CROUSE-HINDS LANDFILL
ONONDAGA COUNTY, NEW YORK
NYSDEC SITE NUMBER: 7-34-004

100% SITE MANAGEMENT PLAN

Prepared for:

Cooper Industries, LLC
600 Travis, Suite 5600
Houston, Texas 77002

Prepared by:

Tetra Tech, Inc.
175 N. Corporate Drive, Suite 100
Brookfield, WI 53045

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1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 Introduction

This document is required as an element of the remedial program at the Cooper Crouse-Hinds North and South Landfills (hereinafter referred to as the "Site") under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with Order on Consent Index No. R7-0666-05-11, Site No. 7-34-004, which became effective on September 8, 2011.

1.1.1 General

Cooper Industries entered into an Order on Consent with the NYSDEC to remediate a 21.5 acre North Landfill located in the Town of Salina and a 19.4 acre South Landfill located in the City of Syracuse, Onondaga County, New York. This Order on Consent required the Remedial Party, Cooper Industries, to investigate and remediate contaminated media at the site. A figure showing the site location is provided in Figure 1 and boundaries of the area subject to this plan is provided in Figure 2. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement.

After completion of the remedial work described in the Remedial Action Work Plan, some contamination was left in the subsurface at this site, which is hereafter referred to as "remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by Tetra Tech, Inc., on behalf of Cooper Industries, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, effective June 18, 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site.

1.1.2 Purpose

The site contains contamination left after completion of the remedial action. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Onondaga County Clerk, will require compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of

the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) maintenance of the landfill caps; and (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) a Maintenance Plan for the landfill composite cover systems.

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent Index No. R7-0666-05-11, Site No. 7-34-004, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 Site Background

1.2.1 Site Location and Description

The Cooper Crouse-Hinds, LLC (CC-H) Site consists of two former landfills, referred to as the North Landfill and South Landfill with associated wetland areas, separated by seventh North Street, which are located immediately west of CSX railroad tracks and the adjacent operating CC-H manufacturing facility. The Site is located in the Town of Salina (North Landfill) and City of Syracuse (South Landfill), Onondaga County, New York (Latitude 043º 05' 7" N, Longitude 076º 09' 40" W). The North Landfill consists of three contiguous parcels (Tax ID Nos. 073.-01-08.1, 073.-01-08.3, and 073.-01-08.4) totaling 21.48 acres in size. The South Landfill consists of one parcel (Tax ID No. 01.01-03) totaling 19.4 acres in size. The Site is located in an area of mixed usage including light industrial/manufacturing, commercial and retail usage. Seventh North Street is oriented

southeast-northwest and separates the two landfills that comprise the Site. A Site Location Map is presented as Figure 1 and a Site Plan is presented as Figure 2.

1.2.1.1 Landfills

The North Landfill is bordered along its northern border by a former landfill (approximately 37 acres) owned by Plaza East, LLC (Plaza), which consists of areas of fill (municipal waste and miscellaneous debris) with woodland cover and wetland areas. The North Landfill is bordered to the east and southeast by CSX railroad tracks and the CC-H facility and to the south and southwest by Seventh North Street and the South Landfill. West of the North Landfill are wetlands (Plaza property) followed by Ley Creek.

The South Landfill is bordered to the north by Seventh North Street and the North Landfill. To the east and southeast of the South Landfill are CSX railroad tracks followed by mixed commercial and retail development and Hiawatha Boulevard. Further to the South is undeveloped woods, wetlands and mixed commercial and retail development border the South Landfill further to the south. Ley Creek abuts the entire west and northwest boundary of the South Landfill.

Review of available historical documentation indicates that prior to the mid-to-late 1950s the North and South Landfills had been occupied by low lying fields, salt marshes and woodlands. From the mid-1950s to 1989 fill material had been placed across various areas of the North and South Landfills. An overall Site Plan is shown on Figure 2. Current topographic conditions are shown on the topographic survey map included on Figure 3.

1.2.1.2 Topography

The site topography is shown on Figure 3. Topography of the North Landfill is generally flat across the southern half of the landfill with an average elevation range of approximately 370 feet to 372 feet above mean sea level (AMSL). However, moving to the north from the central area of the North Landfill, the elevation rises moderately and increases to near an average of 381 feet AMSL across a notably mounded area of the landfill. Topography slopes moderately to steeply downward from the fill-mound along the northern portion of the North Landfill. Drainage across the North Landfill is generally radially outward from the fill-mound area in all directions. Drainage to the north and west is to the west wetland (Wetland B) and then to the adjacent wetland property owned by Plaza East. Drainage to the south and east is towards the east wetland (Wetland A) and the eastern stream segment (Stream A).

Topography of the South Landfill is generally flat across the landfill area with an average elevation range of 373 feet to 377 feet AMSL. Topography along the edges of the fill-mound slopes moderately to steeply away from the fill-mound to the north, east, south and west. Drainage across the South Landfill is generally radially outward from the fill-mound in all directions. Drainage to the east-southeast is to the stream (Stream B) and wetland areas (Wetland C) located on the east-southeast side of the landfill. Drainage to the south is to the wetland area (Wetland C) located to the south of the fill-mound.

Drainage to the west is collected along the landfill's western border for drainage into Wetland C and eventual flows to Ley Creek.

1.2.1.3 Surface Water Features

Ley Creek is located between 80 feet and 120 feet west of the western property boundary of the North Landfill and adjacent to the western boundary of the South Landfill (Figure 2). Ley Creek is part of the Onondaga Lake drainage basin and flows to the south/southwest towards Onondaga Lake. Between the mouth of Ley Creek and the Onondaga County Ley Creek Transfer Station and former sewage treatment plant (POTW) outfall, Ley Creek is classified as a Class C water body. From the POTW outfall to a point located 3.1 miles north of the creek mouth, Ley Creek is classified as a Class B water body. The section of Ley Creek adjacent to the CC-H Landfill Site is classified as a Class C water body. Flood insurance maps indicate that the CC-H Landfill Site is located within the 100-year flood plain of Ley Creek as defined by the Federal Emergency Management Agency (FEMA). The base flood water surface water elevation for the Site is 374 feet AMSL.

Bear Trap Creek drains into Ley Creek at its terminus that is located approximately 260 feet west of the southwest corner of the North Landfill, which is to the immediate north of the Seventh North Street bridge that crosses Ley Creek (Figure 2). Bear Trap Creek extends northward from its terminus and receives drainage from areas that range from undeveloped usage to commercial usage and potentially light industrial usage.

Two stream segments and one drainage ditch are located on the CC-H Landfill Site and are described in the next section.

1.2.1.4 Wetlands

In November 2005, wetland delineation was conducted across the Site to define the extent of wetlands on-site. All work was conducted according to the criteria set forth in the *1987 United States Army Corps of Engineers Wetlands Delineation Manual*, *Classification of Wetlands and Deepwater Habitats of the United States*, and the *1995 NYSDEC Freshwater Wetlands Delineation Manual*. Wetland areas identified on-site are described further below.

Two wetland areas and one stream section were identified on the North Landfill (Figure 2). The first wetland, Wetland A (a.k.a. the "east wetland") extends along the majority of the southeastern side of the North Landfill and is approximately 2.63 acres in size. The east wetland receives flow from an off-site drainage ditch/stream form the Plaza East former landfill and CSX Railroad properties that enters the wetland at the east corner of the landfill. Surface water in this ditch/stream appears to originate as surface water runoff and drainage from and across the adjacent properties owned by Plaza East, LLC and CSX Railroad. Surface water discharge from the east wetland is to a stream (Stream A) that is 675 feet in length and flows southwest from Wetland A to the south point of the North Landfill where it then turns to the northwest and parallels Seventh North Street. At its terminus, the stream discharges into two 24-inch diameter culverts, which carry flow beneath Seventh North Street and into a drainage ditch that is located along the northeast

boundary of the South Landfill. Drainage in the ditch flows northwest and ultimately discharges to Ley Creek. The second wetland, Wetland B (a.k.a. the "west wetland") is located along the northwest side of the North Landfill; the on-site portion of this wetland feature is approximately 2.61 acres in size. Wetland B occurs adjacent to and within the flood plain of Ley Creek and extends offsite from the northwest property boundary, and across the adjacent property owned by Plaza East, LLC, to Ley Creek. Wetland B is identified on National Wetland Inventory (NWI) maps (ID No. PFO1/SS1E).

One wetland area, stream section, and drainage ditch were identified on the South Landfill (Figure 2). Wetland C (a.k.a. the "south wetland") is located south of the southwest point of the South Landfill and is approximately 1.29 acres in size. The stream section (Stream B) is approximately 1,825 feet in length and extends along the southeast side of the South Landfill. The stream channel begins near the east point of the landfill and runs parallel with the CSX railroad tracks and southeastern edge of the landfill until it enters the Wetland C. Upon entering Wetland C, the stream flows southwest along the northwest edge of Wetland C.

Prior to 2009, surface water from Stream B and Wetland C discharged into Ley Creek at the terminus of the stream via a 36-inch diameter culvert pipe. The culvert pipe was removed in 2009 and the area backfilled with imported gravel material and fill (Figure 2) to prevent the flow of surface water and entrained sediments from Ley Creek to the South Landfill and vice versa. There is no longer a discharge point to Ley Creek, however surface water can still flow along Stream B and into Wetland C.

Surface water flow in Stream B appears to be primarily from surface water runoff from the South Landfill and the adjacent CSX railroad property. Observations indicate that flow in the stream is generally limited to times of heavy runoff due to either rainfall events or snow melt. Generally, the upper one third of the stream area is dry for the majority of the year. Prior to the removal of the 36-inch culvert pipe, observations indicated that surface water from Ley Creek flowed into Stream B and Wetland C during high water events in Ley Creek.

The drainage ditch is located along the northern boundary of the South Landfill and Seventh North Street. The ditch is 1,075 feet in length and begins at the east point of the South Landfill. Flow in the ditch is to the northwest to its terminus where it discharges into Ley Creek. The ditch accepts discharge from a culvert pipe located at the head of the ditch and from the two 24-inch culvert pipes leading beneath the roadway. The source of flow from the culvert pipe at the head of the ditch is from unknown off-site sources to the southeast. The head of the ditch is located at an elevation of approximately two feet below the head of the South Landfill (Stream B) and does not provide discharge flow to Stream B.

Based on the NYSDEC wetlands maps, the wetlands located on the North and South Landfills are not under the direct jurisdiction of New York State. The United States Army Corps of Engineers (USACE) provided a preliminary Jurisdictional Determination (JD) dated June 19, 2009 on these wetland areas.

1.2.2 Site History

Available information indicates that prior to the mid-1950s the area of the North Landfill had been undeveloped and occupied by fields, salt marshes and woodlands. Beginning in the mid-1950s, CC-H reportedly began using the North Landfill for disposal of wastes that were generated at their adjacent manufacturing facility. Between the mid- 1950s and 1972 the North Landfill reportedly accepted an unknown quantity of solid industrial waste (i.e., foundry sand) from the CC-H facility. In April of 1981, CC-H applied for a Part 360 permit to operate the North Landfill as a non-hazardous landfill. On March 10, 1982, CC-H withdrew its application. Waste disposal was discontinued at the North Landfill in 1989. The North Landfill has been inactive since 1989.

Available information indicates that prior to 1959 the area of the South Landfill had been undeveloped and occupied by fields, salt marshes and woodlands. Beginning in 1960, CC-H reportedly began using the South Landfill for disposal of wastes that were generated at their adjacent manufacturing facility. Between 1960 to early 1965 the South Landfill also accepted approximately 2,000 cubic yards per week of municipal solid waste (sanitary, domestic, trash, debris, etc.) from the City of Syracuse.

In a memo dated December 1, 1960, from the City of Syracuse Department of Public Works (DPW) to CC-H, the DPW indicated that the landfill (reportedly the South Landfill) would be prepared for usage in a way that would correct drainage issues in ditches and culverts across the South Landfill and along Seventh North Street and also in a way that would allow for the development of a lagoon for use in clarifying liquid plant wastes. [Note: The source of the liquid waste was not identified]. It was also indicated at this time (1960) that the Ley Creek channel west from Seventh North Street would be cleaned for the length of the CC-H creek frontage to improve area drainage and reduce odor problems. In a memo dated June 9, 1961, from the City of Syracuse DPW to CC-H, the DPW presented a plan for cleaning the ditches across the North and South Landfills in lieu of conducting cleaning of the Ley Creek channel by crane and drag-line. The date of channel cleaning completed by the City of Syracuse DPW, and/or how the sediments from Ley Creek were handled and where they were disposed of was not noted in available documentation. However, it is clear from available documentation and aerial photographs that the DPW actively modified drainage in ditches along the east side of both the North and South Landfills and along Seventh North Street to facilitate usage of the South Landfill by DPW. The location of these ditches also correlates with the location of the stream sections (Stream A and B) and drainage ditches that are currently mapped on the CC-H Site in Figure 2.

At some time in early 1965, CC-H terminated use of the South Landfill by the City of Syracuse due to concerns over the remaining useful volume of the fill area and because the City was not providing cover material per the agreement. Waste disposal activities were reportedly discontinued at the South Landfill in 1969 and the South Landfill has been inactive since that time.

After the City of Syracuse's use of the South Landfill was terminated in 1965, the City entered into an agreement with Plaza East, LLC to dispose of municipal solid waste on

property located immediately north of the North Landfill. Access to this area was through a 100-foot wide strip of land located along the northwest portion of Wetland B (adjacent to Ley Creek) which was conveyed to Plaza East, LLC by CC-H in 1964. A road was constructed on this strip to allow the City of Syracuse to use Plaza East property for the continued disposal of municipal waste. A letter from the City of Syracuse, Department of Public Works dated June 24, 1968 states that the access road would be first landfilled to approximately 12 to 18 inches below grade before placement of a road surface. There is no indication as to the type of fill material to be placed by the City.

In the early 1970s, Onondaga County formed the Bear Trap-Ley Creek Drainage District to address periodic flooding in Ley Creek. The County began operations intended to widen and deepen the Ley Creek channel for the majority of its length. As part of that plan the County took the 100-foot wide Plaza East, LLC parcel which left Plaza East, LLC with no access to their property from Seventh North Street. On August 30, 1972, CC-H entered into a land transfer and right of-way (ROW) agreement with Onondaga County in which an additional 100-foot wide strip of land was transferred from CC-H to Onondaga County so that the County could grant an easement to Plaza East, LLC for access to the landfill property. At some point the 100-foot wide parcel was transferred back to Plaza East, LLC. The 150-foot wide strip of land between Wetland B and Ley Creek is currently owned by Plaza East, LLC as shown on Figure 2.

As part of the 1972 ROW agreement, CC-H also granted Onondaga County a semi-permanent ROW along the entirety of the western property border of the South Landfill. This agreement allowed Onondaga County temporary access to the CC-H Site for a period of one year in order to complete widening and deepening of Ley Creek in association with the Ley Creek drainage project. Available information indicates that work on the Ley Creek dredging and drainage channel improvements for the South Landfill was completed in about January 1973. CC-H indicated that a dike had been located in the area of the southwest corner of the South Landfill and that dredge spoils had reportedly been spread over the southwest corner of the South Landfill in the area of Wetland C.

1.2.3 Geologic Conditions

Appendix A includes geologic cross-sections and groundwater flow maps for the site. The site geology consists of unconsolidated glaciolacustrine and glaciofluvial sediments as described below. A shallow groundwater flow system, located from approximately 6 to 30 below ground surface, in the fill, peat, sand and silt deposits, and a deep confined groundwater flow system located in sand and gravel deposits are present at the site. The deep groundwater system is separated from the overlying shallow groundwater system by a continuous confining layer of silt and clay deposits of varying thickness commencing at approximately 30 feet below ground surface.

Groundwater flow in the shallow groundwater system is generally to the west toward Ley Creek. Groundwater flow in the deep groundwater flow system is generally to the east. Groundwater in the deep aquifer exhibits a strong upward vertical gradient and at times exhibits artesian conditions in the deep wells located on the North Landfill.

1.3 Summary of Remedial Investigation Findings

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in the following report: Remedial Investigation Report prepared by GeoTrans, Inc. for Cooper Industries, Inc., dated August 5, 2009.

The RI was conducted between June 2004 and August 2009. The RI included test pits and boreholes for collection of waste material and surface and subsurface soil samples. New monitoring wells were installed and groundwater samples were collected from new and existing monitoring wells. Surface water samples were collected from on-site stream segments and Ley Creek. Surface and subsurface sediment samples were collected from the on-site wetlands, stream segments and ditches and from Ley Creek.

Subsequent to the RI an investigation was conducted in November 2010 to delineate the hot spot areas that were targeted for removal in the North Landfill. A landfill methane gas survey was also conducted on the North and South Landfills to determine the level of methane being generated at each landfill. The results were presented in a September 7, 2011 letter report.

Below is a summary of site conditions when the RI was performed in 2004-2009 and the supplemental hot spot delineation and landfill gas survey was performed in 2010:

1.3.1 Waste Materials

The North Landfill is predominantly industrial fill ranging in thickness from 3 to 17 feet and consisting primarily of foundry sand, foundry core butts, foundry molds, metal debris, wood debris, and miscellaneous industrial debris. The industrial fill was generally black in color and had an oily type nature. Varying amounts of municipal waste (glass, bottles, plastic debris, metal cans, paper, etc.) was observed along the northern/northeastern property boundary. The volume of waste in the North Landfill is estimated at 223,000 yd^3. Three hot spot areas were identified within the North Landfill containing NAPL oil, elevated VOCs and elevated PCBs (Figure 2).

The South Landfill contains industrial fill and municipal waste ranging in thickness from 0 to 19 feet. The industrial fill consists primarily of foundry sand, foundry core butts, foundry molds, metal debris, wood debris, and miscellaneous industrial debris. The industrial fill was black in color and generally had an oily type nature. The municipal waste consists of glass, bottles, plastic debris, metal cans, paper, and general municipal refuse. The fill along the western boundary with Ley Creek is all municipal waste and no industrial fill. The volume of waste in the South Landfill is estimated at 220,000 yd^3.

1.3.2 Landfill Gas

A total of 39 bar hole probes were installed on the North (22 probes) and South (17 probes) Landfills (Figure 4). On the North Landfill, methane gas concentrations were observed at three probes located in a small area near the south entrance gate to the North Landfill, where peak methane measurements ranged from 8.2 to 23.5 % and sustained methane measurements ranged from 7.8 to 17 %. On the South Landfill, methane gas

measurements were observed at six probes across a large portion of the South Landfill, where peak methane measurements ranged from 7.0 to 79 % and sustained methane measurements ranged from 6.9 to 79 %.

1.3.3 Soil

Shallow and subsurface soil samples were collected at the site during the RI. Shallow soil samples were collected from a depth of 0-6 inches. Subsurface soil samples were collected from a depth of 2 - 18 feet to assess soil contamination impacts to groundwater. The results indicate that soils at the site in the waste masses exceed the unrestricted SCGs for volatile and semi-volatile organics, PCBs/pesticides and metals (Table 1). The results indicate that soils along the eastern property boundary of both landfills along a strip of land between the wetlands and the railroad property exceed the unrestricted SCGs for PCBs.

The primary soil contaminants are benzene, benzo(a)pyrene, phenol and metals (arsenic and cadmium) associated with disposal of wastes in the landfill. In addition, PCB contamination exists in soil along the eastern boundary of the site (see Figure 5).

Based on the findings of the RI, the disposal of hazardous waste has resulted in the contamination of soil. Protection of groundwater SCOs are also exceeded for benzene, chlorobenzene and phenol. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, benzene, benzo(a)pyrene, phenol, metals (arsenic and cadmium) and PCBs.

In August 2013 a total of 38 additional shallow soil samples (0-0.5’) were collected along the bank of Ley Creek on the South Landfill to determine if soils overlying waste to be removed in the buffer zone contain PCB concentrations >1 mg/kg.

1.3.4 Sediment

Sediment samples were collected during the RI in Ley Creek from upstream of the site, adjacent to the site and downstream of the site. Sediment samples were also collected from on-site wetlands and drainage channels during the RI. The samples were collected to assess the potential for impacts to on-site wetlands and drainage channel sediment, and Ley Creek sediment, from the site. The results indicate that sediment in the on-site wetlands and on-site drainage channels exceed the Department’s SCGs for sediments for benz(a)anthracene, PCBs and metals (Table 2). Additional sediment sampling was conducted in the North Landfill wetlands to further delineate TSCA level (>50 mg/kg) PCB concentrations. In Ley Creek, sediment concentrations exceed criteria for several PAHs, PCBs and several metals; however, sediment quality was generally consistent in Ley Creek from upstream to downstream indicating that the site does not currently impact Ley Creek sediment (see Figure 6).

The primary wetlands and drainage swales sediment contaminants are PCBs and metals, such as cadmium, chromium, lead and zinc, associated with the historic waste disposal at the landfills. The iron found in sediment was also found in groundwater, including deep

groundwater not impacted by the site and appears to be ubiquitous. Therefore, iron in sediment is not considered a site specific contaminant of concern.

Based on the findings of the RI, the disposal of hazardous waste has resulted in the contamination of sediment in on-site wetlands and drainage swales. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of sediment to be addressed by the remedy selection process are PCBs and metals, such as cadmium, chromium, lead and zinc.

1.3.4.1 Wetland A and Stream Segment A

As part of the RI a total of 183 sediment samples were collected from the east wetland area (Wetland A) and eastern stream segment (Stream A) of the North Landfill. All samples were analyzed for PCBs and 5 samples were analyzed for VOCs, SVOCs and metals. No VOCs were detected in any of the sediment samples at concentrations in excess of the NYSDEC soil screening values (SSVs). Some SVOCs and metals were detected in the sediment samples at concentrations in excess of the NYSDEC SSVs.

PCBs (including Aroclors 1242, 1248, 1254 and 1260) were detected in 123 of the 183 sediment samples to a maximum depth of 7 feet. Total PCB concentrations ranged from 0.0064 ppm to 140 ppm. The highest concentrations of PCBs were detected in the samples collected from the 0.0 to 0.5 foot depth interval with an average PCB concentration of 31.05 ppm. Average PCB concentrations in sediment samples collected from the subsequently lower depth intervals were observed to decrease significantly with depth.

In August/September 2013 a total of 82 additional sediment samples were collected from Wetland A to further delineate the areas containing PCB concentrations >50 mg/kg which would be removed and transported off-site to a TSCA landfill.

1.3.4.2 Wetland B

As part of the RI a total of 118 sediment samples were collected from the west wetland area (Wetland B) of the North Landfill. All samples were analyzed for PCBs and 5 samples were analyzed for VOCs, SVOCs and metals. No VOCs were detected in any of the sediment samples at concentrations in excess of the NYSDEC SSVs. Some SVOCs and metals were detected in the sediment samples at concentrations in excess of the NYSDEC SSVs.

PCBs (including Aroclors 1248, 1254 and 1260) were detected in 73 of the 118 sediment samples to a maximum depth of 4 feet. Total PCB concentrations ranged from 0.012 ppm to 90.4 ppm. The highest concentrations of PCBs were detected in the samples collected from the 0.0 to 0.5 foot depth interval with an average PCB concentration of 23.13 ppm. Average PCB concentrations in sediment samples collected from the subsequently lower depth intervals were observed to decrease significantly with depth.

In August/September 2013 a total of 36 additional sediment samples were collected from Wetland B to further delineate the areas containing PCB concentrations >50 mg/kg which would be removed and transported off-site to a TSCA landfill.

1.3.4.3 Wetland C, Stream Segment B and North Drainage Ditch

As part of the RI a total of 172 sediment samples were collected from the south wetland area (Wetland C), eastern stream segment (Stream B) and the northern drainage ditch on the South Landfill. All samples were analyzed for PCBs and 10 samples were analyzed for VOCs, SVOCs and metals. No VOCs were detected in any of the sediment samples at concentrations in excess of the NYSDEC SSVs. Some SVOCs and metals were detected in the sediment samples at concentrations in excess of the NYSDEC SSVs.

PCBs (including Aroclors 1242, 1248, 1254 and 1260) were detected in 123 of the 172 sediment samples to a maximum depth of 9 feet. Total PCB concentrations ranged from 0.013 ppm to 13.2 ppm. The highest average concentrations of PCBs (2.91 ppm) were detected in the samples collected from the 1.0 to 1.5 foot depth interval.

1.3.5 Groundwater

A shallow water table groundwater flow system, located in the fill, peat and associated mixed deposits, and a deep confined groundwater flow system, located in sand and gravel deposits, are located beneath the CC-H Landfill Site. The deep groundwater system is separated from the overlying shallow water bearing system by a continuous confining layer of silt and clay deposits of varying thickness.

The analytical data for shallow groundwater samples collected on the North Landfill indicate that shallow groundwater beneath the North Landfill has been minimally impacted by VOCs (benzene, chlorobenzene, chloroethane, 1,4-dichlorobenzene, ethylbenzene, methylene chloride, chloroform and toluene), SVOCs (fluoranthene, naphthalene, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, phenanthrene and pyrene), total recoverable phenols and metals (primarily iron but also lead and cadmium) at concentrations slightly in excess of the NYSDEC Class GA groundwater standards (Table 3). The analytical data for shallow groundwater samples collected on the South Landfill indicate that shallow groundwater beneath the South Landfill has not been impacted by VOCs or SVOCs and has been minimally, and infrequently, impacted by phenols and limited metals at concentrations slightly in excess of the NYSDEC Class GA groundwater standards. No pesticides, PCBs or cyanide were detected in the shallow groundwater.

The analytical data for deep groundwater samples collected on the North and South Landfills indicate no reproducible detections of VOCs, SVOCs, or total recoverable phenolics. Metals (primarily aesthetic water quality criteria for iron) were detected at concentrations slightly in excess of the NYSDEC Class GA groundwater standards. No pesticides, PCBs or cyanide were detected in the deep groundwater.

Based on the findings of the RI, the disposal of hazardous waste has resulted in the localized contamination of groundwater on-site. While groundwater migrates off-site, there was no discernible impact detected off-site (*e.g.*, to Ley Creek) from site groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: total phenols, benzene, chlorobenzene and 1,4-dichlorobenzene (see Figure 7). The iron found in groundwater was found in both the shallow aquifer (site impacted aquifer) and deep groundwater (non-impacted aquifer), and appears to be ubiquitous to the area. Therefore, iron in groundwater is not considered a site specific contaminant of concern.

1.3.6 Surface Water

Surface water samples were collected during the RI in Ley Creek from upstream of the site, adjacent to the site and downstream of the site. Surface water samples were also collected from on-site wetlands and drainage channels.

The samples were collected to assess the surface water conditions on and off-site. The results indicate that contaminants in surface water on-site in wetlands and drainage swales exceed the Department's SCG for methylene chloride, benz(a)anthracene, benzo(a)pyrene and metals (aluminum, cadmium, chromium, copper, iron, lead and zinc) (Table 4). Surface water quality was generally consistent and below standards in Ley Creek from upstream to downstream indicating that the site does not currently impact Ley Creek surface water. Lead in Ley Creek surface water was detected at concentrations in excess of the New York State surface water quality standard (17.9 ppb) adjacent to the site; however, the highest concentration (84.2 ppb) detected in Ley Creek during the RI was at the upgradient sampling location (see Figure 8). PCBs were detected in only one surface water sample (*i.e.*, upstream in Ley Creek**).**

Based on the findings of the RI, the disposal of hazardous waste has resulted in the contamination of on-site surface water in wetlands and drainage swales. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of surface water to be addressed by the remedy selection process are SVOCs (benz(a)anthracene and benzo(a)pyrene) and metals (cadmium, lead and zinc). The iron found in the wetlands and drainage swales surface water was also found in groundwater, including deep groundwater not impacted by the site and appears to be ubiquitous. Therefore, iron in surface water is not considered a site specific contaminant of concern.

1.4 Summary of Remedial Actions

The site was remediated in accordance with the NYSDEC-approved Removal Action Work Plan dated October, 2012 and Remedial Design dated June, 2013. The following is a summary of the Remedial Actions performed at the site:

1. A Removal Action that included excavation and off-site disposal was conducted on three areas in the North Landfill with elevated contaminant levels. One area included 149 tons of waste containing PCBs at concentrations of 50 parts per

million (ppm) or greater. A couple of other areas included 2,267 tons of waste that contained concentrations of VOCs greater than 50 ppm. A final area included 2,882 tons of non-aqueous phase liquid (NAPL) oil saturated waste. The PCB Toxic Substances Control Act (TSCA) waste was transported off-site to the Waste Management Model City Landfill facility. The VOC and oily wastes were transported to the Seneca Meadows Landfill.

2. Both the North and South Landfills were consolidated to reduce their current area. The consolidated areas are fenced and have engineered cap systems designed and constructed in conformance with the substantive requirements for landfill caps set forth in 6 NYCRR Part 360. The consolidation included waste removal from a 50-foot buffer zone area between the South Landfill and Ley Creek, 30-foot buffer zone areas between the landfills and on-site wetlands and a buffer zone between the North Landfill and Seventh North Street. The excavated material was consolidated in the landfills above the water table.

3. Wetland sediment with PCB concentrations greater than 1 ppm and less than 50 ppm was excavated for consolidation and capping on-site with the material discussed above. PCB contaminated sediment with concentrations of 50 ppm or greater was properly transported off-site for disposal at the Model City Landfill.

4. The excavated wetlands and buffer zones were restored and will be maintained per the approved restoration plan. Buffer zone soils meet the Unrestricted Use Soil Cleanup Objectives set forth in Table 375-6.8(a) of 6 NYCRR Part 375 for a minimum of two feet in depth measured from the finished surface grade. The remaining buffer zone soils meet, at a minimum, the lower of the protection of groundwater or the protection of public health soil cleanup objectives for commercial use as set forth in Table 375-6.8(b) of 6 NYCRR Part 375.

5. Imposition of an institutional control in the form of an environmental easement for the controlled property that:
    a. Requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
    b. Allows the use and development of the controlled property for industrial use, although subject to local zoning laws;
    c. Restricts the use of groundwater and surface water as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH; prohibit agriculture or vegetable gardens on the controlled property;
    d. Requires compliance with the Department approved Site Management Plan; and,
    e. Includes provisions to evaluate the potential for vapor intrusion for any buildings developed on the site and to implement actions recommended for addressing exposures related to soil vapor intrusion.

6. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting.

No long-term treatment systems were installed as part of the site remedy. Remedial activities were completed at the site in [month, year].

1.5 Summary of Remaining Contamination

Post-excavation sampling for PCBs in the wetlands will take place during site construction. Base of excavation samples will be apportioned at 900-square foot intervals as indicated in DER-10(5.4)(b)(5.)(iii). Wall samples will be collected along cuts greater than 4 feet. The base of excavation samples are presumed to be an adequate indicator of residual contamination at cuts less than 4 feet deep. Samples will be field located on 30+ feet grids, equally spaced across excavation cell areas, and the locations recorded using a GPS device at the time of sample collection.

To be completed post-remediation.

- A narrative description of the remaining contamination, including:
  - A description of the demarcation layer;
  - A description of the depths at which the demarcation layer or surface of remaining contamination will be encountered, and at which contamination is no longer expected. If the upper surface of the remaining contamination zone varies due to differing cover types, a figure showing the elevations of top of remaining contamination zone will be included. Similarly the thickness of the remaining contamination zone may be shown on a figure.
  - If certain areas of the site contain source areas or higher levels of contamination than others, these will be described.
  - If contamination was not remediated due to the presence of critical infrastructure (e.g., water main, utility poles) contaminant levels in these areas will be described, so that future maintenance activities can be properly planned.
- A summary of all contaminated soil and sediment left on-site after remedy is complete. Include the following as applicable:
  - Table 5 of exceedances of applicable/relevant Track 1 SCOs (Part 375-6) after Remedial Action;
  - Figure 9 of exceedances of applicable/relevant Track 1 SCOs (Part 375-6) after Remedial Action (i.e., below the cover system);
  - Figure 10 of areas complying with unrestricted SCOs (Part 375-6) after Remedial Action;

Table 5 and Figure 9 summarize the results of all soil samples remaining at the site after completion of Remedial Action that exceed the Track 1 (unrestricted) SCOs. Figure 10 summarizes the results of all soil samples remaining at the site after completion of remedial action that meet the SCOs for unrestricted use of the site.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 Introduction

2.1.1 General

Since remaining wastes and contaminated soil and groundwater exists beneath the site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 Engineering Controls

2.2.1 Engineering Controls Systems

This section includes a description of the engineering controls system in place at the Site. Procedures for monitoring the systems are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the site, occurs.

2.2.1.1 Fencing

An eight-foot high chain link fence surrounds both the North and South Landfills. The location of the fence is shown in Figure 11.

2.2.1.2 Landfill Cover

Exposure to remaining contamination in soil/fill at the site is prevented by a soil cover system placed over the site. This cover system is comprised of a 60 mil HDPE geomembrane layer covered by 12 inches of clean soil and 6 inches of topsoil. The location of the landfill covers for the North and South Landfills is shown in Figure 11.

The Excavation Work Plan that appears in Appendix B outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

2.2.2 Criteria for Completion of Remediation

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Composite Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

2.2.2.2 Passive Landfill Gas Venting System

The passive landfill gas venting system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

2.2.2.3 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 Institutional Controls

A series of Institutional Controls is required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to industrial uses only. Adherence to these Institutional Controls on the site is required by the Environmental Easement and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Groundwater and landfill gas monitoring must be performed as defined in this SMP;

- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP;

Institutional Controls identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may only be used for industrial use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted or restricted residential or commercial use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the surface water on or groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area noted on Figure 11 , and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited;
- The site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The site has been remediated for restricted industrial use. Any future intrusive work that will penetrate the soil cover or cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix B to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site. A HASP is attached as Appendix C to this SMP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. The CAMP is attached as Appendix D to this SMP and is the generic CAMP provided as Appendix 1A of DER-10. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-

submitted with the notification provided in the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain remaining contamination and the potential for soil vapor intrusion (SVI) has been identified (see Figure 11), an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 Inspection and Notifications

2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;

- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system;

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5.3).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Order on Consent and all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to Mike Noel with Tetra Tech, the qualified environmental professional. These emergency contact lists must be maintained in an easily accessible location at the site.

Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Site Contact Numbers

Tom Bonk (Crouse-Hinds)	(315) 491 -3081
Dave Sensinger (Crouse-Hinds)	(315) 477- 5258
Paul Grondin (Crouse-Hinds)	(315) 477- 5560
Nelson Olavarria (Cooper Industries)	(713) 209-8850
Mike Noel (Tetra Tech)	(262) 853-4983

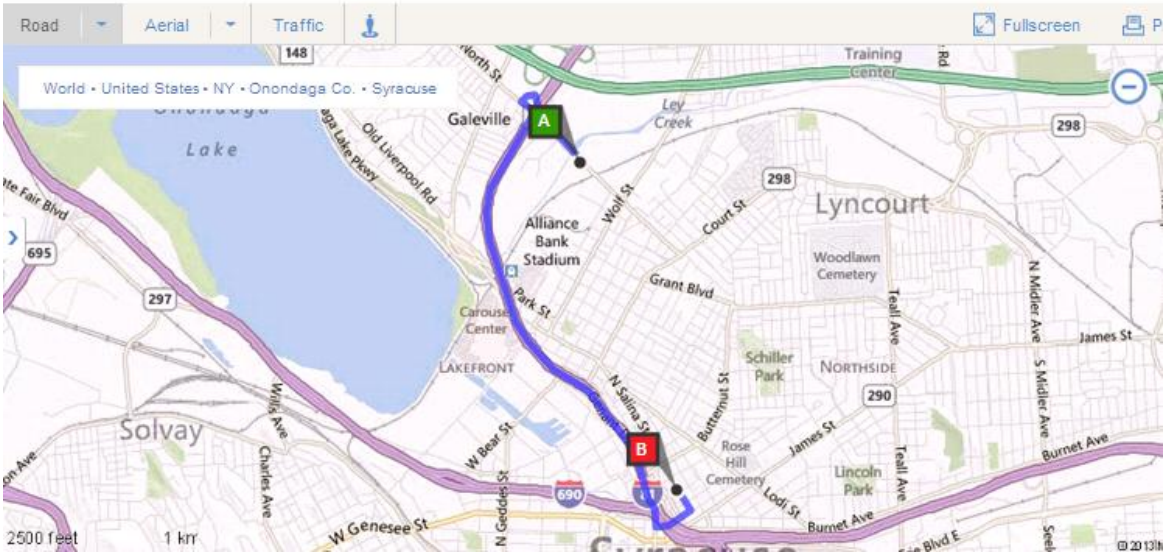
* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Direction to Nearest Hospital

Site Location: Crouse-Hinds Landfills [A]
Nearest Hospital Name: St. Joseph's Hospital Health Center [B]
Hospital Location: 301 Prospect Avenue, Syracuse, NY
Hospital Telephone: 315-448-5111
Directions to the Hospital:

1. North on 7th North St / CR-45 toward Terminal Rd (0.5 mi)
2. Take ramp right for I-81 South toward Syracuse (3.0 mi)
3. At exit 19, take ramp right for Salina St toward Clinton St (0.3 mi)
4. Turn left onto E Willow St (0.3 mi)
5. Turn left onto Prospect Ave (0.1 mi)
6. Arrive at 301 Prospect Ave.
   Total Distance: 4.2 miles
   Total Estimated Time: 7 minutes

Map Showing Route from the site to the Hospital:



2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan. The list will also be posted prominently at the site and made readily available to all personnel at all times.

3.0 SITE MONITORING PLAN

3.1 Introduction

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the composite cover system, and all affected site media identified below. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, surface water, landfill gas, wetlands biota);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

  To adequately address these issues, this Monitoring Plan provides information on:
- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Quarterly monitoring of the performance of the remedy and overall reduction in contamination on-site will be conducted for the first two years. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in groundwater, surface water, landfill gas and/or wetlands biota will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 6 and outlined in detail in the sections below.

Table 6: Monitoring/Inspection Schedule

Program	Frequency*	Matrix	Analysis
Landfill Cover	Semiannual	cover	visual
Landfill Gas	Quarterly	gas	% LEL
Groundwater	Quarterly	water	VOCs
Surface Water	Quarterly	water	PCBs, metals
Wetlands	Quarterly	vegetation	visual

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 Landfill Cover System Maintenance and Monitoring

3.2.1 Landfill Cover System Monitoring

Maintenance activities for the landfill cover are generally described below. A comprehensive and detailed maintenance schedule is detailed below. This will allow for early identification and correction of potential problems. Observations noted during the inspections shall be recorded on the Post-Closure Inspection Checklist (Appendix E). The cover maintenance activities include the following:

- Conduct inspections of the landfill cap once during the spring and fall, noting condition of soil slopes, and vegetative cover. Any changes in the soil or vegetative cover will be noted and corrected as weather conditions permit; and
- Mow the cover vegetation and manage vegetation present along the perimeter fence as needed.

3.2.2 Potential Operating Problems

Potential operational problems that may be encountered with the landfill cap include the following:

Soil Grades – Potential operational problems may arise through formation of erosional gullies, landfill blowout zones, loss of vegetative cover, underbrush growth, trash accumulation, soil fracturing, or rutting. Any of these situations could potentially impair effectiveness of the landfill cap to minimize infiltration of surface runoff and precipitation. Burrowing wildlife may also undermine the integrity of the landfill cap and side slope stability. Surface traffic, such as ground maintenance equipment, should be controlled and monitored to minimize disruption of the soil cover.

Vegetative Cover – the function of the vegetative cover is to protect the soil layer and to minimize erosion. The effectiveness of the vegetative cover may be impaired through invasion of non-desirable and competitive species, destruction by wildlife (overgrazing, burrowing) and other situations that would result in loss of growth. Deep-rooting plant species, such as deciduous trees and shrubs, should not be allowed to grow, as they may interfere with the integrity of the landfill cap, particularly the geotextiles. Over-growth of the vegetative cover could result in increased non-desirable species.

Settlement – Settlement may occur with decomposition of the deposited waste materials and removal of the leachate. Changes in surface grades may result from the settlement and could create situations of ponding of surface water and precipitation, and could also result in shifting of the cap's compositional layers.

3.2.3 Corrective Action

Corrective actions for the landfill cap will be instituted appropriate to the given operational situation, and will be in accordance with the original design specifications for

the cap system. Weather or unanticipated site activities may cause portions of the landfill surface to become eroded. Any areas of erosion will require restoration and reseeding to prevent degradation of the cover system and ensure the cover system integrity. Areas that are observed to be in need of repair will be scheduled for repair as soon as practical. Repairs to eroded areas may include placement of additional topsoil and reseeding. Corrective actions might also entail the placement of additional topsoil in settled areas, where ponded surface water is observed, to restore or maintain positive drainage off the cap. Whenever possible, corrective actions should be performed during the drier, summer months to minimize damage to the cap soils from operating heavy equipment during periods of wet weather. However, corrective measures must also be undertaken and implemented in a timely manner.

3.3 Landfill Gas

3.3.1 System Description

The objectives of the landfill gas venting system are to limit the migration of gas through the landfill cap and perimeter soils, and to preserve the integrity of the landfill cap. As part of the remedial design a passive landfill gas venting system was installed. The system consists of nine (9) passive gas vents located on the North Landfill and ten (10) passive gas vents on the South Landfill. The passive gas vents consist of four-inch diameter vertical pipes with gooseneck vent heads. Landfill gas migration around the landfills will be monitored quarterly at seven (6) gas probes around the North Landfill and six (7) seven gas probes around the South Landfill. These gas probes are located outside the waste limits, along the borders of each landfill. The location of gas vents and probes are shown on Figure 12.

3.3.2 System Inspection and Maintenance

Inspection and Maintenance activities for the landfill gas venting and monitoring system are generally described below. Inspections/Maintenance of the system will be conducted during scheduled monitoring/inspection activities. Observations noted during the inspection(s) shall be recorded on the Post-Closure Inspection Checklist.

Each time gas monitoring is conducted the integrity of the gas vents and monitoring probes will be inspected. A record of each inspection and corrective action or repairs will be made on both the Post-Closure Inspection Checklist and the Explosive Gas Monitoring Field Data Sheet (Appendix E). Inspection performed outside of scheduled explosive gas monitoring activities will be recorded on the Post Closure Inspection Checklist only.

The expected maintenance activities include the following:

- Observations will be noted for integrity of gas probe riser, cap, and locking cap.
- Observations will be noted for the gas discharge vents to include any notations on obstructions in the discharge vents or integrity of riser pipe.
- Observations of the condition of the ground surface surrounding the gas vents and probes will be noted to check for integrity of seals and to check for possible heaving of the riser pipes or erosion around the piping.

3.3.3 Sampling Protocol

The purpose of the gas monitoring program is to evaluate the concentration of explosive gases generated by the facility referenced to the lower explosive limit of methane. The "lower explosive limit" is defined as the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 degrees Celsius and atmospheric pressure. Methane is explosive when present in the range of 5% to 15% by volume in air. The lower (5%) threshold is referred to as the lower explosive limit (LEL) for methane in air. The upper (15%) threshold is referred to as the upper explosive limit (UEL) for methane in air.

Maximum allowable explosive gas concentrations have been established in Subpart 360-2.17 both for facility structures and for the facility property boundary. The concentration of methane and other explosive gases generated by the facility must not exceed:

- 25 percent of the lower explosive limit for gases in structures on or off-site, excluding gas control or recovery system components; and
- the lower explosive limit for the gases at or beyond the property boundary.

Monitoring Equipment

Field metering equipment will be used to measure pressure, explosive gas concentration, and depth to water in the gas monitoring probes.

A gas differential pressure gauge (Dwyer Magnehelic or equivalent) capable of measuring positive and negative pressure in the range of five inches of water column (±5" W.C.) will be used to measure pressure in the monitoring probes. The gauge will be mounted in a portable carrying case and equipped with the necessary fittings so that it can be attached to the hose barb fittings on the top of the monitoring probes.

A dual range, double gas meter (Gas Scope Model 62S or equivalent) will be used to measure the concentration of explosive gas in the monitoring probes and punch bar probes (if applicable). This type of instrument employs a dual range meter, i.e. it measures the lower explosive limit (LEL) of methane and also measures oxygen levels. The instrument will be operated and calibrated according to the manufacturer's instructions.

An electronic water level meter will be used to measure the depth to water within the monitoring probes. This type of instrument utilizes a conductivity probe that senses when the water surface has been contacted.

Monitoring Procedures

The gas monitoring probe will normally be sealed such that it is not vented to the atmosphere. The pressure in the sealed monitoring probe will be measured and the presence and concentration of explosive gas will be determined. The probe will then be opened to allow the measurement of the depth to water, if any. The specific procedures are described below in greater detail.

- *Pressure Measurement* - A pressure measurement will be made on the sealed monitoring probe. This will be accomplished by connecting the pressure gauge to the quick-connect fitting that is installed on each monitoring probe. The pressure will then be read directly off the instrument and recorded.

- *Explosive Gas Measurements* - The determination of explosive gas (LEL referenced to methane) within the sealed monitoring probe will be made after pressure gauge have been remove. This will be accomplished by attaching the explosive gas meter to the sealed monitoring probed through the connection with hose barb fitting. An initial reading for LEL will be made with the meter set to the high range in order to prevent damage to the filament in the meter during subsequent readings. If the reading is less than 5% of the LEL, the measurement will be repeated at the low range. Upon stabilization of the LEL reading, the LEL reading will be recorded on the field data (Appendix E).

3.3.4 Gas Vent and Gas Probe Repair and Replacement

If damage or excessive wear to the gas vents or gas probes is observed, they will be repaired, if possible. If it is not possible to repair the gas vent it will be replaced. If it is not possible to repair the gas probe and the damage can potentially affect the integrity of gas measurement, the gas probe will be replaced.

3.4 Groundwater Monitoring

3.4.1 System Description

Groundwater monitoring will be performed on a quarterly basis to assess the performance of the remedy. The sampling frequency may be modified with the approval NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

The network of monitoring wells has been installed to monitor both up-gradient and down-gradient groundwater conditions at the site. The network of on-site wells has been designed based on the following criteria:

Monitoring wells are located around the perimeter of the North Landfill and outside the limits of fill. Because of the adjoining Plaza East landfill along the north boundary of the CC-H North Landfill, it is not possible to place monitoring wells along the north property line without penetrating the landfill cap. No monitoring wells are required for the South Landfill because the Remedial Investigation sampling showed ground water quality did not exceed criteria.

Groundwater flow is expected to be towards Ley Creek. The locations of the monitoring wells are shown in Figure 12 with one (1) upgradient and three (3) downgradient locations. The wells are completed within the upper water bearing unit and extend to a depth of 20 feet with a 10-foot screen interval. The well screens are positioned to intersect the sand/silty sand unit, if present, sandwiched between the overlying peat layer and the underlying silty clay unit.

3.4.2 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix E. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Sample Collection

Groundwater samples will be collected from the monitor wells using dedicated polyvinyl chloride (PVC) bailers and new hollow-braid polypropylene rope. The procedures that will be used to sample the monitor wells are summarized below:

1. Open the protective casing cover and remove the well cap from the monitor well casing. The monitor wells have dedicated PVC bailer hanging inside the well from an I-bolt attached to the well cap. Remove the bailer from the well cap and place the bailer on a clean surface. Measure the depth to groundwater from the top of the well casing using an electronic water level meter. The depth to groundwater should be measured at the surveyed measuring point on the top of the well casing, which is typically placed on the north side of the casing and is identified by a line drawn on the top and side of the casing using a permanent marker. Record the measurement to the nearest 0.01 feet on the field water quality sampling and analysis form (Appendix E). Rinse the water level meter off with distilled water after reeling the cable back onto the spool.

2. Calculate the volume of water inside the well casing using the following equation:

   1 casing volume in gallons (gal) = 7.48 gal/ft^3 ((pi x r^2) x h)

   where pi = 3.14159

   r = radius of well casing in feet

   h = height of water column in well casing in feet = total well depth minus depth to groundwater

   Record the casing volume on the field water quality sampling and analysis form.

3. Use the dedicated bailer to purge a minimum of three (3) well casing volumes of groundwater from the well by slowly lowering the bailer attached to the rope into the water column. When retrieving the bailer, do not allow the bailer or rope to touch the ground or contact other surfaces that may cause foreign particles or contaminants to be introduced into the well. If a monitoring well is a very low yield well, purge one casing volume of water from the well (purge dry) and allow the water level in the well to recover until there is enough water in the well to collect a groundwater sample. Wait a maximum of 24 hours for the water level in the well to recover. If after 24 hours there is insufficient water for sampling <u>any</u> parameter, then the well is considered dry for the sampling event. If the volume of water available is insufficient for filling <u>all</u> of the sample containers, portions of the sample are to be collected (unless otherwise specified by the regulatory agency or the Project Manager). In all of these situations, notify the Project Manager immediately.

3.4.2 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix E. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Sample Collection

Groundwater samples will be collected from the monitor wells using dedicated polyvinyl chloride (PVC) bailers and new hollow-braid polypropylene rope. The procedures that will be used to sample the monitor wells are summarized below:

1. Open the protective casing cover and remove the well cap from the monitor well casing. The monitor wells have dedicated PVC bailer hanging inside the well from an I-bolt attached to the well cap. Remove the bailer from the well cap and place the bailer on a clean surface. Measure the depth to groundwater from the top of the well casing using an electronic water level meter. The depth to groundwater should be measured at the surveyed measuring point on the top of the well casing, which is typically placed on the north side of the casing and is identified by a line drawn on the top and side of the casing using a permanent marker. Record the measurement to the nearest 0.01 feet on the field water quality sampling and analysis form (Appendix E). Rinse the water level meter off with distilled water after reeling the cable back onto the spool.

2. Calculate the volume of water inside the well casing using the following equation:

   1 casing volume in gallons (gal) = 7.48 gal/ft^3 ((pi x r^2) x h)

   where pi = 3.14159

   r = radius of well casing in feet

   h = height of water column in well casing in feet = total well depth minus depth to groundwater

   Record the casing volume on the field water quality sampling and analysis form.

3. Use the dedicated bailer to purge a minimum of three (3) well casing volumes of groundwater from the well by slowly lowering the bailer attached to the rope into the water column. When retrieving the bailer, do not allow the bailer or rope to touch the ground or contact other surfaces that may cause foreign particles or contaminants to be introduced into the well. If a monitoring well is a very low yield well, purge one casing volume of water from the well (purge dry) and allow the water level in the well to recover until there is enough water in the well to collect a groundwater sample. Wait a maximum of 24 hours for the water level in the well to recover. If after 24 hours there is insufficient water for sampling <u>any</u> parameter, then the well is considered dry for the sampling event. If the volume of water available is insufficient for filling <u>all</u> of the sample containers, portions of the sample are to be collected (unless otherwise specified by the regulatory agency or the Project Manager). In all of these situations, notify the Project Manager immediately.

Use a calibrated bucket to determine the volume of groundwater purged from the monitor well. Record the volume of groundwater purged from the monitor well on the field water quality sampling and analysis form.

4. After the monitor well has been purged, slowly lower the bailer into the water column and retrieve groundwater samples for laboratory analyses and field parameters. If possible, completely fill the bailer with a groundwater sample. First fill the sample containers for laboratory analyses, then fill the container to be used to measure the field parameters.

5. Record the date and time that the groundwater sample was collected on the field water quality sampling and analysis form. Also record the color, odor and clarity of the groundwater sample on the field water quality sampling and analysis form.

6. Place the water quality meter probe into the container holding the field parameters sample. Record the field measurements on the field water quality sampling and analysis form. Discard the water in the container used to measure the field parameters and rinse with distilled water.

7. After a sufficient volume of groundwater is collected from the monitor well to fill all of the sample containers required for the laboratory analyses and to measure field parameters, remove the rope from the bailer, rinse the bailer with distilled water, re-attach the bailer to the well cap, place the well cap over the well casing and close the well.

Field Parameters

Field measurements of pH, temperature and specific conductance will be collected from each monitoring well. A portable digital pH-salinity-conductivity-temperature meter will be used to measure the field parameters for the groundwater samples collected from the monitor wells.

The field parameters will be recorded on field forms. The date and time that the groundwater samples were collected and the color, odor and clarity of each groundwater sample will also be noted on the field forms. Copies of the various field forms that will be used are provided in Appendix E.

Laboratory Parameters

The groundwater samples will be submitted to the Pace Analytical Services laboratory in Greensburg, PA, a New York State Department of Health ELAP certified laboratory, for analysis of target compound list (TCL) VOCs by EPA Method SW-846 8260C, SVOCs by EPA Method SW-846 8270D, PCBs by EPA Method SW-846 8082A and RCRA metals by EPA Method SW-846 6010C. The groundwater samples submitted for analysis will be collected in glass sample vials provided by the laboratory that have a screw-on cap with a teflon-lined septum. The sample containers will be filled so that a positive meniscus is formed at the top of the container and there is no headspace between the sample and the top of cap. The groundwater samples will be kept chilled to at least 4

degrees Celsius prior to analysis and will be delivered to the laboratory following standard chain-of-custody procedures.
Each sample container will have a label affixed to it. The label on each container will contain the following information:

- Project number;
- Date and time the sample was collected;
- Well/Sample identification;
- Sample type (DI for distilled water, GW for groundwater or SW for surface water);
- Sampler's initials;
- Preservative.

3.4.3 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance. The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.5 Surface Water

3.5.1 System Description

Surface water samples will be collected from four (4) station locations; one station will be upstream of Wetland A at the north property boundary, one will be located at a downstream location at the south property boundary of the North Landfill, one will be located upstream of Wetland C at the north property boundary of the South Landfill and the fourth will be located a downstream location at the south boundary of the South Landfill. Sample locations are shown in Figure 12.

3.5.2 Sampling Protocol

The surface water samples will be collected directly in the sample containers provided by the laboratory following the sampling procedures presented below:

1. Measure the water depth at the sampling point with a tape measure and record the value on the field surface water sampling and analysis form.

2. Lower the sample container to the desired depth below the water surface with the sample container sealed.
3. When the sample container is at the desired depth, remove the lid of the sample container so that water enters the container.
4. Secure the lid of the sample container over the opening of the container while the container is still submerged. Retrieve the sample container and place in a cooler filled with ice.
5. If the depth to water is not sufficient to submerge the probe of the water quality meter, fill a beaker or graduated cylinder with water so that the field parameters can be measured. Record the pH, temperature and electrical conductance values on the field surface water sampling and analysis form. Also record the date and time that the sample was collected and the color, odor and clarity of the sample on the field surface water sampling and analysis form.
6. Decontaminate the container used for the field parameter measurements by double-rinsing with distilled water.

Field Parameters

Field measurements of pH, temperature, specific conductance and water depth will be collected at each surface water station. A portable digital pH-salinity-conductivity-temperature meter will be used to measure the field parameters.

The field parameters will be recorded on field forms. The date and time that the surface water samples were collected and the color, odor and clarity of each surface water sample will also be noted on the field forms. Copies of the various field forms that will be used are provided in Appendix E.

Laboratory Parameters

The surface water samples will be submitted to the Pace Analytical Services laboratory in Greensburg, PA, a New York State Department of Health ELAP certified laboratory, for analysis of target compound list (TCL) VOCs by EPA Method SW-846 8260C, SVOCs by EPA Method SW-846 8270D, PCBs by EPA Method SW-846 8082A and RCRA metals by EPA Method SW-846 6010C. The groundwater samples submitted for analysis will be collected in glass sample vials provided by the laboratory that have a screw-on cap with a teflon-lined septum. The sample containers will be filled so that a positive meniscus is formed at the top of the container and there is no headspace between the sample and the top of cap. The groundwater samples will be kept chilled to at least 4 degrees Celsius prior to analysis and will be delivered to the laboratory following standard chain-of-custody procedures.

Each sample container will have a label affixed to it. The label on each container will contain the following information:

- Project number;
- Date and time the sample was collected;
- Well/Sample identification;
- Sample type (DI for distilled water, GW for groundwater or SW for surface water);

- Sampler's initials;
- Preservative.

3.6 Wetlands

3.6.1 Wetlands Restored

The North and South Landfills each contained streams and wetlands that had contaminated sediments removed. Each wetland and stream was restored as follows:

- The wetlands restoration details and plant species were selected to match those for emergent wetland reconstruction as required by the state of NY.
- Wetland A in the North Landfill was restored to an emergent wetland to match its current state.
- Stream A in the North Landfill was restored to an open water stream with an emergent wetland bank to match its current state.
- Wetland B in the North Landfill was restored to an emergent wetland to match its current state.
- Stream B in the South Landfill was restored to an open water stream with an emergent wetland bank to match its current state.
- Wetland C in the South Landfill was restored to an emergent wetland to match its current state.

The buffer zones surrounding the landfill caps were restored as grassed swales to conduct surface water flow to the adjacent wetlands in an orderly sheet manner to avoid erosion.

3.6.2 Sampling Protocol

The wetland restoration areas will be monitored annually for a minimum of five years to evaluate the success of the restoration. The annual monitoring program will commence following the first full growing season and will involve two monitoring events per year. A field reconnaissance and detailed monitoring program will be conducted during the mid-part of the growing season (e.g., July). A field reconnaissance will be performed during the latter-part of the growing season (e.g., September). The parameters to be monitored include:

- vegetation (type, percent cover, and frequency);
- hydrology; and,
- wildlife usage.

The field reconnaissance surveys will include observations of overall vegetation establishment and wildlife usage, and gauging of surface water levels. Wildlife usage will be assessed by recording evidence of reptiles, amphibians, birds and mammals within the restoration area, and the vicinity through standard field observation methods (e.g., visual observation, tracks, scat, etc.). The surface water elevation will be recorded within Wetlands A, B and C. This will require the installation of a staff gauge within the open water area and subsequent survey (northing, easting, and elevation) of the staff gauge. The detailed monitoring program will involve a qualitative and quantitative evaluation of the parameters mentioned above at designated sampling locations (i.e.,

plots) within the restoration area, in addition to the observations made during the reconnaissance surveys. A total of six to nine sampling locations will be established within the Wetland A/B/C complex during the first monitoring event (Year 1). Wetland vegetation will be evaluated for cover type, percent cover, and frequency at the designated monitoring stations. Herbaceous vegetation will likely be evaluated within a 10' x 10' (100 ft2) plot at each monitoring station and woody vegetation will be evaluated within a 20' x 20' (400 ft2) plot. The line intercept method (e.g., 30-foot line) configuration may be used instead of a plot configuration, if deemed appropriate during the first monitoring event. The annual goal for percent herbaceous cover of hydrophytic wetland species (those with an indicator status of facultative or wetter) following the second full growing season is 85 percent.

The information gathered during the wetland monitoring events will be documented in an annual periodic review report, as described in Section 5.3. Contents of the monitoring report will include, at a minimum, the following elements:

1. Photographs taken at each of the monitoring stations;
2. Surface water elevation data within open water area(s);
3. Percent cover and frequency of each plant species at each of the monitoring stations;
4. Vegetation cover maps and a description of each vegetation type;
5. A list of wildlife species using the area; and,
6. An overall qualitative description of the success of the restoration areas and recommendations to correct problems within the restoration area, if necessary.

The final report (fifth year) will identify trends in data collected during each of the previous monitoring events, as described in Section 6.4. Additionally, the final report will evaluate hydrological conditions to date and project whether these conditions will be sustained in the future.

3.6.3 Wetlands Maintenance

The wetland monitoring program will incorporate an adaptive management approach that identifies and rectifies restoration concerns. Potential concerns will be identified and mitigated on a case-by-case basis. For example, if by the end of year two the vegetative cover has not met the prescribed percent herbaceous cover listed above, those areas lacking acceptable coverage will be reseeded or replanted as appropriate. Additionally, measures to control the propagation of invasive species (e.g., Phragmites and purple loosestrife) within the restored wetlands may be warranted.

The restored wetlands were designed to promote long-term control of invasive species. For example, the design incorporates the creation of conditions that are not conducive for the growth of Phragmites and that provide other species an opportunity to compete against Phragmites. These conditions include: 1) a good quality topsoil of sufficient depth (6 – 12 inches), 2) water depths greater than can be tolerated by Phragmites (deeper than 1 to 2 feet), 3) use of fast growing species of wetland plants, and 4) planting of shrubs and trees where saturated surfaces occur on a seasonal basis to provide shade. Even though these strategies will limit the occurrence of Phragmites, the total eradication

of Phragmites that may propagate within the restoration areas will be difficult, at best, and likely unattainable due to the presence of extensive Phragmites stands within and adjacent to the restoration areas.

Nonetheless, a hand application of a chemical herbicide (e.g., Rodeo®) will be applied to help control invasive species over the short term, if necessary. To avoid harming any amphibian larvae and/or young of the year chemical herbicide (e.g., Rodeo®) will be applied in later summer/early fall, although prior to seed production. This will entail applying chemical herbicides to isolated patches of invasive species observed within the restoration area. Chemical herbicides will not be applied to invasive species observed within standing water areas. Chemical herbicides will be applied in accordance with the manufactures instructions. The application of herbicides will be conducted once a year for a maximum of five years.

3.7 Site Wide Inspection

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed (Appendix E). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

3.8 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site (Appendix F). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:

  - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
  - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

3.9 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections will be kept on file at the CC-H facility. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. A letter report will also be prepared [if required by NYSDEC], subsequent to each sampling event. The report (or letter) will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (o be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in Table 7 below.

Table 7: Schedule of Monitoring/Inspection Reports

Task	**Reporting Frequency***
Monitoring Report: Landfill Gas, Groundwater and Surface Water	Quarterly
Inspection Report: Landfill Cover and Wetlands	Quarterly
Periodic Review Report	Annual

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

4.0 OPERATION AND MAINTENANCE PLAN

The site remedy does not rely on any mechanical systems, such as sub-slab depressurization systems or air sparge/ soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 Site Inspections

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms for their respective system which are contained in Appendix E. Additionally, a general site-wide inspection form will be completed during the site-wide inspection (see Appendix E). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,

The site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP and FER.

5.2 Certification of Engineering and Institutional Controls

After the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare the following certification:

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;

- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] for the site.

The signed certification will be included in the Periodic Review Report described below.

5.3 Periodic Review Report

A Periodic Review Report will be submitted to the Department every year, beginning eighteen months after the Certificate of Completion or equivalent document (e.g., Satisfactory Completion Letter, No Further Action Letter, etc.) is issued. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;

- A site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;
    - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
    - The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

Table 1. Soil Contamination Summary

Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency of Exceeding Unrestricted SCG	Restricted SCG[c] (ppm)	Frequency of Exceeding Industrial Land Use SCG
VOCs					
1,1,1-Trichloroethane	0.002-15	0.68	1 of 61	1000	0 of 61
1,1-Dichloroethane	0.004-22	0.27	1 of 61	480	0 of 61
Acetone	0.002-2.6	0.05	28 of 61	1000	0 of 61
Benzene	0.001-0.230	0.06	3 of 61	0.06 [d]	3 of 61
Chlorobenzene	0.004-2.1	1.1	1 of 61	1.1 [d]	1 of 61
Ethylbenzene	0.002-330	1	9 of 61	780	0 of 61
Methylene Chloride	0.001-87	0.05	2 of 61	1000	0 of 61
Tetrachloroethene	0.002-5.8	1.3	1 of 61	300	0 of 61
Toluene	0.002-310	0.7	5 of 61	1000	0 of 61
Trichloroethene	1.7	0.47	1 of 61	400	0 of 61
Xylenes, Total	0.004-19	0.26	8 of 61	1000	0 of 61
SVOCs					
Benzo(a)anthracene	0.045-14	1	15 of 61	11	1 of 61
Benzo(a)pyrene	0.035-12	1	14 of 61	1.1	13 of 61
Benzo(b)fluoranthene	0.041-20	1	19 of 61	11	1 of 61
Benzo(k)fluoranthene	0.021-7.5	0.8	13 of 61	110	0 of 61
Chrysene	0.053-17	1	14 of 61	110	0 of 61
Dibenzo(a,h) anthracene	0.014-1.4	0.33	10 of 61	1.1	1 of 61
Dibenzofuran	0.019-7.2	6.2	1 of 61	1000	0 of 61
Indeno(1,2,3-cd)pyrene	0.020-3.8	0.5	13 of 61	11	0 of 61
Phenol	0.060-3.9	0.33	15 of 61	0.33 [d]	15 of 61
Pesticides/PCBs					
4,4'-DDE	0.0022-0.017	0.0033	3 of 20	120	0 of 20
Aldrin	0.011	0.005	1 of 20	1.4	0 of 20
Dieldrin	0.0053-0.032	0.005	5 of 20	2.8	0 of 20
Total PCBs	0.000835-65	0.1	53 of 96	25	2 of 96
Metals					
Arsenic	1.6-31.3	13	8 of 61	16	4 of 61
Cadmium	0.11-1200	2.5	29 of 61	60	5 of 61
Chromium	7.5-1560	10 or SB[j]	55 of 61	800	2 of 61
Copper	15.9-12900	50	40 of 61	10000	1 of 61
Lead	11.8-621	63	26 of 61	3900	0 of 61
Mercury	0.02-2.0	0.18	26 of 61	5.7	0 of 61
Nickel	4.0-302	30	17 of 61	10000	0 of 61
Zinc	41.5-33600	109	47 of 61	10000	1 of 61
Total Cyanide	107	27	1 of 20	10000	0 of 61

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil.
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted (Industrial landuse) Soil Cleanup Objectives.
d - SCG: Part 375-6.8 (b), Restricted Soil Cleanup Objectives, Protection of Groundwater - used for the primary contaminants of concern.

Table 2. Sediment Contamination Summary

Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency of Exceeding SCG	Site Derived Value (SDV)[c] (ppm)	Frequency of Exceeding SDV
SVOCs					
Benzo(a)anthracene	0.220-4.2	2	7 of 33	NA	NA
Pesticides/PCBs					
Total PCBs	0.0055-140	0.228	257 of 499	1.0	186 of 499
Metals					
Arsenic	1.9-30.5	LEL- 6	27 of 33	NA	NA
		SEL- 33	0 of 33		
Cadmium	0.66-199	LEL- 0.6	33 of 33	NA	NA
		SEL- 9	23 of 33		
Chromium	28.4-5,440	LEL- 26	33 of 33	NA	NA
		SEL- 110	18 of 33		
Iron	13,900-51,700	LEL- 20,000	21 of 33	NA	NA
		SEL-40,000	18 of 33		
Lead	46.0-676	LEL- 31	33 of 33	NA	NA
		SEL- 110	23 of 33		
Manganese	165-1,360	LEL- 460	15 of 33	NA	NA
		SEL- 1,000	1 of 33		
Mercury	0.097-0.774	LEL- 0.15	27 of 33	NA	NA
		SEL- 1.3	0 of 33		
Nickel	26.7-1990	LEL- 16	33 of 33	NA	NA
		SEL- 50	15 of 33		
Silver	0.43-11.6	LEL- 1	26 of 33	NA	NA
		SEL- 2	18 of 33		
Zinc	274-3,500	LEL- 120	28 of 33	NA	NA
		SEL- 270	28 of 33		

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in sediment.
b - SCG: The Department's "Technical Guidance for Screening Contaminated Sediments."
c - Site Derived Value: Previously selected sediment clean-up goal at New York State hazardous waste sites.
NA - Not Applicable

Table 3. Groundwater Contamination Summary

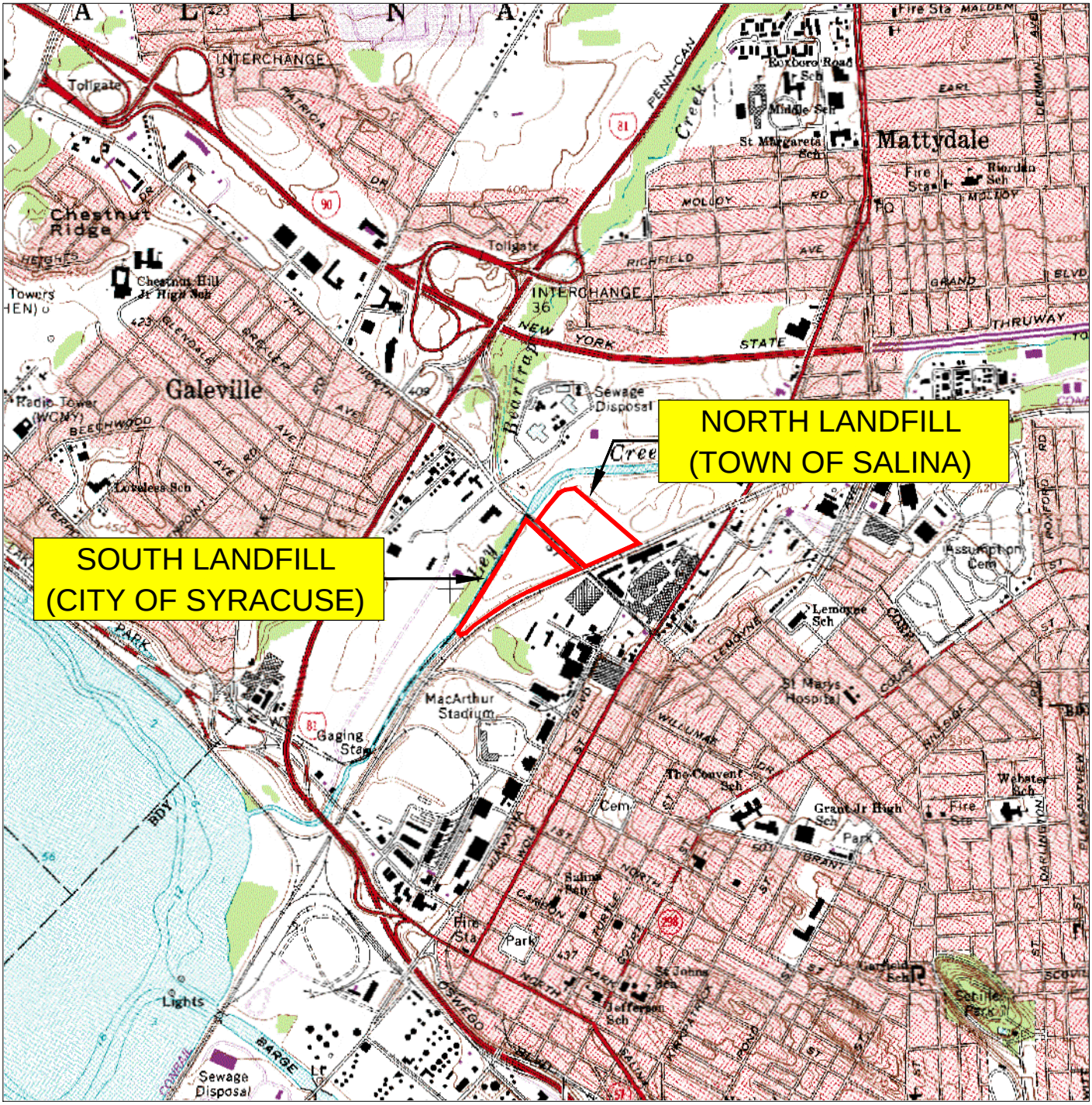
Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency of Exceeding SCG
VOCs			
1,4-Dichlorobenzene	2.0-8.2	3.0	8 of 74
Benzene	1.1-10.0	1.0	22 of 74
Chlorobezene	10.0-42	5.0	9 of 74
Chloroethane	.68-190	5.0	3 of 74
Chloroform	0.7-25	7.0	2 of 74
Ethylbenzene	2.0-19	5.0	3 of 74
Methylene Chloride	7.6-110	5.0	2 of 74
Toluene	1.0-14	5.0	1 of 74
SVOCs			
Benzo(a)anthracene	0.2-5.0	0.002	4 of 74
Benzo(a)pyrene	0.2-9.0	0.002	2 of 74
Benzo(b)fluoranthene	1.5	0.002	1 of 74
Benzo(k)fluoranthene	1.5	0.002	1 of 74
Bis(2-Ethylhexyl)phthalate	1.0-20	5.0	1 of 74
Chrysene	0.4-9.0	0.002	3 of 74
Fluoranthene	0.3-85	50	1 of 74
Indeno(1,2,3-cd)pyrene	6	0.002	1 of 74
Naphthalene	0.4-11	10	1 of 74
Phenanthrene	0.2-73	50	1 of 74
Pyrene	0.2-97	50	1 of 74
Total Phenols	1.5-1360	1.0	18 of 74
Metals			
Arsenic	2.0-28	25	2 of 50
Barium	24-2350	1000	3 of 50
Beryllium	0.31-5.8	3.0	4 of 50
Cadmium	0.39-37.5	5.0	3 of 74
Chromium	0.81-85.6	50	1 of 74
Iron	706-53000	300	25 of 50
Lead	1.6-351	25	4 of 74
Magnesium	12200-199000	35000	2 of 50
Manganese	36-657	300	2 of 50
Selenium	9.1-49	10	8 of 50
Sodium	64600-4370000	20000	4 of 50
Zinc	1.6-5160	2000	2 of 74

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Table 4. Surface Water Contamination Summary

Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCGb (ppb)[b]	Frequency of Exceeding SCG
VOCs			
Methylene Chloride	34-3700	200	1 of 11
SVOCs			
Benzo(a)athracene	0.6-12	0.03	3 of 19
Benzo(a)pyrene	0.2-16	0.0012	5 of 19
Pesticides/PCBs			
Heptachlor	0.017	0.0002	1 of 8
Heptachlor epoxide	0.01	0.0003	1 of 8
4,4'-DDE	0.011	0.000007	1 of 8
4,4'-DDT	0.038-0.044	0.00001	3 of 8
Total PCBs	0.86	0.000001	1 of 8
Metals			
Aluminum	96.1-548	100	2 of 8
Cadmium	0.42-83.9	6.6[f]	3 of 19
Chromium	0.78-332	250[f]	1 of 19
Copper	1.4-60.2	31.4[f]	2 of 8
Iron	955-30600	300	8 of 8
Lead	3.4-675	17.9[f]	7 of 19
Zinc	12.1-3500	290[f]	5 of 19

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), and 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards.

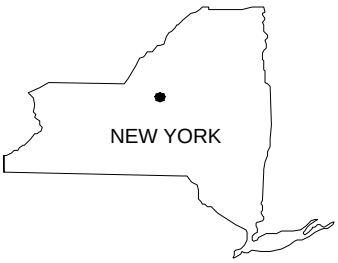


National Geodetic Vertical Datum of 1929
Contour Interval 10 Feet

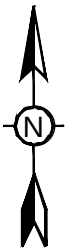
SCALE

0 5000

FEET



QUADRANGLE LOCATION



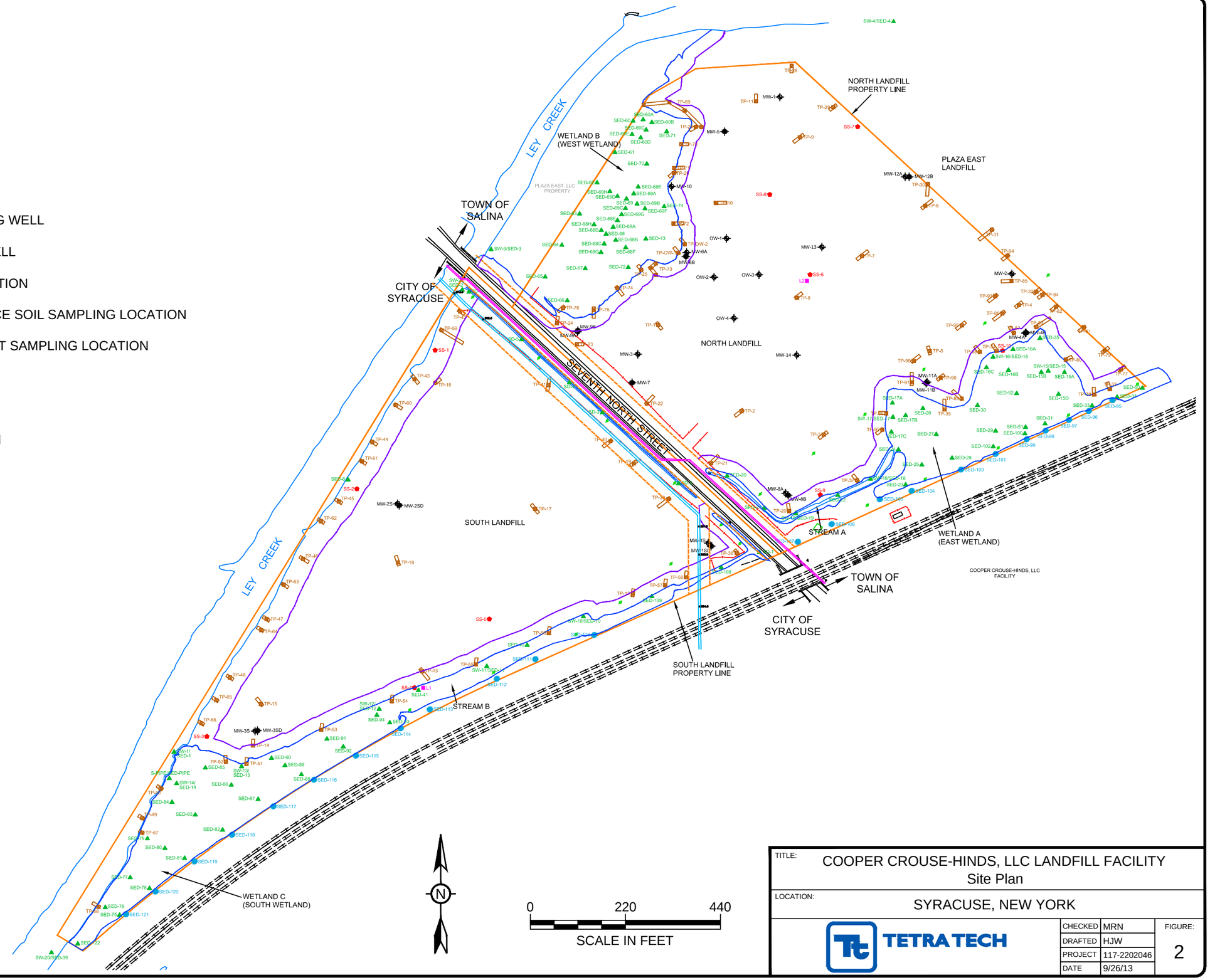
COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SYRACUSE, NEW YORK	DATE: 8/1/12
	DESIGNED: HJW
	CHECKED: MRN
SITE LOCATION MAP	APPROVED: MRN
	DRAWN: HJW
	PROJ.: 117-2202046
TETRA TECH	Figure 1

Base map from U.S.G.S. 7.5' SYRACUSE WEST, NEW YORK topographic quadrangle map.

