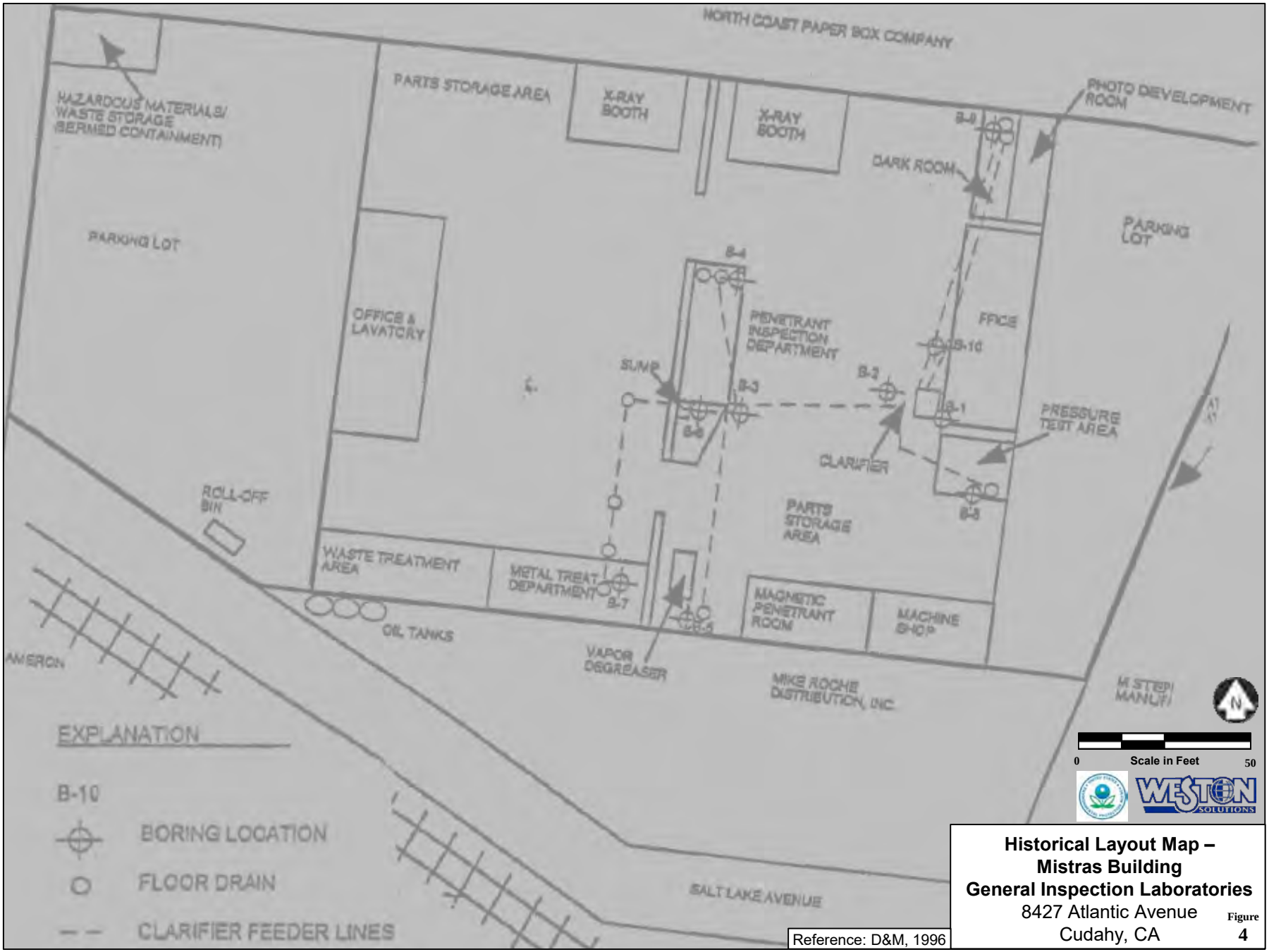
Parcel Layout Map
General Inspection Laboratories
8427 Atlantic Avenue
Cudahy, California

Figure
2



Site Layout Map
General Inspection Laboratories
8427 Atlantic Avenue
Cudahy, CA

Figure
3

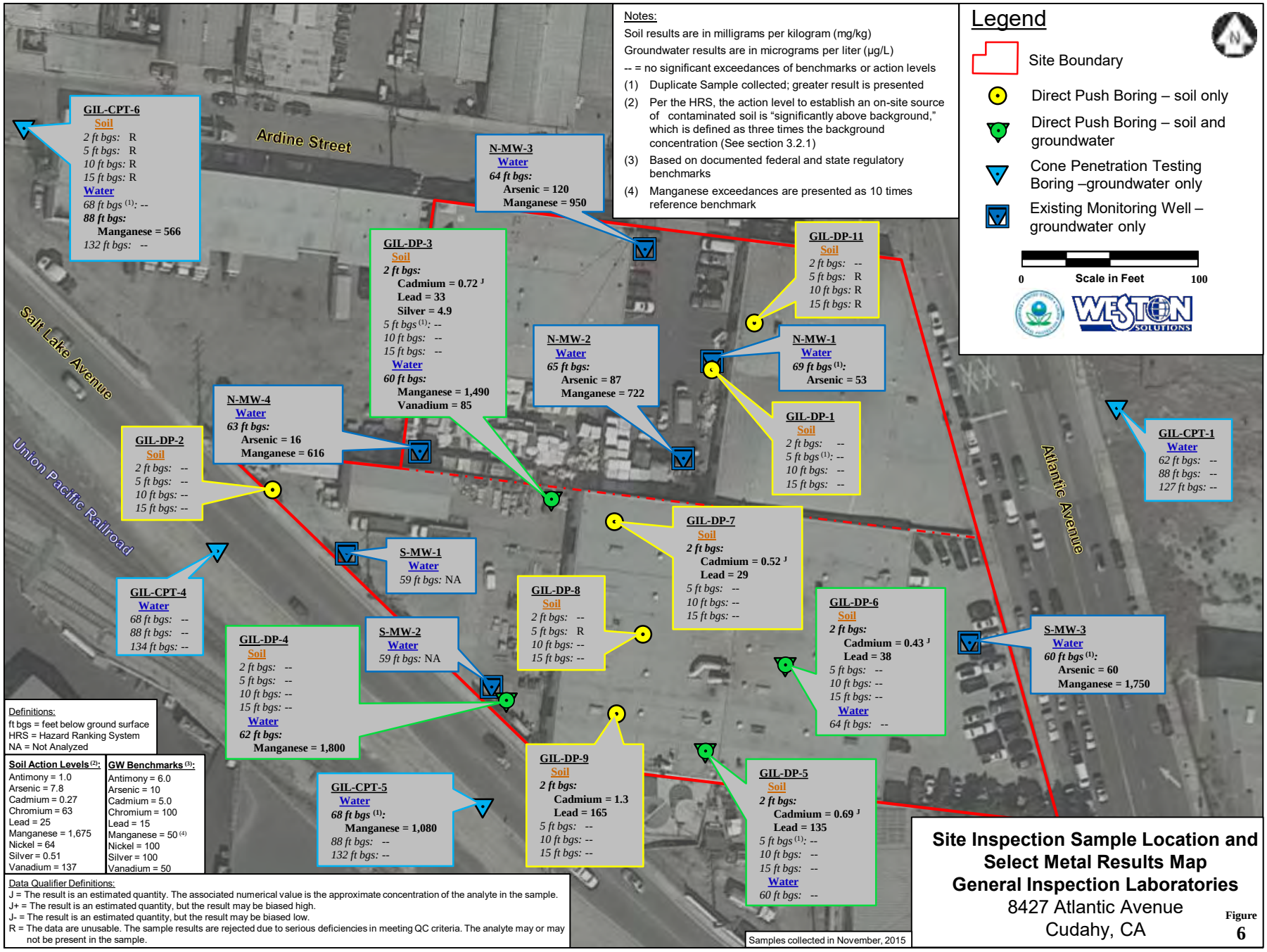


Reference: D&M, 1996

Historical Layout Map – Mistras Building
General Inspection Laboratories
8427 Atlantic Avenue
Cudahy, CA

Figure **4**

Legend
Site Boundary
Direct Push Boring – soil only
Direct Push Boring – soil and groundwater
Cone Penetration Testing Boring –groundwater only
Existing Monitoring Well – groundwater only
Notes:
(1) Soil samples were also collected from GIL-CPT-6; however, results are not included in report discussions (see section 3.2.1)
0
Scale in Feet
100
GIL-CPT-6
Ardine Street
N-MW-3
N-MW-1
GIL-DP-11
GIL-DP-1
N-MW-4
N-MW-2
GIL-CPT-1
Atlantic Avenue
GIL-DP-2
GIL-DP-3
GIL-DP-7
GIL-CPT-4
S-MW-1
GIL-DP-8
GIL-DP-6
S-MW-3
Union Pacific Railroad
S-MW-2
GIL-DP-9
GIL-DP-4
GIL-DP-5
GIL-CPT-5
Salt Lake Avenue
Google earth
Samples collected in November, 2015
Site Inspection Sample Location Map
General Inspection Laboratories
8427 Atlantic Avenue
Cudahy, CA
Figure
5



Notes:

Soil results are in milligrams per kilogram (mg/kg)

Groundwater results are in micrograms per liter (µg/L)

-- = no significant exceedances of benchmarks or action levels

(1) Duplicate Sample collected; greater result is presented

(2) Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)

(3) Based on documented federal and state regulatory benchmarks

(4) Manganese exceedances are presented as 10 times reference benchmark

Legend

- Site Boundary
- Direct Push Boring – soil only
- Direct Push Boring – soil and groundwater
- Cone Penetration Testing Boring –groundwater only
- Existing Monitoring Well – groundwater only

0 Scale in Feet 100

Definitions:
ft bgs = feet below ground surface
HRS = Hazard Ranking System
NA = Not Analyzed

