FIFTH FIVE-YEAR REVIEW REPORT FOR WASATCH CHEMICAL CO. (LOT 6) SUPERFUND SITE SALT LAKE COUNTY, UTAH

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Prepared by

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
AOC	Administrative Order on Consent
bgs	Below Ground Surface
BSHW	Utah Bureau of Solid and Hazardous Waste
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DERR	Division of Environmental Response and Remediation
DWRi	Utah Division of Water Rights
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
FYR	Five-Year Review
HCB	Hexachlorobenzene
IC	Institutional Control
IRIS	Integrated Risk Information System
ISV	In-Situ Vitrification
MCL	Maximum Contaminant Level
$\mu g/m^3$	Micrograms per Cubic Meter
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethylene
PCP	Pentachlorophenol
PRP	Potentially Responsible Party
Questar	Dominion Energy Questar Corporation
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSL	Regional Screening Level
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
UDEQ	Utah Department of Environmental Quality
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) § 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Wasatch Chemical Co. (Lot 6) Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one operable unit (OU), which includes both contaminated soil and groundwater.

EPA remedial project manager Sam Garcia led the FYR. Participants included EPA hydrologist Ian Bowen, Tony Howes from the Utah Department of Environmental Quality (UDEQ), and Ryan Burdge and Treat Suomi from EPA contractor Skeo. EPA notified the potentially responsible party (PRP), Dominion Energy Questar Corporation, of the initiation of the FYR. The review began on 8/11/2016.

Site Background

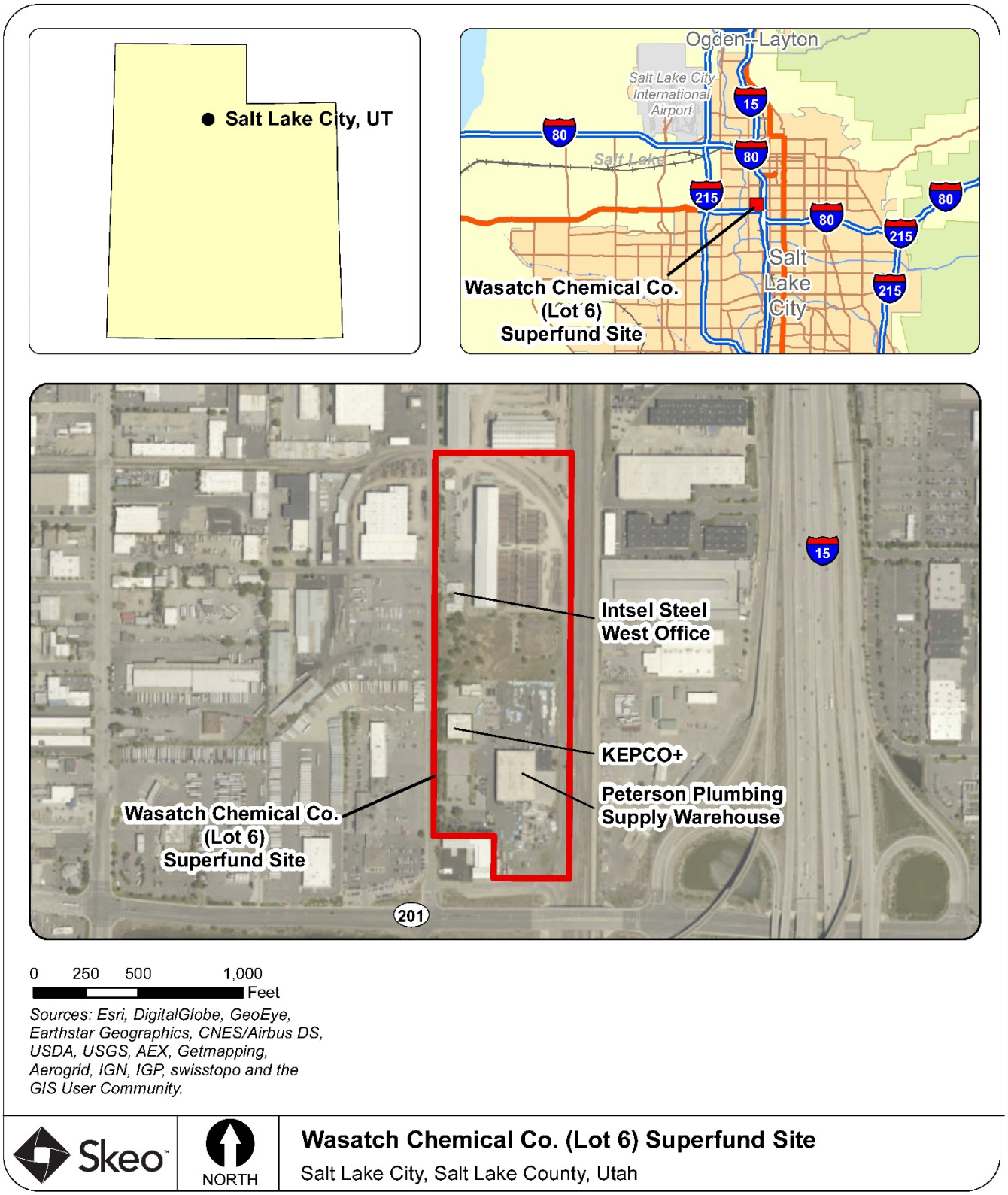
The Site is located near the intersection of 700 West Street and 2100 South Street in an industrial area of Salt Lake City in Salt Lake County, Utah (Figure 1). The approximately 18-acre Site includes property owned by Dominion Energy Questar Corporation (Questar) and portions of adjacent properties. Appendix B includes a chronology of site events.

The Site's topography is flat, with an elevation variance of no more than several feet. Most surface drainage flows west toward a small drainage ditch that connects to other industrial drainageways, with ultimate discharge to the Great Salt Lake. Groundwater flows horizontally toward the Jordan River and Great Salt Lake, to the west and northwest.

The deep portion of the aquifer underlying the site is used for the region’s water supply. The shallow portion flows to the northwest and is not currently used for drinking water, although there is the potential for use in the future. Businesses at the Site connect to and receive water from the public water system, which is operated by the Salt Lake City Department of Public Utilities. The nearest residential area is about a quarter-mile northwest of the Site.

From 1957 to 1971, Wasatch Chemical Company used the area to warehouse, produce and package industrial chemical products. From the 1970s to 1992, site operations included blending and packaging of pesticides, herbicides, fertilizers, industrial chemicals and cleaners. The company also discharged wastewater into on-site tanks and evaporation ponds and onto the ground.

Figure 1: Site Vicinity Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: WASATCH CHEMICAL CO. (LOT 6) SUPERFUND SITE		
EPA ID: UTD000716399		
Region: 8	**State:** Utah	**City/County:** Salt Lake City/Salt Lake

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name: Sam Garcia, with contractor support provided by Skeo
Author affiliation: EPA Region 8 and Skeo
Review period: 8/11/2016 – 9/25/2017
Date of site inspection: 12/6/2016
Type of review: Statutory
Review number: 5
Triggering action date: 9/25/2012
Due date *(five years after triggering action date)*: 9/25/2017

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In January 1987, EPA proposed listing the Site on the Superfund program's National Priorities List (NPL). Site PRPs conducted the remedial investigation and an endangerment assessment in 1990. Several media were investigated at the Site: waste (sludge and liquid), soil, sediment, surface water, groundwater and air. In each medium, samples were analyzed for target compound list chemicals, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), herbicides, pesticides, dioxins/furans and metals. The PRP Questar performed an endangerment assessment to evaluate potential adverse impacts to human health and the environment. Using the data collected during the remedial investigation, the assessment chose 12 indicator chemicals and identified risks to three potential receptor populations: off-site residents, off-site workers and on-site workers. Primary exposure pathways included incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive dust.

While the 1990 assessment analyzed risk present at that time, Questar and EPA determined future potential risks were of greatest concern. Questar and EPA performed subsequent calculations to further evaluate future on-site

worker exposures, residential exposures and acute exposures. EPA performed additional evaluations to assess potential acute exposure risks as well as sub-chronic exposure risks associated with direct exposure to contaminants in sludges in the process and yard drain system. In addition, based on site hydrogeology, EPA and UDEQ determined that a potential for future human exposure to contaminated groundwater did exist.

Primary indicator chemicals include VOCs and SVOCs, pesticides, and dioxins and furans.

Response Actions

In June 1986, in cooperation with the Utah Bureau of Solid and Hazardous Waste (BSHW), an EPA emergency removal action removed approximately 50 drums, cylinders and other containers of chemical waste from the Site and provided temporary on-site storage of several drums containing dioxin waste.

EPA signed the Site's Record of Decision (ROD) on March 29, 1991, and an Explanation of Significant Differences (ESD) on November 30, 1995. Remedial action objectives (RAOs) identified in the ROD include:

- Treating soils, sludges and dioxin removal wastes so that the level of contaminants remaining in these materials does not pose an unacceptable risk to human health or the environment.
- Restoring contaminated groundwater to action levels suitable for potential future use as a source of drinking water.
- Protecting uncontaminated groundwater by minimizing the migration of contaminants.
- Ensuring that the level of contaminants remaining in groundwater does not pose unacceptable risk to human health and the environment.

The remedy selected for the Site in the 1991 ROD and 1995 ESD included:

- Excavation of all soils containing indicator chemicals above action levels and sludges from the yard and process drain systems and the septic system (Table 1, Figure C-7).
- Excavation and landfarming of approximately 1,000 cubic yards of hydrocarbon-contaminated soils (Figure C-7).
- Consolidation of these contaminated materials and dioxin removal wastes in the former evaporation pond.
- Treatment of staged soils, sludges and dioxin removal wastes by thermal destruction of contaminants of concern (COCs) through in-situ vitrification (ISV).
- Extraction of on-site contaminated groundwater until maximum contaminant levels (MCLs) are met and treatment, to the extent necessary, of extracted groundwater by air stripping to meet publicly owned treatment works or Utah pollution discharge elimination system standards (Table 2).
- Disposal of any residuals remaining from the treatment of groundwater at an off-site hazardous material disposal facility.
- Implementation of institutional controls to restrict use of groundwater and prevent site properties from being used for non-industrial purposes.