S:\CAD\COOPER\SYRACUSE\12-11-09\2202036FIG1.DWG

EXPLANATION

MW-3S	SHALLOW AQUIFER MONITORING WELL
MW-3SD	DEEP AQUIFER MONITORING WELL
SS-1	SURFACE SOIL SAMPLING LOCATION
SED-95	SURFACE SOIL AND SUBSURFACE SOIL SAMPLING LOCATION
SW-1/SED-1	SURFACE WATER AND SEDIMENT SAMPLING LOCATION
SED-27	SEDIMENT SAMPLING LOCATION
TP-48	TEST PIT LOCATION
L1	LEACHATE SAMPLING LOCATION
	WETLAND BOUNDARY
	LEY CREEK / WETLAND BUFFER
	PROPERTY BOUNDARY
	EASEMENT
	WATER MAIN
	GAS MAIN
	EXISTING CHAIN LINK FENCE
	ELECTRIC UTILITY POLE

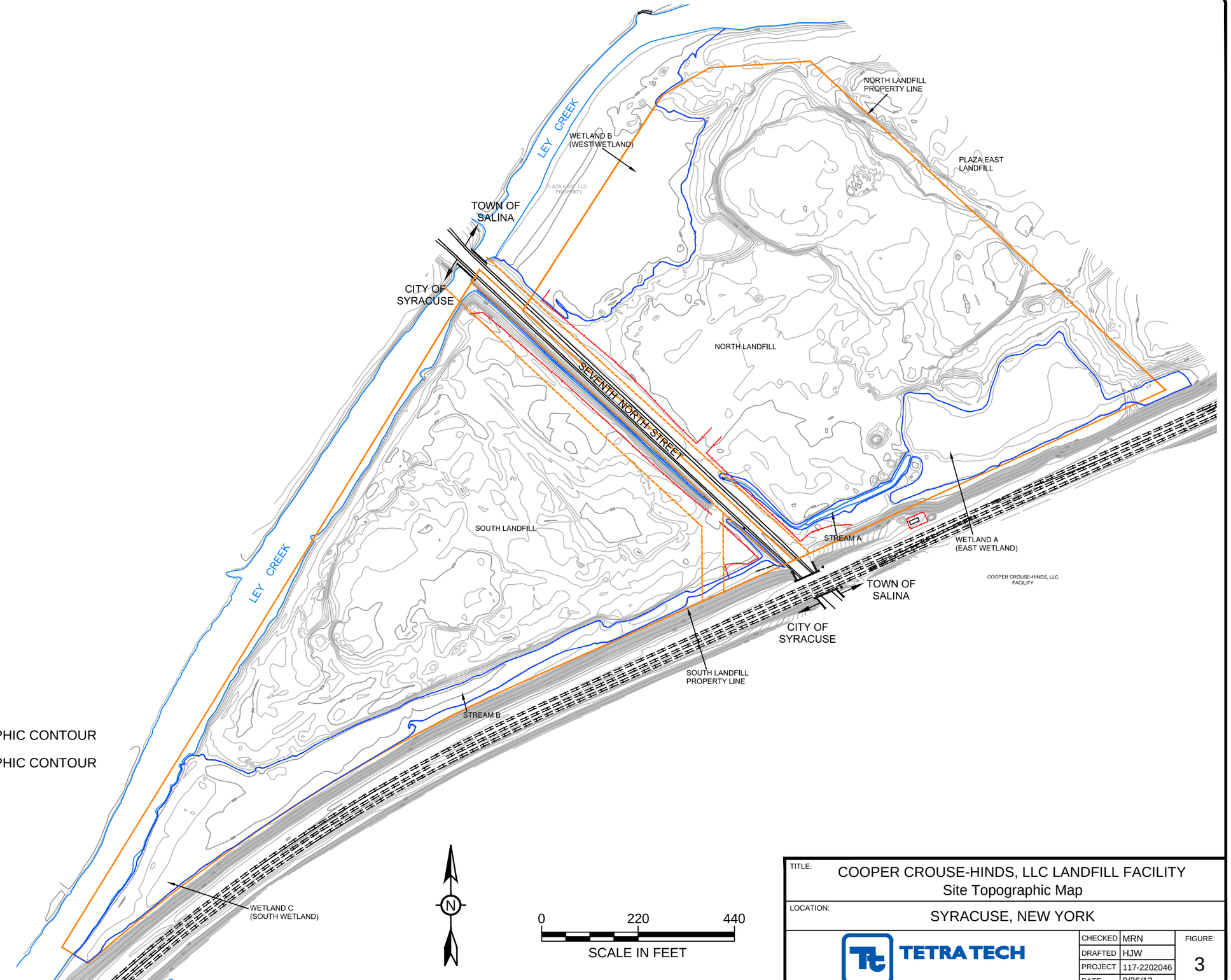


TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY Site Plan
LOCATION:	SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	2
PROJECT	117-2202046	
DATE	9/26/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG2 - SITE PLAN.DWG

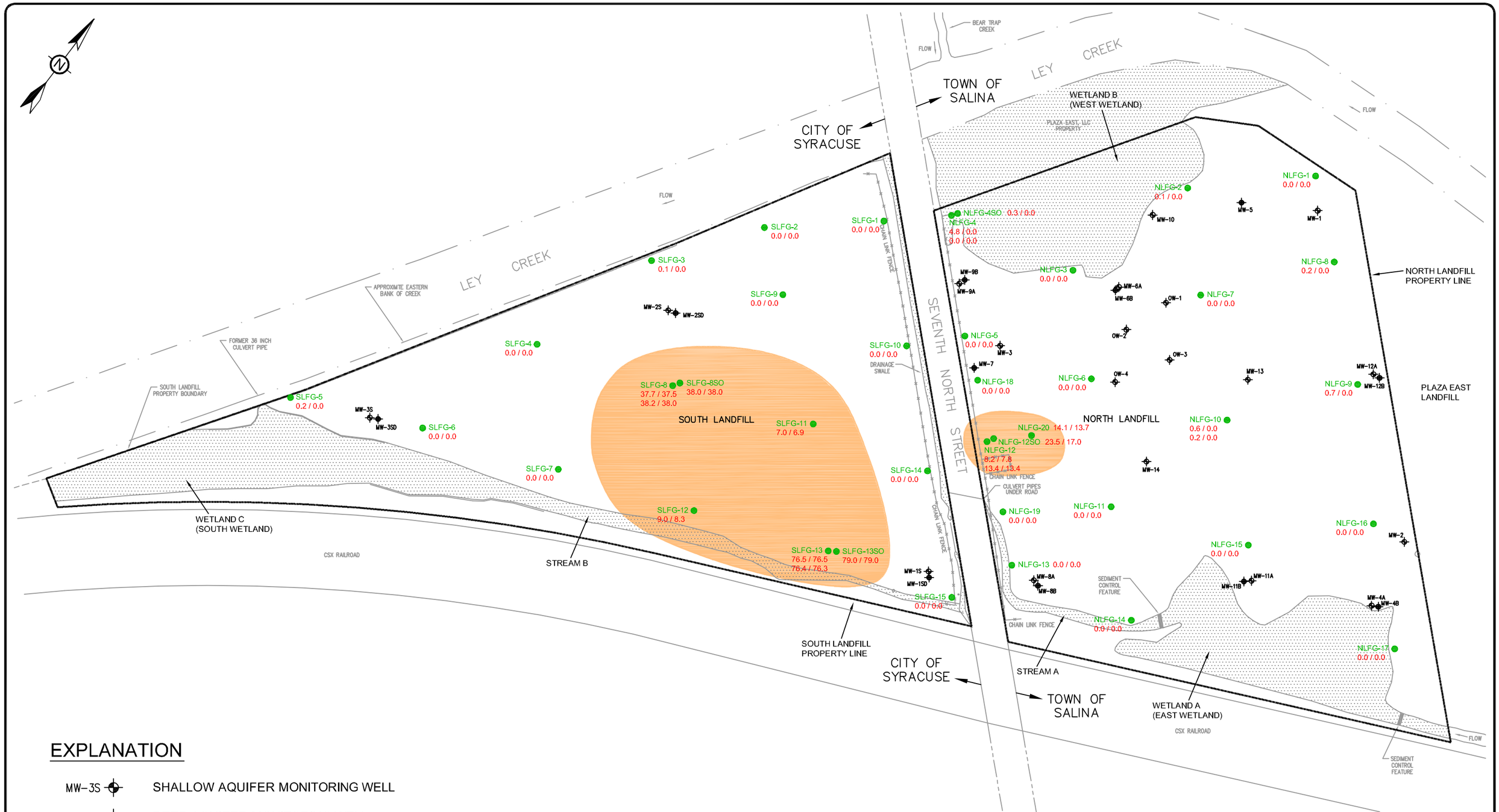


EXPLANATION

- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE
- WETLAND BOUNDARY
- 5-FOOT INTERVAL TOPOGRAPHIC CONTOUR
- 1-FOOT INTERVAL TOPOGRAPHIC CONTOUR

TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY Site Topographic Map		
LOCATION:	SYRACUSE, NEW YORK		
TETRA TECH	CHECKED	MRN	FIGURE:
	DRAFTED	HJW	3
	PROJECT	117-2202046	
	DATE	9/26/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG3 - SITE TOPOGRAPHIC MAP.DWG



EXPLANATION

MW-3S	SHALLOW AQUIFER MONITORING WELL
MW-3SD	DEEP AQUIFER MONITORING WELL
NLFG-1	BARHOLE SAMPLING LOCATION
8.2 / 7.8	PEAK / STABLE METHANE PERCENTAGE
	AREAS OF HIGHEST METHANE GAS DETECTION

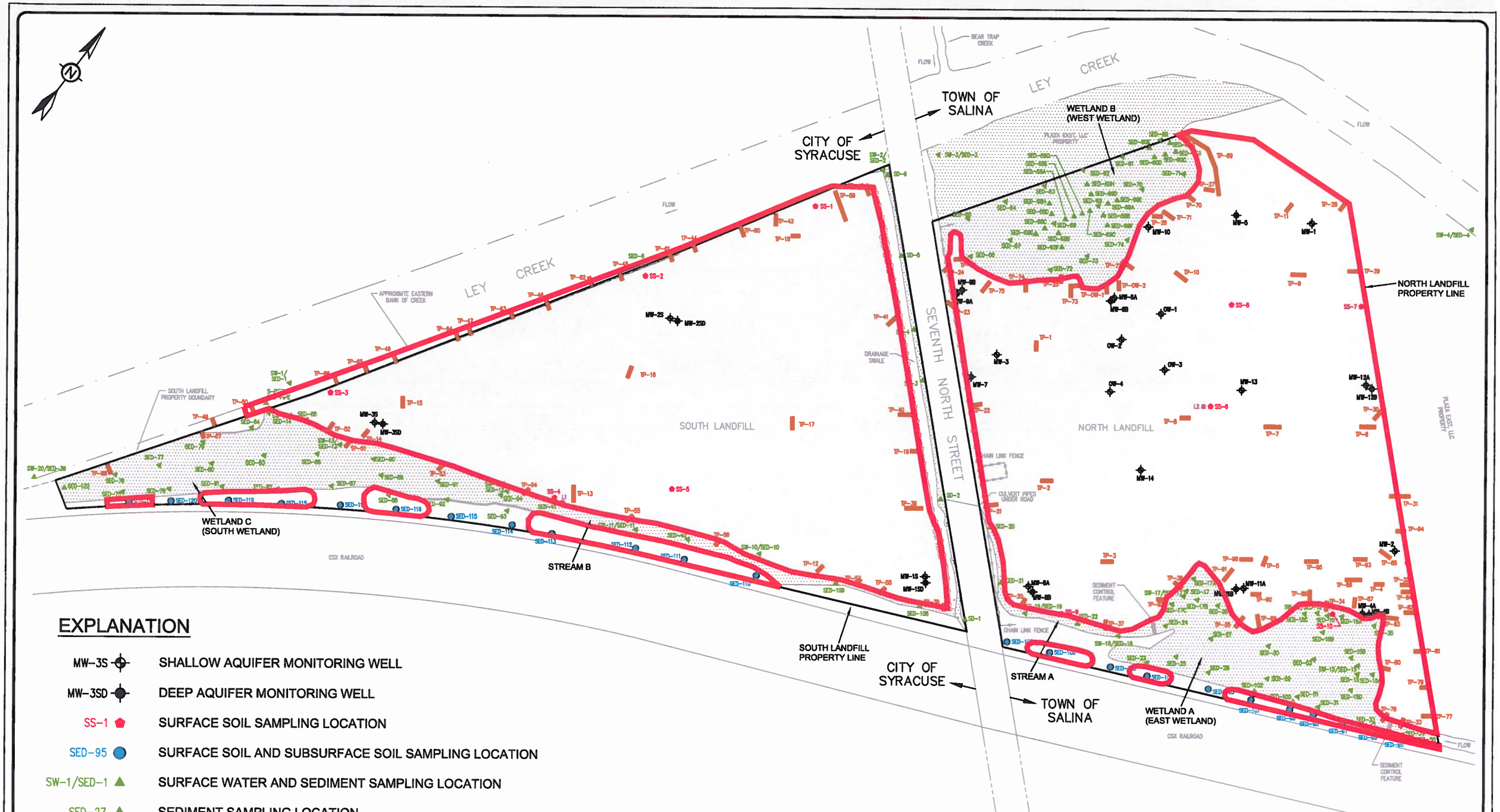
TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY LANDFILL GAS RESULTS

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	4
PROJECT	117-2202036	
DATE	9/6/11	

S:\CAD\Cooper\Syracuse\2-15-11\2202036Fig5.dwg



EXPLANATION

MW-3S	SHALLOW AQUIFER MONITORING WELL
MW-3SD	DEEP AQUIFER MONITORING WELL
SS-1	SURFACE SOIL SAMPLING LOCATION
SED-95	SURFACE SOIL AND SUBSURFACE SOIL SAMPLING LOCATION
SW-1/SED-1	SURFACE WATER AND SEDIMENT SAMPLING LOCATION
SED-27	SEDIMENT SAMPLING LOCATION
TP-13	TEST PIT LOCATION
L1	LEACHATE SAMPLING LOCATION
	EXTENT OF SOIL ABOVE SCOs (UNRESTRICTED)

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
EXTENT OF SOIL CONTAMINATION

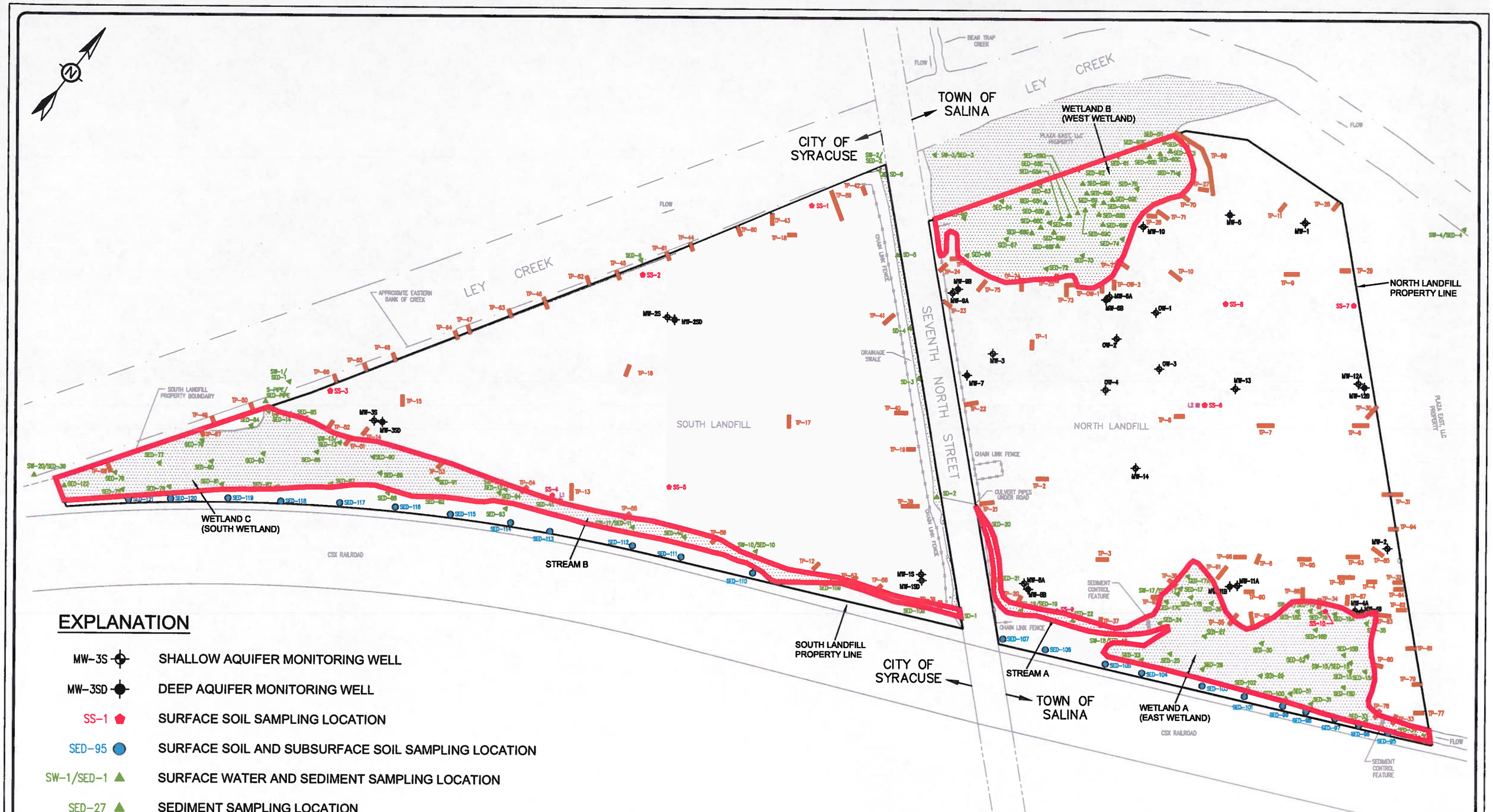
LOCATION: SYRACUSE, NEW YORK

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202036
DATE	1/27/11

FIGURE: 5

S:\CAD\Cooper\Syracuse\11-11-10\2202036Fig4.dwg



TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
EXTENT OF CONTAMINATED SEDIMENTS

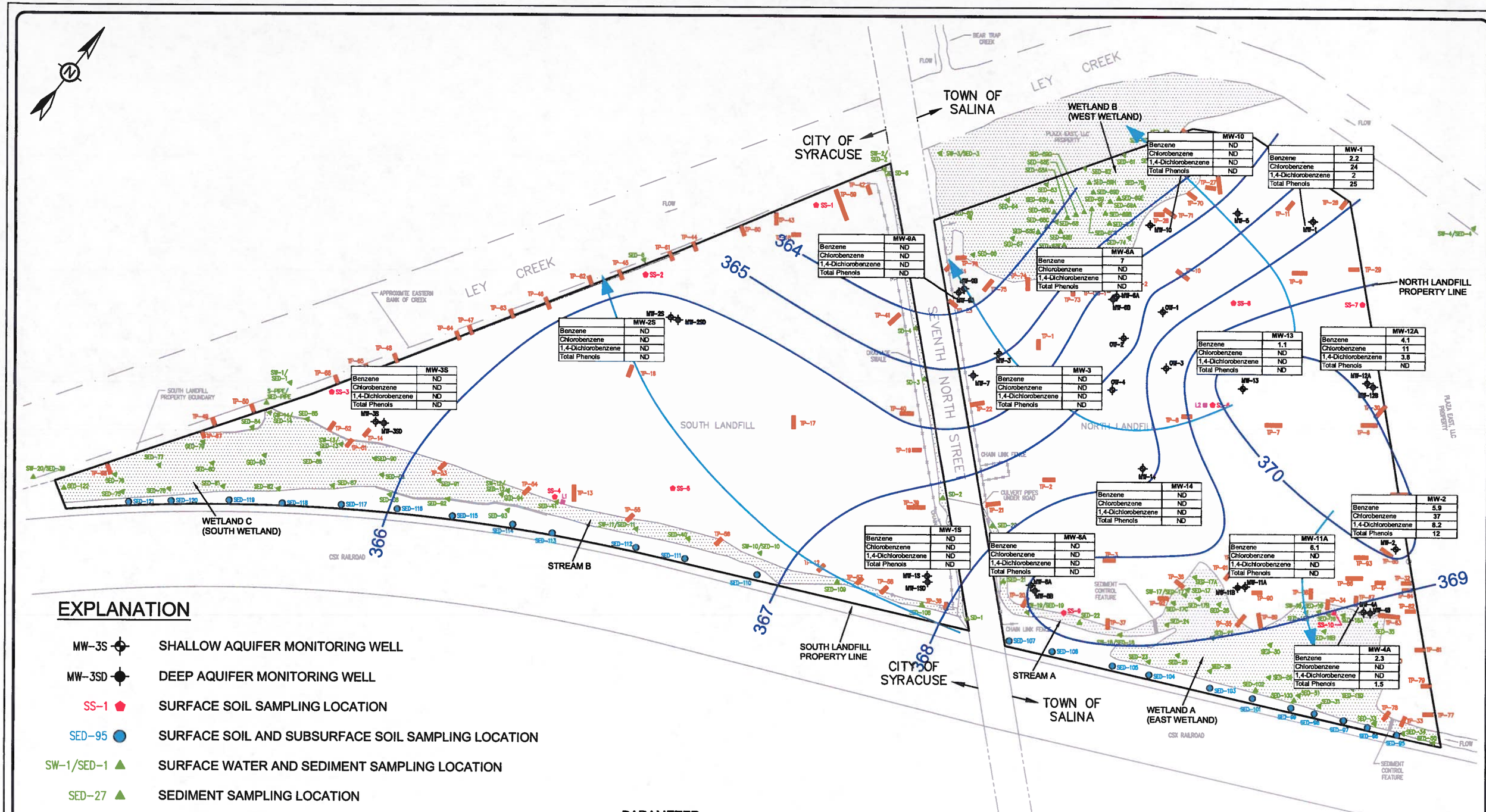
LOCATION: SYRACUSE, NEW YORK

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202036
DATE	1/27/11

FIGURE: 6

S:\CAD\Cooper\Syracuse\11-11-10\2202036Fig6.dwg



EXPLANATION

- MW-3S — SHALLOW AQUIFER MONITORING WELL
- MW-3SD — DEEP AQUIFER MONITORING WELL
- SS-1 — SURFACE SOIL SAMPLING LOCATION
- SED-95 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLING LOCATION
- SW-1/SED-1 — SURFACE WATER AND SEDIMENT SAMPLING LOCATION
- SED-27 — SEDIMENT SAMPLING LOCATION
- TP-13 — TEST PIT LOCATION
- L1 — LEACHATE SAMPLING LOCATION
- 366 — GROUNDWATER ELEVATION CONTOUR (SEPTEMBER 10, 2008)
- GROUNDWATER FLOW DIRECTION

	MW-4A
Benzene	2.3
Chlorobenzene	ND
1,4-Dichlorobenzene	ND
Total Phenols	1.5

PARAMETER
SAMPLING LOCATION
NON-DETECT
CONCENTRATION (ug/L)
BOLD INDICATES NYSDEC CLASS GA GROUNDWATER STANDARDS EXCEEDED

0 180 360
SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
EXTENT OF CONTAMINATED SHALLOW GROUNDWATER

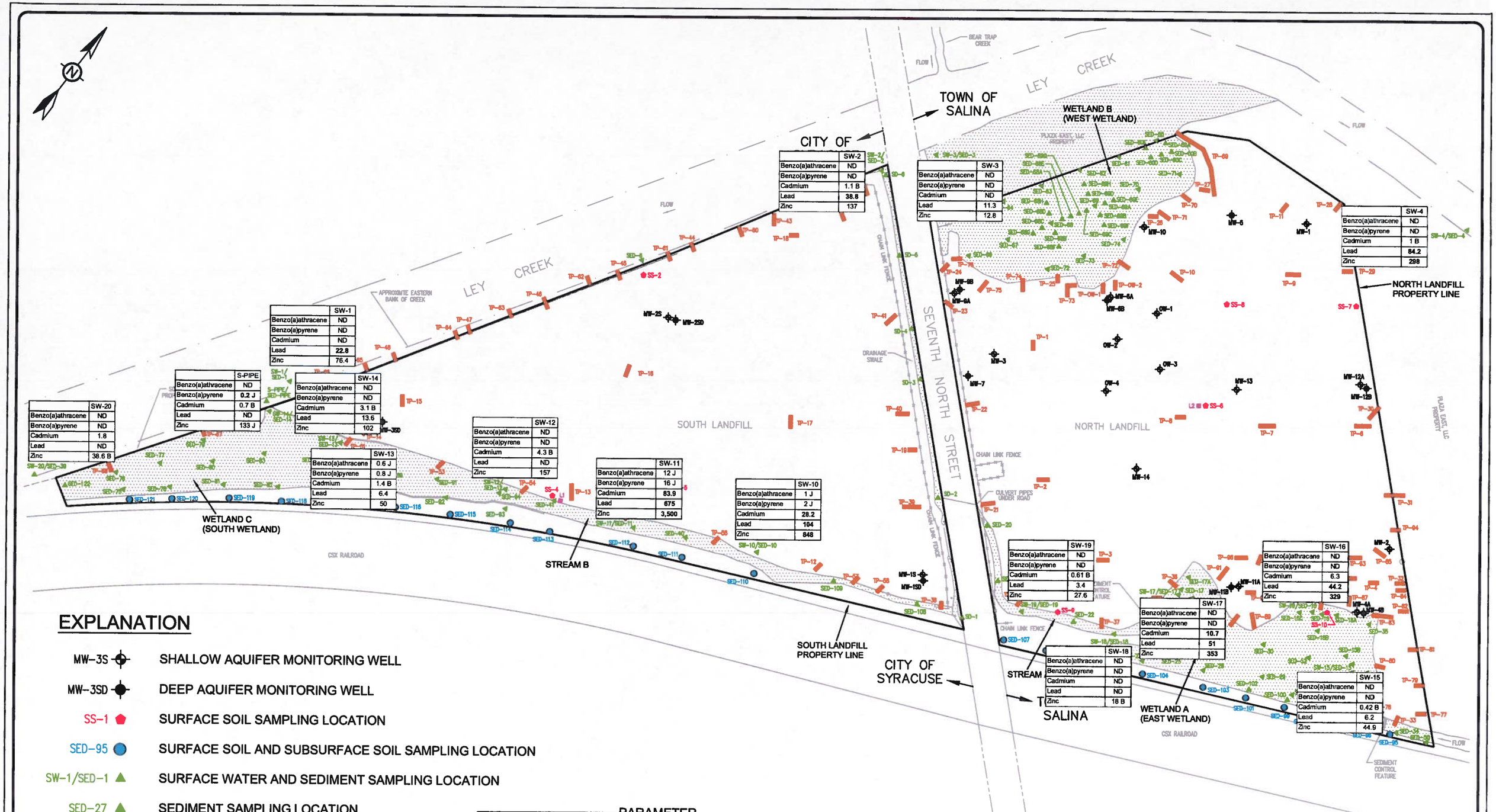
LOCATION: SYRACUSE, NEW YORK

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202036
DATE	11/11/10

FIGURE: 7

S:\CAD\Cooper\Syracuse\11-11-10\2202036Fig3.dwg



	SW-1
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	ND
Lead	22.8
Zinc	76.4

	SW-2
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	1.1 B
Lead	38.8
Zinc	137

	SW-3
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	ND
Lead	11.3
Zinc	12.8

	SW-4
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	1 B
Lead	84.2
Zinc	298

	S-PIPE
Benzo(a)athracene	ND
Benzo(a)pyrene	0.2 J
Cadmium	0.7 B
Lead	ND
Zinc	133 J

	SW-14
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	3.1 B
Lead	13.6
Zinc	102

	SW-20
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	1.8
Lead	ND
Zinc	38.6 B

	SW-13
Benzo(a)athracene	0.6 J
Benzo(a)pyrene	0.8 J
Cadmium	1.4 B
Lead	6.4
Zinc	50

	SW-12
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	4.3 B
Lead	ND
Zinc	157

	SW-11
Benzo(a)athracene	12 J
Benzo(a)pyrene	16 J
Cadmium	83.9
Lead	675
Zinc	3,500

	SW-10
Benzo(a)athracene	1 J
Benzo(a)pyrene	2 J
Cadmium	28.2
Lead	104
Zinc	848

	SW-19
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	0.61 B
Lead	3.4
Zinc	27.6

	SW-16
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	6.3
Lead	44.2
Zinc	329

	SW-17
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	10.7
Lead	51
Zinc	353

	SW-18
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	ND
Lead	ND
Zinc	18 B

	SW-15
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	0.42 B
Lead	6.2
Zinc	44.9

EXPLANATION

- MW-3S — SHALLOW AQUIFER MONITORING WELL
- MW-3SD — DEEP AQUIFER MONITORING WELL
- SS-1 — SURFACE SOIL SAMPLING LOCATION
- SED-95 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLING LOCATION
- SW-1/SED-1 — SURFACE WATER AND SEDIMENT SAMPLING LOCATION
- SED-27 — SEDIMENT SAMPLING LOCATION
- TP-13 — TEST PIT LOCATION
- L1 — LEACHATE SAMPLING LOCATION

	SW-4
Benzo(a)athracene	ND
Benzo(a)pyrene	ND
Cadmium	1 B
Lead	84.2
Zinc	298

PARAMETER
SAMPLING LOCATION
NON-DETECT
CONCENTRATION (ug/L)
BOLD INDICATES NYSDEC CLASS C SURFACE WATER STANDARD EXCEEDED

0 180 360
SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
EXTENT OF CONTAMINATED SURFACE WATER

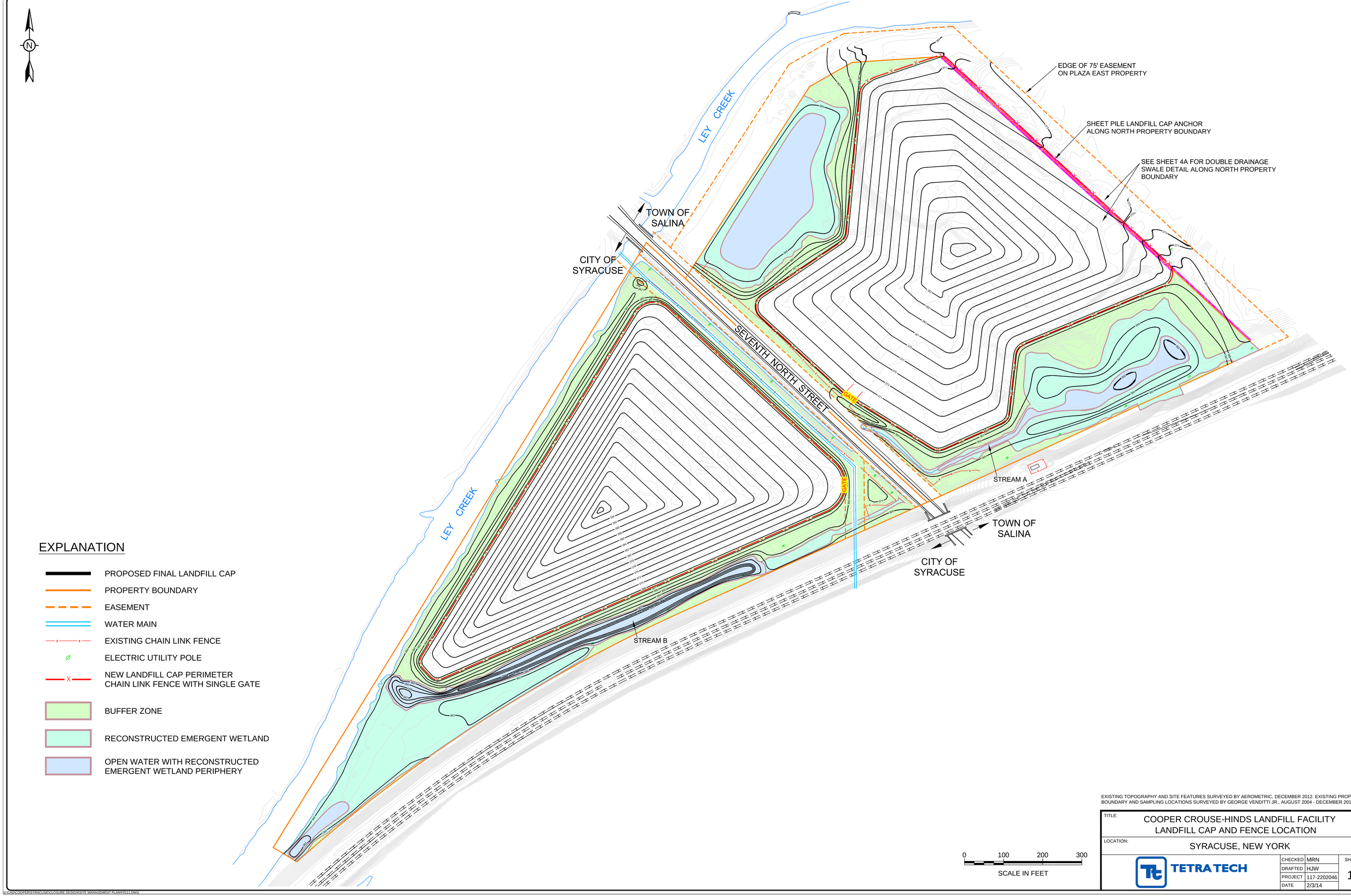
LOCATION: SYRACUSE, NEW YORK

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202036
DATE	11/11/10

FIGURE: 8

S:\CAD\Cooper\Syracuse\11-11-10\2202036Fig5.dwg



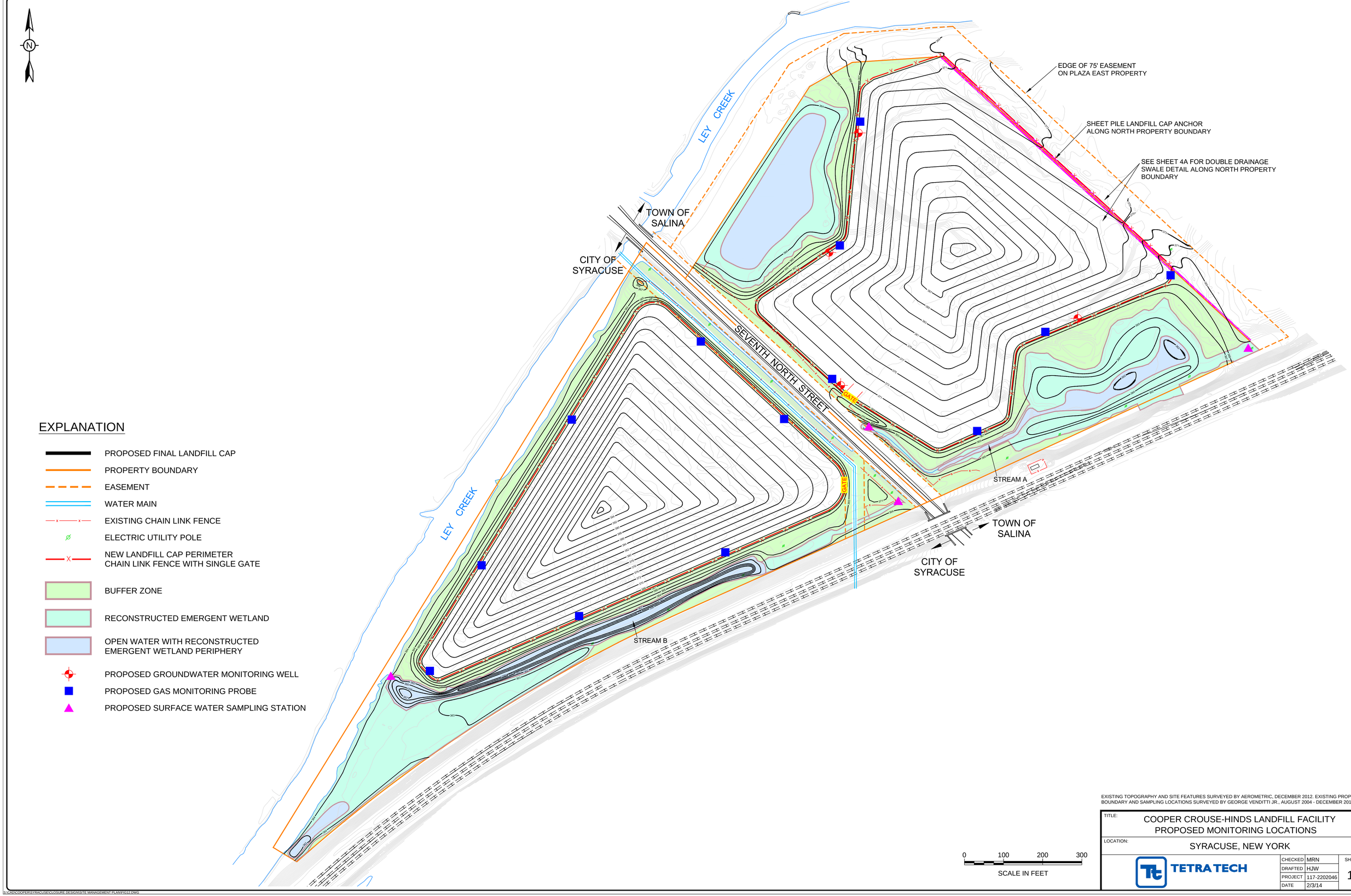
EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE:	COOPER CROUSE-HINDS LANDFILL FACILITY LANDFILL CAP AND FENCE LOCATION
LOCATION:	SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	SHEET:
DRAFTED	HJW	11
PROJECT	117-2202046	
DATE	2/3/14	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\SITE MANAGEMENT PLAN\FIG11.DWG



EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

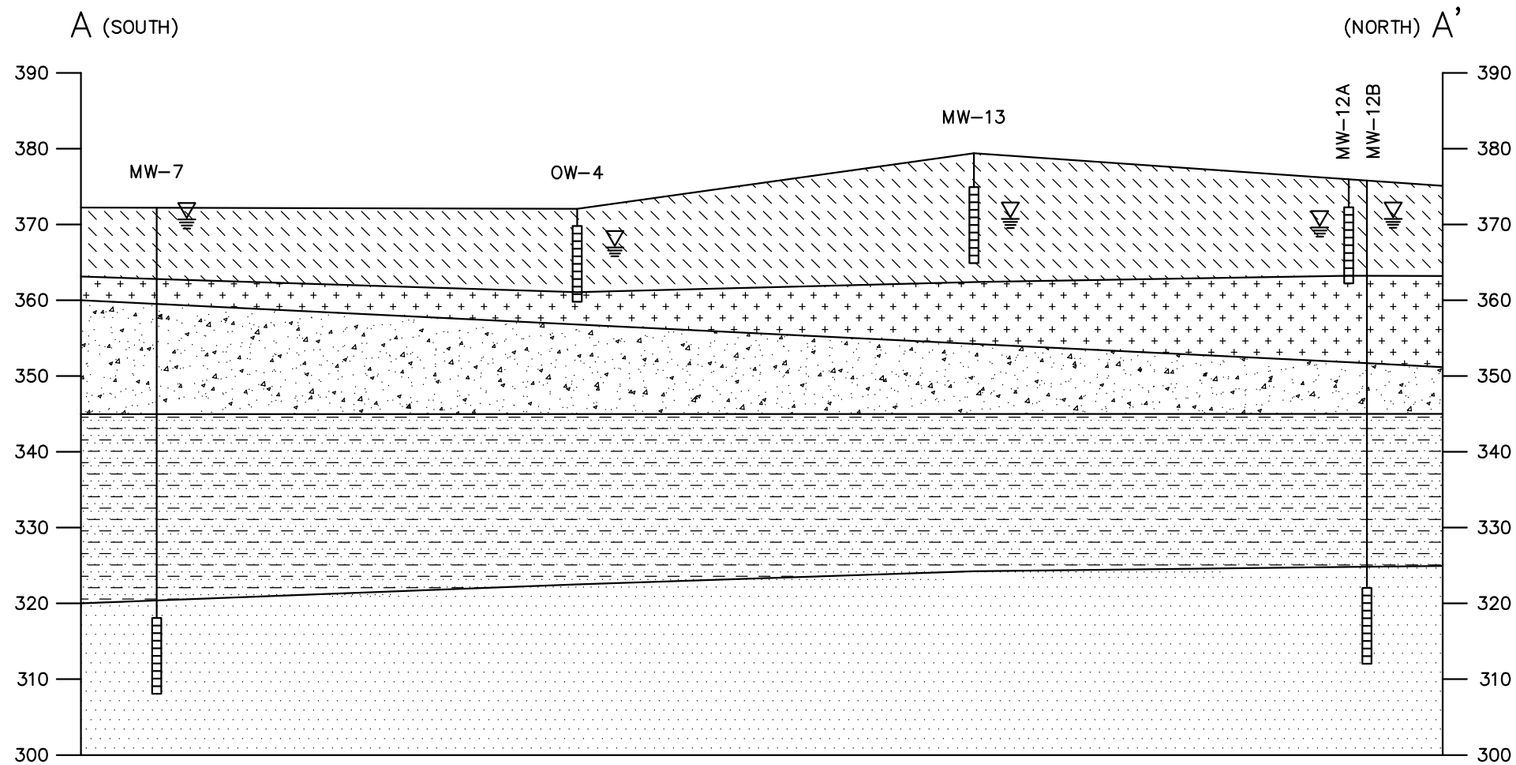
TITLE:	COOPER CROUSE-HINDS LANDFILL FACILITY PROPOSED MONITORING LOCATIONS
LOCATION:	SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	SHEET:
DRAFTED	HJW	12
PROJECT	117-2202046	
DATE	2/3/14	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\SITE MANAGEMENT PLAN\FIG12.DWG

REMEDIAL INVESTIGATION GEOLOGIC CROSS-SECTIONS AND WATER LEVEL MAPS



FILL

PEAT

SAND AND GRAVEL

SILT & CLAY

SAND

LEGEND

CASING

SCREEN

OW-4 MONITORING WELL

GROUNDWATER ELEVATION (SEPTEMBER 10, 2008)

SCALE:

1" = 20'

1" = 100'

NORTH LANDFILL A–A'
GEOLOGIC CROSS SECTION

COOPER CROUSE–HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE–HINDS

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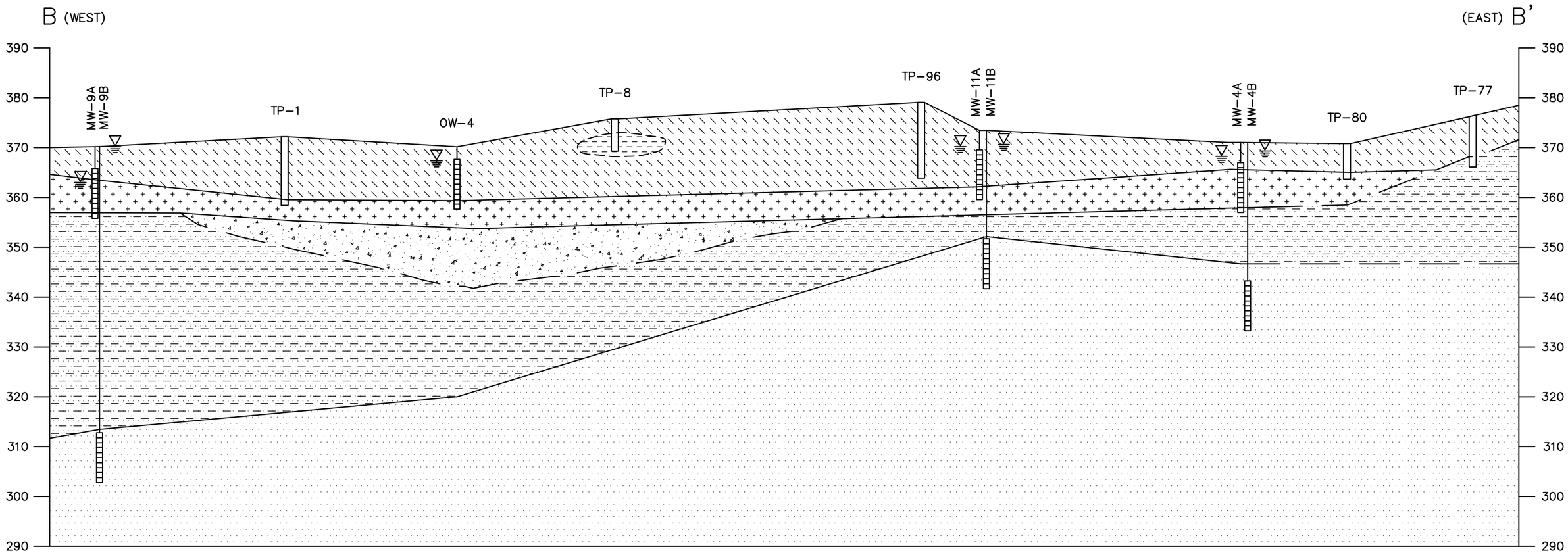
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIGURE 3	



FILL

CLAY

PEAT

SAND AND GRAVEL

SILT & CLAY

SAND

LEGEND

CASING

SCREEN

TEST PIT

OW-4 MONITORING WELL

GROUNDWATER ELEVATION (SEPTEMBER 10, 2008)

SCALE:

1" = 20'

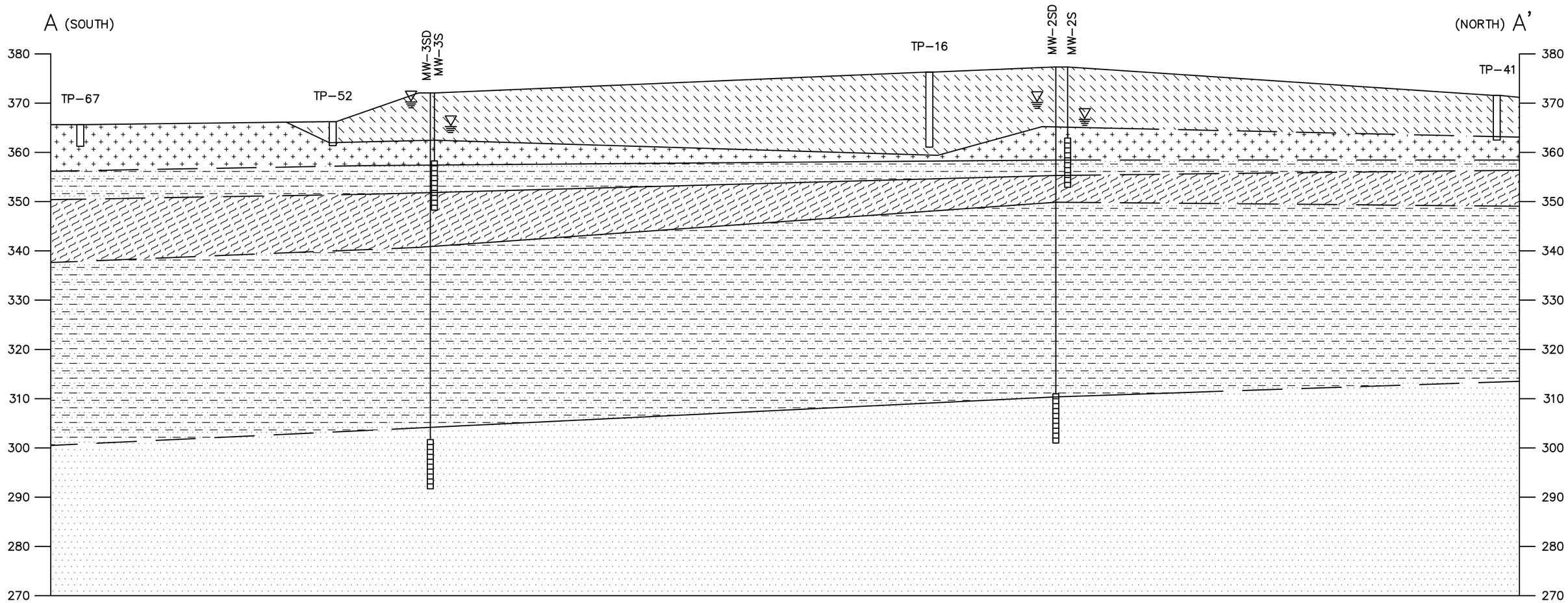
1" = 100'

NORTH LANDFILL B–B'
GEOLOGIC CROSS SECTION

COOPER CROUSE–HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE–HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIGURE 4	



FILL

PEAT

SILT & CLAY

SAND

SILT & SAND

LEGEND

CASING

SCREEN

TEST PIT

MW-2SD MONITORING WELL

GROUNDWATER ELEVATION (SEPTEMBER 10, 2008)

SCALE:

1" = 20'

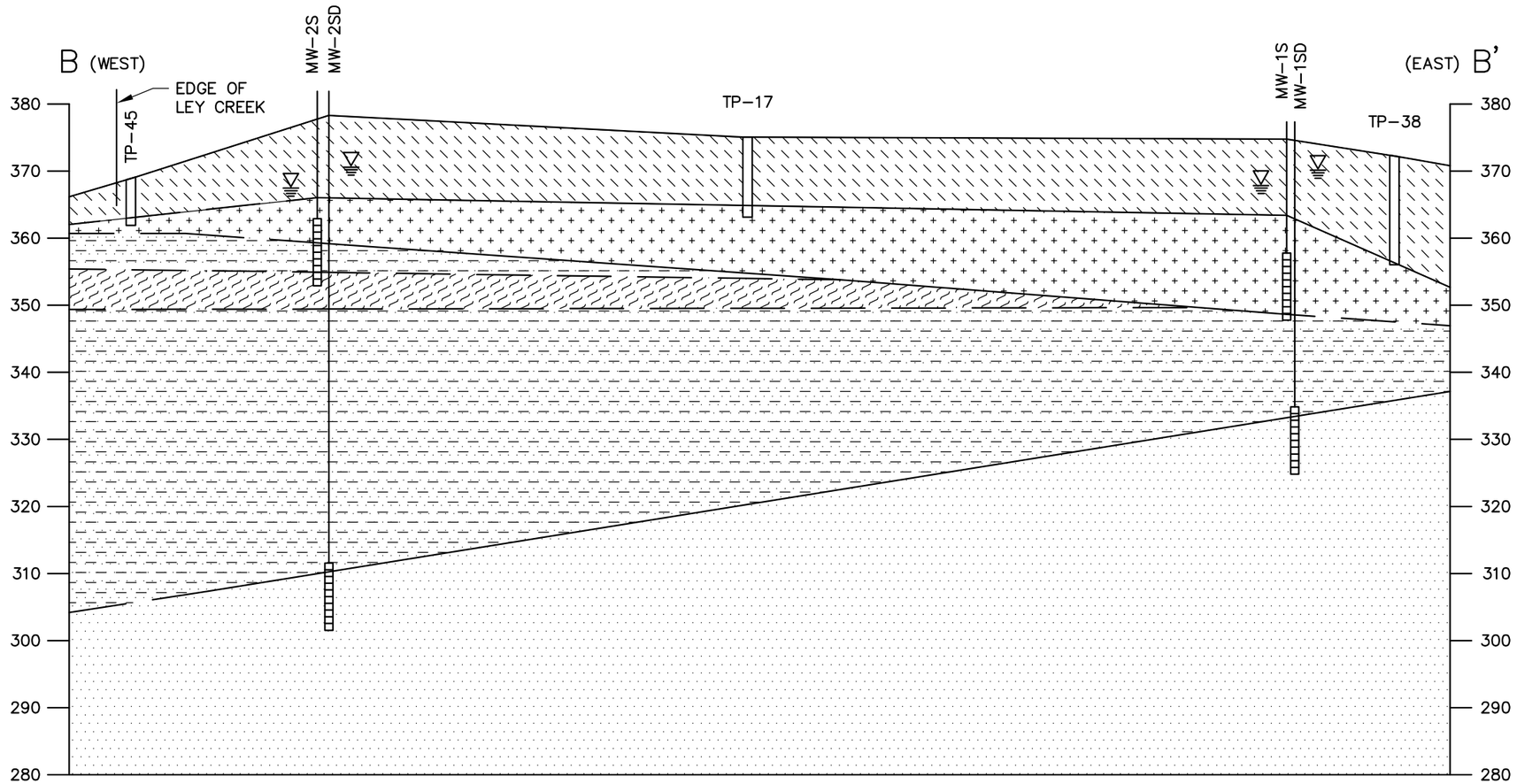
1" = 100'

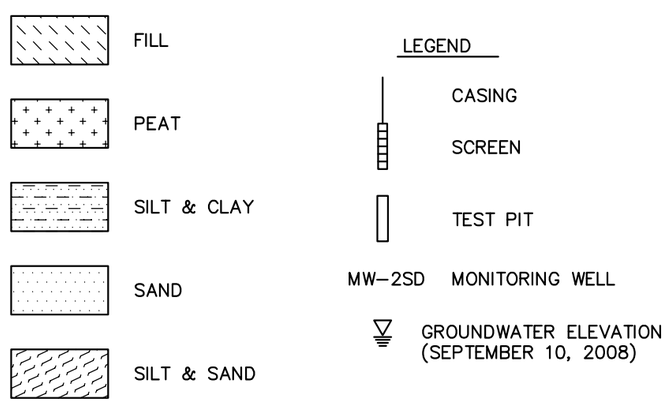
SOUTH LANDFILL A-A'
GEOLOGIC CROSS SECTION

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIGURE 5	





SCALE:

1" = 20'

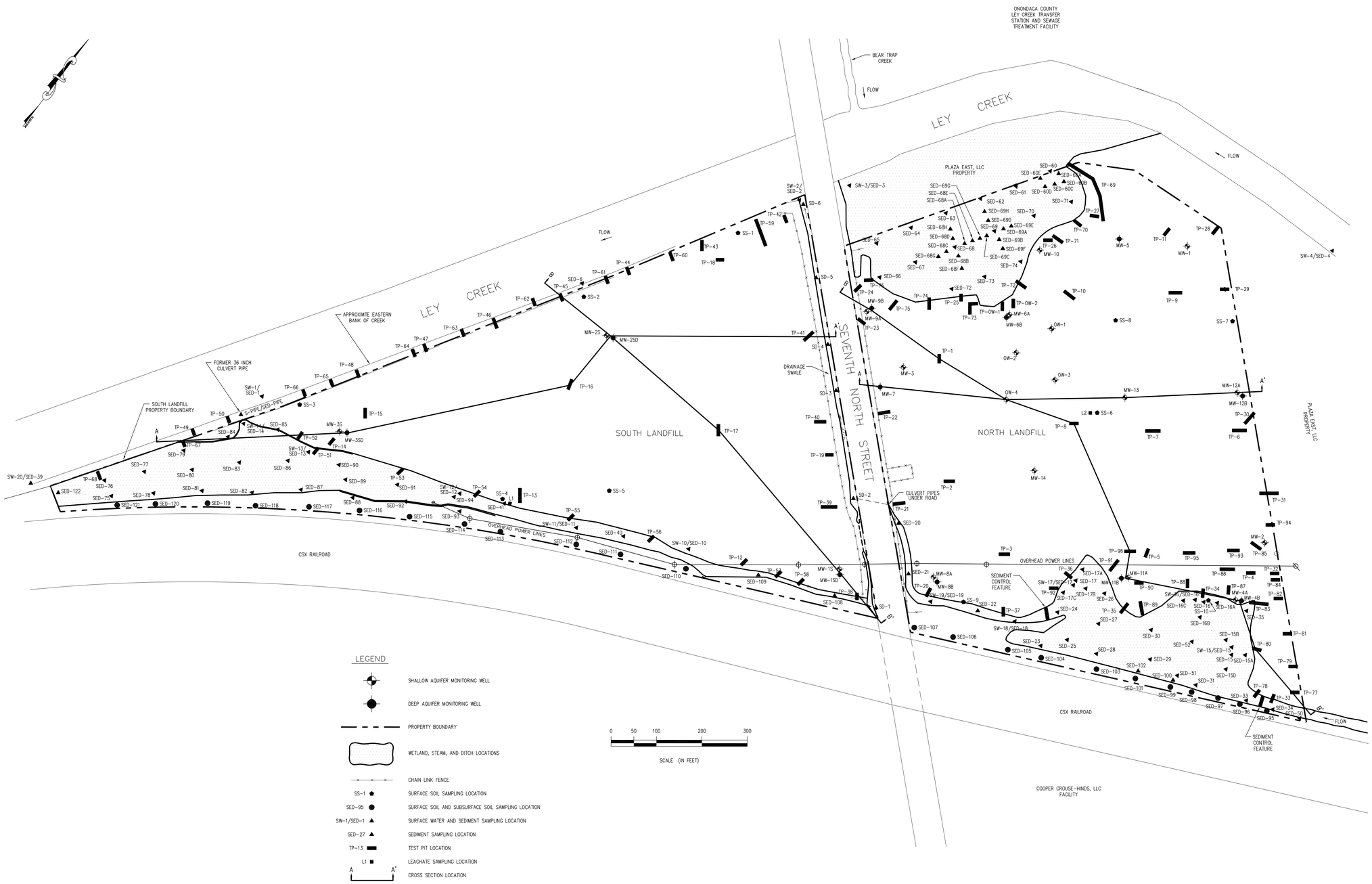
1" = 100'

SOUTH LANDFILL B–B'
GEOLOGIC CROSS SECTION

COOPER CROUSE–HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE–HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIGURE 6	

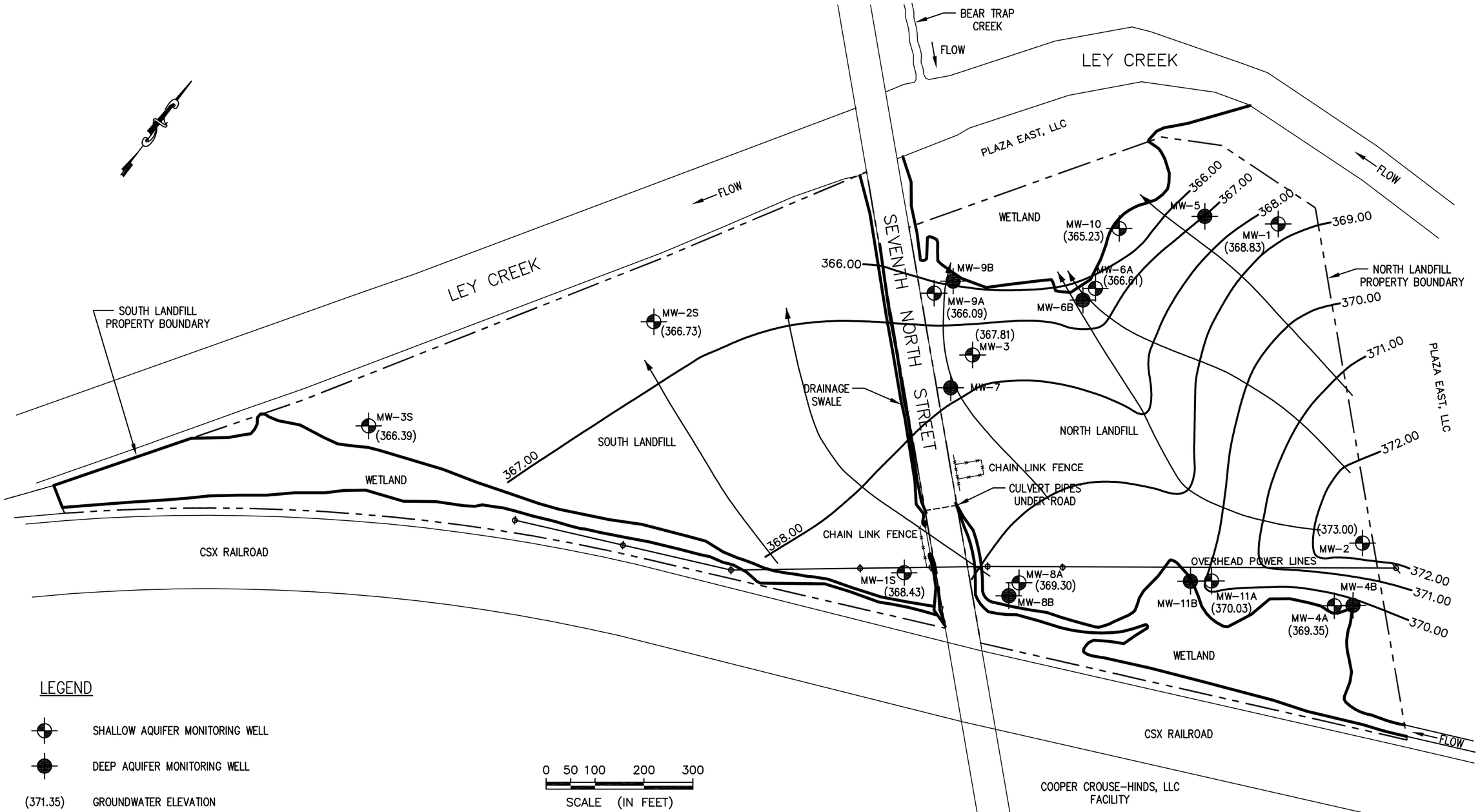


SAMPLE LOCATION MAP

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		
DATE	REVIEWED BY	FILE NAME	
2/10/09		FIGURE 7	DELTA



LEGEND

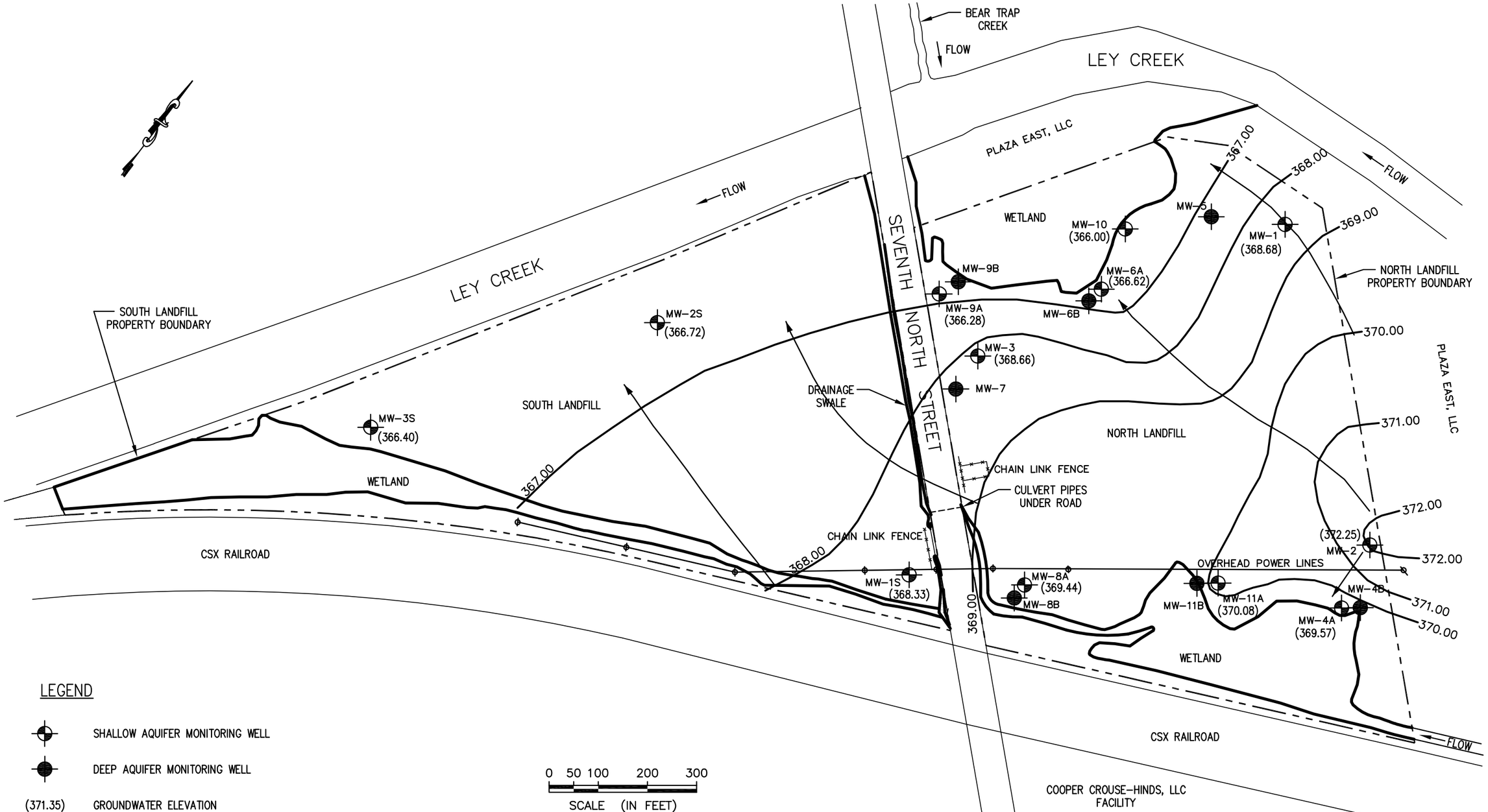
- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
- (371.35) GROUNDWATER ELEVATION
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (6-30 TO 7-1-2004)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 8	

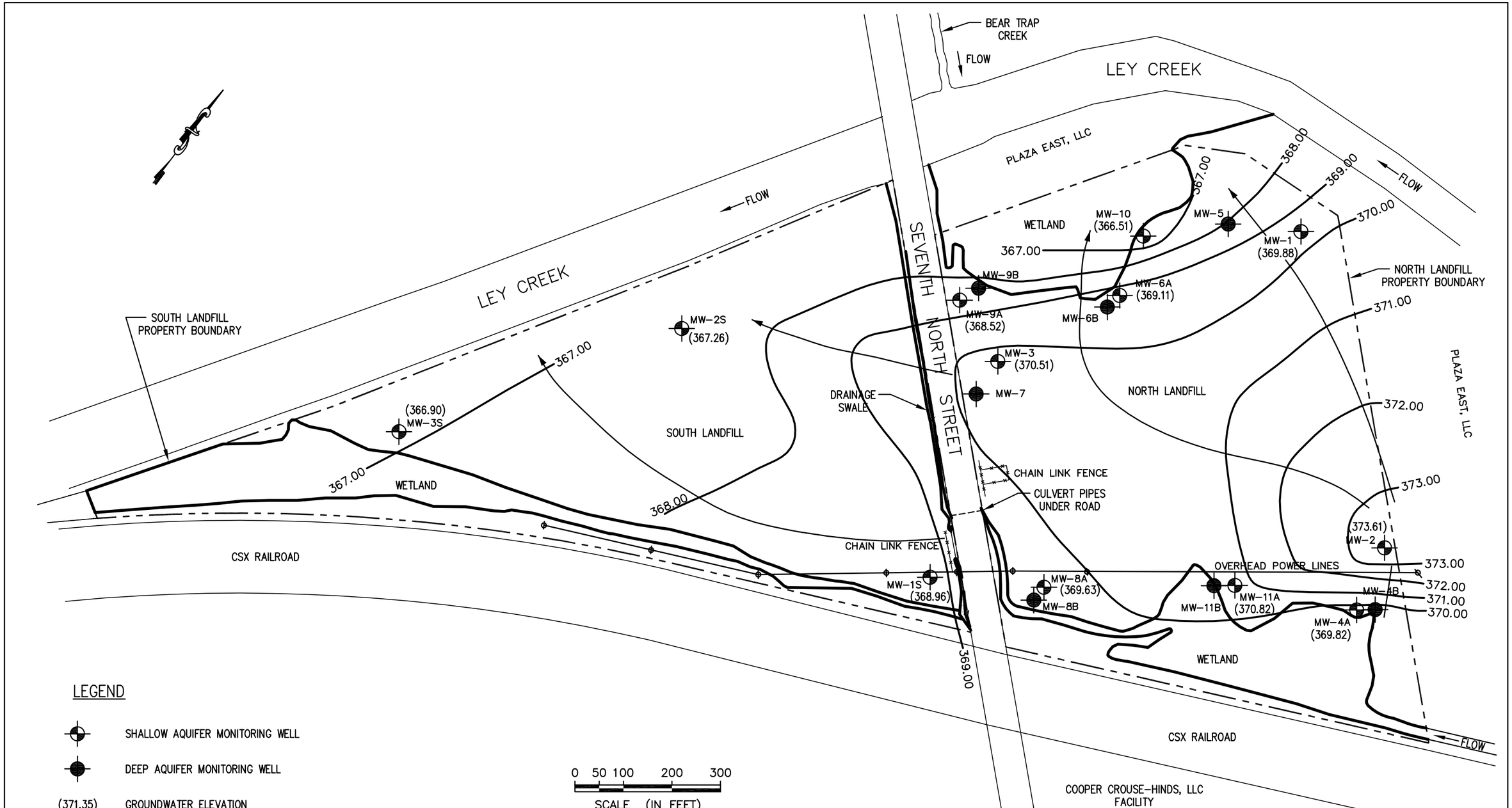


SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (11-23-2004)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 9	



LEGEND

- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
- (371.35) GROUNDWATER ELEVATION
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

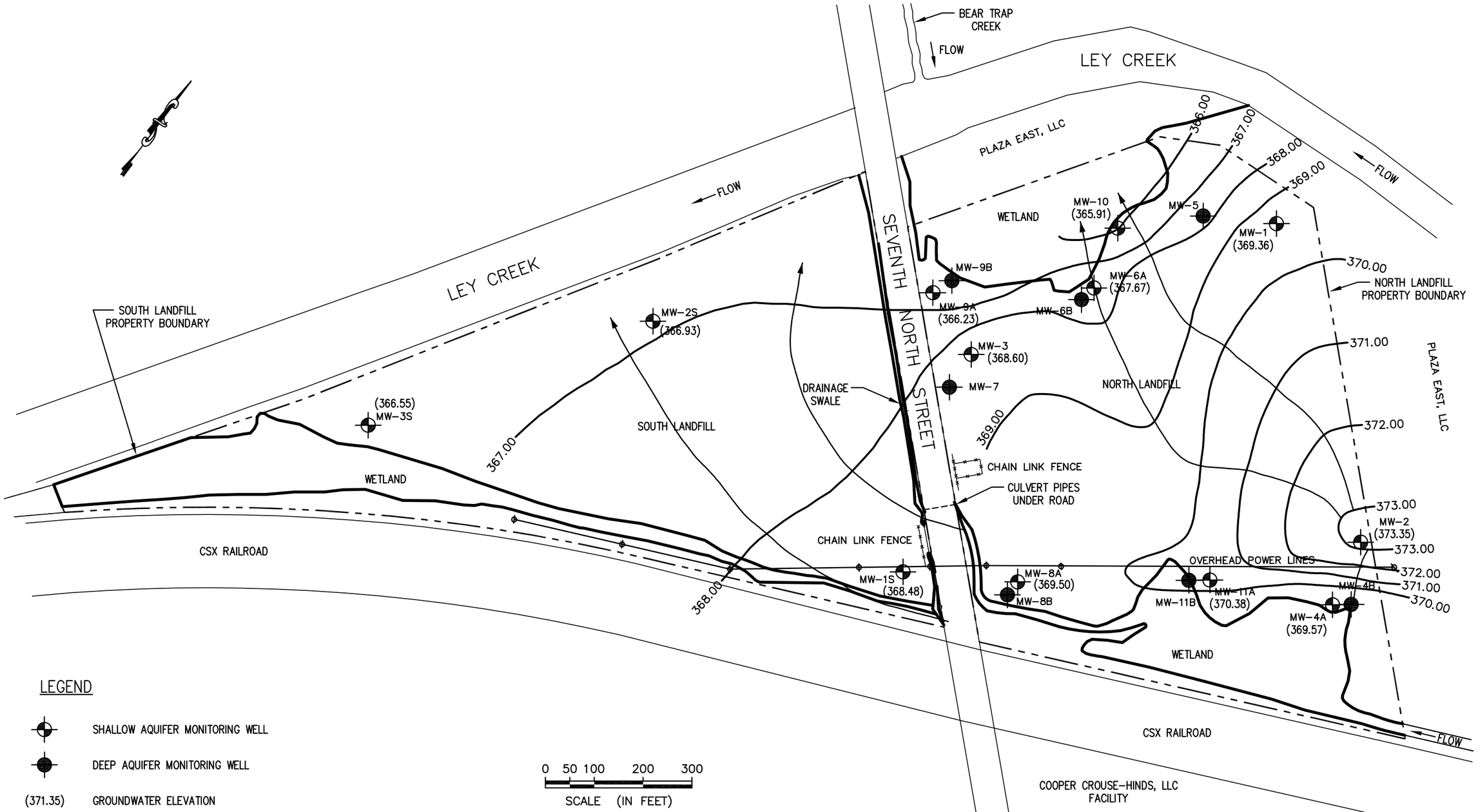
SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (2-28-2005)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY
8E0708524P	MTG	
DATE	REVIEWED BY	FILE NAME
02/13/09		FIG. 10

DELTA

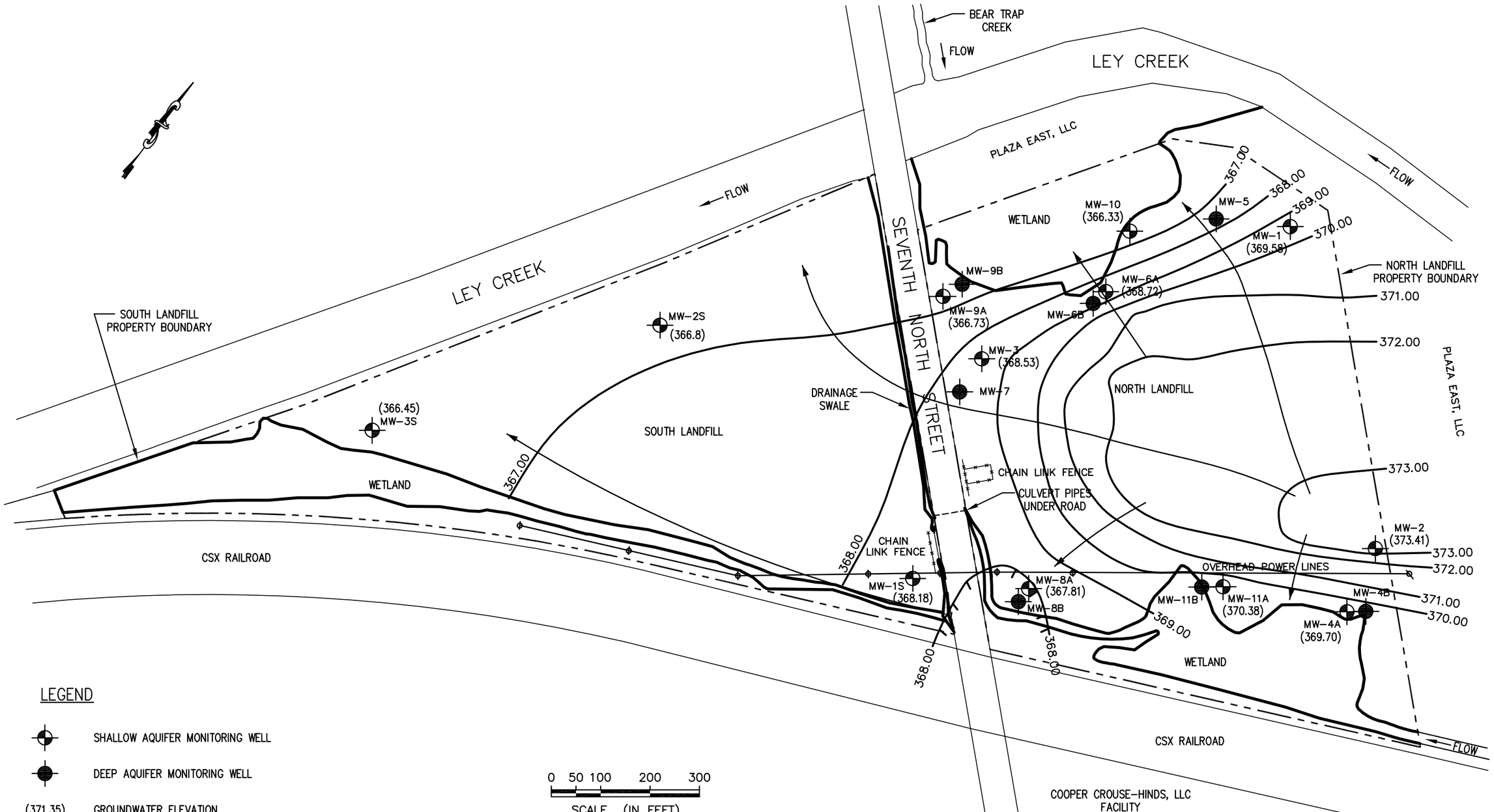


SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (5-26-2005)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 11	

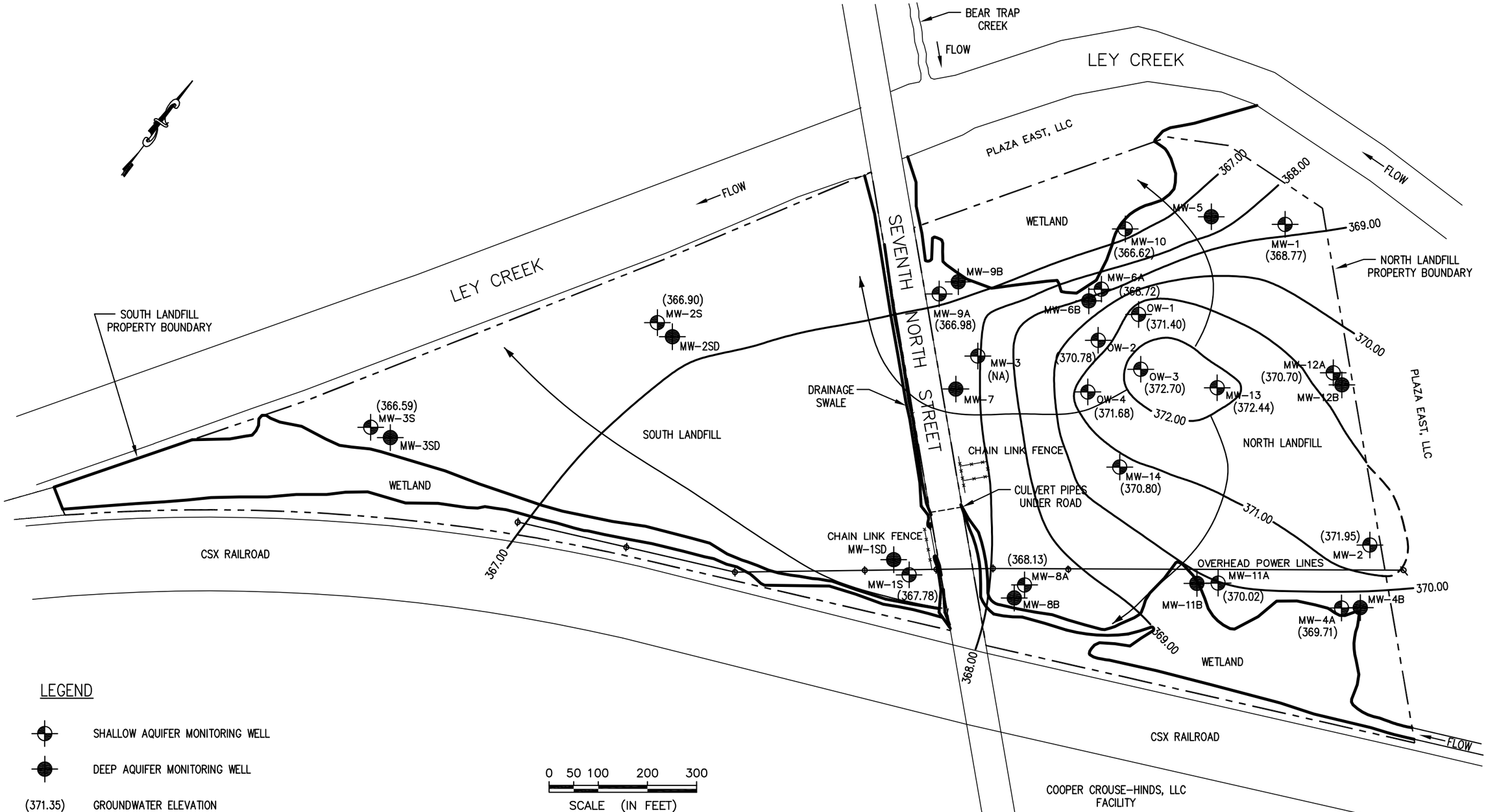


SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (11-21-2005)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 12	

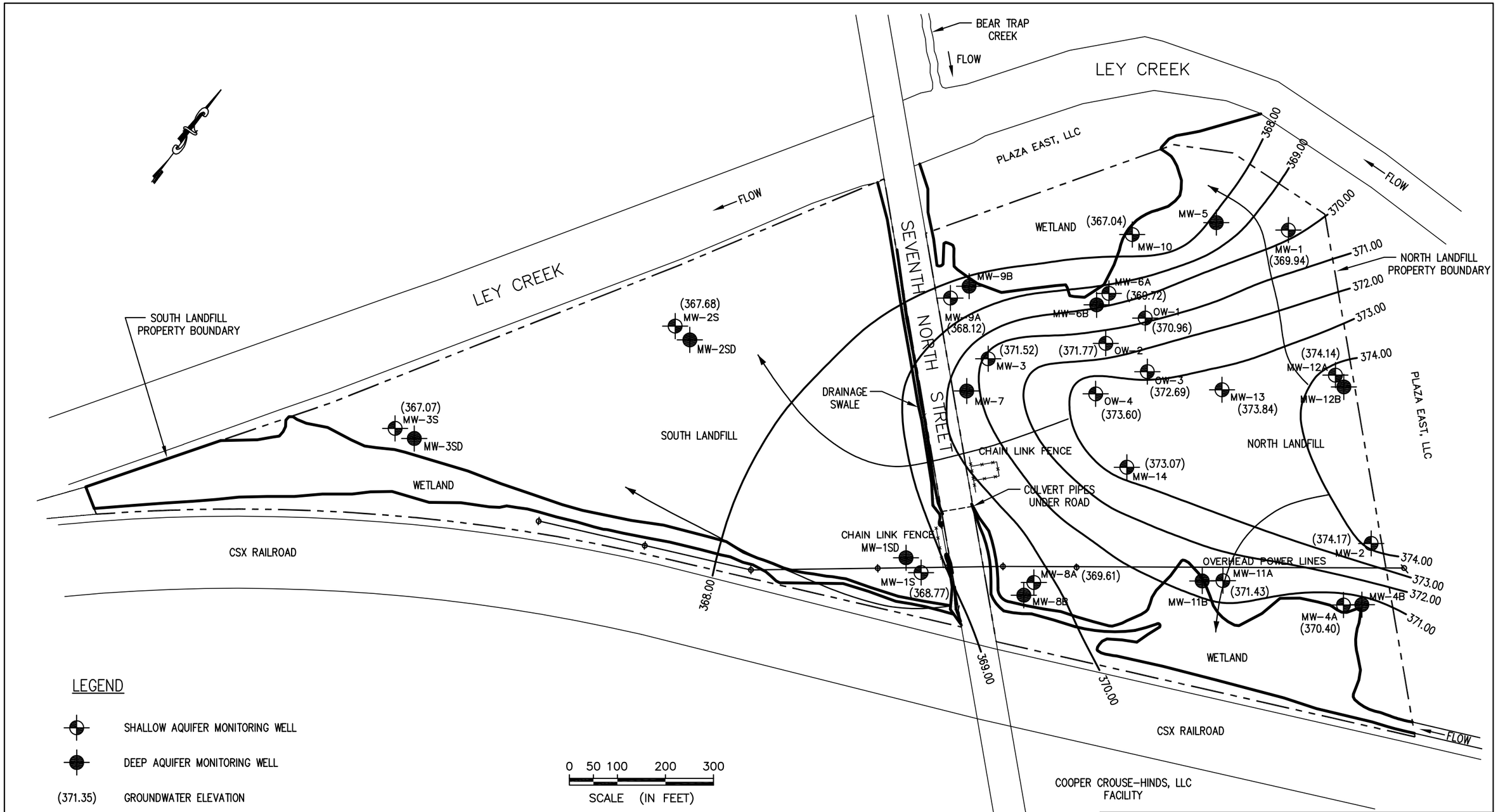


SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (12-4-2007)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIG. 13	



LEGEND

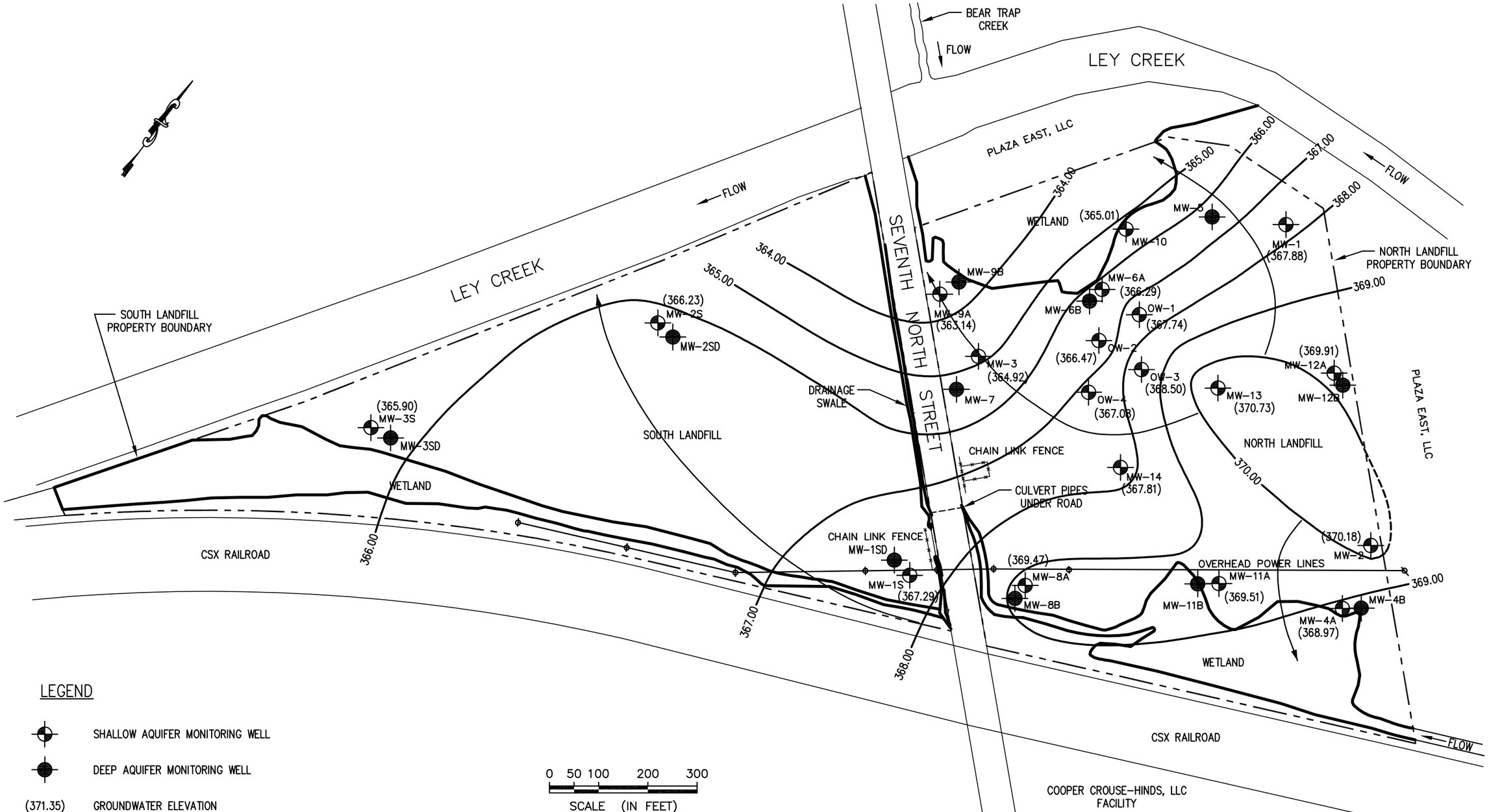
- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
- (371.35) GROUNDWATER ELEVATION
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (3-20-2008)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIG. 14	

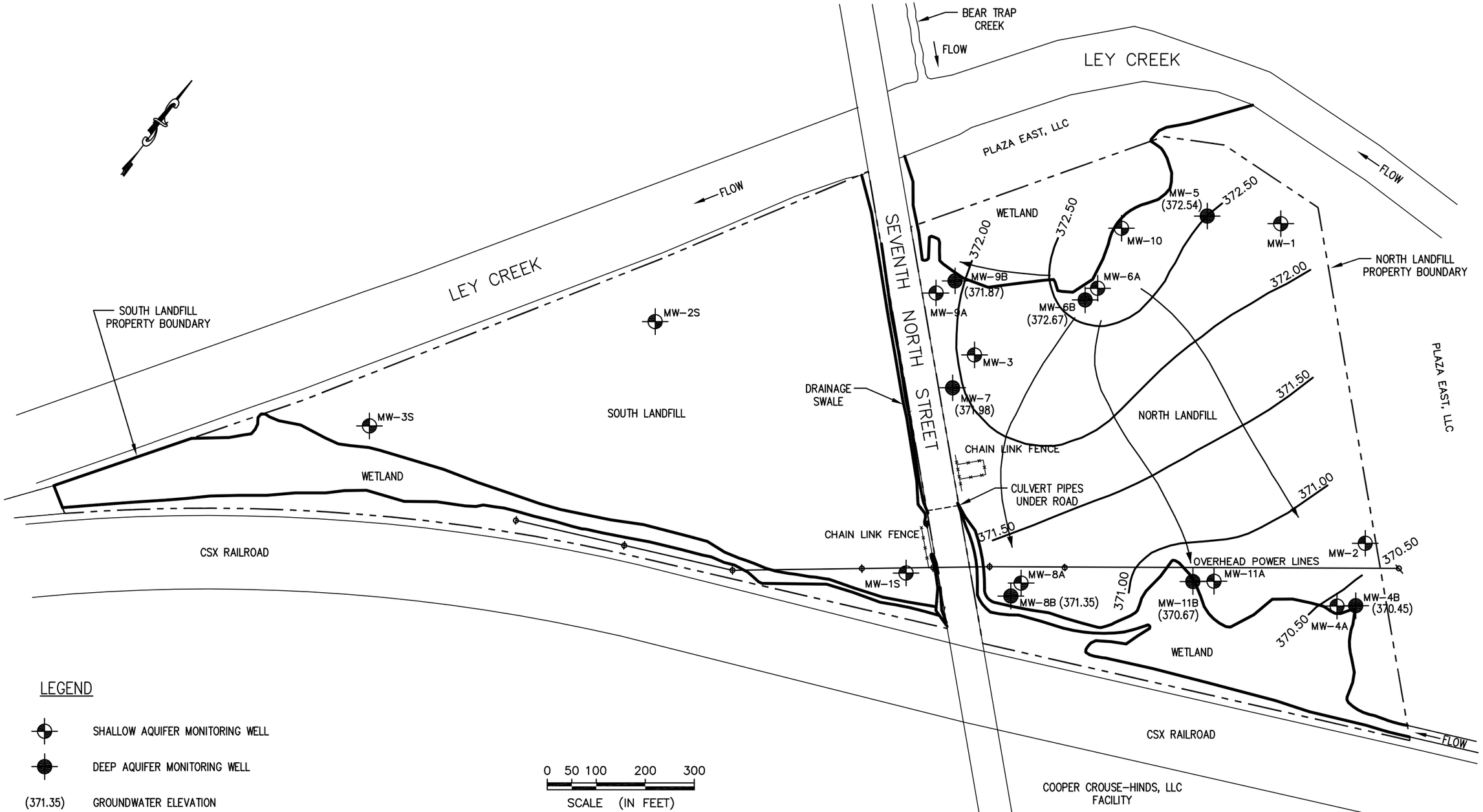


SHALLOW AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (9-10-2008)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIG. 15	



LEGEND

- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
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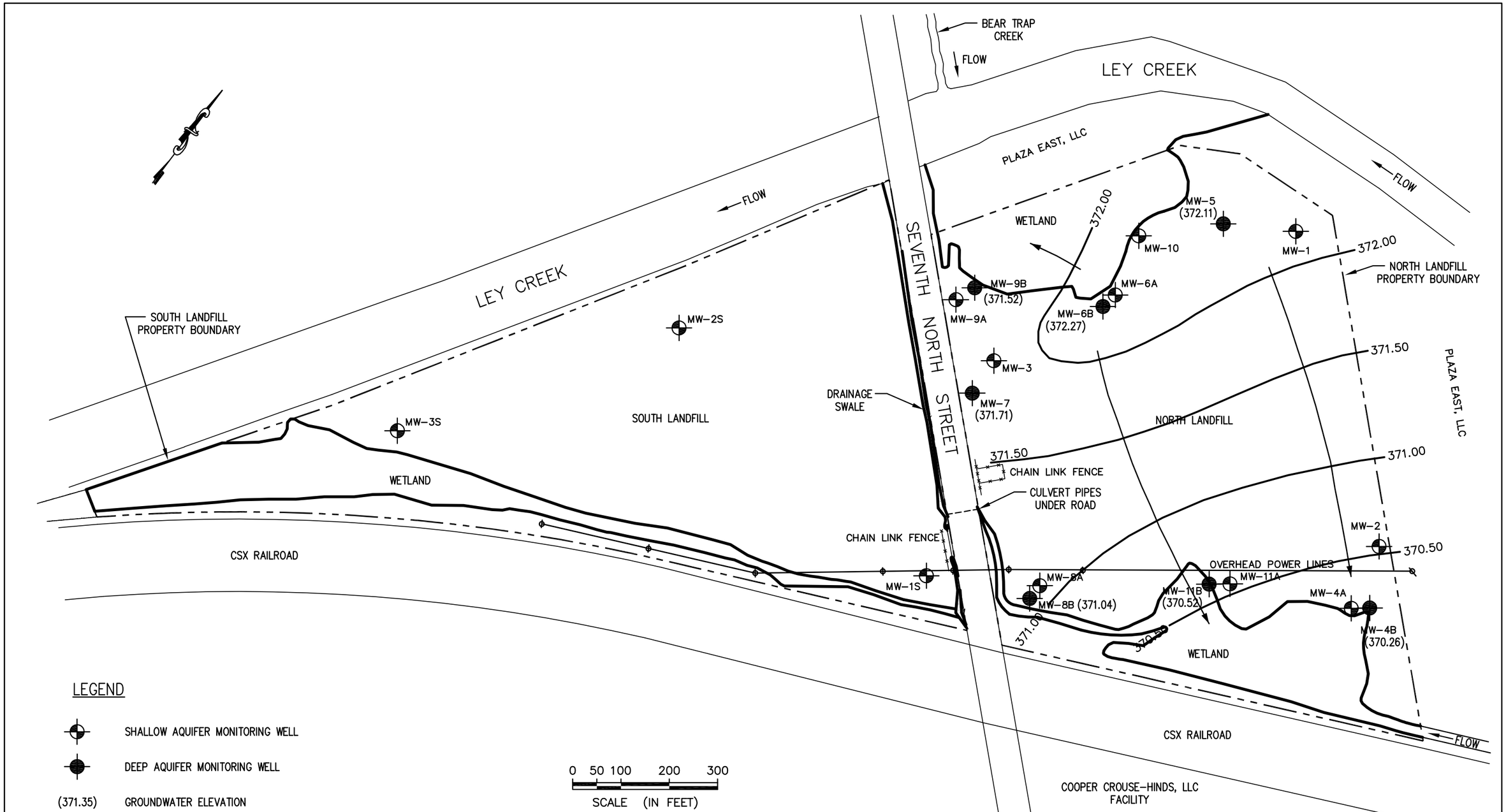
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (6-30 TO 7-1-2004)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 16	



LEGEND

- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
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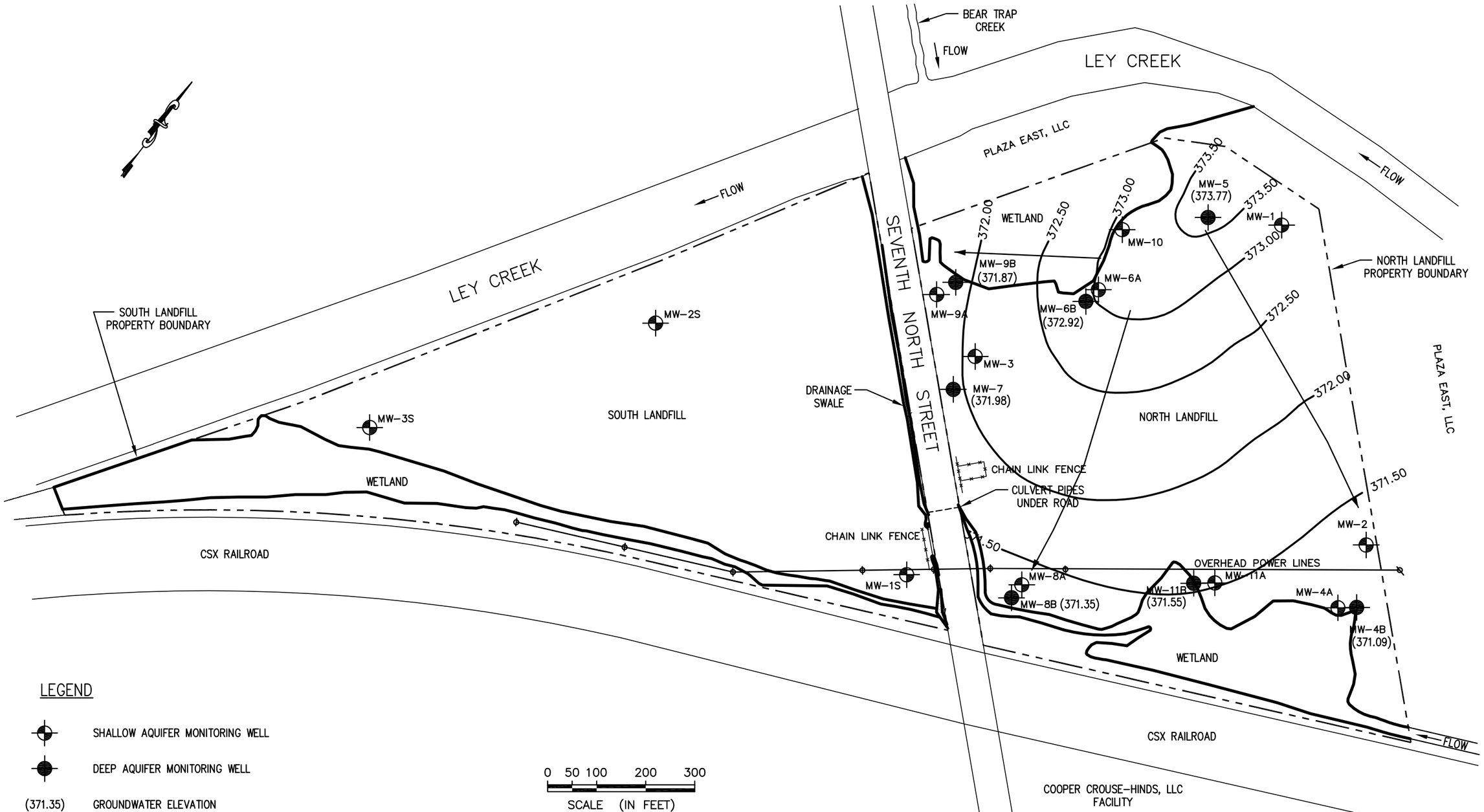
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (11-23-2004)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 17	

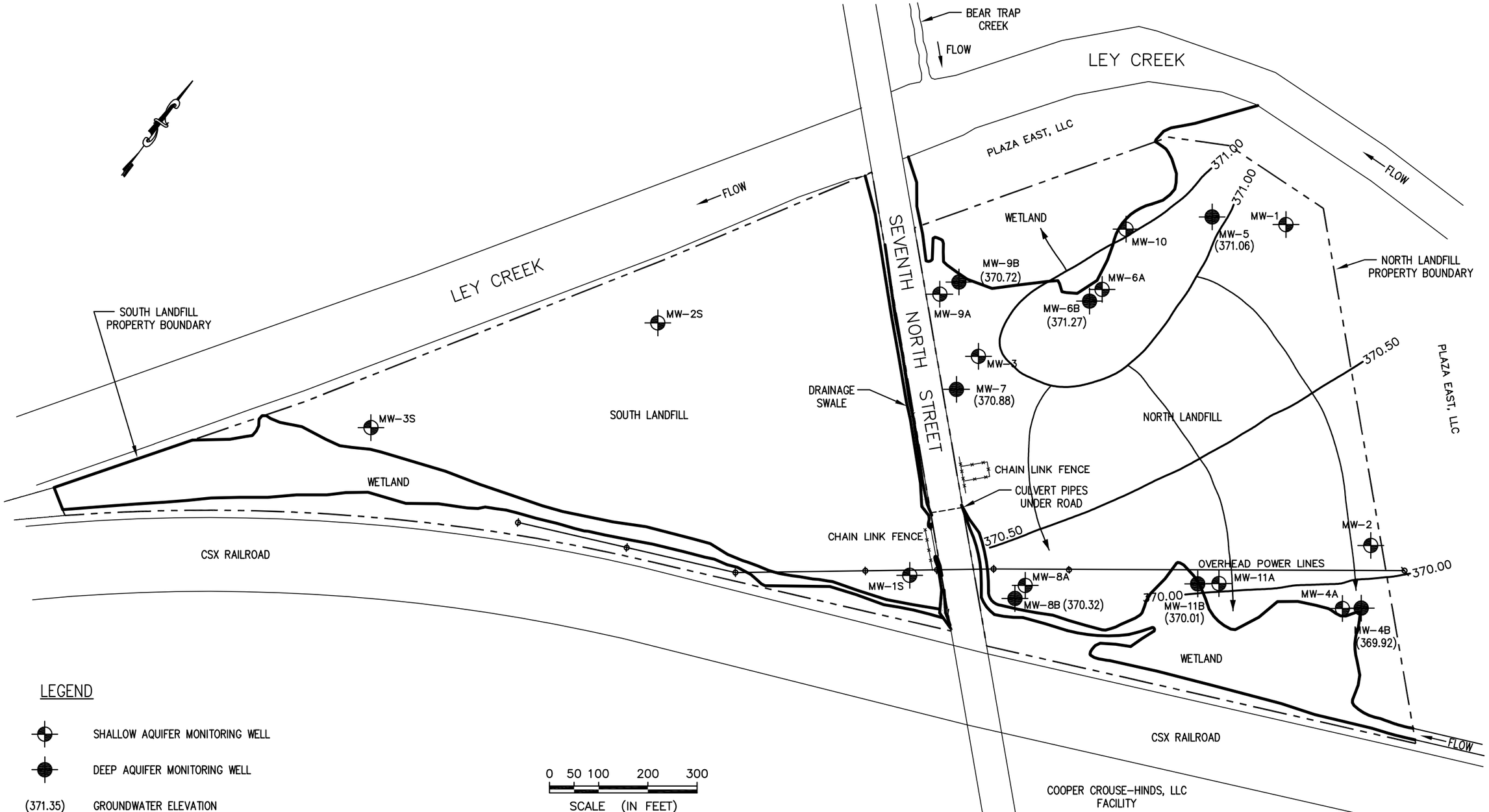


DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (2-28-2005)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 18	