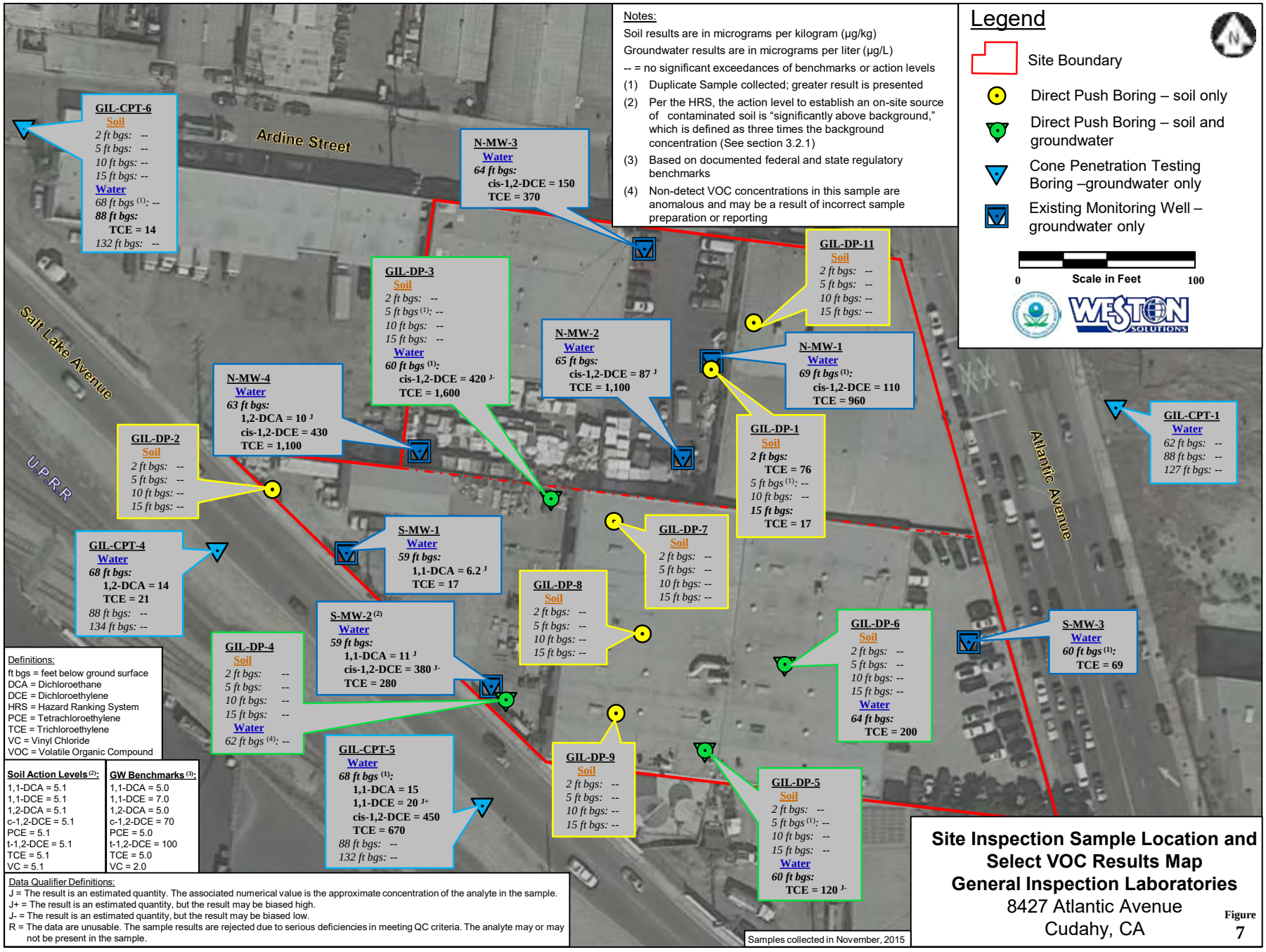
Soil Action Levels (2):	GW Benchmarks (3):
Antimony = 1.0	Antimony = 6.0
Arsenic = 7.8	Arsenic = 10
Cadmium = 0.27	Cadmium = 5.0
Chromium = 63	Chromium = 100
Lead = 25	Lead = 15
Manganese = 1,675	Manganese = 50 (4)
Nickel = 64	Nickel = 100
Silver = 0.51	Silver = 100
Vanadium = 137	Vanadium = 50

Data Qualifier Definitions:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Samples collected in November, 2015

Site Inspection Sample Location and Select Metal Results Map
General Inspection Laboratories
8427 Atlantic Avenue
Cudahy, CA

Figure 6



Notes:

Soil results are in micrograms per kilogram (µg/kg)

Groundwater results are in micrograms per liter (µg/L)

-- = no significant exceedances of benchmarks or action levels

(1) Duplicate Sample collected; greater result is presented

(2) Per the HRS, the action level to establish an on-site source of contaminated soil is "significantly above background," which is defined as three times the background concentration (See section 3.2.1)

(3) Based on documented federal and state regulatory benchmarks

(4) Non-detect VOC concentrations in this sample are anomalous and may be a result of incorrect sample preparation or reporting

Legend

- Site Boundary
- Direct Push Boring – soil only
- Direct Push Boring – soil and groundwater
- Cone Penetration Testing Boring –groundwater only
- Existing Monitoring Well – groundwater only

0 Scale in Feet 100

Definitions:

ft bgs = feet below ground surface
DCA = Dichloroethane
DCE = Dichloroethylene
HRS = Hazard Ranking System
PCE = Tetrachloroethylene
TCE = Trichloroethylene
VC = Vinyl Chloride
VOC = Volatile Organic Compound

Soil Action Levels (2):	GW Benchmarks (3):
1,1-DCA = 5.1	1,1-DCA = 5.0
1,1-DCE = 5.1	1,1-DCE = 7.0
1,2-DCA = 5.1	1,2-DCA = 5.0
c-1,2-DCE = 5.1	c-1,2-DCE = 70
PCE = 5.1	PCE = 5.0
t-1,2-DCE = 5.1	t-1,2-DCE = 100
TCE = 5.1	TCE = 5.0
VC = 5.1	VC = 2.0

Data Qualifier Definitions:

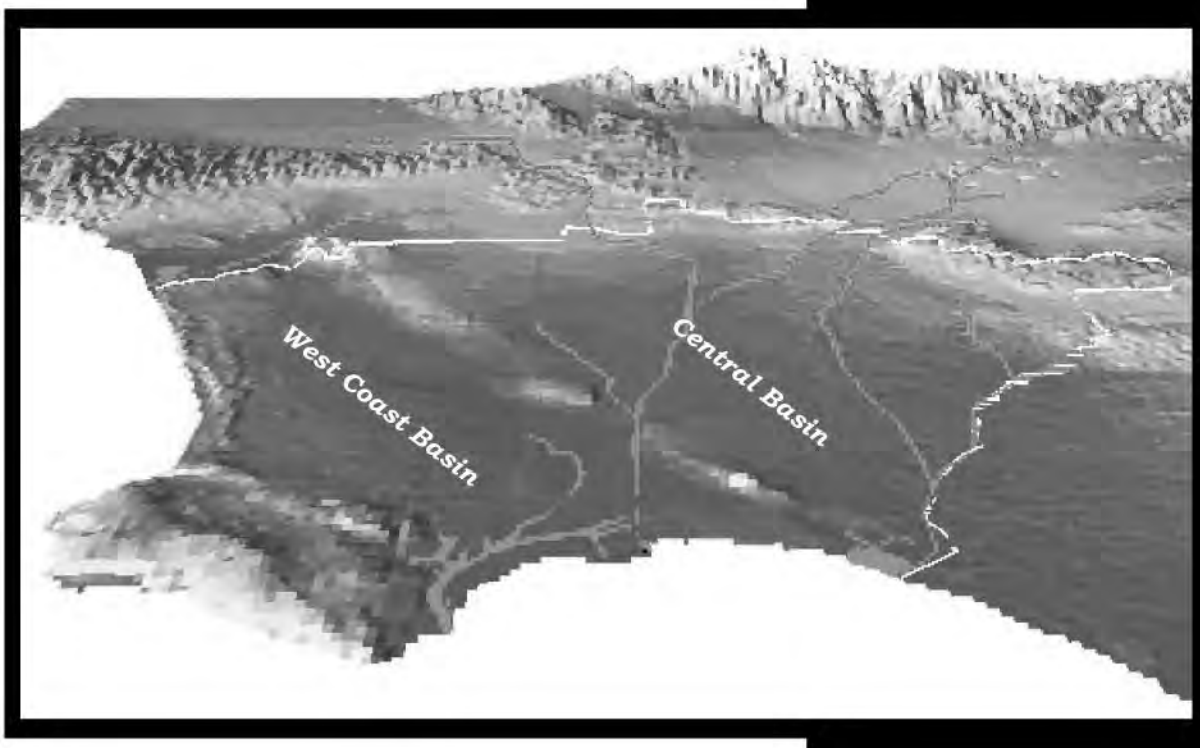
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, but the result may be biased high.
J- = The result is an estimated quantity, but the result may be biased low.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Samples collected in November, 2015

Site Inspection Sample Location and Select VOC Results Map
General Inspection Laboratories
8427 Atlantic Avenue
Cudahy, CA

Figure 7

Reference:
WRD, 2017



Engineering Survey and Report

2017

WRD

WATER REPLENISHMENT DISTRICT
OF SOUTHERN CALIFORNIA

March 2, 2017

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CHAPTER 3 - GROUNDWATER CONDITIONS

Introduction

The California Water Code Section 60300 requires WRD to determine annually in the Engineering Survey and Report ("ESR") the following items related to groundwater conditions in the Central Basin and West Coast Basin ("CBWCB"):

1) Total groundwater production for the previous water year ("WY") and estimates for the current and ensuing WYs;

2) The Annual Overdraft for the previous WY and estimates for the current and ensuing WYs;

3) The Accumulated Overdraft for previous WY and an estimate for the current WY;

4) Changes in groundwater levels (pressure levels or piezometric heights) within the District and the effects these changes have on groundwater supplies within the District; and

5) An estimate of the quantity, source, and cost of water available for replenishment during the ensuing WY;

To meet these requirements, WRD's hydrogeologists and engineers closely monitor and collect data to manage the groundwater resources of the District throughout the year. They track groundwater levels from WRD's network of specialized monitoring wells and from groundwater producers' production wells. They utilize computer models developed by the United States Geological Survey ("USGS") and others to provide parameters for data analysis and to simulate groundwater conditions and predict future conditions. They use their geographic information system ("GIS") and database management system to store, analyze, map, and report on the information required for the ESR. They work closely with the Los Angeles County Department of Public Works ("LACDPW") on spreading grounds and seawater barrier wells to determine current and future operational impacts to groundwater supplies. They work closely with the Metropolitan Water District of Southern California ("MWD" or "Met"), the local MWD member agencies, and the Sanitation Districts of Los Angeles County ("SDLAC") on the current and future availability of replenishment water. They also work with regulators on replenishment criteria for water quality and recycled water use, and with the groundwater pumpers, the pumpers' Technical Advisory Committee ("TAC"), the Budget Advisory Committee ("BAC"), and other stakeholders to discuss the current and future groundwater conditions and beneficial projects and programs within the District and neighboring basins.

The information on Annual Overdraft, Accumulated Overdraft, water levels, and change in storage are discussed in the remainder of this chapter. Groundwater production was previously discussed in Chapter 2. The estimated quantity, source, and cost of replenishment water will be discussed in Chapter 4. Projects and programs are discussed in Chapter 5.

Annual Overdraft

Section 60022 of the Water Replenishment District Act defines Annual Overdraft as "*...the amount...by which the quantity of groundwater removed by any natural or artificial means from the groundwater supplies within such replenishment district during the water year exceeds the quantity of non-saline water replaced therein by the replenishment of such groundwater supplies in such water year by any natural or artificial means other than replenishment under the provisions of Part 6 of this act or by any other governmental agency or entity.*" (Part 6 of the Act pertains to water that WRD purchases for replenishment). Therefore, the Annual Overdraft equals the natural inflows to basins

(not including WRD purchased water) minus all of the outflows (mostly pumping). There is an Annual Overdraft almost every year for the simple fact that the groundwater extractions typically exceed the natural inflows into the groundwater basins. It has been one of the District's main responsibilities since its formation in 1959 to help make up this Annual Overdraft by purchasing artificial replenishment water to recharge the aquifers and supplement natural recharge.