Table 1: Soil and Sludge Indicator COCs and Action Levels

Soil and Sludge COC	ROD Action Level (Micrograms per kilogram [µg/kg])
Trichloroethylene (TCE)	103,000
Tetrachloroethylene (PCE)	22,000
Hexachlorobenzene (HCB)	7,000
4,4-Dichlorodiphenyldichloroethane (DDD)	26,000
4,4-Dichlorodiphenyldichloroethylene (DDE)	19,000
4,4-Dichlorodiphenyltrichloroethane (DDT)	19,000
Alpha-chlordane	7,000
Gamma-chlordane	7,000
Heptachlor	2,000
TCDD (total)	20 (soils) <1.0 (ISV)

Table 2: Groundwater COC Action Levels

Groundwater COC	ROD Action Level (Micrograms per Liter [µg/L])[a]
VOCs	
PCE	5
TCE	5
1,1-Dichloroethylene (DCE)	7
SVOCs	
Pentachlorophenol (PCP)	1
Herbicides and Pesticides	
2,4-D	70
a. Based on federal MCL.	

<u>Status of Implementation</u>

In 1991, EPA, UDEQ, and Questar Corporation (now Dominion Energy Questar Corporation) signed a Consent Decree to implement the remedy selected in the ROD. Questar conducted the Site's remedial design from September 30, 1991, to September 10, 1993.

Questar remediated source material and groundwater at the Site in four stages. Stage 1 included excavation and landfarming of hydrocarbon-contaminated material. Excavation activities took place from October 1992 to April 1993. They included removal and disposal of about 1,000 cubic yards of hydrocarbon-contaminated material in a landfarm containment cell on site. To ensure the removal of all contamination, excavation went to a depth of 2 feet below the groundwater table.

Nutrients and pH adjustments were added to the landfarm cell to optimize biodegradation of the hydrocarbon-contaminated material. Treated soil that met the standard was used as backfill. Soils exceeding the action levels were placed in the evaporation pond for later ISV treatment. Questar completed the landfarming portion of Stage 1 in December 1994. ISV was finished in 1996 as part of Stage 2. The ISV system treated 5,600 tons of contaminated soils and sludges.

Stages 3 and 4 included groundwater extraction and treatment and a groundwater pilot study of alternative remedies. Groundwater extraction and treatment (Stage 3) was implemented in 1995. In January 2003, Questar proposed discontinuing groundwater treatment and extraction and submitted a long-term monitoring plan to EPA and UDEQ. EPA approved discontinuation of groundwater extraction and treatment and a Monitored Natural Attenuation (MNA) program began in 2003.

In an effort to accelerate the degradation of chlorinated hydrocarbons at the site, in 2004, EPA approved an enhanced in-situ bioremediation pilot study. Enhanced biodegradation activities took place in May 2004 and July 2006. Results from these pilot tests indicated substantial mass reduction of the COCs in areas of relatively higher permeability, but very limited impact in areas where native silts and clays are more prevalent.

In 2010, Questar submitted a Draft Groundwater Remediation Focused Feasibility Study (FFS) to identify goals, objectives and remediation alternatives based on the pilot study results. EPA is working with Questar to identify additional data necessary to assess remedial alternatives.

Additional Investigations

Following the 2012 FYR, Questar conducted several investigations, including soil, groundwater and indoor air sampling investigations.

Deeper Groundwater
Though ongoing groundwater monitoring had been conducted since 1995 for shallow groundwater (less than 25 feet below ground surface [bgs]), the deeper groundwater monitoring network was missing coverage in the southeast portion of the site. Four deeper monitoring wells were installed in October 2011 to determine whether deeper groundwater (greater than 25 feet bgs) was impacted by Site contaminants.

Data collected from one of the four wells (MW-33D) revealed that shallow soil (< 5 feet bgs) and deeper groundwater contamination (35 to 45 feet bgs) were in fact contaminated.

The focused deeper groundwater investigation consisted of hydrogeologic and geotechnical field data and analytical data from depths ranging between 15 feet bgs and 160 feet bgs (Figure C-4). COCs were detected above MCLs at five locations north and west of MW-33D (Figure C-5). PCE and TCE were detected above their respective MCLs at a maximum depth of 130 feet bgs. PCP was detected above its MCL at a maximum depth of 120 feet bgs.

Data indicated deeper groundwater contamination is bound by results below screening levels horizontally in the presumed direction of groundwater flow (northwest) and vertically in the center and downgradient edge of the deeper groundwater investigation area (Figure C-5).

Sentry Groundwater Investigation
Shallow groundwater data for MW-30, installed in 2011 and located on the downgradient (western) edge of the Site indicated an additional sentry well was needed to monitor potential contaminant migration. A new shallow sentry well (MW-34) was installed just outside the western site boundary in June 2013. The well is 20 feet deep and screened in the shallow groundwater zone. Samples have been collected from MW-34 over five monitoring events. Results are all below laboratory reporting limits.

Shallow Soil Focused Investigation
Shallow subsurface soil and deeper groundwater contamination was discovered during installation of MW-33D in October 2011. In 2013, Questar's contractor collected shallow soil samples in the immediate area around MW-33D (Figure C-4). Samples were collected above the groundwater table and about 1 foot into the saturated zone using direct-push technology. A total of 91 soil samples were collected from 53 discrete locations. Sample depths typically ranged between approximately 1.5 feet bgs and 4.5 feet bgs. Samples were analyzed for VOCs and herbicides. Results at some locations exceeded the default industrial soil screening levels for PCE, TCE,

ethylbenzene, xylenes and PCP. Soil contamination above the screening levels appear to be most concentrated along the eastern edge of the investigation area and on the north side of the eastern portion of Peterson Plumbing Supply Warehouse. Questar is completing a human health risk assessment to identify appropriate actions or controls for the area.

Indoor Air
Due to shallow groundwater VOC contamination near occupied buildings, indoor air sampling to assess the potential for vapor intrusion has been conducted in 2012, 2015, 2016 and early 2017. Air samples have been collected in the three occupied buildings on the Site – Intsel Steel West (Intsel), KEPCO+ Architectural Cladding Systems (KEPCO+) and the Peterson Plumbing Supply Warehouse.

The December 2015 sampling event detected 16 of the 25 analytes. Except for TCE in trace concentrations in the KEPCO+ building, all detected analytes in the Intsel and KEPCO+ office buildings were also detected in outdoor air. Two analytes – naphthalene and TCE – were detected inside the Peterson Plumbing Supply Warehouse and naphthalene was detected in the warehouse office. A screening-level risk evaluation of the February 2016 verification samples found that naphthalene is the primary risk driver for human health risk inside the warehouse office. To assess whether subsurface vapor is contributing to indoor air quality, subfloor and indoor air sampling will take place in 2017. Additional sampling will occur as needed, based on EPA recommendations.

Institutional Controls (ICs) Review

The Utah Division of Water Rights (DWR) implemented a formal process in February 2008 to notify UDEQ's Division of Environmental Response and Remediation (DERR) and EPA whenever a well permit or groundwater use application is filed for the Site.

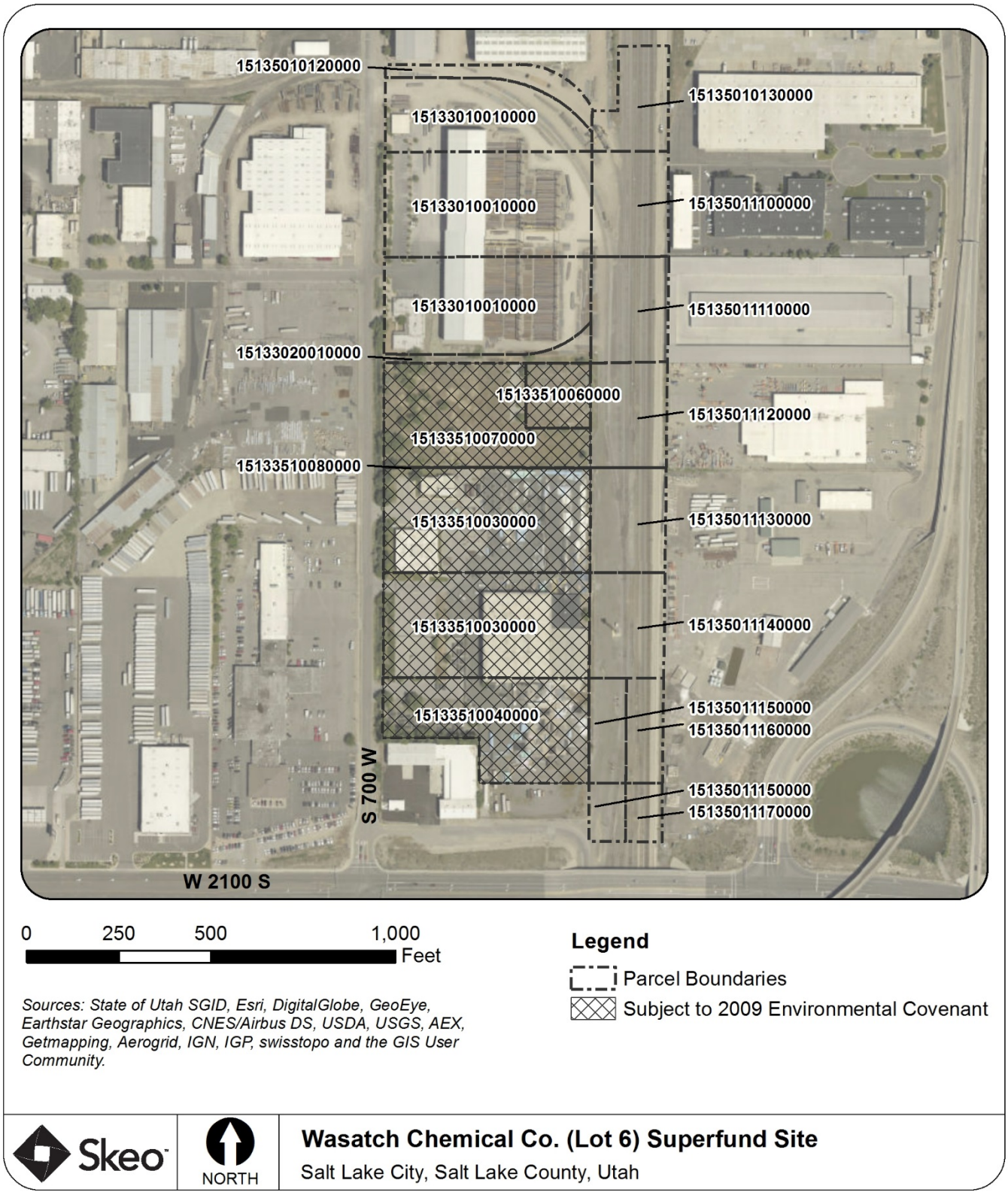
EPA, UDEQ and Questar signed an environmental covenant requiring land use restrictions, notification of building demolition and groundwater restrictions. Although vapor intrusion investigations are ongoing, assessment and mitigation requirements were also implemented. The environmental covenant was recorded with the Salt Lake County Recorder's Office on January 14, 2009. The covenant applies only to the five parcels owned by Questar (Table 3, Figure 2).