LEGEND

- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
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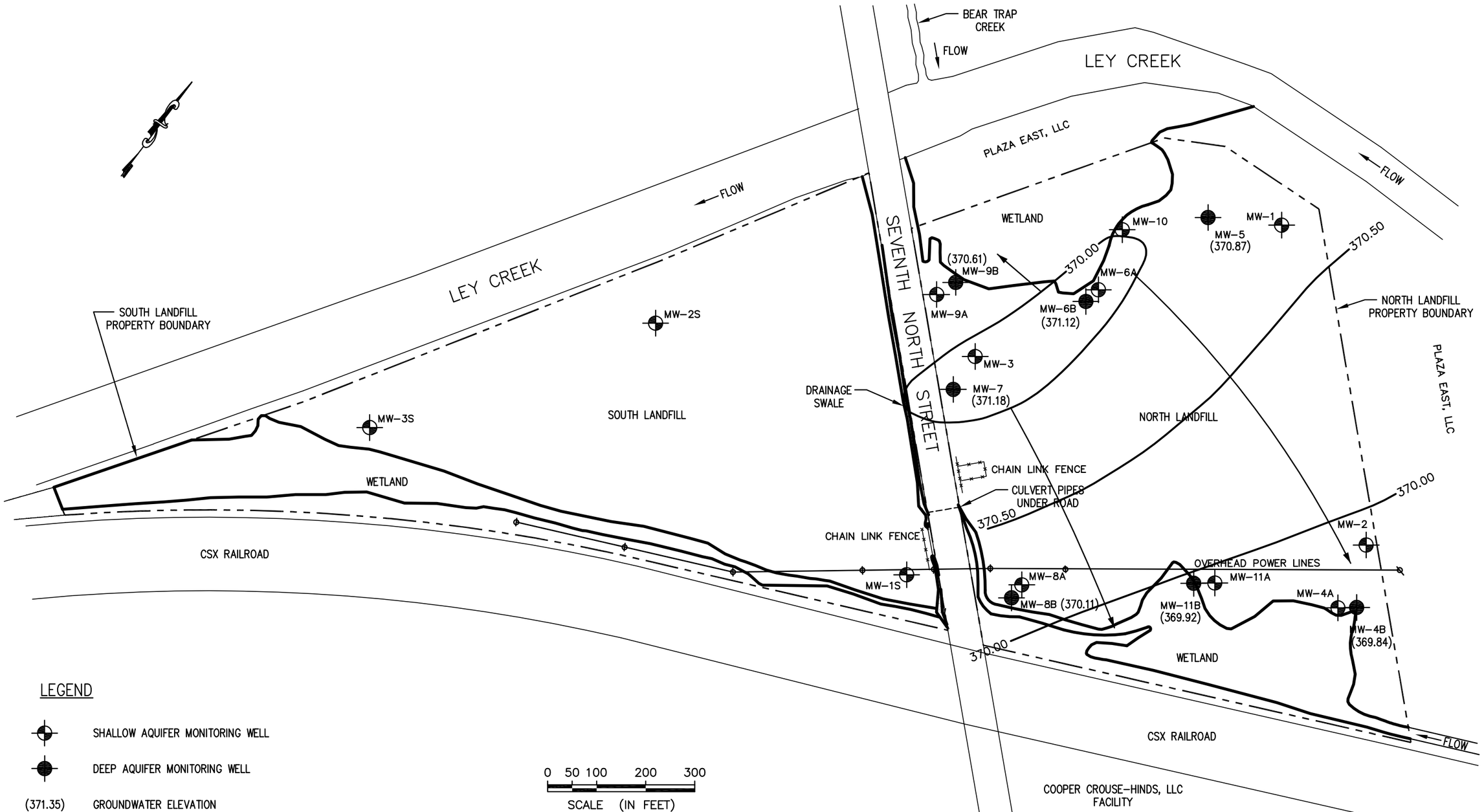
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (5-26-2005)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 19	

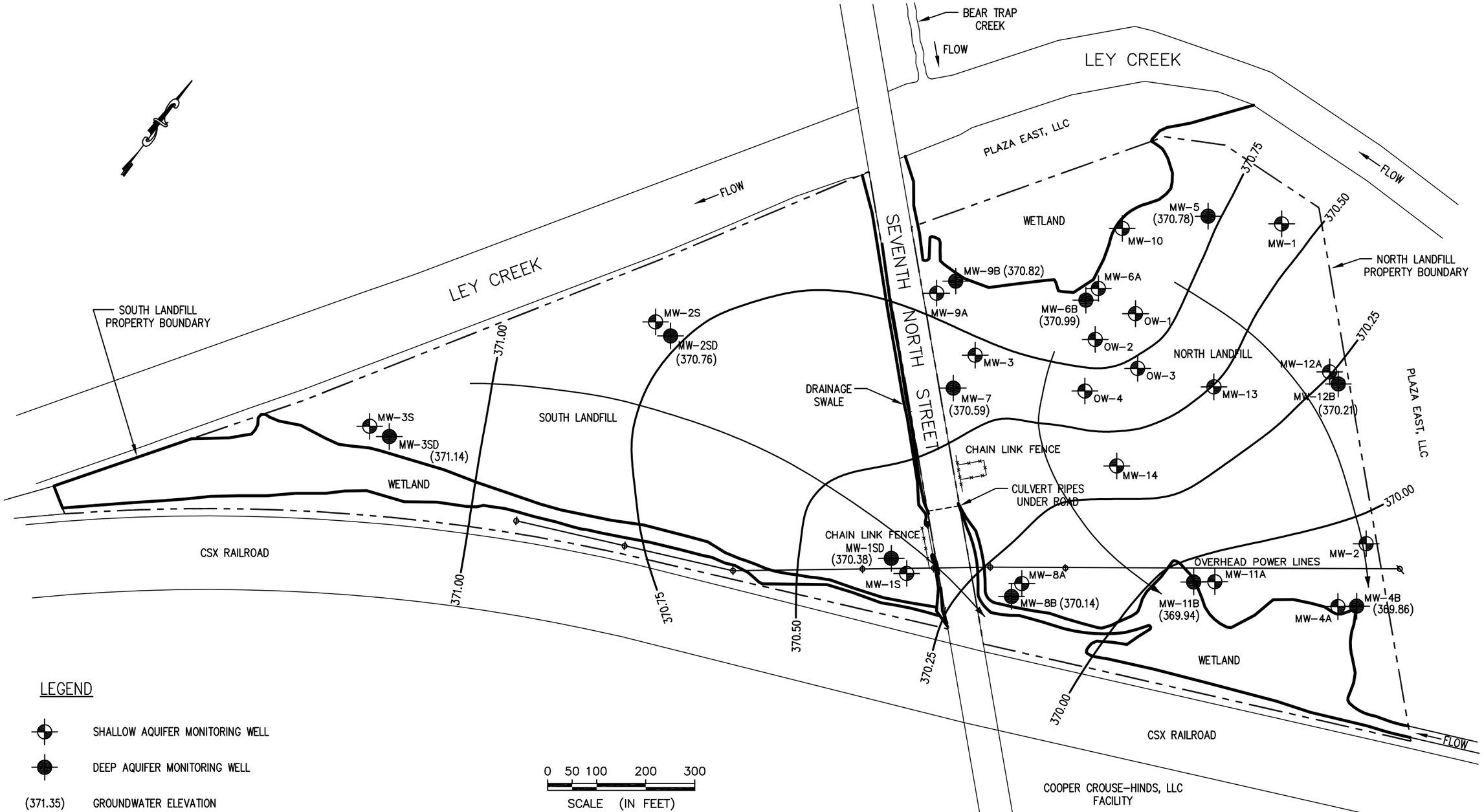


DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (11-21-2005)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/13/09		FIG. 20	



LEGEND

- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
- (371.35) GROUNDWATER ELEVATION
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

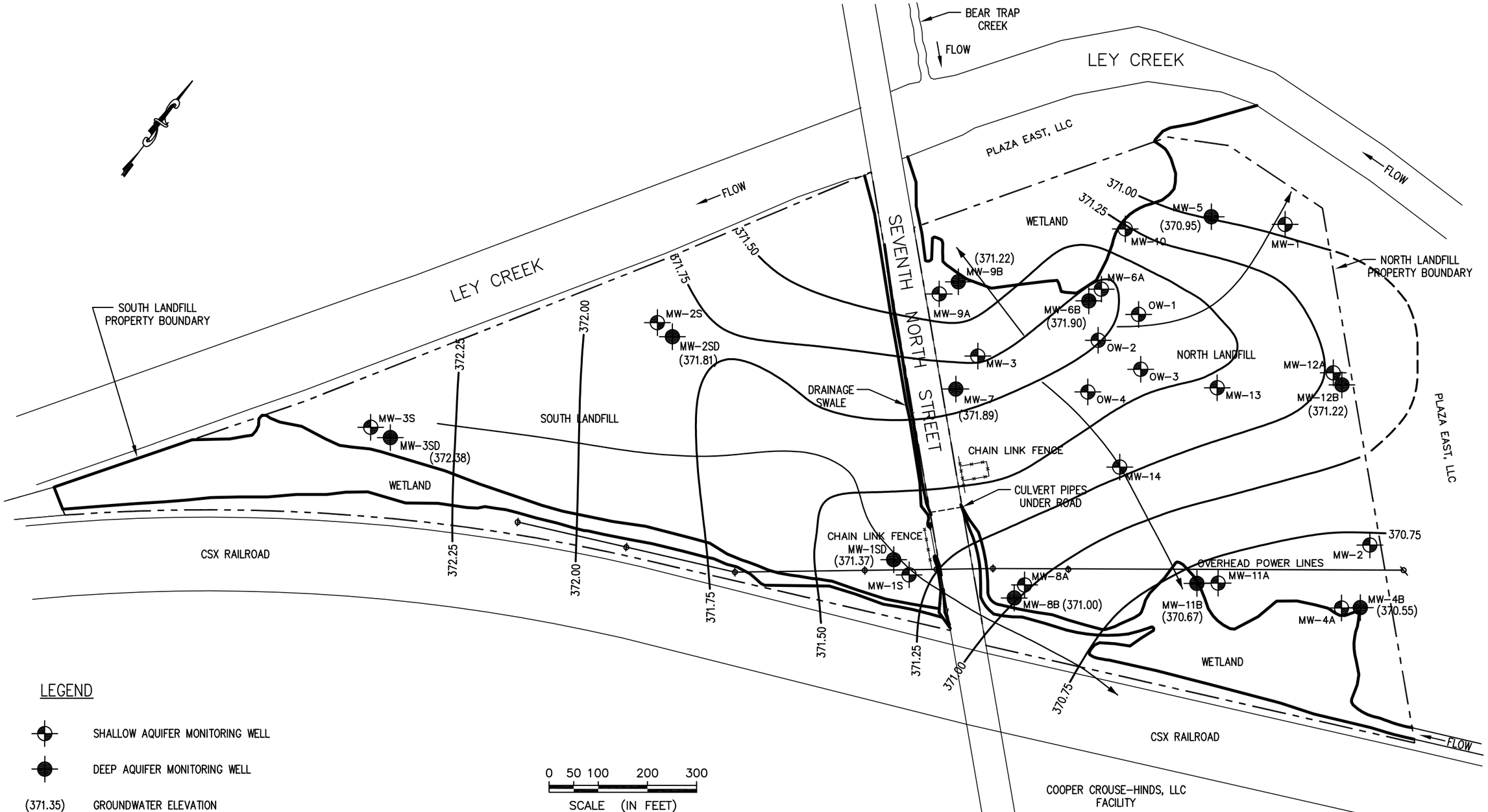
0 50 100 200 300
SCALE (IN FEET)

DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (12-4-2007)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIG. 21	



LEGEND

- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
- (371.35) GROUNDWATER ELEVATION
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

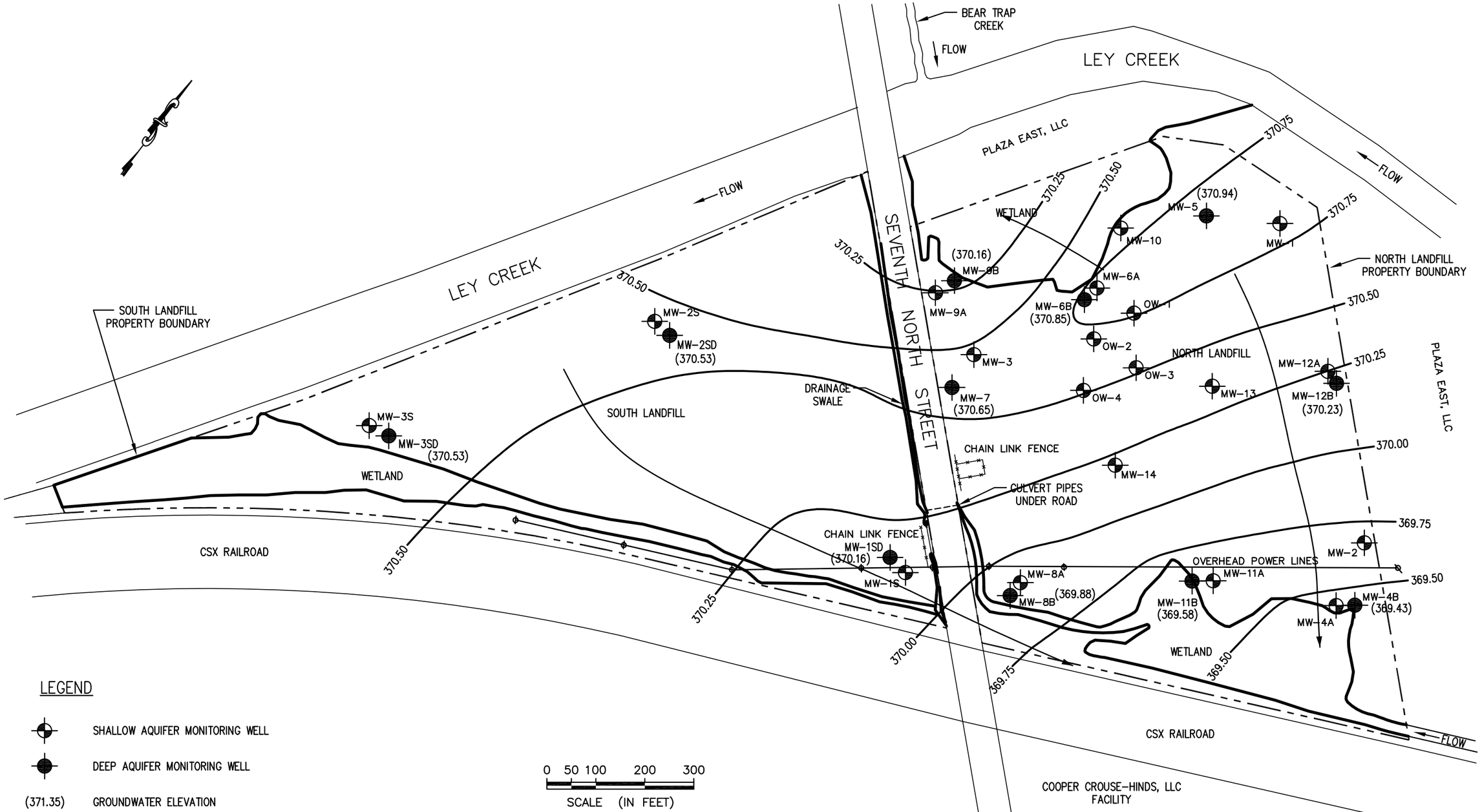
0 50 100 200 300
SCALE (IN FEET)

DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (3-20-2008)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIG. 22	



LEGEND

- SHALLOW AQUIFER MONITORING WELL
- DEEP AQUIFER MONITORING WELL
- (371.35) GROUNDWATER ELEVATION
- 372.00 GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

DEEP AQUIFER GROUNDWATER ELEVATION CONTOUR MAP (9-10-2008)

COOPER CROUSE-HINDS LANDFILL FACILITY
SYRACUSE, NY

PREPARED FOR: COOPER CROUSE-HINDS

PROJECT NO.	PREPARED BY	DRAWN BY	
8E0708524P	MTG		DELTA
DATE	REVIEWED BY	FILE NAME	
02/10/09		FIG. 23	

EXCAVATION WORK PLAN

SMP APPENDIX B
EXCAVATION WORK PLAN

1.0 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Mr. Richard Mustico
Regional Hazardous Waste Remediation Engineer
625 Broadway, Albany, NY 12233-7013 Phone: 518-402-9676

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix C of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

2.0 SOIL SCREENING METHODS

Visual, olfactory and PID instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soil screening for VOCs will be conducted using a PID. The samples screened in the field for VOCs will be placed in 16-ounce glass canning jars. The jars will be half-filled with soil and the top of each jar will be sealed with aluminum foil and a canning jar screw-on metal retaining ring. The headspace in the jars will be allowed to equilibrate for a minimum of 10 minutes at an ambient temperature of at least 55 degrees Fahrenheit to allow any organic compounds to off-gas. The headspace of the container will then be measured for volatile compounds using the PID. The peak PID response and the PID

reading after 15 seconds will be recorded on field PID data sheets. The PID will be calibrated at the start of each work day by the environmental scientist. The PID will be calibrated in accordance with the manufacturer's calibration procedures using 100 parts per million isobutylene calibration gas. The PID calibration results will be recorded on an equipment calibration record form. A PID response greater than 10 instrument units (IUs) above background will be considered an indication of possible contamination.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

3.0 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points. Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced. Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

4.0 MATERIALS EXCAVATION AND LOAD OUT

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan. A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking. The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

5.0 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used. All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are as follows: Exiting the North or South Landfill to the west along 7th North Street and traveling 0.6 miles leads to the I-81 northbound ramp. From that point interstate highways west provide the route to the landfill. No residential streets in Syracuse are on the truck route. Once I-81 is accessed, the trucks will be using normal truck routes to reach the destination landfill. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site. Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development. Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

6.0 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

7.0 MATERIALS REUSE ON-SITE

'Reuse on-site' means reuse of on-site of material that originates at the site and which does not leave the site during the excavation. Chemical criteria for on-site reuse of material have been approved by NYSDEC and are listed in attached Tables 375-6.8(a) and (b), as applicable. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site may be reused on-site if spread thin.

8.0 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

9.0 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Order on Consent. The demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil or composite cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the 'Remaining Contamination. A figure showing the modified surface

will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

10.0 BACKFILL FROM OFF-SITE SOURCES

A possible commercial source for imported clean fill material is:

Hanson Aggregates New York LLC
PO Box 513
4800 Jamesville Road
Jamesville, NY 13078

bsckfill source from TSCA removal?

In addition to Hanson Aggregates, the following clean fill material sources are located within a short hauling distance to the site:

Riccelli Enterprises, Inc.
6131 E. Taft Road
Syracuse, NY
(315) 433-5115

Mill Creek Products and Supplies
6414 East Taft Road
East Syracuse, NY
(315) 452-9400

WF Saunders & Sons, Inc.
5126 South Onondaga Road
Nedrow, NY
(315) 469-3217

Van Slyke Trucking, Inc.
5096 South Onondaga Road
Nedrow, NY
(315) 492-8174

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in attached Tables 375-6.8(a) and (b), as applicable. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

11.0 STORMWATER POLLUTION PREVENTION

For excavations exceeding 1 acre, procedures specified in the Stormwater Pollution Prevention Plan (Appendix F of the Site Management Plan) should be followed.

For any excavation, silt fencing or hay bales will be installed around the entire perimeter of the construction area. Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

12.0 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

13.0 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan (CAMP) will follow the generic plan provided as Appendix 1A of DER-10. The location of air sampling stations will be based on the generally westerly prevailing wind conditions at the site. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

14.0 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

15.0 DUST CONTROL PLAN

Fugitive Dust and Particulate Monitoring will follow the generic plan provided as Appendix 1B of DER-10. A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

16.0 OTHER NUISANCES

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

375-6.8 Soil cleanup objective tables.

(a) Unrestricted use soil cleanup objectives.

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
Metals		
Arsenic	7440-38-2	13 [c]
Barium	7440-39-3	350 [c]
Beryllium	7440-41-7	7.2
Cadmium	7440-43-9	2.5 [c]
Chromium, hexavalent [e]	18540-29-9	1[b]
Chromium, trivalent [e]	16065-83-1	30 [c]
Copper	7440-50-8	50
Total Cyanide [e, f]		27
Lead	7439-92-1	63 [c]
Manganese	7439-96-5	1600 [c]
Total Mercury		0.18 [c]
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9[c]
Silver	7440-22-4	2
Zinc	7440-66-6	109 [c]
PCBs/Pesticides		
2,4,5-TP Acid (Silvex) [f]	93-72-1	3.8
4,4'-DDE	72-55-9	0.0033 [b]
4,4'-DDT	50-29-3	0.0033 [b]
4,4'-DDD	72-54-8	0.0033 [b]
Aldrin	309-00-2	0.005 [c]
alpha-BHC	319-84-6	0.02
beta-BHC	319-85-7	0.036
Chlordane (alpha)	5103-71-9	0.094

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
delta-BHC [g]	319-86-8	0.04
Dibenzofuran [f]	132-64-9	7
Dieldrin	60-57-1	0.005 [c]
Endosulfan I [d, f]	959-98-8	2.4
Endosulfan II [d, f]	33213-65-9	2.4
Endosulfan sulfate [d, f]	1031-07-8	2.4
Endrin	72-20-8	0.014
Heptachlor	76-44-8	0.042
Lindane	58-89-9	0.1
Polychlorinated biphenyls	1336-36-3	0.1
Semivolatile organic compounds		
Acenaphthene	83-32-9	20
Acenapthylene [f]	208-96-8	100 [a]
Anthracene [f]	120-12-7	100 [a]
Benz(a)anthracene [f]	56-55-3	1[c]
Benzo(a)pyrene	50-32-8	1[c]
Benzo(b)fluoranthene [f]	205-99-2	1[c]
Benzo(g,h,i)perylene [f]	191-24-2	100
Benzo(k)fluoranthene [f]	207-08-9	0.8 [c]
Chrysene [f]	218-01-9	1[c]
Dibenz(a,h)anthracene [f]	53-70-3	0.33 [b]
Fluoranthene [f]	206-44-0	100 [a]
Fluorene	86-73-7	30
Indeno(1,2,3-cd)pyrene [f]	193-39-5	0.5 [c]
m-Cresol [f]	108-39-4	0.33 [b]
Naphthalene [f]	91-20-3	12
o-Cresol [f]	95-48-7	0.33 [b]

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
p-Cresol [f]	106-44-5	0.33 [b]
Pentachlorophenol	87-86-5	0.8 [b]
Phenanthrene [f]	85-01-8	100
Phenol	108-95-2	0.33 [b]
Pyrene [f]	129-00-0	100
Volatile organic compounds		
1,1,1-Trichloroethane [f]	71-55-6	0.68
1,1-Dichloroethane [f]	75-34-3	0.27
1,1-Dichloroethene [f]	75-35-4	0.33
1,2-Dichlorobenzene [f]	95-50-1	1.1
1,2-Dichloroethane	107-06-2	0.02 [c]
cis -1,2-Dichloroethene [f]	156-59-2	0.25
trans-1,2-Dichloroethene [f]	156-60-5	0.19
1,3-Dichlorobenzene [f]	541-73-1	2.4
1,4-Dichlorobenzene	106-46-7	1.8
1,4-Dioxane	123-91-1	0.1 [b]
Acetone	67-64-1	0.05
Benzene	71-43-2	0.06
n-Butylbenzene [f]	104-51-8	12
Carbon tetrachloride [f]	56-23-5	0.76
Chlorobenzene	108-90-7	1.1
Chloroform	67-66-3	0.37
Ethylbenzene [f]	100-41-4	1
Hexachlorobenzene [f]	118-74-1	0.33[b]
Methyl ethyl ketone	78-93-3	0.12
Methyl tert-butyl ether [f]	1634-04-4	0.93
Methylene chloride	75-09-2	0.05

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
n - Propylbenzene [f]	103-65-1	3.9
sec-Butylbenzene [f]	135-98-8	11
tert-Butylbenzene [f]	98-06-6	5.9
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.7
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene [f]	95-63-6	3.6
1,3,5-Trimethylbenzene[f]	108-67-8	8.4
Vinyl chloride[f]	75-01-4	0.02
Xylene (mixed)	1330-20-7	0.26

All soil cleanup objectives (SCOs) are in parts per million (ppm).

Footnotes

[a] The SCOs for unrestricted use were capped at a maximum value of 100 ppm. See Technical Support Document (TSD), section 9.3.

[b] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.

[c] For constituents where the calculated SCO was lower than the rural soil background concentration, as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.

[d] SCO is the sum of endosulfan I, endosulfan II and endosulfan sulfate.

[e] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[f] Protection of ecological resources SCOs were not developed for contaminants identified in Table 375-6.8(b) with "NS". Where such contaminants appear in Table 375-6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources SCO according to the TSD.

(b) Restricted use soil cleanup objectives.

>2' 0-2'

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent [h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'- DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).

Footnotes

[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b] The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d] The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g] This SCO is derived from data on mixed isomers of BHC.

[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

375-6.9 Development or modification of soil cleanup objectives.

(a) Applicability. This section identifies when and the procedures under which a contaminant-specific soil cleanup objective may be developed or modified.

(1) Soil cleanup objectives for contaminants not included in Tables 375-6.8(a) and (b) may be developed by the remedial party or required by the Department.

(2) Soil cleanup objectives for contaminants included in Tables 375-6.8(a) and (b), may be modified based on site-specific data if desired by the remedial party; as set forth in:

(i) subpart 375-3 for Tracks 3 or 4, as set forth in paragraphs 375-3.8(e)(3) or (4), respectively; or

(ii) subparts 375-2 and 375-4, as set forth in subparagraph 375-2.8(b)(1)(iii) and subparagraph 375-4.8(c)(1)(iii).

(3) Protection of ecological resources soil cleanup objectives were not developed for certain contaminants, which are identified in Table 375-6.8(b) as "NS". Where such contaminants:

(i) appear in Table 375-6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources soil cleanup objective for the contaminant for use in Track 1 and apply such soil cleanup objective where it is lower than the soil cleanup objective set forth in Table 375-6.8(a); or

(ii) are identified as impacting or threatening an ecological resource for a restricted use remedial program the Department may require a protection of ecological resources soil cleanup objective be developed.

(b) New soil cleanup objectives must:

(1) Be developed utilizing the same methodologies that were used by the Department to develop the respective soil cleanup objective, as provided in the Technical Support Document.

(2) Apply the following caps, as set forth in section 9.3 of the Technical Support Document, on any soil cleanup objective included in Tables 375-6.8(a) and (b), with the exception of metals, as set forth in paragraph (3) below, developed for:

(i) unrestricted use, residential use, restricted-residential use and the protection of ecological resources, a maximum value of 100 ppm;

(ii) commercial use, a maximum value of 500 ppm; and

(iii) industrial use and the protection of groundwater a maximum value of 1000 ppm, and

(3) Apply a cap for metals at a maximum value of 10,000 ppm.

(c) Development of unrestricted use soil cleanup objectives. The unrestricted use soil cleanup objective for a compound will be the lowest of the soil cleanup values, calculated as set forth in appendix E of the Technical Support Document, for the protection of groundwater, protection of ecological resources and protection of public health.

(d) Development of restricted use soil cleanup objectives. The protection of:

(1) Groundwater soil cleanup objective will be the values calculated for the protection of groundwater as set forth in appendix E of the Technical Support Document;

(2) Ecological resources soil cleanup objectives will be the values calculated for the protection of ecological resources as set forth in appendix E of the Technical Support Document; and

(3) Public health cleanup objective will be the values calculated for the protection of public health for the identified use of the site, as set forth in appendix E of the Technical Support Document.

(e) Modification of soil cleanup objectives. The contaminant-specific soil cleanup objectives set forth at Tables 675-6.8(a) and (b)[1] may be modified by site specific data as set forth in this subdivision.

---

[1] Original should read "Tables 375-6.8(a) and (b)"

(1) Contaminant-specific soil cleanup objectives modified in accordance with this subdivision may be utilized by the remedial party for a site remedial program undertaken pursuant to:

(i) subpart 375-3 in Tracks 3 or 4, as set forth in paragraphs 375-3.8(e)(3) or (4), respectively; or

(ii) subparts 375-2 and 375-4, as set forth in subparagraph 375-2.8(b)(1)(ii) and subparagraph 375-4.8(c)(1)(ii).

(2) For the calculation of a protection of groundwater or ecological resources contaminant -specific soil cleanup objective, the site-specific percentage of total organic carbon in the soil at the site may be substituted in the algorithms provided in appendix E of the Technical Support Document.

(3) For the calculation of a protection of public health contaminant-specific soil cleanup objective, site-specific data may be used to modify two of the five exposure pathways, as follows:

(i) for the particulate inhalation pathway six parameters rely on site-specific data; and

(ii) for the volatile inhalation pathway, four parameters rely on site-specific data.

(4) The algorithms to be used for each protection of public health pathway and details on the parameters which can be substituted are included in appendix E of the Technical Support Document.

(f) Use of soil cleanup objectives developed or modified. Once approved by the Department, contaminant-specific soil cleanup objectives developed or modified as set forth in this section may be utilized by the Department at other sites consistent with paragraphs (1) and (2) below.

(1) Contaminant-specific soil cleanup objectives developed for contaminants not included in Tables 375-6.8(a) and (b), as set forth in subdivision 375-6.9(b) above, will be used as guidance and shall be considered by the Department for inclusion in the Tables in this subpart during any subsequent reevaluation of the soil cleanup objectives, as set forth by ECL 27-1415.

(2) Contaminant-specific soil cleanup objectives modified for site specific parameters, as set forth in subdivision 375-6.9(e) above, may be utilized at sites manifesting similar parameters, if approved by the Department.

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50° C (14 to 122° F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

HEALTH & SAFETY PLAN

Tetra Tech
Site Health and Safety Plan
Project Name: Cooper Crouse-Hinds Landfill
Syracuse, NY
Project # 117-2202046

Prepared for:
Cooper Industries
600 Travis, Suite 5600
Houston, TX 77210

Prepared by:

Tetra Tech
175 N. Corporate Drive, #100
Brookfield, WI 53045

September, 2013

TT PROJECT NO. 117-2202046
DATE 09-25-2013

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1.0 INTRODUCTION

A. GENERAL INFORMATION

Site:	North & South Crouse-Hinds Landfills	Project No.	117-2202046
Location/Address:	7th North Street at Wolf Street, Syracuse, NY		
Plan Prepared By:	Daniel Morgan	Date:	09-25-2013
Hazard Assessment Certification:*		Date:	
* This certifies that Tetra Tech has assessed the type, risk level and severity of hazards for this project and has selected appropriate personal protective equipment for site personnel in accordance with OSHA Standard 29CFR1910.132.			
Reviewed by:	Michael Noel	Date:	09-26-2013
Proposed Dates of Work:	10-21-2013 through 12-21-2013		
Owner/Operator Maintains a Site Health and Safety Plan: Yes ___ No _X_ (If yes, attach)			

B. PERSONNEL/RESPONSIBILITIES

Key Personnel		Title/Responsibilities		Signature
Mike Noel		Project Manager		
Dan Morgan		Project Engineer		
Drew Lent* **		Site Manager/ H&S Officer		

* Designated Site Safety Coordinator
** Designated Site Supervisor

C. PROJECT TASKS/ACTIVITIES

1.	Soil excavation & hauling	5.	
2.	Soil sampling	6.	
3.		7.	
4.		8.	

2.0 SITE AND HAZARD CHARACTERISTICS

A. FACILITY DESCRIPTION

(Attach map/sketch; include topography and prevailing winds):

Former landfill located north and south of 7th North Street adjacent to Cooper plant in Syracuse NY. Both landfills are adjacent to Ley Creek, standing water often present

North Landfill is 21.5 acres in size, the South Landfill is 19.4 acres in size.

B. SITE ACCESS AND SECURITY

Both landfills are fenced with locked, gated access and signs posted. Gravel driveways at the gates give way to two-track trails from former vehicle traffic. CC-H Security personnel monitor activities at both landfills.

C. UNUSUAL FEATURES

(accessibility, power lines, terrain, etc.):

Care must be taken with vehicles due to water and flooding. Wetlands, drainage swales, ditches, and creeks may cause vehicles to become stuck. Power lines and railroad tracks are evident along the landfill boundaries.

D. STATUS

(active, inactive, unknown):. Both landfills have been inactive for at least 20 years.

E. SUSPECTED NATURE OF CONTAMINATION

(Sources, impacted areas, migration, dispersion pathways)

Source of contamination is predominantly solid wastes (South Landfill) and foundry sand (North Landfill), primarily in top 10 feet. Metals, PCBs, petroleum residues, and spent solvents are present. All solids and liquids should be assumed to be contaminated. Wetlands Sediments are contaminated with PCBs.

F. DESCRIPTION OF ADJOINING PROPERTIES AND SURROUNDING AREA

The landfills are surrounded by other landfills, industrial sites, Ley Creek and CSX Railroad.

G. WASTE CHARACTERISTICS

Hazard Form(s):	Liquid	__X_	Solid	_X_	Sludge	__X_	Gas	__X_
Characteristic(s):	Corrosive	__X_	Ignitable	__X_	Radioactive	_____		
	Volatile	_X_	Toxic	_X_	Reactive	_X_	Other	_____

H. SITE HAZARD INFORMATION

Physical and Safety Hazards:

Heat in summer_X__ Cold in winter_X__ Noise __X__ Vehicles ___X___

Heavy Lifting _____ Slippery/Wet Surfaces __X__

Buried/Overhead Utilities __X__ Motors/Belts/Pulleys _____

Heavy/Large Equipment __X__ Elevated Surfaces _____

Hot Surfaces _____ Electrical Equipment _____

Power Tools ____ Poisonous Insects/Plants/Animals __X__

Other Hazards (Specify): Dust

Major Chemical Hazards:

(**NOTE**: Attach material safety data sheets for chemicals brought onto the site)

COMPOUND/DESCRIPTION*		EXPOSURE LIMIT/IDLH**		EXPOSURE ROUTE(S)***		HEALTH EFFECTS
Cutting Oil		See MSDS		Inh, Ing, Abs, Con		See MSDS
PCBs		See MSDS		Inh, Ing, Abs, Con		See MSDS
Ethylbenzene		See MSDS		Inh, Ing, Abs, Con		See MSDS
Methylene Chloride		See MSDS		Inh, Ing, Abs, Con		See MSDS

* Provide physical state and appearance
** Provide OSHA PEL and/or ACGIH TLV. Indicate Immediately Dangerous to Life and Health Concentration (IDLH)
*** Inh = Inhalation; Ing = Ingestion; Abs = Skin absorption; Con = Skin and/or Eye contact
Note: ppm = parts per million; mg/M3 = milligrams per cubic meter

3.0 SITE SAFETY AND HEALTH CHARACTERIZATION

TASK/ACTIVITY

Soil Excavation and Hauling

Soil Sampling

A. HAZARD/RISK EVALUATION

(Note: Standard operating procedures are included as an attachment to this plan)

Task Hazards (List)	Risks From Hazards	Control Methods
Contact with soils and water	Contamination	Gloves and PPE
Rig/Equipment Noise	Hearing Loss	Hearing Protection PPE
Moving Machinery	Entanglement	Safe Distance
Contaminant Vapors	Inhalation	PID Monitoring - Evacuation
Wet Surfaces	Slips and Falls	Verify Stable Work Surface
Dust	Inhalation	Spray water and PPE

B. PERSONAL PROTECTION

(Indicate Initial and Upgrade)

Level of Protection for Task: A _____ B _____ C _____ D initial

(NO UPGRADE INTENDED)

Specific Protective Equipment Types and Materials:

NOTE: *A Respiratory Hazard Assessment (Form RP-2) must be completed for all tasks which may require use of a respirator including disposable dust masks. Attach the completed Form RP-2 to this HASP for documentation of the assessment.*

Respirator: Respirators will not be required. PID will be used to monitor work area, and work area will be vacated until gasses disperse.

Protective Clothing: Long pants and long sleeved shirts.

Hand and Foot Protection: Gloves and steel toe boots

Eye and Head Protection: Safety glasses and hard hats

Hearing Protection: Ear plugs or ear muffs if equipment noise is excessive.

Other: Wear gloves to protect against any contact with soil or water on site.

C. AREA/PERSONNEL MONITORING REQUIREMENTS

Vapors/Gases:

Instruments: PID for monitoring vapors in work area. Dust meter for monitoring work area

Monitoring Location and Frequency: Full time while working on site

Calibration Procedures: Daily using isobutylene for PID

Action Levels for Upgrades: No upgrades – work will stop until vapor concentrations are below Action Levels.

Aerosols/Dusts: No upgrades – Work is being performed in wet soil area. Any dust will be controlled with spraying using on site water.

Flammable Atmospheres/Other (Specify): N/A – No flammable substances present – work is outside any buildings.

4.0 GENERAL SITE REQUIREMENTS

A. FIT TESTING REQUIREMENTS

Not applicable to this site – respirators will not be used.

B. MEDICAL MONITORING REQUIREMENTS

All personnel (including visitors) entering the landfills must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f). Documentation of medical monitoring is the responsibility of each employer.

C. ADDITIONAL MEDICAL MONITORING REQUIRED

(specific to site): NONE.

D. TRAINING REQUIREMENTS

All personnel (including visitors) entering the landfills must have completed training for hazardous waste site work in accordance with OSHA 29 CFR 1910.120, or be qualified by previous training or experience.

E. SPECIAL PROCEDURES OR TASKS

(Attach Appropriate Safe Work Practices)

Confined Space Entry ___ Excavation _X_ Hot Work ___ Electrical Work

NOTE: Excavations are in unpredictable, saturated soils and waste.

HUMAN ENTRY INTO ANY EXCAVATION IS PROHIBITED.

F. SITE RESOURCES

(Location and type)

Water Supply: None on site, available at nearby CC-H plant

Telephone: None on site, use cell phones, landline available at nearby CC-H plant

Bathroom: None on site, use nearby CC-H plant, excavation contractor may provide portable toilet during excavation

Electricity: None on site

Fire Extinguisher: None on site, if contractor does not have on rig/equipment, purchase locally or obtain from CC-H plant

First Aid Supplies: None on site, bring with field equipment

Other:_____

5.0 CONTAMINATION CONTROL

A. WORK ZONE DATA

(Attach map or figures of exclusion zone and decontamination area)

Zone of contamination/exclusion zone: At North landfill, areas for excavations are shown on drawings.

Decontamination zone/area: Equipment decon will take place at location of excavation work. Vehicle/Trailer tire decon will take at decon pads located at site access gate.

B. DECONTAMINATION EQUIPMENT & SUPPLIES

Excavation contractor to furnish drums for spent decon materials and PPE. TSP or Alconox plus potable water from CC-H plant to be used to decon sampling equipment. All vehicle/trailer tires checked before leaving site and spray washed if needed at access gate decon pad.

C. DECONTAMINATION PROCEDURES

(Attach additional procedures, information, if necessary)

Personnel: Dispose of gloves as needed. Remove mud and soils from boots before leaving site.

Equipment: Use decon pad to clean equipment.

Vehicles: Spray wash tires at decon pad at property access gate

D. WASTE DISPOSAL PROCEDURES

Fluids: Transport drums to CC-H plant for liquid disposal through CC-H WWTP.

Solids: Remove trash drum to CC-H plant for disposal in dumpster. Soils and mud to remain on site.

6.0 EMERGENCY RESPONSE PLAN

A. LOCAL RESOURCES

(Names & Phone Numbers)

Ambulance: Call 911

Hospital Emergency Room: St. Joseph's Hospital 315-448-5111

Hospital address is 301 Prospect Avenue, Syracuse, NY 13203, 2.5 miles from the site.

Poison Control Center: Upstate NY – Syracuse 315-464-7078

Police: 911

Fire Department: 911

National Response Center: 1-800-424-8802

State Contact: NYSDEC Spill Hotline 1-800-457-7362

Other:_____

B. PERSONNEL/ROLES

Designated First Aid/CPR On-Site Provider: Assign on site daily

Designated Emergency Coordinator: The on-site Health & Safety (H&S) Officer has primary responsibility for responding to and correcting emergency situations. All responses will be coordinated with the CC-H facility representative. The individual contractor organizations are responsible for assisting the on-site H&S Officer in his/her mission within the parameters of their scope of work.

C. EMERGENCY CONTACTS/PHONE NUMBERS

1. Project Manager Mike Noel 1-262-792-1282 (office) 1-262-853-4983 (cell)
2. Corporate Health and Safety Michelle Gillie 1-610-337-7660
3. Contractor(s) To be determined
4. _____
5. _____

D. EMERGENCY ROUTES

(give road or other directions; attach map with route highlighted)

Hospital: See attached map

1. Leave site by access gates only, wet conditions do not permit alternates
2. _____
3. _____
4. _____
5. _____

Evacuation Routes/Safe Locations: Review at daily safety meeting on site as evacuation route will depend on work location.

E. SITE COMMUNICATIONS

Emergency Signal (horns, alarms, vocal, etc.): Assign at on-site safety meeting.

Pre-Emergency: A pre-work meeting will be held to discuss the content of this plan, specific site requirements, and responsibilities.

Daily Tail-Gate: Each working day a tail-gate meeting will be held at the start of the work day to review any health and safety questions, to discuss the upcoming day's work, and highlight any particular hazards for that day's work. Immediately after the tail-gate meeting,

the work area for the day will be policed by the crew with all obstacles (protruding steel rebar, concrete chunks, metal debris, tree stumps, etc.) that might endanger workers or equipment being flagged, painted, or staked to provide a warning. A daily log form of the meeting and work area walk will be completed by the on-site Health & Safety Officer.

F. REPORTING PROCEDURES

1. Alert on-site personnel of emergency and response procedures. Move to safe area via evacuation route.
2. Arrange for appropriate emergency response services (fire department, ambulance, police, etc.)
3. Call office and notify of Project Manager of incident and planned response.
4. Contact the offices of any on-site subcontractors if their personnel or equipment are involved in the emergency.

G. EMERGENCY RESPONSE PROCEDURES

Fire: Stop work, shut off equipment, and evacuate to safe distance upwind of fire (company vehicle should be kept at a reasonable distance from work area to prevent endangerment from fire). Contact fire department, notify CC-H site contact, then Tetra Tech office. Keep at a safe distance until emergency services arrive. *Do Not Attempt To Fight Fires Beyond Incipient Fires!! Do Not Attempt to Approach Fires With the Potential for Release of Hazardous Combustion Products!!*

Injury/Illness: Perform first aid, following appropriate blood borne pathogens precautions. Call emergency medical services if injury is serious. Do not unnecessarily move if broken bones are suspected, unless life is endangered. If person is safe to move (minor cuts, burns, etc.), transport the person to designated hospital. If serious, arrange for rescue squad/ambulance

Over-exposure: Remove employee (only if there is no danger to rescue) from exposure source to a safe location. For skin contact, remove affected clothing and flush the area with water. For inhalation, remove to fresh air. Provide artificial respiration, if necessary. Contact rescue squad/ambulance as necessary. Do not continue work until the source of contamination is found, identified, and controlled. Contact the office for technical assistance.

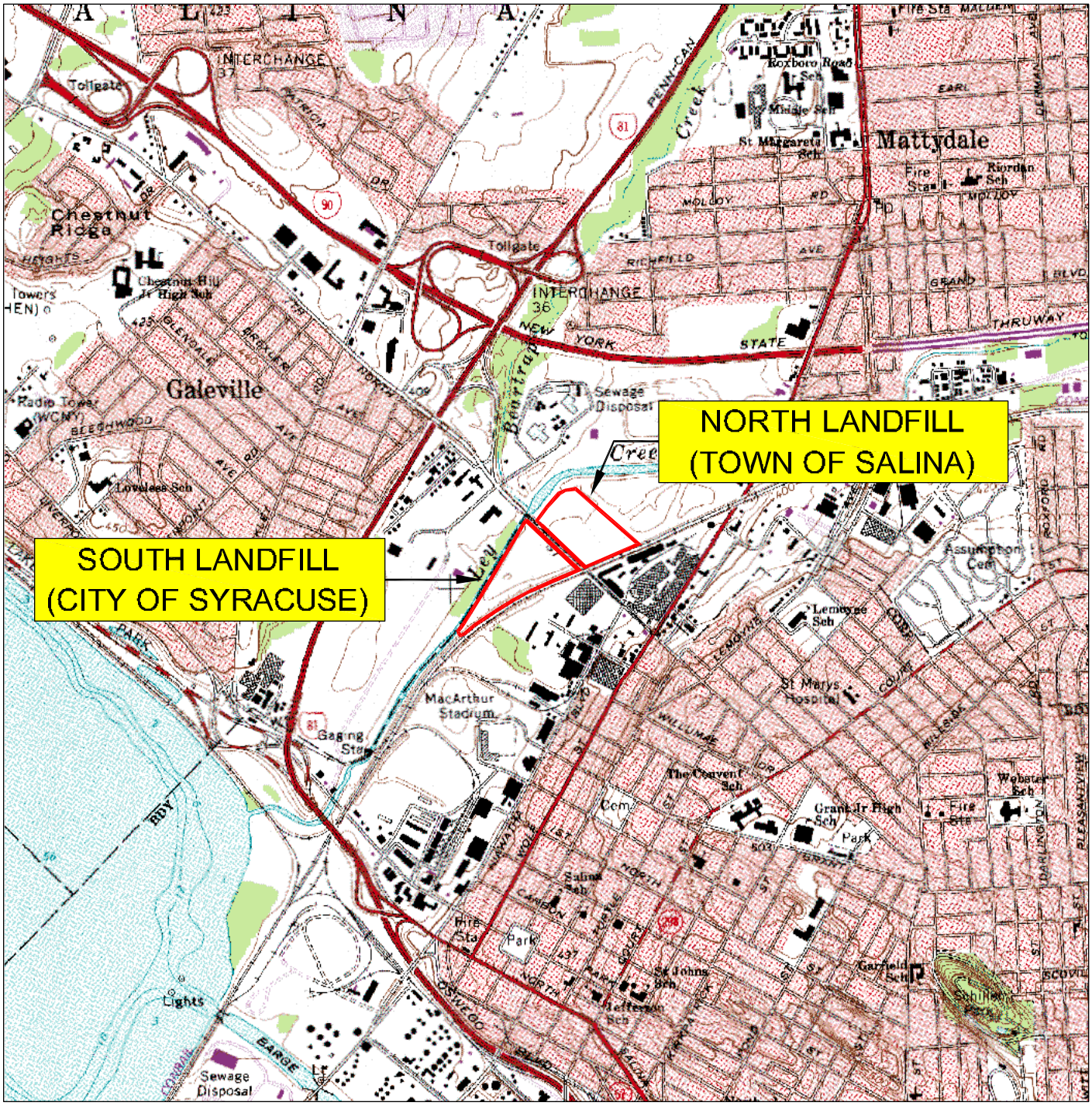
Hazardous Materials

Accident: Stop equipment and work and relocate to a safe distance. To the extent possible, determine nature of incident (utility, gas, pipe, etc.). Contact office for instructions. Do not attempt equipment backout from utility strike without guidance of utility company.

NOTE: All emergency situations must be reported to the office and require a follow-up accident or near-miss investigation report.

HASP ATTACHMENTS

HASP FIGURES



National Geodetic Vertical Datum of 1929
Contour Interval 10 Feet

SCALE
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QUADRANGLE LOCATION

N

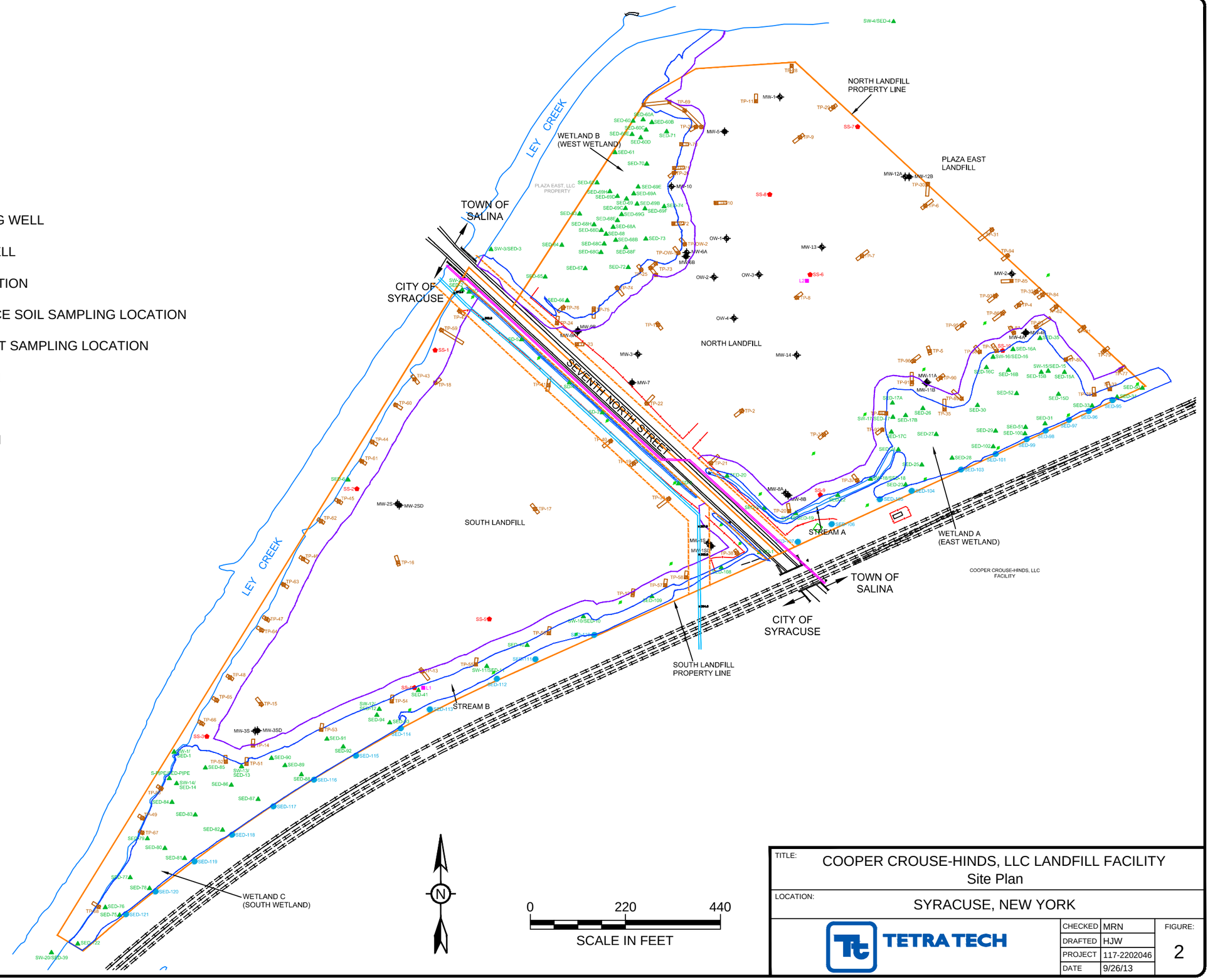
COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SYRACUSE, NEW YORK	DATE: 8/1/12
	DESIGNED: HJW
	CHECKED: MRN
Site Location Map	APPROVED: MRN
	DRAWN: HJW
	PROJ.: 117-2202046
TETRA TECH	Figure 1

Base map from U.S.G.S. 7.5' SYRACUSE WEST, NEW YORK topographic quadrangle map.

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG1 - SITE LOCATION MAP.DWG

EXPLANATION

MW-3S	SHALLOW AQUIFER MONITORING WELL
MW-3SD	DEEP AQUIFER MONITORING WELL
SS-1	SURFACE SOIL SAMPLING LOCATION
SED-95	SURFACE SOIL AND SUBSURFACE SOIL SAMPLING LOCATION
SW-1/SED-1	SURFACE WATER AND SEDIMENT SAMPLING LOCATION
SED-27	SEDIMENT SAMPLING LOCATION
TP-48	TEST PIT LOCATION
L1	LEACHATE SAMPLING LOCATION
	WETLAND BOUNDARY
	LEY CREEK / WETLAND BUFFER
	PROPERTY BOUNDARY
	EASEMENT
	WATER MAIN
	GAS MAIN
	EXISTING CHAIN LINK FENCE
	ELECTRIC UTILITY POLE

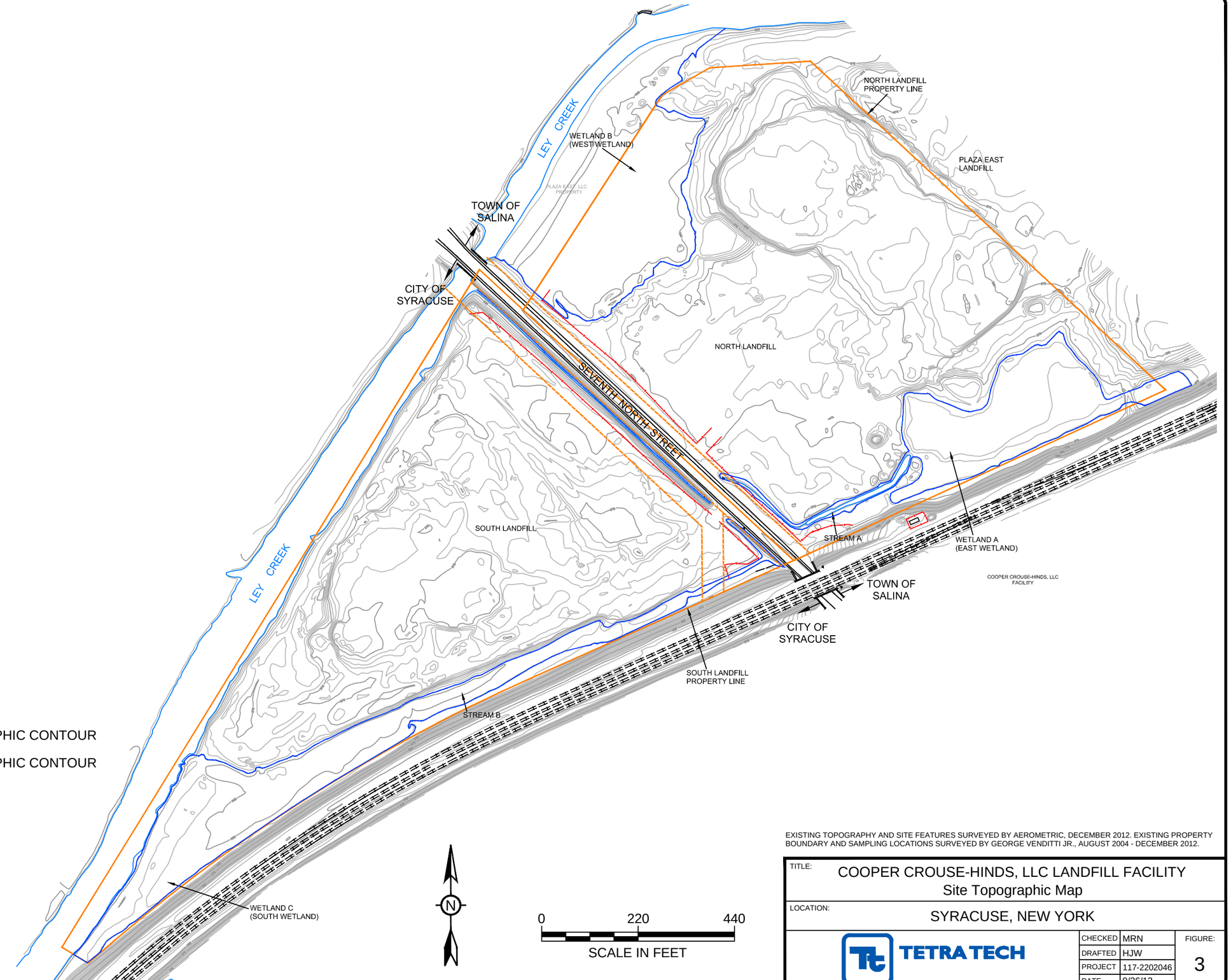


TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY Site Plan
LOCATION:	SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	2
PROJECT	117-2202046	
DATE	9/26/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG2 - SITE PLAN.DWG



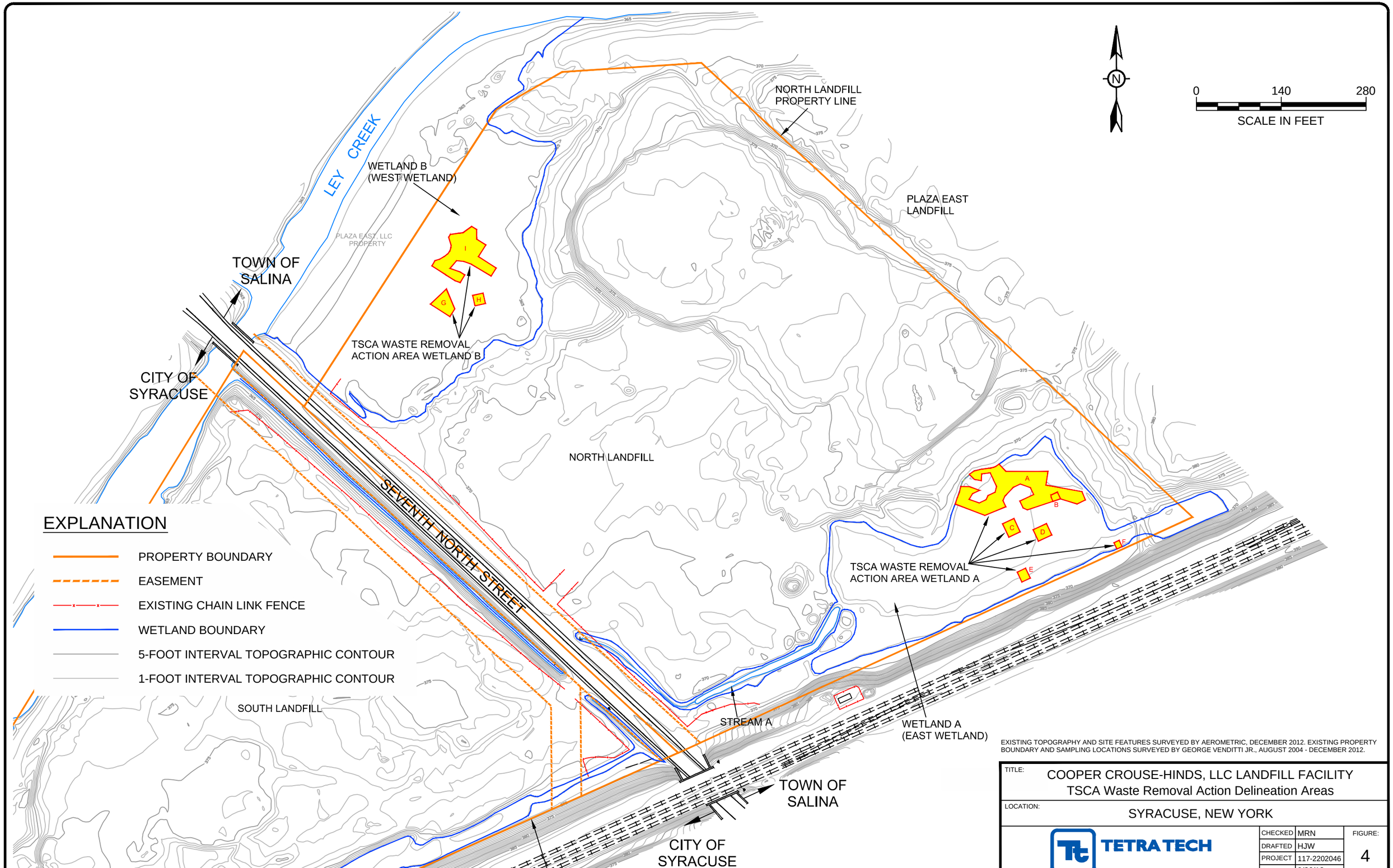
EXPLANATION

- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE
- WETLAND BOUNDARY
- 5-FOOT INTERVAL TOPOGRAPHIC CONTOUR
- 1-FOOT INTERVAL TOPOGRAPHIC CONTOUR

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY Site Topographic Map			
LOCATION: SYRACUSE, NEW YORK			
TETRA TECH	CHECKED	MRN	FIGURE:
	DRAFTED	HJW	3
	PROJECT	117-2202046	
	DATE	9/26/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG3 - SITE TOPOGRAPHIC MAP.DWG



EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY TSCA Waste Removal Action Delineation Areas
LOCATION:	SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	4
PROJECT	117-2202046	
DATE	9/26/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG4 - TSCA WASTE DELINEATION AREAS.DWG

EXPLANATION

- EXCAVATED SOILS TO BE TRANSPORTED OFF-SITE (PCB CONCENTRATIONS EXCEED 50 mg/Kg)
- NOVEMBER 2012 HOT SPOT EXCAVATION
- SED-41 — SEDIMENT SAMPLING LOCATION AND DESIGNATION
- WETLAND BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE
- ELECTRIC UTILITY POLE
- WA-33 — ADDITIONAL SAMPLING LOCATION
- 28 — ORIGINAL SAMPLE CONCENTRATION
- 16 — ADDITIONAL SAMPLE CONCENTRATION

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SCALE IN FEET

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
Wetland A TSCA Waste Removal Action Location

LOCATION: SYRACUSE, NEW YORK

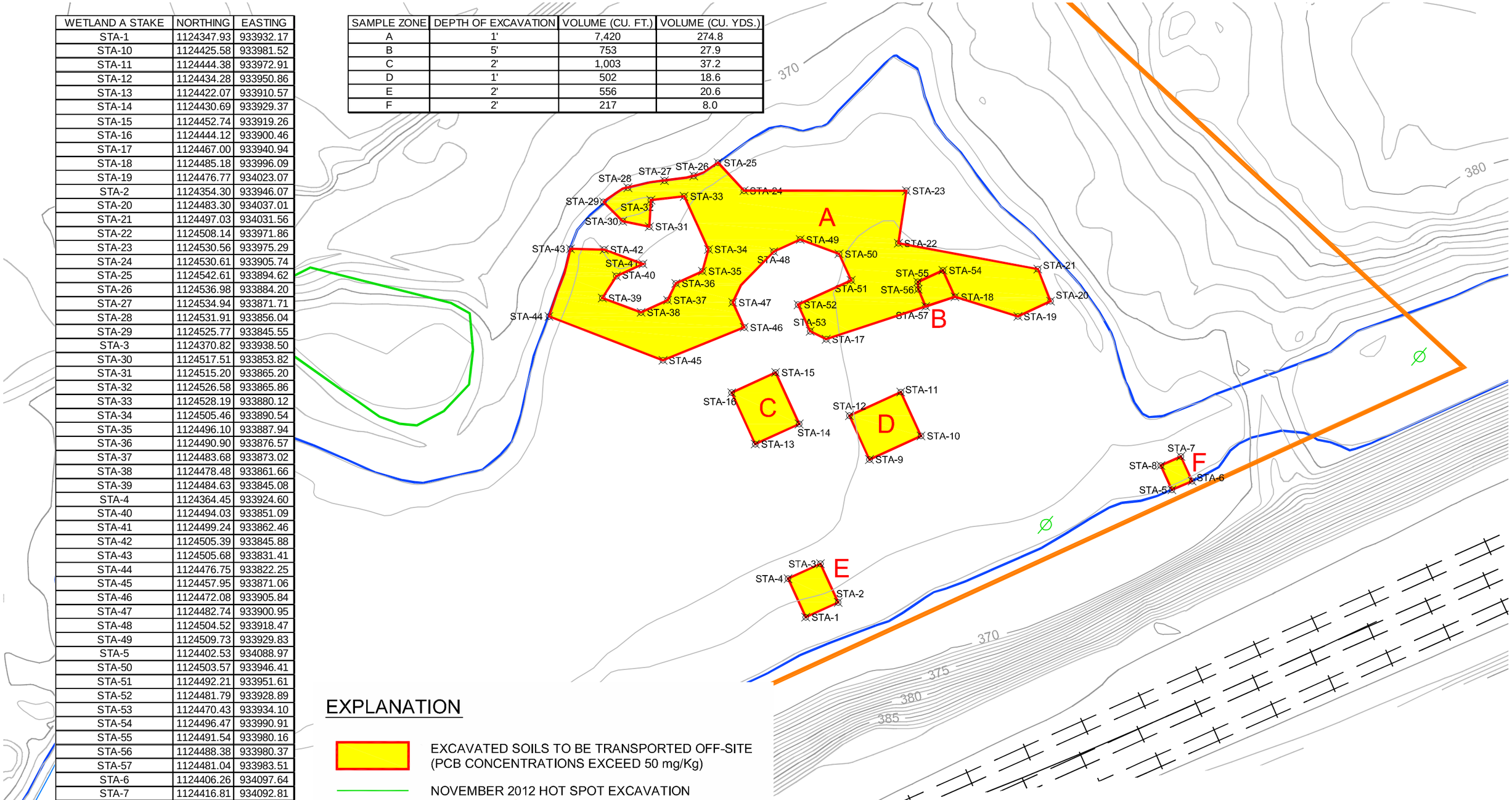
TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	5
PROJECT	117-2202046	
DATE	9/26/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG5 - WETLAND A TSCA WASTE LOCATION.DWG

WETLAND A STAKE	NORTHING	EASTING
STA-1	1124347.93	933932.17
STA-10	1124425.58	933981.52
STA-11	1124444.38	933972.91
STA-12	1124434.28	933950.86
STA-13	1124422.07	933910.57
STA-14	1124430.69	933929.37
STA-15	1124452.74	933919.26
STA-16	1124444.12	933900.46
STA-17	1124467.00	933940.94
STA-18	1124485.18	933996.09
STA-19	1124476.77	934023.07
STA-2	1124354.30	933946.07
STA-20	1124483.30	934037.01
STA-21	1124497.03	934031.56
STA-22	1124508.14	933971.86
STA-23	1124530.56	933975.29
STA-24	1124530.61	933905.74
STA-25	1124542.61	933894.62
STA-26	1124536.98	933884.20
STA-27	1124534.94	933871.71
STA-28	1124531.91	933856.04
STA-29	1124525.77	933845.55
STA-3	1124370.82	933938.50
STA-30	1124517.51	933853.82
STA-31	1124515.20	933865.20
STA-32	1124526.58	933865.86
STA-33	1124528.19	933880.12
STA-34	1124505.46	933890.54
STA-35	1124496.10	933887.94
STA-36	1124490.90	933876.57
STA-37	1124483.68	933873.02
STA-38	1124478.48	933861.66
STA-39	1124484.63	933845.08
STA-4	1124364.45	933924.60
STA-40	1124494.03	933851.09
STA-41	1124499.24	933862.46
STA-42	1124505.39	933845.88
STA-43	1124505.68	933831.41
STA-44	1124476.75	933822.25
STA-45	1124457.95	933871.06
STA-46	1124472.08	933905.84
STA-47	1124482.74	933900.95
STA-48	1124504.52	933918.47
STA-49	1124509.73	933929.83
STA-5	1124402.53	934088.97
STA-50	1124503.57	933946.41
STA-51	1124492.21	933951.61
STA-52	1124481.79	933928.89
STA-53	1124470.43	933934.10
STA-54	1124496.47	933990.91
STA-55	1124491.54	933980.16
STA-56	1124488.38	933980.37
STA-57	1124481.04	933983.51
STA-6	1124406.26	934097.64
STA-7	1124416.81	934092.81
STA-8	1124412.88	934084.23
STA-9	1124415.48	933959.48

SAMPLE ZONE	DEPTH OF EXCAVATION	VOLUME (CU. FT.)	VOLUME (CU. YDS.)
A	1'	7,420	274.8
B	5'	753	27.9
C	2'	1,003	37.2
D	1'	502	18.6
E	2'	556	20.6
F	2'	217	8.0



EXPLANATION

- EXCAVATED SOILS TO BE TRANSPORTED OFF-SITE (PCB CONCENTRATIONS EXCEED 50 mg/Kg)
- NOVEMBER 2012 HOT SPOT EXCAVATION
- WETLAND BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE
- STA-1 TSCA WASTE SURVEY STAKE

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SCALE IN FEET

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
Wetland A TSCA Waste Survey Stake Locations

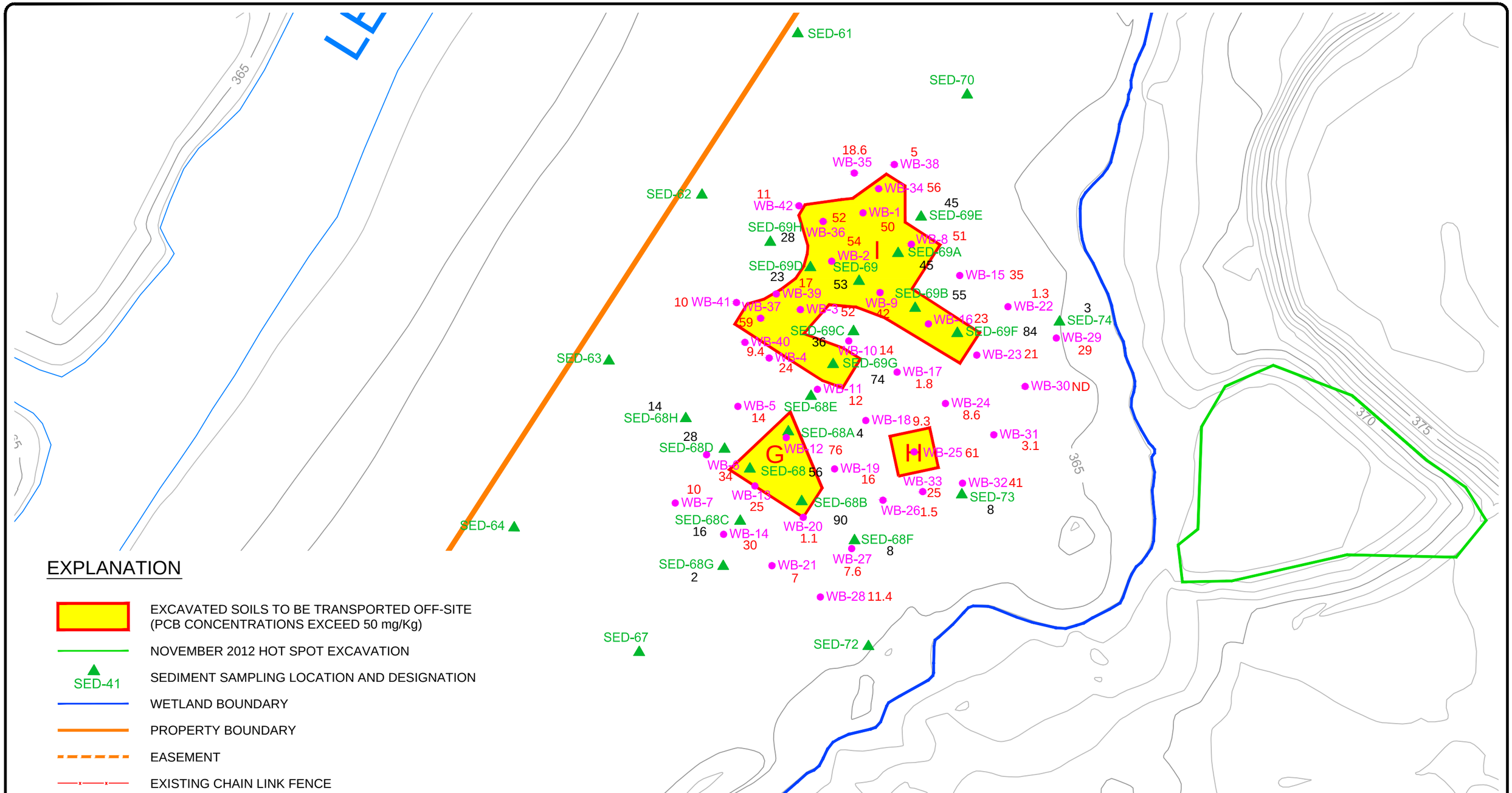
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	9/26/13

FIGURE: 5A

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG5A - WETLAND A TSCA SURVEY STAKES.DWG



EXPLANATION

- EXCAVATED SOILS TO BE TRANSPORTED OFF-SITE (PCB CONCENTRATIONS EXCEED 50 mg/Kg)
- NOVEMBER 2012 HOT SPOT EXCAVATION
- SED-41 — SEDIMENT SAMPLING LOCATION AND DESIGNATION
- WETLAND BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE
- ELECTRIC UTILITY POLE
- WB-33 — ADDITIONAL SAMPLING LOCATION
- 28 — ORIGINAL SAMPLE CONCENTRATION
- 16 — ADDITIONAL SAMPLE CONCENTRATION

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SCALE IN FEET

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY Wetland B TSCA Waste Removal Action Location
LOCATION:	SYRACUSE, NEW YORK

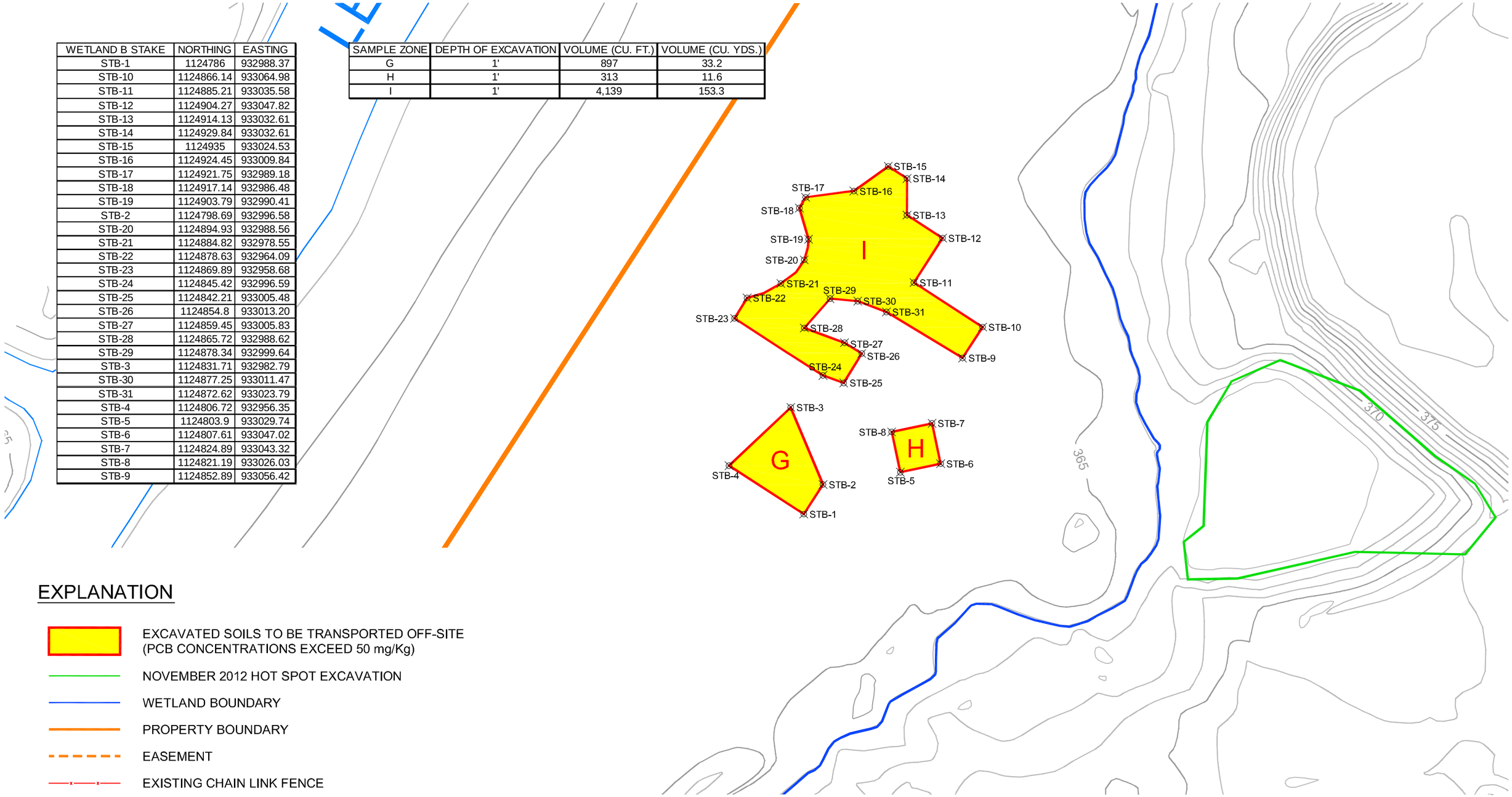
TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	6
PROJECT	117-2202046	
DATE	9/26/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG6 - WETLAND B TSCA WASTE LOCATION.DWG

WETLAND B STAKE	NORTHING	EASTING
STB-1	1124786	932988.37
STB-10	1124866.14	933064.98
STB-11	1124885.21	933035.58
STB-12	1124904.27	933047.82
STB-13	1124914.13	933032.61
STB-14	1124929.84	933032.61
STB-15	1124935	933024.53
STB-16	1124924.45	933009.84
STB-17	1124921.75	932989.18
STB-18	1124917.14	932986.48
STB-19	1124903.79	932990.41
STB-2	1124798.69	932996.58
STB-20	1124894.93	932988.56
STB-21	1124884.82	932978.55
STB-22	1124878.63	932964.09
STB-23	1124869.89	932958.68
STB-24	1124845.42	932996.59
STB-25	1124842.21	933005.48
STB-26	1124854.8	933013.20
STB-27	1124859.45	933005.83
STB-28	1124865.72	932988.62
STB-29	1124878.34	932999.64
STB-3	1124831.71	932982.79
STB-30	1124877.25	933011.47
STB-31	1124872.62	933023.79
STB-4	1124806.72	932956.35
STB-5	1124803.9	933029.74
STB-6	1124807.61	933047.02
STB-7	1124824.89	933043.32
STB-8	1124821.19	933026.03
STB-9	1124852.89	933056.42

SAMPLE ZONE	DEPTH OF EXCAVATION	VOLUME (CU. FT.)	VOLUME (CU. YDS.)
G	1'	897	33.2
H	1'	313	11.6
I	1'	4,139	153.3



EXPLANATION

- EXCAVATED SOILS TO BE TRANSPORTED OFF-SITE (PCB CONCENTRATIONS EXCEED 50 mg/Kg)
- NOVEMBER 2012 HOT SPOT EXCAVATION
- WETLAND BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE
- STB-1 TSCA WASTE SURVEY STAKE

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SCALE IN FEET

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
Wetland B TSCA Waste Survey Stake Locations

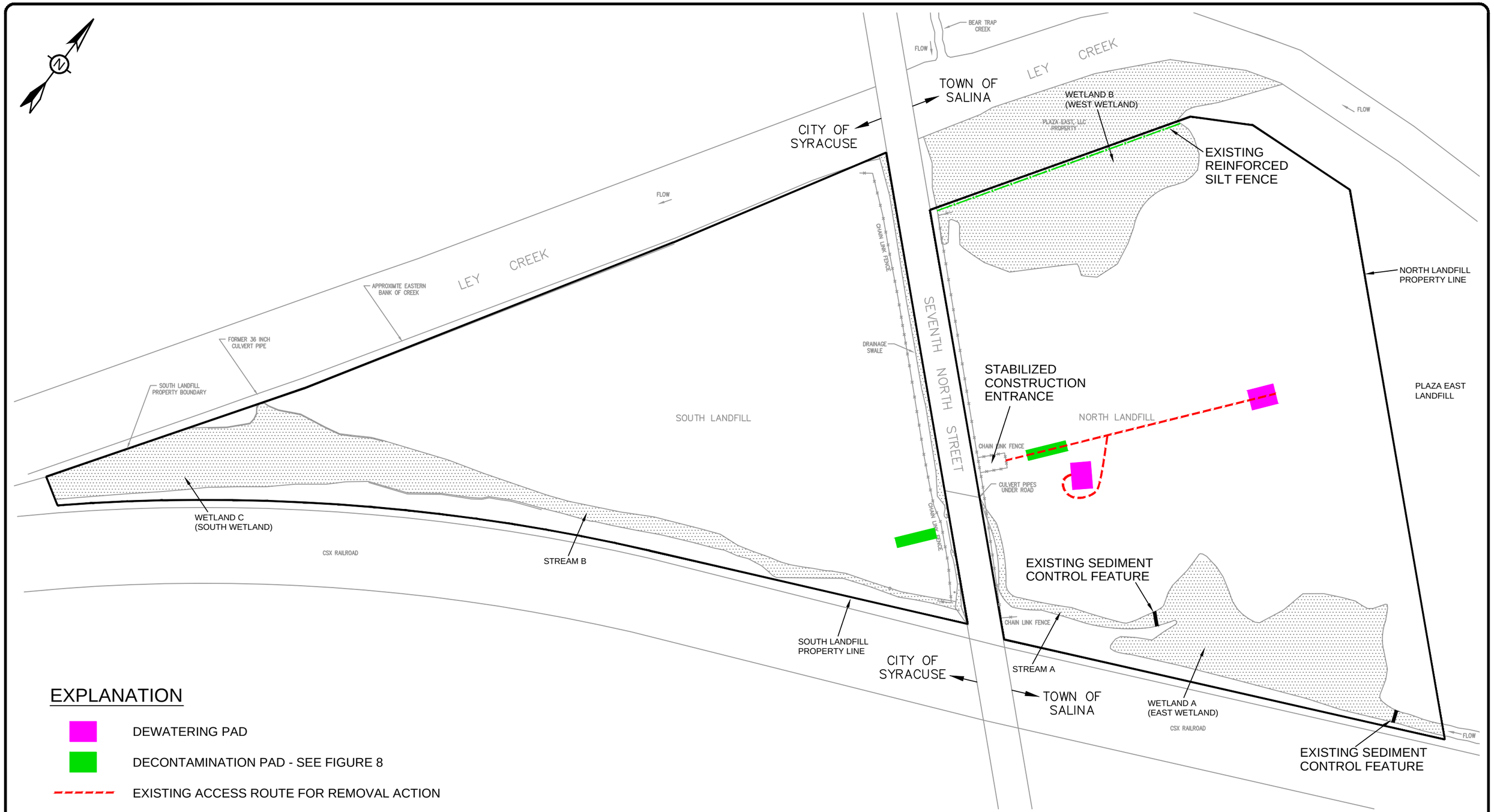
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	9/26/13

FIGURE: 6A

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG6A - WETLAND B TSCA SURVEY STAKES.DWG



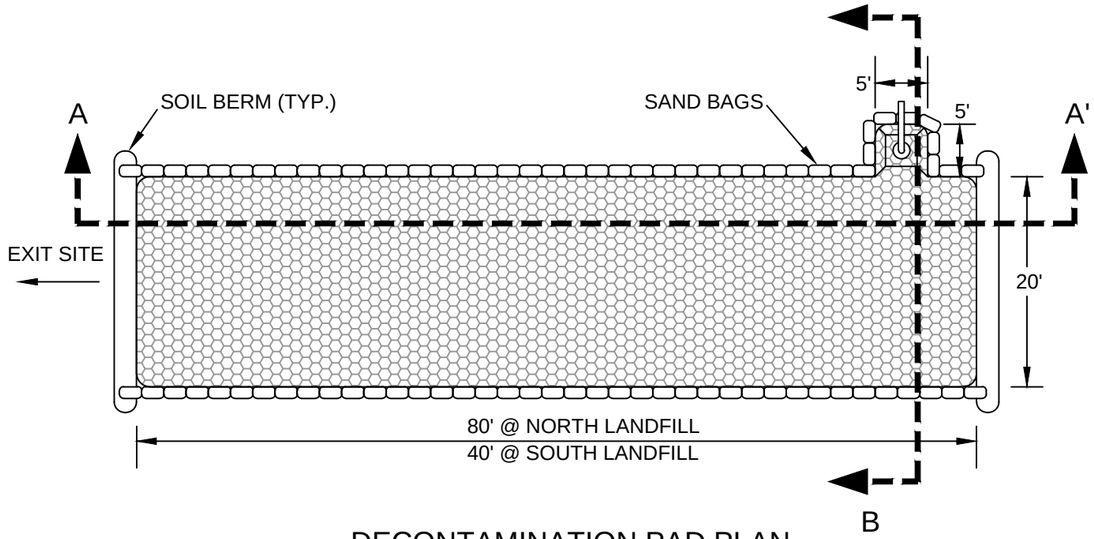
TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
Removal Action Decon and Dewatering Pad Locations

LOCATION: SYRACUSE, NEW YORK

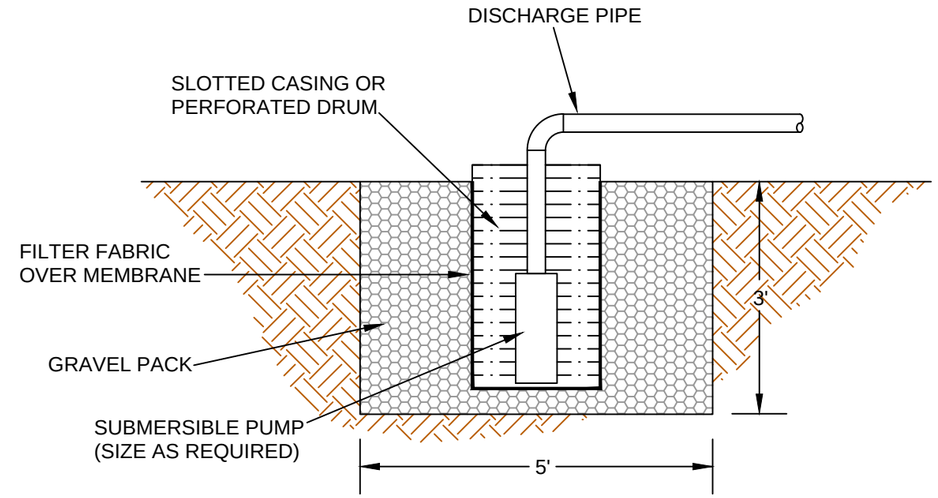
TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	7
PROJECT	117-2202046	
DATE	9/25/12	

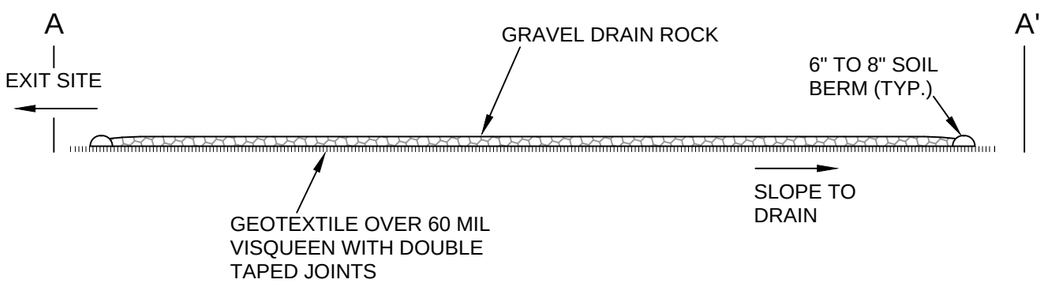
S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG7 - DECON PAD LOCATIONS.DWG



DECONTAMINATION PAD PLAN



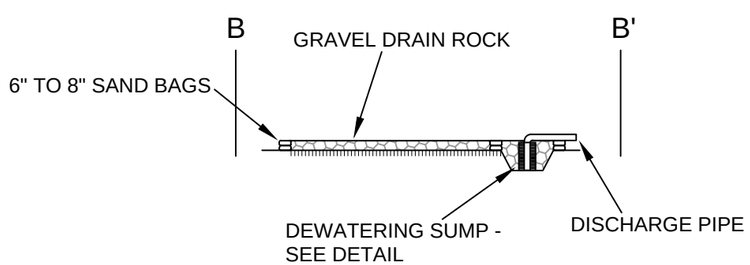
DECONTAMINATION PAD SUMP DETAIL



DECONTAMINATION PAD PROFILE

NOTES:

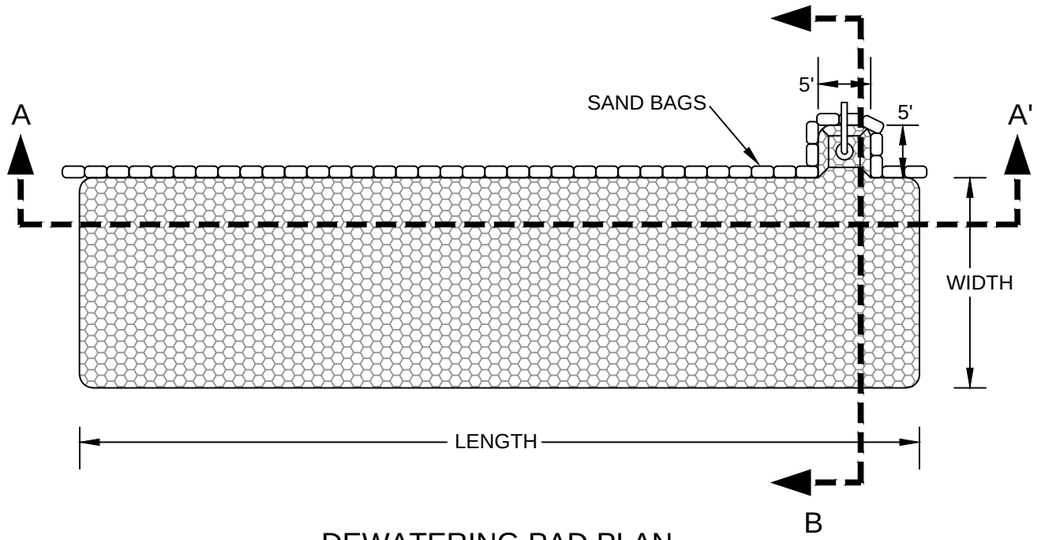
1. GRAVEL TO BE SLIGHTLY CROWNED TO ENCOURAGE SURFACE WATER RUN-OFF.
2. DECONTAMINATION PAD GRAVEL - 100% PASSING 4" SIEVE, 5% PASSING 2" SIEVE, 1% PASSING NO.4 SIEVE.
3. LOCATE SUMP AT PAD LOWEST ELEVATION.