To determine the Annual Overdraft for the previous WY, WRD determines the inflows and outflows of the CBWCB. In the previous WY 2015/16, natural inflows (storm water capture, areal recharge, and net groundwater underflow) totaled 104,316 AF and WRD added 110,051 AF of supplemental recharge water (imported and recycled) at the seawater barrier wells and spreading grounds. Total natural and artificial inflows, therefore, equaled 214,367 AF. Total pumping in the basins was 214,867 AF. The Annual Overdraft is the natural inflows minus total outflows, or 110,551 AF (rounded to 110,600 AF).

For the current and ensuing WY estimates for Annual Overdraft, the concept of "Average Annual Groundwater Deficiency" is utilized. The Average Annual Groundwater Deficiency is the long-term average of natural inflows minus total outflows and represents the long term average deficit in the basins. The development of the USGS/WRD computer model derived these long term average inflow and outflow terms. **Table 4** presents this information, which concluded that the Average Annual Groundwater Deficiency is 105,385 AFY. Values for the Average Annual Groundwater Deficiency are based on the 30-year average inflows and outflows as calculated by the computer model which ran from October 1970 through September 2000. Long-term average inflows are influenced by the amount of precipitation falling on the District as well as for storm water capture at the spreading grounds. **Table 5** and **Figure A** show the historical precipitation amounts in the District. Current measurements are utilized from LACDPW Precipitation Station #383 (Imperial Yard) located in unincorporated County land near the cities of South Gate, Downey, and Lynwood.

The calculation of the Average Annual Groundwater Deficiency represents that, in general, WRD needs to replenish about 105,385 AFY assuming long-term average conditions over that 30 year period for the water balance to reach equilibrium, the overall change in storage to equal zero, and groundwater levels to remain relatively constant. To estimate the current and ensuing year Annual Overdraft, adjustments are made to the Average Annual Groundwater Deficiency for any expected deviations in the current and ensuing water years. **Table 6** presents these adjustments and the calculation of the Annual Overdraft. For the current year, the Annual Overdraft is estimated at 61,500 AF (lower than usual because of the wet year and reduced pumping) and for the ensuing year 82,800 AF.

Accumulated Overdraft

Section 60023 of the Water Replenishment District Act defines *"Accumulated Overdraft"* as *"...the aggregate amount...by which the quantity of ground water removed by any natural or artificial means from the groundwater supplies...during all preceding water years shall have exceeded the quantity of non-saline water replaced therein by the replenishment of such ground water supplies in such water years by any natural or artificial means..."*

In connection with the preparation of Bulletin No. 104-Appendix A (1961), the DWR estimated that the historically utilized storage (Accumulated Overdraft) between the high WY of 1904 and 1957[1] was 1,080,000 AF (780,000 in CB, 300,000 in WCB). Much of this storage removal was from the forebay areas (Montebello Forebay and Los Angeles Forebay), where aquifers are merged, unconfined and serve as the "headwaters" to the confined pressure aquifers. Storage loss from the confined and completely full, deeper aquifers was minimal in comparison or was replaced by seawater intrusion,

[1] DWR Bulletin 104-A did not refer to the ending year for the storage determination. WRD has assumed it to be the year 1957, as this is the end year for their detailed storage analysis presented in Bulletin 104-B – Safe Yield Determination.

which cannot be accounted for under the language of the Water Code since it is considered saline water.

The goal of groundwater basin management by WRD is to ensure a sufficient supply of safe and reliable groundwater in the basins for annual use by the pumpers, to keep a sufficient supply in storage for times of drought when imported water supplies may be curtailed for several consecutive years as well as to keep suitable room available in the basins to receive natural water replenishment in very wet years.

To compute the Accumulated Overdraft since this initial amount of 1,080,000 AF, WRD takes each consecutive year's Annual Overdraft and replenishment activities and determines the change in storage. It adds to or subtracts from the corresponding value from the Accumulated Overdraft. Since the base level, the aggregate excess of extractions over recharge has been reduced due to the artificial replenishment activities by LACDPW and WRD at the spreading grounds and seawater barrier wells and the reduction of pumping established by the adjudications and by WRD's In-Lieu Program. The Accumulated Overdraft at the end of the previous WY was determined to be 832,822 AF. For the current year, the Accumulated Overdraft is forecast to improve to 761,700 AF due to the above normal precipitation, the reduction in pumping, and the purchase of extra imported water for spreading (makeup water from previous years when it was not available). This could change if hydrology or pumping patterns or planned artificial replenishment activities vary considerably in the near future.

Table 7 presents information for the previous and current Accumulated Overdraft estimate. The annual changes in storage are presented on **Table 8**.

Groundwater Levels

A groundwater elevation contour map representing water levels within the District in fall 2016 (end of the WY) was prepared for this report and is presented as **Plate 2**. The data for the map were collected from wells that are screened in the deeper basin aquifers where the majority of groundwater pumping occurs. These deeper aquifers include the Upper San Pedro Formation aquifers, including the Lynwood, Silverado, and Sunnyside. Water level data was obtained from WRD's network of monitoring wells and from groundwater production wells that are screened in the deeper aquifers.

As can be seen on **Plate 2**, groundwater elevations range from a high of about 150 feet above mean sea level (msl) in the northeast portion of the basin above the spreading grounds in the Whittier Narrows to a low of about 105 feet below mean sea level (msl) in the Long Beach area. With the exception of the Montebello Forebay and along the West Coast Basin Barrier Project, the majority of groundwater levels in the District remain below sea level (red colored contour lines on **Plate 2**), which is why continued injection at the seawater barriers is needed to prevent saltwater intrusion.

Plate 2 also shows the location of the key wells used for long-term water level data. These long-term hydrographs have been presented in the ESR for years, and provide a consistent basis from which to compare changing water levels. A discussion of water levels observed in the key wells is presented below.

Los Angeles Forebay

The Los Angeles Forebay occupies the westerly portion of the Central Basin Non-Pressure Area. Historically a recharge area for the Los Angeles River, this forebay's natural recharge capability has been substantially reduced since the river channel was lined and open areas paved over. Recharge is now limited to deep percolation of precipitation in limited areas, In-Lieu replenishment when available, subsurface inflow from the Montebello Forebay, the northern portion of the Central Basin outside of WRD's boundary, and the San Fernando Valley through the Los Angeles Narrows.

Key well #2778 (2S/13W-10A01) represents the water level conditions of the Los Angeles Forebay (see **Figure B**). The water level high was observed in 1938 at an elevation of approximately 70 feet above msl and by 1962 water levels had fallen nearly 180 feet to an elevation of 109 ft below msl due to basin over-pumping and lack of sufficient natural recharge. Since then, basin adjudication and managed aquifer recharge by WRD and others have improved water levels in this area. At the end of WY 2015/16, groundwater levels were at an elevation of 22.6 feet below msl and were 0.6 feet lower than the previous year. The average water level change throughout the entire Los Angeles Forebay based on WRD's GIS analysis was a drop of 2.6 feet.

Montebello Forebay

The Montebello Forebay lies in the northeastern portion of the Central Basin and connects with the San Gabriel Basin to the north through the Whittier Narrows. The Rio Hondo and San Gabriel River Coastal Spreading Grounds (often called the "Montebello Forebay Spreading Grounds") provide a substantial amount of recharge water to the CBWCB since the aquifers there are unconfined and allow easy infiltration of surface water impounded at the spreading grounds to the deeper groundwater.

Three key wells help describe the groundwater level conditions in the Montebello Forebay, a northern well, a middle well, and a southeastern well (**Plate 2**). The historic water levels in these three key wells are discussed below:

- Well Pico1_4 (2S/11W-18C07) is in the northern part of the Montebello Forebay. The upper chart on **Figure C** shows the water levels for this well. Historic water levels at this well or its predecessors have ranged from a high elevation of 164.7 feet above mean sea level in April 1944 to a low of 42.8 feet above msl in December 1957. At the end of WY 2015/16, groundwater levels in this well were at an elevation of 86.6 feet above msl and were 7.6 feet higher than the previous year.

- Well 1601T (2S/12W-24M08) is centrally located between the Rio Hondo and San Gabriel spreading grounds. This well is monitored weekly to assess water levels in the middle of the forebay. The center chart on **Figure C** shows the water levels for this well. The historic water level high was observed in 1942 at an elevation of 137.8 feet above mean sea level, but by 1957 it had fallen 117 feet to an all-time low elevation of 20.9 feet above msl due to basin over-pumping and insufficient natural recharge. As described above for the Los Angeles Forebay, adjudication of pumping rights and managed aquifer recharge helped restore water levels in the Montebello Forebay. At the end of WY 2015/16, groundwater levels in this well were at an elevation of 61.7 feet above msl and were 5.8 feet higher than the previous year. So far in the current WY, water levels have risen nearly 40 feet due to above normal precipitation and imported water purchased by WRD for spreading.

- Well 1615P (3S/12W-01A06) is located downgradient and southeast of the spreading grounds near the southern end of the Montebello Forebay. Water level responses in this well are typically less pronounced than the other two wells because it is further from the spreading grounds and the recharge that occurs there. The lower chart on **Figure C** shows the water level history for this well. The historic water level high was observed in 1947 at an elevation of 113.6 feet above mean sea level but by 1957 had dropped 102 feet to an all-time low elevation of 11.4 feet above msl. Since then, water levels have recovered. At the end of WY 2015/16, groundwater levels were at an elevation of 40.1 feet above msl and were 1.4 feet lower than the previous year.

The average water level change throughout the entire Montebello Forebay during the previous WY was a rise of 0.6 feet.

Central Basin Pressure Area

The District monitors long term key wells 906D (4S/13W-12K01) and 460K (4S/12W-28H09) which represent the conditions of the pressurized groundwater levels in the Central Basin Pressure Area. The hydrographs for these two wells are shown on **Figure D**.

Groundwater highs were observed in these wells in 1935 when they began to continually drop over 110 feet until their lows in 1961 due to the over-pumping and insufficient natural recharge. Groundwater levels recovered substantially during the early 1960s as a result of replenishment operations and reduced pumping. Between 1995 and 2007 there were 100-foot swings in water levels each year between winter and summer caused by pumping pattern changes by some of the Central Basin producers who operate with more groundwater in the summer months and less groundwater in the winter months, and took advantage of the MWD and WRD In-Lieu programs. From May 2007 to March 2011 the In-Lieu water was not available, so pumping remained more constant throughout those years and water levels remain low. Since then, In-Lieu with the City of Long Beach has occurred on several occasions, with resulting water levels rising as the pumps go off, and falling when the pumps come on.

At the end of WY 2015/16, groundwater levels in well 906D were at an elevation of 59.1ft below msl and were 4.9 feet higher than the previous year. Water levels in well 460K were at an elevation of 90.9 ft below msl and were 5.7 feet higher than the previous year. The average water levels change throughout the entire Central Basin Pressure Area during the previous WY was a drop of 0.6 feet.

West Coast Basin

The West Coast Basin is adjacent to the Central Basin along the Newport-Inglewood Uplift, which is a series of discontinuous, sub-parallel hills and faults that act as a partial barrier to groundwater flow. Groundwater moves across the uplift based on water levels on both sides and the "tightness" (hydraulic conductivity) of the uplift along its various reaches, both horizontally and vertically. Like the Central Basin Pressure Area, most of the aquifers used for water supply are confined aquifers and therefore do not respond rapidly to precipitation events, but instead to changes in pumping patters or seawater barrier well injection rates.