Table 3: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, Engineered Controls, and Areas that Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date
Groundwater	Yes	Yes	1513351003 1513351004 1513351006 1513351007 1513351008	Restrict installation of groundwater wells.	An environmental covenant filed on January 14, 2009, provides for groundwater restrictions for the portion of the Site owned by Questar. The State Engineer's Office implemented a process in 2008 to send a warning email notification to UDEQ-DERR and EPA if there is a well permit or groundwater use application for the Site.

Media, Engineered Controls, and Areas that Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date
Soil	Yes	Yes	1513351003 1513351004 1513351006 1513351007 1513351008	Prohibit any activity that may disturb the integrity of the engineering controls, assess risks associated with potential vapor intrusion for new buildings, and limit future uses to industrial land uses.	An environmental covenant filed on January 14, 2009, provides for land use restrictions for the portion of the Site owned by Questar.

Figure 2: Institutional Control Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Systems Operations/Operation & Maintenance (O&M)
Current O&M activities include monitoring of groundwater and reporting of sampling results in accordance with the 2002 Monitoring Plan. In addition, Questar is conducting additional groundwater sampling and analysis. The O&M Plan will be updated, as needed, after the vapor intrusion, surficial soil, and deeper groundwater reports are finalized.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the status of those recommendations.

Table 4: Protectiveness Determinations/Statements from the 2012 FYR

OU #	Protectiveness Determination	2012 FYR Protectiveness Statement
1	Protectiveness Deferred	*"A protectiveness determination of the remedy cannot be made at this time until further information is obtained. This will require additional sampling and analysis to fully determine the potential for vapor intrusion at the Site and a dioxin toxicity reassessment at the Site. It is expected that these actions will take approximately 36 months to complete. At that time, a protectiveness determination will be made. The remedy at the Site has resulted in the excavation and landfarming of hydrocarbon-contaminated soils, consolidation of materials, placement of a clean soil cap, and treatment by ISV to reduce chemical concentrations below risk-based action levels established for the Site in 1996; implementation of land use and groundwater institutional controls for a portion of the Site; and an evaluation of the effectiveness of the remediation of groundwater."*

Table 5: Status of Recommendations from the 2012 FYR

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
The selected remedy is not currently in operation. MNA is in the process of evaluation.	Evaluate the effectiveness of MNA and issue a final decision regarding whether to reinstate the pump-and-treat remedy or evaluate other remedial alternatives.	Ongoing	EPA will make a determination following the completion of ongoing soil, indoor air, and deep groundwater investigations.	
Dioxin toxicity values have changed.	Reevaluate the risk associated with dioxins in site soil.	Completed	See Section V of this FYR Report.	9/15/2017
Additional sampling and analysis is required to evaluate the potential risk from vapor intrusion.	Collect necessary data and evaluate how sampling results affect risk estimates.	Ongoing	Vapor intrusion sampling has been conducted at the Site in 2012, 2015 and 2017. Results to date indicate no unacceptable risks from indoor air.	

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
Changes in cancer slope factors and oral reference doses have occurred for PCE and TCE.	Evaluate how changes in toxicity factors affect risk estimates.	Ongoing	EPA is evaluating ongoing soil and indoor air sampling. Current toxicity data are being applied in the soil and indoor air investigations. See Section V of this FYR Report for additional discussion.	
VOCs and PCP were detected in soil samples collected during installation of two new groundwater monitoring wells, including concentrations of TCE and PCE that exceed soil performance standards for the Site.	Delineate the extent of the newly identified area of soil contamination and determine if remedial actions are needed to address soil contamination present at levels above performance standards for the Site.	Ongoing	The PRP is currently conducting a risk assessment. In the interim, no exposures are anticipated.	
Vinyl chloride exceeded MCLs throughout the FYR period. Although current work plans regard vinyl chloride as a COC, vinyl chloride is not listed as a COC in EPA's decision documents.	If decision documents are developed to address site-wide groundwater, vinyl chloride should be included as a COC.	Ongoing	EPA will select a final remedy following the completion of ongoing soil, indoor air, and deep groundwater investigations. Modifications to the remedy will be recorded in an EPA decision document. Changes to COCs and cleanup goals will be recorded at that time.	

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement and Site Interviews

A public notice was made available on the EPA website. It stated that the FYR was underway and invited the public to submit any comments to EPA. No comments were received. Due to a historic lack of community interest, no community interviews were conducted as part of the FYR**.** The results of the review and the report will be made available at the Site's information repository, located at Utah Department of Environmental Quality, Division of Environmental Response and Remediation, 195 North 1950 West, Salt Lake City, UT 84116.

Data Review

The data collected during this FYR period (2012-2016) include routine semi-annual groundwater monitoring data and data collected as part of a focused investigation to delineate the nature and extent of soil and groundwater contamination in the southeast area of the Site. These data were provided in the Draft Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Report (2014) and include shallow soil and deep and downgradient groundwater data. Indoor air samples were also collected in response to recommendations from the previous FYR. The data is summarized below and organized according to media. Well locations are included in Figure 3. Plume maps are included in Appendix C.

Semi-annual Monitoring

During this FYR period, groundwater monitoring took place semi-annually and was summarized in progress reports submitted by Questar contractor MWH/Stantec in January and July of each year. The most recent monitoring event took place in November 2016. Seventeen shallow wells (including newly-installed sentry well MW-34) and three deeper wells were sampled and analyzed for PCE, TCE, DCE isomers, vinyl chloride, PCP and

geochemical parameters. Table 6 provides a summary of the results of the maximum detected contaminant concentrations in shallow groundwater from 2012 to 2016.

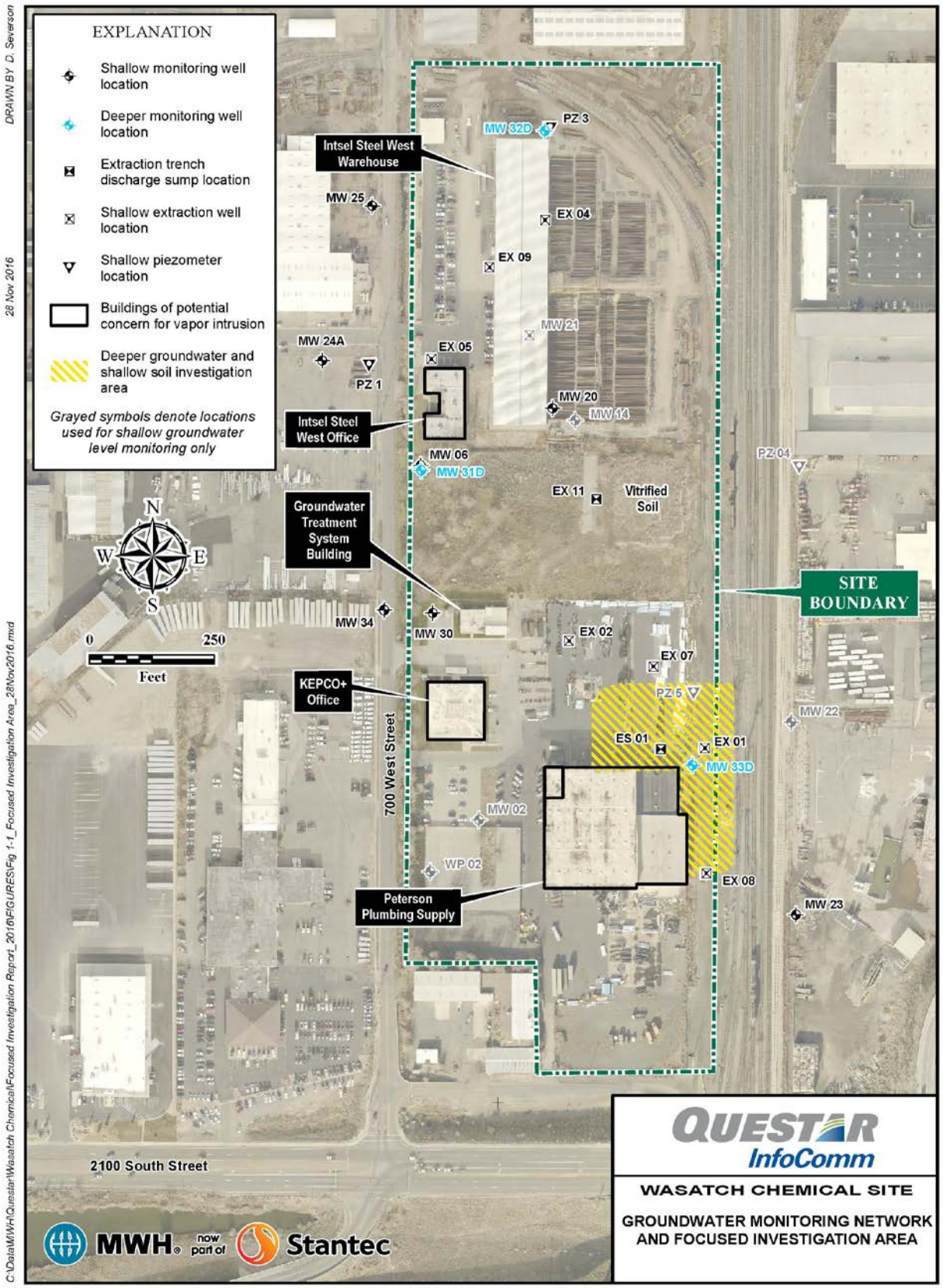
Exceedances were observed for every contaminant of concern (COC) except for PCE. Shallow plume maps from April 2013 and April 2016 are provided in Figures C-1 and C-2. Overall, the plumes for TCE, 1,1-DCE, vinyl chloride and PCP have reduced in size based on plume maps from progress reports 2013-2016. They are all currently assessed as "stable" based on the statistical procedure outlined in the 2016 Progress Report.