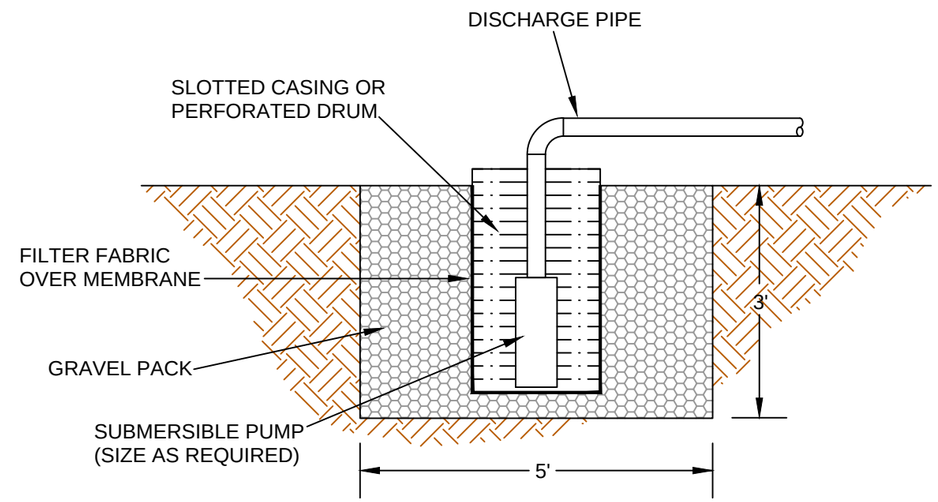
DECONTAMINATION PAD SUMP SECTION

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY Decontamination Pad Detail (as-built)			
LOCATION: SYRACUSE, NEW YORK			
TETRA TECH	CHECKED	MRN	FIGURE:
	DRAFTED	HJW	8
	PROJECT	117-2202046	
	DATE	9/25/13	

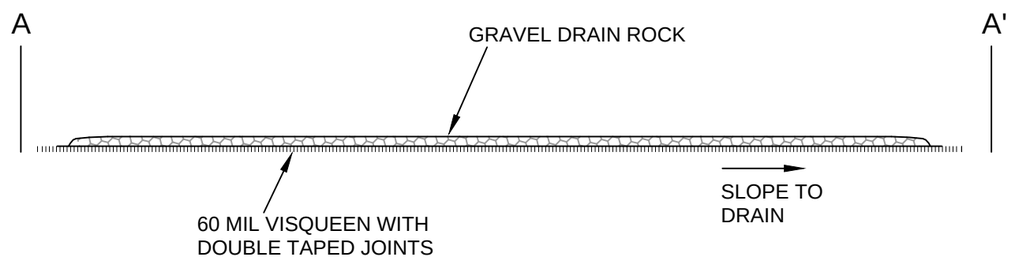
S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG8 - DECON PAD DETAILS.DWG



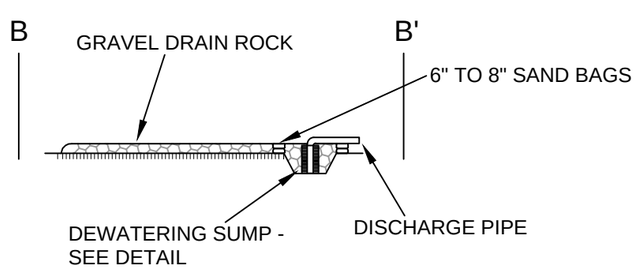
DEWATERING PAD PLAN



DEWATERING PAD SUMP DETAIL



DEWATERING PAD PROFILE



DEWATERING PAD SUMP SECTION

NOTES:

1. GRAVEL TO BE SLIGHTLY CROWNED TO ENCOURAGE SURFACE WATER RUN-OFF.
2. DECONTAMINATION PAD GRAVEL - 100% PASSING 4" SIEVE, 5% PASSING 2" SIEVE, 1% PASSING NO.4 SIEVE.
3. LOCATE SUMP AT PAD LOWEST ELEVATION.
4. USE SANDBAGS IF NECESSARY TO DIRECT FLOW.
5. ADJUST LENGTH AND WIDTH TO SUIT EXCAVATION SIZE AND EQUIPMENT REACH.

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY Dewatering Pad Detail (as-built)			
LOCATION: SYRACUSE, NEW YORK			
TETRA TECH	CHECKED	MRN	FIGURE:
	DRAFTED	HJW	9
	PROJECT	117-2202046	
	DATE	9/25/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\TSCA\WORK PLAN\FIG9 - DEWATERING PAD DETAILS.DWG

bing Maps

A **101 7th North St, Liverpool, NY 13088**

Via: US-11 / Wolf St

B **301 Prospect Ave, Syracuse, NY 13203**

Route: **2.9 mi, 9 min**

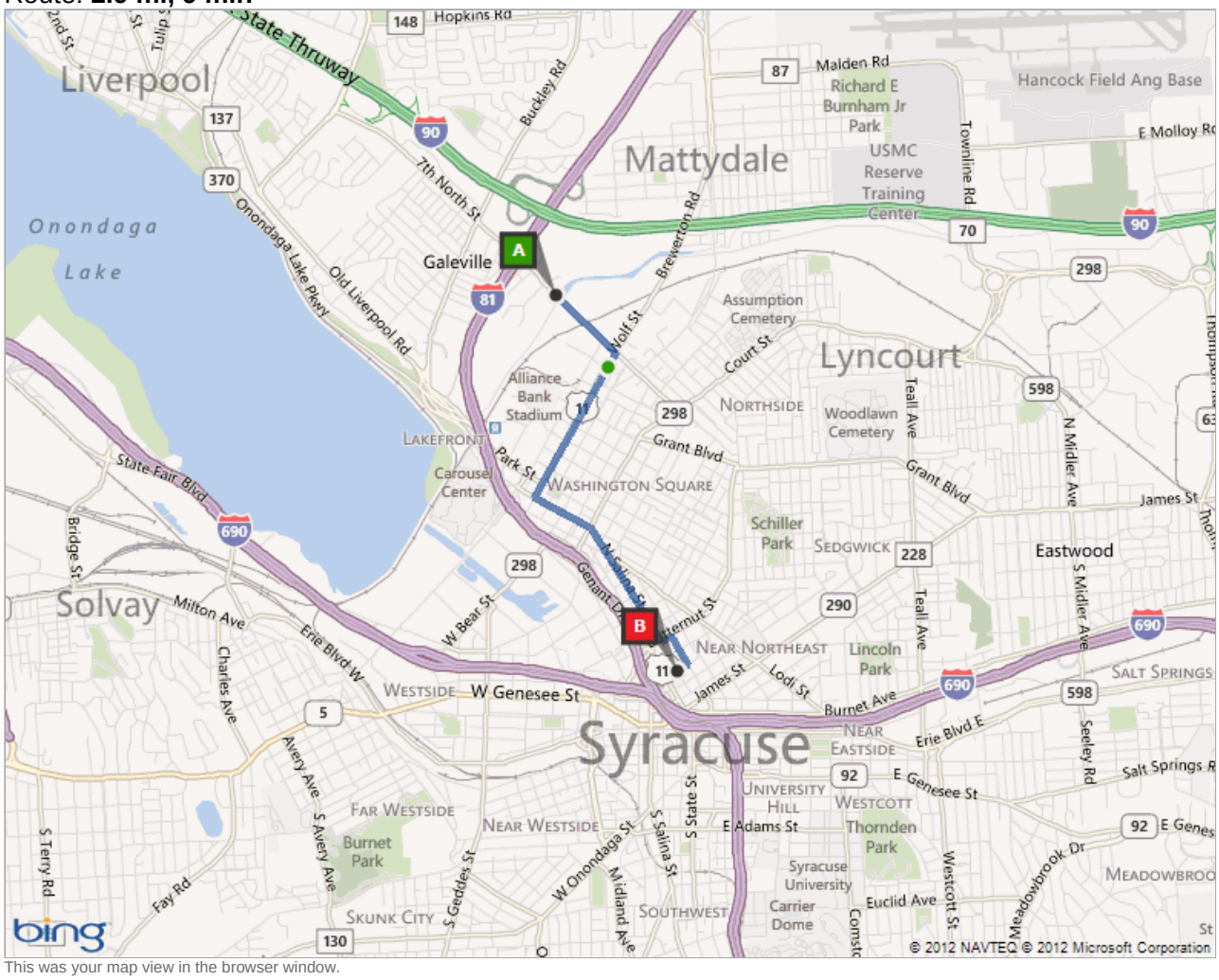
My Notes

On the go? Use **m.bing.com** to find maps, directions, businesses, and more

A	**101 7th North St, Liverpool, NY 13088**	**A–B: 2.9 mi** 9 min
	1. Depart **7th North St / CR-45** toward Hiawatha Blvd E	0.5 mi
	2. Turn **right** onto **US-11 / Wolf St**	0.9 mi
	3. Turn **left** to stay on **US-11 / N Salina St**	0.4 mi
	4. Keep **right** to stay on **US-11 / N Salina St**	0.7 mi
	5. Keep **left** onto **Prospect Ave**	515 ft
	6. Turn **left** onto **Butternut St**	358 ft
	7. Turn **right** onto **N Townsend St**	0.2 mi
	8. Turn **right** onto **Union Ave**	371 ft
B	9. Arrive at **301 Prospect Ave, Syracuse, NY 13203** *The last intersection is N Townsend St*	

These directions are subject to the Microsoft®: Service Agreement and for informational purposes only. No guarantee is made regarding their completeness or accuracy. Construction projects, traffic, or other events may cause actual conditions to differ from these results. Map and traffic data © 2010 NAVTEQ™.

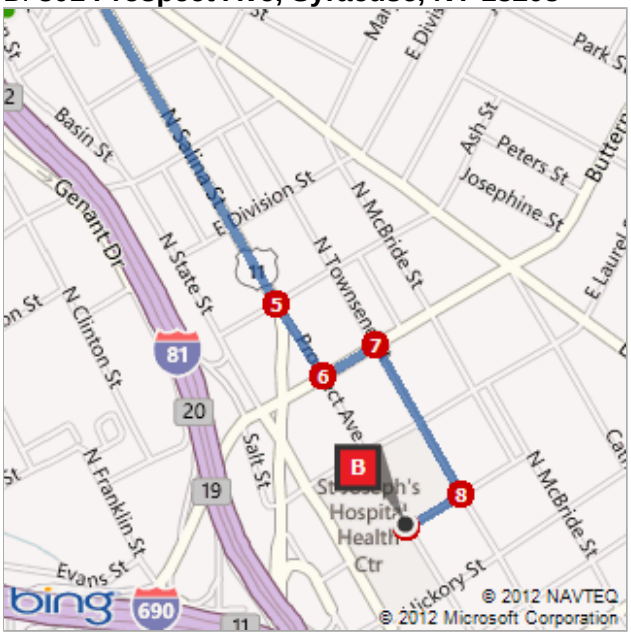
Route: **2.9 mi, 9 min**



This was your map view in the browser window.

A: **101 7th North St, Liverpool, NY 13088**

B: **301 Prospect Ave, Syracuse, NY 13203**



HASP FORMS

	TETRA TECH, INC. HEALTH AND SAFETY PLAN COMPLIANCE AGREEMENT	Revision Date: 10/1/2008 Document Control Number: FORM HSP-4 Page 1 of 1

Project Name: _____

Project Number: _____

I have read and understand the health and safety plan indicated above and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Name	Signature	Employer	Date

	TETRA TECH, INC. DAILY SAFETY MEETING FORM	Revision Date: 10/1/2008 Document Control Number: FORM HST-2 Page 1 of 2

Project: _____ Project Number: _____ PM/SSC: _____

Date/Time: _____ Project No.: _____

Client: _____ Site Location: _____

Site Activities Planned for Today: _____

_____

Safety Topics Discussed
Protective clothing and equipment:
Chemical hazards:
Physical hazards:
Environmental and biohazards:
Equipment hazards:
Decontamination procedures:
Other:
Review of emergency procedures:

Employee Questions or Comments:

Attendees	
Printed Name	Signature

Meeting Conducted by:

_____ _____

Name Title

_____

Signature

	TETRA TECH, INC. DAILY SITE LOG	Revision Date: 10/1/2008 Document Control Number: FORM SSC-1 Page 1 of 1

Site Name: _____ Date: _____

Site Safety Coordinator:_____ Project Number:_____

Name (print)	Company	I have received site-specific training	Time	
			In	Out

Comments:

_____

_____

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HASP SWPS

To prevent injuries and adverse health effects, the following general safe work practices (SWP) are to be followed when conducting work involving known and unknown site hazards on hazardous waste sites. These SWPs establish a pattern of general precautions and measures for reducing risks associated with hazardous site operations. This list is not inclusive and may be amended as necessary.

- Do not eat, drink, chew gum or tobacco, take medication, or smoke in contaminated or potentially contaminated areas or where the possibility for contact with site contamination exists.

- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. If a source of potable water is not available at the work site that can be used for hands-washing, the use of waterless hand cleaning products will be used, followed by actual hand-washing as soon as practicable upon exiting the site. A thorough shower and wash must be conducted as soon as possible if excessive skin contamination occurs.

- Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on drums, equipment, or the ground. Do not place monitoring equipment on potentially contaminated surfaces.

- Remove beards or facial hair that interferes with a satisfactory qualitative respirator fit test or routine pre-entry positive and negative pressure checks.

- Be familiar with and knowledgeable of and adhere to all instructions in the site-specific health and safety plan (HASP). At a minimum, a safety meeting will be held at the start of each project to discuss the HASP. Additional meetings will be held, as necessary, to address new or continuing safety and health concerns.

- Be aware of the location of the nearest telephone and all emergency telephone numbers.

- Attend a briefing on the anticipated hazards, equipment requirements, SWPs, emergency procedures, and communication methods before going on site.

- Plan and delineate entrance, exit, and emergency escape routes.

- Rehearse unfamiliar operations prior to implementation.

- Use the "buddy system" whenever respiratory protection equipment is in use. Buddies should establish hand signals or other means of emergency communication in case radios break down or are unavailable.

- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity in order to assist each other in case of emergency.

- Minimize the number of personnel and equipment in contaminated areas (such as the exclusion zone). Nonessential vehicles and equipment should remain within the support zone.

- Establish appropriate support, contamination reduction, and exclusion zones.

- Establish appropriate decontamination procedures for leaving the site.

- Immediately report all injuries, illnesses, and unsafe conditions, practices, and equipment to the site safety coordinator (SSC).

- Maintain a portion of the site field logbook as a project safety log. The project safety log will be used to record the names, entry and exit dates, and times on site of all Tetra Tech personnel, subcontractor personnel, and project site visitors; air quality and personal exposure monitoring data; and other information related to safety matters. Form SSC-1, Daily Site Log, may be used to record names of on-site personnel.

- A portable eyewash station should be located in the support zone if chemical splashes to eyes are possible.

- Do not bring matches and lighters in the exclusion zone or contamination reduction zone. Flames and open fires are not permitted on site.

- Observe coworkers for signs of toxic exposure and heat or cold stress.

- Inform coworkers of nonvisual effects of illness if you experience them, such as headaches, dizziness, nausea, or blurred vision.

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Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format

This document establishes safe work practices (SWP) to follow during drilling operations. These SWPs are based on suggested safety procedures provided in the National Drilling Association's "Drilling Safety Guide." Procedures to follow before, during, and after drilling are listed below.

Before beginning any drill operation, each employee must conform to the following requirements:

- Wear a hard hat, safety glasses or goggles, steel-toed work boots, a shirt and full-length pants when working with or near the drill rig. Shirts must be tucked in at the belt.
- Do not wear loose or frayed clothing, loose long hair, or loose jewelry while working with rotating equipment.
- Do not eat, drink, or smoke near the drill rig.
- Identify all underground utility and buried structure locations before drilling.
- Ensure that drill masts or other projecting devices will be farther than 25 feet in any direction from overhead power lines.
- Ensure that the drill rig and any other machinery used is inspected daily by competent, qualified individuals. The site safety coordinator (SSC) will ensure compliance with this precaution.
- Drill rig operators will be instructed to report any abnormalities, such as equipment failure, oozing liquids, and unusual odors, to their supervisors or the SSC.
- Establish hand-signal communications for use when verbal communication is difficult. One person per work team will be designated to give hand signals to equipment operators.

While the drill rig is operating, employees must:

- Wear appropriate respiratory and personal protective equipment (PPE) when conditions warrant their use.
- Avoid direct contact with known or suspected contaminated surfaces.
- Move tools, materials, cords, hoses, and debris to prevent tripping hazards and contact with moving drill rig parts.

- Adequately secure tools, materials, and equipment subject to displacement or falling.
- Store flammable materials away from ignition sources and in approved containers.
- Maintain adequate clearance of the drill rig and mast from overhead transmission lines. The minimum clearance is 25 feet unless special permission is granted by the utility company. Call the local utility company for proper clearance.
- Only qualified and licensed personnel should operate drill rigs.
- Workers should not assume that the drill rig operator is keeping track of the rig's exact location. Workers should never walk directly behind or beside heavy equipment without the operator's knowledge.
- Workers should maintain visual contact with drill rig operators at all times.
- When an operator must maneuver equipment in tight quarters, the presence of a second person is required to ensure adequate clearance. If much backing is required, two ground guides will be used: one in the direction the equipment is moving, and the other in the operator's normal field of vision to relay signals.
- Auger sections and other equipment are extremely heavy. All lifting precautions should be taken before moving heavy equipment. Appropriate equipment, such as chains, hoists, straps, and other equipment, should be used to safely transport heavy equipment too heavy to safely lift.
- Proper personal lifting techniques will be used. Workers should lift using their legs, not their backs.
- Workers will not use equipment they are not familiar with. This precaution applies to heavy as well as light equipment.
- All personnel not essential to work activities will be kept out of the work area.
- Workers will be aware of their footing at all times.
- Workers will remain alert at all times.

After drilling operations are completed, employees should do the following:

- Shut down machinery before repairing or lubricating parts (except parts that must be in motion for lubrication).
- Shut down mechanical equipment prior to and during fueling operations. When refueling or transferring fuel, containers and equipment must be bonded to prevent the buildup of static electricity.
- Keep drill rigs in the exclusion zone until work has been completed. Such equipment should then be decontaminated within the designated decontamination area.
- Engage parking brakes when equipment is not in use.
- Implement an ongoing maintenance program for all tools and equipment. All tools and moving equipment should be inspected regularly to ensure that parts are secured, are intact, and have no cracks or areas of weakness. The equipment must turn smoothly without wobbling and must operate in accordance with manufacturer specifications. Defective items should be promptly repaired or replaced. Maintenance and repair logs will be kept.
- Store tools in clean, secure areas to prevent damage, loss, or theft.

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Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format

Truck-mounted heavy equipment and field trucks are among the types of equipment that may be used during field work. Heavy equipment can present a substantial hazard to workers. General requirements for motor vehicles and material-handling equipment are provided in the Occupational Safety and Health Administration (OSHA) Construction Industry Standards, 29 CFR 1926, Subpart O. The following precautions will be followed when heavy equipment (such as drill rigs, front-end loaders, and backhoes) is in use:

- Heavy equipment will be inspected by the operator before each work shift. The site safety coordinator (SSC) will ensure compliance with these precautions.

- Equipment operators will be instructed to report any abnormalities, such as equipment failure, oozing liquids, and unusual odors, to their supervisors or the SSC.

- Only qualified and licensed personnel will operate heavy equipment.

- Hard hats, steel-toed boots, and safety glasses or goggles will be worn at all times around heavy equipment. Other personal protective equipment (PPE) may be required as specified in the site health and safety plan (HASP); construction site health and safety plan (C-HASP); Job Hazard Analysis (JHA), Job Safety Analysis (JSA) or other site-specific health and safety documentation.

- Workers will not assume that the equipment operator is keeping track of the exact location of operating equipment. Workers will never walk directly behind or to the side of heavy equipment without the operator's knowledge.

- Workers in close proximity to heavy equipment will maintain visual contact with equipment operators at all times.

- When an operator must maneuver equipment in tight quarters, the presence of a second person will be required to ensure adequate clearance. If backing is required, two ground guides will be used: one in the direction the equipment is moving, and the other in the operator’s normal field of vision to relay signals.

- All heavy equipment used at a contaminated work site will be kept in the exclusion

zone until the work has been completed. Such equipment will then be decontaminated within the designated decontamination area.

- Hand-signal communications will be established when verbal communication is difficult. One person per work team will be designated to give hand signals to equipment operators.
- Equipment with an obstructed rear view must have an audible alarm that sounds when the equipment is moving in reverse (unless a spotter guides the operator).
- Parking brakes will be kept engaged when equipment is not in use.
- Blades, buckets, dump bodies, and other hydraulic systems will be kept fully lowered when equipment is not in use.
- Equipment cabs will be kept free of all nonessential and loose items.
- Seat belts must be present in all vehicles having a rollover protective structure (ROPS).
- With certain exceptions, all material-handling equipment must be equipped with ROPS.
- Material-handling equipment that lacks a ROPS will not be operated on a grade unless the grade can safely accommodate the equipment involved.
- Drilling auger sections and other equipment are extremely heavy. All precautions must be taken before moving heavy equipment. Appropriate equipment must be used to transport heavy equipment.
- Only chains, hoists, straps, and other equipment that safely aids transport of heavy materials will be used.
- Proper personal lifting techniques will be used. Workers will lift using their legs, not their backs.
- A safety barrier will be used to protect workers when tires are inflated, removed, or

installed on split rims.

- An ongoing maintenance program for all tools and equipment must be in place. All tools and moving equipment will be inspected regularly to ensure that parts are secured, are intact, and have no cracks or areas of weakness. The equipment must turn smoothly without wobbling and must operate according to manufacturer specifications. Defective items will be promptly repaired or replaced. Maintenance and repair logs will be kept.
- Tools will be stored in clean, secure areas to prevent damage, loss, or theft.
- Workers will not use equipment with which they are not familiar. This precaution applies all equipment and tolls.
- Loose-fitting clothing and loose, long hair will be prohibited around moving machinery.
- Workers will make sure that no underground or overhead power lines, sewer lines, gas lines, or telephone lines present a hazard in the work area.
- All personnel who are not essential to work activities will be kept out of the work area.
- Workers will be aware of their footing at all times.
- Workers will remain alert at all times.

Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format

This safe work practice (SWP) describes situations where heat stress is likely to occur and provides procedures for the prevention and treatment of heat-related injuries and illnesses. Wearing personal protective equipment (PPE), especially during warm weather, puts employees at considerable risk of developing heat-related illness. Health effects from heat stress may range from transient heat fatigue or rashes to serious illness or death.

Many factors contribute to heat stress, including PPE, ambient temperature and humidity, workload, and the physical condition of the employee, as well as predisposing medical conditions. However, the primary factors are elevated ambient temperatures in combination with fluid loss. Because heat stress is one of the more common health concerns that may be encountered during field activities, employees must be familiar with the signs, symptoms, and various treatment methods of each form of heat stress. Heat stroke is the most serious heat-related illness—it is a threat to life and has a 20 percent mortality rate. Direct exposure to sun, poor air circulation, poor physical condition, and advanced age directly affect the tendency to heat stroke. Table 1 lists the most serious heat conditions, their causes, signs and symptoms, and treatment.

Training is an important component of heat stress prevention. Employees are instructed to recognize and treat heat-related illnesses during 8-hour health and safety refresher and first aid training courses. When working in hot environments, specific steps should be taken to lessen the chances of heat-related illnesses. These include the following:

- Ensuring that all employees drink plenty of fluids (Gatorade® or its equivalent)
- Ensuring that frequent breaks are scheduled so overheating does not occur
- Revising work schedules, when necessary, to take advantage of the cooler parts of the day (such as working from 5:00 a.m. to 11:00 a.m. and 6:00 p.m. to nightfall).

When PPE must be worn (especially Levels A and B), suggested guidelines relating to ambient temperature and maximum wearing time per excursion are as shown in Table 2.

TABLE 1
HEAT STRESS CONDITIONS

Condition	Causes	Signs and Symptoms	Treatment
Heat cramps	Fluid loss and electrolyte imbalance from dehydration	• Painful muscle cramps, especially in legs and abdomen • Faintness • Profuse perspiration	• Move affected worker to cool location • Provide sips of liquid such as Gatorade® • Stretch cramped muscles • Transport affected worker to hospital if condition worsens
Heat Exhaustion	Blood transport to skin to dissipate excessive body heat, resulting in blood pooling in the skin with inadequate return to the heart	• Weak pulse • Rapid and shallow breathing • General weakness • Pale, clammy skin • Profuse perspiration • Dizziness • Unconsciousness	• Move affected worker to cool area • Remove as much clothing as possible • Provide sips of cool liquid or Gatorade® (only if conscious) • Fan the person but do not overcool or chill • Treat for shock • Transport to hospital if condition worsens
Heat Stroke	Life threatening condition from profound disturbance of body's heat-regulating mechanism	• Dry, hot, and flushed skin • Constricted pupils • Early loss of consciousness • Rapid pulse • Deep breathing at first, and then shallow breathing • Muscle twitching leading to convulsions • Body temperature reaching 105 or 106 °F or higher	• Immediately transport victim to medical facility • Move victim to cool area • Remove as much clothing as possible • Reduce body heat promptly by dousing with water or wrapping in wet cloth • Place ice packs under arms, around neck, at ankles, and wherever blood vessels are close to skin surface • Protect patient during convulsions

TABLE 2
SUGGESTED GUIDELINES WHEN WEARING PPE

Ambient Temperature	Maximum PPE Wearing Time per Excursion
Above 90 °F	15 minutes
85 to 90 °F	30 minutes
80 to 85 °F	60 minutes
70 to 80 °F	90 minutes
60 to 70 °F	120 minutes
50 to 60 °F	180 minutes

Source: National Institute for Occupational Safety and Health (NIOSH). 1985. Memorandum Regarding Recommended Personal Protective Equipment Wearing Times at Different Temperatures. From Austin Henschel. To Sheldon Rabinovitz. June 20.

To monitor the level of an employee's heat stress, the following should be measured:

- Heart Rate: Count the radial (wrist) pulse during a 30-second period as early as possible in the rest period; if heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

  If the heart rate still exceeds 110 beats per minute at the next period, shorten the following work cycle by one-third.

- Oral Temperature: Use a clinical thermometer (3 minutes under the tongue) to measure the oral temperature at the end of the work period. If oral temperature exceeds 99.6 °F (37.6 °C), shorten the next work cycle by one-third without changing the rest period. If oral temperature still exceeds 99.6 °F at the beginning of the next rest period, shorten the following work cycle by one-third. Do not permit a worker to wear impermeable PPE when his or her oral temperature exceeds 100.6 °F (38.1 °C).

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Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format

This safe work practices (SWP) describes situations where cold stress is likely to occur and discusses procedures for the prevention and treatment of cold-related injuries and illnesses. Cold conditions may present health risks to employees during field activities. The two primary factors that influence the risk potential for cold stress are temperature and wind velocity. Wetness can also contribute to cold stress. Other factors that increase susceptibility to cold stress include age (very young or old), smoking, alcohol consumption, fatigue, and wet clothing. Hypothermia can occur at temperatures above freezing if the individual has on wet or damp clothing or is immersed in cold water. The combined effect of temperature and wind can be evaluated using a wind chill index as shown in Table 1.

Bare flesh and body extremities that have high surface area-to-volume ratios such as fingers, toes, and ears are most susceptible to wind chill or extremely low ambient temperatures. Because cold stress can create the potential for serious injury or death, employees must be familiar with the signs and symptoms and various treatments for each form of cold stress. Table 2 provides information on frostbite and hypothermia, the two most common forms of cold-related injuries.

Training is an essential component of cold stress prevention. Employees are instructed to recognize and treat cold-related injuries during 8-hour health and safety refresher and first aid training courses. When working in cold environments, specific steps should be taken to lessen the chances of cold-related injuries. These include the following:

- Protecting of exposed skin surfaces with appropriate clothing (such as face masks, handwear, and footwear) that insulates, stays dry, and blocks wind;
- Shielding the work area with windbreaks to reduce the cooling effects of wind;
- Providing equipment for keeping workers' hands warm by including warm air jets and radiant heaters in addition to insulated gloves;
- Using adequate insulating clothing to maintain a body core temperature of above 36 °C;
- Providing extra insulating clothing on site;
- Reducing the duration of exposure to cold; and
- Changing wet or damp clothing as soon as possible.

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During periods of extreme cold (10 °F or less) workers should use the buddy system to ensure constant protective observation.

Specific monitoring criteria are not established for cold stress. However, employees should be thoroughly cognizant of the signs and symptoms of frostbite and hypothermia (see Table 1) in themselves as well as in coworkers. All instances of cold stress should be reported to the site safety coordinator. Work schedules may be adjusted and warm-up regimes imposed as needed to deal with temperature and wind conditions.

TABLE 1
COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS EQUIVALENT TEMPERATURE

Estimated Wind Speed (in miles per hour - mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
CALM	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	*LITTLE DANGER* in less than 1 hour with dry skin; maximum danger from false sense of security				*INCREASING DANGER* from freezing of exposed flesh within 1 minute				*GREAT DANGER* that flesh may freeze within 30 seconds			
	Trench foot and immersion foot may occur at any point on this chart.											

Source: Modified from American Conference of Governmental Industrial Hygienists. 1997. "Threshold Limit Values for Chemical Substances and Physical Agents."

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TABLE 2
COLD STRESS CONDITIONS

Condition	Causes	Signs and Symptoms	Treatment
Frostbite	Freezing of body tissue, usually the nose, ears, chin, cheeks, fingers, or toes	• Pain in affected area that later goes away • Area feels cold and numb • Incipient frostbite (frostnip) - skin is blanched or whitened and feels hard on the surface • Moderate frostbite - large blisters • Deep frostbite - tissues are cold, pale, and hard	• Move affected worker to a warm area • Immerse affected body part in warm (100 to 105 °F) water—not hot! • Handle affected area gently; do not rub • After warming, bandage loosely and seek immediate medical treatment
Hypothermia	Exposure to freezing or rapidly dropping temperatures	• Shivering, dizziness, numbness, weakness, impaired judgment, and impaired vision • Apathy, listlessness, or sleepiness • Loss of consciousness • Decreased pulse and breathing rates • Death	• Immediately move affected person to warm area • Remove all wet clothing and redress with loose, dry clothes • Provide warm, sweet drinks or soup (only if conscious) • Seek immediate medical treatment

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Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format

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Biological hazards, or "biohazards," include plants, animals or their products, and parasitic or infectious agents that may present potential risks to worker health. This safe work practice (SWP) discusses procedures for working with biohazards, preventive guidelines, and first-aid procedures for the most common hazards field staff are likely to encounter. This SWP does not address biohazards such as those associated with medical waste. Procedures for working with this type of biohazard should be addressed in the site-specific health and safety plan (HASP), construction health and safety plan (C-HASP), job safety analyses (JSAs), activity hazard analyses (AHAs), or other health and safety project planning documents on a case-by-case basis.

During preparation for site work, the document preparer should consider which plants, animals, and other biological agents may be encountered; assess their potential risk to project personnel; and attach this SWP to the document if necessary. Office health and safety representatives should become familiar with biological hazards indigenous to the geographical area in which most of their office personnel work and assist in evaluating the risks to personnel on projects staffed from their offices. SWPs for insects, snakes, animals, plants, waterborne pathogens (giardia), and hantavirus are provided below.

1.0 INSECTS

SWPs for reducing the chance of insect bites or stings and for treating bites or stings are listed below.

- Workers should keep as much skin area covered as possible by wearing long-sleeved shirts, long pants, and a hat. Pant legs should be tucked into socks or boots and shirts into pants. In addition, workers should wear light colored clothing.
- A proven insect repellent should be used on bare skin and clothing.
- When possible, tall grasses and brush that could harbor ticks should be avoided.
- Several times during the day and at the end of the work day, each worker should perform a check for evidence of imbedded ticks or previous bites. Particular attention should be paid to the scalp, neck, ankles, back of the legs, and waist.

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- When opening well covers, vaults, or other closed items, workers should watch for hornet or wasp nests and black widow or brown recluse spiders. Workers should never reach into spaces with unprotected arms.

- Workers should watch carefully for bees around open soft drinks or food.

- If a worker is stung by a bee, the stinger should be carefully removed, if present. The wound should be washed and a cold pack applied. Allergic reaction should be watched for and is evidenced by extreme swelling, redness, pain, or difficulty breathing.

- If a worker is stung or bit by a spider or scorpion, medical attention should be obtained immediately.

2.0 SNAKES

SWPs for encounters with snakes and for treating snakebites are listed below.

- Workers should avoid walking in areas known to harbor snakes. Workers should be cautious when picking up or moving items that have been on the ground.

- Workers should wear boots made of heavy material that protect the ankles and pants. Heavy work gloves should be worn for picking up items.

- If one snake is encountered, others may be present. Workers should leave the area by retracing their steps.

- If a worker is bitten, the wound should be washed and the injured area immobilized and kept lower than the heart, if possible. Ice or a tourniquet should not be applied to a snake bite. The wound should not be cut. If medical care is more than 30 minutes away from a work site, a snakebite kit should be available on site and workers should know how to use it.

3.0 ANIMALS

SWPs for encounters with animals and for treating associated wounds are listed below.

- If workers encounter a wild animal, the animal should be observed for unusual behavior such as a nocturnal animal out during the day, drooling, an appearance of partial paralysis, irritability, meanness, or a strangely quiet demeanor.

- Workers should never touch the body of a dead animal because certain diseases could be carried by fleas still on the body.

- Workers should avoid animal droppings (including bird droppings). Pathogens, some of which can become airborne, may still be present in the droppings.

- If a worker is bitten, he or she should get away from the animal to avoid further bites. Workers should not try to stop, hold, or catch the animal.

- If the wound is minor, it should be washed with soap and water. Any bleeding should then be controlled, and an antibiotic ointment and dressing should be applied. All animal bite wounds should be watched for signs of infection.

- If the wound is bleeding seriously, the bleeding should be controlled but the wound should not be cleaned. Medical assistance should be summoned immediately.

- If a rabid animal is suspected, immediate medical attention should be summoned. If possible, workers should try to remember what the rabid animal looked like and the area in which it was last seen. The animal should be reported by calling the local emergency number.

4.0 PLANTS

SWPs for plants are as follows:

- Workers should be aware of the types and appearances of poisonous plants in the work site area. Poison ivy, oak, and sumac are the most frequently encountered plants that can cause reaction from casual contact. If a worker is extremely sensitive to these plants, he or she should avoid the area entirely because airborne drift could be sufficient to cause a reaction. Other plants, such as fireweed, can cause painful, short-term irritation and should be avoided as well. Workers should avoid touching face and eye areas after contact with any suspicious plant.

- Workers should wear proper clothing if working in or near overgrown areas. Disposable outerwear should be used, if necessary, and workers should not touch the material with bare hands during removal if the outerwear may have contacted poisonous plants.

- If contact with a poisonous plant has occurred, the affected area should be immediately washed thoroughly with soap and water. If a rash or weeping sore has already begun to develop, a paste of baking soda and water should be applied to the area several times a day to reduce discomfort. Lotions such as Calamine or Caladryl should be applied to help soothe the area. If the condition gets worse and affects large areas of the body or the face, a doctor should be consulted.

- Bushy and wooded areas should be thoroughly checked for thorn-bearing trees, brush, and bramble. In some cases, impalement can cause severe pain or infection.

5.0 WATERBORNE PATHOGENS-GIARDIA

Giardia is a waterborne pathogen consisting of a protoplasmic parasite of the mammalian digestive tract. Giardia is present worldwide, with the highest occurrence in areas with poor sanitation. In the United States, most reported cases are in mountainous regions where drinking water is obtained from streams and is unfiltered or untreated.

Giardia is contracted by ingesting water contaminated with giardia cysts in the dormant state. Giardia parasites can only thrive in the digestive tracts of mammals. Dormant giardia organisms enter water through the feces of infected animals or humans. Giardia symptoms include severe diarrhea and upset stomach. Some people are asymptomatic but can transmit the disease to others. Medical treatment of giardia can be difficult and unpleasant; therefore, prevention is critical. Precautions for preventing exposure to giardia are listed below.

- Workers should assume that all fresh water streams are infected with the giardia organism and not drink any <u>untreated</u> water.

- Team members collecting sediment and water samples from streams should wash their hands thoroughly with soap and water after collecting the samples.

- Giardia parasites are relatively easy to destroy or filter. Water should be treated for drinking or cooking with iodine or another recommended giardia treatment before use.

6.0 HANTAVIRUS

Hantavirus pulmonary syndrome (HPS) is a potentially fatal infection caused by a rodent-borne hantavirus. HPS begins with a brief illness most commonly characterized by fever, muscle pain, headache, coughing, and nausea or vomiting. Other early symptoms include chills, diarrhea, shortness of breath, abdominal pain, and dizziness. In the first identified cases of HPS, this stage of the infection lasted 2 to 5 days before victims were hospitalized. Typically, by the time of hospitalization, victims were found to have tachycardia (a heart rate of greater than 100 beats per minute) and tachypnea (a breathing rate of greater than 20 breaths per minute). Fever was also common. In most cases, death occurred within 2 to 16 days of the onset of symptoms, and victims exhibited pulmonary edema and severe hypotension.

Currently, experts believe that HPS is spread by the deer mouse (*Peromyscus maniculatus*). Though the deer mouse has been found to be the primary host of hantavirus, several other rodent species have also tested positive for the virus. Pinon mice (*Peromyscus truei*), brush mice (*Peromyscus boylii*), and western chipmunks (*Tamia spp.*) are also likely to carry the virus. Also, cases of HPS have been reported in areas of the United States where these particular rodents are not indigenous.

Infected rodents shed the virus in their urine, feces, and saliva. Humans can be exposed to the virus through (1) inhalation of suspended rodent excreta or dust particles containing rodent excreta, (2) introduction of rodent excreta into the eyes or broken skin, and (3) ingestion of food or water contaminated by rodent excreta. HPS has a reported mortality rate of 55 percent. Transmission of hantavirus from infected individuals to healthy persons has not been documented.

Prevention of HPS infection is essential because no known antidote and no specific treatment exists for treating HPS. Therefore, employees should practice risk reduction and control measures. Guidelines for workers in locations that may have rodent infestations or habitats are listed below.

- The best approach for HPS control and prevention is through environmental hygiene practices that deter rodents from colonizing the work environment.

- Information about the symptoms of HPS and detailed guidance on preventive measures should be provided to all employees assigned to field activities.

- Medical attention should be sought immediately for workers who develop a febrile or respiratory illness within 45 days of the last potential exposure to rodents. Attending physicians should be advised of each worker's potential for occupational exposure to hantavirus. Physicians should contact local health authorities promptly if hantavirus-associated illness is suspected. A blood sample should be obtained from the affected worker and forwarded with the baseline serum sample through the state health department to the Centers for Disease Control and Prevention for hantavirus antibody testing.

- Respiratory protective equipment should be worn when handling rodents, when removing rodents from traps, and when working in areas with evidence of rodent droppings or hair. Respiratory protective equipment should include, at a minimum, a half-face air-purifying respirator (APR) or powered APR equipped with a high-efficiency particulate air (HEPA) filter (P100). Full-face regulators may be needed under some circumstances. Respiratory protective equipment should be used in accordance with Occupational Safety and Health Administration regulations.

- Dermal protection should be worn when handling rodents or traps containing rodents, or if contact with contaminated surfaces could occur. Dermal protection should include rubber or plastic gloves that should be washed and disinfected before removal.

- A trap contaminated with rodent urine or feces or in which a rodent was captured should be disinfected with a commercial disinfectant or a 0.4 percent bleach solution. A dead rodent should be disposed of by placing the carcass in a plastic bag containing enough general-purpose household disinfectant to thoroughly wet the carcass. The bag should be sealed and disposed of by burning or by burying it in a 2- to 3-foot-deep hole. Local and state health departments can also provide appropriate disposal methods.

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Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format

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This safe work practice (SWP) establishes minimum procedures for protecting Tetra Tech, Inc. (Tetra Tech), personnel against the hazardous properties of oil and petroleum distillate fuel products during the performance of field work, including known and suspected releases of such materials. The SWP was developed to enable health and safety personnel and project managers (PMs) to quickly prepare and issue site-specific health and safety plans (HASPs) or other site-specific health and safety related documents for investigations of such releases. Forms HSP-3A and HSP-3B in can be used as checklists for site preparation activities and attached to the HASP with this SWP. Safety procedures for drilling, trenching, and other construction operations should be attached as necessary. Anticipated physical hazards associated with site activities should be discussed in the HASP.

This SWP must not be used for confined space entry (including trench entry) or for installing or operating full-scale fuel recovery systems. The applicability of this SWP, hazard evaluation, health and safety requirements, air monitoring, area controls, decontamination, underground storage tank (UST) preparation, emergency response, and accident reporting associated with work involving oil and petroleum distillate fuel products are discussed below.

1.0 APPLICABILITY

This SWP is applicable to field investigations involving any of the substances listed below and involving any of the activities listed below.

1.1 SUBSTANCES

- Motor oil (used and unused);
- Leaded and unleaded gasoline;
- Fuel oil No. 1 (kerosene and JP-1);
- Fuel oil No. 1-D (light diesel);
- Fuel oil No. 2 (home heating oil);
- Fuel oil No. 2-D (medium diesel);
- Fuel oil No. 4 (residual fuel oil);

- Fuel oil No. 5 (residual fuel oil);
- Fuel oil No. 6 (Bunker C fuel oil);
- JP-3, JP-4, and JP-5 (Jet fuels); and
- Gasohol.

1.2 ACTIVITIES

- Collection of subsurface soil samples using a truck-mounted drill rig, hand-held power auger, or hand auger;
- Construction, completion, and testing of groundwater monitoring wells;
- Collection of groundwater samples from new and existing wells;
- Observation of removal of underground fuel pipes and USTs; and
- Small-scale removal of contaminated soils.

2.0 HAZARD EVALUATION

Oil and petroleum distillate fuel products are mixtures of aliphatic and aromatic hydrocarbons. The predominant classes of compounds in motor oil, gasoline, kerosene, and jet fuels are paraffins (such as hexane and octane), naphthenes (such as cyclohexane), and aromatics (such as benzene and toluene). For example, gasoline contains about 80 percent paraffins, 6 percent naphthenes, and 14 percent aromatics. Kerosene and jet fuels contain 42 to 48 percent paraffins, 36 to 68 percent naphthenes, and 16 to 20 percent aromatics. Diesel fuels and heating oils contain 14 to 23 percent naphthenes, 68 to 78 percent nonvolatile aromatics, and less than 10 percent paraffins. Heavier fuels contain almost no volatile aromatic compounds. Other chemicals are often added to automotive and aviation fuels to improve their burning properties. Examples are tetraethyl-lead and ethylene dibromide. Flammability, toxicity, and exposure limits of oil and petroleum distillate fuel products are discussed below.

2.1 FLAMMABILITY

Oil and petroleum distillate fuel products possess two intrinsic hazardous properties—flammability and toxicity. The flammable property of oils and fuels presents a far greater hazard to field personnel than toxicity. Vapors of volatile components of oils and fuels can therefore also be explosive when confined.

Oil and petroleum distillate fuel products will not burn in liquid form. Only the vapors burn and then only if (1) the vapor concentration is between the compound-specific upper explosive limit (UEL) and lower explosive limit (LEL), (2) sufficient oxygen is present, and (3) an ignition source is present. The probability of fire and explosion can be minimized by eliminating any of the three factors needed to produce combustion. Two of the factors, ignition source and vapor concentration, can be controlled in many cases. Ignition can be controlled by the following:

- Open fires and smoking should be prohibited on site.
- Spark arresters should be installed on drill rig engines.
- Engines should be turned off when any compound's LEL is approached.

Vapor concentrations can be reduced by using fans and portable ventilation systems. In fuel storage tanks, vapor concentrations in head spaces can be reduced by introducing dry ice (solid carbon dioxide) into the tank because the carbon dioxide gas displaces combustible vapors and oxygen.

The LELs (in air) of the fuels discussed in this section range from 0.6 percent for JP-5 to 1.4 percent for gasoline. Flash points range from -36 °F for gasoline to greater than 150 °F for fuel oil No. 6. JP-5 has a flashpoint of 140 °F. Although it has a lower LEL than gasoline, JP-5 is usually considered less hazardous than gasoline because its vapors must be heated to a higher temperature to ignite.

2.2 TOXICITY

Oil and petroleum distillate fuel products exhibit relatively minor acute inhalation and dermal toxicity effects. Concentrations of 160 to 270 parts per million (ppm) gasoline vapor have been reported to cause eye, nose, and throat irritation after several hours of exposure. Gasoline vapor concentrations of 500 to 900 ppm can cause irritation and dizziness in 1 hour, and levels of

2,000 ppm or above have produced mild anesthesia in 30 minutes. Most fuels, particularly gasoline, kerosene, and jet fuels, are capable of causing skin irritation after prolonged contact.

Some gasoline additives, such as ethylene dichloride, ethylene dibromide, and tetraethyl and tetramethyl lead, are highly toxic; however, the additives are present in gasoline at low concentrations and their contribution to the overall toxicity of gasoline and other fuels is therefore negligible in most cases.

2.3 EXPOSURE LIMITS

In 1989, the Occupational Safety and Health Administration (OSHA) developed a permissible exposure limit (PEL) of 300 ppm for gasoline. However, this PEL was subsequently vacated. OHSA has also established PELs for individual components, such as benzene. The American Conference of Governmental Industrial Hygienists has established a threshold limit value (TLV) Time Weighted Average (TWA) of 300 ppm and Short Term Exposure Limit of 500 ppm for gasoline. These TLVs take into consideration the average concentration of benzene in gasoline (1 percent), as well as gasoline's common additives. Oil mist has a PEL of 5 milligrams per cubic meter of air. Exposure limits have been established for some of the other petroleum constituents.

3.0 HEALTH AND SAFETY REQUIREMENTS

This section discusses medical surveillance, training, and personal protective equipment (PPE) requirements for personnel working at sites where oil or petroleum distillate fuel products may be encountered.

3.1 MEDICAL SURVEILLANCE REQUIREMENTS

On-site personnel must participate in a medical surveillance program and be certified by an occupational health physician as being physically fit to wear respiratory protective devices and to perform their assigned field work. Tetra Tech's medical surveillance program is discussed in Document Control Number (DCN) 3-2.

3.2 TRAINING REQUIREMENTS

On-site personnel potentially exposed to uncontrolled releases of hazardous materials, including petroleum products must successfully complete 40 hours of initial, off-site training and receive a

certificate from a course meeting the requirements of Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.120 (e). Supervisory and refresher training must also have been completed, as necessary, for applicable site personnel. Tetra Tech's health and safety training program is discussed in DCN 3-1.

Before field work begins, the site safety coordinator (SSC) will brief all field personnel, including subcontractor employees, on their work assignments and site safety procedures. Each worker must read the site-specific HASP and sign a safety compliance agreement before commencing work. Individuals that refuse to sign the agreement will be prohibited from on-site work.

3.3 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PPE for work at sites where oil or petroleum distillate fuel products may be encountered is summarized below.

- Chemical-resistant safety boots, such as neoprene or butyl boots with safety toe and shank, must be worn during the performance of work where surface soil is obviously contaminated with oil or fuel, when product quantities of oil or fuel are likely to be encountered, and within 10 feet of operating heavy equipment.
- National Institute for Occupational Safety and Health-approved full- or half-face respirator with organic vapor cartridges must be worn whenever total airborne hydrocarbon levels in the breathing zone of field personnel reach or exceed a 15-minute average of 11 ppm in summer and 25 ppm in winter. If total airborne hydrocarbons in the breathing zone exceed 100 ppm, work must be suspended, personnel directed to move a safe distance from the source, and the operating unit health and safety manager (HSM) or designee consulted.
- Chemical-resistant gloves, such as nitrile or neoprene gloves must be worn whenever soil or water known or suspected of containing oil or petroleum hydrocarbons is collected or otherwise handled.
- Chemical-resistant coveralls, such as Saranex or polyethylene-coated Tyvek coveralls must be worn whenever product quantities of oil or fuel are actually encountered and when oil- or fuel-saturated soil is handled.
- Splash-proof safety goggles or glasses with full side shields must be worn when working within 10 feet of any operating heavy equipment (such as a drill rig or

backhoe). Splash-proof goggles or face shields must also be worn whenever product quantities of oil or fuel are encountered.

- Hard hats must be worn when personnel work with or in the vicinity of an operating drill rig, backhoe, or other heavy equipment.

Operators of some sites such as refineries often require all personnel working within site boundaries to wear certain specified safety equipment. Such requirements shall be strictly observed by Tetra Tech personnel and subcontractors.

4.0 AIR MONITORING

Air monitoring shall be performed to protect field personnel and prevent fires or explosions. Monitoring must be performed by individuals trained in the use and care of the monitoring equipment. Instruments used on site must be maintained and calibrated in accordance with manufacturer requirements. Instrument manuals with calibration instructions shall be transported to each site along with the instrument. The following equipment is required for monitoring for oil or petroleum distillate vapors:

- Organic vapor monitor using flame ionization or photoionization technology; and
- Combustible gas indicator (CGI).

During drilling operations, vapor emissions from boreholes must be measured whenever the auger is removed from the boring and whenever flights are added or removed from hollow-stem augers. This requirement does not apply to borings less than 5 feet deep and borings of any depth drilled to install monitoring wells in soil known to be uncontaminated. Measurements should first be made with an organic vapor monitor and then with a CGI if vapor levels exceed the highest concentration measurable with the organic vapor monitor. (For example, if the organic vapor monitor goes off the scale when set on the highest range.)

Initially, measurements shall be made about 12 inches from the borehole at both upwind and downwind positions. If the total hydrocarbon concentration 12 inches from the borehole exceeds the respirator use action level (11 ppm in summer and 25 ppm in winter averaged over 15 minutes), measurements must be made in the breathing zone of the individual(s) working closest to the borehole. Decisions regarding respiratory protection should be made based on vapor concentrations in the breathing zone.

If total organic vapor concentrations within 12 inches of the borehole exceed the capacity of the organic vapor monitor, a CGI must be used to determine if explosive conditions exist. If combustible gas concentrations reach 5 to 10 percent of the LEL, continuous monitoring is required and operations may proceed with caution. If combustible gas concentrations reach 10 percent of the LEL within a 12-inch radius of the borehole or 5 percent of the LEL at a distance greater than 24 inches from the borehole, operations must be suspended, the drill rig motor shut down, and corrective action taken. If corrective action cannot be taken, field personnel and all other individuals in the vicinity of the borehole must move to a safe area and the local fire department and project manager must be alerted.

5.0 AREA CONTROLS

Access to hazardous and potentially hazardous areas must be controlled to reduce the possibility of physical injury and chemical exposure to field personnel, site visitors, and the public. A hazardous or potentially hazardous area includes any area where field personnel are required to wear respirators, borings are being drilled with powered augers, or excavation with heavy equipment is being performed.

The boundaries of hazardous and potentially hazardous areas must be identified by cordons, barricades, or emergency traffic cones, depending on conditions. If such areas are left unattended, signs warning of danger and forbidding entry must be placed around the perimeter if the areas are accessible to the public. Trenches and other large holes must be guarded with wooden or metal barricades spaced no further than 20 feet apart and connected with yellow or yellow and black nylon tape not less than 0.75 inch wide. The barricades must be placed no less than 2 feet from the edge of the excavation or hole.

Entry to hazardous areas shall be limited to individuals who must work in these areas. Unofficial visitors must not be permitted to enter hazardous areas while work is in progress. Official visitors should be discouraged from entering hazardous areas but may be allowed to enter only if they agree to abide by the provisions of this document, follow orders issued by the SSC, and are informed of the potential dangers that could be encountered in these areas.

6.0 DECONTAMINATION

A mild detergent and hot water can be used to remove oil and petroleum distillate fuel products from skin. Liquid dishwashing detergent is more effective than hand soap, and hot water is more effective than cold. Mechanic's waterless hand cleaner is recommended for initial cleaning,

followed by a detergent and water wash, for removing motor oil and heavier fuel oils (fuel oils No. 4 through 6) that are weathered to an asphaltic condition.

Detergent and hot water should also be used to clean gloves, respirators, hard hats, boots, and goggles. However, if boots do not come clean after washing with detergent and water, a strong solution of trisodium phosphate and hot water can be used. Split-spoon sampling equipment, augers, vehicle undercarriages, and tires should be steam cleaned.

7.0 UNDERGROUND STORAGE TANK PROCEDURES

Procedures used by the firm responsible for UST removal and transport must agree with procedures recommended by the American Petroleum Institute (API). If the removal and transport firm's procedures, especially firms addressing the removal or inerting of flammable vapors, disagree substantially with API procedures, the Tetra Tech project manager must be notified immediately. The project manager shall then inform the client that Tetra Tech personnel will not report to the site during UST removal or transport operations unless proper procedures are used. If the firm responsible for tank removal or transport is under subcontract to Tetra Tech, it must follow API procedures (see SWP DCN 5-18, "UST Removal Practices," for additional information).

8.0 EMERGENCY RESPONSE

Standard procedures to follow in the event of an emergency involving oil and petroleum distillate fuel products are summarized below. All responses should be coordinated through the designated SSC. First aid should be administered by trained first aid providers.

- In the event of a fire,
  - Stop work, shut off equipment, and evacuate to safe distance (a company vehicle should be kept at a reasonable distance from the work area to prevent fire hazards);
  - Contact the fire department and then the appropriate Tetra Tech office;
  - Keep a safe distance away until emergency services arrive; and
  - Do not attempt to fight fires that are not incipient fires

- In the event of an injury or illness,
  - Perform first aid, if possible, and call 911;
  - Do not move the victim if broken bones are suspected unless life is endangered; and
  - If the person is safe to move (has minor cuts or burns), transport the person to the hospital, but if injuries or illness are more serious, arrange for a rescue squad or ambulance.
- In the event of overexposure,
  - Remove the employee (only if there is no danger to rescuers) from the exposure source to a location with fresh air;
  - Contact a rescue squad or ambulance as necessary;
  - Do not continue work until the source of exposure is identified and controlled; and
  - Contact the appropriate Tetra Tech office for technical assistance.
- In the event of a hazardous materials accident,
  - Stop equipment and work;
  - Relocate to a safe distance;
  - To the extent possible, determine the source of incident (such as a utility line, gas line, pipeline, or other);
  - Contact the appropriate Tetra Tech office; and
  - Do not attempt to backout equipment from an underground utility strike without the guidance of the utility company.

9.0 ACCIDENT REPORTING

All incidents, including near misses must be reported as required by Tetra Tech company policy. Information on accident reporting is presented in the corporate Health and Safety Manual, DCN 2-2, "Incident Investigation Program."

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Revision Date	DOCUMENT AUTHORIZER	REVISION DETAILS
10/1/2008	Chris McClain	Update from 1998 format

The purpose of the Tetra Tech, Inc. (Tetra Tech), air monitoring program is to set forth the criteria necessary to conduct air monitoring as part of a comprehensive site evaluation that accomplishes the following:

- Identifies work areas and activities that require the use of engineering or work technique controls or require the use of personal protective equipment (PPE);
- Provides data to confirm that levels of protection afforded by the assigned PPE and engineering or work technique controls are adequate to protect workers;
- Provides data to ensure that all necessary controls and precautions are being taken to protect the public and the environment; and
- Complies with Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.120(c)(6) and (h).

1.0 SCOPE

This Program applies to hazardous waste operations and emergency response (HAZWOPER) sites as defined in OSHA 29 CFR 1910.120 and 29 CFR 1926.65. Tetra Tech subcontractors must adhere to an air monitoring program that meets or exceeds the requirements of this program.

2.0 RESPONSIBILITIES

The site safety coordinator (SSC), appointed by the project manager (PM) for each site, shall be responsible for implementation of the air monitoring program at the site. The PM is responsible for ensuring that a site-specific health and safety plan, which includes an air monitoring program for the site, is prepared and approved prior to field work beginning on a site. The air monitoring program section of the HASP shall include the identification of known or potential hazards, the implementation of sound industrial hygiene monitoring practices, equipment calibration, and analytical operations, as appropriate. The SSC will take all steps necessary to ensure that the appropriate monitoring equipment and supplies are available during hazardous materials projects. Air monitoring equipment will be used by the SSC or individuals trained in the operation, calibration, care, and limitations of the equipment under the supervision of the SSC.

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The criteria for selecting air monitoring equipment, instrumentation, calibration, monitoring implementation, and air monitoring documentation are discussed below.

3.0 CRITERIA FOR SELECTING AIR MONITORING EQUIPMENT

Priorities for monitoring should be based on information gathered during initial site characterization (see Document Control No. 3-5). This information serves as the basis for selecting the appropriate monitoring equipment and PPE to use when conducting site monitoring. Depending on site conditions, activities, the length of time spent on site, and project goals, the air monitoring program can vary from simply monitoring for immediately dangerous to life or health (IDLH) conditions and other dangerous circumstances to more extensive monitoring, such as personal exposure monitoring, perimeter monitoring, and community monitoring. Thus, not all types of monitoring described in this program will be conducted for every project.

The air monitoring requirements for a particular project must be specified in the site-specific health and safety plan (HASP). The types of field instruments to be used for a particular project shall also be discussed in the HASP. This list shall include specific equipment, models, accessories, frequency of use, procedures for calibration, and frequency of checks.

4.0 INSTRUMENTATION

Air monitoring equipment may include, but is not limited to the following:

- **Photoionization Detector (PID):** This instrument is generally used for the determination of trace concentrations of hydrocarbons (except methane gas) and other photoionizable organic and inorganic contaminants in work zones and ambient air. It is a “real-time” or direct indicating instrument nonspecific in its detection capability and has a response that varies for different chemical contaminants. A data logging feature on some PIDs can be used when a permanent record of monitoring results is desired.

- **Flame Ionization Detector (FID):** This instrument is used for surveying work zones and ambient air for the presence of organic vapors. Organic materials in the air are burned in a hydrogen fueled flame. It is also a real-time instrument nonspecific in its detection capability and has a response that varies for

different chemical contaminants. An audible alarm warns the user when a preset level is exceeded. Data logging is also available with some FIDs.

- **Personal Air Sampling Pumps:** These devices may be used in conjunction with ongoing, real-time monitoring. When an air sampling plan calls for exposure and ambient air concentration monitoring of contaminants for 8-hour (or another specified period), time-weighted averages (TWA), these pumps are used for sample collection onto specified sample media (such as filter cassettes, sorbent tubes, and grab sample bags). The pump typically provides air flow from 0.5 to 5 liters of air per minute. Samples collected on the media are analyzed in a laboratory and therefore do not provide results or readings at the time the sample was collected. Samples shall be analyzed only by laboratories successfully participating in and meeting the requirements of the American Industrial Hygiene Association's Proficiency Analytical Testing or Laboratory Accreditation programs.

- **Hand Pump and Colorimetric Indicator Tubes:** The hand pump draws a measured quantity of air through a colorimetric indicator tube. The chemical "bed" inside the tube undergoes a characteristic color change in the presence of specific contaminants. The degree or length of color change as measured and observed through the glass tube surrounding the chemical bed yields a semiquantitative measurement of the concentration of a given contaminant or class of contaminants. Colorimetric indicator tubes are available for a wide variety of chemical gases or vapors.

- **Combustible Gas Indicators (CGI):** These instruments are capable of detecting the presence of flammable gases and are used to determine the potential for explosive atmospheres. Concentrations are expressed as a percent of the lower explosive limit. Nearly all CGIs are based on the catalytic combustion of gases on a filament. Flammable gases actually burn on the filament. The resulting change in temperature produces an increase in electrical current resistance and decreases current flow. This change in current is translated by the Wheatstone bridge circuit into a meter reading.

- **Oxygen Meter:** This instrument is capable of measuring the concentration of oxygen. The sensor employs an electrolyte to detect the presence and concentration of the gas.

- **Meteorological Instrumentation:** Meteorological instruments provide data on wind speed and direction, precipitation, humidity, and other environmental conditions and are used on site as an adjunct in determining perimeter and off-site monitoring or sampling locations and may be used for interpretation of air monitoring results.

- **Noise Monitoring Instrumentation:** Noise monitoring may consist of taking spot readings with a sound-level meter or full-shift measurements using dosimeters. All noise monitoring shall be conducted in compliance with procedures detailed in the Tetra Tech Hearing Conservation Program in Document Control No. 2-4.

- **Radiation Monitoring Instrumentation:** A radiation survey is necessary when there is reason to suspect the presence of radioactive material or contamination. All radiological survey equipment shall be used in accordance with the guidelines detailed in the Safe Work Practice Document 6-21.

5.0 CALIBRATION

The SSC or a designee under the SSC's direction will calibrate monitoring equipment in accordance with manufacturers' instructions. Frequency of calibration varies with the instrument. Some instruments require calibration before use and after each use. Other instruments are less prone to response drift and may require less frequent checks of instrument response. The user should verify the calibration frequency before use. Factory servicing of the monitoring instruments will be conducted periodically as recommended by the manufacturers. The SSC will make provisions for replacement equipment when factory service of an instrument is needed.

Documentation of instrument calibration is required. A calibration logbook is recommended. Each calibration event should be noted in the logbook. For portable monitoring instruments such as the PID or FID, the information recorded should include the following:

- Instrument type, brand, model, and serial numbers and other information such as lamp specifications;

- Date of calibration;

- Time of calibration;

- Concentration and source of calibration gas standard;
- Instrument scale range; and
- Name of person calibrating instrument.

For personal air sampling pumps, pump flow calibration results will be documented. A copy of the current calibration curve for the rotameter used for calibration will be filed with the pump calibration data. Documentation of any field servicing or repair of an instrument will be documented in the calibration logbook.

Any and all user comments regarding instrument operation, problems, questionable readings, misuse, or other issues will be fully documented in the field logbook. Certifications of analysis for calibration gas standards and span gases will be maintained on file by the SSC. Any and all factory or manufacturer communications regarding the instruments will be documented in the field logbook. Primary calibration documents for flow meters calibrated by the manufacturer or equipment technician will be maintained with the calibration documentation (especially the calibration curves).

6.0 MONITORING IMPLEMENTATION

Monitoring for airborne hazards at a work site will fall into four categories: screening and periodic monitoring, personal exposure monitoring, perimeter (work zone or work site) monitoring, and community monitoring. Before commencement of site work, background air monitoring should be conducted by the SSC at locations representative of and consistent with work zones proposed in the HASP. The prestartup or background sampling locations will be determined by the SSC, who will consider such factors as wind direction, terrain, and building locations. The four categories of monitoring are discussed below.

6.1 Screening and Periodic Monitoring

Site characterization is used to identify primary health and safety concerns associated with a work site (see Document Control Number (DCN) 3-5). Once site work has begun, screening monitoring should be conducted to evaluate the potential threats associated with air contaminant sources identified. Screening should be performed with the instrument and detector appropriate for the contaminant to evaluate the actual sources and concentrations of contaminants released in the immediate area of site personnel. Information from the

screening will help determine the need for periodic monitoring of site conditions or personal exposure monitoring.

Periodic monitoring of ambient air in the work area is necessary when screening has demonstrated an air contaminant source that may persist as a hazard to personnel. Periodic monitoring is also necessary when a new task has begun or a change in procedures has occurred. Periodic monitoring should be conducted using direct reading instrumentation to fully evaluate the work area. The HASP should provide information on which concentration, indicated as action levels, will trigger specific employee protection actions such as donning of respirators or evacuation of the work area.

6.2 Personal Exposure Monitoring

Personal exposure monitoring will be conducted whenever routine, real-time screening or periodic monitoring has determined that an action level requiring PPE upgrade has been reached. Personal worker exposure monitoring related to hazardous work activities will also be conducted whenever personnel voice concerns regarding hazardous substance exposure based on qualified symptoms confirmed by the SSC or documented by a physician.

Personal exposure monitoring may include both worker breathing zone and ambient work zone air. The monitoring should be conducted during each hazardous, task-specific activity. Samples can be collected to determine the 8-hour TWA or short-term exposures represented by the specific task at hand. Initial samples will be collected for workers with the highest likelihood of exposure. The number of initial determination samples will be determined by the SSC based on the extent and conditions of the new task-specific activity. Sampling may include survey or real-time monitoring with the PID or FID supplemented by filter cassette (for dusts and metals), sorbent tube (organics), and badge (organics) sampling media data. Colorimetric indicator tube readings can also be used.

Specific hazard exposure will be monitored on or around personnel engaged in unique work activities (such as electric arc welding, torch cutting or welding, and plastic pipe cement use) and where there exists a concern for exposure over an Occupational Safety and Health Administration (OSHA) permissible exposure limit.

6.3 Perimeter Monitoring

Perimeter monitoring needs will be determined by the SSC based on site and contaminant characteristics. Perimeter monitoring will be conducted during all active phases of a hazardous materials operation until sufficient documentation has established either no hazard or a constant known hazard level unlikely to change. Work zone perimeter monitoring may additionally involve any of the previously discussed passive, active, or real-time, or other specialized monitoring techniques as necessary, based on the SSC's determination.

6.4 Community Monitoring

Monitoring of nuisance dust, metals, and organics at the site perimeter may be necessary when hazardous activities likely to be a source of fugitive emissions are in progress. These samples will be taken at the site perimeter or just outside the perimeter downwind of work in progress. These samples will be taken using normal occupational exposure sampling strategies as discussed in Section 4.0.

To comply with requirements of the California Air Quality Control Regions defined in the Clean Air Act or with other state and local requirements, periodic high-volume sampling for dusts may need to be conducted at the site perimeter. The SSC may also use real-time aerosol monitoring as appropriate and within the requirements of applicable regulations.

7.0 AIR MONITORING DOCUMENTATION

All air monitoring data should be logged daily by the SSC in a field logbook or on forms developed for the project. All other documents (such as strip chart records or printouts from data logging instruments) will be collected and maintained with the monitoring records. All calibration- and instrument-related documentation will be maintained with the monitoring records. Chain-of-custody forms will accompany all analytical samples to the laboratory.

When personal exposure monitoring has been conducted, results will be documented and provided to the employees monitored. A copy of this information will also be filed in the employee's medical surveillance record.

All monitoring documents will be kept secure by the SSC for inclusion in the project file.

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Decontamination is the physical process of removing or neutralizing contaminants that have accumulated on personnel and equipment. The Tetra Tech, Inc. (Tetra Tech), decontamination program establishes proper decontamination procedures for site work to protect field personnel from hazardous materials and prevent the migration of chemicals from hazardous waste sites.

The levels and types of decontamination procedures required are based on site-specific factors, including the following:

- Chemical, physical, and toxicological properties of on-site wastes;
- Pathogenicity of infectious wastes;
- Potential for contaminant contact based on assigned worker duties, activities, and functions;
- Potential for wastes to permeate, degrade, or penetrate materials used for PPE, clothing, vehicles, tools, and instruments;
- Movement of personnel and equipment between different work zones;
- Emergencies;
- Methods available for protecting workers during decontamination; and
- Impact of the decontamination process and compounds on worker health and safety.

1.0 SCOPE

This program is an integral part of health and safety plan (HASP) development and implementation. Decontamination methods must be included in the HASP for all sites covered by the Occupational Safety and Health Administration (OSHA) standard for hazardous waste operation and emergency response (HAZWOPER) in Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.120.

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2.0 RESPONSIBILITIES

The operating unit health and safety manager (HSM) shall provide technical guidance to project managers and site safety coordinators (SSC) regarding appropriate decontamination procedures for a site. The project manager (PM) is responsible for ensuring that decontamination procedures are implemented on each project. The SSC will oversee and enforce the requirements of the decontamination program on site. Field personnel and subcontractors are required to adhere to the decontamination procedures specified in the site-specific health and safety plan (HASP).

HASP components related to decontamination, decontamination facility design, decontamination by commercial laundries or cleaning establishments, decontamination waste disposal methods, and decontamination during medical emergencies are discussed below.

3.0 HASP COMPONENTS

A decontamination plan is part of a HASP and is implemented before any personnel or equipment may enter areas where the potential for contact with hazardous substances exists. The decontamination plan should contain the following information:

- Number and layout of decontamination stations;
- Decontamination equipment needed;
- Appropriate decontamination methods;
- Procedures to prevent contamination of clean areas;
- Methods and procedures to minimize worker contact with contaminants during removal of personal protective equipment (PPE) and clothing; and
- Methods for disposing of clothing and equipment that are not completely decontaminated.

The decontamination plan should be revised as necessary to reflect changes in the type of PPE, site conditions, or site hazards.

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HASPs shall also contain procedures to minimize contact with and contamination by hazardous materials. The procedures should address the following:

- Decontamination should be performed in areas that will minimize exposure of uncontaminated employees or equipment;
- The level of protection worn by the decontamination crew in the decontamination plan;
- Appropriate decontamination procedures for all personnel leaving a contaminated area;
- Proper decontamination or disposal of all contaminated clothing and equipment;
- Proper decontamination or disposal of all equipment and solvents used for decontamination;
- Decontamination, cleaning, laundering, or replacement of protective clothing and equipment to maintain effectiveness;
- Decontamination of impermeable protective clothing that has contacted or is likely to have contacted hazardous material before removal;
- Immediate removal of permeable clothing that has becomes wet with hazardous substances and, if possible, showering of personnel; and
- Work sites requiring showers and change rooms must meet the requirements of Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.141, and "Sanitation".

4.0 DECONTAMINATION FACILITY DESIGN

Decontamination facilities are typically located within a contamination reduction zone (CRZ). Specific areas within the CRZ are typically designated as decontamination areas for personnel, equipment, machinery, and vehicles. The established area must have sufficient room to provide for full decontamination. The CRZ also should have marked entry and exit points and should control access into and out of the exclusion zone.

5.0 DECONTAMINATION BY COMMERCIAL LAUNDRIES OR CLEANING ESTABLISHMENTS

Any commercial laundries or cleaning establishments used by Tetra Tech to clean protective clothing or equipment shall be informed by the PM or SSC of the potentially harmful effects of exposure to hazardous substances.

6.0 DECONTAMINATION WASTE DISPOSAL METHODS

All decontamination equipment used must be decontaminated and disposed of properly. Buckets, brushes, clothing, tools, and other contaminated equipment should be collected, placed in containers, and labeled. Also, all spent solutions and wash water should be collected and disposed of properly. Clothing that is not completely decontaminated should be placed in plastic bags pending further decontamination and disposal. Collection and disposal methods should be specified in the HASP.

7.0 DECONTAMINATION DURING MEDICAL EMERGENCIES

In the event of an injury, the SSC must decide if decontamination of the victim is necessary or appropriate. Situations may arise when decontamination may aggravate the injury or when the injury is so serious that the victim should not be decontaminated. If the SSC decides that decontamination will not interfere with the necessary medical treatment, then protective clothing and equipment should be washed, rinsed, and removed.

In medical emergencies when decontamination cannot be performed, provisions should be made to minimize contamination of rescue personnel (for example, by wrapping the victim in blankets or plastic sheets). All rescue or emergency service personnel should be informed of the presence of contamination and the procedures required for decontamination. A designated on-site representative should accompany the victim to the emergency facility to provide information to the attending physician (such as Material Safety Data Sheets on the hazardous materials present at the site and other information as appropriate).

8.0 EVALUATING THE EFFECTIVENESS OF DECONTAMINATION

Each HASP shall include a plan for evaluating the effectiveness of decontamination. Some methods that may be used depending on site operations, site conditions, and contaminants, may include:

- Wipe sampling of equipment or protective clothing;
- Sampling of decontamination rinseate;
- Screening with monitoring equipment; or
- Visual evaluation of decontaminated equipment.

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This Traffic Work Zone Protection Program has been developed to provide for the safety of Tetra Tech employees when engaged in activities where they are exposed to vehicular traffic. The types of operations where employees and equipment are at risk include; surveying, construction, utility work, maintenance operations, environmental sampling and incident management operations. Protective measures such as work zone protection plans, high-visibility clothing; traffic control devices, pedestrian safety; flagger control and worker training are discussed in this safe work practice.

1.0 SCOPE

This SWP applies to all employees assigned to work where the primary work activity takes place in areas of vehicular traffic. Vehicular traffic includes the movement of passenger/commercial motor vehicles as well as construction-related vehicles and mobile equipment.

2.0 RESPONSIBILITIES

2.1. Project Engineer/Project Manager

Traffic work zone hazards shall be evaluated by the Project Manager prior to performing work in any roadway, highway or other area where vehicular traffic is of concern. Upon evaluation of project requirements, the Project Manager shall identify site specific controls to ensure conformance with the safe work practices outlined in this document.

2.2. Site Safety Coordinator

The Site Safety Coordinator shall communicate and enforce the site-specific work zone protection requirements of the project.

2.3. Employees

All employees assigned to work on projects covered by this safe work practice shall follow all safety precautions established. All employees shall immediately report any unsafe condition to their supervisor.

2.4. Operating unit Health and Safety Manager

The HSM shall ensure that this SWP has been communicated to effected engineers and employees. The HSM shall periodically audit compliance with this safe work practice.

3.0 PROGRAM ELEMENTS

Work zone protective measures should be an integral part of every project from planning, through design and construction. The primary function of these protective measures is to protect workers and equipment; and to provide for the safe and efficient movement of vehicles, bicyclists and pedestrians through or around projects that require temporary traffic control planning. The various elements that may be implemented include work zone protection plans, high visibility clothing, traffic control devices, pedestrian safety, flagger control, illumination, and worker training. Program element requirements are primarily adopted from the Department of Transportation Manual of Uniform Traffic Control Devices, (2003 Edition with Revisions No. 1 and 2 Incorporated) and other standard resources.

3.1. Work Zone Protection Plan

A work zone protection plan (WZPP) shall be developed for Tetra Tech projects where project activities may impact traffic and expose employees to moving vehicles. The WZPP must address traffic hazards and traffic controls that will meet the changing conditions on the site. The plan must address items such as accountability and coordination at the work site, flow of construction vehicles, equipment and workers at the site, work zone layout (i.e. warning area, signage, transition areas, and work-zone, buffer and termination zones), use of temporary traffic control devices, contact information and emergency response services.

Form- WZPP provides the basic format for this plan. This form or its equivalent in conjunction with city, state or client traffic control requirements shall be part of the work zone protection plan for the project. The work zone protection plan shall be developed prior mobilization and shall be signed and approved by the project engineer and site safety coordinator. The details of the plan shall be communicated to all site employees during the initial health and safety meeting.

In those cases where work falls under the scope of the OSHA HAZWOPER Standard, the elements of the work zone protection plan may be included in the OSHA required site specific Health and Safety Plan (HASP).

3.2. High Visibility Clothing

Employees working in the vicinity of traffic areas shall wear high visibility clothing that conforms to the ANSI/ISEA 107-1999 Standard. This standard specifies performance for materials and clothing design. It also classifies garments according to risk. The design principles for all classifications require that clothing must have 360-degree visibility and must have either an orange, red-orange, or yellow-green fluorescent background. The higher hazard classifications require greater areas of fluorescent background and retroreflective trim. The following presents the high visibility clothing requirements according to the ANSI defined conspicuity classes:

Class 1: Low Risk

This class includes work where the employee can give full and undivided attention to approaching traffic, there is ample separation of pedestrian workers and vehicle traffic, the background in not complex and vehicle/equipment speeds do not exceed 25 miles per hour (mph). Types of activities falling under this class include: directing vehicles to parking areas, sidewalk maintenance activities, sampling activities greater than 15 feet from the roadway, and activities conducted by warehouse workers and delivery vehicle drivers.

A class 1 vest may have a mesh inset and must be striped with retroreflective bands at least 1" wide.

Class 2: Medium Risk

This class includes work where greater visibility is desired due to inclement weather, complex backgrounds are present, employees perform tasks which divert attention from approaching traffic, vehicle/equipment exceeds 25 mph but is less than 50 mph and work activities take place in or near vehicle traffic. Types of activities include roadway construction, utility workers, survey crew, and environmental sampling activities within 15 feet of the roadway, as well as emergency response and accident site investigations.

A class 2 vest is completely constructed of high visibility material (no mesh insets), must be striped with retroreflective bands at least 1 3/8" wide, and will look different from front and back (typically the bands will cross in the back).

Class 3: High Risk

This classification covers work where employees are exposed to traffic travelling greater than 50 mph, or when the pedestrian worker and vehicle operator have high task loads. Class 3 activities include roadway construction, utility work, survey crew activities and emergency response activities.
A class 3 worker must be conspicuous through the full range of body motions at a minimum of a quarter mile and must be identifiable as a person. Class 3 conspicuity requirements cannot be met with a conventional vest alone and may include a jacket, coveralls and pants. Clothing must contain bands of retroreflective material at least 2" wide

3.3. Traffic Control Devices

Traffic control devices can be utilized to provide adequate warning, delineation, and channelization to assist road users in advance of and through temporary traffic control zones.

This can be accomplished by the proper use of signage, channeling devices, barricades, barriers, crash cushions and impact attenuators.

All temporary traffic control devices should be removed as soon as practical when they are no longer needed. When work is suspended for a short period of time, temporary traffic control devices that are no longer appropriate shall be removed or covered.

Chapter 6H of the MUTCD Manual provides specific traffic control applications for a variety of work zone situations. These applications shall be referred to and implemented as appropriate for the type of work being conducted. The MUTCD protective measures and work zone layout shall be included the temporary traffic control plan developed for the site.

The most common temporary traffic control devices used by Tetra Tech are discussed below.

3.4. Signage

Signage is used to warn and direct traffic. Size, color and shape are dictated by the Department of Transportation and approved signs can be found in Part 2 of the Federal Highway Administration "Standard Highway Signs" book. Signs must be placed between five and seven feet from the ground depending on location. Typically, warning signs in a temporary traffic control zone must have a black legend on an orange background.

Where road conditions permit, appropriate warning signs should be placed in advance of the temporary traffic control zone at varying distances depending on the type of roadway, condition, activity and posted speed. Section 6F.16 through 6F.51 and Table 6C-1 of the MUTCD contains guidance regarding the use and spacing of advance warning signs. Appendix A or web link.

3.5. Channelizing Devices

The function of channelizing devices is to warn road users of conditions created by work activities in or near the roadway and to guide road users through the temporary disruption. Channelizing devices include cones, tubular markers, panels, barricades and drums. They should be placed to separate traffic from the work zone, delineate pedestrian or bicycle paths or opposing directions of motor vehicle traffic. They also provide for smooth and gradual motor vehicle traffic flow from one lane to another, onto a bypass or detour, or into a narrower lane.

Channelization devices should be constructed and ballasted in such a way that they do not pose a hazard to workers or drivers if struck by a vehicle. The placement of the various types of channelization devices is discussed in the MUTCD manual Section 6F.55 through 6F.62 .

In areas where there is frequent fog, snow or severe road curvature, warning lights may be added to these devices.

3.6. Pedestrian safety

In addition to safety measures developed for worker and vehicular traffic, safety precautions shall be implemented for pedestrians that can be expected at the work site. Pedestrians should be provided with a safe and convenient path. Members of the public shall not be permitted to pass through Tetra Tech work zones at any time unless specific safety accommodations have been made. Accommodations include but are not limited to, advanced notice of sidewalk closures (signs placed at intersections to discourage midblock crossing), installation of suitable fencing of the work area, channelization of foot traffic using traffic control devices and caution tape and construction of a covered walkway to protect from falling debris.

Movement by work vehicles and equipment across designated pedestrian paths should be kept to a minimum. When crossing pedestrian paths is necessary, flaggers should control traffic. The staging or stopping of work vehicles or equipment shall not be permitted along the side of pedestrian paths.

Provisions for persons with disabilities shall also be given consideration.

3.7. Flagger Control

Traffic shall be coordinated through the use of flaggers in situations when alternative traffic management systems are not feasible. Flaggers may be required when traffic in both directions must use a single lane; traffic must be stopped during movement of equipment to and from the work zone, or any other operation where equipment will obstruct the free flow of traffic.

Flagging operations should only be performed by employees that have had adequate training in safe traffic control practices. They shall be stationed far enough from the work zone to slow down or stop traffic before they enter the work zone. All pre-warning signs shall be placed well in advance of the flagger as possible.

All flaggers shall wear high visibility clothing appropriate for the class of work conducted. A STOP/SLOW paddle shall be used to control road users through temporary traffic control zones. When flaggers are utilized, there must be a means to communicate between the supervisor of the operation and/or additional flaggers.

3.8. Illumination

Utility, maintenance, or construction activities on or near roadways may be conducted at night when traffic volumes are lower. When nighttime work is being performed, floodlights should be

used to illuminate the work area, flagger stations, equipment crossings and other areas as necessary. When floodlights are used they should not be placed in such a manner that they produce a glare or blinding condition for passing motorists. Researchers at the University of Florida have developed illumination guidelines for nighttime work. They are as follows:

Category 1
For large-scale visual tasks with comparatively low need for accuracy the general illumination for the required work zone shall be a minimum of 5 foot-candles.

Category 2
For work conducted around machinery and requires a greater level of accuracy, a minimum of 10 foot-candles shall be provided.

Category 3
In situations that require extreme caution and attention such as flagging or signaling operations, a minimum of 20 foot-candles shall be provided.

3.9. Safety Training

Workers assigned to work in areas of vehicular traffic shall receive information and training on how to work next to motor vehicle traffic in a way that minimizes their risk. Employees with specific traffic control responsibilities should be trained in temporary traffic control techniques, device usage, and placement.

The work zone protection plan shall be reviewed with all employees prior to mobilization on site. Specific safety measures to be implemented shall be reviewed.

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Appendix A
FORM WZPP (Work Zone Protection Plan)

Tetra Tech Operating Unit	**Project Name**
Proposed Dates and Time of Scheduled Work	**Project Number**
Description of Project Provide a brief description of the scope of work, identifying major job/operations that will be conducted. Include the number of personnel expected on site and types of equipment that will be used.	
Describe Work Zone Provide names of effected roadways, physical characteristics, including the correct number of lanes, turn lanes, pavement markings, parking lanes, medians, traffic islands, posted speed limits as well as all intersecting streets and affected sidewalks within the proposed work zone. Attached detailed drawings.	
Work Zone Protective Measures Identify and provide for specific locations for all traffic control devices (i.e. signs, cones, tubular markers, flaggers etc.) Refer to specific MUTCD traffic control applications set forth in Part 6 of the MUTCD Manual. Attach copy of MUTCD work zone set up.	
Name and Location of Nearest Emergency Medical Facility	
Contacts	
Project Manager	Phone
Client Representative	Phone
Site Safety Coordinator	Phone

Approvals		
Project Manager	Signature	Date
Site Safety Coordinator	Signature	Date

This program outlines minimum requirements to protect employees who may be exposed to hazards during trenching and excavation activities and to provide general guidance for compliance with Title 29 of the *Code of Federal Regulations* (CFR), Part 1926, Subpart P, "Excavations."

1.0 SCOPE

This program and procedures applies to all sites and activities involving excavation or trenching as defined in 29 CFR 1926 Subpart P.

2.0 RESPONSIBILITIES

Project managers (PMs) shall ensure that all excavation, shoring, and trenching activities are conducted in accordance with the requirements outlined in this document and Subpart P of 29 CFR 1926. Project managers must also ensure that projects involving trenching and excavation are staffed by an individual trained and qualified to perform "competent person" duties as described in this procedure. Operating unit health and safety managers (HSMs) will provide assistance to PMs in implementing this SWP.

The site safety coordinator (SSC) is responsible for on-site enforcement of this SWP.

3.0 DEFINITIONS

The following definitions apply to this SWP:

Benching: Forming one or a series of horizontal levels or steps in the sides of an excavation to protect employees from cave-ins.

Competent Person: One capable of identifying existing or predictable hazards in the work environment that are unsanitary or dangerous to employees and who has authorization to take prompt corrective measures to eliminate the hazards.

Excavation: Any manmade cut, cavity, trench, or depression in an earth surface formed by earth removal.

Shoring: Metal, hydraulic, mechanical, or timber system that supports the sides of an excavation and that is designed to prevent cave-ins.

Sloping: Sloping the sides of an excavation at an incline away from the excavation to protect employees from cave-ins.

Trench: A narrow excavation (in relation to its length) that is usually deeper than it is wide but less than 15 feet wide.

4.0 PROCEDURES

Described below are the general safety requirements and protective system requirements for trenching and excavation activities.

4.1 General Safety Requirements

General safety requirements that must be in place before work begins are as follows:

- Utility companies or a utilities locating service in the area must be notified **before excavation or trenching activities begin** to arrange for locating and protecting underground utilities.
- Access to trenching areas must be controlled and limited to authorized personnel. Prior to entering a trench or excavation, workers must notify the project manager, SSC, and nearby equipment operators whose activities could affect the trench or excavation.
- No person may enter a trench or work at the foot of the face of an excavation until a qualified, competent person has inspected the excavation and determined whether sloping or shoring is required to protect against cave-in or subsidence and the appropriate protection has subsequently been installed.
- Trenches and excavations must be assessed by a qualified, competent person, even in the absence of working personnel, whenever heavy equipment will be operating nearby in order to ensure that the trench or excavation will support the weight of the equipment without subsistence or causing the accidental overturning of machinery.

- Trenches and excavations must be inspected regularly (daily at a minimum) to ensure that changes in temperature, precipitation, shallow groundwater, overburden, nearby building weight, vibration, or nearby equipment operation have not caused weakening of the sides, faces, and floors and to ensure that personnel protection is being maintained. Form TEC – Trenching and Excavation Checklist or its equivalent is to be used to document inspections.

- When subsidence or tension cracks are apparent anywhere in an excavation, all work should be stopped until the problem is corrected.

- The competent person must inspect trenches or excavations after any precipitation event to ensure integrity has been maintained.

- Sufficient ramps or ladders must be provided in excavations 4 or more feet deep to allow quick egress. Ramps or ladders may be placed no more than 25 feet apart, must be secured from shifting, and must extend at least 3 feet above the top of the trench or excavation. Structural ramps must be designed by a competent person.

- Material removed from an excavation or trench must be placed far enough from the edge (at least 2 feet) to prevent it from sliding into the excavation or trench or from stressing the trench or excavation walls. Worker protection must also be provided from loose rock or soil on the excavation faces.

- If trenches or excavations are near walkways or roadways, guards or warning barriers must be placed to alert pedestrians and drivers of the presence of the trench or excavation.

- If possible, trenches or excavations should be covered or filled in when unattended. Otherwise, strong barriers must be placed around the trench or excavation and lighting must be provided at night if the trench or excavation is near a walkway or roadway.

- When a hazardous atmosphere could exist, the excavation must be tested for appropriate hazardous substances and oxygen level before personnel entry. Excavation where hazardous atmospheres exist must be treated as a confined space. Entry must follow procedures outlined in “Confined Spaced Entry Program,” Document Control No. 2-5.

- Entry is not allowed into excavations where water has accumulated.

4.2 Protective System Requirements

Protective systems protect employees from cave-ins, material that could fall in or roll off the face of the excavation, and collapse of adjacent structures. Protective systems include shoring, shielding, sloping and benching, and other systems. Sloping and benching and shoring system requirements are described below.

4.2.1 Sloping and Benching Requirements

Sloping and benching system construction must follow the guidelines established in Appendix B to Subpart P of 29 CFR 1926. Maximum allowable slopes for excavations are summarized below. All slopes indicated are expressed as the ratio of horizontal distance (H) to vertical rise (V).

Soil or Rock Type	Maximum Allowable Slope (H:V) for Excavations Less than 20 Feet Deep
Stable Rock	Vertical (90°)
Type A	0.75:1 (53°)
Type B	1:1 (45°)
Type C	1.5:1 (34°)

Soil types are defined in Appendix A to Subpart P of 29 CFR 1926 and are summarized below.

Type A: Cohesive soils with an unconfined compression strength of 1.5 tons per square foot (ton/ft^2) or greater (such as clay, silty clay, sandy clay, or clay loam)

Type B: Cohesive soils with unconfined compression strength of greater than 0.5 but less than 1.5 ton/ft^2 (such as angular gravel, silt, silt loam, or sandy loam)

Type C: Cohesive soils with an unconfined compression strength of less than 0.5 ton/ft^2 (such as gravel, sand, loamy sand, submerged soil, or unstable submerged rock)

Sloping and benching for excavations greater than 20 feet deep must be designed by a registered professional engineer.

Soil types must be determined by the competent person using at least one visual and one manual test. Manual tests include plasticity, dry strength, thumb penetration, and drying tests.

4.2.2 Shoring System Requirements

Appendixes C, D, and E to Subpart P of 29 CFR 1926 outline requirements for timber shoring for trenches, aluminum hydraulic shoring for trenches, and alternatives to timber shoring, respectively. Guidelines for shoring systems are listed below.