Figure E shows the hydrographs of key well Wilmington1_3 and well Lawndale1_4. These two wells represent the general conditions of the water levels in the West Coast Basin. In 1955, the control of groundwater extractions in the West Coast Basin resulted in stabilizing and reversal of the declining water levels in the center of the basin whereas at the eastern end near the Dominguez Gap Barrier water levels continued to decline until about 1971, when a recovery began due mostly to the startup of the Dominguez Gap Barrier Project.

At the end of the previous WY 2015/16, water levels in well Lawndale1_4 were at an elevation of 4.2 ft below msl and were 4.0 feet higher than the previous year. Water levels in well Wilmington1_3 were at an elevation of 43.4 ft below msl and were 2.4 feet lower than the previous year. Over the entire West Coast Basin during the previous WY, the average water level change was a rise of 1 foot.

Whittier Area

The Whittier Area is in the northeastern-most portion of the Central Basin and historically has not been used for significant water supplies due to poor natural water quality conditions (high total dissolved solids) and low production rates. Some minor pumping does occur towards the western end. Because of this, WRD does not maintain long term hydrographs for this area, but does track current groundwater levels. Over the past WY, the groundwater levels fell on average 2.2 feet in the Whittier Area.

Plate 3 shows the water level changes over the entire WRD Service area for the previous WY.

Because of the fifth year of drought and below normal precipitation, WY 2015/16 saw a net loss of groundwater storage of 500 AF. However, this is a small amount and the basins were nearly balanced due to the reduction of pumping from the State-mandated water use restrictions and conservation measures, and the aggressive replenishment of recycled water and imported water by WRD to help make-up for the lack of natural replenishment. Groundwater levels in the WRD service area fell on average only 1.2 foot during the previous WY, which resulted in only the small storage loss.

In the current WY 2016/17, through February the District has received over 15 inches of precipitation, which exceeds its normal full year amount of 13.9 inches causing groundwater levels to rise significantly. In addition, WRD has been purchasing imported water and recycled water for additional recharge. As a result, water levels in the Montebello Forebay have risen nearly 40 feet and are within 20 feet of the pre-drought levels last seen in May 2011. With the rainy season expected to continue in March, April, and May of 2017, additional recharge and rising groundwater levels are anticipated. Because the current groundwater levels in the CBWCB are within historic ranges and the anticipated replenishment activities by WRD will continue as planned, the District anticipates that there will continue to be sufficient supplies of safe and reliable groundwater to meet the demands of the pumpers in our service area in the current and ensuing years.

Change in Storage

The District determines the annual change in groundwater storage by comparing water levels from one year to the next, and factoring in the storage coefficients of the major aquifer layers. Rising groundwater means there is an increase in the amount of groundwater in storage whereas a drop in groundwater levels means there is a decrease in storage. Using groundwater elevation data collected from WRD's monitoring well network and selected production wells, the District constructs a groundwater level change map showing water level differences from one year to the next (**Plate 3**). The data from this map are converted to grids in the District's Geographic Information System (GIS) and multiplied by the storage coefficient value grids for the aquifer layers as obtained from the USGS calibrated Modflow computer model of the District. This calculation produces the change in storage value for the previous WY.

As discussed above, in WY 2015/16 there was a slight decrease in water levels in the District (1.2 feet), although rises occurred in some areas and drops in others. The result was a net decrease in groundwater storage of 500 AF, which is nearly a balanced basin. **Table 8** provides the historical groundwater storage changes in the CBWCB. Based on the groundwater recharge occurring in the current WY due to above normal precipitation and the imported and recycled water being purchased by WRD, it is expected that the groundwater basins will gain storage in the current WY.

Optimum and Minimum Groundwater Quantity

In response to a 2002 State audit of the District's activities, the Board of Directors adopted an Optimum and Minimum Quantity for groundwater amounts in the CBWCB. The Optimum Quantity is based on the Accumulated Overdraft (AOD) concept described in the Water Code and this ESR. The historic maximum groundwater drawdown due to over pumping reported in the CBWCB between 1904 and 1957 was 1,080,000 AF. This is defined as the historic maximum AOD. As pumping eased and artificial replenishment occurred, more water was put back into the basins and the AOD was reduced resulting in rising water levels.

After considerable analysis and discussion, the Board of Directors on June 18, 2003 adopted an Optimum Quantity of groundwater in the WRD service area at an AOD of 400,000 AF and a Minimum Quantity of an AOD of 900,000 AF. Several years later, additional reviews were conducted to update the Optimum Quantity to recognize the need for groundwater storage space within the District. On

April 19, 2006 the WRD Board of Directors revised the Optimum Quantity to an AOD of 612,000 AF. This value was based on an extensive review of over 70 years of water level fluctuations in the District and recognizing that in WY 1999/00 groundwater amounts were at an acceptable quantity to sustain the adjudicated pumping rights in the basins. The AOD at that time was 611,900 AF (rounded to 612,000 AF), and therefore was set by the Board of Directors as the Optimum Quantity. The Minimum Quantity was not modified and therefore remains at an AOD of 900,000 AF.

The Board of Directors on April 19, 2006 also adopted a policy to make up the Optimum Quantity should it fall too low. The policy is as follows:

> *An Accumulated Overdraft greater than the Optimum Quantity is a deficit. WRD will make up the deficit within a 20 year period as decided by the Board on an annual basis. If the deficit is within 5 percent of the Optimum Quantity, then no action needs to be taken to allow for natural replenishment to makeup the deficit.*

The Accumulated Overdraft at the end of WY 2015/16 was 832,822 AF, or 220,800 AF below the Optimum Quantity. Based on the groundwater recharge occurring in the current WY due to above normal precipitation and the imported and recycled water being purchased by WRD, it is expected that the AOD will be reduced and be closer to the Optimum Quantity by the end of the WY.