Table 6: Maximum Detected COC Concentrations, 2012-2016

COC	MCL	Maximum Detected Concentration 2012 (Location)	Maximum Detected Concentration 2013 (Location)	Maximum Detected Concentration 2014 (Location)	Maximum Detected Concentration 2015 (Location)	Maximum Detected Concentration 2016[a] (Location)
	µg/L					
PCE	5	1.6 (ES 01 and EX 02)	0.87 J (EX 02)	1.1 (ES 01)	0.72 J (EX 07)	1.8 (EX 07)
TCE	5	110 (EX 02)	300 (EX 02)	87 (EX 02)	91 (EX 02)	140 (EX 02)
1,1-DCE	7	10 (EX 02)	15 (EX 11)	13 (EX 05)	11 (EX 05)	9.8 (EX 11)
cis-1,2-DCE[b]	70	360 (EX 11)	670 (EX 11)	430 (EX 11)	260 (EX 02)	570 (EX 11)
trans-1,2-DCE[b]	100	150 (EX 05)	160 (EX 05)	180 (EX 05)	130 (EX 05)	130 D (EX 05)
Vinyl chloride	2	590 (EX 11)	460 (EX 11)	530 (EX 11)	72 (EX 11)	330 (EX 11)
PCP	1	13 (EX 02)	6.3 (EX 02)	8.2 (EX 02)	6.2 (EX 02)	7 J (EX 02)

Notes:
J = Data are estimated due to associated laboratory quality control data.
D = Sample was diluted.
a = April 2016 data only; November 2016 data not available for review during this FYR. Wells and plume depicted in Figure F-2.
b = Constituents are monitored to aid in evaluation of natural attenuation processes.

Figure 3: Detailed Site Map



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Three deep wells – MW-31D, MW-32D and MW-33D – were sampled during this FYR period. Consistent with historical data, COCs were not detected in monitoring wells MW-31D and MW-32D. Figure C-3 in Appendix C summarizes historical VOC and PCP data for MW-33D. COC results in all three wells have been below MCLs since November 2013. Hydrocarbon concentrations continue to be detected but are below the Utah Leaking Underground Storage Tank Program initial screening levels and drinking water MCLs.

Site Inspection

The site inspection took place on December 6, 2016. Participants included Sam Garcia from EPA Region 8, Tony Howes and Dave Allison from UDEQ, Scott Bassett from Questar, Susan L. Eyzaguirre from Questar contractor MWH/Stantec, and Ryan Burdge and Treat Suomi from EPA FYR contractor Skeo. The purpose of the inspection was to assess the protectiveness of the remedy. The inspection checklist and inspection photos are included in Appendices D and E.

Prior to the site inspection, participants met at Questar's offices to discuss ongoing site investigations and the anticipated timeline for resolving issues identified in the 2012 FYR. Site inspection participants then toured the Site, including the groundwater treatment system building, monitoring wells, the evaporation pond ISV area and general site conditions. Participants inspected the area of additional soil investigation and vapor intrusion evaluation. Several industrial businesses are operating on site. All wells were locked and in good condition. No issues were noted during the inspection.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

No. The long-term remedy included excavation of contaminated soil and sludge; consolidation of the contaminated soil and sludge in the former evaporation pond; treatment of consolidated soil, sludge and dioxin-removal wastes; excavation and landfarming of hydrocarbon-contaminated soil; groundwater extraction and treatment; and institutional controls. The review of documents, Applicable or Relevant and Appropriate Requirements (ARARs), risk assumptions, institutional controls, and the site inspection indicate that portions of the remedy may not be functioning as intended by site decision documents.

Excavation and landfarming of hydrocarbon-contaminated soils finished in 1994. Excavation of contaminated soils, sludges and debris extended to 2 feet below the water table to ensure the removal of all identified contamination. Following landfarming, residual soils not meeting action levels were placed on top of consolidated material in the evaporation pond for ISV treatment along with the dioxin wastes. After ISV finished, verification samples of the vitrified material showed the ISV process effectively reduced chemical concentrations to below the required standards. EPA and UDEQ determined that remedial activities had attained performance standards for soils, sludges and dioxin removal wastes and issued a construction completion report for the soils remedy in January 1996.

Groundwater extraction and treatment occurred from 1995 until 2003, when MNA was implemented. Due to the demonstrated limitations of the pump-and-treat remedy, Questar submitted a groundwater study of alternative remedies (draft FFS Report) in 2010 to EPA to identify goals, objectives and remediation alternatives. In 2013, Questar conducted a focused deep groundwater investigation. VOCs and PCP were detected above MCLs in a limited area northeast of the Peterson Plumbing Supply Warehouse to a depth of 130 feet bgs. Additional wells will be installed and monitored to further assess contamination. In October 2011, remedial contractors detected additional shallow soil contamination during drilling activities associated with the groundwater monitoring program. In 2013, sampling results at some locations exceeded screening levels for PCE, TCE, ethylbenzene, xylenes and PCP. Soil contamination above screening levels appears to be most concentrated along the eastern edge of the investigation area and on the north side of the eastern portion of the Peterson Plumbing Supply

Warehouse. Questar is completing a human health risk assessment to identify appropriate actions or controls for the area. In the interim, because of low level soil concentrations, no exposures are anticipated.

Both land use restrictions and groundwater institutional controls are required as part of the selected remedy. An environmental covenant is in place for the portion of the Site owned by Questar. It includes land use and groundwater restrictions, and requires EPA and UDEQ notification in advance of building demolition as well as vapor intrusion risk assessment and mitigation associated with new building construction. Groundwater use at the remaining affected parcels is controlled by a permit process that sends a warning email notification to UDEQ-DERR and EPA if there is a well permit or groundwater use application for the Site.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

No. Several changes have occurred related to the toxicity data for COCs at the Site. For soils, sludges and dioxin removal wastes, the remedial goal was treatment so that the level of contaminants remaining in these materials does not pose an unacceptable risk to human health or the environment (see Table 1). Since there are no federal or state chemical-specific ARARs for soils and sludges, action levels were determined through a site-specific risk analysis. Standards for the ISV treatment are based on Resource Conservation and Recovery Act (RCRA) land disposal requirements.

To determine if soil cleanup goals remain protective for industrial land use, the cleanup goals were compared to EPA's 2016 regional screening levels (RSLs). The RSLs incorporate current toxicity values and standard default exposure factors (Appendix F). Based on these default screening levels, the action levels for TCE and dioxins are no longer valid.[1] However, during the remedial action, soils were excavated to 2 feet below the water table to ensure the removal of all contamination. For the ISV area, the treatment goal for dioxin exceeds the current RSL for industrial land use. However, clean fill was placed on the evaporation pond prior to ISV treatment and clean fill was later applied to grade the area. Therefore, the soil removal areas remain protective. An FFS is underway to assess risks from a recently-identified area of soil contamination. The risk assessment incorporates current toxicity for all contaminants, including the recently updated toxicity for PCE and TCE.

Questar conducted indoor air sampling in 2012, 2015 and 2017 at properties potentially affected by vapor intrusion. Initial assessments indicated that three of the four sampled spaces do not pose unacceptable risk. The 2017 sampling is intended to better determine the source of and risk from indoor air concentrations at the Peterson Plumbing Supply Warehouse office. Questar will conduct a human-health risk evaluation using air data collected during the 2017 sampling event. The draft air sampling report is anticipated in 2017. Based on 2012 and 2015 data, EPA acknowledges a potential risk from indoor air. However, results may not exceed the 1×10^{-4} threshold.

Vinyl chloride, which was not included as an indicator COC in the 1991 ROD, has been detected above the MCL in several rounds of groundwater sampling. Vinyl chloride concentrations are now routinely monitored at the Site as part of current work plans. Vinyl chloride will be added as a COC when EPA modifies the remedy. MCLs for selected groundwater indicator COCs remain valid (Table F-1).

[1] EPA's dioxin reassessment has been developed and undergone review for many years, with the participation of scientific experts in EPA and other federal agencies, as well as scientific experts in the private sector and academia. EPA followed current guidelines and incorporated the latest data and physiological/biochemical research into the reassessment. On February 17, 2012, EPA released the final human health non-cancer dioxin reassessment, publishing an oral non-cancer toxicity value, or reference dose (RfD), of 7×10^{-10} mg/kg-day for 2,3,7,8-TCDD in EPA's Integrated Risk Information System (IRIS). The dioxin cancer reassessment will follow. The dioxin RfD was approved for immediate use at Superfund sites to ensure the protection of human health.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
None

Issues and Recommendations Identified in the FYR:

OU(s): 1	Issue Category: Remedy Performance			
	Issue: The groundwater remedy is not currently in operation and an alternative remedy has not been selected and recorded.			
	Recommendation: Issue a final decision documenting the final remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2020

OU(s): 1	Issue Category: Monitoring			
	Issue: The vapor intrusion pathway has not been fully assessed.			
	Recommendation: Collect all necessary data for multiple lines of evidence for site-related vapor intrusion and determine if control measures are needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	9/30/2018

OU(s): 1	Issue Category: Other			
	Issue: Soil contamination exceeding the default industrial screening levels remains on site.			
	Recommendation: Finalize the risk assessment for the newly-identified area of soil contamination and determine if remedial actions or controls are needed to address soil contamination.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	9/30/2018

OTHER FINDINGS

An additional recommendation was identified during the FYR. This recommendation does not affect current and/or future protectiveness:

- Vinyl chloride is not formally included as a COC in the 1991 ROD. Vinyl chloride concentrations are now routinely monitored at the Site as part of current work plans. Vinyl chloride will be added as a COC when EPA modifies the remedy.
- The O&M Plan will be updated after the vapor intrusion, surficial soil, and deeper groundwater reports are finalized.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
Operable Unit:1	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The OU1 remedy is currently protective of human health and the environment because there are no current completed exposure pathways. For the remedy to be protective over the long term, the following actions need to be taken: issue a final decision documenting the final remedy; collect all necessary data for multiple lines of evidence for site-related vapor intrusion and determine if control measures are needed; and finalize the risk assessment for the identified area of soil contamination and determine if remedial actions or controls are needed to address soil contamination.		