- If it is not economically feasible or there are space restrictions to prevent cutting the trench or excavation walls back to a safe angle of repose, all trenches or excavations 5 feet deep or more must be shored.
- Shoring should be erected as trenching or excavation progresses and as closely as possible to the excavation floor.
- Shoring timber dimensions must meet the minimum timber requirements specified in Tables C1.1 through C1.3 of Appendix C to Subpart P 29 CFR 1926. Aluminum hydraulic shoring must be constructed using the guidelines and dimension requirements specified in Appendix D of the same standard.
- Trench shields may be used instead of shoring or bracing. Shields must be constructed of steel flat sides welded to a heavy framework of structural pipe. Shields should be moved along by the excavator as trenching or excavation proceeds.

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	TETRA TECH, INC. TRENCHING AND EXCAVATION CHECKLIST	Revision Date: 10/1/2008 Document Control Number: DCN 4-05 F Page 1 of 2

This document has been developed to ensure that potential hazards associated with trenching and excavation operations are identified, evaluated, and that proper hazard controls are implemented onsite. This document must be used for all trenching or excavation work lasting for more than three days in length. Regardless of project duration, a daily inspection is required of all excavations, adjacent areas and protective systems. Documentation of this inspection must be maintained in the project log. The information in this document should be reviewed with all employees prior to commencing site operations.	
Date:	Project Name:
Location:	Foreman:
Competent Person:	Competent Person Signature:
Scope of Work:	

Soil and Site Condition (respond to each item listed)			
Class	❒ A	❒ B	❒ C
Determined By	❒ Visual Test	❒ Manual Test	❒ Penetrometer
Soil Layered	❒ Yes	❒ No	❒ NA
Zones of weak soils or fractured planes in material	❒ Yes	❒ No	❒ NA
Evidence of shrinkage cracks in or on trench walls	❒ Yes	❒ No	❒ NA
Evidence of possible cave in or slide	❒ Yes	❒ No	❒ NA
Vibration	❒ Yes	❒ No	❒ NA
Previously disturbed soil	❒ Yes	❒ No	❒ NA
Previous rain/snow	❒ Yes	❒ No	❒ NA

Protection Methods (indicate protection method selected)			
Slope	❒ Yes	❒ No	❒ NA
Horizontal : Vertical			
Bench system	❒ Yes	❒ No	❒ NA
Trench shoring	❒ Yes	❒ No	❒ NA
Trench box	❒ Yes	❒ No	❒ NA
Shield system	❒ Yes	❒ No	❒ NA
Other			
Describe			

Hazard Assessment	Hazard Control			
Underground Utilities				
	Underground utilities located and marked	❒ Yes	❒ No	❒ NA
	Locate tickets onsite	❒ Yes	❒ No	❒ NA
Exposure to Falling Loads, Heavy Equipment or Loose Rock				
	Restricted access while excavating or lifting material	❒ Yes	❒ No	❒ NA
	Warning system for mobile equipment near excavation edge	❒ Yes	❒ No	❒ NA
	Barricades	❒ Yes	❒ No	❒ NA
	Cones	❒ Yes	❒ No	❒ NA
	Hand signals	❒ Yes	❒ No	❒ NA
	Stop logs	❒ Yes	❒ No	❒ NA
	Excavation scaling	❒ Yes	❒ No	❒ NA
	Material and spoils storage at least 2 feet from edge	❒ Yes	❒ No	❒ NA
Exposure to Vehicular Traffic				
	Traffic Control Plan	❒ Yes	❒ No	❒ NA
	Work Zone Protection	❒ Yes	❒ No	❒ NA
	High Visibility Clothing	❒ Yes	❒ No	❒ NA
Access and Means of Egress				
	Means of egress (ladder or other means) at no more than 25 feet of travel distance	❒ Yes	❒ No	❒ NA
	Ladder extends 3 feet beyond surface of trench	❒ Yes	❒ No	❒ NA
Hazardous Atmospheres				
Oxygen Concentration < 19.5%	Confined Space Entry Procedures Required Implement Ventilation	❒ Yes	❒ No	❒ NA
Toxic Gases approaching permissible exposure limits	Confined Space Entry Procedures Required Implement Ventilation	❒ Yes	❒ No	❒ NA
Flammable Atmosphere > 20% LEL of flammable gas	Confined Space Entry Procedures Required Implement Ventilation	❒ Yes	❒ No	❒ NA
	Respiratory Protection	❒ Yes	❒ No	❒ NA
Exposure to Water Accumulation				
	Increase frequency of competent person inspections and monitoring	❒ Yes	❒ No	❒ NA
	Water removal system in place	❒ Yes	❒ No	❒ NA
Exposure to Falls > 6 feet				
	Provide walkways with guardrails	❒ Yes	❒ No	❒ NA
Undermined Adjacent Structures i.e. buildings, pavement, walls, sidewalks				
	Competent Person inspection	❒ Yes	❒ No	❒ NA
	Bracing and support provided to protect structures from undermining the undercuts	❒ Yes	❒ No	❒ NA

This safe work practice (SWP) has been prepared to address health and safety issues associated with haulage and earth moving at construction work sites. This SWP has been prepared to supplement a construction site health and safety plan (C-HASP).

1.0 APPLICABILITY

This SWP shall apply to all projects which involve hauling and earth moving activities. The project manager (PM) shall ensure application and adherence to this SWP. This SWP may be used as an attachment to a Tetra Tech Construction Health and Safety Plan (C-HASP).

2.0 HAULAGE AND EARTH MOVING

Haulage and earth moving requirements provided in this section are based on Article 10 of the California Construction Safety Orders. General, construction and maintenance, warning methods, operation, fueling, repair, and rollover protective structure requirements are defined in the following sections.

2.1. General Requirements

The following sections describe general requirements for haulage and earth moving on private roadways and off-highway conditions, dust control, equipment control, exhaust, and heat shields in the State of California. These requirements are based on CCR Title 8 Section 1590.

2.1.1 Private Roads and Off-Highway Condition

On single-lane private roads with two-way traffic shall be provided with turnouts. Where turnouts are not practicable, a control system shall be provided to prevent vehicles from meeting on such single-lane roads.

On private roads used for two-way traffic, arrangements shall be such that vehicles travel on the right side as much as possible. Signs shall be posted to clearly indicate variations from this system. Where practicable, separate haulage roads shall be provided between loaded and empty units. Haulage roads shall be wide enough to allow for safe passage. Safe distances between moving units shall be maintained.

NOTE: Left hand traffic patterns are permitted provided that vehicle operators are advised of the pattern and job site conditions warrant that the procedure is safe.

Private roads shall be maintained free from holes and ruts that affect the safe control of the vehicle. Emergency access ramps and berms used by an employer shall be constructed to restrain and control runaway vehicles.

Where a hazard exists to employees because of traffic or haulage conditions, a system of traffic controls shall be required so as to abate the hazard.

NOTE: Nothing in this SWP shall preclude the use of additional signs that are not included in the "Manual of Traffic Controls for Construction and Maintenance Work Zones". Examples include the following: "Haul Road," "Left Hand Pattern," "Scraper Crossing," etc.

Employees, such as grade-checkers, surveyors and others exposed to vehicular traffic, shall wear flagging garments, or equivalent, as required for flaggers in Document Control Number (DCN) 4-4 "Vehicle Use, Traffic Control, and Flaggers".

2.1.2 Dust Control

Action shall be taken to prevent dust from seriously reducing visibility. In dusty operations, equipment operators shall use adequate respiratory protection in accordance with the Tetra Tech Respiratory Protection Program (DCN 2-6).

2.1.3 Equipment Control.

Equipment shall be under control at all times and shall be kept in gear when descending grades.

No vehicle shall be driven at a speed greater than is reasonable and proper. Vehicles shall be operated with due regard for weather, traffic, intersections, width and character of the roadway, type of motor vehicle, and any other existing conditions.

2.1.4 Exhaust

Arrangements shall be made to direct exhaust gases away from the operator's breathing zone.

2.1.5 Heat Shields

When push-tractors are working in tandem, heat shields, or equivalent protection, shall be provided for operators.

2.2 Construction and Maintenance Requirements

The construction and maintenance requirements for haulage vehicles and equipment are listed below:

Windshields: Windshields complying with the applicable provisions of the state vehicle code shall be provided and maintained on haulage vehicles and scrapers.

Equipment and Accessories: Equipment and accessories installed on haulage vehicles shall be arranged so as to avoid impairing the driver's operational vision to the front or sides.

Brakes: Service brake systems for self-propelled, rubber-tired, off-highway equipment manufactured before January 1, 1972 (for scrapers January 1, 1971) shall meet minimum performance criteria for service brake systems as set forth in the Society of Automotive Engineers Recommended Practices listed below. Service, emergency and parking brake systems for self-propelled, rubber-tired, off-highway equipment manufactured after January 1, 1972 (for scrapers January 1, 1971) shall meet the applicable minimum performance criteria for each system as set forth in the same Society of Automotive Engineers Recommended Practices:

Self-Propelled Graders	SAE J236-1971
Trucks and Wagons	SAE J166-1971
Front-End Loaders and Dozers	SAE J237-1971
Self-Propelled Scrapers	SAE J319b-1971

Note: Equipment that meets the performance criteria of SAE Recommended Practice J1152-APR 1980, Braking Performance—Rubber-Tired Construction

Machines, satisfies the requirements of this Section.

Air Tank Service: Liquids should be drained automatically from vehicle's compressed air tanks, but if such automatic equipment is not provided, the tanks shall be drained manually at least once each operating shift.

Cab Shield: Haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

Fenders complying with the following standards from SAE Recommended Practice J321, November, 1967 or J321b April, 1978, shall be provided on new scrapers, carryalls, related power units, and trailed hauling units manufactured and placed into service after January 1, 1971.

Lights: Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition.

Canopy: Crawler tractors, bulldozers, carryalls and similar equipment manufactured and used prior to April 1, 1971, except for scrapers, front-end loaders and new equipment covered by 1596, shall have canopy protection and seat belts for the operator when used where there is exposure to falling or rolling objects.

Operating Levers: Operating levers controlling hoisting or dumping devices on haulage bodies shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.

Trip Handles: Trip handles for tailgates of dump trucks shall be so arranged that in dumping, the operator will not be exposed either to the hazard of being struck by failing material or any part of the truck.

Dump Bodies: Haulage vehicles equipped with dump bodies that tilt to release their load by gravity through an opening at the rear or side shall be provided with a device that gives the operator a clearly audible or visible warning when sufficient force is applied by the elevating

mechanism to cause or sustain dump body elevation.

Hazard Signals: Tractor-scrapers (self-propelled) pushed by other equipment during loading operations shall be provided with a clearly audible or visible warning device that can be activated by the operator of the tractor-scraper to communicate an "ALL STOP" warning to the pushing equipment in event of an emergency.

2.3 Warning Methods

Every vehicle with a haulage capacity of 2 ½ cubic yards or more used to haul dirt, rock, concrete, or other construction material shall be equipped with a warning device that operates automatically while the vehicle is backing. The warning sound shall be of such magnitude that it will normally be audible from a distance of 200 feet and will sound immediately on backing. In congested areas or areas with high ambient noise which obscures the audible alarm, a signaler, in clear view of the operator, shall direct the backing operation.

Those vehicles not subject to the above circumstances and operating in areas where their backward movement would constitute a hazard to employees working in the area on foot, and where the operator's vision is obstructed to the rear of the vehicle shall be equipped with an effective device or method to safeguard employees such as:

- An automatic back-up audible alarm which would sound immediately on backing, or
- An automatic braking device at the rear of the vehicle that will apply the service brake immediately on contact with any obstruction to the rear, or In lieu of the above, administrative controls shall be established such as:
- A spotter or flagger in clear view of the operator who shall direct the backing operation, or
- Other procedures which will require the operator to dismount and circle the vehicle immediately prior to starting a back-up operation, or
- Prohibiting all foot traffic in the work area.

Other means shall be provided that will furnish safety equivalent to the foregoing for personnel working in the area.

All vehicles shall be equipped with a manually operated warning device which can be clearly heard from a distance of 200 feet.

The operator of all vehicles shall not leave the controls of the vehicle while it is moving under its own engine power.

Hauling or earth moving operations shall be controlled in such a manner as to ensure that equipment or vehicle operators know of the presence of rootpickers, spotters, lab technicians, surveyors, or other workers on foot in the areas of their operations.

2.4 Haulage Vehicle Operation

Vehicles shall not be operated at speeds which will endanger the driver or traffic.

Haulage vehicles shall be under positive control during all periods of operation. When descending grades, the vehicles shall be kept in gear.

When wire rope is being wound on a power-driven drum, a mechanical threading device shall be used, where practicable, to guide the cable. When this operation must be done manually, the feet shall not be used and the hands shall be kept at least 3 feet from the drum.

All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use:

- Service brakes, including trailer brake connections;
- Parking system (hand brake);
- Emergency stopping system (brake);

- Tires;
- Horn;
- Steering mechanism;
- Coupling devices;
- Seat belts;
- Operating controls; and
- Safety devices.

All defects affecting safe operation shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, and such where such equipment is necessary.

Exhaust Gases: Vehicle engines shall not be allowed to run in closed garages or other enclosed places, unless vents are provided which effectively remove the exhaust gases from the building.

Unstable Loads: Loads on vehicles shall be secured against displacement.

Tire Repair: Except for emergency field repairs, a safety tire rack, cage, or equivalent protection shall be used when inflating truck or equipment tires after mounting on a rim, if such tires depend upon a locking ring or similar device to hold them on the rim.

Parking Brakes: Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set or be otherwise prevented from moving by effective mechanical means.

Scissor points on all front-end loaders which constitute a hazard to the operator shall be adequately guarded.

A loader shall not travel without adequate visibility for the driver and stability of the equipment.

No loading device shall be left unattended until the load or bucket is lowered to the ground, unless proper precautions such as blocking are taken to prevent accidental lowering.

All high lift trucks (e.g., forklifts), industrial trucks, and rider trucks used on a construction site shall conform with the applicable orders in Article 25 of the General Industry Safety Orders and shall meet the following requirements:

- If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.

- Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering hand wheel to spin. The steering knob shall be mounted within the periphery of the wheel.

- Loading buckets, scoops, blades or similar attachments on haulage vehicles shall not be used as work platforms or to elevate or transport employees.

2.5 Fueling

No internal combustion engine fuel tank shall be refilled with a flammable liquid while the engine is running. Fueling shall be done in such a manner that the likelihood of spillage is minimal. *If a spill occurs it shall be washed away completely, evaporated, or equivalent action taken to control vapors before restarting the engine.* Fuel tank caps shall be replaced before starting the engine.

A good metal-to-metal contact shall be kept between fuel supply tank or nozzle of supply hose and the fuel tank.

No open lights, welding, or sparking equipment shall be used near internal combustion equipment being fueled or near storage tanks.

No smoking shall be permitted at or near the gasoline storage area or on equipment being fueled. Post a conspicuous sign in each fuel storage and fueling area stating: "**NO SMOKING WITHIN 25 FEET**."

Class I liquids shall not be dispensed by pressure from drums, barrels, and similar containers. Approved pumps taking suction through the top of the container or approved self-closing faucets shall be used.

No repairs shall be made to equipment while it is being fueled.

Each fuel storage tank or drum shall have the word "Flammable" conspicuously marked thereon and should also have a similarly sized word indicating the contents of the container.

A dry chemical or carbon dioxide fire extinguisher rated 6:BC or larger shall be in a location accessible to the fueling area.

2.6 Repair of Haulage Vehicles, Tractors, Bulldozers and Similar Equipment

No repairs shall be attempted on power equipment until arrangements are made to eliminate possibility of injury, caused by sudden movements or operation of the equipment or its parts. When the equipment being repaired is a bulldozer, carryall, ripper, or other machine having sharp or heavy moving parts such as blades, beds, or gates, such parts shall be lowered to the ground or securely and positively blocked in an inoperative position.

All controls shall be in a neutral position, with the engine(s) stopped and brakes set, unless work being performed requires otherwise.

Trucks with dump bodies shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done. In all cases where the body is raised for any work, the locking device shall be used.

2.7 Roll-Over Protective Structures (ROPS)

Requirements for ROPS are based on CCR Title 8 Section 1596 and are described in the following subsections.

2.7.1 General Requirements

ROPS and seat belts shall be installed and used on all equipment listed below:

- Scrapers, tractors, front-end loaders, bulldozers, motor graders and water wagon prime movers having brake horsepower ratings above 20. The provisions of this section do not apply to non-rider equipment.

Exceptions to this section include the following:

- Side boom, pipe-laying tractors.
- An operator restraining system, acceptable to the Division, shall be permitted to be used in lieu of the required seat belts on motor graders not designed for seated operations.
- ROPS or seat belts shall not be required for the equipment identified in above when loading/unloading from transportation vehicles on relatively flat surfaces.
- Rollers and compactors having a weight greater than 5,950 pounds.
- Rollers or compactors having segmented and/or sheepsfoot-type wheels or drums.

All rollers and compactors when operating under any of the following conditions:

- Parallel to and within 3 feet of a down slope steeper than 3 feet horizontal to 1 foot vertical, or
- Within 3 feet of a vertical or nearly vertical drop-off exceeding 1 foot in height, or
- On any grade exceeding 15 percent (10 feet horizontal to 1½ feet vertical)

2.7.2 ROPS Design Criteria

ROPS shall be in compliance with or equivalent to SAE Recommended Practice J-1040-a,

February, 1975, for equipment manufactured on or after April 1, 1971, or J1040c, April, 1979.

2.7.3 Overhead Protection

ROPS shall provide operator protection against the hazard of falling objects.

2.7.4 Retrofit Design Criteria

The basic design criteria for retrofit ROPS used on scrapers, tractors, front-end loaders, bulldozers, motor graders and water wagon prime movers manufactured prior to April 1, 1971, and for rollers and compactors manufactured prior to July 1, 1977 must meet the requirements defined in Section 1596(d).

2.7.5 Seat Belts

Seat belts shall be adequate for the intended service and in good repair. Belts shall meet the following requirements, which parallel those of SAE Recommended Practice J-386-a, November, 1973, and the applicable provisions of SAE Recommended Practice, J-4-c, July, 1965. The following requirements apply:

Adjustment: The seat belts shall be capable of snug adjustment by the occupant by a means easily within his reach or shall be provided with an automatic locking or emergency locking retractor.

Marking: Each seat belt shall be permanently and legibly marked or labeled with year of manufacture, model or style number and name or trademark of manufacturer or distributor, or of the importer if manufactured outside of the United States. Marking should also include indication of compliance with SAE Recommended Practice J-386-a, November, 1973.

Stiffness: To minimize "roping," the seat belt webbing shall be woven and/or treated to produce a stiffness in the transverse direction equal to or greater than that obtained with a weave of double plain with one up, one down binder, without stuffers. This stiffness shall be effective for the usable life of the webbing. The webbing shall be flexible in the longitudinal direction to permit adjustment to -40°F.

Material: The seat belt webbing material shall have a resistance to acids, alkalis, mildew,

aging, moisture and sunlight equal to or better than that of untreated polyester fiber. The webbing shall not be less than three (3) inches in width; its ends shall be protected or treated to prevent unraveling and the breaking strength shall be at least 6,000 pounds.

Release: The seat belt buckle shall be designed so that it can be easily released with a single motion. It shall also be capable of being released with either available mittened hand.

Closure: The seat belt buckle shall be designed so that it can be easily closed with mittened hands.

Location: When a two-piece belt is used, the adjustment means shall be on each half of the belt to allow for the centering of the buckle on the operator.

Operation: Each adjustment shall be capable of being made with the use of one mittened hand.

Tests: A typical complete seat belt assembly, including webbing, straps, buckles, adjustment and attachment hardware, and retractors, shall be capable of passing the following destructive tests:

- The assembly loop shall withstand, without failure, a force of not less than 5,000 pounds and each structural component of the assembly a force of not less than 2,500 pounds.
- The length of the assembly loop between anchorages shall not increase more than 14 inches and each half of the assembly loop shall not increase more than 7 inches when subjected to a force of 5,000 pounds.
- Any webbing cut by the hardware during testing shall have a breaking strength at the cut of not less than 4,200 pounds.
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Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	Update from 1998 format

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HASP MSDS

GRAINGER
FOR THE ONES WHO GET IT DONE

Close this window

MSDS

Common Name: DAYTON MULTI-PURPOSE CUTTING OIL 6Z150

Manufacturer: MORAINE OIL

MSDS Revision Date: 8/1/1990

Grainger Item Number(s): 6Z149

Manufacturer Model Number(s): INACTIVE

MORAINE OIL SALES, INC., 1212 W. Second Street, Oconomowoc, Wisconsin 53066
414/5677-7523
W.W. Grainger, Inc., 333 Knightsbridge Pkwy, Lincolnshire, IL 60069
708/913-7400
6Z149

Revision date: August 1, 1990
PRODUCT TRADE NAME; Dayton Multi-Purpose Cutting CAS# 64742650
Oil #6Z150
TRANSPORTATION EMERGENCY PH NO: 414/567-7523
NFPA CODE: Health: 0 Fire: 1 Reactivity: 0
Petroleum Lubricating Mineral
Oil range % 95.00 - 99.99
Additive: Proprietary

SECTION 1 - HAZARDOUS INGREDIENTS

- This material does not contain any chemical listed as a carcinogen or potential carcinogen by OSHA, IARC Monographs or National Toxicology Program.
= 2SF34 =
- None

SECTION 2 - FIRE AND EXPLOSION HAZARDS

FLASH POINT: 390 F
UPPER FLAMMABLE LIMIT: Not Determined LOWER FLAMMABLE LIMIT: Not Determined
EXTINGUISHING MEDIA: CO2, dry chemical, foam, water spray; water fog
SPECIAL FIREFIGHTING PROCEDURES: Wear self-contained breathing apparatus with full face piece
UNUSUAL FIRE & EXPLOSION HAZARDS: None

SECTION 3 - HEALTH HAZARD DATA

ORAL TOXICITY: Greater than 5000 mg/kg in rats. Based on data from

components
EYE IRRITATION: Not expected to cause eye irritation. Based on data from components
SKIN IRRITATION: Not expected to cause skin irritation. Based on data from components
OTHER: Unknown TLV: None established. Oil mist = 5 mg/cu meter

Emergency First Aid Procedures
SKIN: Wash with soap & water EYE: Flush with water for 15 minutes
INHALATION: Remove to fresh air. See physician if irritation persists
ORAL: Call a physician. DO NOT induce vomiting. ADDITIONAL: None

SECTION 4 - SPECIAL PROTECTION INFORMATION

VENITTATION PROCEDURE: Mechanical ventilation recommended.
EYE PROTECTION: Safety Glasses
GLOVES PROTECTION: Neoprene or nitrile rubber gloves recommended
OTHER PROTECTION: None

SECTION 5 - PHYSICAL DATA

VAPOR PRESSURE: Not Determined pH; Not determined
SPECIFIC GRAVITY: 0.875 WATER SOLUBILITY: In soluble
PRECENT VOLATILE: Not Determined
VAPOR DENSITY: Not Determined EVAPORATION RATE: Not Determined
ODOR: Mild
APPEARANCE: Amber Liquid

SECTION 6 - STABILITY

STABILITY; Stable INCOMPATIBILITY: Oxidizing agents
POLYMERIZATION: Will not occur
THERMAL DECOMPOSITION: Oxides of carbon

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL PROCEDURES: Prevent entry into sewers and waterways. Pick up free liquid for recycle/disposal. Absorb small amounts on inert material for disposal.
WASTE DISPOSAL: If disposal of, this material is believed to be non-hazardous. Disposal should be in compliance with federal, state and local laws.

SECTION 8 - SPECIAL PRECAUTIONS

SPECIAL PRECAUTIONS: Remove contaminated clothing and launder before reuse.

SECTION 9 - TRANSPORTATION AND LABELING

DOT PROPER SHIPPING NAME: Not Applicable
DOT HAZARD CLASS: Not Applicable DOT ID NUMBER: None
IMO CLASS: None ICAO CLASS: None EPA HAZARDOUS SUBSTANCES: None
PRECAUTIONARY LABELS: None

The information presented herein has been compiled from sources considered to be dependable and is accurate to the best of Moraine Oil Sales' knowledge; however, Moraine makes no warranty whatsoever, expressed or implied, of MERCHANITABILITY or FITNESS FOR THE PARTICULAR PURPOSE, regarding the accuracy of such data or the results to be obtained from the use thereof. Moraine assumes to responsibility for injury to recipient or to third persons or for any damage to any property and recipient assumes all such risks.

Monsanto
Material Safety Data

POLYCHLORINATED BIPHENYLS (PCBs)

Emergency Phone No.
(Call Collect)
314-694-1000

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: POLYCHLORINATED BIPHENYLS (PCBs)
Aroclor® Series 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268
Therminol® FR Series

MSDS Number: M00018515 Date: 12/95

Chemical Family: Chlorinated Hydrocarbons
Chemical Name: Polychlorinated biphenyls
Synonyms: PCBs, Chlorodiphenyls, Chlorinated biphenyls

Trade Names/Common Names:

PYRANOL® and INERTEEN® are trade names for commonly used dielectric fluids that may have contained varying amounts of PCBs as well as other components including chlorinated benzenes.

ASKAREL is the generic name for a broad class of fire resistant synthetic chlorinated hydrocarbons and mixtures used as dielectric fluids that commonly contained about 30 - 70% PCBs. Some ASKAREL fluids contained 99% or greater PCBs and some contained no PCBs.

PYDRAUL® is the trade name for hydraulic fluids that, prior to 1972, may have contained varying amounts of PCBs and other components including phosphate esters.

The product names/trade names are representative of several commonly used Monsanto products (or products formulated with Monsanto products). Other trademarked PCB products were marketed by Monsanto and other manufacturers. PCBs were also manufactured and sold by several European and Japanese companies. Contact the manufacturer of the trademarked product, if not in this listing, to determine if the formulation contained PCBs.

In 1972, Monsanto restricted sales of PCBs to applications involving only closed electrical systems, (transformers and capacitors). In 1977, all manufacturing and sales were voluntarily terminated. In 1979, EPA restricted the manufacture, processing, use, and distribution of PCBs to specifically exempted and authorized activities.

MONSANTO COMPANY, 800 N. LINDBERGH BLVD., ST. LOUIS, MO 63167

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT
Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands. For calls originating elsewhere: 202-483-7616 (collect calls accepted)

For additional nonemergency information, call: 314-694-3344.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemically, commercial PCBs are defined as a series of technical mixtures, consisting of many isomers and compounds that vary from mobile, oily liquids to white crystalline solids and hard noncrystalline resins. Technical products vary in composition, in the degree of chlorination, and possibly according to batch.

The mixtures generally used contain an average of 3 atoms of chlorine per molecule (42% chlorine) to 5 atoms of chlorine per module (54% chlorine). They were used as components of dielectric fluids in transformers and capacitors. Prior to 1972, PCB applications included heat transfer media, hydraulic, and other industrial fluids, plasticizers, carbonless copy paper, paints, inks, and adhesives.

Component	CAS No.
chlorinated biphenyl	1336-36-3
Aroclor 1016	12674-11-2
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1242	53469-21-9
Aroclor 1248	12672-29-6
Aroclor 1254	11097-69-1
Aroclor 1260	11096-82-5
Aroclor 1262	37324-23-5
Aroclor 1268	11100-14-4

There are also CAS Numbers for individual PCB congeners and for mixtures of Aroclor® products.

PCBs are identified as hazardous chemicals under criteria of the OSHA Hazard Communication Standard (29 CFR Part 1910.1200). PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Annual Report on Carcinogens (Seventh).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance and Odor: PCB mixtures range in form and color from clear to amber liquids to white crystalline solids. They have a mild, distinctive odor and are not volatile at room temperature. Refer to Section 9 for details.

WARNING!
CAUSES EYE IRRITATION
MAY CAUSE SKIN IRRITATION

PROCESSING AT ELEVATED TEMPERATURES MAY RELEASE VAPORS OR FUMES WHICH MAY CAUSE RESPIRATORY TRACT IRRITATION

POTENTIAL HEALTH EFFECTS

Likely Routes of Exposure: Skin contact and inhalation of heated vapors

Eye Contact: Causes moderate irritation based on worker experience.

Skin Contact: Prolonged or repeated contact may result in redness, dry skin and defatting based on human experience. A potential exists for developing chloracne. PCBs can be absorbed through intact skin.

Inhalation: Due to the low volatility of PCBs, exposure to this material in ambient conditions is not expected to produce adverse health effects. However, at elevated processing temperatures, PCBs may produce a vapor that may cause respiratory tract irritation if inhaled based on human experience.

Ingestion: No more than slightly toxic based on acute animal toxicity studies. Coughing, choking and shortness of breath may occur if liquid material is accidentally drawn into the lungs during swallowing or vomiting.

Other: Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed populations, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF ON SKIN, immediately flush the area with plenty of water. Wash skin gently with soap as soon as it is available. Get medical attention if irritation persists.

IF INHALED, remove person to fresh air. If breathing is difficult, get medical attention.

IF SWALLOWED, do NOT induce vomiting. Rinse mouth with water. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTE TO PHYSICIANS: Hot PCBs may cause thermal burn. If electrical equipment arcs between conductors, PCBs or other chlorinated hydrocarbon dielectric fluids may decompose to produce hydrochloric acid (HCl), a respiratory irritant. If large amounts are swallowed, gastric lavage may be considered.

5. FIRE FIGHTING MEASURES

Flash Point: 284 degrees F (140 degrees C) or higher depending on the chlorination level of the Aroclor product

Fire Point: 349 degrees F (176 degrees C) or higher depending on the chlorination level of the Aroclor product

NOTE: Refer to Section 9 for individual flash points and fire points.

Extinguishing Media: Extinguish fire using agent suitable for surrounding fire. Use dry chemical, foam, carbon dioxide or water spray. Water may be ineffective. Use water spray to keep fire-exposed containers or transformer cool.

PCBs are fire-resistant compounds. They may decompose to form CO, CO2, HCl, phenolics, aldehydes, and other toxic combustion products under severe conditions such as exposure to flame or hot surfaces.

Dielectric fluids having PCBs and chlorinated benzenes as components have been reported to produce polychlorinated dibenzo-p-dioxins (PCDDs) and furans (PCDFs) during fire situations involving electrical equipment. At temperatures in the range of 600-650 degrees C in the presence of excess oxygen, PCBs may form polychlorinated dibenzofurans (PCDFs). Laboratory studies under similar conditions have demonstrated that PCBs do not produce polychlorinated dibenzo-p-dioxins (PCDDs).

Federal regulations require all PCB transformers to be registered with fire response personnel.

If a PCB transformer is involved in a fire-related incident, the owner of the transformer may be required to report the incident. Consult and follow appropriate federal, state and local regulations.

Fire Fighting Equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Cleanup and disposal of liquid PCBs and other PCB items are strictly regulated by the federal government. The regulations are found at 40 CFR Part 761. Consult these regulations as well as applicable state and local regulations prior to any cleanup or disposal of PCBs, PCB items, or PCB contaminated items.

If PCBs leak or are spilled, the following steps should be taken immediately:

All nonessential personnel should leave the leak or spill area.

The area should be adequately ventilated to prevent the accumulation of vapors.

The spill/leak should be contained. Loss to sewer systems, navigable waterways, and streams should be prevented. Spills/leaks should be removed promptly by means of absorptive material, such as sawdust, vermiculite, dry sand, clay, dirt or other similar materials, or trapped and removed by pumping or other suitable means (traps, drip-pans, trays, etc.).

Personnel entering the spill or leak area should be furnished with appropriate personal protective equipment and clothing as needed. Refer to Section 8 for personal protection equipment and clothing.

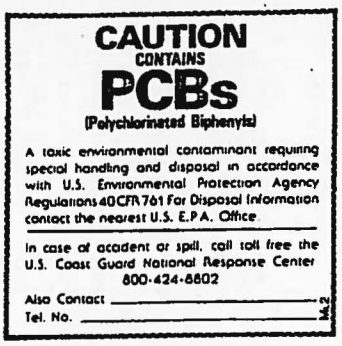
Personnel trained in emergency procedures and protected against attendant hazards should shut off sources of PCBs, clean up spills, control and repair leaks, and fight fires in PCB areas.

Refer to Section 13 for disposal information and Sections 14 and 15 for information regarding reportable quantity, and Section 7 for marking information.

7. HANDLING AND STORAGE

Care should be taken to prevent entry into the environment through spills, leakage, use vaporization, or disposal of liquid or containers. Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact, flush with water. In case of spillage onto clothing, the clothing should be removed as soon as practical, skin washed, and clothing laundered. Comply with all federal, state, and local regulations.

Federal regulations under the Toxic Substances Control Act require PCBs, PCB items, storage areas, transformer vaults, and transport vehicles to be marked (check regulations, 40 CFR 761, for details).



Storage: The storage of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB waste is strictly regulated by 40 CFR Part 761. The storage time is limited, the storage area must meet physical requirements, and the area must be labeled.

Avoid contact with eyes.
Wash thoroughly after handling.
Avoid breathing processing fumes or vapors.
Process using adequate ventilation.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection: Wear chemical splash goggles and have eye baths available where there is significant potential for eye contact.

Skin Protection: Wear appropriate protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine the appropriate type glove for a given application. Wear chemical goggles, face shield, and chemical resistant clothing such as a rubber apron when splashing is likely. Wash immediately if skin is contacted. Remove contaminated clothing promptly and launder before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

ATTENTION! Repeated or prolonged skin contact may cause chloracne in some people.

Respiratory Protection: Avoid breathing vapor, mist, or dust. Use NIOSH/MSHA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended when airborne exposure limits are exceeded and, if used, replaces the need for face shield and/or chemical splash goggles. Consult respirator manufacturer to determine the type of equipment for a given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. High airborne concentrations may require use of self-contained breathing apparatus or supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR Part 1910.134.

ATTENTION! Repeated or prolonged inhalation may cause chloracne in some people.

Ventilation: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of vapor or mist, such as open process equipment.

Airborne Exposure Limits:

Product: Chlorodiphenyl (42% chlorine)

OSHA PEL: 1 mg/m^3 8-hour time-weighted average - Skin*
ACGIH TLV: 1 mg/m^3 8-hour time-weighted average - Skin*

Product: Chlorodiphenyl (54% chlorine)

OSHA PEL: 0.5 mg/m^3 8-hour time-weighted average - Skin*
ACGIH TLV: 0.5 mg/m^3 8-hour time-weighted average - Skin*

*For Skin notation see Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Government Industrial Hygienists, 1995-1996.

9. PHYSICAL AND CHEMICAL PROPERTIES

PROPERTIES OF SELECTED AROCLORS[1]							
PROPERTY	**1016**	**1221**	**1232**	**1242**	**1248**	**1254**	**1260**
Color (APHA)	40	100	100	100	100	100	150
Physical state	mobile oil	mobile oil	mobile oil	mobile oil	mobile oil	viscous liquid	sticky resin
Stability	inert	inert	inert	inert	inert	inert	inert
Density (lb/gal 25°C)	11.40	9.85	10.55	11.50	12.04	12.82	13.50
Specific gravity x/15.5°C	1.36-1.37 x-25°	1.18-1.19 x-25°	1.27-1.28 x-25°	1.30-1.39 x-25°	1.40-1.41 x-65°	1.49-1.50 x-65°	1.55-1.56 x-90°
Distillation range (°C)	323-356	275-320	290-325	325-366	340-375	365-390	385-420
Acidity mg KOH/g, maximum	.010	.014	.014	.015	.010	.010	.014
Fire point (°C)	none to boiling point	176	238	none to boiling point	none to boiling point	none to boiling point	none to boiling point
Flash point (°C)	170	141-150	152-154	176-180	193-196	none	none
Vapor pressure (mm Hg @ 100°F)	NA	NA	0.005	0.001	0.00037	0.00006	NA
Viscosity (Saybolt Univ. Sec. @ 100°F) (centistokes)	71-81 13-16	38-41 3.6-4.6	44-51 5.5-7.7	82-92 16-19	185-240 42-52	1800-2500 390-540	— —

[1]NA—*Not Available*

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Stability: PCBs are very stable, fire-resistant compounds.
Materials to Avoid: None
Hazardous Decomposition
Products: PCBs may decompose to form CO, CO_2, HCl, phenolics, aldehydes, and other toxic combustion products under severe conditions such as exposure to flame or hot surface.
Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Data from laboratory studies conducted by Monsanto and from the available scientific literature are summarized below.
Single exposure (acute) studies indicate:
Oral - Slightly Toxic (Rat LD50 - 8.65 g/kg for 42% chlorinated; 11.9 g/kg for 54% chlorinated)

The liquid products and their vapors are moderately irritating to eye tissues. Animal experiments of varying duration and at different air concentrations show that for similar exposure conditions, the 54% chlorinated material produces more liver injury than the 42% chlorinated material.

There are literature reports that PCBs can impair reproductive functions in monkeys. The National Cancer Institute (NCI) performed a study in 1977 using Aroclor 1254 with both sexes of rats. NCI stated that the PCB, Aroclor 1254, was not carcinogenic under the conditions of their bioassay. There is sufficient evidence in the scientific literature to conclude that Aroclor 1260 can cause liver cancer when fed to rodents at high doses. Similar experiments with less chlorinated PCB products have produced negative or equivocal results.

The consistent finding in animal studies is that PCBs produce liver injury following prolonged and repeated exposure by any route, if the exposure is of sufficient degree and duration. Liver injury is produced first, and by exposures that are less than those reported to cause cancer in rodents. Therefore, exposure by all routes should be kept sufficiently low to prevent liver injury.

Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed population, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Seventh Annual Report on Carcinogens.

12. ECOLOGICAL INFORMATION

Care should be taken to prevent entry of PCBs into the environment through spills, leakage, use, vaporization or disposal of liquid or solids. PCBs can accumulate in the environment and can adversely affect some animals and aquatic life. In general, PCBs have low solubility in water, are strongly bound to soils and sediments, and are slowly degraded by natural processes in the environment.

13. DISPOSAL CONSIDERATIONS

The disposal of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB wastes is strictly regulated by 40 CFR Part 761. For example, all wastes and residues containing PCBs (wiping cloths, absorbent material, used disposable protective gloves and clothing, etc.) should be collected, placed in proper containers, marked and disposed of in the manner prescribed by EPA regulations (40 CFR Part 761) and applicable state and local regulations.

14. TRANSPORT INFORMATION

The data provided in this section are for information only. Please apply the appropriate regulations to properly classify a shipment for transportation.

DOT Classification:	IF WEIGHT OF PCBs TO BE SHIPPED IS OVER ONE POUND, THE FOLLOWING CLASSIFICATION AND LABEL APPLY.	
DOT Label:	LIQUID:	Environmentally Hazardous Substance, liquid, n.o.s. (Contains PCB), 9, UN 3082, III
	SOLID:	Environmentally Hazardous Substance, solid, n.o.s. (Contains PCB), 9, UN 3077, III
DOT Label:	Class: 9	
DOT Reportable Quantity:	One Pound	
IMO Classification:	Polychlorinated Biphenyls, IMO Class 9, UN 2315, II IMO Page 9034, EMS 6.1-02	
IATA/ICAO Classification:	Polychlorinated Biphenyls, 9, UN2315, II	

15. REGULATORY INFORMATION

For regulatory purposes, under the Toxic Substances Control Act, the term "PCBs" refers to a chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contain such a substance (40 CFR Part 761).

TSCA Inventory: not listed.

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate, Delayed.
SARA Section 313 Toxic Chemical(s): Listed-1993 (De Minimis concentration 0.1%.)

Reportable Quantity (RQ) under DOT (49 CFR) and CERCLA Regulations: 1 lb. (polychlorinated biphenyls) PCBs.

Release of more than 1 (one) pound of PCBs to the environment requires notification to the National Response Center (800-424-8802 or 202-426-2675).

Various state and local regulations may require immediate reporting of PCB spills and may also define spill cleanup levels. Consult your attorney or appropriate regulatory officials for information relating to spill reporting and spill cleanup.

16. OTHER INFORMATION

Reason for revision: Conversion to the 16 section format. Supersedes MSDS dated 10/88.

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FOR ADDITIONAL NONEMERGENCY INFORMATION, CONTACT:

Gary W. Mappes
Manager, Product & Environmental Safety

Robert G. Kaley, II
Director, Environmental Affairs

Monsanto Company
800 North Lindbergh Boulevard
St. Louis, MO 63167
(314) 694-3344

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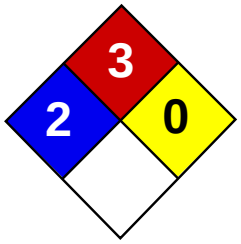

Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Ethylbenzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylbenzene

Catalog Codes: SLE2044

CAS#: 100-41-4

RTECS: DA0700000

TSCA: TSCA 8(b) inventory: Ethylbenzene

CI#: Not available.

Synonym: Ethyl Benzene; Ethylbenzol; Phenylethane

Chemical Name: Ethylbenzene

Chemical Formula: C8H10

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ethylbenzene	100-41-4	100

Toxicological Data on Ingredients: Ethylbenzene: ORAL (LD50): Acute: 3500 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant, sensitizer). CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 432°C (809.6°F)

Flash Points:
CLOSED CUP: 15°C (59°F). (Tagliabue.) OPEN CUP: 26.667°C (80°F) (Cleveland) (CHRIS, 2001) CLOSED CUP: 12.8 C (55 F) (Bingham et al, 2001; NIOSH, 2001) CLOSED CUP: 21 C (70 F) (NFPA)

Flammable Limits: LOWER: 0.8% - 1.6%UPPER: 6.7% - 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Vapors may form explosive mixtures in air.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Sensitive to light. Store in light-resistant containers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 STEL: 125 (ppm) from OSHA (PEL) [United States] TWA: 435 STEL: 545 from OSHA (PEL) [United States] TWA: 435 STEL: 545 (mg/m3) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from ACGIH (TLV) [United States] TWA: 100 STEL: 125 (ppm) [United Kingdom (UK)] TWA: 100 STEL: 125 (ppm) [Belgium] TWA: 100 STEL: 125 (ppm) [Finland] TWA: 50 (ppm) [Norway] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish. Gasoline-like. Aromatic.

Taste: Not available.

Molecular Weight: 106.16 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 136°C (276.8°F)

Melting Point: -94.9 (-138.8°F)

Critical Temperature: 617.15°C (1142.9°F)

Specific Gravity: 0.867 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.66 (Air = 1)

Volatility: 100% (v/v).

Odor Threshold: 140 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in diethyl ether. Very slightly soluble in cold water or practically insoluble in water. Soluble in all proportions in Ethyl alcohol. Soluble in Carbon tetrachloride, Benzene. Insoluble in Ammonia. Slightly soluble in Chloroform. Solubility in Water: 169 mg/l @ 25 deg. C.; 0.014 g/100 ml @ 15 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources (flames, sparks, static), incompatible materials, light

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation.

Toxicity to Animals: Acute oral toxicity (LD50): 3500 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc 50% Kill: LD50 [Rabbit] - Route: Skin; Dose: 17800 ul/kg Lowest Published Lethal Dose/Conc: LDL[Rat] - Route: Inhalation (vapor); Dose: 4000 ppm/4 H

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data. May cause cancer based on animals data. IARC evidence for carcinogenicity in animals is sufficient. IARC evidence of carcinogenicity in humans inadequate. May affect genetic material (mutagenic).

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Can cause mild skin irritation. It can be absorbed through intact skin. Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS) Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include

headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987). Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Ethylbenzene UNNA: 1175 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ethylbenzene Illinois toxic substances disclosure to employee act: Ethylbenzene Illinois chemical safety act: Ethylbenzene New York release reporting list: Ethylbenzene Rhode Island RTK hazardous substances: Ethylbenzene Pennsylvania RTK: Ethylbenzene Minnesota: Ethylbenzene Massachusetts RTK: Ethylbenzene Massachusetts spill list: Ethylbenzene New Jersey: Ethylbenzene New Jersey spill list: Ethylbenzene Louisiana spill reporting: Ethylbenzene California Director's List of Hazardous Substances: Ethylbenzene TSCA 8(b) inventory: Ethylbenzene TSCA 4(a) proposed test rules: Ethylbenzene TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97 SARA 313 toxic chemical notification and release reporting: Ethylbenzene

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASSE D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S29- Do not empty into drains.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References:
-Manufacturer's Material Safety Data Sheet. -Fire Protection Guide to Hazardous Materials, 13th ed., Nationial Fire Protection Association (NFPA) -Registry of Toxic Effects of Chemical Substances (RTECS) -Chemical Hazard Response Information System (CHRIS) -Hazardous Substance Data Bank (HSDB) -New Jersey Hazardous Substance Fact Sheet -Ariel Global View -Reprotext System

Other Special Considerations: Not available.

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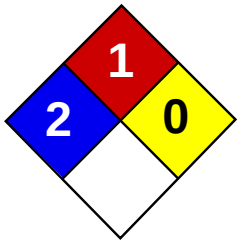

Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Methylene chloride MSDS

Section 1: Chemical Product and Company Identification

Product Name: Methylene chloride

Catalog Codes: SLM2398, SLM3772, SLM1297, SLM2677, SLM4054

CAS#: 75-09-2

RTECS: PA8050000

TSCA: TSCA 8(b) inventory: Methylene chloride

CI#: Not available.

Synonym: Dichloromethane

Chemical Name: Methylene Chloride

Chemical Formula: C-H2-Cl2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Methylene chloride	75-09-2	100

Toxicological Data on Ingredients: Methylene chloride: ORAL (LD50): Acute: 1600 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects: Very hazardous in case of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (irritant, permeator). Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Classified + (Proven.) by OSHA. Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, the nervous system, liver, mucous membranes, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 556°C (1032.8°F)

Flash Points: Not available.

Flammable Limits: LOWER: 12% UPPER: 19%

Products of Combustion: These products are carbon oxides (CO, CO2), halogenated compounds.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances: Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions: Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/ fumes/ vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill: Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: TWA: 50 from ACGIH (TLV) [United States] TWA: 174 from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 84.93g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: 39.75°C (103.5°F)

Melting Point: -96.7°C (-142.1°F)

Critical Temperature: Not available.

Specific Gravity: 1.3266 (Water = 1)

Vapor Pressure: 46.5 kPa (@ 20°C)

Vapor Density: 2.93 (Air = 1)

Volatility: Not available.

Odor Threshold: 214 ppm

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, n-octanol, acetone.

Solubility: Easily soluble in methanol, diethyl ether, n-octanol, acetone. Partially soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 1600 mg/kg [Rat]. Acute toxicity of the vapor (LC50): 52000 1 hours [Rat].

Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified + (Proven.) by OSHA. Classified 2B (Possible for human.) by IARC. Causes damage to the following organs: lungs, the nervous system, liver, mucous membranes, central nervous system (CNS).

Other Toxic Effects on Humans: Very hazardous in case of ingestion, of inhalation. Hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Human: passes through the placenta, excreted in maternal milk.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Dichloromethane UNNA: 1593 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations: California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Methylene chloride California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Methylene chloride Pennsylvania

RTK: Methylene chloride Massachusetts RTK: Methylene chloride TSCA 8(b) inventory: Methylene chloride SARA 313 toxic chemical notification and release reporting: Methylene chloride CERCLA: Hazardous substances.: Methylene chloride

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC): R22- Harmful if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment: Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 11/01/2010 12:00 PM

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COMMUNITY AIR MONITORING PLAN

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50° C (14 to 122° F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

FIELD FORMS

FIELD LOG FOR SOIL SAMPLES

Project #:	Drilled By (Company):	Drilling Method:	Borehole Number:
Project Name:	Drilled By (Crew Chief):	Sampling Method:	
Site Location:	Type of Drill Rig:		Page of
Date (start): / Date (end):		Final Borehole Diameter: inches	Logged By:

Sample #	Depth Interval (ft bgs)	Blow Counts (per 6 inches)				Sample Recovery Time & Length (24 hr & ft)	Particle Size Distr. (Est. to nearest 5%)				Size			Angularity		Silt and Clay Soil Identification Criteria				Munsell Color		Odor	Moisture Content	Other Features	Qu
		1st	2nd	3rd	4th		Cbbls Bldrs	Grvl	Sand	Silt & Clay	Max (in)	Grvl	Sand	Grvl	Sand	Plas-ticity	Dry Strngth	Dila-tancy	Tough-ness	Number	Name				
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		
												F C	F M C	A SA SR R	A SA SR R	None L M H	N L M H VH	None S R	Low Med Hi				Dry Moist Wet		

End of Boring:
Start Time (Military):
Time Drilling Completed (Military):

WELL DEVELOPMENT/PURGE SUMMARY FORM

WELL ID. _____

PROJECT INFORMATION		WELL INFORMATION		INSTRUMENTS	
PROJECT		WELL COORDINATES		TEMPERATURE	
		CASING ELEVATION		CONDUCTIVITY	
PROJECT NO.		GROUND LEVEL ELEVATION		pH METER	
LOCATION		CONSTRUCTED WELL DEPTH		WATER LEVEL PROBE	
PERSONNEL		WELL CASING INSIDE DIAMETER		OTHER	

Date	Time (Military)	Purge Method	Water Level* (Feet)	Measured Well Depth* (Feet)	Total Volume Purged** (Gallons)	APPEARANCE Color / Odor / Clarity	pH (s.u.)	Temp (^{o}C)	Elec. Cond. (umhos/cm) Measured	Elec. Cond. (umhos/cm) at 25°C	COMMENTS

One Well Volume = _____ **Can Well be purged dry? Yes No**

*** Depth below top of well casing. Record both initial and final measurements when using as Well Development Summary.**

**** Purge three to four well casing volumes, if possible, prior to sampling.**

EQUIPMENT CALIBRATION FORM

Equipment Make	
Equipment Model	
Instrument Identification	

DATE	TIME	CALIBRATION MEDIA	RESULTS	COMMENTS

TETRA TECH

FIELD PID DATA FORM

Project Number:	Date(s):
Project Name:	Personnel:
Site Location:	Meter Identificaiton:
	Probe eV:

Sample Number	Location	Sample Media (1)	Moisture (2)	Time Sample Collected	Time Sample Analyzed	Volatilization Period Air Temp. (^{O}C)	PID Readings (Instrument Units)			Comments
							Background	At 15 seconds	Peak Response	

(1) SO - Soil SD - Sediment GW - Ground Water SW - Surface Water WS - Waste (Solid) WL - Waste (Liquid) SG- Soil Gas Air

(2) D - Dry M - Moist W - Wet

TETRA TECH

FIELD SOIL GAS DATA FORM

Project Number:	Date(s):
Project Name:	Personnel:
Site Location:	PID Identification: / Probe eV:
	Gas Meter Identification:

Sample Number	Location	Probe Depth (inches)	Sample Media (1)	% LEL	O_2 (ppm)	CO (ppm)	H_2S (ppm)	PID Readings (Instrument Units)			Comments
								Background	Peak Response	After 15 sec.	

(1) SO - Soil SD - Sediment GW - Ground Water SW - Surface Water WS - Waste (Solid) WL - Waste (Liquid)

(2) D - Dry M - Moist W - Wet

TETRA TECH

EXPLOSIVE GAS MONITORING
FIELD DATA SHEET

Site: _____

Personnel: _____ Date: _____

Meteorologic Data: _____ Attach data from preceding days (Optional)

Ambient Temperature: _____ Barometric Pressure _____ (inches Hg)

Measurement Station: NOAA _____ On-Site _____ Other _____

MONITORING LOCATION TYPE:		FIELD INSTRUMENTATION:						
Monitoring Probe	_____	LEL Meter	Mod #	_____	S/N	_____	Calib. Date/Time	_____
Barhole Probe	_____	Pressure Gauge	Mod #	_____	S/N	_____	Calib. Date/Time	_____
Continuous Monitor	_____	Water Level Meter	Mod #	_____	S/N	_____	Calib. Date/Time	_____
Hand Held (Ambient)	_____	Other	Mod #	_____	S/N	_____	Calib. Date/Time	_____

LOCATION IDENTIFICATION							
Monitoring Probe Construction							
Total Depth (feet)							
Depth to Top of Screen (feet)							
Monitoring Probe Condition							
Clearly Labeled?	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____
Pro. Csg. In Good Condition?	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____
Concrete Pad Intact?	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____
Padlock Functional?	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____
Inner Csg. Properly Capped?	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____
Sample Ftg. Good Condition?	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____
Field Measurements							
Time of Measurement	_____ AM PM	_____ AM PM	_____ AM PM	_____ AM PM	_____ AM PM	_____ AM PM	_____ AM PM
Pressure (inches W.C.)							
% LEL							
% Carbon Monoxide							
% Oxygen							
% Hydrogen Sulfide							
Depth to Water (feet)							
Top of Screen Submerged?	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____	Yes ____ No _____
Comments							

I certify that these data were obtained in accordance with applicable regulatory and project protocols:

Signature: Date

TETRA TECH

FIELD SURFACE WATER QUALITY SAMPLING AND ANALYSIS FORM

PROJECT INFORMATION		INSTRUMENTS	
PROJECT		Temp. & pH	
PROJECT NO.		Conductivity	
LOCATION		ORP	
PERSONNEL		DO	

SAMPLE POINT ID						
WATER TYPE		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
DATE (month/day/year)						
CLOCK TIME (Military)						
WATER BODY TYPE						
SAMPLE LOCATION						
WATER DEPTH (feet)*						
SAMPLE DEPTH (feet)*						
SAMPLING DEVICE						
FIELD TEMPERATURE (^{o}C)						
pH						
ELEC. COND. (uS/cm)	Measured					
	at 25° C					
ORP (mV)						
DISSOLVED OXYGEN (ppm)						
DISSOLVED OXYGEN (% Sat.)						
COLOR						
ODOR						
CLARITY						
SAMPLING PARAMETERS	# OF CONTAINERS & VOLUME; CONTAINER TYPE (A = AMBER GLASS; G = GLASS; P = PLASTIC); PRESERVATIVE TYPE (L = LAB ADDED; F = FIELD ADDED) OR NEUTRAL; FILTERED (YES or NO)					
NAME OF LABORATORY						
DATE SENT TO LAB						
SAMPLER=S NAME						

***Feet below water surface.**

FIELD WATER LEVEL DATA SHEET

Project Number:_____ Project Name:_____

Location:_____ Instrument:_____

Personnel:_____

Monitor Well/ Sample Port Identification	Date	Time	Depth to Groundwater (feet below top of casing)	Comments

TETRA TECH

FIELD WATER QUALITY SAMPLING AND ANALYSIS FORM

PROJECT INFORMATION		INSTRUMENTS	
PROJECT		Temp. & pH	Hanna
PROJECT NO.		Conductivity	Hanna
LOCATION		ORP	Not Measured
PERSONNEL		DO	Not Measured

SAMPLE POINT ID						
WATER TYPE		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
DATE (month/day/year)						
CLOCK TIME (Military)						
DEPTH TO WATER (ft)*						
MEASURED WELL DEPTH (ft)*						
CASING VOLUME (gallons)						
PURGE VOLUME (gallons)						
DEPTH SAMPLE TAKEN (ft)*						
SAMPLING DEVICE						
FIELD TEMPERATURE (^{o}C)						
pH						
ELEC. COND. (uS/cm)	Measured	NM	NM	NM	NM	
	at 25° C					
ORP (mV)		NM	NM	NM	NM	
DISSOLVED OXYGEN (ppm)		NM	NM	NM	NM	
DISSOLVED OXYGEN (% Sat.)		NM	NM	NM	NM	
COLOR						
ODOR						
CLARITY						
SAMPLING PARAMETERS		# OF CONTAINERS & VOLUME; CONTAINER TYPE (A = AMBER GLASS; G = GLASS; P = PLASTIC); PRESERVATIVE TYPE (L = LAB ADDED; F = FIELD ADDED) OR NEUTRAL; FILTERED (YES or NO)				
NAME OF LABORATORY						
DATE SENT TO LAB						
SAMPLER=S NAME						

***Measured from top of well casing.**

LOW-FLOW METHOD FIELD WATER QUALITY SAMPLING AND ANALYSIS FORM FOR SAMPLEPRO AND PERISTALTIC PUMPS

PROJECT INFORMATION		INSTRUMENTS	
PROJECT		Temp., pH,	
PROJECT NO.		Conductivity	
LOCATION		ORP	
PERSONNEL		DO	

MONITOR WELL ID									
WATER TYPE		Groundwater			Groundwater			Groundwater	
DATE (month/day/year)									
STATIC WATER LEVEL (ft)*/TIME									
WELL DEPTH (feet)*									
PUMP INLET DEPTH (feet)*									
ENDING WATER LEVEL (ft)*/TIME									
START PURGE TIME (Military)									
END PURGE TIME (Military)									
PURGE VOLUME (gallons)									
SAMPLE TIME (Military)									
INDICATOR PARAMETERS		1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
TIME (minutes)										
TEMPERATURE (^{o} C)										
pH										
ELEC. COND. (uS/cm)	Measured									
	at 25° C									
ORP (mV)										
DISSOLVED OXYGEN (ppm)										
DISSOLVED OXYGEN (% Sat.)										
COLOR										
ODOR										
CLARITY										
SAMPLING PARAMETERS		# OF CONTAINERS & VOLUME; CONTAINER TYPE (A=AMBER; G=GLASS; P=PLASTIC); PRESERVATIVE TYPE (L=LAB ADDED; F=FIELD ADDED) OR NEUTRAL; FILTERED (YES or NO)								
NAME OF LABORATORY										
DATE SENT TO LAB										
SAMPLER=S NAME										

***Measured from top of well casing.**

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MONITOR WELL INSPECTION FORM

Project Name: _____ Location: _____

Project No: _____ Personnel: _____

Well No.: _____ Inspection Date: _____

ITEM	YES	NO	N/A	COMMENTS
Map Location Accurate?				
Adequately Visible in Hard-to-Find Area?				
Protective Posts Present? Type?				
Protective Posts Necessary?				
Is Well Painted?				
Located in a Dry Area?				
Well Labelled Inside and Outside?				
Is Well Flushmount?				
Protective Casing Diameter? Material?				
Is Well Immobile?				
Protective Casing Locked? Type of Lock?				
Protective Casing Secure in Ground?				
Rust Inside Protective Casing Cap?				
Evidence of Frost Heave?				
Weep Hole at Base of Protective Casing?				
Well Casing Free of Kinks or Bends?				
Well Cap Present, Vented?				
Well Diameter and Material				
Solvent cement present?				
Type of Surface Seal? Is Seal Cracked?				
Ground/Seal Sloped to Prevent Ponding?				
Well stickup (ft. above grade)				
Protective casing stickup (ft. above grade)				
Depth to Water Level (below PVC casing)				
Measured Well Depth (below PVC casing)				
Saturated Thickness (feet)				
Constructed Well Depth (from log):				
Thickness of Siltation: (ft.)				
Bailer easily inserted/removed?				
Proximity to drainage ditches:				

PASSIVE DIFFUSION BAG (PDB) FIELD DATA SHEET

Project Number:	Project Name:	Location:

Personnel:

Monitor Well Identification	Date PDB Deployed	Time PDB Deployed	Depth to Groundwater (ft btoc)	PDB Depth (ft btoc)	Date PDB Retrieved & Sampled	Time PDB Retrieved & Sampled	Depth to Groundwater (ft btoc)

Note: ft btoc = feet below top of casing.

TETRA TECH

QUALITY ASSURANCE PROJECT PLAN

CROUSE-HINDS LANDFILL
ONONDAGA COUNTY, NEW YORK
NYSDEC SITE NUMBER: 7-34-004

QUALITY ASSURANCE PROJECT PLAN

Prepared for:

Cooper Industries, LLC
600 Travis, Suite 5800
Houston, Texas 77002

Prepared by:

Tetra Tech, Inc.
175 N. Corporate Drive, Suite 100
Brookfield, WI 53045

September 2013

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Project Manager – Tetra Tech	**1**
QAO – Tetra Tech	**1**
Program Manager – Cooper Industries, LLC	**1**
Project Manager – TestAmerica	**1**
Remedial Project Manager – NYSDEC	**1**

LIST OF ACRONYMS AND SHORT FORMS

CC-H	**Cooper Crouse-Hinds**
COC	**Constituents of Concern**
Cooper	**Cooper Industries, LLC**
COC	**Contaminant of Concern**
DQO	**Data Quality Objectives**
EDD	**Electronic Data Deliverable**
e:DAT	**Electronic Database Access Tool**
ESD	**Explanation of Significant Difference**
GIS	**Geographical Information Systems**
LCS	**Laboratory Control Sample**
LIMS	**Laboratory Information Management System**
MS/MSD	**Matrix Spike/Matrix Spike Duplicate**
NELAP	**National Environmental Laboratory Accreditation Program**
NYSDEC	**New York State Department of Environmental Conservation**
PARCCS	**Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity**
PCB	**Polychlorinated Biphenyl**
QA	**Quality Assurance**
QA/QC	**Quality Assurance/Quality Control**
QAPP	**Quality Assurance Project Plan**
QC	**Quality Control**
ROD	**Record of Decision**
RPD	**Relative Percent Difference**
RSD	**Relative Standard Deviation**
SMP	**Site Management Plan**
SDG	**Sample Delivery Group**
Site	**Cooper Crouse-Hinds Landfill**
SOP	**Standard Operating Procedure**
USEPA	**United States Environmental Protection Agency**
VOC	**Volatile Organic Compound**

1. INTRODUCTION

The Cooper Crouse-Hinds (CC-H) Landfills Site consists of two inactive landfills, referred to as the North and South Landfills. The Site is a Class 2 inactive hazardous waste disposal site located in the Town of Salina (North Landfill) and City of Syracuse (South Landfill), Onondaga County, New York. The North Landfill is 21.5 acres in size, and the South Landfill is 19.4 acres in size. Seventh North Street is oriented southeast-northwest and separates the two landfills that comprise the site. Adjacent to the North Landfill are on-site wetlands to the east and west, along with an on-site drainage channel to the east. Adjacent to the South Landfill are on-site wetlands to the south and an on-site drainage channel to the east.

This Quality Assurance Project Plan (QAPP) details the protocols and procedures that will be followed during post-construction monitoring that will occur at the CC-H Landfill Site. The purpose of these protocols and procedures is to ensure that all project activities will be performed in a manner consistent with the data quality objectives (DQOs) established for the project and all data collected are precise, accurate, representative, comparable, and complete.

All QA/QC procedures will be in accordance' with applicable professional technical standards, NYSDEC requirements, government regulations and guidelines, and specific project goals and requirements. There are four basic groups of elements that must be included in a QAPP. These four groups and associated elements are:

- Group A - Project Management. The elements in this group include all aspects of project management, project objectives, and project history.
- Group B - Data Generation and Acquisition. The elements in this group include descriptions of the design and implementation of all measurement systems that will be used during the project.
- Group C - Assessment/Oversight. The elements in this group encompass the procedures used to ensure proper implementation of the QAPP.
- Group D - Data Validation and Usability. The elements in this group cover the QA activities that occur after the data collection phase of the project is completed.

The elements that comprise project management, data generation and acquisition, assessment/ oversight, and data validation and usability for the additional investigation activities at the Site are documented in this QAPP.

2. PROJECT MANAGEMENT

2.1. Project Organization and Responsibilities

The responsibilities of the project personnel are described below.

- *Cooper Project Manager – (Nelson Olavarria)* Provides oversight of the contract, and all program activities. Reviews final project QA objectives, needs, problems, and requests. Approves appropriate QA corrective actions as needed. Ensures compliance with NYSDEC QA/QC policies.

- *Project Manager – (Michael Noel)* Directs project and provides technical expertise to accomplish program objectives. Ensures that project tasks are successfully completed within the projected time periods and projected budget. Oversees all remedial construction and post-construction activities, subcontractor management, technical support, and supervises and schedules field activities.

- *Quality Assurance Officer – (Daniel Morgan)* Responsible for preparation and approval of QAPP. Responsible for performing quality assurance audits and ensuring that any necessary corrective actions are implemented.

- *Field Engineers/Scientists* - Perform tasks identified in work plan in accordance with designated procedures. Adhere to procedures within health and safety plan. Provide technical QA assistance on site to accomplish project objectives including making suggestions for corrective actions.

2.2. Problem Definition

Post-construction monitoring and inspections will be conducted to evaluate performance of the implemented remedy at the CC-H Landfill Site. Constituents of concern (COCs) reported at the Site in previous reports include VOCs, PCBs and metals in Site soil, surface water and groundwater and methane gas from the landfill. This QAPP addresses sampling and analysis conducted or required to monitor the performance of the implemented remedies.

2.3. Site Background

Information on the Site background, implemented remedial actions and residual contamination are presented in Section 1.0 of the Site Management Plan (SMP).

2.4. Project Task Description and Schedule

A description of the project tasks and schedule are provided in Section 3.0 of the SMP and include the following:

Program	Frequency*	Matrix	Analysis
Landfill Cover	Semiannual	cover	visual
Landfill Gas	Quarterly	gas	% LEL
Groundwater	Quarterly	water	VOCs
Surface Water	Quarterly	water	PCBs, metals
Wetlands	Quarterly	vegetation	visual

2.5. Quality Objectives and Criteria for Measurement Data

The data quality objectives and measurement performance criteria for the project are presented in the following subsections.

2.5.1. Data Quality Objectives

Data quality objectives (DQOs) are qualitative and quantitative statements derived from the outputs of each step of the DQO process. The DQO process is a series of planning steps based on the scientific method that is designed to ensure that the type, quantity, and quality of environmental data used in decision-making are appropriate for the intended application.

There are seven steps in the DQO process that include:

1. stating the problem;
2. identifying the decision;
3. identifying inputs to the decision;
4. defining the boundaries of the study;
5. developing a decision rule;
6. specifying limits on decision errors; and
7. optimizing the design for obtaining data.

The details of DQO process for the project are provided below.

- The problem is identified COC impacts in the soil, surface water and groundwater and landfill gas at the Site.

- The decision is to verify the performance of the implemented remedial activities to decrease COC concentrations and/or limit exposure to COCs at the Site.

- The inputs to the decision are the data from previous investigations, implementation of remedial activities and post-construction monitoring of the implemented remedies.

- The spatial boundaries are the sampling locations presented in the SMP. The only practical constraints for the Site activities are inclement weather conditions.

- The decision rule is whether or not the implemented remedies meet Site clean-up objectives.

- The limits on decision errors include the time and resource constraints for post-construction monitoring.

- The sampling and analysis program has been designed to ensure that the problem identified above can be solved in a resource-efficient and timely manner. The scope of work for the post-construction monitoring is presented in the SMP.

2.5.2. Measurement Performance Criteria

The measurement performance criteria for· precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are provided in the following subsections.

2.5.2.1.Field Precision Criteria

Precision of the field sample collection procedures will be assessed by the data from analysis of field duplicate samples. Relative percent differences (RPDs) will be calculated for detected analytes from surface water and groundwater and their respective field duplicate samples. Field duplicate samples will be collected at a minimum frequency of 5 percent of investigative samples. An RPD of 20 percent for water samples will be used as an advisory limit for analytes detected in both the investigative samples and field duplicate samples at concentrations greater than or equal to their quantitation limits. RPD calculations will not be performed when either one or both of the sample results for the field replicate sample pairs are reported as less than the quantitation limit. Although the RPD will be calculated between an investigative sample and its field duplicate sample, the results will not be used as a basis for qualifying data or accepting or rejecting data. The RPD and actual results will be evaluated qualitatively to assess precision of field sample collection procedures. Professional judgment will be used to qualify associated investigative sample data.

2.5.2.2. Laboratory Precision Criteria

Laboratory precision will be assessed through the calculation of RPDs for replicate/duplicate sample analyses. These will be matrix spike/matrix spike duplicate (MS/MSD) samples, which will be collected/designated at a frequency of 1 per 20 or fewer samples of the same matrix. The equation to be used to determine precision is presented in Section 4.3.1 of this QAPP. Precision control limits for the analysis are presented in Table 2.1.

2.5.2.3. Field Accuracy Criteria

The criteria for accuracy of the field sample collection procedures will be to ensure that samples are not affected by sources external to the sample, such as sample contamination by ambient conditions or inadequate equipment decontamination procedures. Field sampling accuracy will be assessed by the data from field blank samples.

Trip blanks will be included within each sample shipment container. Trip blanks containing deionized water will be routed from the lab to the field and back to the lab. Field blank samples will be collected at a frequency of 1 per 20 or fewer sampling equipment decontamination procedures or a least once per day of sampling equipment cleanings, whichever is more frequent. Field blank samples will be collected by routing laboratory-provided deionized water through decontaminated sampling equipment. Field blank samples will be analyzed to check procedural contamination and/or ambient conditions and/or sample container contamination that may cause sample contamination. Field blank samples will not be collected when precleaned, disposable sampling equipment is used.

Trip and field blank samples should not contain target analytes above the quantitation limits. Trip and field blank sample data will be evaluated using the procedures specified in Section 4.3.2 of this QAPP. Accuracy will be ensured by adhering to all sample handling procedures, sample preservation requirements, and holding time periods.

Accuracy of field PID and landfill gas detector measurements will be assessed by analyzing calibration gas.

2.5.2.4. Laboratory Accuracy Criteria

Laboratory accuracy will be assessed by determining percent recoveries from laboratory control sample (LCS) analyses. An LCS will be analyzed at a frequency of 1 per batch of 20 or fewer samples of the same matrix. Accuracy relative to the sample matrix will be assessed by determining percent recoveries from the analysis of matrix spike samples. MS/MSD samples will be collected/designated for chemical analyses at a frequency of 1 per 20 or fewer samples of the same matrix. The equation to be used to determine accuracy for this project is presented in Section 4.3.2 of this QAPP. Accuracy control limits are presented in Table 2.1.

The accuracy of the organic analyses will also be monitored through the analysis of surrogate compounds. Surrogate compounds are added to each sample, standard, blank, and QC sample prior to sample preparation and analysis. Surrogate compounds are not expected to be found occurring naturally in the samples, but behave analytically similar to the compounds of interest. Consequently, surrogate compound percent recoveries will provide information on the effect that the sample matrix exhibits on the accuracy of the analyses. Table 2.1 provides surrogate compound percent recovery control limits for the organic analyses.

2.5.2.5. Field Representativeness Criteria

Representativeness is dependent upon the proper design of the sampling program. The representativeness criteria for field sampling will be to ensure that the sampling locations are properly established, that the correct locations are sampled, and that the sampling procedures in the SMP are followed. The sampling program was designed to provide data representative of Site conditions. During development of this program, consideration was given to past data collection activities, existing analytical data, and the physical setting. The rationale for the sampling program is provided in the SMP.

2.5.2.6. Laboratory Representativeness Criteria

The representativeness criteria for laboratory data will be to ensure that the proper analytical procedures are used for sample preparation (e.g., homogenizing the sample prior to subsampling), sample analysis, and that sample holding times are met. Additionally, the accuracy and precision of the laboratory data affect representativeness. The laboratory representativeness criteria will include achieving the accuracy and precision criteria for the sample analyses.

2.5.2.7. Field Comparability Criteria

The criteria for field comparability will be to ensure and document that the sampling locations are properly established, and the sampling procedures in the SMP are followed.

2.5.2.8. Laboratory Comparability Criteria

The criteria for laboratory data comparability will be to ensure that the analytical methods used for the investigation are comparable to the methods used for previous sampling events, as applicable. The analytical methods identified in the SMP are comparable to the methods used to generate data for previous investigations.

2.5.2.9. Field Completeness Criteria

The criteria for field completeness will be that a minimum of 90 percent of the field-measured data is valid. The procedure for determining field data validity is provided in Section 3.9.2 of this QAPP. The equation for calculating completeness is presented in Section 4.3.4 of this QAPP.

2.5.2.10. Laboratory Completeness Criteria

The criteria for laboratory completeness will be that a minimum of 90 percent of the laboratory data is determined to be valid (usable) for the intended purpose. The procedure for determining laboratory data validity is provided in Section 3.9.2 of this QAPP. The equation for calculating completeness is presented in Section 4.3.4 of this QAPP.

2.5.2.11. Field Sensitivity Criteria

The criterion for field measurement sensitivity is 0.1 ppm organic vapors and 1.0 percent methane or background whichever is higher. The sensitivity of the field instruments will be measured by analyzing calibration gas and ambient air.

2.5.2.12. Laboratory Sensitivity Criteria

The sensitivity requirements for the laboratory analyses are provided in Table 2.1. The analytical methods selected for this project are U.S. EPA methods routinely used to prepare and analyze samples for these analytes. The analysis methods are sufficiently sensitive to detect the analytes of interest at or below the required cleanup goals.

2.6. Special Training/Certification Requirements

Tetra Tech's field sampling team members are required to have received the 40-hour Hazardous Waste Operations and Emergency Response safety training and annual 8-hour refresher courses required by 29 CFR Parts 1910 and 1926. On-Site subcontractor

personnel performing intrusive activities are required to have received the same training. Each subcontractor is responsible for compliance of its personnel with the applicable health and safety regulations.

The laboratory used for this project is required to be accredited by the National Environmental Laboratory Accreditation Program (NELAP) to demonstrate compliance with U.S. EPA's requirement that the laboratory have a documented quality system that complies with ANSI/ ASQC E4-94 ("Specifications and Guidelines for Quality System for Environmental Data Collection and Environmental Technology Programs", January 1995), and EPA QA/R-2 ("EPA Requirements for Quality Management Plans", March 2001). TestAmerica is accredited by NELAP for the methods of analysis and the TestAmerica QA Manual is included in Appendix A.

The surveyor used for the project will be registered in and licensed by the State of New York, as necessary.

2.7. Documentation and Records

The documents, records, and reports generated during the project are identified in the following subsections.

2.7.1. Field and Laboratory Records

Documents and records generated during the project include sample collection records, QC sample records, field measurement records, laboratory records, and data handling records. A brief description of these documents and records are provided below. Detailed information regarding these records is provided in subsequent sections of this QAPP.

Sample collection records that will be generated during the sampling activities include field logbooks, chain-of-custody records, and shipping papers. QC sample records that will be generated during the project to document QC sample collection include field logbooks for recording field' blank samples, field duplicate samples, and MS/MSD samples. TestAmerica will maintain quality records for sample integrity information. Records of sample preservation will be maintained by the project laboratory.

Field measurements will be recorded in bound logbooks or, on standard field forms. Calibration data, where applicable, will also be recorded in these logbooks or on these forms.

Laboratory records that will be maintained for the project include sample receipt documentation, field and laboratory chain-of-custody documentation, sample container cleanliness certifications, reagent and standard reference material certifications, sample preparation records, sample analysis records (e.g., run logs), instrument/raw data, QC data, calibration data, corrective action reports, and final reports. Data handling records that will be maintained include verification of computer programs used to manipulate or reduce raw data into final results and data validation reports. PASI will maintain documentation of data verification and reduction procedures as necessary for the analyses

conducted during the project. Tetra Tech will maintain checklists, notes, and reports generated during the external data validation process.

2.7.2. Data Reporting Format

Field data will be recorded in bound logbooks or on standard forms. The details for recording field data are provided in Section 3.2.2.1 of this QAPP. Field data will be generated primarily from direct reading meters or consist of field readings or observations. These data will be tabulated and included in project reports or submittals.

Laboratory reports for the analyses will include data deliverables consistent with Level II standard reporting requirements. Method detection limit studies, instrument detection limit studies, and method performance and validation studies will be maintained by TestAmerica.

2.7.3. Data Archiving and Retrieval

All records, including field and laboratory data, generated during the project will be maintained by TestAmerica and Tetra Tech consistent with the US EPA record retention requirements.

3. DATA GENERATION AND ACQUISITION

The design and implementation of the measurement systems that will be used during the project, including sampling procedures, analytical procedures and data handling and documentation are detailed in the following subsections.

3.1. Sampling Process Design

The rationale for the sampling program is provided in the SMP.

3.1.1. Sampling Methods

Sampling methods are provided in the SMP.

3.1.2. Field Equipment and Sample Container Cleaning Procedures

Equipment cleaning/decontamination procedures will be provided in the SMP. All sample containers will be provided by TestAmerica. The containers will be precleaned in accordance with the U.S. EPA guidance document entitled "Specifications and Guidance for Contaminant-Free Sample Containers II (EPA 540/R-93/051). Certificates of analysis for each lot of containers will be maintained by TestAmerica.

3.1.3. Field Equipment Maintenance, Testing, and Inspection Requirements

Field equipment will be inspected and tested prior to being shipped to the field. Maintenance logs for all field equipment are kept in Tetra Tech's field equipment files at the Tetra Tech office from which the equipment was shipped. Prior to use in the field, the equipment is checked again, generally during field calibration, and the performance information is recorded in the field logbook. All equipment shipped back from the field is inspected and tested upon return. Any required maintenance is performed and documented prior to the equipment being returned to service.

Critical spare parts for field equipment and replacement field equipment are available at each Tetra Tech office and can be shipped for overnight delivery, picked up at the Tetra Tech office, or delivered to the field when the need is identified. Alternately, field equipment vendors (e.g., Total Safety or Pine Environmental) can provide replacement equipment if needed. The replacement equipment can be shipped for overnight delivery as necessary.

3.1.4. Inspection and Acceptance Requirements for Supplies and Sample Containers

Supplies and consumables for field measurements and sampling will be obtained from various vendors and include PID calibration gas, sample containers, detergent and water for equipment decontamination, and equipment blank water. Additional field supplies and consumables include disposable sampling tools and personnel protective equipment. All field supplies will be consumed or replaced with sufficient frequency to prevent deterioration or degradation that may interfere with the analyses.

Sample containers will be provided by TestAmerica. The lab will maintain documentation of the purity/cleanliness for these materials. TestAmerica’s QA Officer is

ultimately responsible for ensuring that these materials are acceptable for the project. The acceptability of these materials for use will be evaluated by reviewing lot analysis certificates, as applicable. Water and containers that do not meet PASI's acceptability requirements will not be shipped to the field.

3.2. Sample Handling and Custody Requirements

The procedures for sample handling, labeling, shipping, and chain-of-custody documentation are provided in the subsections that follow.

3.2.1. Sample Handling

The procedures used to collect samples are provided in the SMP. The container volume, container type (material of construction), sample preservation, holding time periods, packaging, and shipping requirements for the analyses are identified in Table 3.1.

The sample- numbering system for the project has been designed to uniquely identify each sample from each sampling program and event. This numbering system consists of the sample matrix code, sample collection date, sampler's initials, and sequential number beginning with 01 for each sampling program and event.

An example of the sample numbering system follows:

MC-mmddyy-XX-0l

Where:	MC (Matrix Code)	= S – soil, GW – groundwater, IA – indoor air
	mmddyy	= Date in month-day-year
	XX	= Sampler's first and last initials
	01	= Sequential number for sampling event

Field duplicate samples will be numbered using this system to prevent laboratory bias of field QC samples. Samples designated for MS/MSD analysis will be identified as such in the remarks column of the chain-of-custody document.

Samples will be placed in shipping coolers containing bagged, cubed ice immediately following collection. The samples will be grouped in the shipping cooler by the order in which the samples were collected. Samples will be shipped to the laboratory via an express courier service generally on the day they are collected. However, samples that are collected after the courier service has picked up the shipment for the day (generally only at remote sites) and samples collected on a Sunday or holiday will be shipped on the next business day.

3.2.2. Sample Custody

Chain of custody is the sequence of possession of an item. An item (such as a sample or final evidence file) is considered to be in a person's custody if the item is in actual possession of a person, the item is in the view of the person after being in his/her actual possession, or the item was in a person's physical possession but was placed in a secure

area by that person. Field, laboratory, and final evidence file custody procedures are described in the subsections that follow.

3.2.2.1. Field Custody Procedures

Logbooks will used to record field data collection activities. Entries into field logbooks will be described in as much detail as possible to ensure that a particular situation could be reconstructed solely from logbook entries. Field logbooks will be bound field survey books or notebooks with consecutively numbered pages. Logbooks will be assigned to field personnel and will be stored at Tetra Tech's Brookfield, Wisconsin office when not in use. Each logbook will be identified by the project-specific document number (117-2202046).

The title page of each logbook will contain the following information:

- person to whom the logbook is assigned;
- logbook number;
- project name;
- project start date; and
- end date.

Entries into the logbook will contain a variety of information. At the beginning of each day's logbook entry, the date, start time, weather conditions, and the names of all sampling team members present will be entered. The names of individuals visiting the Site or field sampling team and the purpose of their visit will also be recorded in the field logbook.

All field measurements obtained and samples collected will be recorded. All logbook entries will be made in ink, signed and dated with no erasures. If an incorrect logbook entry is made, the incorrect information will be crossed out with a single strike mark that is initialed and dated by the person making the erroneous entry. The correct information will be entered into the logbook adjacent to the original entry.

Whenever a sample is collected or a measurement is made, a detailed description of the location will be recorded in the logbook. Photographs taken at a location, if any, will also be noted in the logbook. All equipment used to obtain field measurements will be recorded in the field logbook. In addition, the calibration data for all field measurement equipment will be recorded in the field logbook or on standard field forms.

Samples will be collected following the sampling procedures documented in the SAP. The equipment used to collect samples, time of sample collection, sample description, volume and number of containers, preservatives added (if applicable) will be recorded in the field logbook. Each sample will be uniquely identified using the sample numbering system provided in Section 3.2.1 of this QAPP.

The packaging and shipping procedures summarized below will ensure that the chain-of-custody of samples collected for chemical analysis remains intact:

1. The field sampler is personally responsible for the care and custody of the samples until they are transferred to another person or the laboratory. As few people as possible will handle the samples.
2. All sample containers will be identified by using sample labels that include the unique sample identification number and the date and time of collection. Sample labels will be completed for each sample using waterproof ink.
3. Samples will be accompanied by a properly completed chain-of-custody form. The sample identification numbers and required analyses will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving the samples will sign and record the date and time on the form. The chain-of-custody form documents sample custody transfers from the sampler to another person, to the laboratory, or to/from a secure storage area. An example chain-of-custody record form is provided as Figure 3.1.
4. Samples will be properly packaged for shipment (see Table 3.1) and dispatched to the laboratory for analysis with a separate signed chain-of-custody form enclosed in and secured to the inside top of each shipping cooler. Shipping coolers will be secured with custody tape for shipment to the laboratory. The custody tape is covered with clear plastic tape to prevent accidental damage to the custody tape.
5. If samples are collocated (split) with a government agency or other entity, it is the responsibility of that entity to prepare its own chain-of-custody form for the samples. Information regarding the identity of the entity and the samples that are being collocated will be recorded in the field logbook.
6. All sample shipments will be accompanied by the chain-of-custody form identifying its contents. The chain-of-custody form is a four-part carbonless-copy form. The form is completed by the sampling team, which, after signing and relinquishing custody to the shipper, retains the bottom (goldenrod) copy. The shipper, if different than the sampling team members, retains the pink copy after relinquishing custody to the laboratory. The laboratory retains the yellow copy and the fully executed white copy is returned as part of the data deliverables package.
7. If the samples are sent by common carrier, a bill of lading (e.g., FedEx air bill) will be used and copies will be retained as permanent documentation. Commercial carriers are not required to sign the chain-of-custody form as long as the form is sealed inside the sample cooler and the custody tape remains intact.

3.2.2.2. Laboratory Custody Procedures

Laboratory sample custody begins when the samples are received at the laboratory. The field sample identification numbers, laboratory sample identification numbers, date and time of sample collection, date and time of sample receipt, and requested analyses will be entered into the sample receiving log.

Following log-in, all samples will be stored within an access-controlled location and will be maintained properly preserved (as defined in Table 3.1) until completion of all laboratory analyses. Unused sample aliquots and sample extracts will be maintained properly preserved for a minimum of 30 days following receipt of the final report by Tetra Tech. TestAmerica will be responsible for the disposal of unused sample aliquots,

sample containers, and sample extracts in accordance with all applicable local, state, and federal regulations.

TestAmerica will be responsible for maintaining analytical logbooks and laboratory data. All laboratory records will be maintained consistent with US EPA record retention requirements.

3.2.2.3. Final Evidence Files Custody Procedures

The final evidence file for the project will be maintained by Tetra Tech and will consist of the following:

1. project plan;
2. project log books;
3. field data records;
4. sample identification documents;
5. chain-of-custody records;
6. correspondence;
7. references, literature;
8. final data packages;
9. miscellaneous - photos, maps, drawings, etc.; and
10. final report.

The final evidence file materials will be the responsibility of the evidentiary file custodian (Tetra Tech's Project Manager) with respect to maintenance and document removal.

3.3. Analytical Method Requirements

The field and laboratory analytical methods that will be used during the investigation are detailed in the following subsections.

3.3.1. Field Analytical Methods

If called for in the sampling and analysis plan, the head space above containerized soil samples will be screened for organic vapors using a field-portable PID. The PID readings will be used to select the appropriate location from which a soil sample will be collected and submitted for analysis. The soil sample interval from each borehole with the highest PID reading will be selected for laboratory analysis of VOCs. The field measurements will be obtained consistent with the operating manual for the equipment.

3.3.2. Laboratory Analytical Methods

The methods that will be used to analyze samples collected during the project are presented in the Table 2.1.

3.4. Quality Control Requirements

The field and laboratory QC requirements for the investigation are discussed in the following subsections.

3.4.1. Field Sampling Quality Control

Field QC requirements include analyzing reference standards for instrument calibration and for routine calibration checks. Field QC samples for this project include field blank samples to determine the existence and magnitude of sample contamination resulting from ambient conditions or sampling procedures and field duplicate samples to assess the overall precision of the sampling and analysis event. The frequency of collection for these field QC samples was provided in Section 2.5 of this QAPP. The evaluation of field QC data is provided in Section 3.9.2 of this QAPP.

3.4.2. Analytical Quality Control

The laboratory QC requirements for the organic analyses include analyzing method blanks, initial calibration standards, calibration verification standards, internal standards, surrogate compound spikes, MS/MSD samples, and LCSs. The analysis frequency and acceptance criteria for method blank samples, initial calibration, calibration verification, and internal standards will be consistent with the analytical methods in the SMP. The analysis frequency and acceptance criteria for surrogate compound spikes are discussed in Section 2.5.2 and summarized in Table 2.1. The analysis frequency and acceptance criteria for MS/MSD and LCS samples are discussed in Section 2.5.2 and summarized in Table 2.1.

The laboratory QC requirements for metals analyses include analyzing preparation blanks, initial calibration blanks, continuing calibration blanks, initial calibration verification standards, continuing calibration verification standards, interference check standards, serial dilution samples, MS/MSD samples, and LCSs. The analysis frequency for preparation blanks, initial calibration blanks, continuing calibration blanks, initial calibration verification standards, continuing calibration verification standards, interference check standards, and serial dilution samples will be consistent with the analytical methods in Table 2.1. The analysis frequency and acceptance criteria for MS/MSD and LCS samples are discussed in Section 2.5.2 and summarized in Table 2.1.

3.5. Instrument/Equipment Testing, Inspection, and Maintenance Requirements

The procedures used, to verify that instruments and equipment are functional and properly maintained are described in the following subsections.

3.5.1. Field Instrument Maintenance

Specific preventive maintenance procedures to be followed for field equipment are those recommended by the manufacturer. Field instruments will be checked and calibrated daily before use.

3.5.2. Laboratory Instrument Maintenance

As part of its QA/QC program, TestAmerica conducts routine preventive maintenance to minimize the occurrence of instrument failure and other system malfunctions. Designated laboratory employees will regularly perform routine scheduled maintenance and repair of (or coordinate the repair of) all instruments. All maintenance that is performed is documented in the laboratory’s maintenance logbooks. All laboratory instruments are maintained in accordance with manufacturer's specifications.

3.6. Calibration Procedures and Frequency

The procedures for maintaining the accuracy for all the instruments and measuring equipment that are used for conducting field tests and laboratory analyses are described in the following subsections. These instruments and equipment will be calibrated prior to each use or according to a periodic schedule.

3.6.1. Field Instruments/Equipment

Equipment to be used during field sampling will be examined to confirm that it is in operating condition. This includes checking the manufacturer's operating manual to ensure that all maintenance requirements are being observed. Individual calibration records will be reviewed to ensure that any prior equipment problems have not been overlooked and all necessary repairs to equipment have been completed.

3.6.2. Laboratory Instruments

Calibration of laboratory equipment will be based on approved written procedures. Records of calibration, repairs, or replacement will be filed and maintained by the designated laboratory personnel performing these quality control activities. These records generally will be filed at the location where the work is performed and will be subject to QA audit. For all instruments, the laboratory will maintain a properly trained repair staff with in-house spare parts or will maintain service contracts with vendors.

The records of calibration typically are maintained as follows:

1. If possible, each instrument will have record of calibration permanently affixed with an assigned record number.
2. A logbook will be assigned to each instrument showing description, manufacturer, model numbers, date of last calibration and the signature of the person who calibrated the instrument, due date of next calibration and compensation or correction figures, as appropriate.
3. A written stepwise calibration procedure will be available for each piece of test and measurement equipment.
4. Any instrument that is not calibrated to the manufacturer's original specification will display a warning tag or will otherwise be removed from service, as appropriate. Specific calibration procedures and frequencies are detailed in the laboratory's SOPs.

3.7. Inspection/Acceptance Criteria for Supplies and Consumables

The procedures that will be used to ensure that supplies and consumables used in the field and laboratory will be available as needed and free of contaminants are detailed in the following subsections.

3.7.1. Field Supplies and Consumables

Supplies and consumables for field measurements and sampling will be obtained from various vendors and include PID calibration gas, sample containers, detergent and water for equipment decontamination, and field blank water. Additional field supplies and consumables include disposable sampling tools and personnel protective equipment. All

field supplies will be consumed or replaced with sufficient frequency to prevent deterioration or degradation that may interfere with the analyses.

3.7.2. Laboratory Supplies and Consumables

Vendors may include general labware, reagents, chromatography supplies and organic and metals standards. The lot numbers of reagents and standards are recorded and dates of receipt, first use, and expiration are documented by the laboratory. Certificates of analysis are maintained on file to document reagent standard purity.

TestAmerica SOPs provide details on identifying contaminants in reagents and standards, determining deterioration of reagents and standards, and the corrective actions required if contaminants or deterioration are identified. The TestAmerica QA Officer is ultimately responsible for the ensuring the acceptability of supplies and consumables.

3.8. Data Acquisition Requirements (Non-Direct Measurements)

Historical data were generated during the studies and monitoring events identified in Section 1.0 of the SMP. Data generated during these events were validated and are usable for this phase of the project.