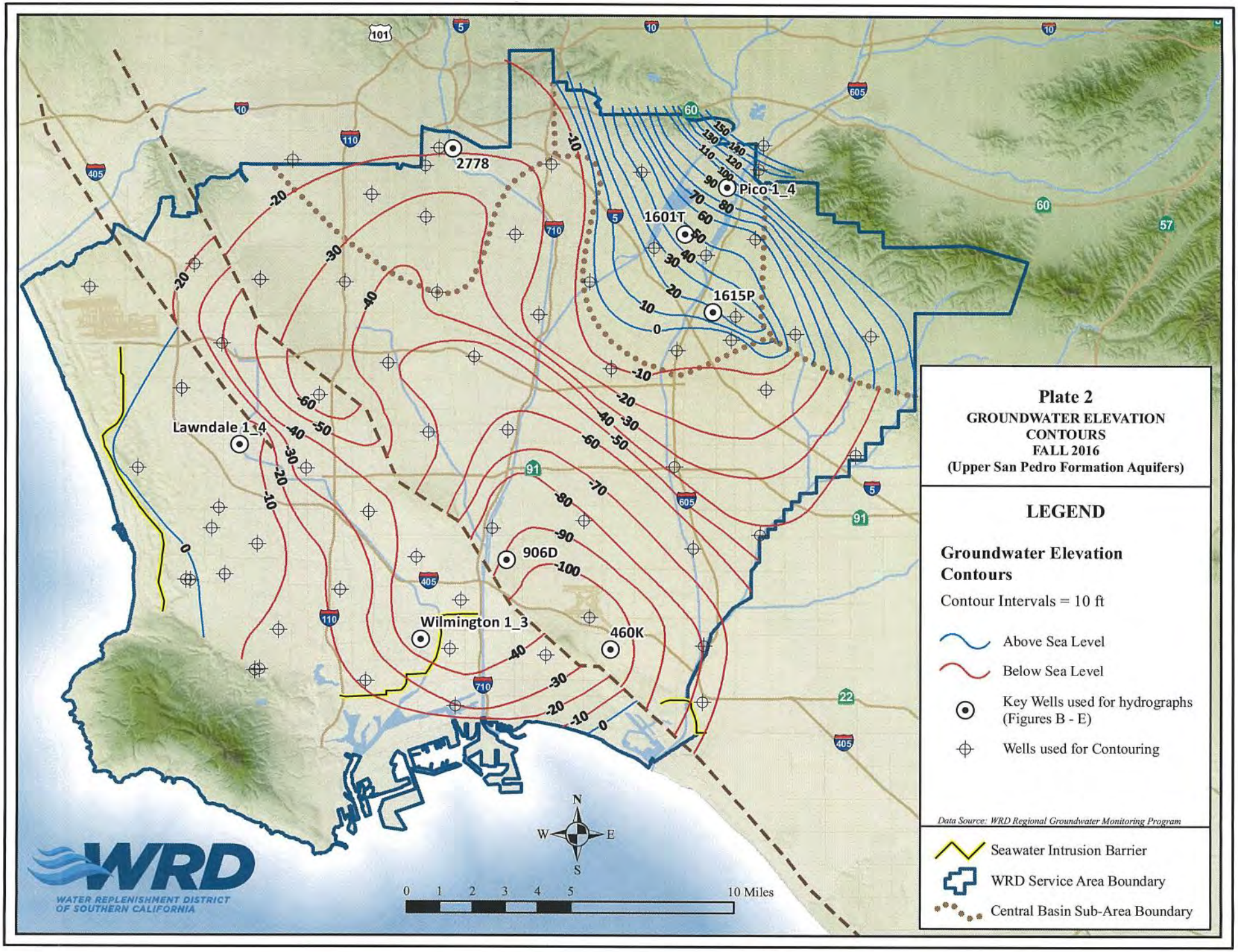
Plate 2
GROUNDWATER ELEVATION CONTOURS
FALL 2016
(Upper San Pedro Formation Aquifers)
LEGEND
Groundwater Elevation Contours
Contour Intervals = 10 ft
Above Sea Level
Below Sea Level
Key Wells used for hydrographs (Figures B - E)
Wells used for Contouring
Data Source: WRD Regional Groundwater Monitoring Program
Seawater Intrusion Barrier
WRD Service Area Boundary
Central Basin Sub-Area Boundary
2778
Pico 1_4
1601T
1615P
Lawndale 1_4
906D
Wilmington 1_3
460K
WRD
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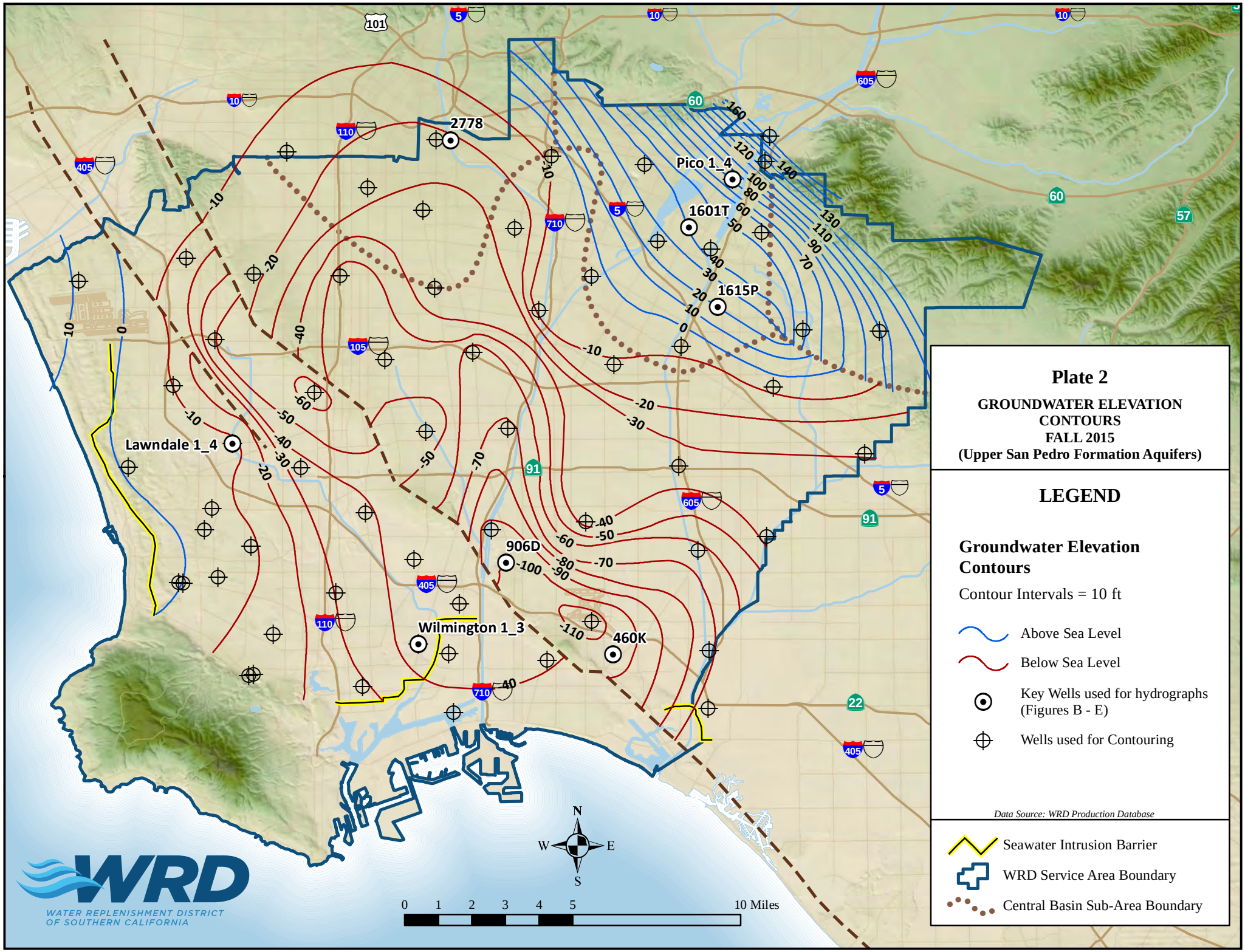
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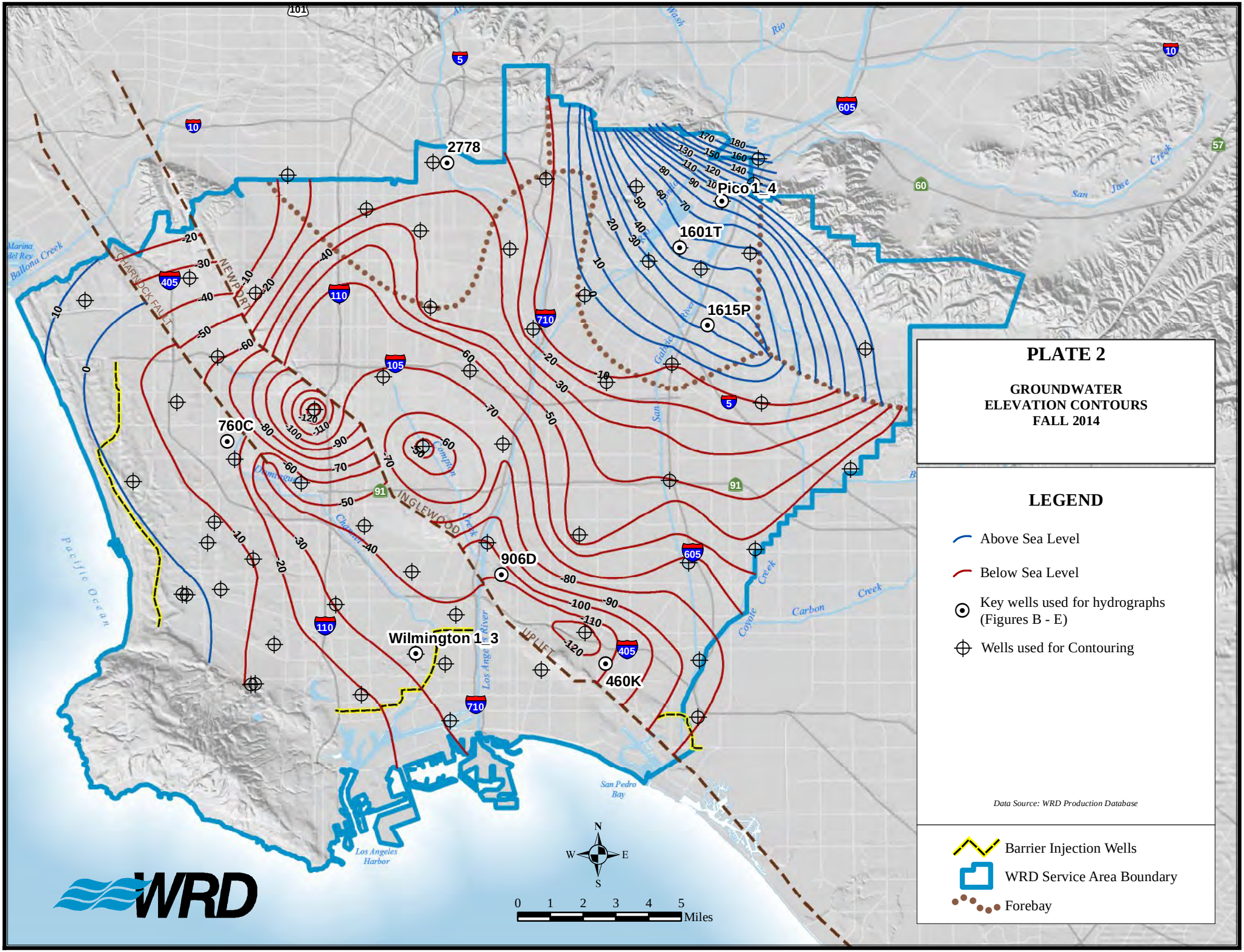
FALL 2015
(Upper San Pedro Formation Aquifers)
LEGEND
Groundwater Elevation Contours
Contour Intervals = 10 ft
Above Sea Level
Below Sea Level
Key Wells used for hydrographs (Figures B - E)
Wells used for Contouring
Data Source: WRD Production Database
Seawater Intrusion Barrier
WRD Service Area Boundary
Central Basin Sub-Area Boundary
2778
Pico 1_4
1601T
1615P
Lawndale 1_4
906D
Wilmington 1_3
460K
N
W
E
S
0 1 2 3 4 5 10 Miles
WRD
WATER REPLENISHMENT DISTRICT OF SOUTHERN CALIFORNIA


2778
Pico 1_4
1601T
1615P
760C
906D
Wilmington 1_3
460K
PLATE 2
GROUNDWATER
ELEVATION CONTOURS
FALL 2014
LEGEND
Above Sea Level
Below Sea Level
Key wells used for hydrographs
(Figures B - E)
Wells used for Contouring
Data Source: WRD Production Database
Barrier Injection Wells
WRD Service Area Boundary
Forebay
N
W
E
S
0 1 2 3 4 5
Miles
WRD