VIII. NEXT REVIEW

The next FYR Report for the Wasatch Chemical Co. (Lot 6) Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

EPA Record of Decision: Wasatch Chemical Co. (Lot 6). Prepared by EPA. March 1991.

Explanation of Significant Differences, Wasatch Chemical Co. (Lot 6) Superfund Site. Prepared by EPA. November 1995.

Five-Year Review Summary Report, Wasatch Chemical Co. (Lot 6) Superfund Site, Salt Lake City, Utah. Prepared by EPA, October 1997.

Five-Year Review Summary Report for the Wasatch Chemical Co. (Lot 6) Superfund Site. Prepared by EPA, September 2002.

Monitoring Plan for Natural Attenuation at Wasatch Chemical. Prepared by MWH Americas, Inc. for Questar InfoComm, Inc. November 14, 2002.

Five-Year Review Summary Report for the Wasatch Chemical Co. (Lot 6) Superfund Site. Prepared by EPA, September 2007.

Five-Year Review Report, Fourth Five-Year Report for Wasatch Chemical Co. (Lot 6). Prepared by EPA, September 2012.

Wasatch Chemical Site, Progress Report No. 99. July 2013.

Wasatch Chemical Site, Progress Report No. 100. January 2014.

Wasatch Chemical Site, Progress Report No. 101. July 2014.

Wasatch Chemical Site, Draft Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Report, Prepared by MWH Americas, Inc. December 2014.

Wasatch Chemical Site, Progress Report No. 102. January 2015.

Wasatch Chemical Site, Final Indoor Air Sampling Work Plan, Prepared by MWH Americas, Inc. April 2015.

Wasatch Chemical Site, Progress Report No. 103. July 2015.

Wasatch Chemical Site, Progress Report No. 104. February 2016.

Wasatch Chemical Site, Draft Indoor Air Sampling Report, Prepared by MWH Americas, Inc. April 2016.

Wasatch Chemical Site, Progress Report No. 105. July 2016.

Wasatch Chemical Site, Draft Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Report, Prepared by MWH Americas, Inc. November 2016.

Wasatch Chemical Site, Draft Indoor Air and Sub-floor Vapor Sampling Work Plan, Prepared by MWH Americas, Inc., November 2016.

Wasatch Chemical Site, Final Indoor Air Sampling Report, Prepared by MWH Americas, Inc. December 2016.

Wasatch Chemical Site, Progress Report No. 106. January 2017.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
EPA discovered contamination	August 1, 1980
EPA conducted a preliminary site assessment	April 1, 1981
State conducted a preliminary site assessment	December 1, 1984
EPA and site PRP began removal negotiations	August 15, 1985
EPA conducted site inspection	September 30, 1985
EPA issued Unilateral Administrative Order	March 13, 1986
EPA began short-term removal action to stabilize the Site	March 19, 1986
EPA and PRP completed removal negotiations EPA signed Administrative Order on Consent (AOC)	April 1, 1986
EPA proposed the Site for listing on NPL	January 22, 1987
EPA completed short-term removal action to stabilize the Site	June 30, 1988
State issued Consent Decree EPA began endangerment assessment and health assessment PRP began remedial investigation and feasibility study (RI/FS)	September 28, 1988
EPA completed endangerment assessment and health assessment	October 23, 1989
EPA performed removal assessment	August 30, 1990
EPA finalized Site on NPL	February 11, 1991
PRP completed RI/FS EPA signed Record of Decision (ROD) for final selected remedy	March 29, 1991
EPA signed AOC	May 22, 1991
PRP began short-term removal action to stabilize the Site	June 12, 1991
EPA completed Removal Assessment	June 17, 1991
PRP completed short-term removal action to stabilize the Site	July 3, 1991
EPA, UDEQ, and PRP signed a Consent Decree	September, 1991
PRP began remedial design	September 30, 1991
CD finalized	September 30, 1992
PRP completed remedial design PRP began remedial action for landfarming	October 16, 1992
EPA began removal assessment	February 18, 1993
PRP completed remedial design PRP began remedial action for in-situ vitrification (ISV)	September 10, 1993
PRP completed remedial action for landfarming	January 19, 1994
PRP began remedial action for groundwater extraction and water treatment	October 11, 1994
PRP completed remedial design	March 8, 1995
EPA issued Explanation of Significant Differences (ESD)	November 30, 1995
PRP completed remedial action for ISV	May 31, 1996
PRP completed remedial action for groundwater extraction and water treatment PRP completed remedy construction	August 29, 1997
EPA prepared Preliminary Close-out Report Site achieved Construction Complete status	September 30, 1997
EPA signed first FYR Report	October 24, 1997
EPA signed second FYR Report	September 25, 2002
EPA-approved discontinuation of groundwater extraction and treatment system and start of MNA evaluation	January 2003
PRP conducted enhanced biodegradation activities	May 2004
PRP conducted enhanced biodegradation activities	July 2006
EPA signed third FYR Report	September 28, 2007

Event	Date
PRP assessed 700 West Street Ditch for purposes of potentially establishing alternate concentration limits	October 2007
Environmental covenant completed for a portion of the Site	January 2009
PRP submitted draft FFS Report	February 2010
PRP completed installation of additional groundwater monitoring wells	October 2011
PRP collected vapor samples for analysis of vapor intrusion	March 2012
EPA signed fourth FYR Report	September 29, 2012
PRP submitted Draft Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Report	December 2014
PRP submitted Draft Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Report	November 2016
PRP submitted Final Indoor Air Sampling Report	December 2016