3.9. Data Management

The procedures for managing data from generation to final use and storage are detailed in subsections that follow.

3.9.1. Data Recording

Field data will be recorded in field logbooks and consist of measurements from direct-reading instruments or direct measurements. Field staff are responsible for recording field data and identifying and correcting any recording errors.

Laboratory data are recorded in a variety of formats. Data from instruments are recorded on magnetic media, strip charts, or bench sheets. The laboratory SOPs provide the data recording requirement for each preparation and analysis method.

3.9.2. Data Validation

Validation of field data for this project will primarily consist of checking for transcription errors and review of data recorded in field logbooks. Data transcribed from the field logbook into summary tables for reporting purposes will be verified for correctness by the QA Officer or her designee. Any limitations on the use of field data will be included in the reports.

Validation of the analytical data will be performed by Tetra Tech’s QA Officer or designee based on the evaluation criteria outlined in "USEPA Contract Laboratory Program. National Functional Guidelines for Organic Data Review", EPA 540/R-99/008, October 1999 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA 540/R-94-013, February 1994. The evaluation and action criteria specified in these documents (referred to hereafter as the National Functional Guidelines) will be used for validating the data. However, the acceptance

limits for QC data will be the control limits determined statistically by the laboratory, not the control limits specified in the National Functional Guidelines. Calibration data will be validated using the acceptance criteria specified in the analytical methods, not the National Functional Guidelines. Qualifiers assigned to the data will be consistent with the data qualifiers specified in the National Functional Guidelines. All data used to verify cleanup will be fully validated (i.e., including the review of all raw data).

3.9.3. Data Transformation/Data Reduction

Field data reduction procedures will be minimal in scope compared to those implemented for laboratory data. Only direct reading instrumentation will be employed in the field. These data will be recorded in field logbooks immediately after the measurements are obtained.

Laboratory data reduction procedures typically will be conducted according to the following protocol:

1. Raw data produced and checked by the responsible analyst is turned over for independent review by another analyst.
2. The area supervisor or senior chemist reviews the data for attainment of QC acceptance criteria.
3. The area supervisor will decide whether any sample re-analysis is required.
4. Upon completion of all reviews and acceptance of the raw data by the area supervisor, a report will be generated and sent to the laboratory Project Manager.
5. The laboratory Project Manager will complete a thorough inspection of all reports.
6. Following review and approval of the preliminary report by the laboratory Project Manager, final reports will be generated and signed.

Specific equations used for data reduction by the laboratory are provided in the laboratory SOPs.

3.9.4. Data Transmittal/Transfer

Survey data will be provided in an electronic format that is compatible with geographic information systems (GIS) software, and field measurements will be entered into a standard Microsoft Excel spreadsheet format, as necessary. Tetra Tech’s Field QA Officer is responsible for verifying the correctness of the field data after the data are transferred to a spreadsheet format. Geographical and field data are maintained in a database that is described below.

Electronic data deliverables (EDDs) will be provided by the TestAmerica. The laboratory's data are downloaded into EDDs directly from the laboratory information management system (LIMS), thus eliminating the possibility of manual transcription errors. EDDs are imported and maintained in the Site database for manipulation and presentation.

Tetra Tech’s QA Officer is responsible for verifying the correctness of the analytical database after the laboratory data have been imported. This is accomplished by

comparing the data from the database to the hardcopy analytical reports for a minimum of 10 percent of the sample results. If discrepancies between the database and hardcopy analytical reports are identified, a complete verification of the database will be performed or a new EDD will be submitted, imported, and verified as described previously.

3.9.5. Data Analysis

Laboratory data will be evaluated as described in Section 2.5.1 of this QAPP. It is anticipated that commercially-available GIS software, such as ArcView, or Tetra Tech' Electronic Database Access Tool (e:DAT) may be used to facilitate the evaluation/ visualization of the data. The actual software used and input parameters/ assumptions will be identified in project reports, as necessary. There is no extreme or unique computer hardware required to use these software.

3.9.6. Data Assessment

Assessment of laboratory data by TestAmerica will be performed using the procedures detailed in its SOPs. These assessments include determining the mean, standard deviation, percent relative standard deviation (RSD), percent difference, RPD, and percent recovery for certain QC elements.

Assessment of QC data for data validation purposes will include determining the mean, standard deviation, percent RSD, correlation coefficient, percent difference, percent recovery, RPD, and percent completeness. The statistical equations to determine percent recovery, RPD, and percent completeness are provided in Section 4.3 of this QAPP.

3.9.7. Data Tracking

Data generated in the field will be recorded in field logbooks or on standard field forms. Survey data will be generated *by* the surveyor and provided to Tetra Tech. There are no unique or special tracking requirements for these data. The data will be transcribed for analysis and reporting as discussed in Section 3.9.3 and the original survey data and field logbooks will be maintained in the final evidence file.

Laboratory data tracking procedures will be consistent with TestAmerica's standard procedures for tracking data from generation to reporting. TestAmerica's LIMS also provides a means for tracking data in the laboratory. TestAmerica's Operations Manager is ultimately responsible for data tracking in the laboratory.

Tracking analytical data in the database includes recording the laboratory generating the data, the date when the EDD was received and imported, the date when qualifiers were applied to the results, and the level of data validation performed. Tetra Tech's Project Manager is ultimately responsible for tracking data from entry into the database to reporting.

3.9.8. Data Storage and Retrieval

Laboratory data will be stored in hardcopy format for a minimum period of 5 years. Electronic instrument data are maintained on magnetic media (i.e., magnetic tape) for this same time period.

Tetra Tech's Project Manager is responsible for project data storage and retrieval. Final evidence files will be maintained by Tetra Tech.

3.9.9. Data Security

Laboratory data security is the responsibility of TestAmerica's Operations Manager. Archived data cannot be accessed without authorization, and the name and purpose of personnel accessing archived data are recorded. TestAmerica's LIMS is password protected and access rights are restricted by job function. Tetra Tech data security procedures include limiting project database access to database managers and analysts and general building security procedures.

4. DATA VERIFICATION, VALIDATION AND USEABILITY

The QA activities that will be performed to ensure that the project data are scientifically defensible, properly documented, of known quality, and meet the project objectives are described in the following sections.

4.1. Data Review, Verification, and Validation Requirements

All field and laboratory data will be reviewed and verified/validated. The procedures and criteria used to verify and validate field and laboratory data will consist of evaluating the· data to the measurement performance criteria in Section 2.5.2 of this QAPP. Field data and logbooks will be reviewed to ensure that the requirements of the sampling program, including the number of samples and locations, sampling, and sample handling procedures, were fulfilled. Acceptable departures from the planned sampling program, such as collecting a sample from an adjacent location because of an obstruction, will not impact data usability.

Sample collection procedures will be reviewed for compliance with the requirements of the SMP and QAPP. If alternate sampling procedures were used, the acceptability of the procedure will be evaluated to determine the affect on the usability of the data. Data usability will not be affected if the procedure used is determined to be an acceptable alternative that fulfills the measurement performance criteria in Section 2.5.2 of this QAPP. However, data generated from sampling procedures that do not provide representative samples will be rejected.

Sample handling records will be reviewed to ensure that sample integrity remained intact from collection to laboratory receipt and that samples were properly preserved. Chain-of-custody documentation and sample condition upon laboratory receipt will be reviewed. The data from samples for which the chain-of-custody or sample identification cannot be verified will be rejected. The data for samples that were not properly preserved will be qualified or rejected depending on the severity of the deviation from the requirements of the SMP and QAPP. The criteria for rejecting improperly preserved samples will be that the sample has been rendered unsuitable for analysis. The criteria for qualifying or rejecting data for samples that are received at the laboratory without being properly preserved, but not rendered unsuitable for analysis, will be based on the sample holding time period evaluation criteria for unpreserved samples specified in the National Functional Guidelines. Data qualification will be consistent with the action specified in the National Functional Guidelines.

Field and laboratory data will be verified to ensure that the methods used to analyze the samples were consistent with the requirements of this QAPP. Data generated from the use of unapproved methods will be rejected. Acceptable departures from the methods specified in this QAPP include using an alternate field meter of comparable capability if the specified meter becomes inoperable.

QC data will be reviewed to determine compliance with the acceptance criteria in Section 2.5 of this QAPP. QC data that do not meet the acceptance criteria will result in sample

data qualification. Significant departures from the QC acceptance criteria may result in rejected data. Situations that result in data rejection include samples analyzed beyond twice the technical holding time period, organic LCS analyte recoveries less than 10 percent if the analyte is not detected in the associated samples, inorganic LCS analyte recoveries less than 30 percent if the analyte is not detected in the associated samples, and surrogate compound spike recoveries less than 10 percent if the analytes associated with the surrogate compound are not detected in the associated samples and the samples were not diluted or determined to exhibit matrix interferences.

4.2. Verification and Validation Methods

Field data will be verified by reviewing field documentation and chain-of-custody records. Data from direct-reading field instruments will be internally verified by reviewing calibration and operating records. TestAmerica will internally verify its data by reviewing and documenting sample receipt, sample preparation, sample analysis (including internal QC checks), and data reduction and reporting. Any deviations from the acceptance criteria, corrective actions taken, and data determined to be of limited usability (i.e., laboratory-qualified data) will be noted in the laboratory reports.

Data validation will be conducted by Tetra Tech consistent with the procedure identified in Section 3.9.2 of this QAPP. The data verification/validation procedure will identify data as being acceptable, of limited usability (qualified as estimated), or rejected. The conditions that result in data being qualified as estimated or rejected were identified in Section 4.1 of this QAPP. The results of the data verification/validation will be provided in data validation memoranda that are provided to Tetra Tech's Project Manager;

Data determined to be unusable may require corrective action to be taken. Potential types of corrective action may include resampling by the field team or reanalysis of samples by the laboratory. The corrective actions taken are dependent upon the ability to mobilize the field team and whether or not the data are critical for project DQOs to be achieved. Should Tetra Tech's QA Officer identify a situation requiring corrective action during data verification/validation, Tetra Tech's Project Manager will be responsible for approving the implementation of the corrective action.

4.3. Usability/Reconciliation with Data Quality Objectives

The overall usability of the data for the investigation will be assessed by evaluating the PARCCS of the data set to the measurement performance criteria in Section 2.5.2 of this QAPP using basic statistical quantities, as applicable. The procedures and statistical formulas to be used for these evaluations are presented in the following subsections.

4.3.1. Precision

Project precision will be evaluated by assessing the RPD data from field duplicate samples. Analytical precision will be evaluated by assessing the RPD data from either duplicate spiked sample analyses or duplicate sample analyses. The RPD between two measurements is calculated using the following simplified formula:

$$RPD = ((R_1-R_2)/(R_1+R_2))*200$$

where:

R 1 = value of first result
R2 = value of second result

Overall precision for the sampling program will be determined by calculating the mean RPD for all field duplicates. This will provide an evaluation of the overall variability attributable to the sampling procedure, sample matrix, and laboratory procedures in each sampling program.

The overall precision requirement will be the same as the project precision. It should be noted that the RPD of two measurements could be very high when the data approach the quantitation limit of an analysis. The calculation of the mean RPD will only include the RPD values for field duplicate sample analyte data that are greater than or equal to 5 times the quantitation limit for an analysis.

4.3.2. Accuracy/Bias

The data from method blank samples, field blank samples, MS/MSD samples, surrogate compound spikes, and LCSs will be used to determine accuracy and potential bias of the sample data.

The data from method blank samples provide an indication of laboratory contamination that may result in bias of sample data. Sample data associated with method blank contamination will have been identified during the data verification/validation process. Sample data associated with method blank contamination are evaluated during data validation procedure to determine if analytes detected in samples associated with contaminated method blanks are “real” or are the result of laboratory contamination. The procedure for this evaluation involves comparing the concentration of the analyte in the sample to the concentration in the method blank sample taking into account adjustments for sample dilutions and dry-weight reporting. In general, the sample data are qualified as not detected if the sample concentration is less than 5 times (10 times for common laboratory contaminants) the method blank concentration. Typically, the quantitation limit for the affected analyte is elevated to the concentration detected in the sample.

The data from field blanks provide an indication of field conditions that may result in bias of sample data. Sample data associated with contaminated field blank samples will have been identified during the data verification/validation process. The evaluation procedure and qualification of sample data associated with field blank contamination is performed in the same manner as the evaluation procedure for method blank sample contamination.

Matrix spike sample data provide information regarding the accuracy/bias of the analytical methods relative to the sample matrix. Matrix spike samples are field samples that have been fortified with target analytes prior to sample preparation and analysis. The percent recovery data provide an indication of the effect that the sample matrix may have

on the preparation and analysis procedure. Sample data exhibiting matrix effects will have been identified during the data verification/validation process.

Surrogate spike recoveries provide information regarding the accuracy/bias of organic analyses on an individual sample basis. Surrogate compounds are not expected to be found in the samples and are added to every sample prior to sample preparation. The percent recovery data provide an indication of the effect that the sample matrix may have on the preparation and analysis procedure. Sample data exhibiting matrix effects will have been identified during the data verification/validation process.

Analytical accuracy/bias will be determined by evaluating the percent recovery data of LCSs. LCSs are artificial samples prepared in the laboratory using a blank matrix fortified with analytes from a standard reference material that is independent of the calibration standards. LCSs are prepared and analyzed in the same manner as the field samples. The percent recovery data from LCS analyses will provide an indication of the accuracy and bias of the analytical method for each target analyte.

Percent recovery is calculated using the following formula:

$$\%R = (SSR-SR)/SA*100$$

where:

SSR	=	Spiked Sample Result
SR	=	Sample Result or Background
SA	=	Spike Added

The percent recovery for surrogate compounds and LCSs are determined by dividing the measured value by the true value and multiplying by 100.

Overall accuracy/bias for the sampling events will be determined by calculating the percent of accuracy measurements that meet the measurement performance criteria specified in Section 2.5.2 of this QAPP. Overall accuracy will be considered acceptable if the surrogate percent recoveries are met for at least 75 percent of the· samples and the LCS percent recoveries are met for all the samples and the MS/MSD percent recoveries are met for at least 75 percent of the samples.

4.3.3. Sample Representativeness

Representativeness of the samples will be assessed by reviewing the results of field audits and the data from field duplicate samples. Overall sample representativeness will be determined by calculating the percentage of field duplicate sample data that achieved the RPD criteria specified in Section 2.5.2 of this QAPP. Overall sample representativeness will be considered acceptable if the results of field audits indicate that the approved sampling methods or alternate acceptable sampling methods were used to collect the samples and the field duplicate RPD data are acceptable for at least 75 percent of the samples.

4.3.4. Completeness

Completeness will be assessed by comparing the number of valid (usable) sample results to the total possible number of results within a specific sample matrix and/ or analysis. Percent completeness will be calculated using the following formula:

% Completeness = (# of Valid (usable) Measurements/ # of Measurements Planned)*100

Overall completeness will be assessed by calculating the mean percent completeness for the entire set of data obtained for each sampling program. The overall completeness will be calculated when all sampling and analysis is concluded. Overall completeness will be considered acceptable if at least 90 percent of the data are determined to be valid.

4.3.5. Comparability

The comparability of data sets will be evaluated by reviewing the sampling and analysis methods used to generate the data for each data set. Project comparability will be determined to be acceptable if the sampling and analysis methods specified in this QAPP and any approved QAPP revisions or amendments are used for generating the data.

Overall comparability of data from split samples (samples that are collected at the same time from the same location and split equally between two parties using sample containers from the same source or vendor) will be evaluated by determining the RPD of detected analytes in both samples following data verification/validation. Analytes that are detected in only one of the two samples will be assessed by reviewing the data verification/ validation reports for both data sets and determining the cause of the discrepancy, if possible. Overall comparability of split sample data will be considered acceptable if the RPD for detected analytes with concentrations greater than or equal to 5 times their respective quantitation limits does not exceed RPD acceptance criteria for field duplicate samples.

4.3.6. Sensitivity and Quantitation Limits

The quantitation limits for the sample data will be reviewed to ensure that the sensitivity of the analyses was sufficient to achieve the detectability requirements specified in Table 2.1 of this QAPP. The method blank sample data and LCS percent recovery data will be reviewed to assess compliance with the measurement performance criteria specified in Section 2.5.2 of this QAPP.

Overall sensitivity will be assessed by comparing the sensitivity achieved for the samples to the detectability requirements for the analyses. Overall sensitivity will be considered acceptable if quantitation/detection limits for the samples are sufficient to achieve the detectability requirements for the project.

It should be noted that quantitation limits might be elevated as a result of high concentrations of target compounds, non-target compounds, and matrix interferences (collectively known as sample matrix effects). In these cases, the sensitivity of the analyses will be evaluated on an individual sample basis relative to the applicable evaluation criteria. The need to investigate the use of alternate analytical methods may be

required if the sensitivity of the analytical methods identified in this QAPP cannot achieve the evaluation criteria as a result of sample matrix effects.

4.3.7. Data Limitations and Actions

Data use limitations will be identified in data validation reports. Data that do not meet the measurement performance criteria specified in this QAPP will be identified and the impact on the project quality objectives will be assessed and discussed in these reports and project reports. Field information will be reviewed to ensure that all sampling procedures and field measurements were conducted in accordance with the requirements of this QAPP. Field measurements obtained or data from samples collected using procedures inconsistent with the requirements of this QAPP will be evaluated using the procedures in Section 4.1. Specific actions for field or laboratory data that do not meet the measurement performance criteria depends on the use of the data, and may require that additional samples be collected or the use of the data be restricted.

Table 2.1 Quality Control Limits

Media	Method Description	Method Code
Soil	Volatile Organic Compounds by GC/MS	8260C
	Closed System Purge and Trap	5035LP_Calc

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
1,1,1-Trichloroethane	71-55-6	5	ug/Kg	0.363	ug/Kg	77	121	%	20	%	77	121	%	30	%			%
1,1,2,2-Tetrachloroethane	79-34-5	5	ug/Kg	0.811	ug/Kg	80	120	%	20	%	80	120	%	30	%			%
1,1,2-Trichloroethane	79-00-5	5	ug/Kg	0.65	ug/Kg	78	122	%	20	%	78	122	%	30	%			%
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5	ug/Kg	1.14	ug/Kg	60	140	%	20	%	60	140	%	30	%			%
1,1-Dichloroethane	75-34-3	5	ug/Kg	0.61	ug/Kg	73	126	%	20	%	73	126	%	30	%			%
1,1-Dichloroethene	75-35-4	5	ug/Kg	0.612	ug/Kg	59	125	%	20	%	59	125	%	30	%			%
1,2,4-Trichlorobenzene	120-82-1	5	ug/Kg	0.304	ug/Kg	64	120	%	20	%	64	120	%	30	%			%
1,2-Dibromo-3-Chloropropane	96-12-8	5	ug/Kg	2.5	ug/Kg	63	124	%	20	%	63	124	%	30	%			%
1,2-Dichlorobenzene	95-50-1	5	ug/Kg	0.391	ug/Kg	75	120	%	20	%	75	120	%	30	%			%
1,2-Dichloroethane	107-06-2	5	ug/Kg	0.251	ug/Kg	77	122	%	20	%	77	122	%	30	%			%
1,2-Dichloropropane	78-87-5	5	ug/Kg	2.5	ug/Kg	75	124	%	20	%	75	124	%	30	%			%
1,3-Dichlorobenzene	541-73-1	5	ug/Kg	0.257	ug/Kg	74	120	%	20	%	74	120	%	30	%			%
1,4-Dichlorobenzene	106-46-7	5	ug/Kg	0.7	ug/Kg	73	120	%	20	%	73	120	%	30	%			%
2-Butanone (MEK)	78-93-3	25	ug/Kg	1.83	ug/Kg	70	134	%	20	%	70	134	%	30	%			%
2-Hexanone	591-78-6	25	ug/Kg	2.5	ug/Kg	59	130	%	20	%	59	130	%	30	%			%
4-Methyl-2-pentanone (MIBK)	108-10-1	25	ug/Kg	1.64	ug/Kg	65	133	%	20	%	65	133	%	30	%			%
Acetone	67-64-1	25	ug/Kg	4.21	ug/Kg	61	137	%	20	%	61	137	%	30	%			%
Benzene	71-43-2	5	ug/Kg	0.245	ug/Kg	79	127	%	20	%	79	127	%	30	%			%
Bromodichloromethane	75-27-4	5	ug/Kg	0.67	ug/Kg	80	122	%	20	%	80	122	%	30	%			%
Bromoform	75-25-2	5	ug/Kg	2.5	ug/Kg	68	126	%	20	%	68	126	%	30	%			%
Bromomethane	74-83-9	5	ug/Kg	0.45	ug/Kg	37	149	%	20	%	37	149	%	30	%			%
Carbon disulfide	75-15-0	5	ug/Kg	2.5	ug/Kg	64	131	%	20	%	64	131	%	30	%			%
Carbon tetrachloride	56-23-5	5	ug/Kg	0.484	ug/Kg	75	135	%	20	%	75	135	%	30	%			%
Chlorobenzene	108-90-7	5	ug/Kg	0.66	ug/Kg	76	124	%	20	%	76	124	%	30	%			%
Dibromochloromethane	124-48-1	5	ug/Kg	0.64	ug/Kg	76	125	%	20	%	76	125	%	30	%			%
Chloroethane	75-00-3	5	ug/Kg	1.13	ug/Kg	69	135	%	20	%	69	135	%	30	%			%
Chloroform	67-66-3	5	ug/Kg	0.309	ug/Kg	80	118	%	20	%	80	118	%	30	%			%
Chloromethane	74-87-3	5	ug/Kg	0.302	ug/Kg	63	127	%	20	%	63	127	%	30	%			%
cis-1,2-Dichloroethene	156-59-2	5	ug/Kg	0.64	ug/Kg	81	117	%	20	%	81	117	%	30	%			%
cis-1,3-Dichloropropene	10061-01-5	5	ug/Kg	0.72	ug/Kg	82	120	%	20	%	82	120	%	30	%			%
Cyclohexane	110-82-7	5	ug/Kg	0.7	ug/Kg	70	130	%	20	%	70	130	%	30	%			%
Dichlorodifluoromethane	75-71-8	5	ug/Kg	0.413	ug/Kg	57	142	%	20	%	57	142	%	30	%			%
Ethylbenzene	100-41-4	5	ug/Kg	0.345	ug/Kg	80	120	%	20	%	80	120	%	30	%			%
1,2-Dibromoethane	106-93-4	5	ug/Kg	0.642	ug/Kg	78	120	%	20	%	78	120	%	30	%			%
Isopropylbenzene	98-82-8	5	ug/Kg	0.754	ug/Kg	72	120	%	20	%	72	120	%	30	%			%
Methyl acetate	79-20-9	5	ug/Kg	0.93	ug/Kg	60	140	%	20	%	60	140	%	30	%			%
Methyl tert-butyl ether	1634-04-4	5	ug/Kg	0.491	ug/Kg	63	125	%	20	%	63	125	%	30	%			%
Methylcyclohexane	108-87-2	5	ug/Kg	0.76	ug/Kg	60	140	%	20	%	60	140	%	30	%			%
Methylene Chloride	75-09-2	5	ug/Kg	2.3	ug/Kg	61	127	%	20	%	61	127	%	30	%			%
Styrene	100-42-5	5	ug/Kg	0.25	ug/Kg	80	120	%	20	%	80	120	%	30	%			%
Tetrachloroethene	127-18-4	5	ug/Kg	0.671	ug/Kg	74	122	%	20	%	74	122	%	30	%			%
Toluene	108-88-3	5	ug/Kg	0.378	ug/Kg	74	128	%	20	%	74	128	%	30	%			%
Toluene-d8 (Surr)	2037-26-5		ug/Kg		ug/Kg			%		%			%		%	71	125	%
trans-1,2-Dichloroethene	156-60-5	5	ug/Kg	0.516	ug/Kg	78	126	%	20	%	78	126	%	30	%			%
trans-1,3-Dichloropropene	10061-02-6	5	ug/Kg	2.2	ug/Kg	73	123	%	20	%	73	123	%	30	%			%
Trichloroethene	79-01-6	5	ug/Kg	1.1	ug/Kg	77	129	%	20	%	77	129	%	30	%			%
Trichlorofluoromethane	75-69-4	5	ug/Kg	0.473	ug/Kg	65	146	%	20	%	65	146	%	30	%			%
Vinyl chloride	75-01-4	5	ug/Kg	0.61	ug/Kg	61	133	%	20	%	61	133	%	30	%			%
Xylenes, Total	1330-20-7	10	ug/Kg	0.84	ug/Kg	70	130	%	20	%	80	120	%	30	%			%
1,2-Dichloroethane-d4 (Surr)	17060-07-0		ug/Kg		ug/Kg			%		%			%		%	64	126	%
4-Bromofluorobenzene (Surr)	460-00-4		ug/Kg		ug/Kg			%		%			%		%	72	126	%

Table 2.1 Quality Control Limits

Media	Method Description	Method Code
Soil	Volatile Organic Compounds by GC/MS	8260C
	Closed System Purge and Trap	5035A_M_Calc

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
1,1,1-Trichloroethane	71-55-6	100	ug/Kg	27.7	ug/Kg			%		%			%		%			%
1,1,2,2-Tetrachloroethane	79-34-5	100	ug/Kg	16.24	ug/Kg			%		%			%		%			%
1,1,2-Trichloroethane	79-00-5	100	ug/Kg	21	ug/Kg			%		%			%		%			%
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	100	ug/Kg	50	ug/Kg			%		%			%		%			%
1,1-Dichloroethane	75-34-3	100	ug/Kg	30.9	ug/Kg	82	138	%	20	%	82	138	%	20	%			%
1,1-Dichloroethene	75-35-4	100	ug/Kg	34.6	ug/Kg	54	144	%	20	%	50	147	%	20	%			%
1,2,4-Trichlorobenzene	120-82-1	100	ug/Kg	37.9	ug/Kg			%		%			%		%			%
1,2-Dibromo-3-Chloropropane	96-12-8	100	ug/Kg	50	ug/Kg			%		%			%		%			%
1,2-Dichlorobenzene	95-50-1	100	ug/Kg	25.5	ug/Kg	80	132	%	20	%	80	132	%	20	%			%
1,2-Dichloroethane	107-06-2	100	ug/Kg	40.9	ug/Kg	78	129	%	20	%	78	129	%	20	%			%
1,2-Dichloropropane	78-87-5	100	ug/Kg	16.2	ug/Kg			%		%			%		%			%
1,3-Dichlorobenzene	541-73-1	100	ug/Kg	26.7	ug/Kg			%		%			%		%			%
1,4-Dichlorobenzene	106-46-7	100	ug/Kg	14	ug/Kg			%		%			%		%			%
2-Butanone (MEK)	78-93-3	500	ug/Kg	297	ug/Kg			%		%			%		%			%
2-Hexanone	591-78-6	500	ug/Kg	205	ug/Kg			%		%			%		%			%
4-Methyl-2-pentanone (MIBK)	108-10-1	500	ug/Kg	32	ug/Kg			%		%			%		%			%
Acetone	67-64-1	500	ug/Kg	411	ug/Kg			%		%			%		%			%
Benzene	71-43-2	100	ug/Kg	4.8	ug/Kg	75	131	%	20	%	52	132	%	20	%			%
Bromodichloromethane	75-27-4	100	ug/Kg	20	ug/Kg			%		%			%		%			%
Bromoform	75-25-2	100	ug/Kg	50	ug/Kg			%		%			%		%			%
Bromomethane	74-83-9	100	ug/Kg	22	ug/Kg			%		%			%		%			%
Carbon disulfide	75-15-0	100	ug/Kg	45.5	ug/Kg			%		%			%		%			%
Carbon tetrachloride	56-23-5	100	ug/Kg	25.5	ug/Kg			%		%			%		%			%
Chlorobenzene	108-90-7	100	ug/Kg	13.2	ug/Kg	80	127	%	20	%	65	129	%	20	%			%
Dibromochloromethane	124-48-1	100	ug/Kg	48.4	ug/Kg			%		%			%		%			%
Chloroethane	75-00-3	100	ug/Kg	20.8	ug/Kg			%		%			%		%			%
Chloroform	67-66-3	100	ug/Kg	68.6	ug/Kg			%		%			%		%			%
Chloromethane	74-87-3	100	ug/Kg	23.8	ug/Kg			%		%			%		%			%
cis-1,2-Dichloroethene	156-59-2	100	ug/Kg	27.6	ug/Kg	79	128	%	20	%	79	128	%	20	%			%
cis-1,3-Dichloropropene	10061-01-5	100	ug/Kg	23.9	ug/Kg			%		%			%		%			%
Cyclohexane	110-82-7	100	ug/Kg	22.2	ug/Kg			%		%			%		%			%
Dichlorodifluoromethane	75-71-8	100	ug/Kg	43.6	ug/Kg			%		%			%		%			%
Ethylbenzene	100-41-4	100	ug/Kg	29.1	ug/Kg	78	136	%	20	%	78	136	%	20	%			%
1,2-Dibromoethane	106-93-4	100	ug/Kg	3.8	ug/Kg			%		%			%		%			%
Isopropylbenzene	98-82-8	100	ug/Kg	15	ug/Kg			%		%			%		%			%
Methyl acetate	79-20-9	100	ug/Kg	47.6	ug/Kg			%		%			%		%			%
Methyl tert-butyl ether	1634-04-4	100	ug/Kg	37.8	ug/Kg	67	137	%	20	%	67	137	%	20	%			%
Methylcyclohexane	108-87-2	100	ug/Kg	46.8	ug/Kg			%		%			%		%			%
Methylene Chloride	75-09-2	100	ug/Kg	19.8	ug/Kg			%		%			%		%			%
Styrene	100-42-5	100	ug/Kg	24.1	ug/Kg			%		%			%		%			%
Tetrachloroethene	127-18-4	100	ug/Kg	13.44	ug/Kg	72	141	%	20	%	72	141	%	20	%			%
Toluene	108-88-3	100	ug/Kg	26.8	ug/Kg	76	133	%	20	%	43	133	%	20	%			%
Toluene-d8 (Surr)	2037-26-5		ug/Kg		ug/Kg			%		%			%		%	50	149	%
trans-1,2-Dichloroethene	156-60-5	100	ug/Kg	23.6	ug/Kg	81	147	%	20	%	81	147	%	20	%			%
trans-1,3-Dichloropropene	10061-02-6	100	ug/Kg	4.8	ug/Kg			%		%			%		%			%
Trichloroethene	79-01-6	100	ug/Kg	27.8	ug/Kg	77	130	%	20	%	77	130	%	20	%			%
Trichlorofluoromethane	75-69-4	100	ug/Kg	46.9	ug/Kg			%		%			%		%			%
Vinyl chloride	75-01-4	100	ug/Kg	33.5	ug/Kg			%		%			%		%			%
Xylenes, Total	1330-20-7	200	ug/Kg	16.8	ug/Kg			%		%			%		%			%
1,2-Dichloroethane-d4 (Surr)	17060-07-0		ug/Kg		ug/Kg			%		%			%		%	53	146	%
4-Bromofluorobenzene (Surr)	460-00-4		ug/Kg		ug/Kg			%		%			%		%	49	148	%

Table 2.1 Quality Control Limits

Media	Method Description	Method Code
Soil	Semivolatile Organic Compounds by GC/MS	8270D
	Ultrasonic Extraction	3550C

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
Biphenyl	92-52-4	170	ug/Kg	10.51428	ug/Kg	71	120	%	20	%	71	120	%	20	%			%
bis (2-chloroisopropyl) ether	108-60-1	170	ug/Kg	17.64	ug/Kg	44	120	%	24	%	44	120	%	24	%			%
2,4,5-Trichlorophenol	95-95-4	170	ug/Kg	36.8149	ug/Kg	59	126	%	18	%	59	126	%	18	%			%
2,4,6-Trichlorophenol	88-06-2	170	ug/Kg	11.13659	ug/Kg	59	123	%	19	%	59	123	%	19	%			%
2,4-Dichlorophenol	120-83-2	170	ug/Kg	8.84975	ug/Kg	52	120	%	19	%	52	120	%	19	%			%
2,4-Dimethylphenol	105-67-9	170	ug/Kg	45.59644	ug/Kg	36	120	%	42	%	36	120	%	42	%			%
2,4-Dinitrophenol	51-28-5	330	ug/Kg	59.06137	ug/Kg	35	146	%	22	%	35	146	%	22	%			%
2,4-Dinitrotoluene	121-14-2	170	ug/Kg	26.13436	ug/Kg	55	125	%	20	%	55	125	%	20	%			%
2,6-Dinitrotoluene	606-20-2	170	ug/Kg	41.30373	ug/Kg	66	128	%	15	%	66	128	%	15	%			%
2-Chloronaphthalene	91-58-7	170	ug/Kg	11.32611	ug/Kg	57	120	%	21	%	57	120	%	21	%			%
2-Chlorophenol	95-57-8	170	ug/Kg	8.59328	ug/Kg	38	120	%	25	%	38	120	%	25	%			%
2-Methylphenol	95-48-7	170	ug/Kg	5.19098	ug/Kg	48	120	%	27	%	48	120	%	27	%			%
2-Methylnaphthalene	91-57-6	170	ug/Kg	2.04484	ug/Kg	47	120	%	21	%	47	120	%	21	%			%
2-Nitroaniline	88-74-4	330	ug/Kg	54.14509	ug/Kg	61	130	%	15	%	61	130	%	15	%			%
2-Nitrophenol	88-75-5	170	ug/Kg	7.71638	ug/Kg	50	120	%	18	%	50	120	%	18	%			%
3,3'-Dichlorobenzidine	91-94-1	170	ug/Kg	148	ug/Kg	48	126	%	25	%	48	126	%	25	%			%
3-Nitroaniline	99-09-2	330	ug/Kg	38.81322	ug/Kg	61	127	%	19	%	61	127	%	19	%			%
4,6-Dinitro-2-methylphenol	534-52-1	330	ug/Kg	58.29008	ug/Kg	49	155	%	15	%	49	155	%	15	%			%
4-Bromophenyl phenyl ether	101-55-3	170	ug/Kg	53.70538	ug/Kg	58	131	%	15	%	58	131	%	15	%			%
4-Chloro-3-methylphenol	59-50-7	170	ug/Kg	6.94446	ug/Kg	49	125	%	27	%	49	125	%	27	%			%
4-Chloroaniline	106-47-8	170	ug/Kg	49.54531	ug/Kg	49	120	%	22	%	49	120	%	22	%			%
4-Chlorophenyl phenyl ether	7005-72-3	170	ug/Kg	3.59842	ug/Kg	63	124	%	16	%	63	124	%	16	%			%
4-Methylphenol	106-44-5	330	ug/Kg	9.4	ug/Kg	50	119	%	24	%	50	119	%	24	%			%
4-Nitroaniline	100-01-6	330	ug/Kg	18.8558	ug/Kg	63	128	%	24	%	63	128	%	24	%			%
4-Nitrophenol	100-02-7	330	ug/Kg	40.91715	ug/Kg	43	137	%	25	%	43	137	%	25	%			%
Acenaphthene	83-32-9	170	ug/Kg	1.98418	ug/Kg	53	120	%	35	%	53	120	%	35	%			%
Acenaphthylene	208-96-8	170	ug/Kg	1.38072	ug/Kg	58	121	%	18	%	58	121	%	18	%			%
Acetophenone	98-86-2	170	ug/Kg	8.66305	ug/Kg	66	120	%	20	%	66	120	%	20	%			%
Anthracene	120-12-7	170	ug/Kg	4.32194	ug/Kg	62	129	%	15	%	62	129	%	15	%			%
Atrazine	1912-24-9	170	ug/Kg	7.51146	ug/Kg	60	164	%	20	%	60	164	%	20	%			%
Benzaldehyde	100-52-7	170	ug/Kg	18.51196	ug/Kg	21	120	%	20	%	21	120	%	20	%			%
Benzo[a]anthracene	56-55-3	170	ug/Kg	2.91388	ug/Kg	65	133	%	15	%	65	133	%	15	%			%
Benzo[a]pyrene	50-32-8	170	ug/Kg	4.06861	ug/Kg	64	127	%	15	%	64	127	%	15	%			%
Benzo[b]fluoranthene	205-99-2	170	ug/Kg	3.27501	ug/Kg	64	135	%	15	%	64	135	%	15	%			%
Benzo[g,h,i]perylene	191-24-2	170	ug/Kg	2.02566	ug/Kg	50	152	%	15	%	50	152	%	15	%			%
Benzo[k]fluoranthene	207-08-9	170	ug/Kg	1.85814	ug/Kg	58	138	%	22	%	58	138	%	22	%			%
Bis(2-chloroethoxy)methane	111-91-1	170	ug/Kg	9.18259	ug/Kg	61	133	%	17	%	61	133	%	17	%			%
Bis(2-chloroethyl)ether	111-44-4	170	ug/Kg	14.57441	ug/Kg	45	120	%	21	%	45	120	%	21	%			%
Bis(2-ethylhexyl) phthalate	117-81-7	170	ug/Kg	54.38616	ug/Kg	61	133	%	15	%	61	133	%	15	%			%
Butyl benzyl phthalate	85-68-7	170	ug/Kg	45.32835	ug/Kg	61	129	%	16	%	61	129	%	16	%			%
Caprolactam	105-60-2	170	ug/Kg	73.02415	ug/Kg	54	133	%	20	%	54	133	%	20	%			%
Carbazole	86-74-8	170	ug/Kg	1.95306	ug/Kg	59	129	%	20	%	59	129	%	20	%			%
Chrysene	218-01-9	170	ug/Kg	1.68779	ug/Kg	64	131	%	15	%	64	131	%	15	%			%
Dibenz(a,h)anthracene	53-70-3	170	ug/Kg	1.98543	ug/Kg	54	148	%	15	%	54	148	%	15	%			%
Di-n-butyl phthalate	84-74-2	170	ug/Kg	58.34917	ug/Kg	58	130	%	15	%	58	130	%	15	%			%
Di-n-octyl phthalate	117-84-0	170	ug/Kg	3.94792	ug/Kg	62	133	%	16	%	62	133	%	16	%			%
Dibenzofuran	132-64-9	170	ug/Kg	1.75662	ug/Kg	56	120	%	15	%	56	120	%	15	%			%
Diethyl phthalate	84-66-2	170	ug/Kg	5.09952	ug/Kg	66	126	%	15	%	66	126	%	15	%			%
Dimethyl phthalate	131-11-3	170	ug/Kg	4.40366	ug/Kg	65	124	%	15	%	65	124	%	15	%			%
Fluoranthene	206-44-0	170	ug/Kg	2.44588	ug/Kg	62	131	%	15	%	62	131	%	15	%			%
Fluorene	86-73-7	170	ug/Kg	3.88915	ug/Kg	63	126	%	15	%	63	126	%	15	%			%
Hexachlorobenzene	118-74-1	170	ug/Kg	8.38584	ug/Kg	60	132	%	15	%	60	132	%	15	%			%
Hexachlorobutadiene	87-68-3	170	ug/Kg	8.63759	ug/Kg	45	120	%	44	%	45	120	%	44	%			%
Hexachlorocyclopentadiene	77-47-4	170	ug/Kg	51.03698	ug/Kg	31	120	%	49	%	31	120	%	49	%			%
Hexachloroethane	67-72-1	170	ug/Kg	13.06357	ug/Kg	41	120	%	46	%	41	120	%	46	%			%
Indeno[1,2,3-cd]pyrene	193-39-5	170	ug/Kg	4.66924	ug/Kg	56	149	%	15	%	56	149	%	15	%			%
Isophorone	78-59-1	170	ug/Kg	8.43613	ug/Kg	56	120	%	17	%	56	120	%	17	%			%
N-Nitrosodi-n-propylamine	621-64-7	170	ug/Kg	13.36969	ug/Kg	46	120	%	31	%	46	120	%	31	%			%
N-Nitrosodiphenylamine	86-30-6	170	ug/Kg	9.22816	ug/Kg	20	119	%	15	%	20	119	%	15	%			%
Naphthalene	91-20-3	170	ug/Kg	2.80953	ug/Kg	46	120	%	29	%	46	120	%	29	%			%
Nitrobenzene	98-95-3	170	ug/Kg	7.48254	ug/Kg	49	120	%	24	%	49	120	%	24	%			%
Nitrobenzene-d5 (Surr)	4165-60-0		ug/Kg		ug/Kg			%		%			%		%	34	132	%
Pentachlorophenol	87-86-5	330	ug/Kg	57.89626	ug/Kg	33	136	%	35	%	33	136	%	35	%			%
Phenanthrene	85-01-8	170	ug/Kg	3.54216	ug/Kg	60	130	%	15	%	60	130	%	15	%			%
Phenol	108-95-2	170	ug/Kg	17.76801	ug/Kg	36	120	%	35	%	36	120	%	35	%			%
Phenol-d5 (Surr)	4165-62-2		ug/Kg		ug/Kg			%		%			%		%	11	120	%
Pyrene	129-00-0	170	ug/Kg	1.09282	ug/Kg	51	133	%	35	%	51	133	%	35	%			%
p-Terphenyl-d14 (Surr)	1718-51-0		ug/Kg		ug/Kg			%		%			%		%	65	153	%
2,4,6-Tribromophenol (Surr)	118-79-6	0	ug/Kg	0	ug/Kg			%		%			%		%	39	146	%
2-Fluorobiphenyl	321-60-8		ug/Kg		ug/Kg			%		%			%		%	37	120	%
2-Fluorophenol (Surr)	367-12-4		ug/Kg		ug/Kg			%		%			%		%	18	120	%

Table 2.1 Quality Control Limits

Media	Method Description	Method Code
Soil	Metals (ICP)	6010C
	Preparation, Metals	3050B

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
Aluminum	7429-90-5	10	mg/Kg	4.4	mg/Kg	41	160	%	20	%	75	125	%	20	%			
Antimony	7440-36-0	15	mg/Kg	0.4	mg/Kg	25	272	%	20	%	75	125	%	20	%			
Arsenic	7440-38-2	2	mg/Kg	0.4	mg/Kg	69	131	%	20	%	75	125	%	20	%			
Barium	7440-39-3	0.5	mg/Kg	0.11	mg/Kg	72	127	%	20	%	75	125	%	20	%			
Beryllium	7440-41-7	0.2	mg/Kg	0.028	mg/Kg	73	127	%	20	%	75	125	%	20	%			
Cadmium	7440-43-9	0.2	mg/Kg	0.03	mg/Kg	73	127	%	20	%	75	125	%	20	%			
Calcium	7440-70-2	50	mg/Kg	3.3	mg/Kg	74	126	%	20	%	75	125	%	20	%			
Chromium	7440-47-3	0.5	mg/Kg	0.2	mg/Kg	68	132	%	20	%	75	125	%	20	%			
Cobalt	7440-48-4	0.5	mg/Kg	0.05	mg/Kg	75	125	%	20	%	75	125	%	20	%			
Copper	7440-50-8	1	mg/Kg	0.21	mg/Kg	74	126	%	20	%	75	125	%	20	%			
Iron	7439-89-6	10	mg/Kg	1.1	mg/Kg	31	169	%	20	%	75	125	%	20	%			
Lead	7439-92-1	1	mg/Kg	0.24	mg/Kg	70	130	%	20	%	75	125	%	20	%			
Magnesium	7439-95-4	20	mg/Kg	0.927	mg/Kg	64	136	%	20	%	75	125	%	20	%			
Manganese	7439-96-5	0.2	mg/Kg	0.032	mg/Kg	74	125	%	20	%	75	125	%	20	%			
Nickel	7440-02-0	5	mg/Kg	0.23	mg/Kg	70	130	%	20	%	75	125	%	20	%			
Potassium	7440-09-7	30	mg/Kg	20	mg/Kg	61	139	%	20	%	75	125	%	20	%			
Selenium	7782-49-2	4	mg/Kg	0.4	mg/Kg	64	137	%	20	%	75	125	%	20	%			
Silver	7440-22-4	0.5	mg/Kg	0.2	mg/Kg	66	135	%	20	%	75	125	%	20	%			
Sodium	7440-23-5	140	mg/Kg	13	mg/Kg	27	174	%	20	%	75	125	%	20	%			
Thallium	7440-28-0	6	mg/Kg	0.3	mg/Kg	67	132	%	20	%	75	125	%	20	%			
Vanadium	7440-62-2	0.5	mg/Kg	0.11	mg/Kg	54	146	%	20	%	75	125	%	20	%			
Zinc	7440-66-6	2	mg/Kg	0.153	mg/Kg	67	133	%	20	%	75	125	%	20	%			

Media	Method Description	Method Code
Soil	PCBs by Gas Chromatography	8082A
	Ultrasonic Extraction	3550C_Med

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
PCB-1016	12674-11-2	0.0167	mg/Kg	0.00326	mg/Kg	51	185	%	50	%	42	159	%	50	%			%
PCB-1221	11104-28-2	0.0167	mg/Kg	0.00326	mg/Kg			%		%			%		%			%
PCB-1232	11141-16-5	0.0167	mg/Kg	0.00326	mg/Kg			%		%			%		%			%
PCB-1242	53469-21-9	0.0167	mg/Kg	0.00326	mg/Kg			%		%			%		%			%
PCB-1248	12672-29-6	0.0167	mg/Kg	0.00326	mg/Kg			%		%			%		%			%
PCB-1254	11097-69-1	0.0167	mg/Kg	0.00782	mg/Kg	20	200	%		%			%		%			%
PCB-1260	11096-82-5	0.0167	mg/Kg	0.00782	mg/Kg	61	184	%	50	%	47	153	%	50	%			%
Tetrachloro-m-xylene	877-09-8		mg/Kg		mg/Kg			%		%			%		%	46	175	%
DCB Decachlorobiphenyl	2051-24-3		mg/Kg		mg/Kg			%		%			%		%	47	176	%

Table 2.1 Quality Control Limits

Media	Method Description	Method Code
Water	Volatile Organic Compounds by GC/MS	8260C
	Purge and Trap	5030C

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
1,1,1-Trichloroethane	71-55-6	1	ug/L	0.82	ug/L	73	126	%	15	%	73	126	%	15	%			%
1,1,2,2-Tetrachloroethane	79-34-5	1	ug/L	0.21	ug/L	70	126	%	15	%	70	126	%	15	%			%
1,1,2-Trichloroethane	79-00-5	1	ug/L	0.23	ug/L	76	122	%	15	%	76	122	%	15	%			%
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1	ug/L	0.31	ug/L	52	148	%	20	%	52	148	%	20	%			%
1,1-Dichloroethane	75-34-3	1	ug/L	0.38	ug/L	71	129	%	20	%	71	129	%	20	%			%
1,1-Dichloroethene	75-35-4	1	ug/L	0.29	ug/L	58	121	%	16	%	58	121	%	16	%			%
1,2,4-Trichlorobenzene	120-82-1	1	ug/L	0.41	ug/L	70	122	%	20	%	70	122	%	20	%			%
1,2-Dibromo-3-Chloropropane	96-12-8	1	ug/L	0.39	ug/L	56	134	%	15	%	56	134	%	15	%			%
1,2-Dichlorobenzene	95-50-1	1	ug/L	0.79	ug/L	80	124	%	20	%	80	124	%	20	%			%
1,2-Dichloroethane	107-06-2	1	ug/L	0.21	ug/L	75	127	%	20	%	75	127	%	20	%			%
1,2-Dichloropropane	78-87-5	1	ug/L	0.72	ug/L	76	120	%	20	%	76	120	%	20	%			%
1,3-Dichlorobenzene	541-73-1	1	ug/L	0.78	ug/L	77	120	%	20	%	77	120	%	20	%			%
1,4-Dichlorobenzene	106-46-7	1	ug/L	0.84	ug/L	75	120	%	20	%	75	120	%	20	%			%
2-Butanone (MEK)	78-93-3	10	ug/L	1.32	ug/L	57	140	%	20	%	57	140	%	20	%			%
2-Hexanone	591-78-6	5	ug/L	1.24	ug/L	65	127	%	15	%	65	127	%	15	%			%
4-Methyl-2-pentanone (MIBK)	108-10-1	5	ug/L	2.1	ug/L	71	125	%	35	%	71	125	%	35	%			%
Acetone	67-64-1	10	ug/L	3	ug/L	56	142	%	15	%	56	142	%	15	%			%
Benzene	71-43-2	1	ug/L	0.41	ug/L	71	124	%	13	%	71	124	%	13	%			%
Bromodichloromethane	75-27-4	1	ug/L	0.39	ug/L	80	122	%	15	%	80	122	%	15	%			%
Bromoform	75-25-2	1	ug/L	0.26	ug/L	66	128	%	15	%	66	128	%	15	%			%
Bromomethane	74-83-9	1	ug/L	0.69	ug/L	55	144	%	15	%	55	144	%	15	%			%
Carbon disulfide	75-15-0	1	ug/L	0.19	ug/L	59	134	%	15	%	59	134	%	15	%			%
Carbon tetrachloride	56-23-5	1	ug/L	0.27	ug/L	72	134	%	15	%	72	134	%	15	%			%
Chlorobenzene	108-90-7	1	ug/L	0.75	ug/L	72	120	%	25	%	72	120	%	25	%			%
Dibromochloromethane	124-48-1	1	ug/L	0.32	ug/L	75	125	%	15	%	75	125	%	15	%			%
Chloroethane	75-00-3	1	ug/L	0.32	ug/L	69	136	%	15	%	69	136	%	15	%			%
Chloroform	67-66-3	1	ug/L	0.34	ug/L	73	127	%	20	%	73	127	%	20	%			%
Chloromethane	74-87-3	1	ug/L	0.35	ug/L	68	124	%	15	%	68	124	%	15	%			%
cis-1,2-Dichloroethene	156-59-2	1	ug/L	0.81	ug/L	74	124	%	15	%	74	124	%	15	%			%
cis-1,3-Dichloropropene	10061-01-5	1	ug/L	0.36	ug/L	74	124	%	15	%	74	124	%	15	%			%
Cyclohexane	110-82-7	1	ug/L	0.18	ug/L	65	126	%	20	%	65	126	%	20	%			%
Dichlorodifluoromethane	75-71-8	1	ug/L	0.68	ug/L	59	135	%	20	%	59	135	%	20	%			%
Ethylbenzene	100-41-4	1	ug/L	0.74	ug/L	77	123	%	15	%	77	123	%	15	%			%
1,2-Dibromoethane	106-93-4	1	ug/L	0.73	ug/L	77	120	%	15	%	77	120	%	15	%			%
Isopropylbenzene	98-82-8	1	ug/L	0.79	ug/L	77	122	%	20	%	77	122	%	20	%			%
Methyl acetate	79-20-9	1	ug/L	0.5	ug/L	60	140	%	20	%	60	140	%	20	%			%
Methyl tert-butyl ether	1634-04-4	1	ug/L	0.16	ug/L	64	127	%	37	%	64	127	%	37	%			%
Methylcyclohexane	108-87-2	1	ug/L	0.16	ug/L	60	140	%	20	%	60	140	%	20	%			%
Methylene Chloride	75-09-2	1	ug/L	0.44	ug/L	57	132	%	15	%	57	132	%	15	%			%
Styrene	100-42-5	1	ug/L	0.73	ug/L	70	130	%	20	%	70	130	%	20	%			%
Tetrachloroethene	127-18-4	1	ug/L	0.36	ug/L	74	122	%	20	%	74	122	%	20	%			%
Toluene	108-88-3	1	ug/L	0.51	ug/L	80	122	%	15	%	80	122	%	15	%			%
Toluene-d8 (Surr)	2037-26-5		ug/L		ug/L			%		%			%		%	71	126	%
trans-1,2-Dichloroethene	156-60-5	1	ug/L	0.9	ug/L	73	127	%	20	%	73	127	%	20	%			%
trans-1,3-Dichloropropene	10061-02-6	1	ug/L	0.37	ug/L	72	123	%	15	%	72	123	%	15	%			%
Trichloroethene	79-01-6	1	ug/L	0.46	ug/L	74	123	%	16	%	74	123	%	16	%			%
Trichlorofluoromethane	75-69-4	1	ug/L	0.88	ug/L	62	152	%	20	%	62	152	%	20	%			%
Vinyl chloride	75-01-4	1	ug/L	0.9	ug/L	65	133	%	15	%	65	133	%	15	%			%
Xylenes, Total	1330-20-7	2	ug/L	0.66	ug/L	76	122	%	16	%	76	122	%	16	%			%
1,2-Dichloroethane-d4 (Surr)	17060-07-0		ug/L		ug/L			%		%			%		%	66	137	%
4-Bromofluorobenzene (Surr)	460-00-4		ug/L		ug/L			%		%			%		%	73	120	%

Table 2.1 Quality Control Limits

Media	Method Description	Method Code
Water	Semivolatile Organic Compounds (GC/MS)	8270D
	Liquid-Liquid Extraction (Separatory Funnel)	3510C_LVI

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
Biphenyl	92-52-4	5	ug/L	0.653	ug/L	30	140	%	20	%	30	140	%	20	%			%
bis (2-chloroisopropyl) ether	108-60-1	5	ug/L	0.52	ug/L	28	136	%	24	%	28	136	%	24	%			%
2,4,5-Trichlorophenol	95-95-4	5	ug/L	0.48	ug/L	65	126	%	18	%	65	126	%	18	%			%
2,4,6-Trichlorophenol	88-06-2	5	ug/L	0.61	ug/L	64	120	%	19	%	64	120	%	19	%			%
2,4-Dichlorophenol	120-83-2	5	ug/L	0.51	ug/L	64	120	%	19	%	64	120	%	19	%			%
2,4-Dimethylphenol	105-67-9	5	ug/L	0.5	ug/L	57	120	%	42	%	57	120	%	42	%			%
2,4-Dinitrophenol	51-28-5	10	ug/L	2.22	ug/L	42	153	%	22	%	42	153	%	22	%			%
2,4-Dinitrotoluene	121-14-2	5	ug/L	0.447	ug/L	65	154	%	20	%	62	148	%	20	%			%
2,6-Dinitrotoluene	606-20-2	5	ug/L	0.4	ug/L	74	134	%	15	%	65	154	%	15	%			%
2-Chloronaphthalene	91-58-7	5	ug/L	0.46	ug/L	41	124	%	21	%	41	124	%	21	%			%
2-Chlorophenol	95-57-8	5	ug/L	0.53	ug/L	48	120	%	25	%	48	120	%	25	%			%
2-Methylphenol	95-48-7	5	ug/L	0.4	ug/L	39	120	%	27	%	39	120	%	27	%			%
2-Methylnaphthalene	91-57-6	5	ug/L	0.6	ug/L	34	122	%	21	%	34	122	%	21	%			%
2-Nitroaniline	88-74-4	10	ug/L	0.42	ug/L	67	136	%	15	%	67	136	%	15	%			%
2-Nitrophenol	88-75-5	5	ug/L	0.48	ug/L	59	120	%	18	%	59	120	%	18	%			%
3,3'-Dichlorobenzidine	91-94-1	5	ug/L	0.4	ug/L	33	140	%	25	%	33	140	%	25	%			%
3-Nitroaniline	99-09-2	10	ug/L	0.48	ug/L	69	129	%	19	%	69	129	%	19	%			%
4,6-Dinitro-2-methylphenol	534-52-1	10	ug/L	2.2	ug/L	64	159	%	15	%	64	159	%	15	%			%
4-Bromophenyl phenyl ether	101-55-3	5	ug/L	0.45	ug/L	71	126	%	15	%	71	126	%	15	%			%
4-Chloro-3-methylphenol	59-50-7	5	ug/L	0.45	ug/L	64	120	%	27	%	64	120	%	27	%			%
4-Chloroaniline	106-47-8	5	ug/L	0.59	ug/L	60	124	%	22	%	60	124	%	22	%			%
4-Chlorophenyl phenyl ether	7005-72-3	5	ug/L	0.35	ug/L	71	122	%	16	%	48	145	%	16	%			%
4-Methylphenol	106-44-5	10	ug/L	0.36	ug/L	39	120	%	24	%	36	120	%	24	%			%
4-Nitroaniline	100-01-6	10	ug/L	0.25	ug/L	64	135	%	24	%	64	135	%	24	%			%
4-Nitrophenol	100-02-7	10	ug/L	1.52	ug/L	16	120	%	48	%	16	120	%	48	%			%
Acenaphthene	83-32-9	5	ug/L	0.41	ug/L	60	120	%	24	%	60	120	%	24	%			%
Acenaphthylene	208-96-8	5	ug/L	0.38	ug/L	63	120	%	18	%	63	120	%	18	%			%
Acetophenone	98-86-2	5	ug/L	0.54	ug/L	45	120	%	20	%	45	120	%	20	%			%
Anthracene	120-12-7	5	ug/L	0.28	ug/L	58	148	%	15	%	58	148	%	15	%			%
Atrazine	1912-24-9	5	ug/L	0.46	ug/L	56	179	%	20	%	56	179	%	20	%			%
Benzaldehyde	100-52-7	5	ug/L	0.267	ug/L	30	140	%	20	%	30	140	%	20	%			%
Benzo[a]anthracene	56-55-3	5	ug/L	0.36	ug/L	55	151	%	15	%	55	151	%	15	%			%
Benzo[a]pyrene	50-32-8	5	ug/L	0.47	ug/L	60	145	%	15	%	60	145	%	15	%			%
Benzo[b]fluoranthene	205-99-2	5	ug/L	0.34	ug/L	54	140	%	15	%	54	140	%	15	%			%
Benzo[g,h,i]perylene	191-24-2	5	ug/L	0.35	ug/L	66	152	%	15	%	66	152	%	15	%			%
Benzo[k]fluoranthene	207-08-9	5	ug/L	0.73	ug/L	51	153	%	22	%	51	153	%	22	%			%
Bis(2-chloroethoxy)methane	111-91-1	5	ug/L	0.35	ug/L	50	128	%	17	%	50	128	%	17	%			%
Bis(2-chloroethyl)ether	111-44-4	5	ug/L	0.4	ug/L	51	120	%	21	%	51	120	%	21	%			%
Bis(2-ethylhexyl) phthalate	117-81-7	5	ug/L	1.8	ug/L	53	158	%	15	%	53	158	%	15	%			%
Butyl benzyl phthalate	85-68-7	5	ug/L	0.42	ug/L	58	163	%	16	%	58	163	%	16	%			%
Caprolactam	105-60-2	5	ug/L	2.2	ug/L	30	140	%	20	%	30	140	%	20	%			%
Carbazole	86-74-8	5	ug/L	0.3	ug/L	59	148	%	20	%	59	148	%	20	%			%
Chrysene	218-01-9	5	ug/L	0.33	ug/L	69	140	%	15	%	69	140	%	15	%			%
Dibenz(a,h)anthracene	53-70-3	5	ug/L	0.42	ug/L	57	148	%	15	%	57	158	%	15	%			%
Di-n-butyl phthalate	84-74-2	5	ug/L	0.31	ug/L	58	149	%	15	%	58	149	%	15	%			%
Di-n-octyl phthalate	117-84-0	5	ug/L	0.47	ug/L	55	167	%	16	%	55	167	%	16	%			%
Dibenzofuran	132-64-9	10	ug/L	0.51	ug/L	49	137	%	15	%	49	137	%	15	%			%
Diethyl phthalate	84-66-2	5	ug/L	0.22	ug/L	59	146	%	15	%	59	146	%	15	%			%
Dimethyl phthalate	131-11-3	5	ug/L	0.36	ug/L	59	141	%	15	%	59	141	%	15	%			%
Fluoranthene	206-44-0	5	ug/L	0.4	ug/L	55	147	%	15	%	55	147	%	15	%			%
Fluorene	86-73-7	5	ug/L	0.36	ug/L	55	143	%	15	%	55	143	%	15	%			%
Hexachlorobenzene	118-74-1	5	ug/L	0.51	ug/L	14	108	%	15	%	38	131	%	15	%			%
Hexachlorobutadiene	87-68-3	5	ug/L	0.68	ug/L	14	108	%	44	%	14	108	%	44	%			%
Hexachlorocyclopentadiene	77-47-4	5	ug/L	0.59	ug/L	13	119	%	49	%	13	119	%	49	%			%
Hexachloroethane	67-72-1	5	ug/L	0.59	ug/L	14	101	%	46	%	14	101	%	46	%			%
Indeno[1,2,3-cd]pyrene	193-39-5	5	ug/L	0.47	ug/L	69	146	%	15	%	69	146	%	15	%			%
Isophorone	78-59-1	5	ug/L	0.43	ug/L	48	133	%	17	%	48	133	%	17	%			%
N-Nitrosodi-n-propylamine	621-64-7	5	ug/L	0.54	ug/L	56	120	%	31	%	56	120	%	31	%			%
N-Nitrosodiphenylamine	86-30-6	5	ug/L	0.51	ug/L	25	125	%	15	%	25	125	%	15	%			%
Naphthalene	91-20-3	5	ug/L	0.76	ug/L	35	117	%	29	%	35	117	%	29	%			%
Nitrobenzene	98-95-3	5	ug/L	0.29	ug/L	45	123	%	24	%	45	123	%	24	%			%
Nitrobenzene-d5 (Surr)	4165-60-0		ug/L		ug/L			%		%			%		%	46	120	%
Pentachlorophenol	87-86-5	10	ug/L	2.2	ug/L	39	136	%	37	%	39	136	%	37	%			%
Phenanthrene	85-01-8	5	ug/L	0.44	ug/L	57	147	%	15	%	57	147	%	15	%			%
Phenol	108-95-2	5	ug/L	0.39	ug/L	17	120	%	34	%	17	120	%	34	%			%
Phenol-d5 (Surr)	4165-62-2		ug/L		ug/L			%		%			%		%	16	120	%
Pyrene	129-00-0	5	ug/L	0.34	ug/L	58	136	%	19	%	58	136	%	19	%			%
p-Terphenyl-d14 (Surr)	1718-51-0		ug/L		ug/L			%		%			%		%	67	150	%
2,4,6-Tribromophenol (Surr)	118-79-6		ug/L		ug/L			%		%			%		%	52	132	%
2-Fluorobiphenyl	321-60-8		ug/L		ug/L			%		%			%		%	48	120	%
2-Fluorophenol (Surr)	367-12-4		ug/L		ug/L			%		%			%		%	20	120	%

Table 2.1 Quality Control Limits

Media	Method Description	Method Code
Water	Metals (ICP)	6010C
	Preparation, Total Metals	3005A_TOT

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
Aluminum	7429-90-5	0.2	mg/L	0.06	mg/L	80	120	%	20	%	75	125	%	20	%			
Antimony	7440-36-0	0.02	mg/L	0.00679	mg/L	80	120	%	20	%	75	125	%	20	%			
Arsenic	7440-38-2	0.01	mg/L	0.00555	mg/L	80	120	%	20	%	75	125	%	20	%			
Barium	7440-39-3	0.002	mg/L	0.0007	mg/L	80	120	%	20	%	75	125	%	20	%			
Beryllium	7440-41-7	0.002	mg/L	0.0003	mg/L	80	120	%	20	%	75	125	%	20	%			
Cadmium	7440-43-9	0.001	mg/L	0.0005	mg/L	80	120	%	20	%	75	125	%	20	%			
Calcium	7440-70-2	0.5	mg/L	0.1	mg/L	80	120	%	20	%	75	125	%	20	%			
Chromium	7440-47-3	0.004	mg/L	0.001	mg/L	80	120	%	20	%	75	125	%	20	%			
Cobalt	7440-48-4	0.004	mg/L	0.00063	mg/L	80	120	%	20	%	75	125	%	20	%			
Copper	7440-50-8	0.01	mg/L	0.0016	mg/L	80	120	%	20	%	75	125	%	20	%			
Iron	7439-89-6	0.05	mg/L	0.0193	mg/L	80	120	%	20	%	75	125	%	20	%			
Lead	7439-92-1	0.005	mg/L	0.003	mg/L	80	120	%	20	%	75	125	%	20	%			
Magnesium	7439-95-4	0.2	mg/L	0.0434	mg/L	80	120	%	20	%	75	125	%	20	%			
Manganese	7439-96-5	0.003	mg/L	0.0004	mg/L	80	120	%	20	%	75	125	%	20	%			
Nickel	7440-02-0	0.01	mg/L	0.00126	mg/L	80	120	%	20	%	75	125	%	20	%			
Potassium	7440-09-7	0.5	mg/L	0.1	mg/L	80	120	%	20	%	75	125	%	20	%			
Selenium	7782-49-2	0.015	mg/L	0.0087	mg/L	80	120	%	20	%	75	125	%	20	%			
Silver	7440-22-4	0.003	mg/L	0.0017	mg/L	80	120	%	20	%	75	125	%	20	%			
Sodium	7440-23-5	1	mg/L	0.324	mg/L	80	120	%	20	%	75	125	%	20	%			
Thallium	7440-28-0	0.02	mg/L	0.01024	mg/L	80	120	%	20	%	75	125	%	20	%			
Vanadium	7440-62-2	0.005	mg/L	0.0015	mg/L	80	120	%	20	%	75	125	%	20	%			
Zinc	7440-66-6	0.01	mg/L	0.0015	mg/L	80	120	%	20	%	75	125	%	20	%			

Media	Method Description	Method Code
Water	PCBs by Gas Chromatography	8082A
	Liquid-Liquid Extraction (Separatory Funnel)	3510C_LVI_1YR

		Reporting Limit		Method Detection Limit		LCSREC Recovery			LCSRPD		MSREC Recovery			MSRPD		SUREC Recovery		
Analyte Description	CAS #	Limit	Units	Limit	Units	Low	High	Units	Precision	Units	Low	High	Units	Precision	Units	Low	High	Units
PCB-1016	12674-11-2	0.5	ug/L	0.176	ug/L	51	137	%	50	%	52	134	%	50	%			%
PCB-1221	11104-28-2	0.5	ug/L	0.176	ug/L			%		%			%		%			%
PCB-1232	11141-16-5	0.5	ug/L	0.176	ug/L			%		%			%		%			%
PCB-1242	53469-21-9	0.5	ug/L	0.176	ug/L			%		%			%		%			%
PCB-1248	12672-29-6	0.5	ug/L	0.176	ug/L			%		%			%		%			%
PCB-1254	11097-69-1	0.5	ug/L	0.25	ug/L			%		%			%		%			%
PCB-1260	11096-82-5	0.5	ug/L	0.25	ug/L	45	139	%	50	%	19	136	%	50	%			%
Tetrachloro-m-xylene	877-09-8		ug/L		ug/L			%		%			%		%	23	127	%
DCB Decachlorobiphenyl	2051-24-3		ug/L		ug/L			%		%			%		%	19	126	%

Table 2.2 Project Target Analytes and Remediation Goals

SOIL	Contaminants of Concern	SCG (mg/kg)
VOCs	Acetone	0.05
	1,1,1-Trichloroethane	0.68
	1,1-Dichloroethane	0.27
	Acetone	0.05
	Benzene	0.06
	Chlorobenzene	1.1
	Chloroethane	1.9
	Ethylbenzene	1
	Methylene Chloride	0.05
	Tetrachloroethene	1.3
	Toluene	0.7
	Trichloroethene	0.47
	Xylenes, Total	0.26
SVOCs	1,2,4-Trichlorobenzene	3.4
	2,4,5-Trichlorophenol	0.1
	2-Methylphenol	0.1 or MDL
	4-Methylphenol	0.9
	Benzo(a)anthracene	1
	Benzo(a)pyrene	1
	Benzo(b)fluoranthene	1
	Benzo(k)fluoranthene	0.8
	Chrysene	1
	Dibenz(a,h)anthracene	0.33
	Dibenzofuran	6.2
	Indeno(1,2,3-cd)pyrene	0.5
	Phenol	0.3
PCBs	Total PCBs	1
Metals	Arsenic	13
	Barium	350
	Beryllium	7.2
	Cadmium	2.5
	Chromium	10 or SB
	Copper	50
	Iron	2000 or SB
	Lead	63
	Mercury	0.18
	Nickel	30
	Silver	2
	Zinc	109
	Total Cyanide	27

Table 2.2 Project Target Analytes and Remediation Goals

GROUNDWATER	Contaminants of Concern	SCG (mg/L)
VOCs	1,4-Dichlorobenzene	0.003
	Benzene	0.001
	Chlorobezene	0.005
	Chloroethane	0.005
	Chloroform	0.007
	Ethylbenzene	0.005
	Methylene Chloride	0.005
	Toluene	0.005
SVOCs	Benzo(a)anthracene	0.000002
	Benzo(a)pyrene	0.000002
	Benzo(b)fluoranthene	0.000002
	Benzo(k)fluoranthene	0.000002
	Bis(2-Ethylhexyl)phthalate	0.005
	Chrysene	0.000002
	Fluoranthene	0.05
	Indeno(1,2,3-cd)pyrene	0.000002
	Naphthalene	0.01
	Phenanthrene	0.05
	Pyrene	0.05
	Total Phenols	0.001
Metals	Arsenic	0.025
	Barium	1
	Beryllium	0.003
	Cadmium	0.005
	Chromium	0.05
	Iron	0.3 *
	Lead	0.025
	Magnesium	35
	Manganese	0.3 *
	Selenium	0.01
	Sodium	20
	Zinc	2

SURFACE WATER	Contaminants of Concern	SCG (mg/L)
VOCs	Methylene Chloride	0.2
SVOCs	Benzo(a)athracene	0.00003 GV
	Benzo(a)pyrene	0.0000012 GV
PCBs	Aroclor 1242	0.000000001
	Total PCBs	0.000000001
Metals	Aluminum	0.1
	Cadmium	0.0066[a]
	Chromium	0.250[a]
	Copper	0.0314[a]
	Iron	0.3
	Lead	0.0179[a]
	Zinc	0.290[a]

Table 2.2 Project Target Analytes and Remediation Goals

SEDIMENTS	Contaminants of Concern	SCG (mg/kg)
SVOCs	Benzo(a)anthracene	0.079
	Benzo(a)pyrene	0.079
	Benzo(b)fluoranthene	0.079
	Benzo(k)fluoranthene	0.079
	Chrysene	0.079
	Fluorene	0.483
	Indeno(1,2,3-cd)pyrene	0.079
PCBs	Total PCBs	1
Metals	Arsenic	LEL- 6
		SEL- 33
	Cadmium	LEL- 0.6
		SEL- 9
	Chromium	LEL- 26
		SEL- 110
	Iron	LEL- 20,000
		SEL-40,000
	Lead	LEL- 31
		SEL- 110
	Manganese	LEL- 460
		SEL- 1,000
	Mercury	LEL- 0.15
		SEL- 1.3
	Nickel	LEL- 16
		SEL- 50
	Silver	LEL- 1
		SEL- 2
	Zinc	LEL- 120
		SEL- 270

Notes:
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
SCG = standards, criteria, and guidance values
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
PCBs = Polychlorinated Biphenyls
LEL = Lowest Effects Level
SEL = Severe Effects Level
SB = Site Background
MDL = Method Detection Limit
[a] The Standard was calculated based on total hardness, which was derived from calcium and magnesium concentrations. The mean total hardness of 434 ppm was used to calculate the Standard.

Table 3.1 Sample Containerization and Holding Times

Soil/Sediment Analysis	**Bottle Type**	**Preservation (a)**	**Holding Time (b)**
Volatile Organic Compounds (VOCs)	Wide-mouth glass w/ Teflon lined cap	Cool to 4ºC	10 days
Semivolatile Organic Compounds (SVOCs)	Wide-mouth glass w/ Teflon lined cap	Cool to 4ºC	10 days (c)
PCBs	Wide-mouth glass w/ Teflon lined cap	Cool to 4ºC	10 days (c)
Metals	Wide-mouth plastic or glass	Cool to 4ºC	6 months, except mercury (26 days)

Water Analysis	**Bottle Type**	**Preservation (a)**	**Holding Time (b)**
Volatile Organic Compounds (VOCs)	(2) 40 mL glass vial with Teflon septum	Cool to 4ºC	10 days
Semivolatile Organic Compounds (SVOCs)	1000 mL glass w/ Teflon-lined cap	Cool to 4ºC	5 days (d)
PCBs	1000 mL glass w/ Teflon-lined cap	Cool to 4ºC	5 days (d)
Metals	1000 mL plastic bottle	Nitric Acid to pH < 2; Cool to 4ºC	6 months, except mercury (26 days)

Notes
(a) All samples to be preserved in ice during collection and transport.
(b) Days from validated time of sample receipt (VTSR)
(c) Sohxlet or sonication procedures for extraction and concentration of soil samples for SVOCs must be completed within 5 days of VTSR. Sohxlet or sonication procedures for extraction and concentration of soil/sediment samples for PCBs must be completed within 5 days of VTSR. Extracts of soil samples must be analyzed within 40 days of extraction.

(d) Continuous liquid-liquid extraction is the required extraction for water samples for SVOCs. Continuous liquid-liquid extraction and concentration of water samples for SVOC analysis must begin within 5 days and be completed within 7 days of VTSR. Extracts of water samples must be analyzed within 40 days of extraction.

TestAmerica Buffalo
10 Hazelwood Drive

Amherst, NY 14228
phone 716.504.9852 fax 716.691.7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	**Project Manager:**	**Site Contact:**	**Date:**	COC No:
Your Company Name here	**Tel/Fax:**	**Lab Contact:**	**Carrier:**	_____ of _____ COCs
Address	**Analysis Turnaround Time**			Sampler:
City/State/Zip	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
(xxx) xxx-xxxx Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)																	Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

UNDER SEPARATE COVER

STORMWATER POLLUTION PREVENTION PLAN

STORMWATER POLLUTION PREVENTION PLAN
REMEDIAL ACTION IMPLEMENTATION

NORTH AND SOUTH LANDFILLS
COOPER CROUSE-HINDS FACILITY
SYRACUSE, NEW YORK

Prepared for:

Cooper Crouse-Hinds, LLC
600 Travis, Suite 5600
Houston, Texas 77002

Prepared by:

Tetra Tech, Inc.
175 N. Corporate Drive, Suite 100
Brookfield, WI 53045

February 3, 2014

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1.0 INTRODUCTION

Prior to excavation and relocation of soils, sediments, and landfill solid waste at part of the selected remedy for the North and South Landfills at the Cooper Crouse-Hinds Facility, submission of a Notice of Intent is being completed to comply with New York State Department of Environmental Conservation (NYSDEC) requirements.

Excavation of soils, sediments, and landfill waste with relocation and capping involving soil disturbances of one (1) or more acres require coverage under SPDES General Permit GP-0-10-001 with an effective date of January 29, 2010 issued by the New York State Department of Environmental Conservation (NYSDEC – Appendix A). The listed activities at the North (21.48 acres) and South (19.4 acres) Landfills thus requires this coverage.

To gain coverage under General Permit GP-0-10-001, a Notice of Intent (NOI – Appendix B) must be filed with the NYSDEC. A Storm Water Pollution Prevention Plan (SWPPP) must be included with the NOI submittal. Coverage under General Permit GP-0-01-001 may not be required as this project is a NYSDEC-approved remediation, however a SWPPP will detail the best practices for project completion.

2.0 PROJECT BACKGROUND INFORMATION

The Cooper Crouse-Hinds, LLC (CC-H) Site consists of two inactive landfills, referred to as the North and South landfills, which are located immediately west of the CSX railroad tracks and the adjacent operating CC-H manufacturing facility. The Site is located in the Town of Salina (North landfill) and City of Syracuse (South landfill), Onondaga County, New York (Latitude 043º 05' 7" N, Longitude 076º 09' 40" W). The North landfill consists of three contiguous parcels (Tax ID Nos. 073.-01-08.1, 073.-01-08.3, and 073.-01-08.4) totaling 21.48 acres in size. The South landfill consists of one parcel (Tax ID No. 01.01-03) totaling 19.4 acres in size. The Site is located in an area of mixed usage including light industrial/manufacturing, commercial, retail and residential usage. Seventh North Street is oriented southeast-northwest and separates the two landfills that comprise the Site. A Site Location Map is presented as Figure 1 and a Site Plan is presented as Figure 2.

2.1 Landfills

The North landfill is bordered along its northern border by vacant land (approximately 37 acres) owned by Plaza East, LLC (Plaza), which consists of areas of fill (municipal waste and miscellaneous debris) with woodland cover and wetlands. The North landfill is bordered to the east and southeast by CSX railroad tracks followed by the CC-H facility, mixed commercial and retail development, Wolf Street and residential development. Seventh North Street followed by the South landfill border the North landfill to the south to southwest. West of the North landfill are wetlands (Plaza property) followed by Ley Creek, mixed commercial and retail development, the Ley Creek waste transfer station, the Onondaga County sewage treatment plant, and Interstate Highway 81.

The South landfill is bordered to the north by Seventh North Street followed by the North landfill. To the east and southeast the South landfill is bordered by CSX railroad tracks followed by mixed commercial and retail development and Hiawatha Boulevard. Further east to southeast is residential development. Undeveloped woods, wetlands and mixed commercial and retail development border the South landfill further to the south. Ley Creek abuts the entire west and northwest boundary of the South landfill. Further west and northwest is a mixture of commercial and retail development.

Review of available historical documentation indicate that prior to the mid-to-late 1950's the North and South landfills had been occupied by low lying fields, salt marshes and woodlands. From the mid-1950's to 1989 fill material had been placed across various areas of the North and South landfills. Current topographic conditions are shown on the topographic survey map included in Figure 2.

2.2 Topography

Topography of the North landfill is generally flat across the southern half of the landfill with an average elevation range of approximately 370 feet to 372 feet above mean sea level (AMSL). However, moving to the north from the central area of the site, the

elevation rises moderately and increases to near an average of 381 feet AMSL across a notably mounded area of the landfill. Topography slopes moderately to steeply downward from the fill mound along the northern, eastern and western areas of the north landfill. Drainage across the North landfill is generally radially outward from the fill mound area in all directions. Drainage to the north-northeast is to lower lying adjacent property owned by Plaza East. Drainage to the east-southeast is towards the east wetland (Wetland A) and the eastern stream segment (Stream A). Drainage to the south tends to go southeast or southwest towards wetland (Wetland A and B) and stream areas (Stream A). Drainage to the west is toward the west wetland (Wetland B) and lower lying areas.

Topography of the South landfill is generally flat across the landfill area with an average elevation range of 373 feet to 377 feet AMSL. Topography along the edges of the fill mound slopes moderately to steeply away from the fill mound to the north, east, south and west. Drainage across the south landfill is generally radially outward from the fill mound in all directions. Drainage to the north-northeast is to the drainage ditch that parallels Seventh North Street and drains into Ley Creek. Drainage to the east-southeast is to the stream (Stream B) and wetland areas (Wetland C) located on the east-southeast side of the landfill. Drainage to the south is to the wetland area (Wetland C) located to the south of the fill mound. Drainage to the west is to Ley Creek, which is located along the landfill's western border.

2.3 Surface Water Features

Ley Creek is located between 80 feet and 120 feet west of the western property boundary of the North landfill and adjacent to the western boundary of the South landfill (Figure 2). Ley Creek is part of the Onondaga Lake drainage basin and flows to the southwest towards Onondaga Lake. Between the mouth of Ley Creek and the Onondaga County Ley Creek Transfer Station and former sewage treatment plant POTW outfall, Ley Creek is classified as a Class C water body. From the POTW outfall to a point located 3.1 miles north of the creek mouth, Ley Creek is classified as a Class B water body. The section of Ley Creek adjacent to the CC-H Site is classified as a Class C water body. Flood insurance maps indicate that the CC-H Site is located within the 100 year flood plain of Ley Creek as defined by the Federal Emergency Management Agency (FEMA). The base flood water surface elevation for the site is 374 AMSL at the southern half of the South Landfill and is 375 AMSL at the northwest corner of the South Landfill and mid-way through the North Landfill.

Bear Trap Creek drains into Ley Creek at its terminus that is located approximately 260 feet west of the southwest corner of the North landfill, which is to the immediate north of the Seventh North Street Bridge that crosses Ley Creek (Figure 2). Bear Trap Creek extends northward from its terminus and receives drainage from areas that range from undeveloped usage to commercial usage and potentially light industrial usage.

Two stream segments and one drainage ditch are located on the CC-H site and are described in the next section.

2.4 Wetlands

In November 2005, wetland delineation was conducted across the Site to define the extent of wetlands onsite. All work was conducted according to the criteria set forth in the *1987 United States Army Corps of Engineers Wetlands Delineation Manual*, *Classification of Wetlands and Deepwater Habitats of the United States*, and the *1995 NYSDEC Freshwater Wetlands Delineation Manual*. Wetland areas identified onsite are described further below.

Two wetland areas and one stream section were identified on the North landfill (Figure 2). The first wetland, Wetland A (a.k.a. the "east wetland") extends from the east corner of the North landfill and along the majority of the eastern side of the landfill and is approximately 2.63 acres in size. The east wetland receives flow from an offsite drainage ditch/stream that enters the wetland at the east corner of the landfill. Surface water in this ditch/stream appears to originate as surface water runoff and drainage from and across the adjacent properties owned by Plaza and the CSX Railroad. Surface water discharge from the east wetland is to a stream (Stream A) that is 675 feet in length and flows south out of the southern portion of the east wetland and parallel to the eastern property boundary of the North landfill to the southeast corner of the North landfill where it then turns to the northwest and parallels Seventh North Street. At its terminus, the stream discharges into two twenty-four-inch diameter culverts, which carry flow beneath Seventh North Street and into a drainage ditch that is located along the north boundary of the South landfill. Drainage in the ditch flows west and ultimately discharges to Ley Creek. The second wetland, Wetland B (a.k.a. the "west wetland") is located along the western side of the North landfill; the onsite portion of this wetland feature is approximately 2.61 acres in size. The west wetland occurs adjacent to and within the flood plain of Ley Creek and extends off-site from the western property boundary, and across the adjacent property owned by Plaza, to Ley Creek. The west wetland is identified on National Wetland Inventory (NWI) maps (ID No. PFO1/SS1E).

One wetland area, stream section, and drainage ditch were identified on the South landfill (Figure 2). The wetland, Wetland C (a.k.a. the "south wetland") is located in the southern area of the South landfill and is approximately 1.29 acres in size. The stream section (Stream B) is approximately 1,825 feet in length and extends along the eastern side of the South landfill from the eastern corner to the southeastern corner. The stream channel begins near the east corner of the landfill and runs parallel with the CSX railroad and eastern-southeastern edge of the landfill until it enters the south wetland. Upon entering the south wetland, the stream flows west and follows the northern edge of the south wetland area to its terminus point near Ley Creek.

Prior to 2009, surface water from the stream and south wetland discharged into Ley Creek at the terminus of the stream via a 36-inch diameter culvert pipe. On January 6, 2009, the culvert pipe was removed and the area backfilled with imported gravel material and fill (Figure 2) to prevent the flow of surface water and entrained sediments from Ley Creek to the South landfill and to Ley Creek from the South landfill; therefore, there is no longer a discharge point to Ley Creek. Surface water can still flow along Stream B and

into Wetland C. If the water level in Ley Creek is lower than the water level in Wetland C, water from Wetland C will seep and/or discharge into Ley Creek.

Surface water flow in the stream appears to be primarily from surface water runoff from the South landfill and the adjacent CSX railroad property. Observations indicate that flow in the stream is generally limited to times of heavy runoff due to either rainfall events or snow melt. Generally, the upper one third of the stream area is dry for the majority of the year. Prior to the removal of the culvert pipe, observations indicated that surface water from Ley Creek flowed into the stream and south wetland during high water events in Ley Creek.

The drainage ditch is located along the northern boundary of the South landfill and Seventh North Street. The ditch is 1,075 feet in length and begins at the east corner of the South landfill. Flow in the ditch is to the west to its terminus where it discharges into Ley Creek. The ditch accepts discharge from a culvert pipe located at the head of the ditch and from the two 24-inch culvert pipes leading beneath the roadway from the North landfill area. The source of flow from the culvert pipe at the head of the ditch is unknown. The head of the ditch is located at an elevation of approximately two feet below the head of the South landfill stream reach (Stream B) and does not provide flow to the stream reach.

Based on the NYSDEC wetlands maps, the wetlands located on the North and South landfills are not under the jurisdiction of New York State; however, they may fall under United States Army Corps of Engineers (USACOE) jurisdiction.

3.0 ENFORCEMENT STATUS

In 1984, the CC-H Site was listed as a "Class 3" New York State Inactive Hazardous Waste Disposal Site (IHWDS) (Site No. 7-34-004) pursuant to Environmental Conservation Law 27-1301(2).

In May 2004, Cooper Industries, Inc. (Respondent) entered into a Consent Order (Index No.D-7-0002-01-07) for the CC-H Site, which became effective on May 14, 2004. Under the terms of the Consent Order the Respondent agreed to: 1) develop and implement a Preliminary Site Assessment (PSA) to characterize that nature and extent of impacts at the Site (completed on May 25, 2006); 2) depending on the findings of the PSA and the corresponding determination made by NYSDEC, to develop and implement an RI/FS for the Site (RI/FS Work Plan approved by NYSDEC on March 26, 2008; RI Report approved by NYSDEC on October 6, 2009); and 3) to perform any mutually agreed upon Interim Remedial Measures (IRMs).

Declaration of Covenants and Restrictions (DCR) were filed with the Onondaga County Clerk on September 15, 2004, in Book 4850 of Deeds at page 833 (Attachment 1). The DCR stipulates that the property (North and South Landfills) is subject to an Order on Consent between the NYSDEC and Cooper Industries, Inc. and that the restrictive covenant shall run with the land and be binding upon Cooper Industries, Inc., its successors and assigns.

In March of 2007, CC-H indicated that the NYSDEC had verbally indicated to CC-H that USEPA will not make the Site part of the Onondaga Lake Superfund site, and that NYSDEC would retain authority for the Site.

4.0 PROJECT DESCRIPTION

4.1 2012 Clearing and Hot Spot Removal Operations

Under the NYSDEC approved remedy for the site, removal of contaminated soils and transportation to an off-site licensed disposal facility was completed at three selected area within the North Landfill during October through November 2012 (Figure 3). At the same time, to allow an aerial photographic survey to be flown over both the North and South Landfills, all trees were cut to leave six-inch stumps, brush was cleared, and grass was mowed to a six-inch height.

Upon examination at the site by the NYSDEC, mowing up to the water's edge along Ley Creek and along all wetlands was completed to allow increased accuracy for the aerial survey.

4.2 Project Disturbance Area

Total Disturbed Area:	+/- 41 acres
Existing Total Impervious Area:	0 acres
Proposed Total Impervious Area:	0 acres

The landfills will be reconstructed in consecutive years. The South Landfill is scheduled for reconstruction in 2013. The North Landfill is scheduled for reconstruction in 2014. Waste relocation to the landfill centers from buffer zones, contaminated wetland sediment relocation to the landfill centers, wetland reconstruction/mitigation, and landfill capping are the project elements.

4.3 Description and Limitations of On-Site Soils

The soil disturbance for the proposed work is approximately 41 acres for all excavation and grading operations.

A summary of the soil composition in the project area is shown in Table 1. Descriptions of each soil type, according to the USDA Soil Survey of Onondaga, New York, are located in Appendix C.

Table 1 – Soil Analyses Summary

Soil Name	Hydrologic Soil Group
Ce – Carlisle muck	A/D
ChB – Collamer silt loam	C
ML – Made Land	No Classified Group (Assumed D)
Ub – Urban Land	No Classified Group (Assumed D)

The Natural Resource Conservation Service (NRCS, formerly known as the SCS), as part of their soil classification system, assigns each soil series to a Hydrologic Soil Group (HSG). The HSG is a four-letter index intended to indicate the minimum rate of infiltration obtained after prolonged wetting, and to indicate the relative potential for a soil type to generate runoff. The infiltration rate is the rate at which water enters the soil at the soil surface. The HSG also indicates the transmission rate – the rate at which water moves within the soil. Soil scientists define the four groups as follows:

- HSG 'A' (sand, loamy sand, or sandy loam): Soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission (> than 0.30 inches/hour).
- HSG 'B' (silt loam or loam): Soils have moderate infiltration rates when thoroughly wetted, and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to fine texture. These soils have a moderate rate of water transmission (0.15 to 0.30 inches/hour).
- HSG 'C' (sandy clay loam): Soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water, and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05 to 0.15 inches/hour).
- HSG 'D' (clay loam, silty clay loam, sandy clay, silty clay, or clay): Soils have high runoff potential. They have very low infiltration rates when thoroughly wetted, and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (< 0.05 inches/hour).

4.4 Historic Places

The proposed project is not shown on the National Register of Historic Places. A Phase IA Cultural Resources Report is included as Appendix D.

4.5 Sequence of Major Activities

This SWPPP presents temporary erosion and sediment controls to assist the operator in compliance with the project's SPDES General Permit for construction activity. To the degree practicable, all temporary erosion and sediment control mitigation measures shall be installed immediately before associated project areas are disturbed in anticipation of all soil disturbing activities to follow. Based upon NYS DEC regulations, the owner or operator of a construction activity shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a regulated, traditional land use control MS4, the MS4 (provided the MS4 is not the owner or operator of the construction activity). At a minimum, the owner or operator must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

1. The owner or operator shall have a qualified inspector conduct at least two (2) site inspections in accordance with Part IV.C.2 every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. When performing just two (2) inspections every seven (7) calendar days, the inspections shall be separated by a minimum of two (2) full calendar days.

2. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York Standards and Specifications for Erosion and Sediment Control.

3. The owner or operator shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

4. The owner or operator shall install any additional site specific practices needed to protect water quality.

5. The owner or operator shall include the requirements above in their SWPPP.

Due to the nature of this project, it is intended to disturb more than 5 acres of land at one time. A waiver will be requested before grading operations commence.

It is the responsibility of the Contractor to ensure that all soils removed from the project site are spoiled in a manner consistent with all local, state, and federal regulations (particularly those governing hazardous waste sites). Appropriate erosion and sediment controls shall be installed at all spoil sites. Additionally, the Contractor is responsible for coordinating the application for a GP-0-10-001 permit (and development of an associated SWPPP) if disturbance associated with any soil spoils area is greater than 1 acre. GP-0-10-001 applications must be signed by the owner of the lands on which soils are spoiled.

This project will be carried out in multiple phases. See approved construction documents for actual construction sequencing. The South Landfill work will be conducted in the first calendar year (2013) and the North Landfill work will be conducted in the second calendar year (2014).