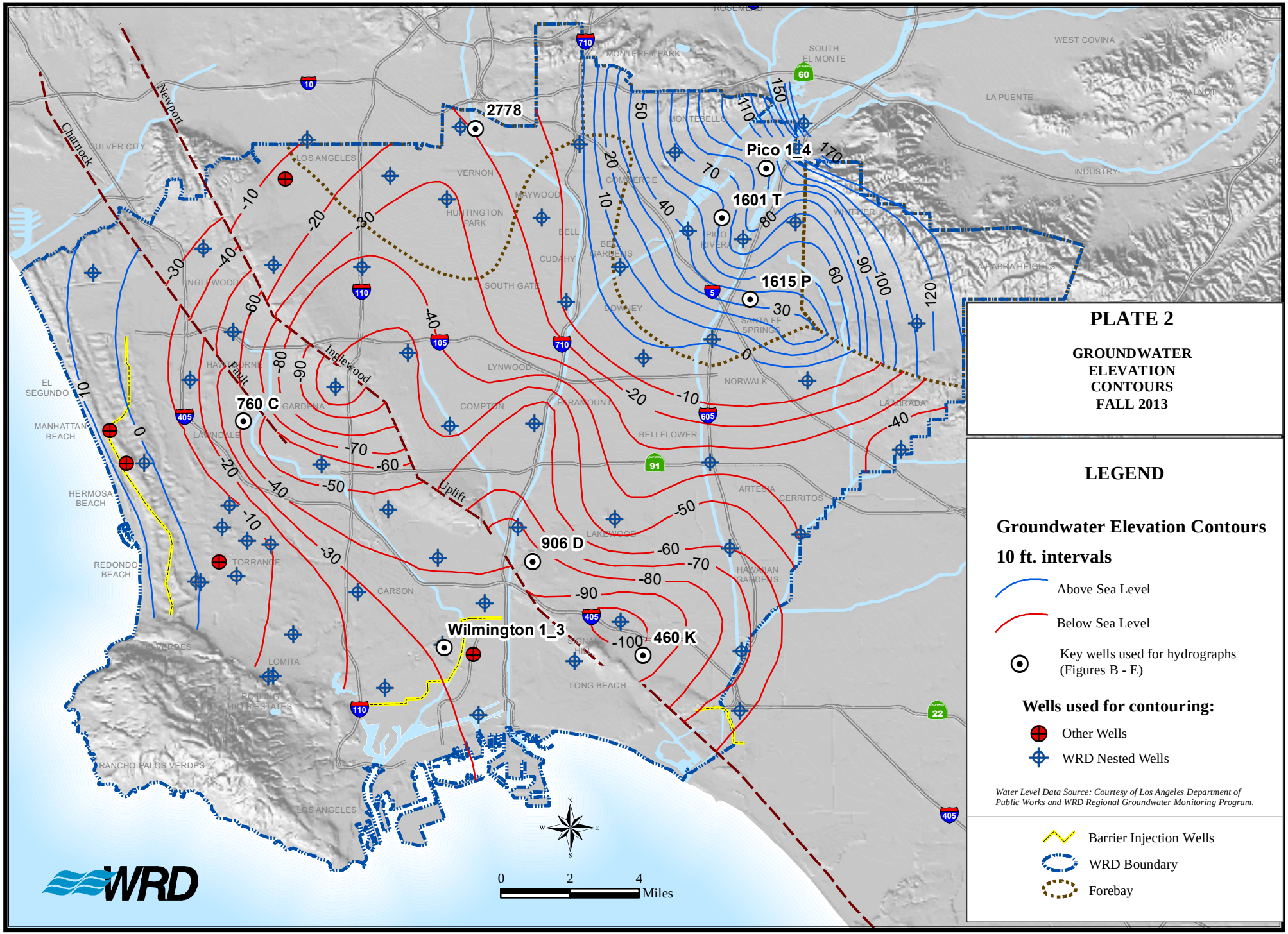
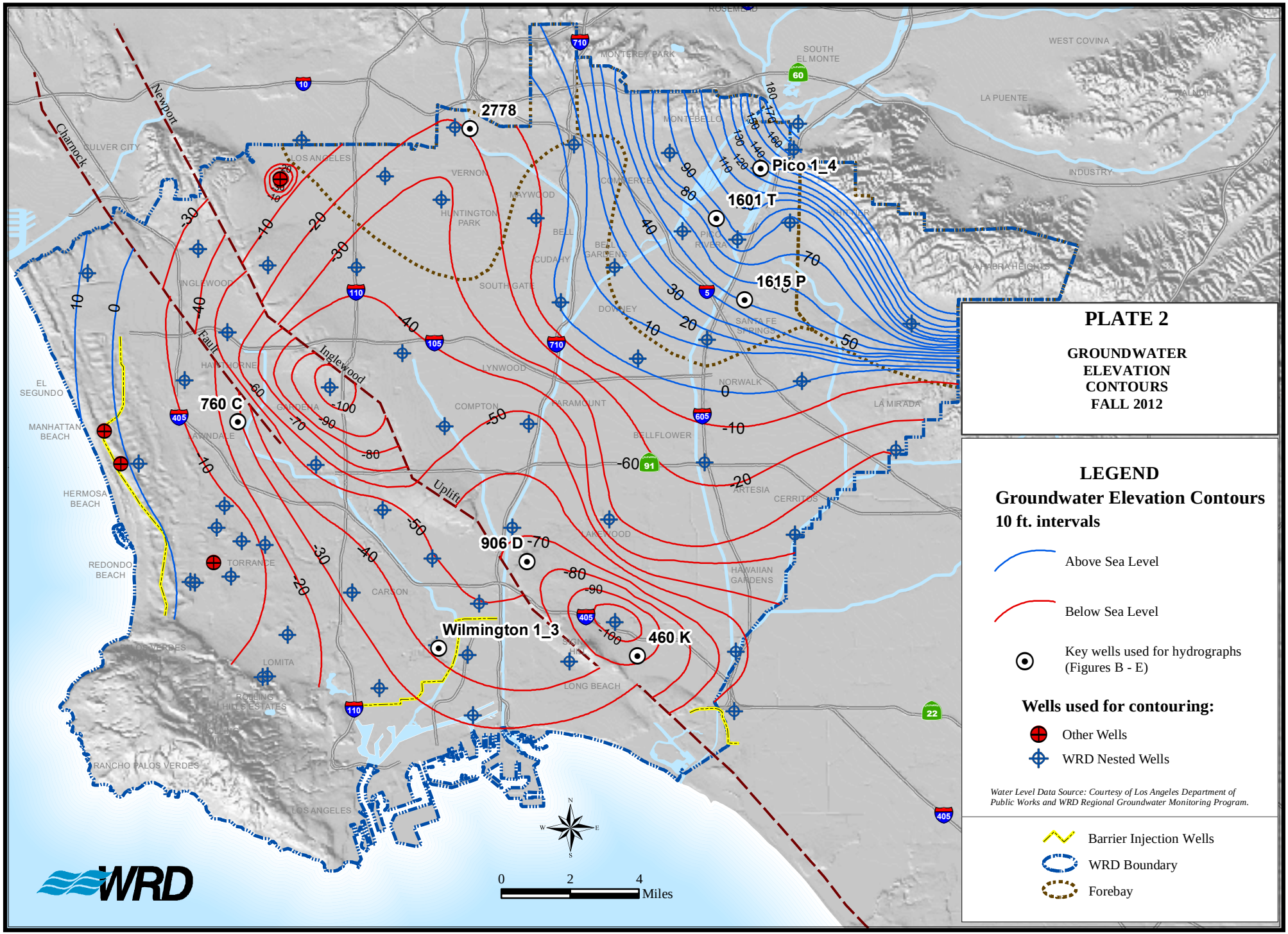


PLATE 2
GROUNDWATER ELEVATION CONTOURS FALL 2013
LEGEND
Groundwater Elevation Contours
10 ft. intervals
Above Sea Level
Below Sea Level
Key wells used for hydrographs (Figures B - E)
Wells used for contouring:
Other Wells
WRD Nested Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.
Barrier Injection Wells
WRD Boundary
Forebay
2778
Pico 1_4
1601 T
1615 P
760 C
906 D
Wilmington 1_3
460 K
Newport
Charnock
Inglewood
Fault
Uplift
WRD
0 2 4 Miles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GROUNDWATER ELEVATION CONTOURS FALL 2012
LEGEND
Groundwater Elevation Contours
10 ft. intervals
Above Sea Level
Below Sea Level
Key wells used for hydrographs (Figures B - E)
Wells used for contouring:
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Pico 1_4
1601 T
1615 P
760 C
906 D
Wilmington 1_3
460 K
Newport
Channock
Fault
Inglewood
Uplift
0 2 4 Miles
WRD

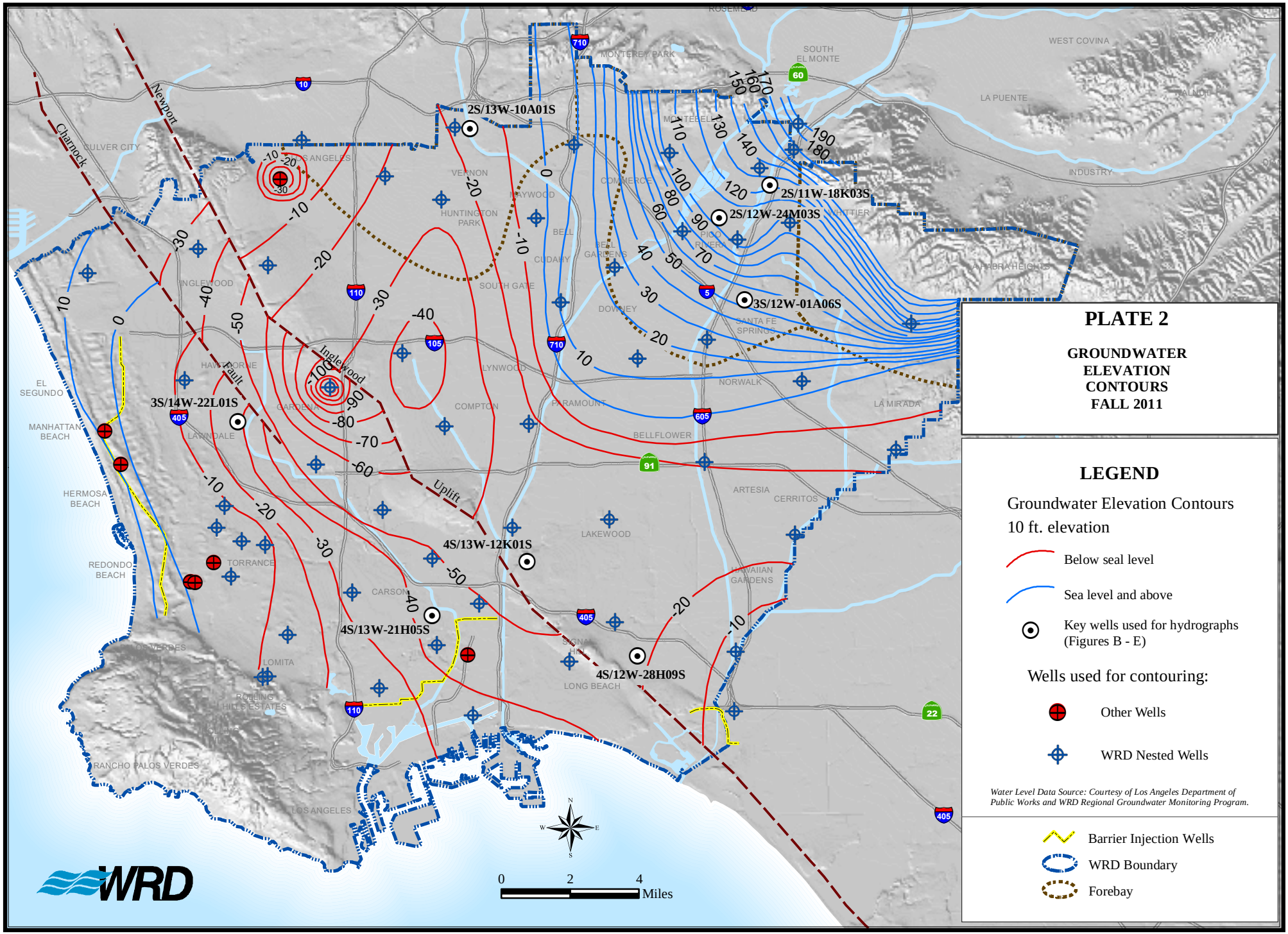
PLATE 2
GROUNDWATER ELEVATION CONTOURS FALL 2011
LEGEND
Groundwater Elevation Contours
10 ft. elevation
Below seal level
Sea level and above
Key wells used for hydrographs (Figures B - E)
Wells used for contouring:
Other Wells
WRD Nested Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.
Barrier Injection Wells
WRD Boundary
Forebay
2S/13W-10A01S
2S/11W-18K03S
2S/12W-24M03S
3S/12W-01A06S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-21H05S
4S/12W-28H09S
Newport
Charnock
Inglewood
Fault
Uplift
WRD
0 2 4
Miles