APPENDIX C – ADDITIONAL SITE MAPS

Figure C-1: Shallow Groundwater COC Plumes – April 2013

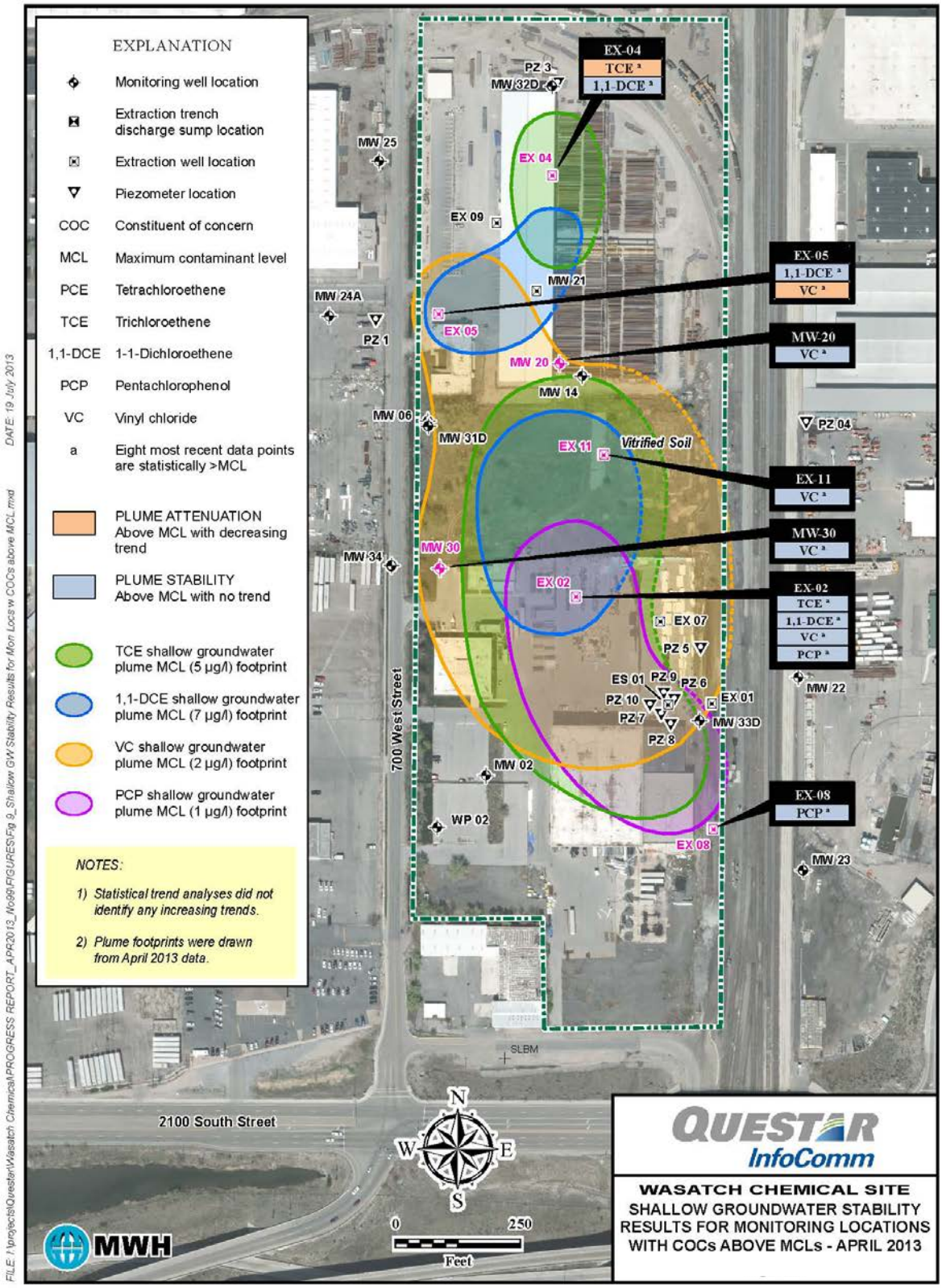


Figure C-2: Shallow Groundwater COC Plumes – April 2016

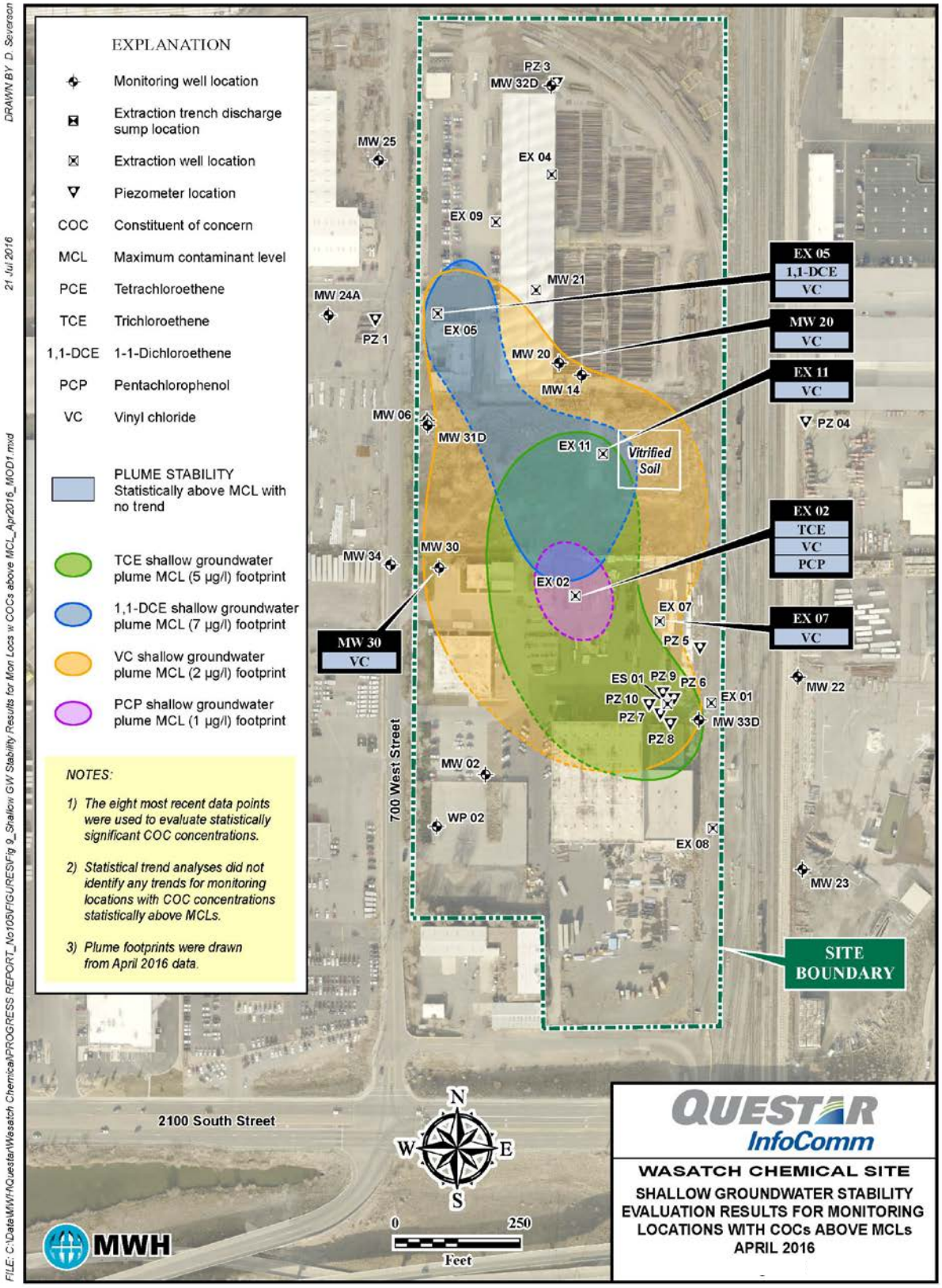
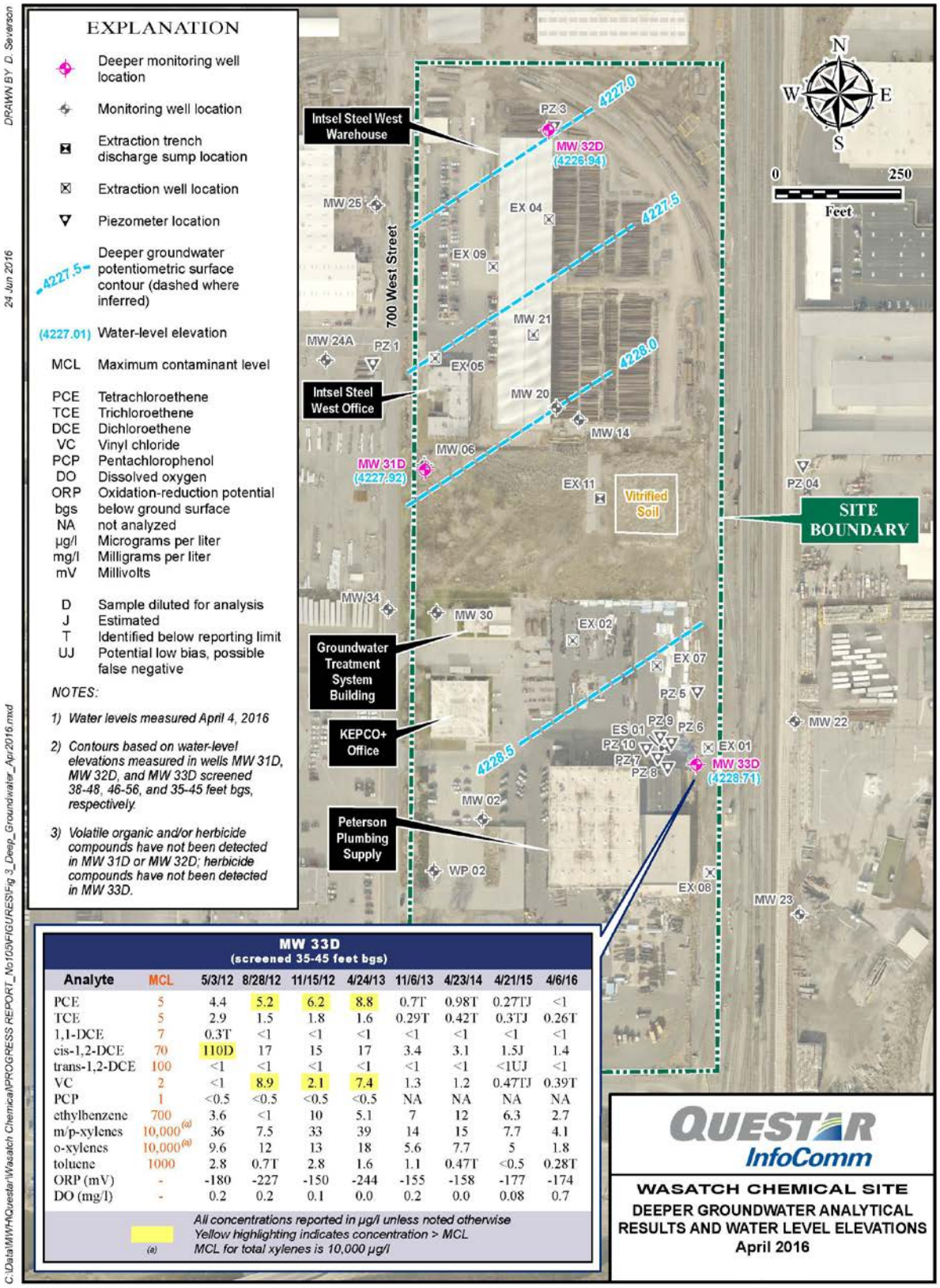


Figure C-3: Deeper Groundwater Analytical Results – April 2016



MW 33D
(screened 35-45 feet bgs)

Analyte	MCL	5/3/12	8/28/12	11/15/12	4/24/13	11/6/13	4/23/14	4/21/15	4/6/16
PCE	5	4.4	5.2	6.2	8.8	0.7T	0.98T	0.27TJ	<1
TCE	5	2.9	1.5	1.8	1.6	0.29T	0.42T	0.3TJ	0.26T
1,1-DCE	7	0.3T	<1	<1	<1	<1	<1	<1	<1
cis-1,2-DCE	70	110D	17	15	17	3.4	3.1	1.5J	1.4
trans-1,2-DCE	100	<1	<1	<1	<1	<1	<1	<1UJ	<1
VC	2	<1	8.9	2.1	7.4	1.3	1.2	0.47TJ	0.39T
PCP	1	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
ethylbenzene	700	3.6	<1	10	5.1	7	12	6.3	2.7
m/p-xylenes	10,000[a]	36	7.5	33	39	14	15	7.7	4.1
o-xylenes	10,000[a]	9.6	12	13	18	5.6	7.7	5	1.8
toluene	1000	2.8	0.7T	2.8	1.6	1.1	0.47T	<0.5	0.28T
ORP (mV)	-	-180	-227	-150	-244	-155	-158	-177	-174
DO (mg/l)	-	0.2	0.2	0.1	0.0	0.2	0.0	0.08	0.7

All concentrations reported in µg/l unless noted otherwise
Yellow highlighting indicates concentration > MCL
(a) MCL for total xylenes is 10,000 µg/l