4.6 Name of Receiving Waters

Stormwater runoff moving off-site will eventually drain into Ley Creek (Class B), which is a 303(d) listed water body.

5.0 EROSION AND SEDIMENT CONTROL PRACTICES

This section presents erosion and control practices that will be used at the North and South Landfills.

5.1 Construction Road Stabilization

One gated access road into each (North and South) landfill currently exists. Extending from Seventh North Street inwards, the initial 50 feet of driveway access has been improved by adding six inches of gravel road base and being sloped away from Seventh North Street. This improvement has stabilized the driveways for heavy equipment use, provides a tracking road and clean-off station for vehicles leaving the site, and directs any water from vehicles away from the street.

Existing access roads on the landfill property are visible on historical landfill air photographs and will be used for access during operations to the extent possible. These access roads will be inspected and wood chips or imported gravel placed as needed to stabilize road surfaces to minimize rutting and reduce soil tracking off-site by clearing and grubbing vehicles.

Dump trucks hauling materials to and from the project site shall be covered with a tarpaulin to reduce dust. An existing decon pad is present at the entrance of each landfill with a rinse off station and an attendant or the driver will inspect any vehicle leaving the site. Any sediment and debris tracked from work area along project adjacent roadways shall be immediately removed with a street sweeper or equivalent sweeping method. Further, sweeping of streets adjacent to disturbed areas shall be performed prior to the end of each work day (at a minimum) when tracking of sediment is occurring.

5.2 Dust Control

Should dust control become an issue, a portable or truck mounted water pump will be used to draw water from an on-site wetland or stream for use in wetting down access roads. If construction operations cause excessive dust, work areas will be wetted down as necessary using on-site water.

5.3 Timing of Controls/Measures

The erosion and sediment control measures shall be constructed prior to clearing or grading of any portion of the project. Where land disturbance is necessary, temporary seeding or mulching must be used on areas which will be exposed for more than 7 days. Permanent stabilization should be performed as soon as possible after completion of grading. After the entire project area is stabilized, the accumulated sediment shall be removed from the project area. Erosion control devices shall remain in place until disturbed areas are permanently stabilized. For projects where soil disturbance is greater than five (5) acres, and construction activity has temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The

soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York Standards and Specifications for Erosion and Sediment Control.

Excavations will occur in the order shown on each design drawing sheet to move from areas of higher elevation to areas of lower elevation. This will allow drainage from each higher elevation area sampled as "clean" to be collected at any temporary swale without re-contaminating the contacted soils.

Excavated soils will be transported to the landfill interior to a pre-determined area as indicated on the contractor's written work plan. The only exception to this will be PCB sediment cells in the North Landfill that will be transported off-site to a TSCA landfill. The contractor's written work plan will be updated on a weekly basis, approved by the on-site engineer, and available on-site for review by any interested party.

Each pre-determined area will have a silt fence perimeter and an interior temporary swale (Figure 6) sized to contain the water quality volume as defined in Section 4.2 of the New York State Stormwater Management Design Manual. The objective is for all interior water to either seep into the ground or evaporate and not leave the pre-determined area silt fence perimeter. Localized areas within the landfill interior may allow excavated soil piling within a pre-determined are without perimeter silt fence if sufficient WQ_v capacity makes a silt fence perimeter unnecessary. This will occur if the swale can be shown to contain 300% of the calculated water quality volume. A silt fence perimeter will always be present on the landfill cap area perimeter (Figure 3).

5.4 Erosion and Sediment Controls / Stabilization Practice

5.4.1 Temporary Stabilization

Topsoil stockpiles, staging areas and disturbed pervious portions of the project area where construction activity temporarily ceases for at least 7 days shall be stabilized with temporary seed and mulch no later than 7 days from the last construction activity in that area.

Temporary seed shall be ryegrass applied at the rates specified below:

- If seeding in spring, summer or early fall then seed with annual or perennial rye at a rate of 30 lbs per acre. If area is to remain stabilized over the winter into the following spring use perennial rye only.
- If seeding in late fall or early winter, use certified Aroostook winter rye (cereal rye) at a rate of 90 lbs per acre.

Any seeding method may be used that will provide uniform application of seed to the area and result in relatively good soil to seed contact. The area must be free of large rocks and debris and seeded within 24 hours of disturbance or scarification of the soil surface will be necessary prior to seeding. Fertilizer or lime is not typically used for temporary plantings.

Mulch shall be applied in conjunction with seeding and applied at the rate of 90 lbs per 1000 square feet. Mulch shall be reapplied as necessary.

Proposed grades which will have slopes steeper than 3:1 shall be stabilized with erosion control fabric. (These specific areas have been highlighted on the Grading Sheets.)

Temporary diversion swales shall be installed on site where necessary. A diversion swale is designed to divert runoff around active construction areas to a point of discharge.

Rip-rap outlet protection shall be installed at all stormwater end sections, including that from the temporary sediment basin(s). Rip-rap material shall be hard, durable field or quarry stone which is angular and resists breaking down when exposed to water or weathering.

Sediment control fencing shall be installed around the site where depicted on the attached plan (Figures 3 and 4). Prior to commencing any earthwork, the existing stabilized construction entrances shall be inspected and improved to comply with the attached plans. These entrances shall be utilized as the exclusive construction entrances and exits to the construction areas. Construction traffic shall be limited to the construction entrances.

5.4.2 Permanent Stabilization

Disturbed portions of the project area where construction activities permanently cease shall be stabilized with permanent seed no later than 7 days after the last construction activity. The permanent seed mix shall be in accordance with the project specifications and plans. Construction and maintenance of erosion and siltation control measures are in accordance with the New York Standards and Specifications for Erosion and Sediment Control.

Where construction activity is complete over areas to be permanently vegetated, stabilize with permanent seeding. Verify seeding dates with engineer. If engineer determines that seed cannot be applied due to climate, topsoil shall not be spread and mulching shall be applied to the exposed surface to stabilize soils until the next recommended seeding period.

5.4.3 Winter Operation

If construction activities proceed through the winter season, access points should be enlarged and stabilized to provide for snow stockpiling. Drainage structures should be kept open and free of potential snow and ice dams. Inspection and maintenance are necessary to ensure the function of these practices during runoff events. For sites where construction activities temporarily cease, temporary and/or permanent soil stabilization measures shall be installed within seven (7) days from the date the soil disturbing activity

ceased. Disturbed areas should be stabilized with seed and mulch, or other approved methods, even if the ground is covered by significant amounts of snow.

5.4.4 Winter Shutdown

Site inspections (by the qualified inspector) may be decreased to a minimum of one (1) time every thirty (30) days for sites where soil disturbing activities have ceased and at least 80% of the site has been stabilized with an approved method. Inlet protection should be installed and/or repaired before shutdown of the site. The owner or operator shall provide written notification to the respective DEC regional office prior to reducing the frequency of any site inspections.

5.4.5 Waste Disposal

Waste materials and foreign waste materials shall be collected and stored in a secured area until removal and disposal by a licensed solid waste management company. All trash and construction debris from the project area shall be disposed of in a portable container unit. No foreign waste materials shall be buried within the project area. All personnel shall be instructed regarding the correct procedure for waste disposal. Notices stating these practices shall be posted in the project trailer and the individual who manages day-to-day project operations will be responsible for seeing that these procedures are followed.

Petroleum-Impacted/Hazardous Waste – During the excavation activities, there is the potential that petroleum impacted soils and/or hazardous waste may be encountered. Except for the defined TSCA sediment areas in the North Landfill, all excavated wastes will be relocated to the area to be capped. Drums and tires discovered during project activities will be segregated and disposed of off-site per current NYSDEC regulations.

Sanitary Waste - Any sanitary waste from portable units shall be collected from the portable units by a licensed sanitary waste management contractor, as required by NYS DEC regulations.

5.4.6 Non-Stormwater Discharges

Non-stormwater discharges are not expected to exit the project sites during construction.

5.4.7 Certification of Compliance with Federal, State, & Local Regulations

The stormwater pollution prevention plan reflects the New York State requirements for stormwater management and erosion and sediment control. To ensure compliance, this plan was prepared in accordance with New York State Standards. There are no other applicable State or Federal requirements for sediment and erosion plans (or permits), or stormwater management plans (or permits).

6.0 POST-CONSTRUCTION STORMWATER MANAGEMENT

6.1 Methodology

In order to evaluate the potential impacts associated with the proposed project, existing and proposed conditions were examined. At each landfill, only land grading activities which do not change overall drainage patterns will take place. No impervious surfaces are proposed throughout either site. Any slight increase in peak flows after construction will be mitigated by detention swales surrounding the landfill cap areas.

Local drainage patterns within the landfill areas will be altered with the sediment and waste consolidation activities locating mounds at the center of each landfill. Construction of the landfill caps in compliance with 6 NYCRR Part 360 and re-vegetation of the buffer zone areas will ensure that the proposed conditions will similarly cause no increase in peak flow leaving the site after construction.

The Enhanced Phosphorus Removal Standards are required in on-site stormwater management practices due to the project location within the Onondaga Lake Watershed. All on-site flow is directed to on-site streams and wetlands where extended retention takes place. The drains to the ditch along 7th North Street that empties into Ley Creek are located at the ends of Streams A and B so that any stormwater entering the ditch has traveled the maximum distance from the center of the site over vegetated cover.

6.2 Existing Conditions

South Landfill – 19.4 acres in size covered with tree stumps, brush, and grasses. Essentially flat across the area, with radial drainage to a stream, wetlands, Ley Creek, and a ditch along 7th North Street.

North Landfill – 21.48 acres in size covered with tree stumps, brush, and grasses. Slightly higher elevations along the north edge draining to the south, east, and west, into a stream, wetlands, and to a ditch along 7th North Street.

6.3 Proposed Conditions

South Landfill – 19.4 acres in size, with a mounded landfill cap in the center bordered by a vegetated buffer zone to the east, south and west. Drainage will occur through the buffer zones to a stream, wetlands, Ley Creek, and a ditch along 7th North Street.

North Landfill – 21.48 acres in size, with a mounded landfill cap in the center bordered by a vegetated buffer zone to the east and west. Drainage will occur through the buffer zones to a stream, wetlands, and a ditch along 7th North Street.

Proposed conditions are indicated on Figure 5.

6.4 Floodplains

Flood insurance maps indicate that the CC-H Site is located within the 100 year flood plain of Ley Creek as defined by the Federal Emergency Management Agency (FEMA). The base flood water surface elevation for the site is 374-375 AMSL. No negative impact will be present due this location.

In November of 2013, upon receipt of comments from the City of Syracuse, calculations were performed to verify that the construction of the North and South Landfill caps, adjacent buffer zones, and wetland sediment relocations would result in no net loss of flood storage at either landfill for the 100-year flood at elevation 374 feet. Appendix E contains the calculations and modifications to the 95% design. The modifications to the design are included in the Final Design documents.

7.0 MAINTENANCE / INSPECTION PROCEDURES

7.1 Erosion and Sediment Control Inspection and Maintenance Practices

These are the minimum required inspection and maintenance practices that shall be used to maintain erosion and sediment controls:

Owner/Operator Inspection Requirements

- Prior to construction activity the owner/operator shall have contractors and sub-contractors identify a trained individual responsible for the implementation of the SWPPP. The trained individual must be on-site on a daily basis when soil disturbing activities are occurring.
- The owner/operator shall inspect the erosion and sediment control measures as identified in the SWPPP to ensure that they are being maintained in effective operating conditions at all times. Where soil disturbing activities temporarily cease and temporary stabilization measures have been applied to all disturbed areas, the owner/operator can stop conducting inspections. The owner/operator shall resume inspections when soil disturbing activities begin again.
- Where soil disturbing activities have ceased with partial project completion, the owner/operator can stop conducting inspections when disturbed areas have reached final stabilization. All post construction stormwater management practices required for the completed areas shall have been constructed in conformance with the SWPPP and be fully operational. Final stabilization means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.
- The owner/operator shall notify the DEC Regional Office's stormwater contact person or, in areas under the jurisdiction of a regulated, traditional land use MS4, the MS4 prior to any reduction in the frequency of site inspections.
- The owner/operator shall retain copies of the NOI, SWPPP, MS4 SWPPP acceptance form and any inspection reports submitted in conjunction with this permit and records or all data used to complete the NOI to be covered by this permit for a period of at least five (5) years from the date that the site is finally stabilized.

Qualified Inspector Inspection Requirements

- The qualified inspector is defined as a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other Department endorsed individual(s). It may also mean someone working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect, provided that

person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means the person has received four (4) hours of training endorsed by the Department and shall receive four (4) hours of training every three (3) years after the initial training.

- A site inspection in accordance with Part IV.C shall be conducted at least once every seven (7) days by the qualified inspector when soil disturbing activities are occurring. Inspections must be conducted at least twice every seven (7) calendar days when soil disturbance is 5 acres or more with no less than 2 calendar days between inspections. A copy of the "Construction Duration Inspection Form" is included in the "inspection forms" section of this plan.
- All measures shall be maintained in good working order; if any repairs or corrective actions are necessary, it is the responsibility of the qualified inspector to notify the owner/operator and appropriate contractor within one business day. The contactor shall begin implementing the corrective action within one business day of being notified.
- All inspection forms must be signed by a qualified inspector.
- For construction sites where soil disturbing activities are temporarily suspended, temporary stabilization measures shall be applied and the qualified inspector shall conduct a site inspection at least once every thirty (30) calendar days.
- Where soil disturbing activities have ceased with partial project completion the qualified inspector can stop conducting inspections when disturbed areas have reached final stabilization and all post construction stormwater management practices required for the completed areas have been constructed in conformance with the SWPPP and are fully operational.
- Where soil disturbing activities are not resumed within two (2) years, from the date of shut down of partial project completion, the qualified inspector shall perform a final inspection and certify that all disturbed areas have achieved final stabilization, all temporary and permanent erosion control measures have been removed, and post-construction stormwater management practices have been constructed in conformance with the SWPPP. Qualified inspector shall sign the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the Notice of Termination (NOT).

General Requirements

- A copy of the SPDES General Permit (GP-0-10-001), SWPPP and inspection reports shall be maintained onsite until the site has achieved final stabilization.
- Built up sediment shall be removed from any silt fence when it has reached one-third the height of the fence / dike.
- Sediment fencing shall be inspected for depth of sediment, and tears, to see if fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
- The construction entrance shall be cleaned of sediment and redressed when voids in the crushed stone become filled and vehicular tracking of sediment is occurring.

- Dust shall be controlled on access points and other disturbed areas subject to surface dust movement and blowing.
- Stabilization fabric and check dams shall be inspected to ensure that slopes and swales are not being eroded. Fabric shall be replaced / reinstalled and rock dams added as necessary to prevent any such erosion.
- Inspection of swales shall be conducted to check condition of swale.
- Inspection must verify that all practices are adequately operational, maintained properly and that sediment is removed from all control structures.
- Inspection must look for evidence of soil erosion on the site, potential of pollutants entering drainage systems, problems at the discharge points, and signs of soil and mud transport from the site to the public road.

7.2 Post-Construction Stormwater Inspection and Maintenance Practices

CCH will maintain ownership of the site and will be responsible for maintaining the drainage system. Long-term inspection forms for the stormwater management practices (included in Appendix F of this plan) are referenced from Appendix G of the New York State Stormwater Management Design Manual.

8.0 INVENTORY FOR POLLUTION PREVENTION PLAN

The materials or substances listed below are expected to be within the project area during construction:

- Fertilizers / seeding materials
- Stone
- Petroleum based products
- Straw bales (Hay will not be used per City of Syracuse requirement)
- Silt fence fabric
- Lumber
- Pavement marking paint
- Iron pipe and corrugated metal pipe (CMP)
- Bonded fiber matrix material
- HDPE Geomembrane material

9.0 SPILL PREVENTION

The following are the material management practices that shall be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

9.1 Good Housekeeping

The following good housekeeping practices shall be followed within project areas during construction:

- An effort shall be made to store only enough products required to do the job.
- All materials stored within project areas shall be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products shall be kept in their original containers with the original manufacturer's label.
- Substances shall not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product shall be used up before disposing of the container.
- Manufacturers' recommendations for proper use and disposal shall be followed.
- The project superintendent shall inspect daily to ensure proper use and disposal of materials.

9.2 Hazardous Products

These practices are used to reduce the risks associated with hazardous materials:

- Products shall be kept in original containers unless they are not resealable.
- Original labels and material safety data shall be retained.
- If surplus product must be disposed of, manufacturers' or local and state recommended methods of proper disposal shall be followed.
- Material Safety Data Sheets for all hazardous products shall be within the project area for the duration of construction.

9.3 Product Specific Practices

The following product-specific practices shall be followed within the project areas:

9.3.1 Petroleum Products

All project related vehicles shall be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products shall be stored in tightly sealed containers which are clearly labeled.

Any asphalt substances used during construction shall be applied according to the manufacturer's recommendations**.**

9.3.2 Fertilizers

Fertilizers used shall be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked into the soil to limit exposure to stormwater. Fertilizers shall be stored in a covered or other contained area.

9.3.3 Paints

All containers shall be tightly sealed and stored when not required for use. Excess paint shall not be discharged to the storm sewer system but shall be properly disposed of according to manufacturer's instructions or State regulations.

9.3.4 Watercourse Protection

Construction operations shall be conducted in such a manner as to prevent damage to watercourses from pollution of debris, sediment, or other foreign material, or from manipulation, from equipment and/or materials in or near the watercourse. The contractor shall not return directly to the watercourse any water used for wash purposes or other similar operations which may cause the water to become polluted with sand, silt, cement, oil or other impurities. If the contractor uses water from the water course, the contractor shall construct an intake or temporary dam to protect and maintain watercourse water quality.

9.3.5 Spill Control Practices

The contractor will be responsible for preparing a project area specific spill control plan in accordance with local and NYS DEC regulations. At a minimum this plan should:

- Reduce stormwater contact if there is a spill.
- Contain the spill.
- Stop the source of the spill.
- Dispose of contaminated material in accordance with manufactures procedures, and NYSDEC regulations.
- Identify responsible and trained personnel.
- Ensure spill area is well ventilated.

10.0 UPDATING THE SWPPP

The SWPPP shall be updated/revised as conditions merit or as directed by the regulating authority. The attached inspection forms included with this document allows for the certification of any updates/revisions.

11.0 SWPPP CERTIFICATION

Contracting Firm Information:

_____

Contracting Firm

_____

Address

_____

City/Town **State** **Zip**

Site Location:

CCH Landfills
Wolf and 7th North Streets
City of Syracuse (South Landfill) and Town of Salina (North Landfill)
Onondaga County, NY

Contractor's Certification

I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

_____

Signature (Contractor/Subcontractor) **Date**

_____

For

_____

Responsible For

_____

Signature (Trained Individual) **Date**

_____

For

_____

Responsible For

_____

Signature (Contractor/Subcontractor) **Date**

For

_____

Responsible For

_____

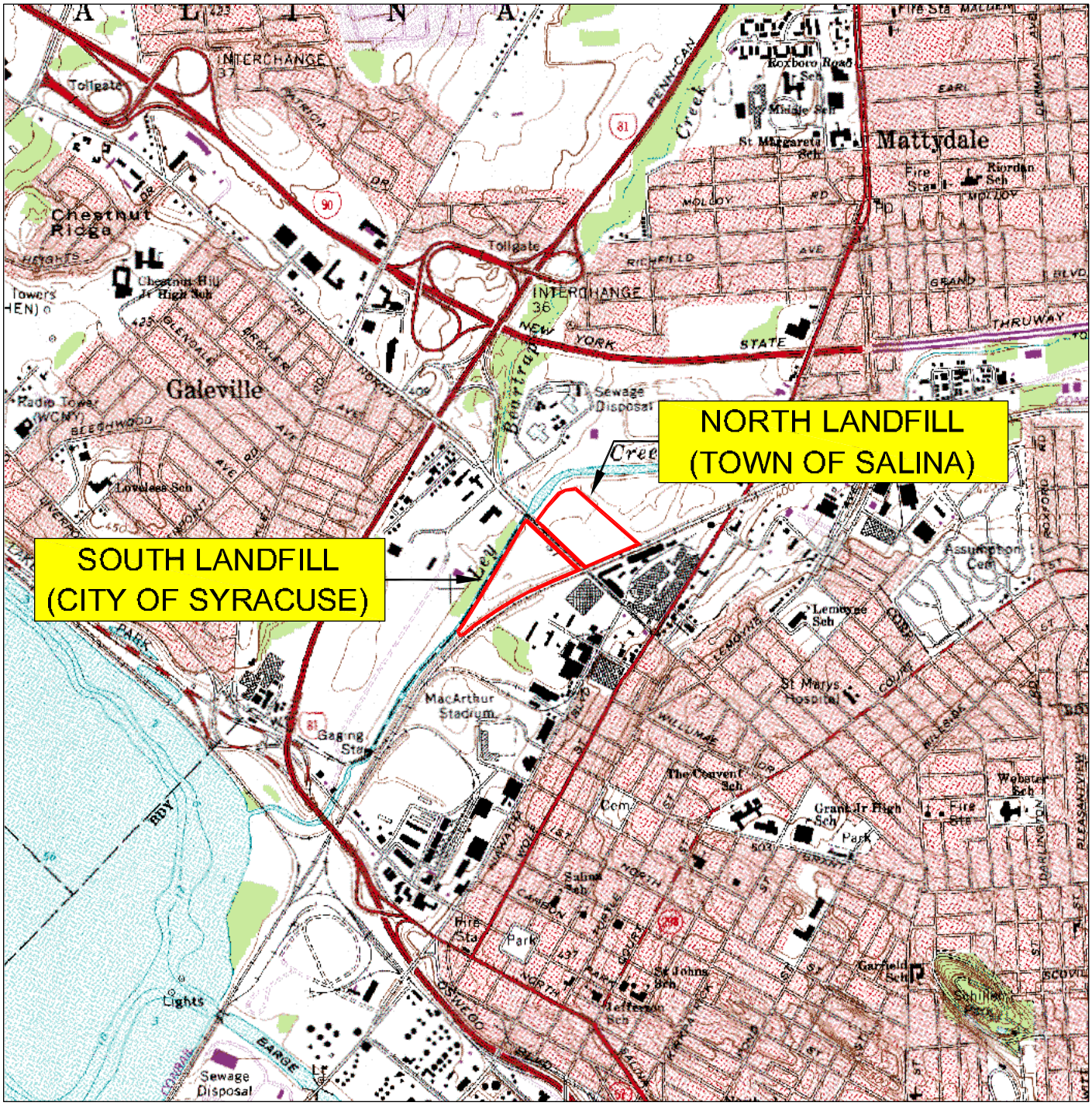
Signature (Trained Individual) **Date**

_____

For

_____

Responsible For



National Geodetic Vertical Datum of 1929
Contour Interval 10 Feet

SCALE
0 5000
FEET

QUADRANGLE LOCATION

N

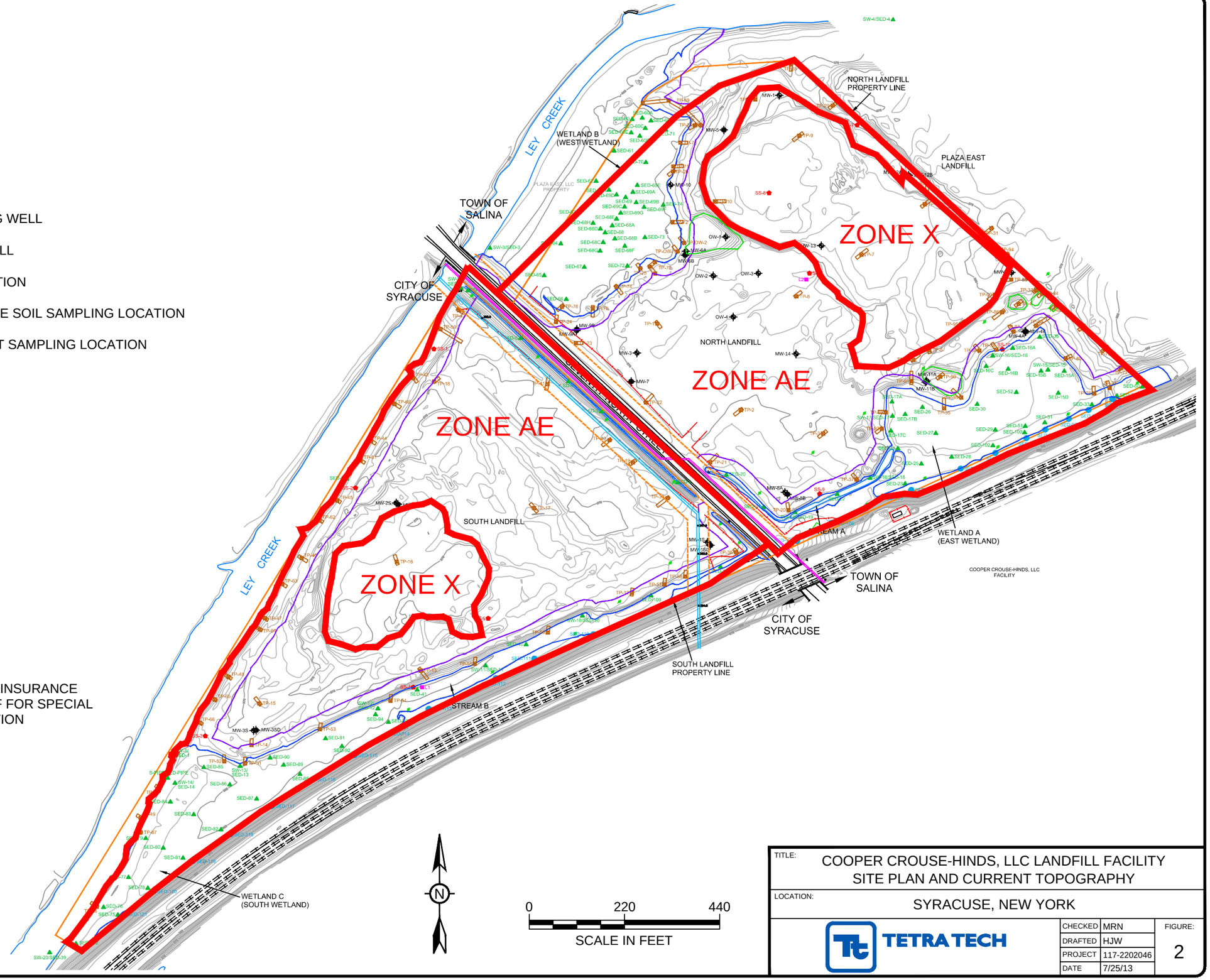
Base map from U.S.G.S. 7.5' SYRACUSE WEST, NEW YORK topographic quadrangle map.

COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SYRACUSE, NEW YORK	DATE: 8/1/12
	DESIGNED: HJW
SITE LOCATION MAP	CHECKED: MRN
	APPROVED: MRN
	DRAWN: HJW
	PROJ.: 117-2202046
TETRA TECH	Figure 1

S:\CAD\COOPER\SYRACUSE\12-11-09\2202036FIG1.DWG

EXPLANATION

- MW-3S — SHALLOW AQUIFER MONITORING WELL
- MW-3SD — DEEP AQUIFER MONITORING WELL
- SS-1 — SURFACE SOIL SAMPLING LOCATION
- SED-95 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLING LOCATION
- SW-1/SED-1 — SURFACE WATER AND SEDIMENT SAMPLING LOCATION
- SED-27 — SEDIMENT SAMPLING LOCATION
- TP-48 — TEST PIT LOCATION
- L1 — LEACHATE SAMPLING LOCATION
- WETLAND BOUNDARY
- LEY CREEK / WETLAND BUFFER
- PROPERTY BOUNDARY
- EASEMENT
- WATER MAIN
- GAS MAIN
- EXISTING CHAIN LINK FENCE
- ELECTRIC UTILITY POLE
- ZONE X AND ZONE AE: SEE FIRE INSURANCE RATE MAP NUMBER 36067C0208F FOR SPECIAL FLOOD HAZARD AREA DESIGNATION



TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SITE PLAN AND CURRENT TOPOGRAPHY
LOCATION:	SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	2
PROJECT	117-2202046	
DATE	7/25/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\SITE PLAN.DWG

EXPLANATION

MW-3S — EXISTING SHALLOW AQUIFER MONITORING WELL. INSTALL STRAW BALES TO SURROUND WELL WITH ORANGE TRAFFIC CONES ON TOP - 2 CONES PER WELL. ABANDON / RECONSTRUCT AS DIRECTED BY ENGINEER

MW-3SD — EXISTING DEEP AQUIFER MONITORING WELL. INSTALL STRAW BALES TO SURROUND WELL WITH ORANGE TRAFFIC CONES ON TOP - 2 CONES PER WELL. ABANDON / RECONSTRUCT AS DIRECTED BY ENGINEER

SOIL REMOVAL AREA ADJACENT TO WETLAND

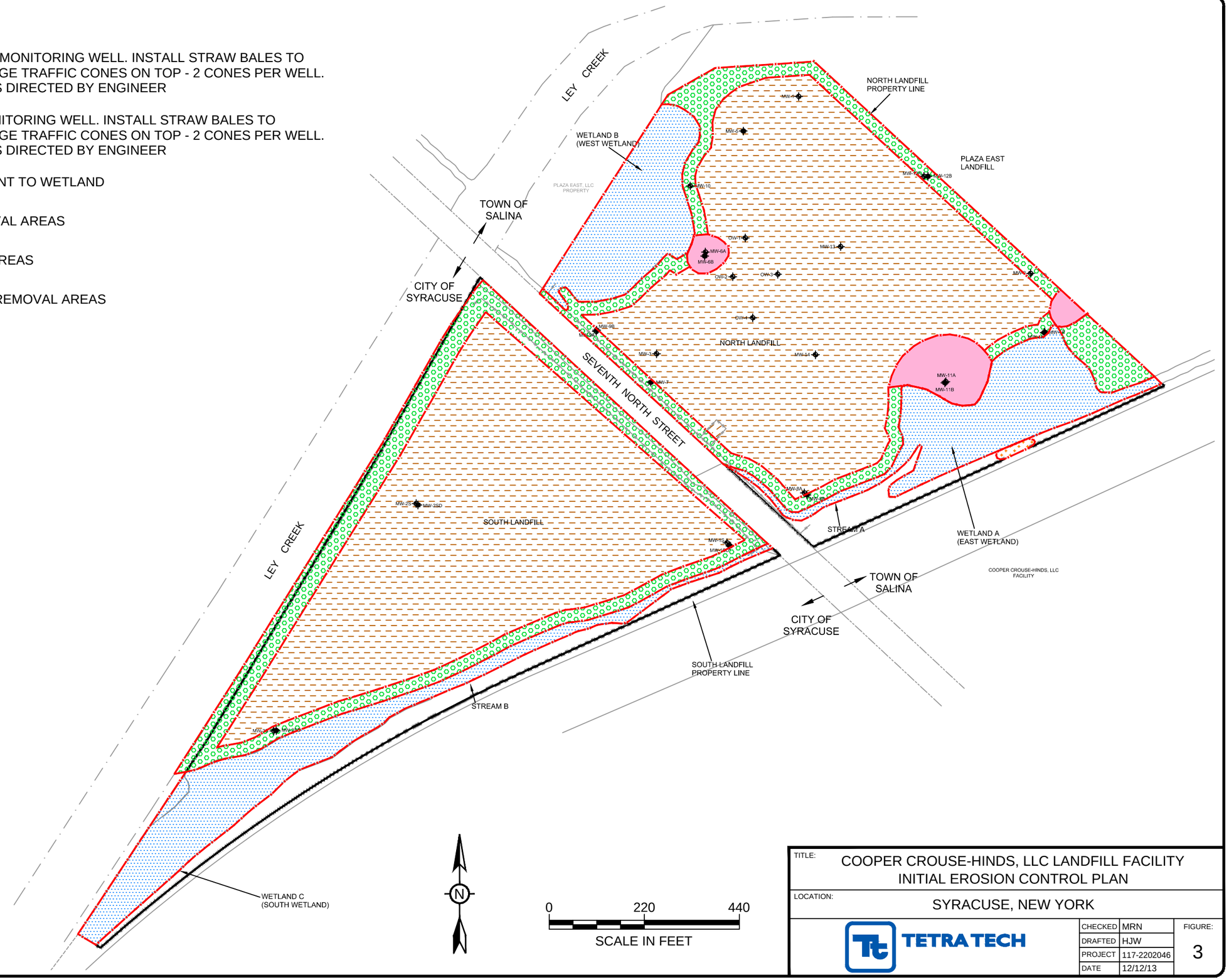
WETLANDS SEDIMENT REMOVAL AREAS

BUFFER ZONE EXCAVATION AREAS

2012 COMPLETED HOT SPOT REMOVAL AREAS

LANDFILL CAP AREA

SILT FENCE PERIMETER



TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY INITIAL EROSION CONTROL PLAN
LOCATION:	SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	3
PROJECT	117-2202046	
DATE	12/12/13	

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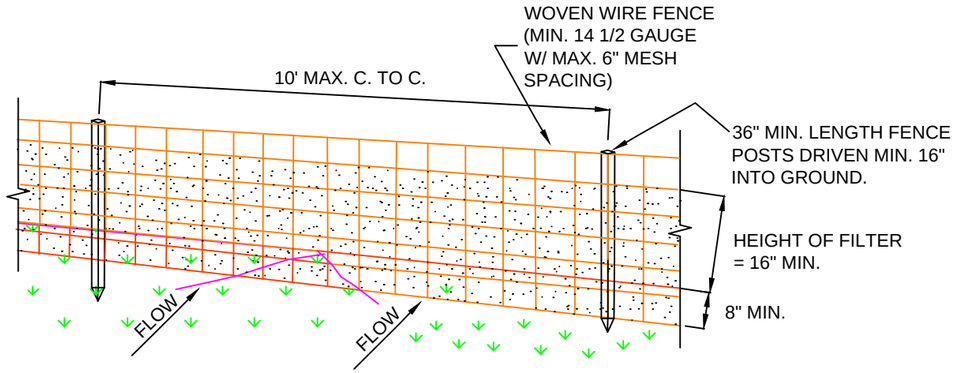
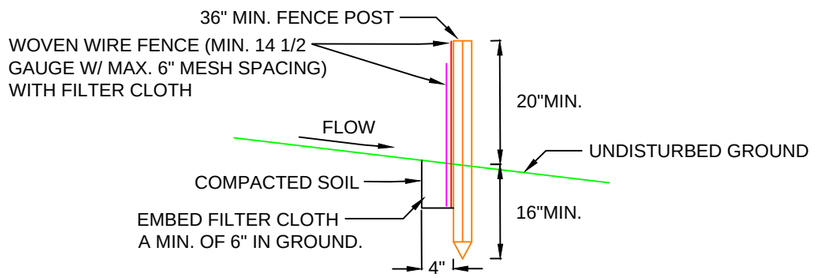


PERSPECTIVE VIEW

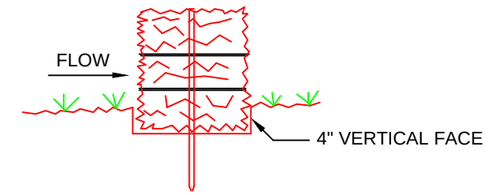


SECTION VIEW

CONSTRUCTION SPECIFICATIONS

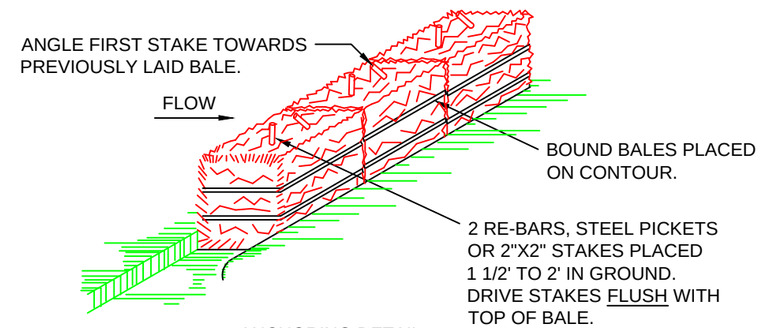
1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

SILT FENCE DETAIL



BEDDING DETAIL
NOT TO SCALE

DRAINAGE AREA NO MORE THAN 1/4 ACRE PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%.



ANCHORING DETAIL
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULLNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

STRAW BALE DIKE DETAIL

TITLE:	COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SILT FENCE AND STRAW BALE DIKE DETAILS		
LOCATION:	SYRACUSE, NEW YORK		
TETRA TECH	CHECKED	MRN	FIGURE:
	DRAFTED	HJW	4
	PROJECT	117-2202046	
	DATE	2/25/13	

S:\CAD\COOPER\SYRACUSE\8-5-10\2202036FIG5.DWG

EXPLANATION

- PROPOSED FINAL TOPOGRAPHY
- EXCAVATION LIMITS
- PROPERTY BOUNDARY
- EASEMENT
- WATER MAIN
- EXISTING CHAIN LINK FENCE
- BUFFER ZONE
- RECONSTRUCTED EMERGENT WETLAND
- OPEN WATER WITH RECONSTRUCTED EMERGENT WETLAND PERIPHERY
- ZONE X AND ZONE AE: SEE FIRE INSURANCE RATE MAP NUMBER 36067C0208F FOR SPECIAL FLOOD HAZARD AREA DESIGNATION

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY

FINAL TOPOGRAPHY AND WETLAND RECONSTRUCTION / MITIGATION PLAN

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	5
PROJECT	117-2202046	
DATE	12/12/13	

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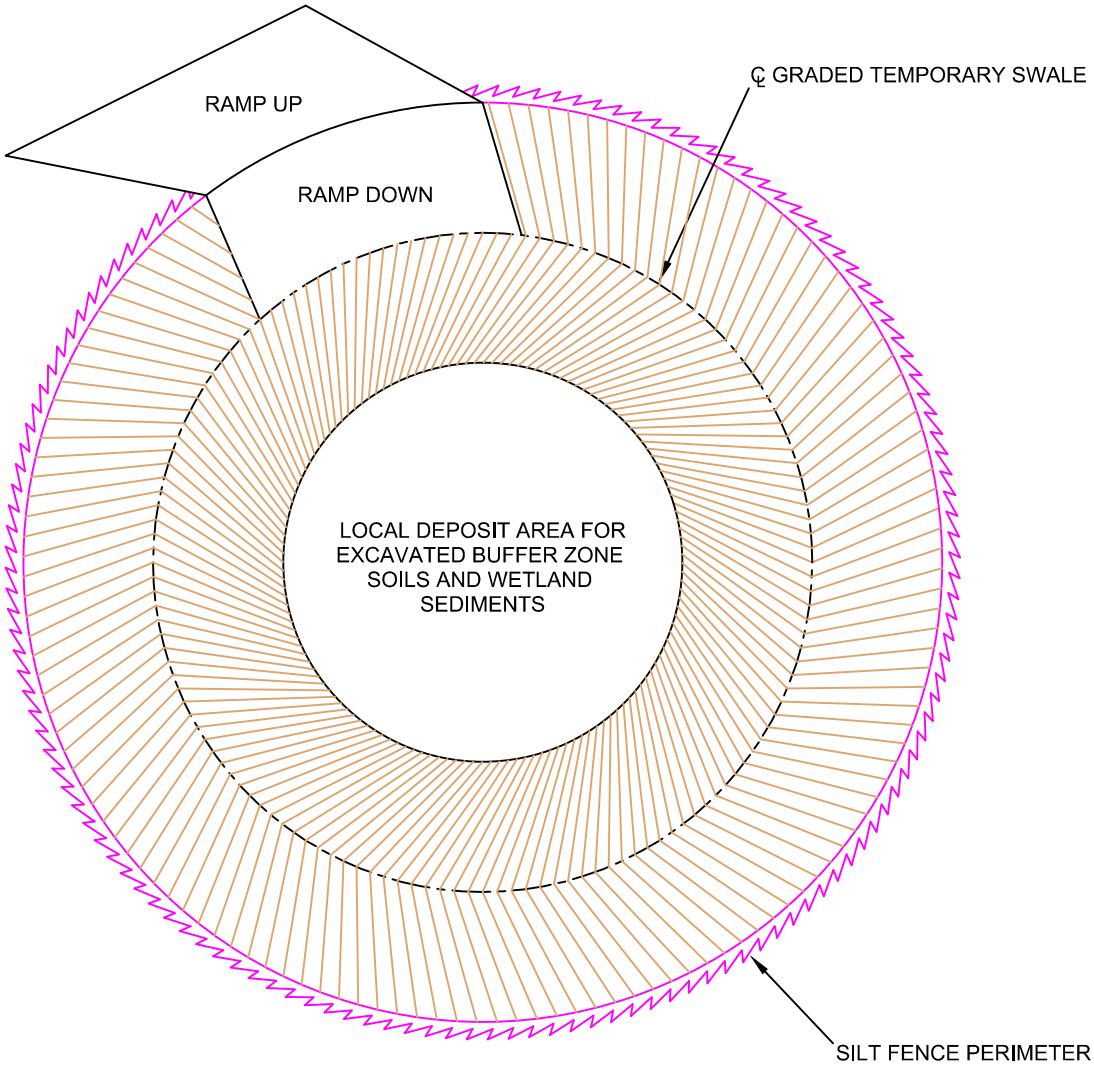

NOTES:

1. DETERMINE TARGET AREA WITHIN LANDFILL CAP AREA TO DEPOSIT EXCAVATED SOILS / SEDIMENTS.
2. GRADE TEMPORARY SWALE SURROUNDING TARGET AREA TO CONTAIN WATER QUALITY VOLUME PER SECTION 4.2 OF NEW YORK STATE STORMWATER DESIGN MANUAL (WQV).
3. PLACE SILT FENCE AT SWALE PERIMETER UNLESS TEMPORARY SWALE VOLUME ≥3WQV.
4. SWALE SHAPE MAY VARY.
5. EXISTING TOPOGRAPHY MAY BE USED FOR SWALE.

LANDFILL CAP SEGMENT AREA PLAN

COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SYRACUSE, NEW YORK	DATE: 8/28/13	
	DESIGNED:	HJW
LANDFILL CAP SEGMENT AREA TEMPORARY STORMWATER SWALE	CHECKED:	MRN
	APPROVED:	MRN
	DRAWN:	HJW
	PROJ.: 117-2202046	
TETRA TECH	Figure 6	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\8-22-13\FIG 6 SEGMENT AREA.DWG

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from digital othophotography provided by the New York Office of Cyber Security & Critical Infrastructure from photography dated April 2006.

This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in *the Flood Insurance Study report (which contains authoritative hydraulic data* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.

This digital FIRM was produced through a unique cooperative partnership between the New York State Department of Environmental Conservation (NYSDEC) and FEMA. As part of the effort, NYSDEC has joined in a Cooperative Technical Partnership agreement to produce and maintain FEMA's digital FIRM.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275 000m N	1000-meter Universal Transverse Mercator grid values, zone 18
6000000 FT	5000-foot grid ticks: New York State Plane coordinate system, central zone (FIPSZONE 3102), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0208F

FIRM
FLOOD INSURANCE RATE MAP
ONONDAGA COUNTY, NEW YORK
(ALL JURISDICTIONS)

PANEL 208 OF 520

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GEDDES, TOWN OF	360579	0208	F
SALINA, TOWN OF	360591	0208	F
SYRACUSE, CITY OF	360595	0208	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
36067C0208F

EFFECTIVE DATE

Federal Emergency Management Agency

APPENDIX A

SPDES GENERAL PERMIT # GP-0-10-001

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010 Expiration Date: January 28, 2015

William R. Adriance
Chief Permit Administrator

William R. Adriance January 28, 2010
Authorized Signature Date

Address: NYS DEC
Div. Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("permit") is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:

http://www.dec.ny.gov/

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES

FROM CONSTRUCTION ACTIVITIES

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Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application - This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

B. Maintaining Water Quality - It shall be a violation of this permit and the *ECL* for any *discharge* to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

C. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph D. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from *construction activities*.

(Part I. C)

3. Notwithstanding paragraphs C.1 and C.2 above, the following non-stormwater *discharges* may be authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated groundwater or spring water; uncontaminated discharges from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with water quality standards in Part I.B.

D. <u>Activities Which Are Ineligible for Coverage Under This General Permit</u> - All of the following are **<u>not</u>** authorized by this permit:

1. *Discharges* after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection C.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII, subparagraph K of this permit;

4. *Discharges* from *construction activities* that adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects that:

    a. are tributary to waters of the state classified as AA or AA-s; and

(Part I. D. 6)

b. disturb one or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects that:
   a. are tributary to waters of the state classified as AA or AA-s; and

   b. disturb two or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

8. *Construction activities* that adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (Note: includes Archeological sites), unless there are written agreements in place with the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same.

Part II. <u>OBTAINING PERMIT COVERAGE</u>

A. <u>Notice of Intent (NOI) Submittal</u>

1. An *owner or operator* of a *construction activity* that is <u>not</u> subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the address below in order to be authorized to *discharge* under this permit. The NOI form shall be one which is associated with this permit, signed in accordance with Part VII.H. of this permit.

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4*, or by a duly authorized representative of that person, and then submit that form along with the NOI to the address referenced under "Notice of Intent (NOI) Submittal".

(Part II. A.2)

This requirement does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of Owner or Operator).

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. <u>Permit Authorization</u>

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied <u>all</u> of the following criteria:

    a. project review pursuant to the State Environmental Quality Review Act (SEQRA) have been satisfied, when SEQRA is applicable,

    b. where required, all necessary Department permits subject to the *Uniform Procedures Act (UPA)* (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Regional Office in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

    c. the final SWPPP has been prepared, and

    d. an NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.B.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

(Part II. B. 3)

a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 and/or 3, or

ii. Sixty (60) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has not been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 or 3.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI and signed "MS4 SWPPP Acceptance" form,

4. The Department may suspend or deny an *owner's or operator's* coverage under this permit if the Department determines that the SWPPP does not meet the permit requirements.

5. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department.

C. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination (NOT) has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-10-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form and inspection reports at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department.

(Part II. C. 2)

The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

    a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

    b. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

    c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

    d. The *owner or operator* shall install any additional site specific practices needed to protect water quality.

    e. The *owner or operator* shall include the requirements above in their SWPPP.

4. The Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements.

(Part II. C)

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4,* the *owner or operator* shall notify the *MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *MS4* prior to commencing construction of the post-construction stormwater management practice.

D. <u>Permit Coverage for Discharges Authorized Under GP-0-08-001</u>

1. Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), a*n owner or operator* of *construction activity* with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to *discharge* in accordance with GP-0-10-001 unless otherwise notified by the Department.

E. <u>Change of Owner or Operator</u>

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, <u>in writing,</u> of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.A.1.. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

   Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. <u>STORMWATER POLLUTION PREVENTION PLAN (SWPPP</u>)

A. <u>General SWPPP Requirements</u>

1. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*.

(Part III. A)

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the pollutants in stormwater discharges and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP:

    a. whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater *discharges* from the site;

    b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants; and

    c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP.

(Part III. A. 6)

The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor*. The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

> "I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

8. The SWPPP must include documentation supporting the determination of permit eligibility with regard to Part I.D.8. (Historic Places or Archeological Resource). At a minimum, the supporting documentation shall include the following:

(Part III. A. 8)

a. Information on whether the stormwater discharge or *construction activities* would have an effect on a property (historic or archeological resource) that is listed or eligible for listing on the State or National Register of Historic Places;

b. Results of historic resources screening determinations conducted. Information regarding the location of historic places listed, or eligible for listing, on the State or National Registers of Historic Places and areas of archeological sensitivity that may indicate the need for a survey can be obtained online by viewing the New York State Office of Parks, Recreation and Historic Places (OPRHP) online resources located on their web site at: http://nysparks.state.ny.us/shpo/online-tools/ (using The Geographic Information System for Archeology and National Register). OPRHP can also be contacted at: NYS OPRHP, State Historic Preservation Office, Peebles Island Resources Center, P.O. Box 189, Waterford, NY 12188-0189, phone: 518-237-8643;

c. A description of measures necessary to avoid or minimize adverse impacts on places listed, or eligible for listing, on the State or National Register of Historic Places. If the *owner or operator* fails to describe and implement such measures, the stormwater *discharge* is ineligible for coverage under this permit; and

d. Where adverse effects may occur, any written agreements in place with OPRHP or other governmental agency to mitigate those effects, or local land use approvals evidencing the same.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

    a. Background information about the scope of the project, including the location, type and size of project;

(Part III. B. 1)

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater discharge(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each construction activity that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of final stabilization;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

(Part III. B. 1)

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6., to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards.

2. Post-construction stormwater management practice component - All construction projects identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual"). If the Design Manual is revised during the term of this permit, an *owner or operator* must begin using the revised version of the Design Manual to prepare their SWPPP six (6) months from the final revision date of the Design Manual.

   Where post-construction stormwater management practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard.

   At a minimum, the post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project;

(Part III. B. 2)

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. The dimensions, material specifications and installation details for each post-construction stormwater management practice;

d. Identification of any elements of the design that are not in conformance with the Design Manual. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards;

e. A hydrologic and hydraulic analysis for all structural components of the stormwater management control system;

f. A detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual; and

g. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.g. above.

(Part III. C)

C. <u>Required SWPPP Components by Project Type</u> - Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3.

Part IV. <u>INSPECTION AND MAINTENANCE REQUIREMENTS</u>

A. <u>General Construction Site Inspection and Maintenance Requirements</u>

1. The *owner or operator* must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. <u>Owner or Operator Maintenance Inspection Requirements</u>

1. The *owner or operator* shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *owner or operator* can stop conducting the maintenance inspections. The *owner or operator* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *owner or operator* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

(Part IV. C)

C. <u>Qualified Inspector Inspection Requirements</u> - The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- Licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, <u>with the exception of</u>:

    a. the construction of a single family residential subdivision with 25% or less impervious cover at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

    d. construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

    a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

(Part IV. C. 2)

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization*, <u>and</u> all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.A.1..

(Part IV. C. 3)

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization*, all points of discharge to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

    a. Date and time of inspection;

    b. Name and title of person(s) performing inspection;

    c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

    d. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

    e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

    f. Identification of all erosion and sediment control practices that need repair or maintenance;

    g. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

    h. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

(Part IV. C 4)

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector*. Pursuant to Part II.C.2., the inspection reports shall be maintained on site with the SWPPP.

Part V. <u>TERMINATION OF PERMIT COVERAGE</u>

A. <u>Termination of Permit Coverage</u>

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

(Part V. A. 2)

a. Total project completion - All construction activity identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT, certify that all disturbed areas have achieved *final stabilization;* and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall also have the MS4 sign the "MS4 Acceptance" statement on the NOT. The *owner or operator* shall have the principal executive officer, ranking elected official, or duly authorized representative from the *regulated, traditional land use control MS4*, sign the "MS4 Acceptance" statement. The MS4 official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The MS4 can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector's* final site inspection certification(s) required in Part V.3.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

(Part V. A. 5)

a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention - The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the site achieves *final stabilization*. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

B. Addresses - With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate Department Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply - The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied.

(Part VII. A)

The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

B. <u>Continuation of the Expired General Permit</u> - This permit expires five (5) years from the effective date. However, coverage may be obtained under the expired general permit, which will continue in force and effect, until a new general permit is issued. Unless otherwise notified by the Department in writing, an *owner or operator* seeking authorization under the new general permit must submit a new NOI in accordance with the terms of such new general permit.

C. <u>Enforcement</u> - Failure of the *owner or operator*, its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. <u>Need to Halt or Reduce Activity Not a Defense</u> - It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. <u>Duty to Mitigate</u> - The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to minimize or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. <u>Duty to Provide Information</u> - The *owner or operator* shall make available to the Department for review and copying or furnish to the Department within five (5) business days of receipt of a Department request for such information, any information requested for the purpose of determining compliance with this permit. This can include, but is not limited to, the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form, executed maintenance agreement, and inspection reports. Failure to provide information requested by the Department within the request timeframe shall be a violation of this permit.

The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review the NOI, SWPPP or inspection reports. Copying of documents will be done at the requester's expense.

G. <u>Other Information</u> - When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any other report, or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s)

changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or impervious area), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. <u>Signatory Requirements</u>

1. All NOIs and NOTs shall be signed as follows:

    a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

        i. a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

        ii. the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

    b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

    c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

        i. the chief executive officer of the agency, or

(Part VII. H. 1. c)

ii. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Part VII.H.1.;

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

   c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. <u>Property Rights</u> - The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. <u>Severability</u> - The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

(Part VII. K)
K. <u>Denial of Coverage Under This Permit</u>

1. At its sole discretion, the Department may require any *owner or operator* authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from *owner or operator* receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Regional Water Engineer, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. Any *owner or operator* authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit or another general permit. In such cases, the *owner or operator* shall submit an individual application or an alternative general permit application in accordance with the requirements of this general permit, 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix F).The request may be granted by issuance of an individual permit or another general permit at the discretion of the Department.

3. When an individual SPDES permit is issued to a discharger authorized to discharge under a general SPDES permit for the same discharge(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. <u>Proper Operation and Maintenance</u> - The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. <u>Inspection and Entry</u> - The *owner or operator* shall allow the Department or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

(Part VII. M)

1. Enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

N. <u>Permit Actions</u> - At the Department's sole discretion, this permit may, at any time, be modified, suspended, revoked, or renewed. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. <u>Definitions</u> - Definitions of key terms are included in Appendix A of this permit.

P. <u>Re-Opener Clause</u>

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with *construction activity* covered by this permit, the *owner or operator* of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. <u>Penalties for Falsification of Forms and Reports</u> – Article 17 of the ECL provides for a civil penalty of $37,500 per day per violation of this permit. Articles 175 and 210 of the New York State Penal Law provide for a criminal penalty of a fine and/or imprisonment for falsifying forms and reports required by this permit.

R. <u>Other Permits</u> – Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "Construction Activity(ies)" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

Groundwater - means waters in the saturated zone. The saturated zone is a subsurface zone in

which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct construction activities are occurring, or will occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
ii. Designed or used for collecting or conveying stormwater;
iii. Which is not a *combined sewer*; and
iv. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from construction activity.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in Parts 700 et seq of this Title.

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics in order to prepare a SWPPP that conforms to the Department's technical standard. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means construction activity that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* will be responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B

Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres: • Single family home not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix E • Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E • Construction of a barn or other agricultural building, silo, stock yard or pen.
The following construction activities that involve soil disturbances of one (1) or more acres of land: • Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains • Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects • Bike paths and trails • Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project • Slope stabilization projects • Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics • Spoil areas that will be covered with vegetation • Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that *alter hydrology from pre to post development* conditions • Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions • Demolition project where vegetation will be established and no redevelopment is planned • Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover* • Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area
The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land: • All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover*, and constructed as part of an over-head electric transmission line project , wind-power project, cell tower project, oil or gas well drilling project or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* <u>and</u> *alter the hydrology from pre to post development* conditions, <u>and</u> are not listed in Table 1

APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4

Figure 1 - New York City Watershed East of the Hudson

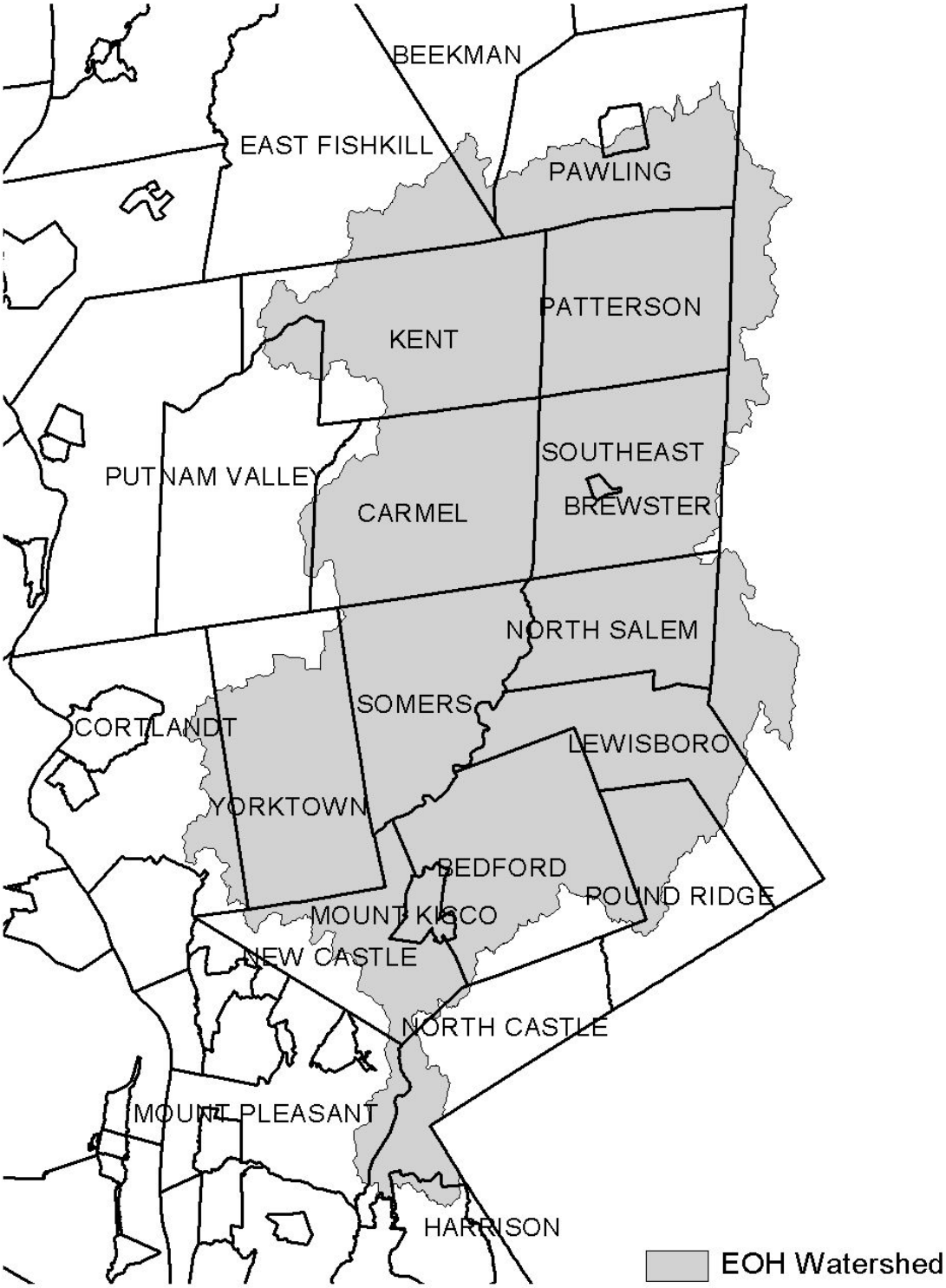
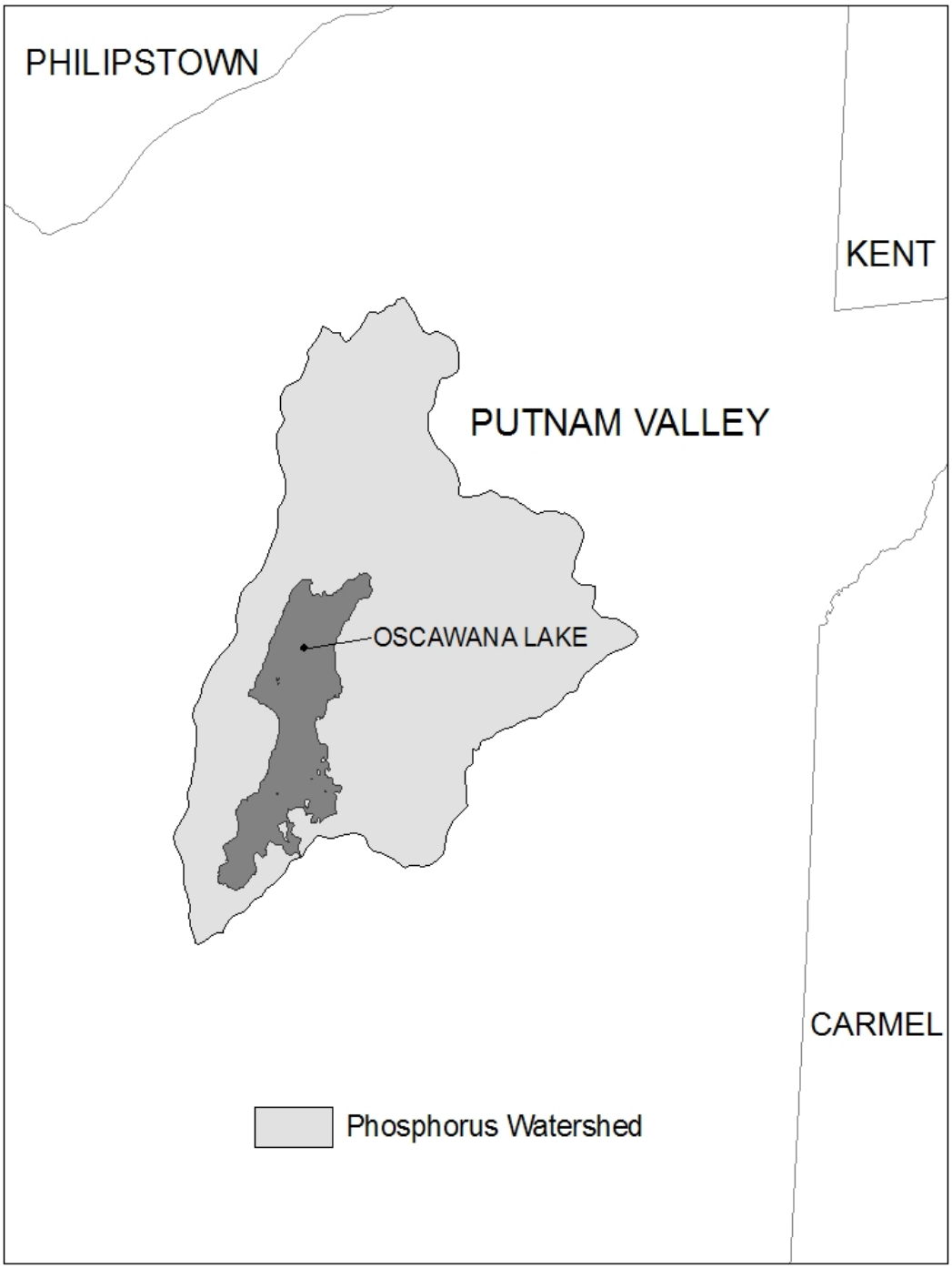


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

Figure 4 - Oscawana Lake Watershed



APPENDIX D

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivision construction activities that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond
Albany	Basic Creek Reservoir
Bronx	Van Cortlandt Lake
Broome	Whitney Point Lake/Reservoir
Broome	Beaver Lake
Broome	White Birch Lake
Chautauqua	Chautauqua Lake, North
Chautauqua	Chautauqua Lake, South
Chautauqua	Bear Lake
Chautauqua	Chadakoin River and tribs
Chautauqua	Lower Cassadaga Lake
Chautauqua	Middle Cassadaga Lake
Chautauqua	Findley Lake
Clinton	Great Chazy River, Lower, Main Stem
Columbia	Kinderhook Lake
Columbia	Robinson Pond
Dutchess	Hillside Lake
Dutchess	Wappinger Lakes
Dutchess	Fall Kill and tribs
Dutchess	Rudd Pond
Erie	Rush Creek and tribs
Erie	Ellicott Creek, Lower, and tribs
Erie	Beeman Creek and tribs
Erie	Murder Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs
Erie	Little Sister Creek, Lower, and tribs
Essex	Lake George (primary county listed as Warren)
Genesee	Black Creek, Upper, and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem
Genesee	Tonawanda Creek, Upper, and minor tribs
Genesee	Little Tonawanda Creek, Lower, and tribs
Genesee	Oak Orchard Creek, Upper, and tribs
Genesee	Bowen Brook and tribs
Genesee	Bigelow Creek and tribs
Greene	Schoharie Reservoir
Greene	Sleepy Hollow Lake
Herkimer	Steele Creek tribs
Kings	Hendrix Creek
Lewis	Mill Creek/South Branch and tribs
Livingston	Conesus Lake
Livingston	Jaycox Creek and tribs
Livingston	Mill Creek and minor tribs
Monroe	Genesee River, Lower, Main Stem
Monroe	Genesee River, Middle, Main Stem
Monroe	Black Creek, Lower, and minor tribs
Monroe	Buck Pond
Monroe	Long Pond
Monroe	Cranberry Pond
Monroe	Mill Creek and tribs
Monroe	Shipbuilders Creek and tribs
Monroe	Minor tribs to Irondequoit Bay
Monroe	Thomas Creek/White Brook and tribs
Nassau	Glen Cove Creek, Lower, and tribs
Nassau	LI Tribs (fresh) to East Bay
Nassau	East Meadow Brook, Upper, and tribs
Nassau	Hempstead Bay
Nassau	Hempstead Lake
Nassau	Grant Park Pond
Niagara	Bergholtz Creek and tribs
Oneida	Ballou, Nail Creeks
Onondaga	Ley Creek and tribs
Onondaga	Onondaga Creek, Lower and tribs
Onondaga	Onondaga creek, Middle and tribs
Onondaga	Onondaga Creek, Upper, and minor tribs
Onondaga	Harbor Brook, Lower, and tribs
Onondaga	Ninemile Creek, Lower, and tribs
Onondaga	Minor tribs to Onondaga Lake
Ontario	Honeoye Lake
Ontario	Hemlock Lake Outlet and minor tribs
Ontario	Great Brook and minor tribs
Oswego	Lake Neatahwanta
Putnam	Oscawana Lake
Putnam	Lake Carmel
Queens	Jamaica Bay, Eastern, and tribs (Queens)
Queens	Bergen Basin
Queens	Shellbank Basin
Rensselaer	Snyders Lake
Richmond	Grasmere, Arbutus and Wolfes Lakes
Saratoga	Dwaas Kill and tribs
Saratoga	Tribs to Lake Lonely
Saratoga	Lake Lonely
Saratoga	Schuyler Creek and tribs
Schenectady	Collins Lake

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Schoharie	Engleville Pond		
Schoharie	Summit Lake		
St. Lawrence	Black Lake Outlet/Black Lake		
Steuben	Lake Salubria		
Steuben	Smith Pond		
Suffolk	Millers Pond		
Suffolk	Mattituck (Marratooka) Pond		
Suffolk	Tidal tribs to West Moriches Bay		
Suffolk	Canaan Lake		
Suffolk	Lake Ronkonkoma		
Tompkins	Cayuga Lake, Southern End		
Tompkins	Owasco Inlet, Upper, and tribs		
Ulster	Ashokan Reservoir		
Ulster	Esopus Creek, Upper, and minor tribs		
Warren	Lake George		
Warren	Tribs to L.George, Village of L George		
Warren	Huddle/Finkle Brooks and tribs		
Warren	Indian Brook and tribs		
Warren	Hague Brook and tribs		
Washington	Tribs to L.George, East Shore of Lake George		
Washington	Cossayuna Lake		
Wayne	Port Bay		
Wayne	Marbletown Creek and tribs		
Westchester	Peach Lake		
Westchester	Mamaroneck River, Lower		
Westchester	Mamaroneck River, Upper, and minor tribs		
Westchester	Sheldrake River and tribs		
Westchester	Blind Brook, Lower		
Westchester	Blind Brook, Upper, and tribs		
Westchester	Lake Lincolndale		
Westchester	Lake Meahaugh		
Wyoming	Java Lake		
Wyoming	Silver Lake		

Note: The list above identifies those waters from the final New York State "2008 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated May 26, 2008, that are impaired by silt, sediment or nutrients.

APPENDIX F

LIST OF NYS DEC REGIONAL OFFICES

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD, PO BOX 220 WARRENSBURG, NY 12885-0220 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

APPENDIX B

NYSDEC NOTICE OF INTENT AND MS4s

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR _____
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE
OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
Cooper Crouse-Hinds

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Olavarria

Owner/Operator Contact Person First Name
Nelson

Owner/Operator Mailing Address
600 Travis, PO Box 4446

City
Houston

State
TX

Zip
77210 -

Phone (Owner/Operator)
713 - 209 - 8850

Fax (Owner/Operator)
713 - 209 - 8990

Email (Owner/Operator)
Nelson.Olavarria@CooperIndustries.com

FED TAX ID
20 - 1288146 (not required for individuals)

Project Site Information

Project/Site Name
Cooper Crouse-Hinds Landfills

Street Address (NOT P.O. BOX)
Wolf and 7th North Streets

Side of Street
● North ● South ○ East ○ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
City of Syracuse and Town of Salina

State: NY
Zip: 13221 -
County: Onondaga
DEC Region: 7

Name of Nearest Cross Street
Wolf Street

Distance to Nearest Cross Street (Feet)
2000

Project In Relation to Cross Street
○ North ○ South ○ East ● West

Tax Map Numbers
Section-Block-Parcel
073.-01-08.1-34

Tax Map Numbers
01.01-03

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting): 405513

Y Coordinates (Northing): 4770894

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in imperviousness**

● **Redevelopment with no increase in imperviousness**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ● OTHER

Landfill

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ● OTHER

Landfill

*note: for gas well drilling, non-high volume hydraulic fractured wells only

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law ? ○ **Yes** ● **No**

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ● **Yes** ○ **No**

6. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ● **No**

7. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	Acreage To Be Disturbed	Existing Impervious Area Within Disturbed	Future Impervious Area Within Disturbed
40.490.9	40.9	0.0	0.00.0

8. Do you plan to disturb more than 5 acres of soil at any one time? ● **Yes** ○ **No**

9. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
%	%	%	100 %

10. Is this a phased project? ● Yes ○ No

11. Enter the planned start and end dates of the disturbance activities

Start Date		End Date
08/01/2013	-	12/31/2014

12. Identify the nearest, natural, surface waterbody(ies) to which construction site runoff will discharge.

Name

Ley Creek

12a. Type of waterbody identified in Question 12?

- ○ Wetland / State Jurisdiction On Site (Answer 12b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 12b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ● Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

12b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ● Yes ○ No

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ● Yes ○ No

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 16.** ○ Yes ● No

16. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? **If Yes, what is the acreage to be disturbed?** ○ **Yes** ○ **No**

[ ][ ][ ][ ].[ ]

17. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

19. What is the name of the municipality/entity that owns the separate storm sewer system?

20. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book) ? ○ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) **(If No, skip questions 23 and 27-35)** ○ **Yes** ○ **No**

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer
Tetra Tech, Inc.

Contact Name (Last, Space, First)
Morgan, Daniel

Mailing Address
175 N Corporate Drive Suite 100

City
Brookfield

State
WI

Zip
53045-

Phone
262-792-1282

Fax
262-792-1310

Email
dan.morgan@tetratech.com

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-10-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name
Daniel

MI
L

Last Name
Morgan

Signature
Daniel L. Morgan

Date
05/03/2013

25. Has a construction sequence schedule for the planned management practices been prepared? ● Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ● Construction Road Stabilization
- ● Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ● Silt Fence
- ○ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ● Straw/~~Hay~~ Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ● Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ● Seeding
- ○ Sodding
- ● Straw/~~Hay~~ Bale Dike
- ● Streambank Protection
- ○ Temporary Swale
- ● Topsoiling
- ● Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ● Diversion
- ○ Grade Stabilization Structure
- ● Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ● Riprap Slope Protection
- ● Rock Outlet Protection
- ○ Streambank Protection

Other

Water Quality and Quantity Control

Important: **Completion of Questions 27-35 is not required if response to Question 22 is No.**

Post-Construction Stormwater Management Practices

27. Indicate **all** Stormwater Management Practice(s) that will be installed/constructed on this site:

Ponds

- ○ **Micropool Extended Detention (P-1)**
- ○ **Wet Pond (P-2)**
- ○ **Wet Extended Detention (P-3)**
- ○ **Multiple Pond System (P-4)**
- ○ **Pocket Pond (P-5)**

Filtering

- ○ **Surface Sand Filter (F-1)**
- ○ **Underground Sand Filter (F-2)**
- ○ **Perimeter Sand Filter (F-3)**
- ○ **Organic Filter (F-4)**
- ○ **Bioretention (F-5)**
- ○ **Other** _____

Alternative Practice

- ○ **Rain Garden**
- ○ **Cistern**
- ○ **Green Roof**
- ○ **Stormwater Planters**
- ○ **Permeable Paving (Modular Block)**

Wetlands

- ○ **Shallow Wetland (W-1)**
- ○ **Extended Detention Wetland (W-2)**
- ○ **Pond/Wetland System (W-3)**
- ○ **Pocket Wetland (W-4)**

Infiltration

- ○ **Infiltration Trench (I-1)**
- ○ **Infiltration Basin (I-2)**
- ○ **Dry Well (I-3)**
- ○ **Underground Infiltration System**

Open Channels

- ○ **Dry Swale (O-1)**
- ○ **Wet Swale (O-2)**

Verified Proprietary Practice

- ○ **Hydrodynamic**
- ○ **Wet Vault**
- ○ **Media Filter**

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

29. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

30. Provide the total water quality volume required and the total provided for the site.

WQv Required ___.___ **acre-feet**

WQv Provided ___.___ **acre-feet**

31. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required ___.___ **acre-feet**

CPv Provided ___.___ **acre-feet**

31a. The need to provide for channel protection has been waived because:

○ **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development ___.___ **CFS**

Post-development ___.___ **CFS**

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development ___.___ **CFS**

Post-development ___.___ **CFS**

31b. The need to provide for flood control has been waived because:

○ **Site discharges directly to fourth order stream or larger**

○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. ___ %

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. ___ %

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed. ___

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems) ___

36. Identify other DEC permits that are required for this project.

DEC Permits

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Other SPDES
- ○ Solid Waste
- ● None
- ○ Other
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15

37. Does this project require a US Army Corps of Engineers Wetland Permit? ○ Yes ● No
If Yes, Indicate Size of Impact. _____.

38. Is this project subject to the requirements of a regulated, traditional land use control MS4? ● Yes ○ No
(If No, skip question 39)

39. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ● Yes ○ No

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. NYR

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name Jesse **MI**

Print Last Name Conklin

Owner/Operator Signature Jesse A Ch

Date 05/08/2013

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information	
1. Owner/Operator Name:	Cooper Industries, LLC
2. Contact Person:	Nelson Olavarria
3. Street Address:	PO Box 4446, 600 Travis, Suite 5600
4. City/State/Zip:	Houston, TX 77210
II. Project Site Information	
5. Project/Site Name:	Cooper Crouse-Hinds South Landfill
6. Street Address:	Wolf and 7th North Streets
7. City/State/Zip:	Syracuse, NY 13208
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information	
8. SWPPP Reviewed by:	RUSSELL HOUCK, PE
9. Title/Position:	FACILITIES ENGINEER
10. Date Final SWPPP Reviewed and Accepted:	1/15/14
IV. Regulated MS4 Information	
11. Name of MS4:	City of Syracuse
12. MS4 SPDES Permit Identification Number: NYR20A	186
13. Contact Person:	RUSSELL HOUCK
14. Street Address:	233 E. WASHINGTON ST
15. City/State/Zip:	SYRACUSE, NY, 13202
16. Telephone Number:	315-448-8059

(NYS DEC - MS4 SWPPP Acceptance Form - January 2010)

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).
Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name: MARY ROBISON, P.E.

Title/Position: CITY ENGINEER

Signature: Mary E Robison

Date: 1/31/14

VI. Additional Information

Approval is based on the following conditions:
1. City of Syracuse Site Preparation Permit needs to be obtained prior to any site disturbance within the City of Syracuse.
2. Stormwater Maintenance and Easement Access agreements need to be executed and filed in the County Clerk's Office prior to the City of Syracuse issuing a Site Preparation Permit.
3. This SWPPP acceptance does NOT include authorization to disturb greater than 5 acres at any time. A justification for disturbance, additional erosion and sediment control measures to mitigate disturbance, phasing plan, cuts and fill plan, and total acreage to be disturbed in each phase must be submitted for review and approval by the City of Syracuse and NYSDEC.

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information	
1. Owner/Operator Name:	Cooper Industries, LLC
2. Contact Person:	Nelson Olavarria
3. Street Address:	PO Box 4446, 600 Travis, Suite 5600
4. City/State/Zip:	Houston, TX 77210
II. Project Site Information	
5. Project/Site Name:	Cooper Crouse-Hinds North Landfill
6. Street Address:	Wolf and 7th North Streets
7. City/State/Zip:	Syracuse, NY 13208
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information	
8. SWPPP Reviewed by:	Kristy Harris, CPESC, CPSWQ (CHA)
9. Title/Position:	Asst. Project Engineer
10. Date Final SWPPP Reviewed and Accepted:	10/11/13
IV. Regulated MS4 Information	
11. Name of MS4:	Town of Salina
12. MS4 SPDES Permit Identification Number: NYR20A	374
13. Contact Person:	Jason Perkins
14. Street Address:	201 School Rd.
15. City/State/Zip:	Liverpool, NY 13088
16. Telephone Number:	(315) 451-0492

(NYS DEC - MS4 SWPPP Acceptance Form - January 2010)

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).
Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name: Mark Nicotra

Title/Position: Supervisor

Signature: Mark T. Nicotra

Date: 10/15/13

VI. Additional Information

APPENDIX C

SOIL DESCRIPTIONS

Map Unit Description (Brief, Generated)

Onondaga County, New York

[Minor map unit components are excluded from this report]

Map unit: Ce - Carlisle muck

Component: Carlisle (75%)

The Carlisle component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on swamps, marshes. The parent material consists of deep organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, September, October, November, December. Organic matter content in the surface horizon is about 84 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria.

Map unit: ChB - Collamer silt loam, 2 to 6 percent slopes

Component: Collamer (85%)

The Collamer component makes up 85 percent of the map unit. Slopes are 2 to 6 percent. This component is on lake plains. The parent material consists of silty and clayey glaciolacustrine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during March, April, May. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Map unit: ML - Made land

Component: Udorthents (70%)

The Udorthents component makes up 70 percent of the map unit. Slopes are 0 to 5 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during January, February, March, April, May, June, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

Map unit: Ub - Urban land

Component: Urban land (70%)

Generated brief soil descriptions are created for major soil components. The Urban land is a miscellaneous area.

APPENDIX D

2013 PHASE 1A CULTURAL RESOURCES REPORT

PHASE IA CULTURAL RESOURCES REPORT

Cooper Crouse-Hinds, LLC.
North Landfill and South Landfill Remedial Action
Town of Salina and City of Syracuse
Onondaga County, New York

Prepared for:

Cooper Crouse-Hinds, LLC
600 Travis, Suite 5600
Houston, Texas 77002

Prepared by:
Tetra-Tech, Inc.
Cultural Resources Services Group
285 Ellicott St
Buffalo, New York 14203
716-849-9419

Report Author:

David Ingleman

Bonnie L. Locking, M.A.
Principal Investigator

February 2013

TETRA TECH

MANAGEMENT SUMMARY

SHPO Project Review Number:

Involved State and Federal Agencies (DEC, CORPS, FHWA, etc.): DEC

Phase of Survey: 1A

Location Information
- Location: Town of Salina and City of Syracuse
- Minor Civil Division: 64815 (Salina) and 73000 (Syracuse)
- County: Onondaga

Survey Area (Metric and English)
- Length: Not applicable
- Depth: Not applicable
- Number of Acres Surveyed: 16.54 hectares (40.88 acres)
- Number of Square Meters and Feet Excavated (Phase II, Phase III only): Not applicable
- Percentage of the Site Excavated (Phase II, Phase III only): Not applicable

USGS 7.5-Minute Quadrangle Map: Syracuse West (1973)

Archaeological Survey Overview
- Number and Interval of Shovel Tests: Not applicable
- Number and Size of Units: Not applicable
- Width of Plowed Strips: Not applicable
- Surface Survey Transect Interval: Not applicable

Results of Archaeological Survey
- Number and name of prehistoric sites identified: Not applicable
- Number and name of historic sites identified: Not applicable
- Number and name of sites recommended for Phase II/Avoidance: Not applicable

Results of Architectural Survey
- Number of buildings/structures/cemeteries within project area: 0
- Number of buildings/structures/cemeteries adjacent to project area: 0
- Number of previously determined NR listed or eligible building/structures/cemeteries/districts: 0
- Number of identified eligible buildings/structures/cemeteries/districts: 0

Report Author(s): David A. Ingleman

Date of Report: February 2013

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LIST OF ATTACHMENTS

ATTACHMENT	DESCRIPTION
Attachment A	Photographic Record
Attachment B	Historic Photographs

1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) Cultural Resources Services Group performed a Phase IA cultural resources investigation for the proposed Cooper Crouse-Hinds, LLC, North Landfill and South Landfill Remedial Action (hereafter referred to as the Project), located in the Town of Salina and City of Syracuse, Onondaga County, New York in December 2012, on behalf of Cooper Crouse-Hinds, LLC (C-CH). This study was conducted in accordance with cultural resource management practices as required on the Federal and State level. Specifically, the Phase IA cultural resources investigation was conducted in accordance with the National Historic Preservation Act of 1966, as amended, Executive Order 11593, the regulations of the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800), Section 14.09 of the New York State Parks, Recreation and Historic Preservation Law of 1980, the New York Archaeological Council's (NYAC) *Standards for Cultural Resource Investigations and Curation of Collections* (1994), and the New York State Historic Preservation Office (SHPO) *Phase I Archaeological Report Format Requirements* (2005).

The Phase IA cultural resources investigation of the Project included a reconnaissance survey (visual assessment, site walkover, and photographic documentation), and background research of the approximately 16.54 hectare (ha) (40.88 acre [ac]) Project area. The purpose of the Phase IA cultural resources investigation is to provide a sensitivity assessment and recommendations regarding Phase IB investigations.

The Phase IA cultural resources investigation was completed under the direction of Bonnie L. Locking. Ms. Locking meets 36 CFR 61 qualifications for conducting archaeological review and compliance projects in New York. David Ingleman served as project archaeologist. Jennifer Laslovich prepared the figures and conducted Geographic Information Systems (GIS) analysis. This report summarizes the background research, describes the environment of the Project Area, describes the results of the field reconnaissance survey, and provides recommendations for further investigations.

1.1 PROJECT DESCRIPTION

The Project area comprises two adjacent, former landfills situated in the Town of Salina and the City of Syracuse, Onondaga County, New York. The two former landfills, referred to as the North Landfill and the South Landfill, are located immediately west of CSX railroad tracks and the adjacent CC-H manufacturing facility, and are separated by Seventh North Street, which also forms the boundary between the Town of Salina (North Landfill) and the City of Syracuse (South Landfill). The Project area is located in an area of mixed usage including light industrial/manufacturing, commercial, and retail usage (Figure 1: Project Location Map).

The North Landfill occupies an irregular polygon shape totaling 8.69 ha (21.48 ac) in size. It is bordered to the north by a former municipal landfill owned by Plaza East, LLC (Plaza), to the east and southeast by CSX railroad tracks and the CC-H facility, to the south and southwest by Seventh North Street and the South Landfill, and to the west by wetlands and Ley Creek. Between the mid-1950s and 1989 CC-H reportedly used the North Landfill for disposal of wastes generated at their adjacent manufacturing facility (Tetra Tech 2012).

The South Landfill occupies a roughly triangular shape totaling 7.85 ha (19.4 ac) in size. The South Landfill is bordered to the north by Seventh North Street and the North Landfill, to the east and southeast by CSX railroad tracks, mixed commercial and retail development, and Hiawatha Boulevard, and to the west and northwest by Ley Creek. Undeveloped woods, wetlands, and mixed commercial and retail development are located further south of the South Landfill. Beginning in 1960, CC-H reportedly began using the South Landfill for disposal of wastes generated at their adjacent manufacturing facility. Between 1960 and early-1965 the South Landfill also accepted approximately 1,529 cubic meters (m^3) (2,000 cubic yards [yd^3]) of municipal solid waste per week from the City of Syracuse. By 1969 all landfilling at the South Landfill had stopped (Tetra Tech 2012).

Both landfills have been designated a Class 3 Inactive Hazardous Waste Disposal Site (Site No. 7-34-004) by the New York State Department of Environmental Conservation (NYSDEC). A Remedial Investigation (RI) completed in August 2009 included the excavation of test pits, boreholes and monitoring wells, as well as the collection of about 200 samples of groundwater, soil, sediments and surface water. On August 29, 2011 CC-H entered into a Consent Order (R7-0666-05-11) with NYSDEC to remediate the Project area. The minimum goals for the remedial program are to eliminate or mitigate all significant threats to public health and the environment presented by the

contamination identified within the Project area. Elements of the proposed remedial action include the following activities:

- Characterization, excavation, and off-site disposal of approximately 5,160 m^3 (6,750 yd^3) of fill material and sediments from three discrete "hot spots" within the North Landfill known to contain elevated contaminant levels.

- Consolidation of the North Landfill and South Landfill to reduce their current areas. The consolidated areas will be fenced and will have engineered cap systems designed and constructed. The areas to be consolidated will be determined during the design; however, areas to be excavated will include a 15-meter (m) (50-foot [ft]) buffer zone area between the South Landfill and Ley Creek and 9-m (30-ft) buffer zone areas between the landfills and on-site wetlands. If required for cap installation, buffer zones will be established between the landfills and Seventh North Street. This excavated material will be consolidated in the landfills above the water table.

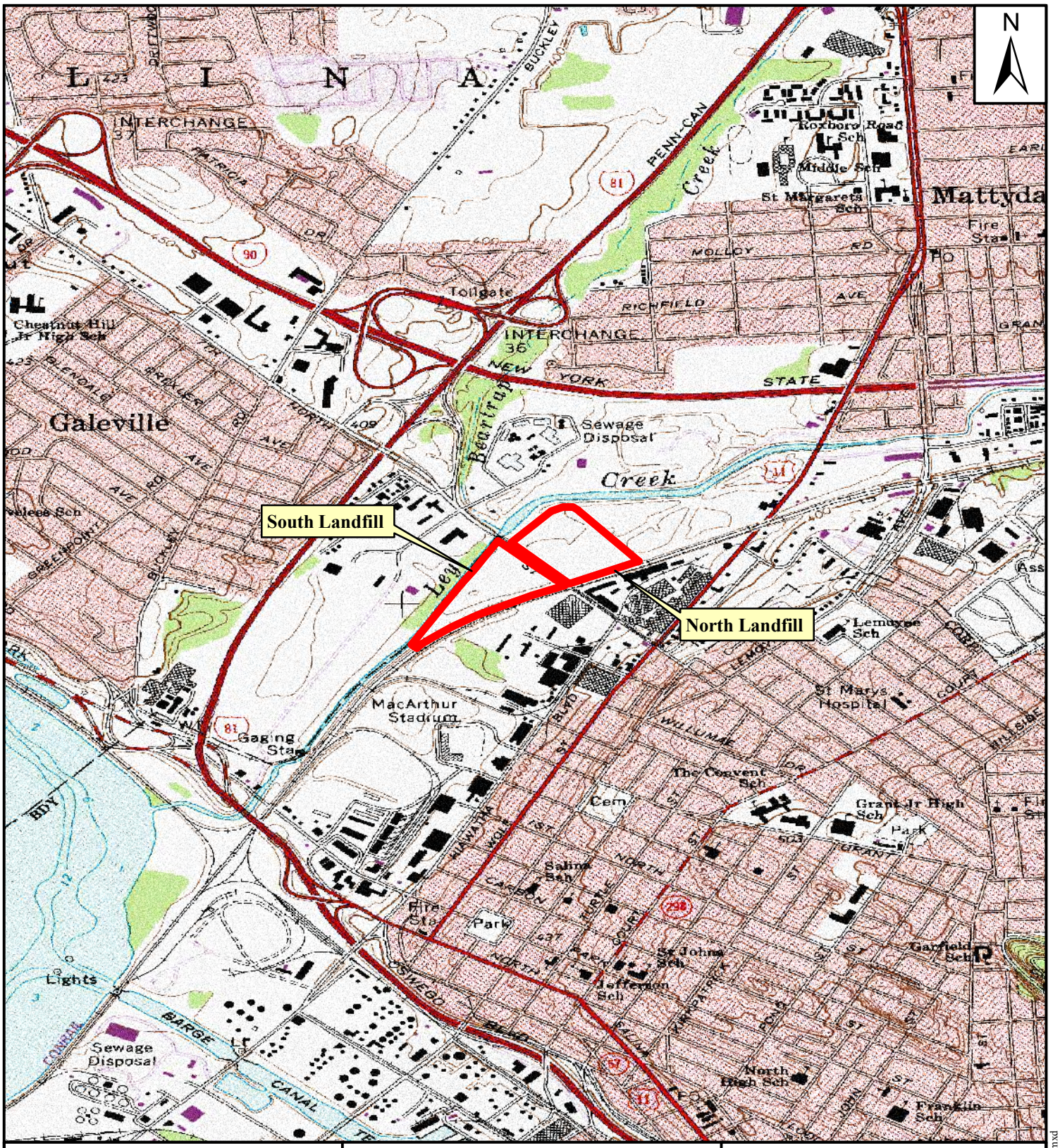
- Excavation of wetland sediment with PCB concentrations greater than 1 part per million (ppm) and less than 50 ppm for consolidation and on-site capping with the material discussed above.

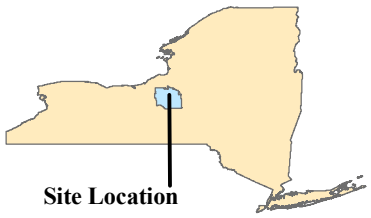
- Excavation of wetland sediment with PCB concentrations of 50 ppm or greater for off-site disposal.

- Restoration and maintenance of excavated wetlands and buffer zones per an approved restoration plan developed during the remedial design phase. Buffer zone soils will be a minimum of 0.6 m (2 ft) in deep, measured from the finished surface grade.

- Possible relocation of several existing utilities that traverse the Project area including overhead power lines (National Grid) and underground water and sanitary sewer pipelines (City of Syracuse).

The Area of Potential Effect (APE) for this cultural resources investigation consists of the entire Project Area. Also included in the APE is any area adjacent to the Project area that may indirectly be impacted through the proposed development.





Source: USDA/NRCS - National Cartography & Geospatial Center; USDA-NRCS-NCGC Digital Raster Graphic MrSID Mosaic for Onondaga County, NY. Project Area on Syracuse West Quad.