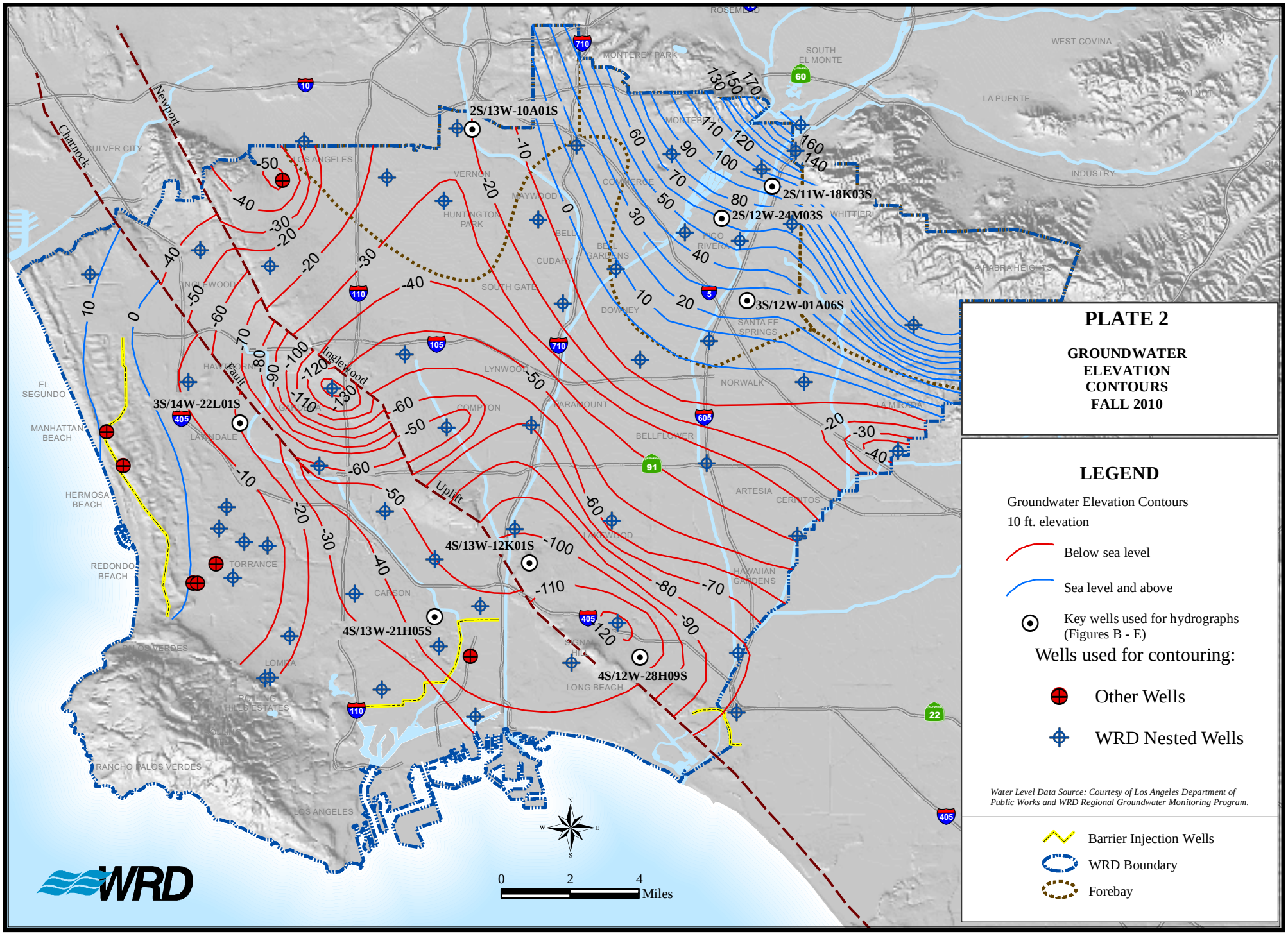
PLATE 2
GROUNDWATER ELEVATION CONTOURS FALL 2010
LEGEND
Groundwater Elevation Contours
10 ft. elevation
Below sea level
Sea level and above
Key wells used for hydrographs (Figures B - E)
Wells used for contouring:
Other Wells
WRD Nested Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.
Barrier Injection Wells
WRD Boundary
Forebay
2S/13W-10A01S
2S/11W-18K03S
2S/12W-24M03S
3S/12W-01A06S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-21H05S
4S/12W-28H09S
Newport
Charnock
Inglewood
Fault
Uplift
WRD
0 2 4 Miles

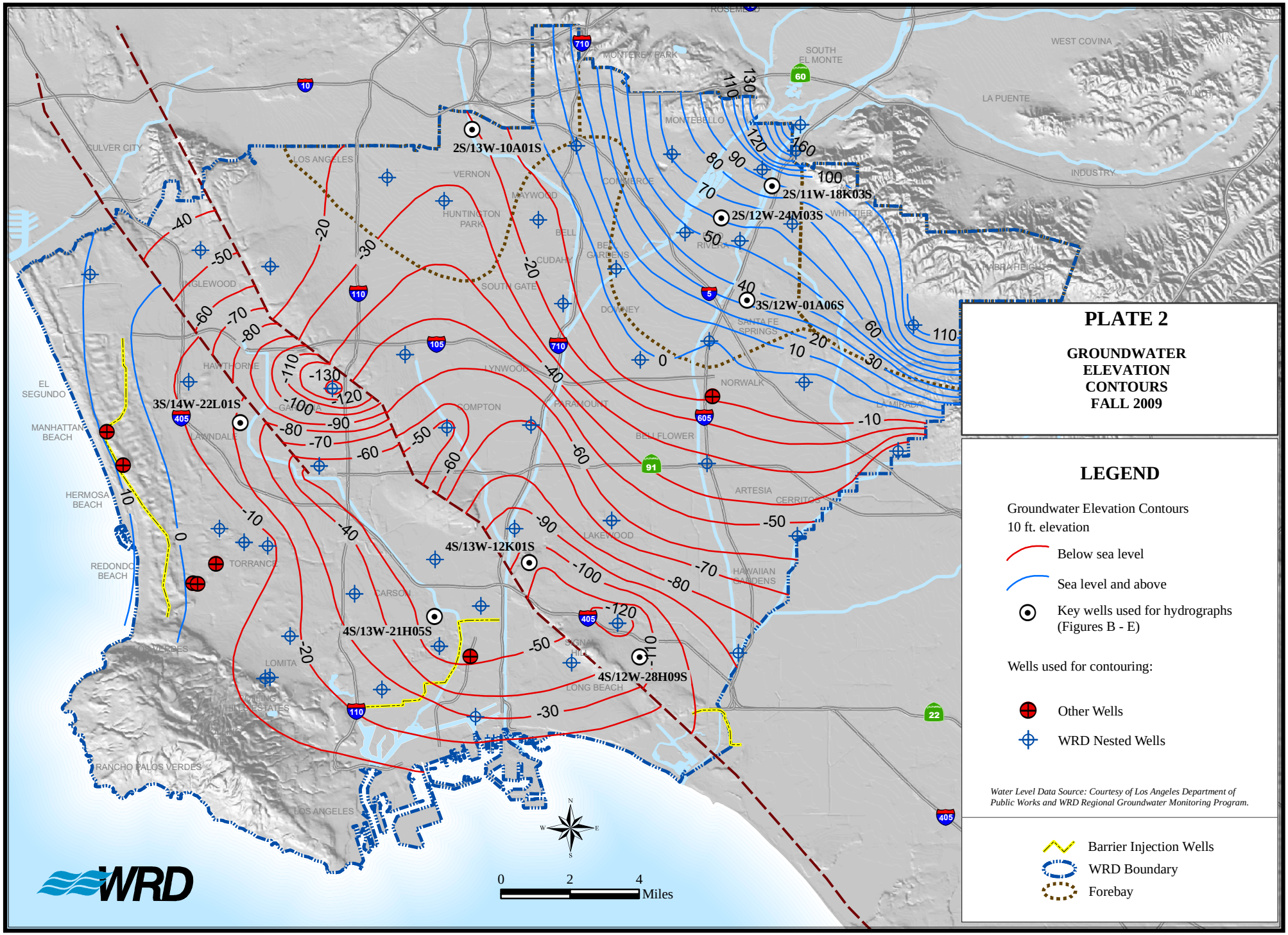
PLATE 2
GROUNDWATER ELEVATION CONTOURS FALL 2009
LEGEND
Groundwater Elevation Contours
10 ft. elevation
Below sea level
Sea level and above
Key wells used for hydrographs (Figures B - E)
Wells used for contouring:
Other Wells
WRD Nested Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.
Barrier Injection Wells
WRD Boundary
Forebay
2S/13W-10A01S
2S/11W-18K03S
2S/12W-24M03S
3S/12W-01A06S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-21H05S
4S/12W-28H09S
WRD
0 2 4 Miles
N
S
E
W

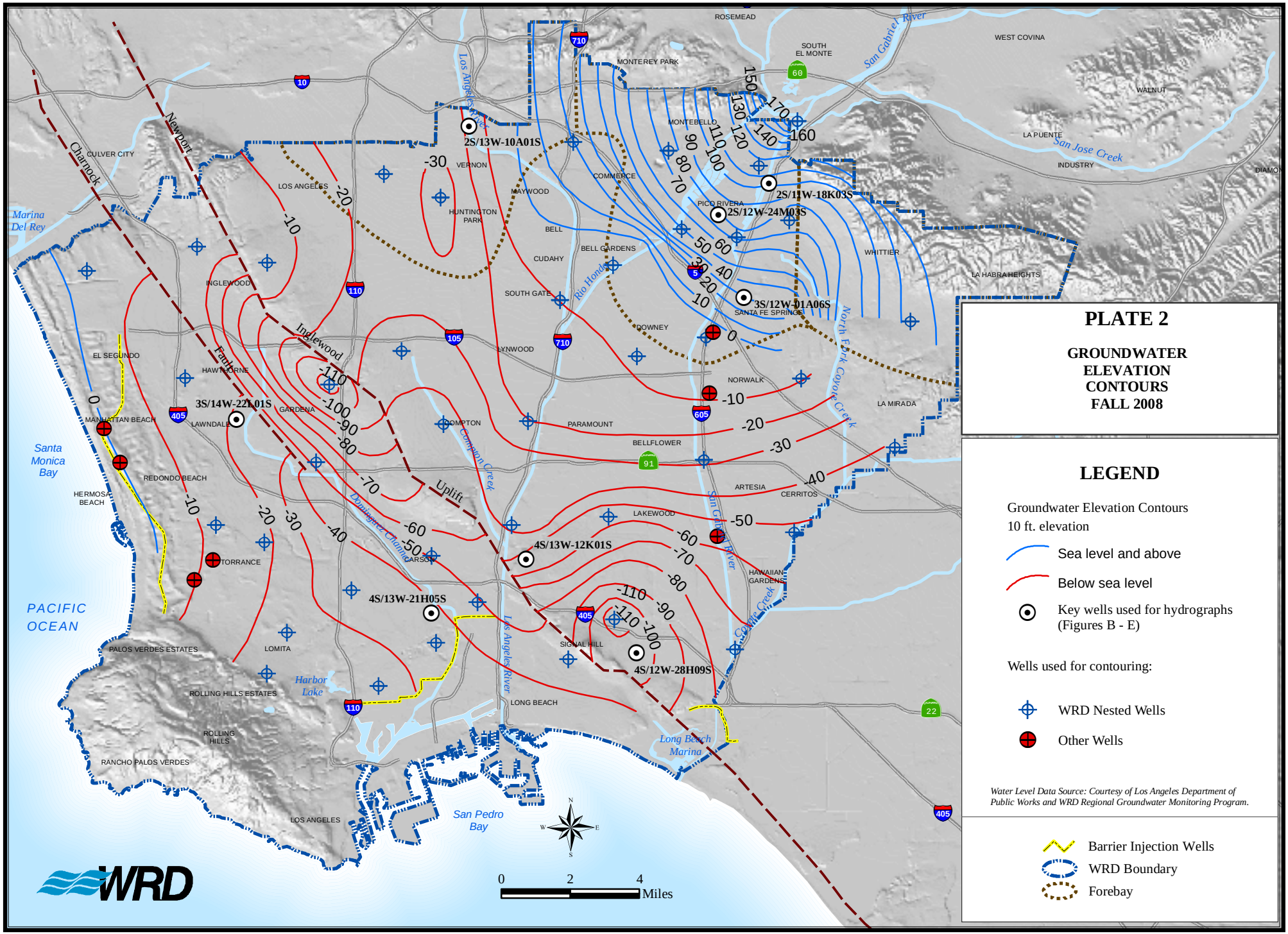
PLATE 2
GROUNDWATER ELEVATION CONTOURS FALL 2008
LEGEND
Groundwater Elevation Contours
10 ft. elevation
Sea level and above
Below sea level
Key wells used for hydrographs (Figures B - E)
Wells used for contouring:
WRD Nested Wells
Other Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.
Barrier Injection Wells
WRD Boundary
Forebay
2S/13W-10A01S
2S/11W-18K03S
2S/12W-24M03S
3S/12W-01A06S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-21H05S
4S/12W-28H09S
Inglewood
Newport
Charnock
Uplift
Dominguez Channel
Compton Creek
Rio Hondo
North Fork Coyote Creek
San Gabriel River
Los Angeles River
San Jose Creek
Coyote Creek
Harbor Lake
Long Beach Marina
San Pedro Bay
PACIFIC OCEAN
Santa Monica Bay
Marina Del Rey
0 2 4 Miles
WRD