Figure C-4: Groundwater Monitoring Locations and Focused Investigation Area

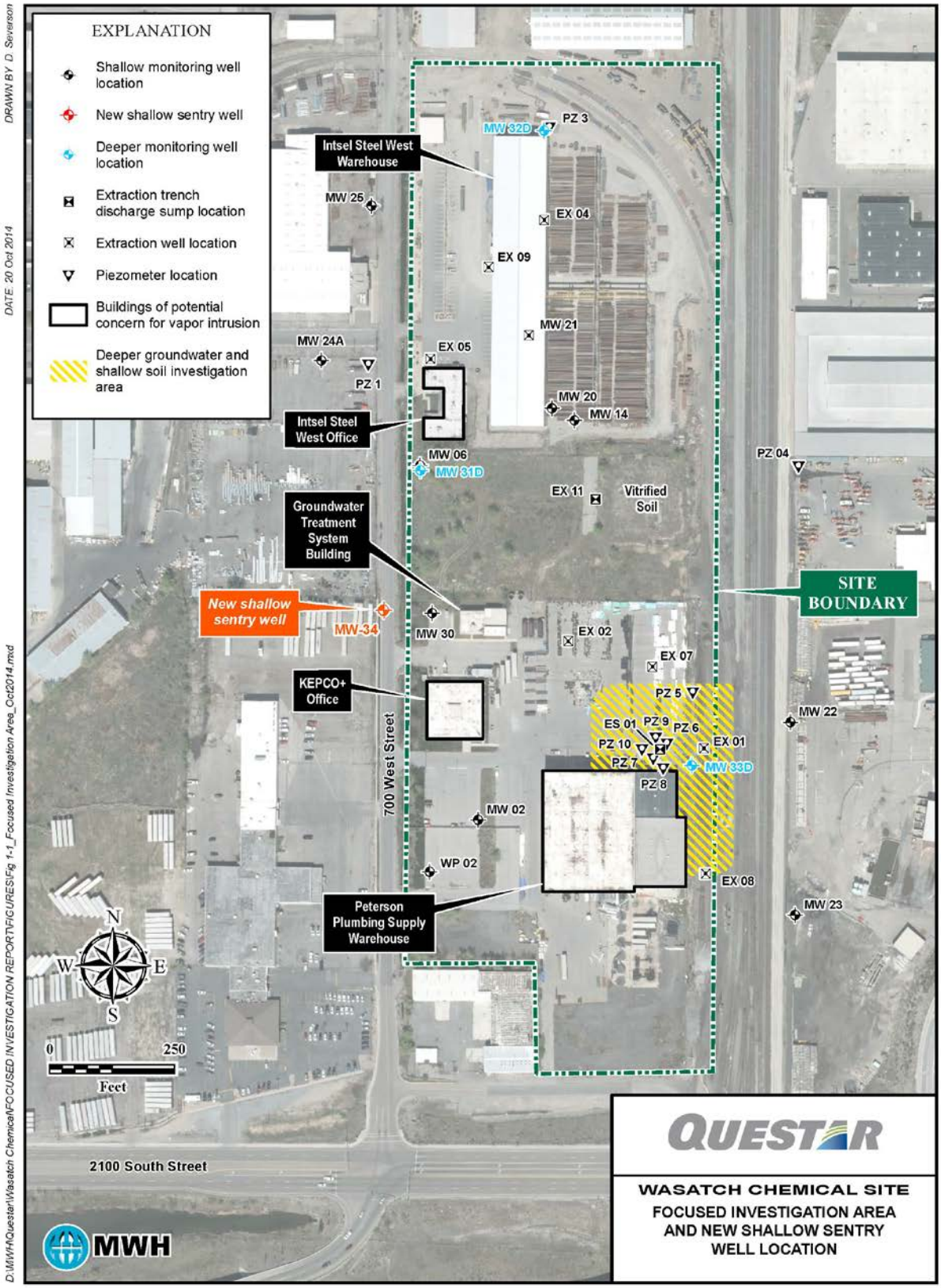


Figure C-5: Focused Deeper Groundwater Investigation Sampling Locations and Exceedances

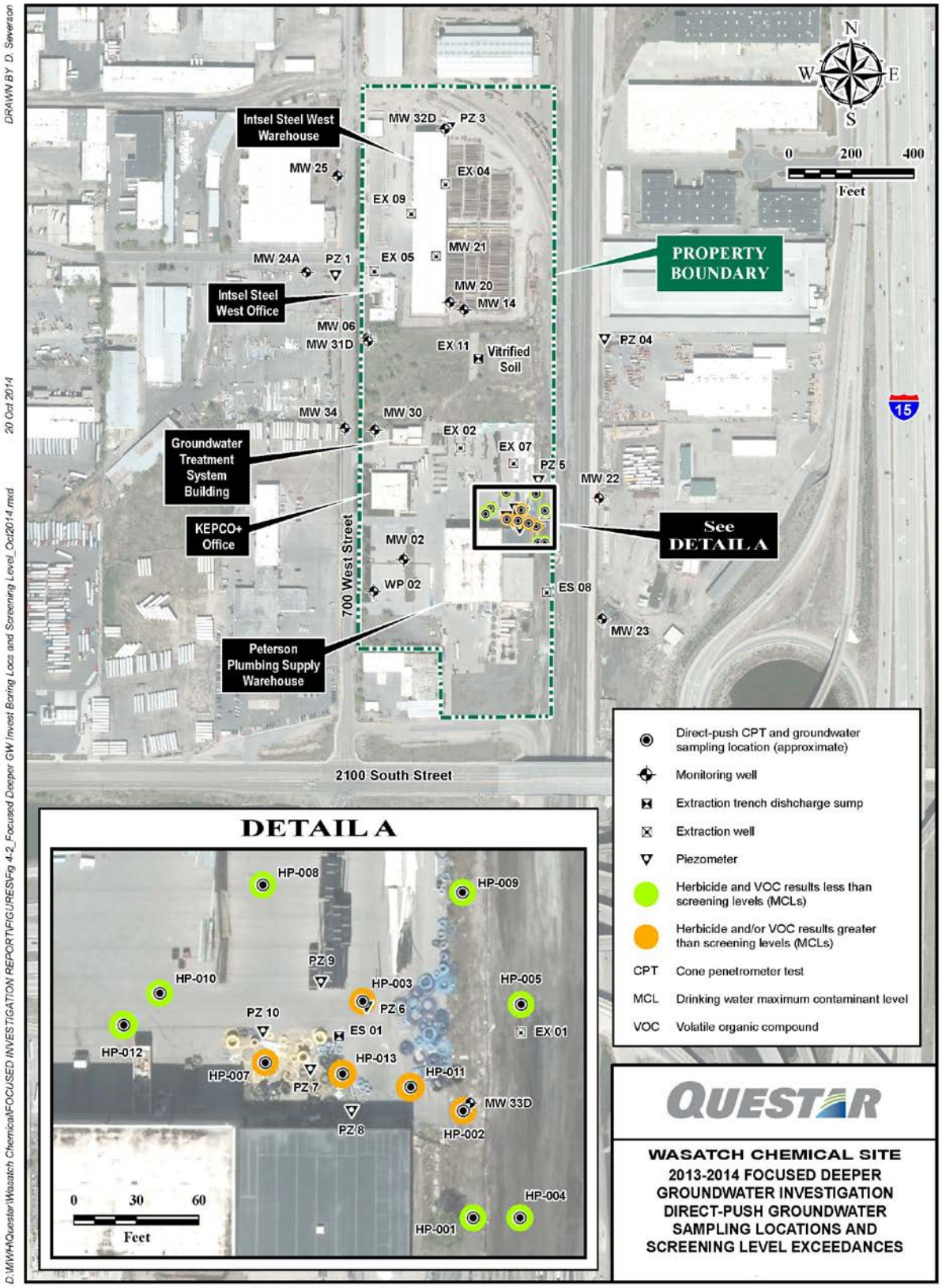


Figure C-6: Focused Shallow Soil Investigation Boring Locations and Results

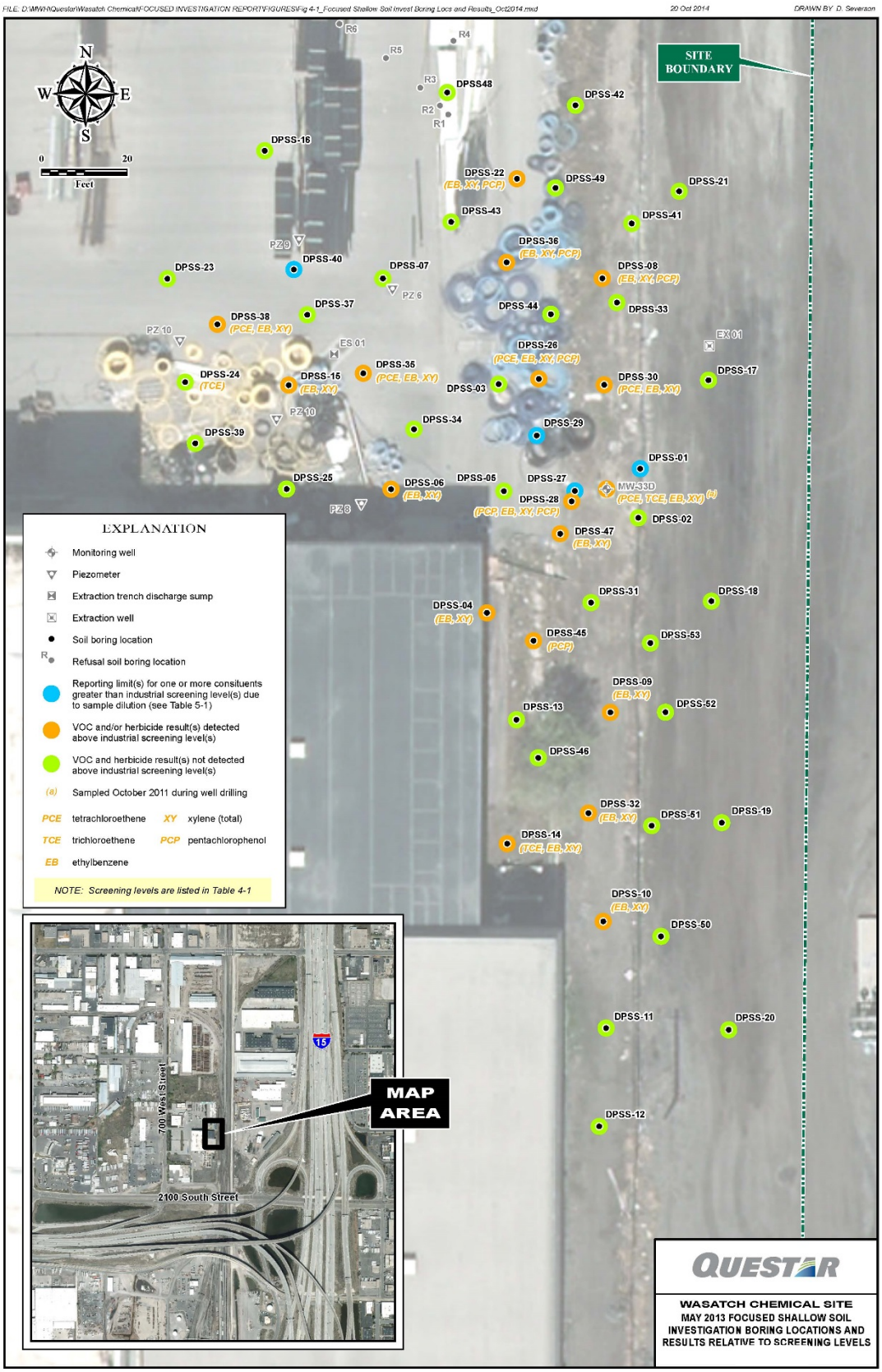
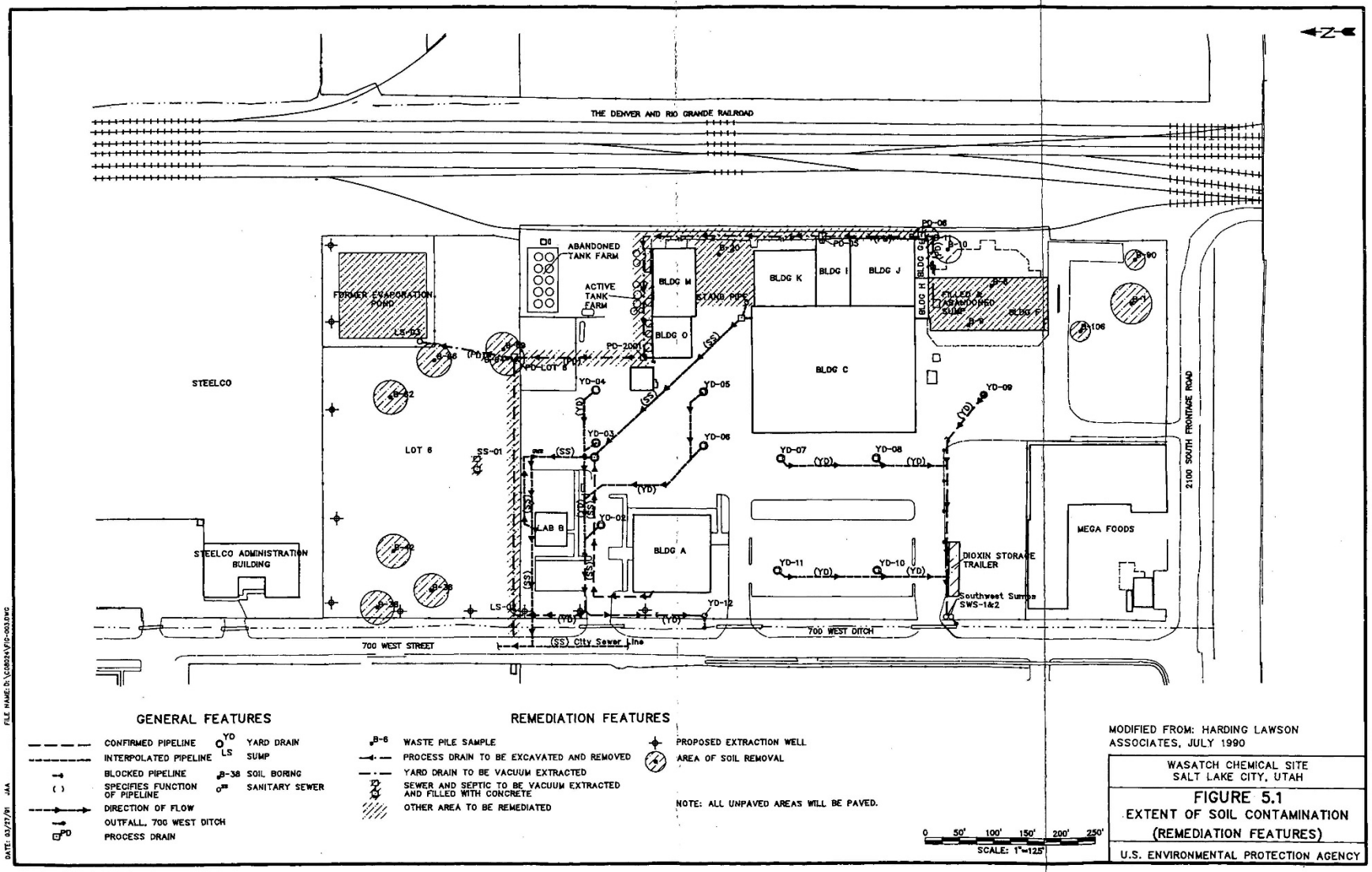


Figure C-7: Source Area Map from 1991 Record of Decision



APPENDIX D – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Wasatch Chemical Co. (Lot 6)	**Date of Inspection:** 12/06/2016
Location and Region: Salt Lake City, Utah 8	**EPA ID: UTD000716399**
Agency, Office or Company Leading the Five-Year Review: EPA Region 8	**Weather/Temperature:** Overcast, 35 degrees

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: In-situ vitrification
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone No.
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____Name _____ _____ _____
   Title Date Phone No.
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone No.
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone No.
   Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

4. **Other Interviews** (optional) ☐ Report attached: _____

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A
☒ Contingency plan/emergency response plan ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

7. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☐ N/A

Remarks: _____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☒ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____	To: _____	_____	☐ Breakdown attached
Date	Date	Total cost	
From: _____	To: _____	_____	☐ Breakdown attached
Date	Date	Total cost	
From: _____	To: _____	_____	☐ Breakdown attached
Date	Date	Total cost	
From: _____	To: _____	_____	☐ Breakdown attached
Date	Date	Total cost	
From: _____	To: _____	_____	☐ Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☒ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: _____

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident

Lengths: _____ Widths: _____ Depths: _____

Remarks: _____

3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☐ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☐ N/A
	(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		

1.	**Settlement** (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
	Arial extent: _____		Depth: _____
	Remarks: _____		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type:_____		Arial extent: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Obstructions**	Type: _____	☐ No obstructions
	☐ Location shown on site map	Arial extent: _____	
	Size: _____		
	Remarks: _____		
6.	**Excessive Vegetative Growth**	Type: _____	
	☐ No evidence of excessive growth		
	☐ Vegetation in channels does not obstruct flow		
	☐ Location shown on site map	Arial extent: _____	
	Remarks: _____		
D. Cover Penetrations		☐ Applicable	☐ N/A
1.	**Gas Vents**	☐ Active	☐ Passive
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at penetration	☐ Needs maintenance	☐ N/A
	Remarks: _____		
2.	**Gas Monitoring Probes**		
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at penetration	☐ Needs maintenance	☐ N/A
	Remarks: _____		
3.	**Monitoring Wells** (within surface area of landfill)		
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at penetration	☐ Needs maintenance	☐ N/A
	Remarks: _____		
4.	**Extraction Wells Leachate**		
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2.	**Degradation**	☐ Location shown on site map	☐ Degradation not evident
	Remarks: _____		
I. Perimeter Ditches/Off-Site Discharge		☐ Applicable	☐ N/A
1.	**Siltation**	☐ Location shown on site map	☐ Siltation not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Vegetative Growth**	☐ Location shown on site map	☐ N/A
	☐ Vegetation does not impede flow		
	Area extent: _____		Type: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Discharge Structure**	☐ Functioning	☐ N/A
	Remarks: _____		
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☐ N/A
1.	**Settlement**	☐ Location shown on site map	☐ Settlement not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Performance Monitoring**	Type of monitoring: _____	
	☐ Performance not monitored		
	Frequency: _____		☐ Evidence of breaching
	Head differential: _____		
	Remarks: _____		
IX. GROUNDWATER/SURFACE WATER REMEDIES		☒ Applicable	☐ N/A
A. Groundwater Extraction Wells, Pumps and Pipelines		☒ Applicable	☐ N/A
1.	**Pumps, Wellhead Plumbing and Electrical**		
	☒ Good condition	☐ All required wells properly operating	☐ Needs maintenance ☐ N/A
	Remarks: _____		
2.	**Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**		
	☒ Good condition	☐ Needs maintenance	
	Remarks: _____		
3.	**Spare Parts and Equipment**		
	☒ Readily available	☐ Good condition	☐ Requires upgrade ☐ Needs to be provided
	Remarks: _____		
B. Surface Water Collection Structures, Pumps and Pipelines		☐ Applicable	☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☒ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

Questar is working with EPA on an FFS to examine the possibility of changing the current groundwater remedy from pump-and-treat to MNA.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M requirements will be updated following EPA's decision on the final remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None noted.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None noted.

APPENDIX E – SITE INSPECTION PHOTOS

Monitoring well MW-33D.

Soil area outside fenceline with elevated contaminant concentrations.

Storage at Peterson Plumbing facility.

Peterson Plumbing facility offices.

Locked monitoring well.

Area of vitrified soil.

Extraction well EX-11.

Former evaporation pond and area of vitrified soil.

APPENDIX F – ARARs and CLEANUP GOAL REVIEW TABLES

Table F-1: ARARs Review for Groundwater COCs

COC	1991 ROD ARARs (µg/L)	Current ARARs[a] (µg/L)	ARAR Change
PCE	5	5	no change
TCE	5	5	no change
1,1-DCE	7	7	no change
PCP	1	1	no change
2,4-D	70	70	no change

Notes:
a = Based on National Primary Drinking Water Regulations available at: https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants (accessed on 11/23/2016).

Table F-2: Industrial Screening-Level Risk Assessment – Soil and Sludges

Soil and Sludge COCs	ROD Action Level (mg/kg)	EPA Industrial Carcinogenic Screening Level	EPA Industrial Noncarcinogenic Screening Level	Cancer Risk	Noncancer Hazard Index
TCE	103	6	19	2.0×10^{-5}	**5.4**
PCE	22	100	390	2.0×10^{-7}	0.06
HCB	7	0.96	930	7.0×10^{-6}	0.01
4,4-DDD	26	9.6	NA	3.0×10^{-6}	NA
4,4-DDE	19	9.3	NA	2.0×10^{-6}	NA
4,4-DDT	19	8.5	NA	2.0×10^{-6}	NA
Alpha-chlordane	7	7.7	450	9.0×10^{-7}	0.02
Gamma-chlordane	7	7.7	450	9.0×10^{-7}	0.02
Heptachlor	2	0.63	580	3.0×10^{-6}	0.003
TCDD (total)	0.02 (soil areas)	0.000022	0.00072	**9.0×10^{-4}**	**27.8**
	0.001 (ISV treatment)	0.000022	0.00072	4.6×10^{-5}	**1.4**

Notes:
EPA RSLs available at: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016 (accessed 11/23/2016).
NA = no screening level is available for this constituent.