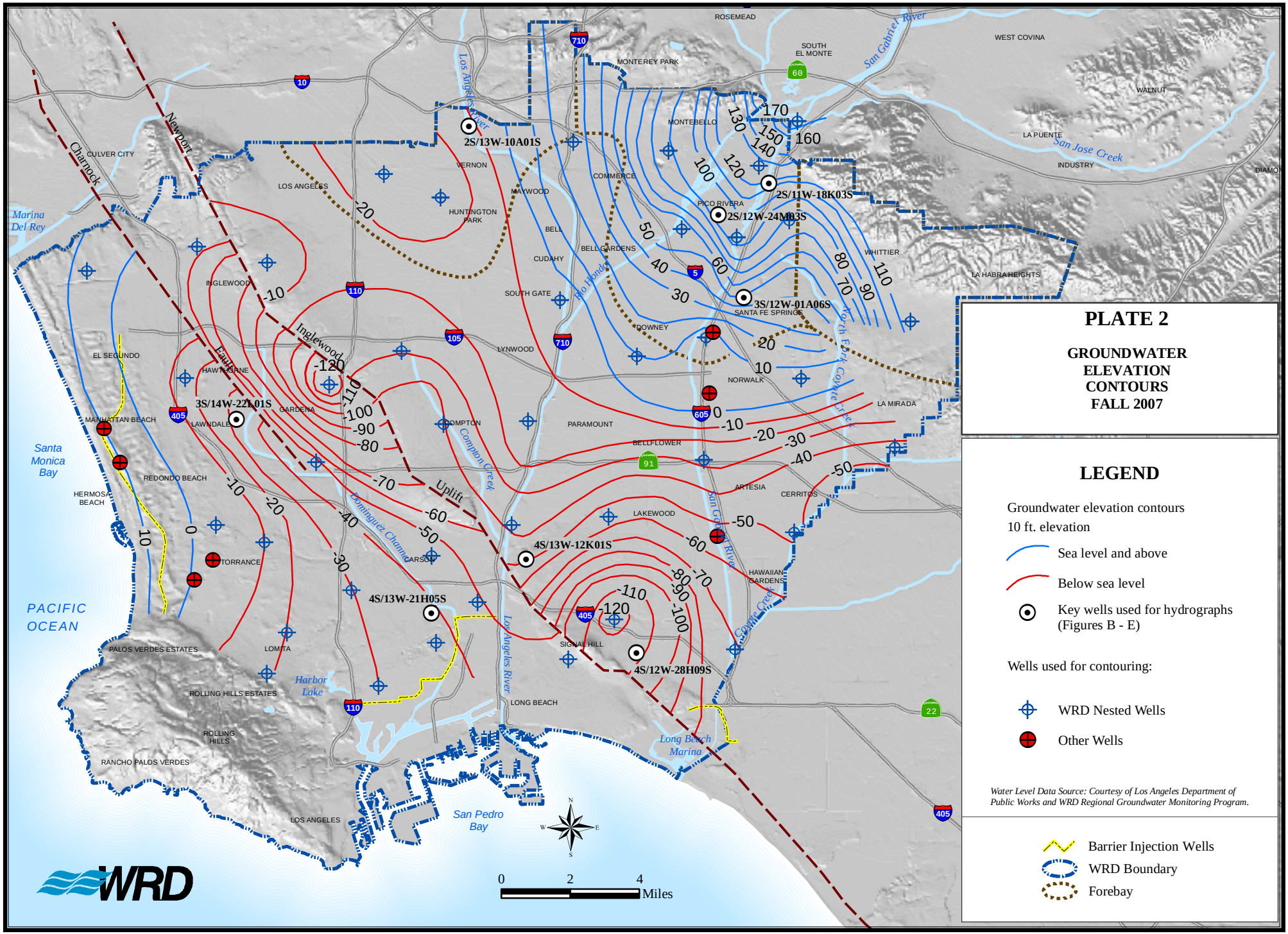

PLATE 2

GROUNDWATER ELEVATION CONTOURS FALL 2007

LEGEND

Groundwater elevation contours
10 ft. elevation

- Sea level and above
- Below sea level
- Key wells used for hydrographs (Figures B - E)

Wells used for contouring:

- WRD Nested Wells
- Other Wells

Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.

- Barrier Injection Wells
- WRD Boundary
- Forebay

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Addressees

RE: TITAN TERMINAL & TRANSPORT
4570 Ardine Street
South Gate, California
EPA ID #: CAD008353211

Dear Addressees:

Enclosed is the Site Investigation Report for Titan Terminal and Transport ("the Site"), which is officially located at 4570 Ardine Street, South Gate, Los Angeles County, California. subject site. For the purposes of this Site Inspection, the site was divided into two distinct operational areas, the Titan Parcels and the Solvay Parcel. The Titan Parcels are comprised of the central and western sections of the site. The Solvay Parcel is located at the southeastern corner of the site.

The Site Investigation was conducted by the U.S. Environmental Protection Agency (EPA) under Section 104(a) of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9604(a), commonly known as Superfund. The investigation took place in November 2015.

The purpose of the Site Investigation is to determine whether a site will qualify and benefit from inclusion on the National Priorities List (NPL) under Superfund.

Based on currently available information, which is contained in the enclosed Site Investigation Report, EPA has determined that the Site is eligible for further Federal consideration for listing on the Superfund National Priorities List or other clean up options under State authorities.

If you should have any questions or comments on this report, please contact Matt Mitguard, Site Assessment Manager, at (415) 972-3096.

Sincerely,

8/22/17

Mindy Clements, Chief
Brownfields and Site Assessment Section

Enclosure:

ADDRESSEES:

Jeff Miller
Site Owner & Operator Representative
Titan Terminal & Transport
Kronos Properties, Inc.
830-13 A1A North #120
Ponte Vedra Beach, FL 32082

Jeffrey S. Lang, Esq.
Site Owner Representative
Solvay USA
8 Cedar Brook Drive
Cranbury, NJ 08512

Paul Nemanic
Site Owner Representative
Solvay USA
504 Carnegie Center
Princeton, NJ 08540

cc w/enclosure:

Javier Hinojosa
CA Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, CA 91311

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

SITE DECISION AND RATIONALE: TITAN TERMINAL& TRANSPORT
EPA ID #: CAD008353211

The Titan Terminal & Transport (Titan) site is officially located at 4570 Ardine St., South Gate, Los Angeles County, California. Additional addresses are also associated with the site. The 7-acre site was formerly known as Stauffer Chemical Company and is located in a primarily urban industrial area. The site is located less than one-quarter mile from residential properties.

For the purposes of this Site Inspection (SI), the site was divided into two distinct operational areas, the Titan Parcels and the Solvay Parcel. The Titan Parcels are comprised of the central and western sections of the site and cover 6.6 acres. The Solvay Parcel, at the southeastern corner of the site, comprises the remaining 0.4 acres.

From approximately 1924 through 1993, the entirety of the facility was owned and operated by Solvay (formerly Rhone-Poulenc, Stauffer Chemical, A.R. Maas, etc.). In approximately 1993, Solvay sold the Titan Parcels portion of the site and, since 1994, Titan has been operating on the site as a hazardous and non-hazardous materials distribution and bulk storage facility. Current operations do not include manufacturing, treatment, or disposal of hazardous materials. No operations are currently conducted on the Solvay Parcel, which is paved and enclosed behind a masonry wall and chain-link fence.

Solvay's historical operations include the manufacturing of trisodium phosphate (TSP), sodium sulfide, and phosphoric acid. The phosphoric acid plant, which operated through approximately 1981, generated an arsenic-containing sludge waste. Between 1940 and 1960, an estimated 200 tons of sludge waste was disposed of to an unlined surface impoundment on the Solvay Parcel. The impoundment was approximately 25 feet (ft) deep and extended off site to the south and east. The impoundment was reportedly retired and resurfaced with asphalt in the mid-1960s with no excavation of the waste materials it contained.

Prior to the 2015 Preliminary Assessment (PA), the U.S. Environmental Protection Agency (EPA) completed a PA in 1984, an SI in 1986, and a Site Reassessment in 2014.

Between 1979 and 1982, in part under the oversight of the California Department of Toxic Substances Control (DTSC), subsurface investigations were conducted on, and adjacent to, the on-site surface impoundment. Since the early 1980s, with the exception of a leaking petroleum underground storage tank case in the early 1990s, no state or local agency has been actively involved with the site.

In November 2015, Weston Solutions, Inc. (WESTON), on behalf of EPA, conducted the SI at the site. During the SI, WESTON collected soil matrix samples at depths up to 20 ft below ground surface (bgs) from eight on-site borings, which included three locations on the Solvay Parcel; collected groundwater release samples at depths up to 134 ft bgs from eight on-site borings, which included

one location on the Solvay Parcel; and collected secondary objective groundwater samples from two off-site borings.

On-site soil/waste samples collected from the Solvay Parcel during the SI investigation exhibited concentrations of metals that exceeded action levels. Arsenic was identified at concentrations as high as 617 milligrams per kilogram (mg/kg); the assigned site-specific action level for arsenic is 7.8 mg/kg. Metals were also identified at elevated concentrations in a perched aquifer groundwater sample collected from the Solvay Parcel. Arsenic was identified at a concentration 15,700 micrograms per liter (µg/L); the federal Maximum Contaminant Level (MCL) for arsenic is 10 µg/L.

On-site soil samples collected from the Titan Parcels during the investigation also exhibited concentrations of metals, notably lead, that exceeded action levels. Lead was also identified at elevated concentrations in Gaspur aquifer groundwater samples collected from the Titan Parcels.

The results of this SI, which were generally consistent with the results of previous investigations, have identified hazardous substance source areas on site. Metals, notably arsenic, were identified at elevated concentrations in samples collected from the surface impoundment area located on the Solvay Parcel and are likely the result of historical waste disposal practices. In addition, metals, notably lead, were identified at elevated concentrations in subsurface soils beneath the one of the Titan Parcels and are likely the result of historical chemical manufacturing activities. The distribution of contaminants in the aquifers underlying the site suggests that arsenic and lead originating from the site have impacted shallow groundwater and have the potential to migrate into the deeper drinking water aquifers. Furthermore, this distribution also suggests that one or more additional lead source areas exist on site. The City of South Gate's Well 7, which was located approximately one-quarter mile southeast of the site, was closed in 2002 due to elevated concentrations of contaminants, including arsenic. The site is located within the North East 710 Study Area, which is an area where drinking water wells have historically been impacted by elevated levels of metals and VOCs.

Based on these findings, the Solvay Parcel is eligible for further Federal consideration for listing on the Superfund National Priorities List (NPL) or other clean up options under State authorities. Soil contamination found on the Titan Parcels, although not of NPL caliber, would benefit from further investigation by State authorities regarding lead sources, in addition to that discussed in this report.

Signature: _____ Date: 8/22/17

Matt Mitguard
Site Assessment Manager