Legend

Project Boundary

0 1,000 2,000 Feet

0 240 480 Meters

Figure 1. Project Location Map for the Cooper Crouse-Hinds North Landfill and South Landfill Project, Town of Salina, Onondaga County New York.

Prepared For: Cooper Crouse-Hinds, LLC

Prepared By: TETRA TECH

Date: 2/2013

P:GIS/Projects/112IC04844-Cooper/MXD/Figure1.mxd

1.2 BACKGROUND RESEARCH

1.2.1 Environmental Setting

The Project area is located within the northern portion of the Allegheny Plateau Physiographic Province (Hutton and Rice 1977). The glaciated topography found within a 1.6 kilometers (km) (1 mile [mi]) of the Project area gently slopes up from about 121.9 m (400 ft) above mean sea level (AMSL) north of the Project area to about 131.1 m (430 ft) AMSL south of the Project area (Hutton and Rice 1977; United States Geological Survey [USGS) 1973).

Naturally occurring salt was abundant in the vicinity of the Project area (Thompson 1977:471). The Ley Creek floodplain, which includes the entire Project area, was historically a salt marsh. The confluence of Ley Creek and Bear Trap Creek is about 79 m (260 ft) west of the southwest corner of the North Landfill. From this confluence Ley Creek follows an artificially channelized course generally southwest before emptying into Onondaga Lake. The National Wetland Inventory (NWI) map identified the location of one wetland (ID No. PFO1/SS1E), including Ley Creek, within or adjacent to the Project area. Two additional wetlands, two stream segments and a drainage ditch were also delineated during the RI (Tetra Tech 2012).

Elevations in the North Landfill generally range between 112.8 – 113.4 m (370 – 372 ft) AMSL except for a large fill-mound situated in the northern half of the North Landfill, where the elevation rises to about 116.1 m (381 ft) AMSL. The topography slopes moderately to steeply downward from the fill-mound towards the North Landfill's northern boundary. Drainage across the North Landfill generally follows topography and radiates outward from the fill-mound. Drainage to the north and west is to a wetland, referred to as Wetland B, and then to the adjacent wetland property. Drainage to the south and east is towards the east wetland, referred to as Wetland A and the eastern stream segment, referred to as Stream A (Tetra Tech 2012).

Topography of the South Landfill is generally flat with an average elevation range of 113.7 – 114.9 m (373 – 377 ft) AMSL. Topographic relief is due largely to mounded fill. The topography slopes moderately to steeply away from the fill-mound in all directions. Drainage across the South Landfill generally follows topography and radiates outward from the fill-mound. Drainage to the south and east-southeast is to a small stream, referred to as Stream B, and a wetland, referred to as Wetland C. Drainage to the west is into Wetland C and eventually to Ley Creek.

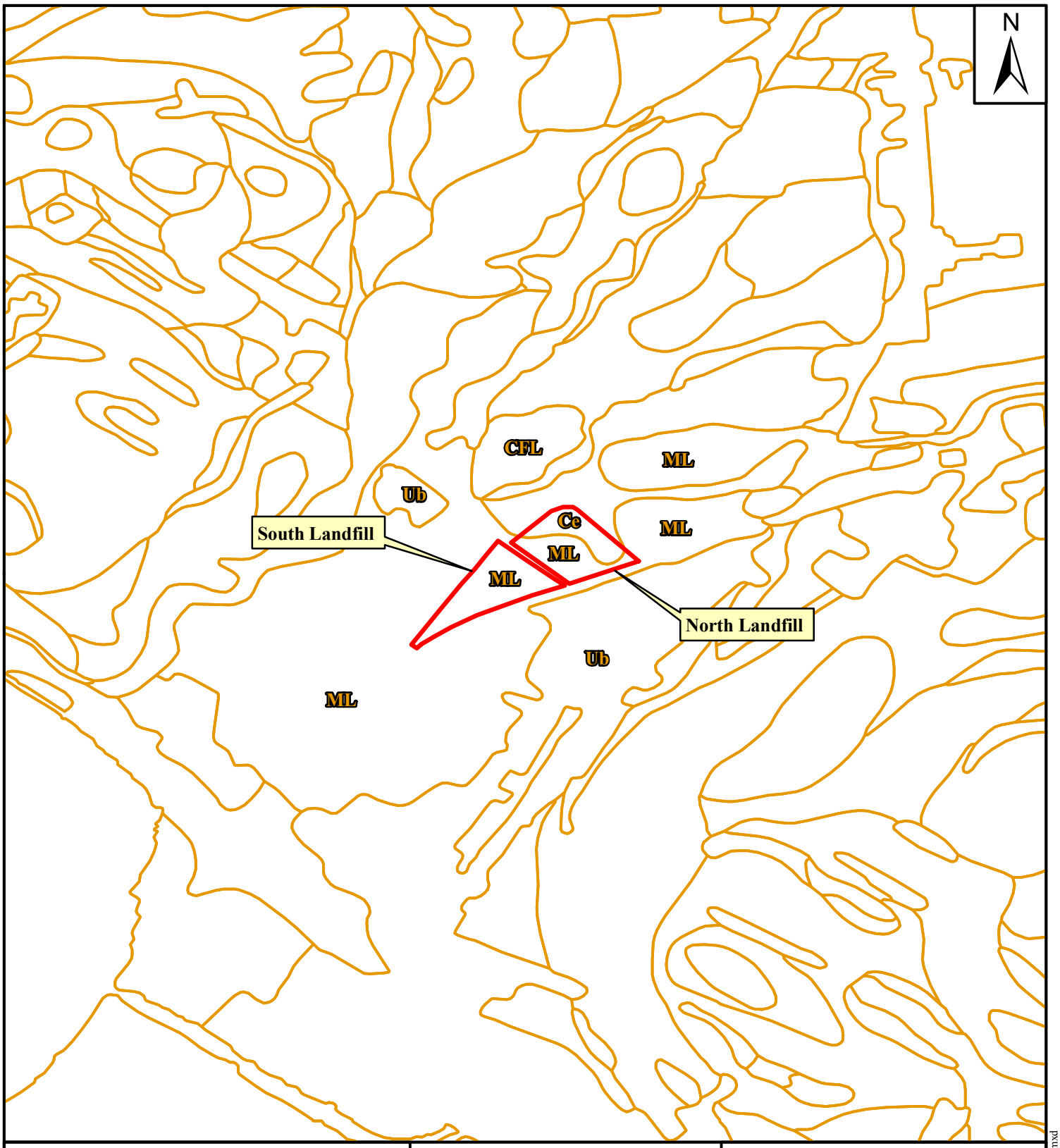
At the time of field investigation the Project area was devoid of vegetation except isolated patches of wetland flora such as cattails (*Typha* sp.) and reeds (*Phragmites* sp.). However, prior to recent vegetative clearing the Project area flora also included several species of deciduous softwoods (Drew Lent, personal communication, December 2012).

The Project area lies mostly within the Urban land soil association, however the northwestern quadrant of the North Landfill lies within the Carlisle-Palms soil association. Generally, Carlisle-Palms soils are deep, very poorly drained, and occur in waterlogged bogs, outwash plains, and flood plains. Urban land soils have been so altered by development that natural soil identification is not feasible. Two Soil Mapping Units — Made Land (Ma) and Carlisle muck (Ce) — are recorded for the Project area and generally correspond to the two soil associations mentioned above (Hutton and Rice 1977). Project area soils are summarized in Table 1 and depicted in Figure 2.

Table 1. Soil Descriptions for the Cooper Crouse-Hinds North Landfill and South Landfill Remedial Action Project, City of Syracuse and Town of Salina, Onondaga County, New York

Name	Soil Horizon Depth cm (in)			Color	Texture, Inclusions	Slope %	Drainage	Landform
Carlisle muck (Ce)	Oa1-3	0 – 165	(0 – 65)	Blk	Muck	0-2	Very poor	Swamps, Marshes
	Oa4	165 – 274	(65 – 108)	VDkBr	Muck			
	Oa5	274 – 282	(108 – 111)	VDkBr	Muck			
	IIC2	282 – 295	(111 – 116)	G	ClLo			
Made land, chemical waste	N/A			N/A	N/A	N/A	N/A	N/A

Source: Hutton and Rice (1977)
Key: Color: Blk – Black, G – Gray, Br – Brown, V – Very, Dk – Dark; Texture: Cl – Clay, Lo – Loam, Sa – Sand, Si – Silt, Muck – Muck



Description of Soil Units Within Project Boundary
Ce - Carlisle muck
ML - Made land

Legend

Project Boundary

USDA Soil Boundary

Source: U.S. Department of Agriculture, Natural Resources Conservation Service; Soil Survey Geographic (SSURGO) database for Onondaga County, New York 2010.

0 1,000 2,000 Feet

0 240 480 Meters

Figure 2. USDA Soils Map for the Cooper Crouse-Hinds North Landfill and South Landfill Project, Town of Salina, Onondaga County New York.

Prepared For: Cooper Crouse-Hinds, LLC

Prepared By: TETRA TECH

Date: 2/2013

P:GIS/Projects/112IC04844-Cooper/MXD/Figure1.mxd

1.2.2 Past and Present Land Uses and Current Conditions

Evidence of prehistoric and historic land use practices in and around the Project area was derived from a review of site files at the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP's) Field Service Bureau, the New York State Museum, published and unpublished archaeological studies (Bradley 1979, 1987; Ritchie 1980; Ritchie and Funk; Parker 1920), local histories (Beauchamp 1908; Clark 1840; Clayton 1878), and historic maps (see Section 1.2.4 below). These sources record six prehistoric archaeological sites recorded within 1.6 km (1 mi) of the Project area (Table 2).

Generally the aboriginal inhabitants of the region showed a preference for lake, stream, river and marsh associations, knolls, and small bluffs. The Project area is situated in a swampy salt marsh just below the confluence of two perennial streams, referred to as Bear Trap Creek and Ley Creek. These waters drain into Onondaga Lake about 1.6 km (1 mi) downstream of the Project area. Although poor drainage make it unlikely that the Project area was utilized prehistorically for a settlement of any size, other specialized prehistoric activity areas may have existed at one time. In this setting only special purpose sites, such as extractive or ritual sites, are expected.

Specifically near the Project area, early to mid-eighteenth century Euro-American settlers and aboriginals of the Onondaga Nation were commercially producing salt from the springs at Onondaga Lake through a boiling process. The economic potential of the Onondaga salt springs motivated New York state to negotiate the 1788 Treaty of Fort Stanwix, which featured the transfer of Onondaga land around Onondaga Lake to the state on the condition that the land would be used for the production of salt for the common benefit of the people of New York and the Onondaga Nation. In 1797 New York State created the Onondaga Salt Spring Reservation – a 1.6 km (1 mi) wide strip of land around the southern shore of Onondaga Lake where salt production, storage, and sale were regulated and taxed. Salt exploitation was further stimulated in the early-nineteenth century by the advent of the solar drying method of salt production. Using this process salt production boomed, which in turn led to the rebranding of the City of Syracuse as the "Salt City" (Kappel 2000). By the mid-nineteenth century Lewis Henry Morgan recorded the Onondaga word for the modern Town of Salina as "*Te-ga-jik-ha-do*" signifying "Place of salt" (Morgan 1922). Salt production remained an important industry locally into the early-twentieth century when salt deposits were depleted and the Onondaga Salt Spring Reservation was closed (Kappel 2000).

As the salt industry waned in the late-nineteenth century manufacturing sprang up as the major local industry (Kappel 2000). One prominent manufacturer was the Crouse-Hinds company, whose factory was constructed adjacent to the Project area in 1911. Between the mid-1950s and 1989 Crouse-Hinds reportedly used the North Landfill for disposal of wastes generated at their adjacent manufacturing facility (i.e. foundry sand). Crouse-Hinds also used the South Landfill for disposal of manufacturing wastes beginning in 1960. Between 1960 and early-1965 the South Landfill also accepted approximately 1,529 m^3 (2,000 yd^3) of municipal solid waste per week from the City of Syracuse. All landfilling at the South Landfill ceased by 1969 (Tetra Tech 2012).

1.2.3 Previous Cultural Resource Investigations

A review of archaeological site files at the NYSOPRHP indicates that the Project area has not been previously surveyed for cultural resources. No historic structures or properties listed in or eligible for listing in the State or National Register of Historic Places (S/NRHP) were recorded in the vicinity of the Project area. A total of eight previously recorded archaeological sites were recorded within 1.6 km (1 mi) of the Project area, one of which is immediately adjacent to the Project area (Table 2). Two of the eight sites (NYSOPRHP sites) reference each other therefore the actual number of sites in the vicinity is six.

Table 2. Previously Identified Cultural Resources within 1.6 km (1 mi) of the Cooper-Crouse Hinds North and South Landfills Project, City of Syracuse and Town of Salina, Onondaga County, New York.

NYSOPRHP Site #	Site Name	Distance to APE m(ft)	Time Period	Site Type
06740.000416	Parker #87	974 (3196)	No info	No info
06740.000415	Parker #86	1439 (4721)	No info	No info
	NYSM 4235, Kaneenda, ACP Onda 83A	1416 (4646	Historic Native (1700)	Village
	NYSM 4239, ACP Onda 86A	764 (2507)	Unidentified precontact	Traces of occupation
	NYSM 4240, ACP Onda 87	0	Historic Native(?)	Camp or hamlet
	NYSM 4281	102 (335)	Unidentified precontact	Traces of occupation
	NYSM 6641, ACP Onda 86B	1142 (3747)	No info	Cemetery
	NYSM 6642	1027 (3369)	Unidentified precontact	Camp

The closest known aboriginal site was recorded by Parker (1920) as a "Camp or hamlet," adjacent to the south of the Project area. Elsewhere in the Town of Salina the presence of a few prehistoric campsites and "traces of occupation," as well as historic period sites including Jesuit missions from the seventeenth and eighteenth centuries and a French fort from the early-eighteenth century were also noted by Parker (1920). Little information is provided for these Parker sites and geographical confirmation has not occurred. There appears to be confusion surrounding the actual location of Parker 83 and 86 based on NYSM records.

1.2.4 Historic Maps and Photographs

Project area land use history is well documented in a series of historic maps and aerial photographs. Table 3 summarizes the historic map and photographic research conducted for this study and describes where select maps and aerial photographs can be found in this report. Unfortunately, many of these historic documents were not able to be reproduced here.

Table 3. Summary of Historic Maps and Photographs Depicting the of the Cooper-Crouse Hinds North and South Landfills Project area, City of Syracuse and Town of Salina, Onondaga County, New York.

Title	Author	Date	Report Reference
A Map of Part of Onondaga Lake, and its vicinity, in the State of New York. From Actual Survey	Anonymous	Ca. 1800	--
Map of the Village of Salina	Geddes	1807	--
Map of Part of the Onondaga Salt Springs Reservation	Kellogg	1827	--
Atlas of Onondaga County	Dawson	1860	--
Atlas of Onondaga County	Sweet	1874	--
Sanborn Fire Insurance Map of Syracuse	Sanborn	1892	Figure 3
Atlas of the State of New York	Bien	1895	--
Syracuse, New York 15 Minute Series Quadrangle	USGS	1898	Figure 4
Atlas of the City of Syracuse N.Y. and Suburbs	Hopkins	1924	--
Airmap of City of Syracuse	AirMap Corp.	1926	Attachment B
Aerial Photograph	Crouse-Hinds	1927	Attachment B
Sanborn Fire Insurance Map of Syracuse	Sanborn	1928	Figure 5
Onondaga Aerial Photograph	Cornell University	1938	--
Aerial Photograph	Crouse-Hinds	1948	Attachment B

Title	Author	Date	Report Reference
Syracuse West, New York 7.5 Minute Series Quadrangle	USGS	1947	Figure 6
Onondaga Aerial Photograph	Cornell University	1951	--
Aerial Photograph	Crouse-Hinds	1952	Attachment B
Aerial Photograph	Crouse-Hinds	1954	Attachment B
Map of Syracuse	Polk	1954	--
Onondaga Aerial Photograph	Cornell University	1966	--
Syracuse West, New York 7.5 Minute Series Quadrangle	USGS	1973	Figure 1
Aerial Photograph	Crouse-Hinds	1995	Attachment B

Figure 3. Cooper Crouse-Hinds North Landfill and South Landfill Remedial Action Project location on the 1892 (Vol.2) Sanborn Fire Insurance Map.

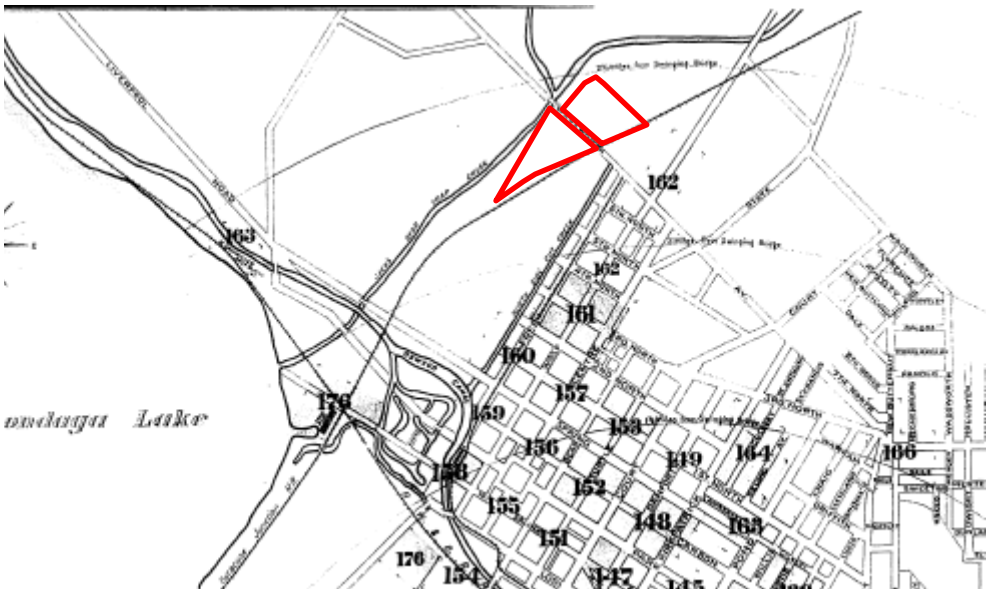


Figure 4. Cooper Crouse-Hinds North Landfill and South Landfill Remedial Action Project location on the 1898 USGS Syracuse, New York 15 Minute Series Quadrangle.

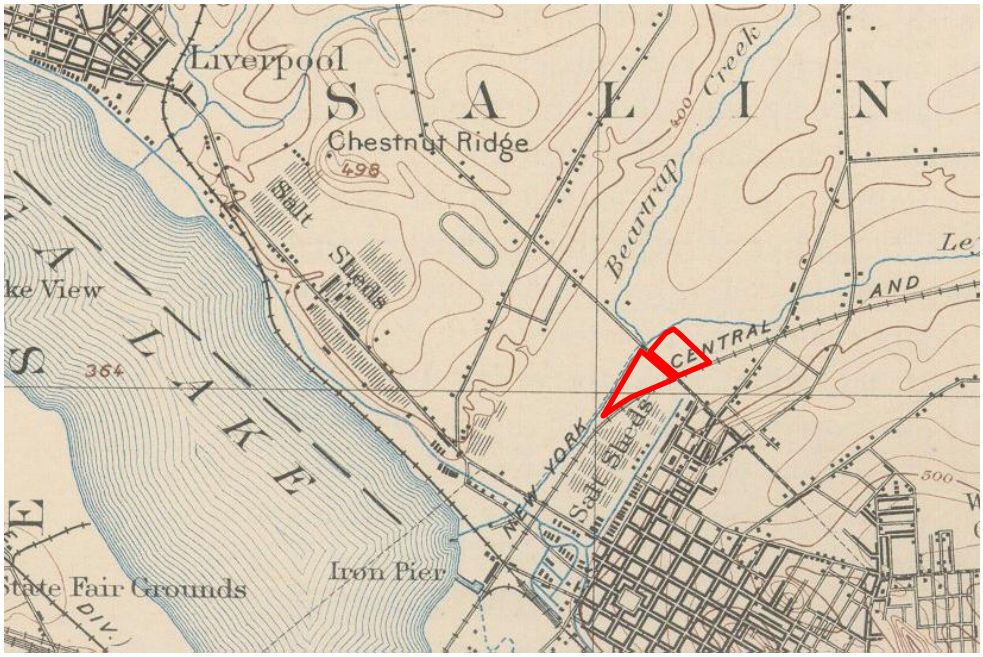


Figure 5. Cooper Crouse-Hinds North Landfill and South Landfill Remedial Action Project location on the 1928 (Vol 4) Sanborn Fire Insurance Co. Map of Syracuse.

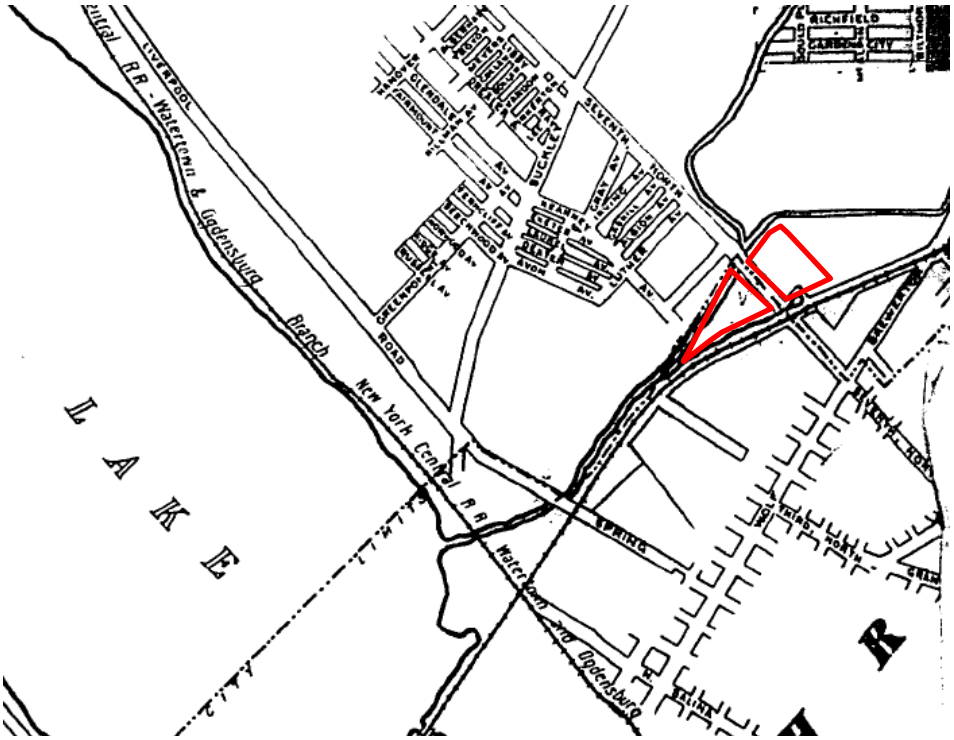
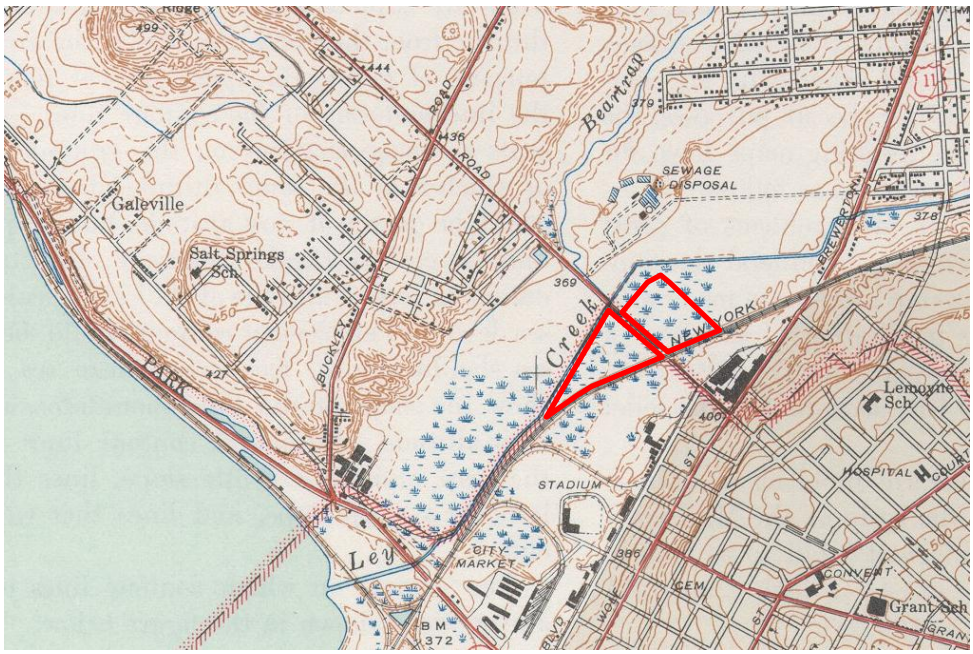


Figure 6. Cooper Crouse-Hinds North Landfill and South Landfill Remedial Action Project on the 1947 USGS Syracuse West, New York 7.5 Minute Series Quadrangle.



Generally, these sources indicate that from the late-nineteenth to early-twentieth century significant transportation and industrial related developments occurred adjacent to the Project area including the construction of Seventh Street along its present alignment, the channelization of Ley (aka Mud) Creek, the construction of the Syracuse Junction (now CSX) Railroad grade, the construction and operation of numerous salt sheds, and the construction of the Crouse-Hinds factory. Despite being surrounded by development, the Project area remained apparently unaltered until the mid-twentieth century when aerial photographs confirm use of the Project area as a landfill.

1.3 PREVIOUS DISTURBANCE

The entire Project Area was previously disturbed in the late-twentieth century by landfill grading and dumping activities. In 2010, as part of a remediation feasibility study, a series of 39 boreholes was excavated throughout the Project Area. This testing revealed widespread disturbances and thick surficial fill layers. Typically, fine brown to black foundry sand, often mixed with metal filings or slag, was found layered with mixed municipal waste (e.g. plastic, fiberglass, beer cans, shoes) to a depth of 1.2 – 3.7 m (4 – 12 ft) below ground surface (BGS). Below the fill peat or silt with shell inclusions was encountered to a maximum depth of 3.0 – 4.3 m (10-14 ft) BGS (Tetra Tech 2012).

1.4 FIELD RECONNAISSANCE

The entire Project area was pedestrian surveyed in December 2012 by Tetra Tech project archaeologist David Ingleman. The survey included visual assessment, site walkover, and photographic documentation. Results of the field reconnaissance are discussed below in Section 2: Archaeological Sensitivity Assessment and Recommendations.

2.0 ARCHAEOLOGICAL SENSITIVITY ASSESSMENT AND RECOMMENDATIONS

2.1 ARCHAEOLOGICAL SENSITIVITY ASSESSMENT

The sensitivity assessment for the Phase IA archaeological reconnaissance survey included a visual assessment, site walkover and photodocumentation of the Project area, and background research including archaeological site file searches at the NYSOPRHP, published and unpublished archaeological studies, and historic research. The assessment for archaeological sensitivity of the Project area was based on site characteristics (*e.g.* landform/terrain, soil characteristics, and proximity to water). Also taken into consideration was the nature and level of observed and documented disturbance and modification to the landscape in the Project area due to historic and recent human development.

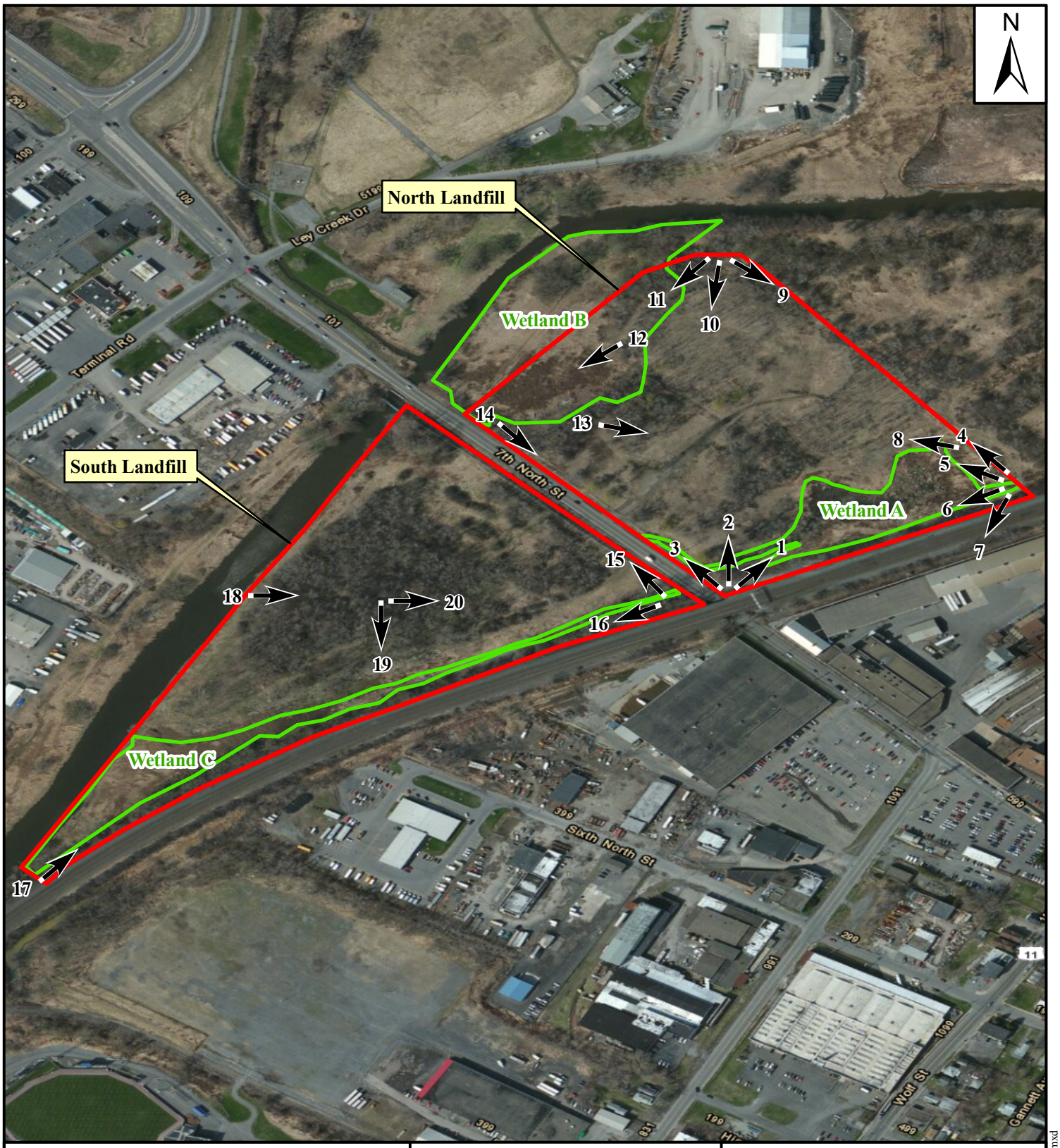
The site walkover indicated that the Project area is situated in a swampy, low lying area with poor drainage. Furthermore, intensive disturbances were observed throughout the Project area. Sundry late-twentieth century artifacts (e.g. rubber soled shoes, assorted plastics, unidentified ferrous metal objects, varicolored glass bottles, shag carpet, Styrofoam, white ware, etc.) were observed scattered throughout the surface of the South Landfill and in the northeast corner of the North Landfill. However, all these artifacts appear to be less than 50 years old and therefore do not meet the minimum age threshold to be considered historic for the purposes of S/NRHP evaluation. Instead, they document the disturbance of the Project area by landfilling activities. Project area conditions are depicted in Attachment A: Photographic Record.

The greatest factors limiting the archaeological potential of the Project area are the environmental setting followed by the nature and extent of modern disturbances. Poor drainage and swampy conditions make the presence of prehistoric and/or historic habitation sites unlikely. In this setting only special purpose sites, such as extractive or ritual sites, are expected. However, the potential of discovering such sites is further limited by the intensive and extensive disturbances associated with late-twentieth century landfilling activities in the Project area. Therefore there is virtually no chance that significant undisturbed prehistoric or historic archaeological deposits could be adversely affected by Project activities.

2.2 TESTING RECOMMENDATIONS

The Phase IA reconnaissance survey of the Project area indicated that there are no historic structures within the Project area. The CSX railroad grade (formerly Syracuse Junction Railroad) located adjacent to the Project area is greater than 50 years old; however design plans indicate no impacts to this resource.

Evidence of prehistoric wetland resource extraction and processing within the Project area is expected to manifest in the archaeological record as small, ephemeral surface or near surface expressions. Unfortunately, if these types of sites formerly existed within the Project area they were likely destroyed by late-twentieth century landfill activities. There is also no evidence of any kind of substantial historic use of the Project area. Therefore, any physical evidence of historic use of the Project area is expected to have manifested in the archaeological record as small ephemeral artifact deposits located at or near the surface. Unfortunately these deposits would also have become mixed and disturbed with late-twentieth century rubbish when landfilling significantly altered the natural landscape. In summary, if prehistoric or historic archaeological resources were ever present within the Project area it is not probable that any intact deposits remain. Given this situation no further archaeological investigations are recommended.



Legend

- Project Boundary
- Wetlands
- Photograph Location/Number

Source: ESRI World Imagery, US-NY-Syracuse 2011.

0 225 450 Feet

0 50 100 Meters

Figure 7. Phase IA Cultural Resources Investigation Map for the Cooper Crouse-Hinds North Landfill and South Landfill Project, Town of Salina, Onondaga County New York.

Prepared For: Cooper Crouse-Hinds, LLC

Prepared By: TETRA TECH

Date: 2/2013

P:GIS/Projects/112IC04844-Cooper/MXD/Figure5.mxd

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ATTACHMENT A

PHOTOGRAPHIC RECORD

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 1
Direction: NE
Comments: Overview of North Landfill, photographed from southern corner. Note disturbed stream segment, referred to as Stream A. Note also elevated CSX railroad grade to right adjacent to Project area and overhead National Grid power lines. Yellow poles mark southern Project area and property boundary.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 2
Direction: N
Comments: Overview of North Landfill, photographed from southern corner. Note disturbed stream segment, referred to as Stream A. Note also overhead National Grid power lines at center.

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 3
Direction: NE
Comments: Overview of North Landfill photographed from southern corner. Note disturbed stream segment, referred to as Stream A. Note also overhead National Grid power lines to center left. Note also Seventh North Street to left.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 4
Direction: NE
Comments: Overview of North Landfill photographed from eastern corner. Note also riprap in foreground. Yellow poles mark northern Project area and property boundary.

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 5
Direction: WNW
Comments: Overview of North Landfill photographed from eastern corner. Note reeds in Wetland A and riprap in foreground.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 6
Direction: W
Comments: Overview of North Landfill from eastern corner. Note elevated CSX Railroad grade to left and overhead utility lines.

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 7
Direction: SW
Comments: Overview of North Landfill from eastern corner. Note elevated CSX Railroad grade to left and rip-rap in foreground.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 8
Direction: N
Comments: View of disturbed ground surface in North Landfill photographed from about 50 m (164 ft) northwest of eastern corner. Note mixed late-20th century debris on surface is municipal waste encroached from the adjacent Plaza East Landfill (to right).

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 9
Direction: SE
Comments: Overview of North Landfill from the northern corner. Note mounded foundry sand. Note also Cooper Crouse-Hinds plant in background. Yellow poles mark northern Project area and property boundary.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 10
Direction: S
Comments: Overview of North Landfill from the northern corner. Note snow fencing around monitoring well in foreground and mounded foundry sand**.**

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 11
Direction: SW
Comments: Overview of North Landfill from the northern corner. Note Ley Creek to right (in tree line) and mounded foundry sand.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 12
Direction: SW
Comments: View of ground disturbance along the west side of the north landfill. Note prevalent ground disturbance and mixed late-20th debris. Note also Ley Creek in background in tree line).

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 13
Direction: SE
Comments: View of deep foundry sand deposit in "Area 3", near center of North Landfill. Note standing water in bottom of excavation. Note also CSX Railroad grade and Cooper Crouse-Hinds plant in background.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 14
Direction: SE
Comments: Overview of the North Landfill photographed from the western corner. Note Seventh North Street to right (past fence line). Note also Cooper Crouse-Hinds plant in background.

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 15
Direction: NW
Comments: Overview of South Landfill photographed from eastern corner. Note Seventh North Street to right.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 16
Direction: SW
Comments: Overview of South Landfill photographed from eastern corner. Note CSX railroad grade to left.

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 17
Direction: NE
Comments: Overview of South Landfill, photographed from southern corner. Note Ley Creek to left, Wetland C in center, and CSX railroad grade to right.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 18
Direction: SE
Comments: Overview of South Landfill photographed from western side. Note prevalent ground disturbances and mounded foundry sand. Note also Cooper Crouse-Hinds plant in background.

ATTACHMENT A

PHOTOGRAPHIC RECORD

Company: Tetra Tech Inc.
Project: Cooper Crouse-Hinds North and South Landfills
Onondaga County, New York

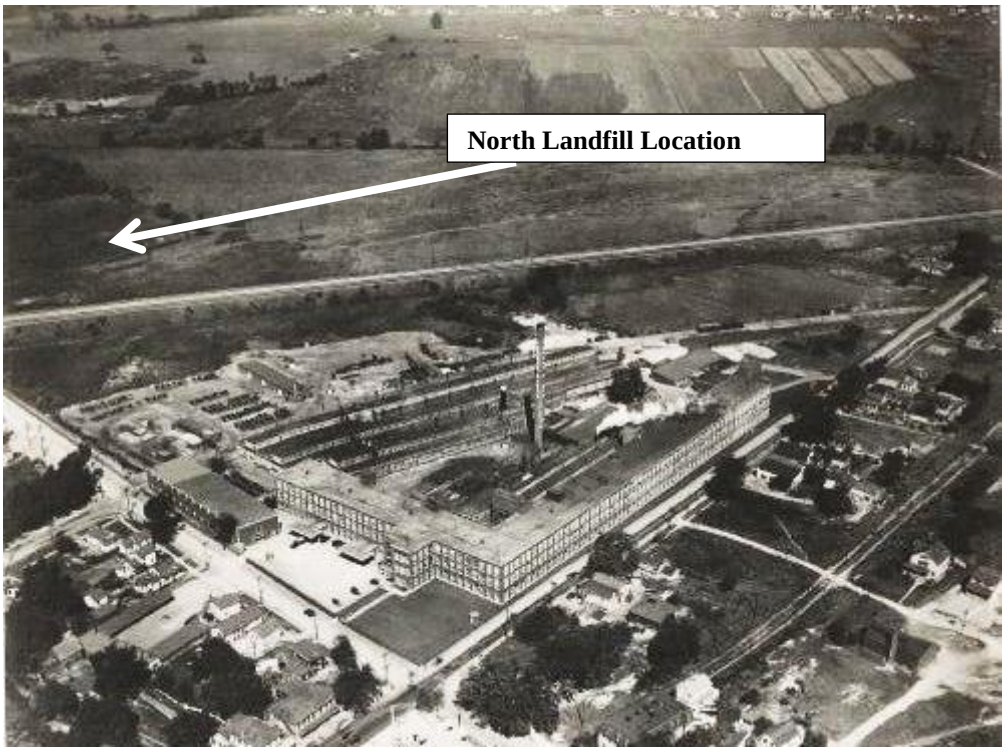
Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 19
Direction: WSW
Comments: Overview of South Landfill photographed from center of landfill. Note mounded foundry sand and Wetland C in background.

Photographer: D. Ingleman
Date: 12/13/12
Photo No.: 20
Direction: E
Comments: Overview of South Landfill photographed from center of landfill. Note Wetland C in middle ground, CSX railroad grade in background, and Cooper Crouse-Hinds plant in distant background.

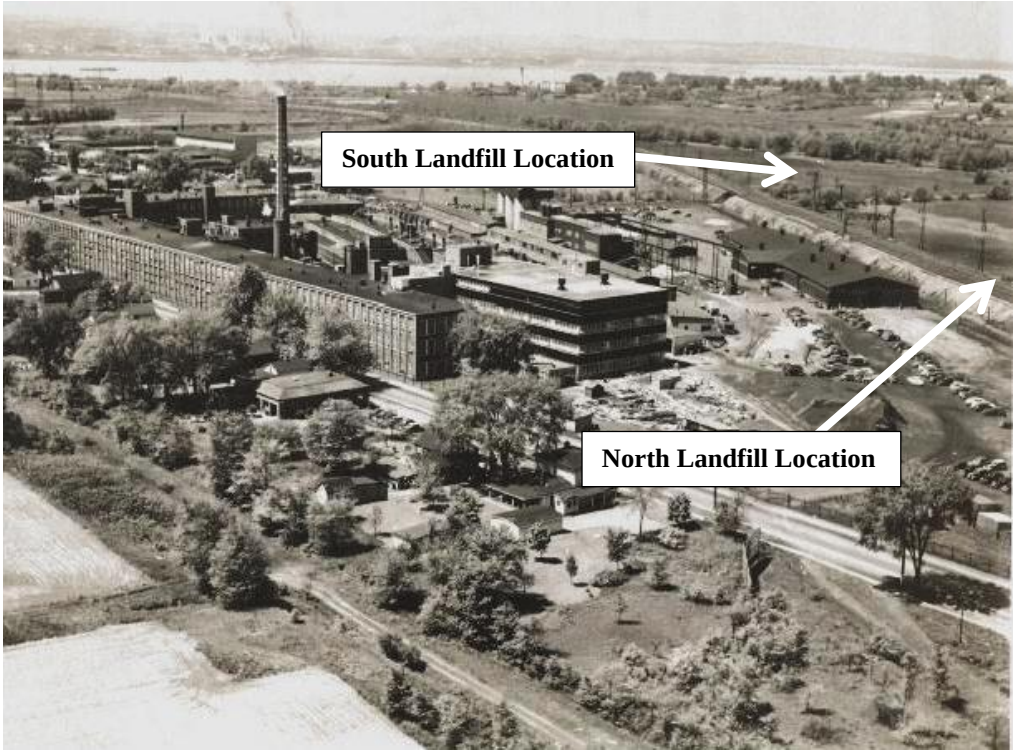
ATTACHMENT B

HISTORIC PHOTOGRAPHS

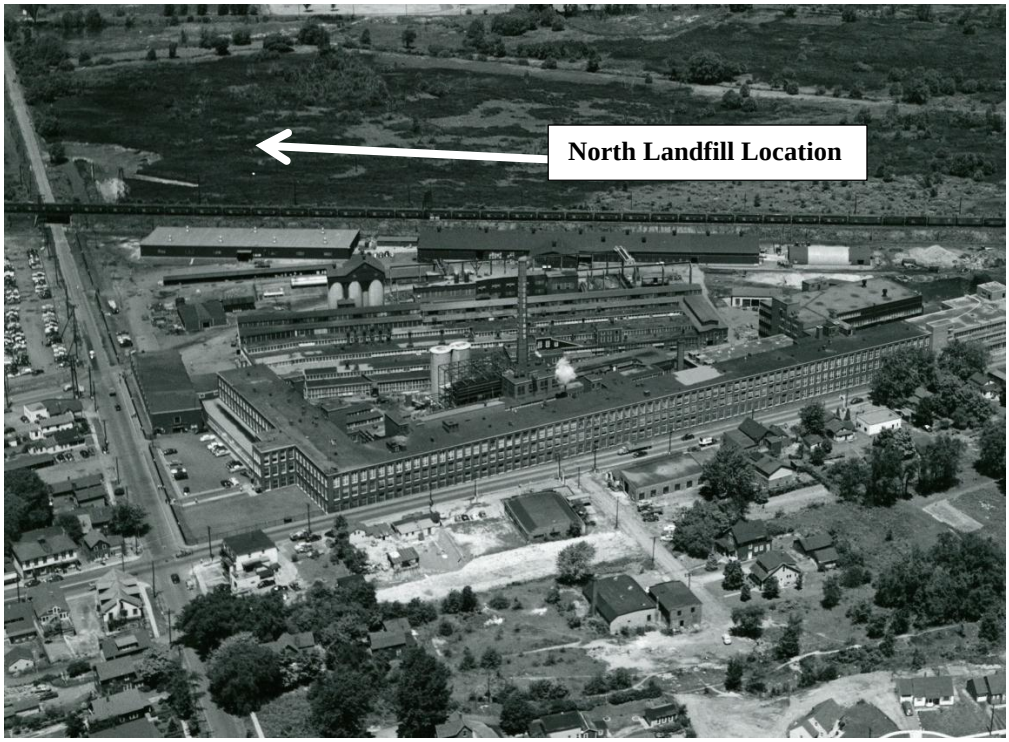
Portion of the 1926 *Airmap of City of Syracuse*, by the Airmap Corporation of America.



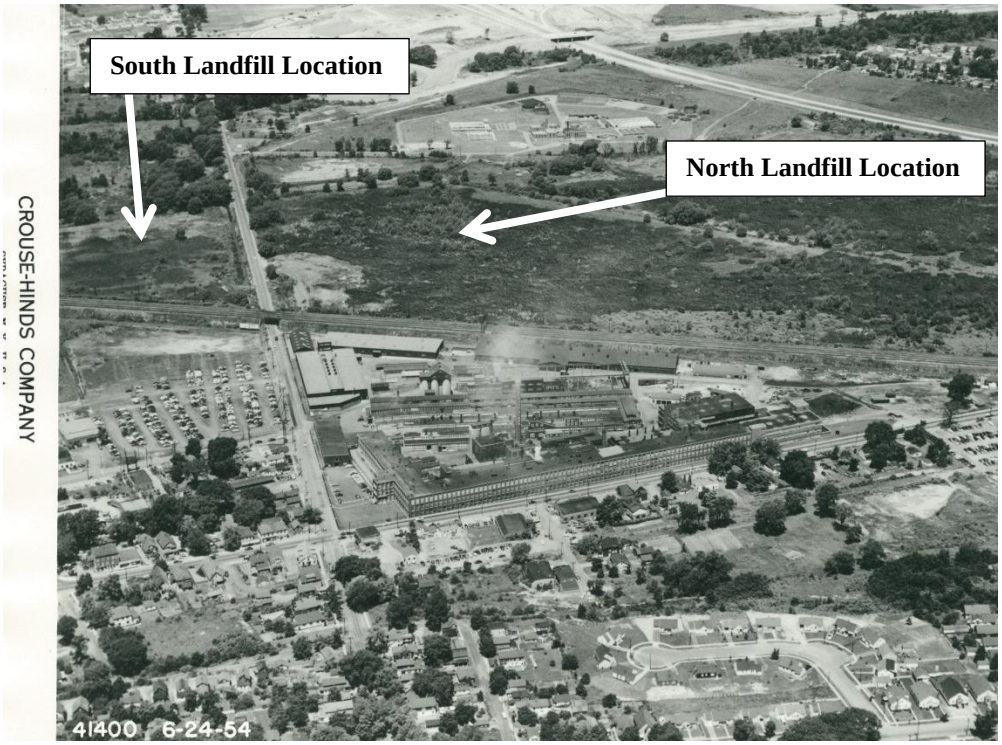
Aerial photograph of the Crouse-Hinds facility in 1927, showing part of the North Landfill location.
Source: Cooper Crouse-Hinds



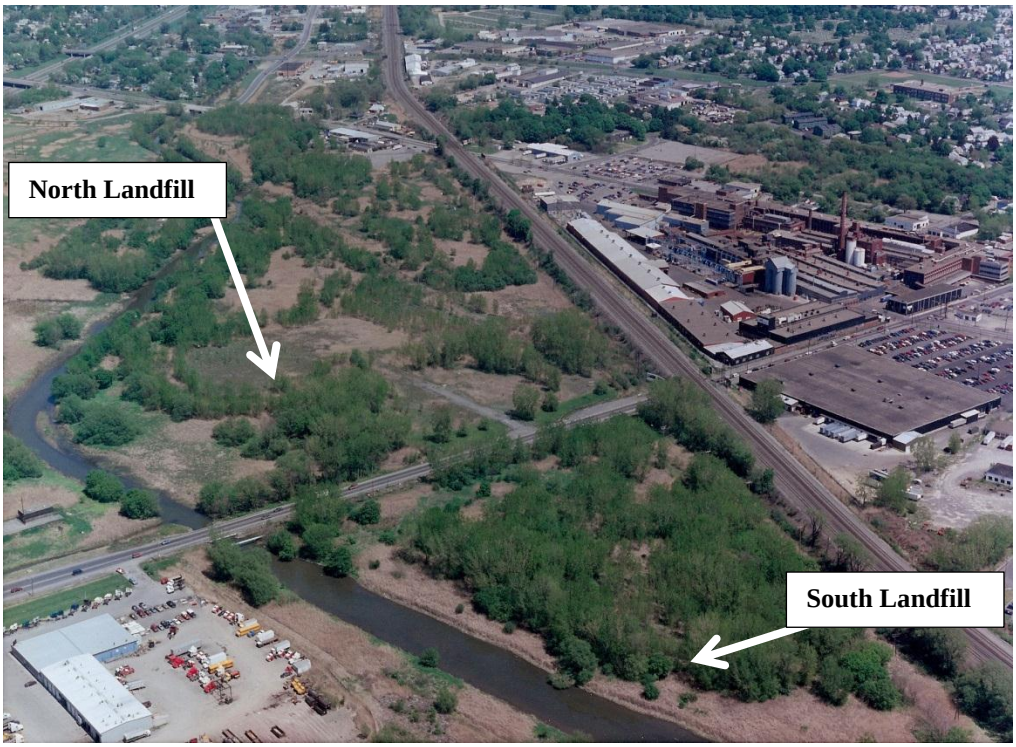
Aerial photograph of the Crouse-Hinds facility in 1948, showing the South Landfill and part of the North Landfill.
Source: Cooper Crouse-Hinds



Aerial photograph of the Crouse-Hinds facility in 1952, showing the North Landfill location.
Source: Cooper Crouse-Hinds



Aerial photograph of the Crouse-Hinds facility in 1954, showing the North Landfill location and part of the South Landfill location.
Source: Cooper Crouse-Hinds



Aerial photograph of the Crouse-Hinds facility in 1995, showing the North Landfill and the South Landfill.
Source: Cooper Crouse-Hinds

APPENDIX E

CALCULATIONS

FOR

NO LOSS OF FLOOD STORAGE

January 3, 2014
117-2202046.19

Mr. Russell Houck, P.E.
Department of Engineering
City of Syracuse
233 E. Washington Street, Room 401
Syracuse, NY 13202

RE: SWPPP for CCH Landfills - Calculations for No Loss of Flood Storage at North and South CCH Landfills

Dear Mr. Houck:

The relocation of contaminated soils and wetland sediments to the center of each landfill property (the South Landfill in the City of Syracuse and the North Landfill in the Town of Salina) and the construction of a landfill cap at each landfill are required by the NYSDEC as a final remedy. At the request of the City of Syracuse, each landfill design was examined and modified as necessary so that the final cap design and resulting topography will result in no loss of flood storage in the event of a 100-year flood (flood elevation of 374') at each landfill, and that the landfill caps will not encroach on the Flood Insurance Rate Map (FIRM) floodway.

Attachment A includes the email chain between Tetra Tech and the City of Syracuse, with other interested parties copied, that lists the concerns to be addressed. The City summary email of November 7, 2013 provides six issues listed below in bold with responses in italics.

1. Please provide the proposed analysis of excavation/fill within the floodplain for the North and South Landfills. Note that the 1% annual chance flood elevation that was provided to Tetra Tech of 374.0 feet is in NAVD88 vertical datum. I don't believe this can be considered the same datum as AMSL and elevation adjustments may need to be made.

We have verified with Aerometrics that the survey topographic contours used in the landfill cap design are in NAVD88 vertical datum. Aerometrics confirmed by email (Attachment A) that the reference to "NGS Mean Sea Level" on the Aerometric survey (Attachment B) is equivalent to NAVD88. NAVD88 is also referenced on Fire Insurance Rate Map Panel 208 of 520 included after Figure 6 in the SWPPP. NAVD88 is the vertical reference datum used for both the landfill design and 100-year flood elevation.

Each landfill property (North and South) was input into AutoCAD using the Aerometric survey data. A cut and fill calculation was then performed for each landfill using elevation 374 as the planar tin. The four calculations are shown on Figures 1 through 4 in Attachment C.

TETRA TECH
175 North Corporate Drive, Suite 100, Brookfield, WI 53045
Tel 262.792.1282 Fax 262.792.1310 www.tetratech.com

<u>South Landfill Analyses of Excavation/Fill Within the Floodplain</u>:

- *Attachment C Figure 1 – South Landfill Existing – The South Landfill as it exists today, with a flood storage volume of 2,900,127 cubic feet below elevation 374. This would be the water volume that the South Landfill Property would hold in the event of the 100-year flood. The calculated number to the left of the "Volume at or below 374" is the volume of earth on the property above elevation 374. The calculated number to the right is the sum.*
- *Attachment C Figure 2 – South Landfill Proposed – The South Landfill as it would exist if the wetland sediment relocation, buffer zone construction, and landfill cap construction as shown in the 95% Design Documents were completed. The new flood storage volume would be 3,273,300 cubic feet below elevation 374. The difference of "Existing" versus "Proposed" is a surplus (gain in flood storage) of 373,173 cubic feet.*

<u>North Landfill Analyses of Excavation/Fill Within the Floodplain</u>:

- *Attachment C Figure 3 -North Landfill Existing – The North Landfill as it exists today, with a flood storage volume of 3,195,702 cubic feet below elevation 374. This would be the water volume that the North Landfill Property would hold in the event of the 100-year flood. The calculated number to the left of the "Volume at or below 374" is the volume of earth on the property above elevation 374. The calculated number to the right is the sum.*
- *Attachment C Figure 4 - North Landfill Proposed – The North Landfill as it would exist if the wetland sediment relocation, buffer zone construction, and landfill cap construction as shown in the 95% Design Documents were completed. The new flood storage volume would be 3,277,690 cubic feet below elevation 374. The difference of "Existing" versus "Proposed" is a surplus (gain in flood storage) of 81,988 cubic feet.*

2. We agree with the revisions to the North landfill cap to eliminate the floodway encroachment.

At the northwest corner of the North Landfill, the edge of the cap has been moved to the southeast and buffer zone cell TP-69 on Sheet 7A has been enlarged so that no portion of the landfill cap is within the floodway. This change is also shown on revised sheets 11 and 13 included in Attachment D and on revised Figures 3 and 5 in the SWPPP. The required changes to other sheets to modify the North Landfill cap area will be included in the 100% (Final) Design Documents.

3. Please provide the revised SWPPP when ready.

The revised SWPPP is attached.

4. With the acceptable SWPPP, the City will provide the SWPPP acceptance form.

Please return the signed MS4 form at your earliest convenience.

5. As noted in the SWPPP, greater than 5 acres will be disturbed at one time as part of the project, and a request will be sent to the City. After receipt of this request, we will provide an authorization letter to the owner. NYSDEC will also need to provide authorization for the greater than 5 acre disturbance.

Prior to the start of work, a request to disturb more than 5 acres at one time will be sent to the City. NYSDEC will also be notified so that the authorization from NYSDEC for the greater than 5 acre disturbance can be granted.

6. The City also requires that the owner provide a Stormwater Maintenance Agreement to maintain any site storm water management facilities, and an Access Agreement allowing the City access to the site for storm water management inspections. Models of these agreements are provided on the City Storm Water Management webpage:

http://www.syracuse.ny.us/Stormwater_Management.aspx .

These agreements can take a little time for the City to review and approve, but there should be more than sufficient time to have these agreements finalized and filed before work commences. The agreements should not be altered from the model form.

Once the City MS4 is signed and returned, the Notice of Intent (NOI) will be submitted to the NYSDEC to obtain coverage under SPDES General Permit GP-0-10-001. Upon receipt of NYSDEC coverage under this general permit, and incorporation of any additional comments to the 95% Design Documents, the Final Design will be submitted to NYSDEC for approval. Once the NYSDEC Design Approval is obtained, the above-mentioned Stormwater Maintenance Agreement and Access Agreement will be completed for City review and approval. The City model forms will be used.

Attachments to this Calculation

A. Email Chain Between Tetra Tech and the City of Syracuse plus the Aerometric email
B. Aerometric Survey
C. Figures 1-4 referenced above
D. Revised 95% Design Sheets 7A, 11, and 13

I trust this information meets your needs. If you have any questions please do not hesitate to call.

Sincerely,
Tetra Tech Inc.

Daniel L. Morgan

Daniel L. Morgan, P.E.
Senior Engineer
encl.

ATTACHMENT A

EMAIL CHAIN

Morgan, Dan

From: Houck, Russell <RHouck@syrgov.net>
Sent: Thursday, November 07, 2013 8:54 AM
To: Morgan, Dan; Richard Mustico
Cc: Robison, Mary; Noel, Mike; William Nechamen; Kevin Delaney; Kelli Higgins-Roche
Subject: RE: Crouse Cooper Hinds Landfill, Syracuse - Floodplain Issues/ SWPPP

Dan and Richard:
Thank you for addressing the City's concerns regarding potential floodplain impacts with the Crouse Copper Hinds Landfill project. The City, along with NYSDEC floodplain management personnel in Syracuse and Albany, reviewed the proposed analyses and revisions to the project to address these concerns. The City believes the proposed work satisfies our concerns and will help reduce potential adverse impacts from flooding in the project area. The NYSDEC also indicated that the proposal was adequate to address these concerns. I have summarized more specifically the proposal items and process for completing the stormwater management requirements:

1. Please provide the proposed analysis of excavation/fill within the floodplain for the North and South Landfills. Note that the 1% annual chance flood elevation that was provided to Tetra Tech of 374.0 feet is in NAVD88 vertical datum. I don't believe this can be considered the same datum as AMSL and elevation adjustments may need to be made.

2. We agree with the revisions to the North landfill cap to eliminate the floodway encroachment.

3. Please provide the revised SWPPP when ready.

4. With the acceptable SWPPP, the City will provide the SWPPP acceptance form .

5. As noted in the SWPPP, greater than 5 Acres will be disturbed at one time as part of the project, and a request will be sent to the City. After receipt of this request, we will provide an authorization letter to the owner. NYSDEC will also need to provide authorization for the greater than 5 acre disturbance.

6. The City also requires that the owner provide a Stormwater Maintenance Agreement to maintain any site stormwater management facilities, and an Access Agreement allowing the City access to the site for stormwater management inspections. Models of these agreements are provided on the City Stormwater Management webpage http://www.syracuse.ny.us/Stormwater_Management.aspx . These agreements can take a little time for the City to review and approve, but there should be more than sufficient time to have these agreements finalized and filed before work commences. The agreements should not be altered from the model form.

Thank you again for your attention to the City's concerns and please don't hesitate to contact me with any questions of if additional information is needed.

- Russell

Russell Houck, P.E., Cert. Floodplain Mgr.
Facilities Engineer
Department of Engineering
City of Syracuse
233 E. Washington Street, Room 401
Syracuse, NY 13202
315-448-8059 (Office)
315-530-0249 (Cell)
rhouck@syrgov.net

From: Morgan, Dan [mailto:Dan.Morgan@tetratech.com]
Sent: Thursday, October 31, 2013 3:45 PM
To: William Nechamen; Kelli Higgins-Roche; Kevin Delaney; Richard Mustico; Houck, Russell
Cc: Robison, Mary; Morgan, Dan; Noel, Mike
Subject: RE: Crouse Cooper Hinds Landfill, Syracuse - Floodplain Issues/ SWPPP

Hello Kevin Delaney and Russell Houck,

I have reviewed the email below and further reviewed the 95% Landfill Cap Design with regards to the floodway encroachment and floodplain excavation and fill concerns. I believe that the concerns expressed can be addressed with changes to the North Landfill (Town of Salina) landfill cap area and buffer zone finished grades at both landfills.

In order to address the concerns, we need to agree on the 1% annual flood elevation at each landfill so that the modifications to the buffer zone finished grades (lowering the central floor of each buffer zone to increase the flood storage and decrease the imported backfill) produce the desired result.

Please confirm that a flood water elevation of 374' is the target for the South Landfill in the City of Syracuse. We will then produce an analyses that shows that the volume of flood water capacity of the existing topography will be equaled or exceeded by the finished topography with the landfill cap installed for the South Landfill site area.

Please confirm that a flood water elevation of 374' is the target for the North Landfill in the Town of Salina. We will then produce an analyses that shows that the volume of flood water capacity of the existing topography will be equaled or exceeded by the finished topography with the landfill cap installed for the North Landfill site area.

With regards to floodway (dashed blue line on map number 36067C0208F) encroachment:

For the South Landfill, the floodway boundary is along the western edge of the property boundary. The edge of the landfill buffer zone may be within the floodway, but when finished will be at a lower elevation than currently exists. We do not see any need to modify the current design along Ley Creek (except as described above for flood water capacity, which will result in a lower amount of imported fill).

For the North Landfill, a review indicates that the northwest corner of the landfill cap may lie within the floodway. This corner of the cap will be converted into buffer zone and the landfill cap terminated at the floodway edge. The remaining floodway area within the North Landfill is buffer zone or wetland, both of which will be finished at a lower elevation than currently exists.

Once the target flood water elevation is determined, we will produce the analyses and include this analyses in the SWPPP.

If I have not correctly interpreted the concerns, please let me know.

Thank you.

Daniel L. Morgan, P.E. | Associate Engineer
Office: 262.792.1282 ext. 269 | FAX: 262.792.1310 | Mobile: 262.408.9399
dan.morgan@tetratech.com

Tetra Tech Inc.
175 N Corporate Drive | Suite 100 | Brookfield WI 53045 |www.tetratech.com

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Morgan, Dan

From: Morgan, Dan
Sent: Thursday, October 31, 2013 2:45 PM
To: William Nechamen; Kelli Higgins-Roche; Kevin Delaney; Richard Mustico; RHouck@syrgov.net
Cc: MRobison@syrgov.net; Morgan, Dan; Noel, Mike
Subject: RE: Crouse Cooper Hinds Landfill, Syracuse - Floodplain Issues/ SWPPP

Hello Kevin Delaney and Russell Houck,

I have reviewed the email below and further reviewed the 95% Landfill Cap Design with regards to the floodway encroachment and floodplain excavation and fill concerns. I believe that the concerns expressed can be addressed with changes to the North Landfill (Town of Salina) landfill cap area and buffer zone finished grades at both landfills.

In order to address the concerns, we need to agree on the 1% annual flood elevation at each landfill so that the modifications to the buffer zone finished grades (lowering the central floor of each buffer zone to increase the flood storage and decrease the imported backfill) produce the desired result.

Please confirm that a flood water elevation of 374' is the target for the South Landfill in the City of Syracuse. We will then produce an analyses that shows that the volume of flood water capacity of the existing topography will be equaled or exceeded by the finished topography with the landfill cap installed for the South Landfill site area.

Please confirm that a flood water elevation of 374' is the target for the North Landfill in the Town of Salina. We will then produce an analyses that shows that the volume of flood water capacity of the existing topography will be equaled or exceeded by the finished topography with the landfill cap installed for the North Landfill site area.

With regards to floodway (dashed blue line on map number 36067C0208F) encroachment:

For the South Landfill, the floodway boundary is along the western edge of the property boundary. The edge of the landfill buffer zone may be within the floodway, but when finished will be at a lower elevation than currently exists. We do not see any need to modify the current design along Ley Creek (except as described above for flood water capacity, which will result in a lower amount of imported fill).

For the North Landfill, a review indicates that the northwest corner of the landfill cap may lie within the floodway. This corner of the cap will be converted into buffer zone and the landfill cap terminated at the floodway edge. The remaining floodway area within the North Landfill is buffer zone or wetland, both of which will be finished at a lower elevation than currently exists.

Once the target flood water elevation is determined, we will produce the analyses and include this analyses in the SWPPP.

If I have not correctly interpreted the concerns, please let me know.

Thank you.

Daniel L. Morgan, P.E. | Associate Engineer
Office: 262.792.1282 ext. 269 | FAX: 262.792.1310 | Mobile: 262.408.9399
dan.morgan@tetratech.com

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From: William Nechamen [mailto:wsnecham@gw.dec.state.ny.us]
Sent: Wednesday, October 23, 2013 12:15 PM
To: Kelli Higgins-Roche; Kevin Delaney; Richard Mustico; RHouck@syrgov.net
Cc: MRobison@syrgov.net; Morgan, Dan
Subject: Re: Crouse Cooper Hinds Landfill, Syracuse - Floodplain Issues/ SWPPP

Kevin: can you take the lead within the region? Kelli: I'll need you to take a look and include Jennifer. I agree with Russ's concerns and possible approaches.
William Nechamen
Chief, Floodplain Management Section
New York State Department of Environmental Conservation
518-402-8146

Sent via Blackberry

>>> "Houck, Russell" <RHouck@syrgov.net> 10/23/2013 12:45:38 PM >>>
Mr. Mustico, Mr. Nechamen and Mr. Delaney,
The City of Syracuse Engineering Department is reviewing the draft SWPPP for the proposed Cooper Crouse-Hinds North and South Landfill project which is planned to be located adjacent to Ley Creek, and within the Ley Creek delineated floodplain. The South Landfill is planned to be located within the City of Syracuse, and the North Landfill located across Seventh North Street in the Town of Salina. The two landfills are planned to consolidate and cap PCB-containing soils and sediments. Both Syracuse and the Town of Salina have effective Flood Insurance Studies for Ley Creek, with a floodway delineated. FEMA is also has draft preliminary FIS and mapping for Ley Creek (dated June 2012 for Syracuse), and planned to be made effective in 2014. The floodways for these two studies are similar in extent in this area.

As planned, both the North and South Landfills will have significant excavation and fill within the 1% annual chance food hazard zone. In addition, the project as proposed will have significant excavation within the floodway in both Syracuse and Salina. Fill is also proposed, to a lesser extent, within the floodway within Salina.

The City of Syracuse has provided comments on the SWPPP to Tetra Tech. We have been in contact with Dan Morgan from TetraTech and appreciate his patience on our review. TetraTech quickly and satisfactorily addressed the majority of these comments. However, we still have concerns with how floodplain management is being addressed. TetraTech's responses indicate no negative impacts to flooding, but there is not an analysis to support this. Excavation is noted as increasing flood storage, which it will; however the fill from the two landfills has not been considered as potentially affecting flood elevations. It appears from the design that fill will exceed excavation within the floodplain.

We recognize that this is a NYSDEC-lead project, and we have reached out to the Region 7 NYSDEC Floodplain Coordinator (Kevin Delaney), who contacted the Dam Safety, Coastal and Flood Protection Bureau (Bill Nechamen) for input. We ask that the NYSDEC floodplain coordinators in Albany and Syracuse review the project and weigh in on potential impacts to the floodplain. The NYSDEC's review and recommendations on the floodplain issues would be welcomed and most likely satisfy the City's concerns.

We believe that, at a minimum, an analysis should be conducted comparing the excavation and fill within the 1% annual chance flood hazard zone, with the results of this analysis included in the SWPPP (goal of excavation exceeding fill). Although the floodway encroachment is not within our municipal jurisdiction (though immediately upstream of Syracuse), typically a floodway encroachment hydraulic analysis is required for this situation, and a No-Rise Certification

provided by the Engineer. To simplify matters, a possible option would be to avoid any fill within the floodway, or at least having none of the proposed landfill within the floodway. Within Syracuse, per City codes, the floodway hydraulic analysis would need to show no increase at all in flood elevations. The analysis should meet the Town of Salina requirements.

Outside of the floodway, but within the floodplain, the City may require a technical analysis to determine a project's impact on flood elevations. By FEMA definition, fill outside of the floodway should not result in an increase to flood elevations greater than 1 foot. However, raising flood elevations by up to one foot in this location would increase the 1% annual flood hazard extents, and impact a greater number of businesses than it currently does (primarily a commercial district). An increase in flood elevations would negatively impact the local area.

Based on these concerns, we ask that the NYSDEC look closely at the proposed project and potential floodplain impacts, and we welcome comments and recommendations. We are available for any discussion on the project.

Thanks,
Russell

Russell Houck, P.E., Cert. Floodplain Mgr.
Facilities Engineer
Department of Engineering
City of Syracuse
233 E. Washington Street, Room 401
Syracuse, NY 13202
315-448-8059 (Office)
315-530-0249 (Cell)
rhouck@syrgov.net

Morgan, Dan

From: Noel, Mike
Sent: Friday, November 08, 2013 11:55 AM
To: Morgan, Dan
Subject: FW: vertical datums

-----Original Message-----
From: Ward, Heath
Sent: Friday, November 08, 2013 11:49 AM
To: Noel, Mike
Subject: FW: vertical datums

Mike, below is exactly what we needed from Ed.
He verified that the topography is based on the North American Vertical Datum of 1988.

From: Edward Crossan [ecrossan@aerometric.com]
Sent: Friday, November 08, 2013 9:45 AM
To: Ward, Heath
Subject: Re: vertical datums

Heath,

As per your recent request with regard to the data on Cooper Crouse-Hinds Landfill, the original mapping submitted by Aerometcic on December 2012 was based on horizontal datum NAD83(Central), vertical datum was NAVD 88(Geoid 09). All units are in feet,call me if you have any questions.

Thanks Ed.

[Quantum Geospatial Logo]
Edward Crossan<mailto:ecrossan@quantumspatial.com> CP, SP VP., Account Manager
45180 Business Court, Suite 800,Dulles, VA 20166
P: (703) 471-4510 M: (703) 887-3116

AeroMetric is now Quantum Spatial. Read all about it here.<http://quantumspatial.com/news/article/Quantum-Spatial-Formed>

On Thu, Nov 7, 2013 at 3:43 PM, Ward, Heath <Heath.Ward@tetratech.com<mailto:Heath.Ward@tetratech.com>> wrote:
Hi Ed, would you mind just sending me an email with any information you have?
I will need to have an explanation in writing, regardless, so that I can present it to Syracuse city officials.
thanks again.

p.s. if you really would rather talk, let me know and I can give you a buzz.

Heath Ward | CAD Designer / IT Coordinator
Direct: 414.550.7911<tel:414.550.7911> | Main: 262.792.1282<tel:262.792.1282> | Fax: 262.792.1310<tel:262.792.1310> Heath.Ward@tetratech.com<mailto:Belinda.Talkington@tetratech.com>

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[cid:image001.png@01CE2FB0.22DAD780]<http://www.facebook.com/tetratech>
[cid:image002.png@01CE2FB0.22DAD780] <http://www.twitter.com/tetratech>
[cid:image003.png@01CE2FB0.22DAD780] <http://www.linkedin.com/company/tetra-tech>

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From: Ward, Heath
Sent: Thursday, November 07, 2013 11:43 AM
To: ecrossan@aerometric.com<mailto:ecrossan@aerometric.com>
Subject: vertical datums

Good morning Ed,
I am working with Mike Noel on the Cooper Crouse – Hinds Landfill in Syracuse, NY. The attached topo map was generated by Aero-Metric.
The map gives reference to the vertical datum as NGS MEAN SEA LEVEL.
We have since been inquired by the local municipalities to establish a relationship between your vertical data mentioned above and NAVD88.
The reason is that there are some flood plain issues, and the City of Syracuse suspects that the datums are not the same. Although based on what I found, I believe them to be identical.
So basically, are they the same? If so, please provide a brief explanation. If they are not the same...can you offer a conversion factor?
The City of Syracuse is concerned about the 374' elevation, which has 100-year flood significance...and they (and we) want to be sure that 374' on your map is 374' NAVD88.
Thank you in advance for your assistance in this matter.

Heath Ward | CAD Designer / IT Coordinator
Direct: 414.550.7911<tel:414.550.7911> | Main: 262.792.1282<tel:262.792.1282> | Fax: 262.792.1310<tel:262.792.1310> Heath.Ward@tetratech.com<mailto:Belinda.Talkington@tetratech.com>

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[cid:image001.png@01CE2FB0.22DAD780]<http://www.facebook.com/tetratech>[cid:image002.png@01CE2FB0.22DAD780]<http://www.twitter.com/tetratech> [cid:image003.png@01CE2FB0.22DAD780]
<http://www.linkedin.com/company/tetra-tech>

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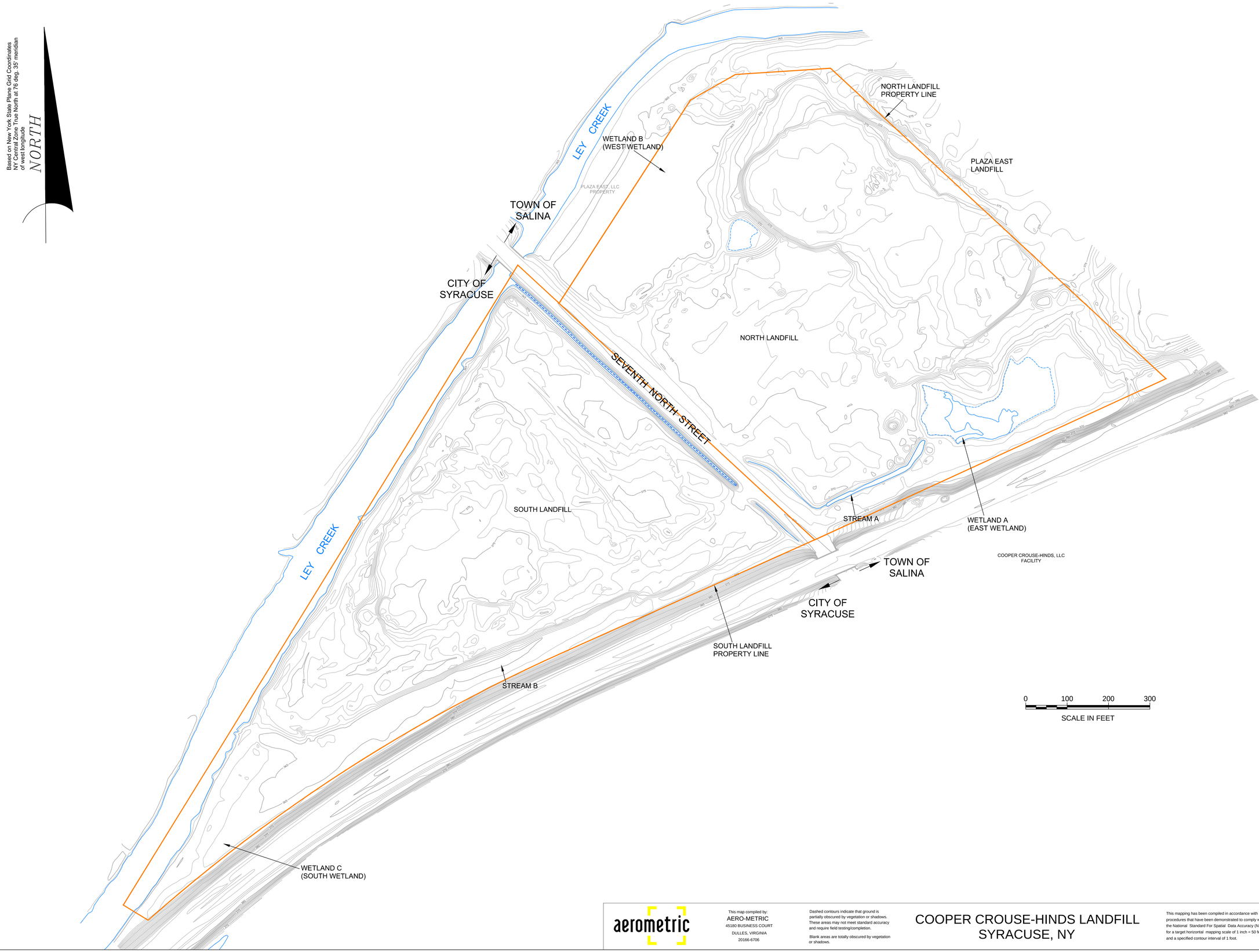
ATTACHMENT B

AEROMETRIC SURVEY



aerometric

This map compiled by:
AERO-METRIC
45180 BUSINESS COURT
DULLES, VIRGINIA
20166-6706

Dashed contours indicate that ground is partially obscured by vegetation or shadows. These areas may not meet standard accuracy and require field testing/completion.

Blank areas are totally obscured by vegetation or shadows.

COOPER CROUSE-HINDS LANDFILL
SYRACUSE, NY

This mapping has been compiled in accordance with procedures that have been demonstrated to comply with the National Standard For Spatial Data Accuracy (NSSDA), for a target horizontal mapping scale of 1 inch = 50 feet and a specified contour interval of 1 foot.

This map compiled by photogrammetric methods from aerial photography dated 11-15-2012
Grid based on New York State Plane
Coordinate System NAD 1983
Vertical datum based on NGS Mean Sea Level

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ATTACHMENT C

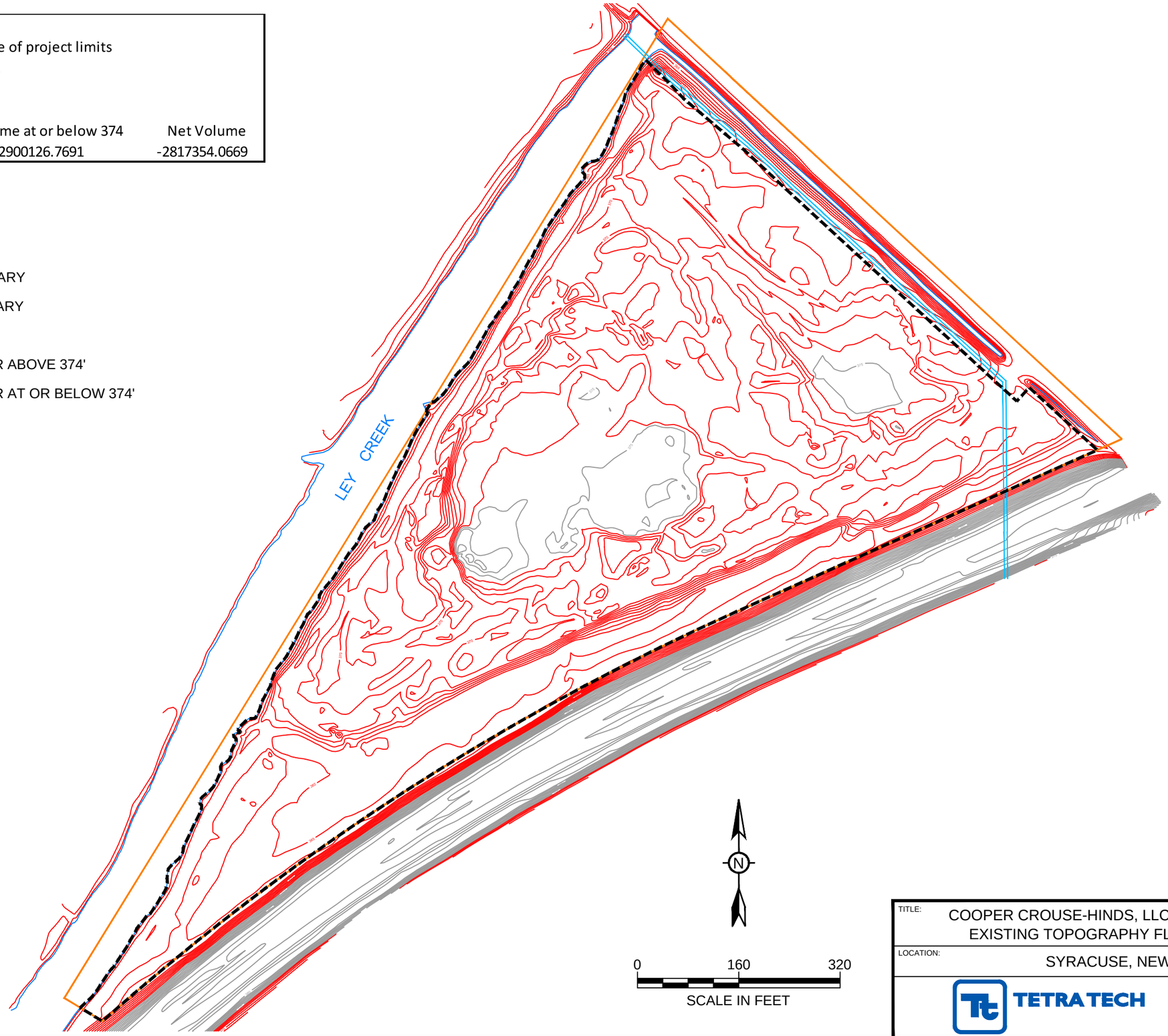
FIGURES 1-4

SOUTH LANDFILL EXISTING
Volume generated from topography inside of project limits
Volume of EXISTING based on a planar tin.
Cubic Feet

Surface	Volume above 374	Volume at or below 374	Net Volume
EXISTING	82772.7022	-2900126.7691	-2817354.0669

EXPLANATION

- LEY CREEK BOUNDARY
- PROPERTY BOUNDARY
- PROJECT LIMITS
- EXISTING CONTOUR ABOVE 374'
- EXISTING CONTOUR AT OR BELOW 374'
- WATER MAIN



TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
EXISTING TOPOGRAPHY FLOOD STORAGE

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	1
PROJECT	117-2202046	
DATE	11/26/13	

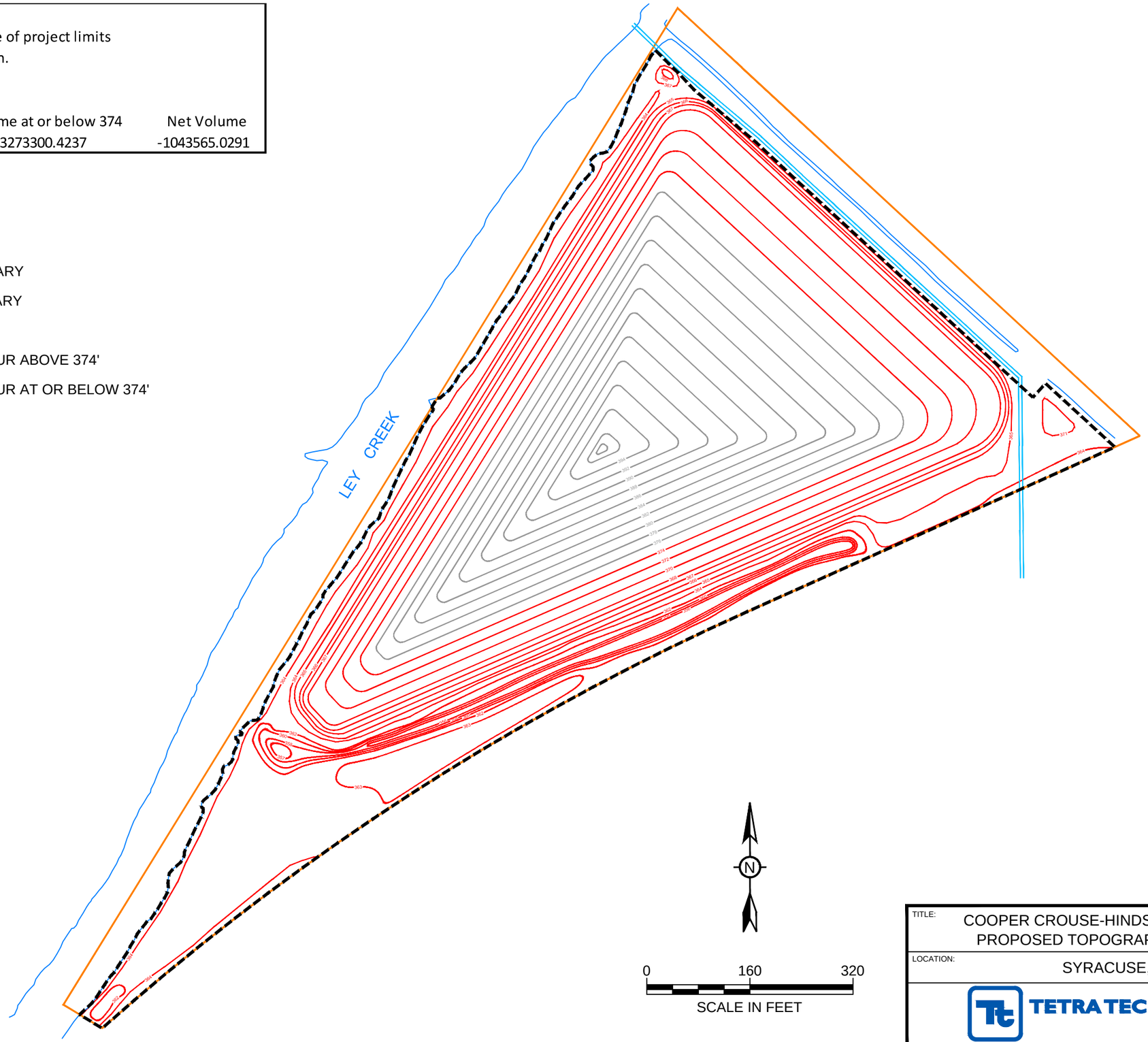
S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\STORMWATER CALCULATIONS\SOUTH LANDFILL 1.DWG

SOUTH LANDFILL PROPOSED
Volume generated from topography inside of project limits
Volume of PROPOSED based on a planar tin.
Cubic Feet

Surface	Volume above 374	Volume at or below 374	Net Volume
PROPOSED	2229735.3947	-3273300.4237	-1043565.0291

EXPLANATION

- LEY CREEK BOUNDARY
- PROPERTY BOUNDARY
- PROJECT LIMITS
- PROPOSED CONTOUR ABOVE 374'
- PROPOSED CONTOUR AT OR BELOW 374'
- WATER MAIN



TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
PROPOSED TOPOGRAPHY FLOOD STORAGE

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	2
PROJECT	117-2202046	
DATE	11/26/13	

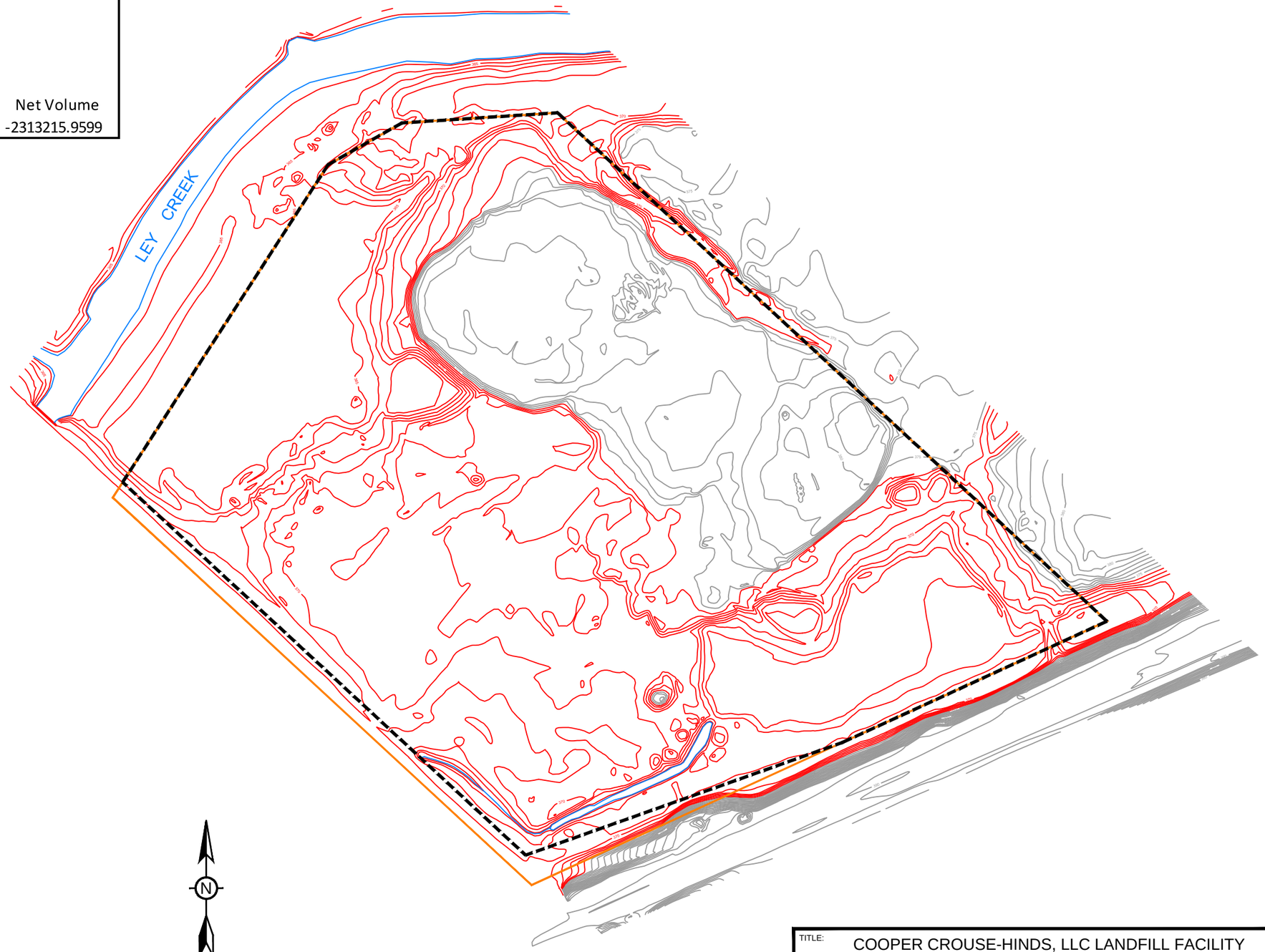
S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\STORMWATER CALCULATIONS\SOUTH LANDFILL 2.DWG

NORTH LANDFILL EXISTING
Volume generated from topography inside of project limits
Volume of EXISTING based on a planar tin.
Cubic Feet

Surface	Volume above 374	Volume at or below 374	Net Volume
EXISTING	882485.7672	-3195701.7271	-2313215.9599

EXPLANATION

- LEY CREEK BOUNDARY
- PROPERTY BOUNDARY
- PROJECT LIMITS
- EXISTING CONTOUR ABOVE 374'
- EXISTING CONTOUR AT OR BELOW 374'



N

0 160 320
SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
EXISTING TOPOGRAPHY FLOOD STORAGE

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	FIGURE:
DRAFTED	HJW	3
PROJECT	117-2202046	
DATE	11/27/13	

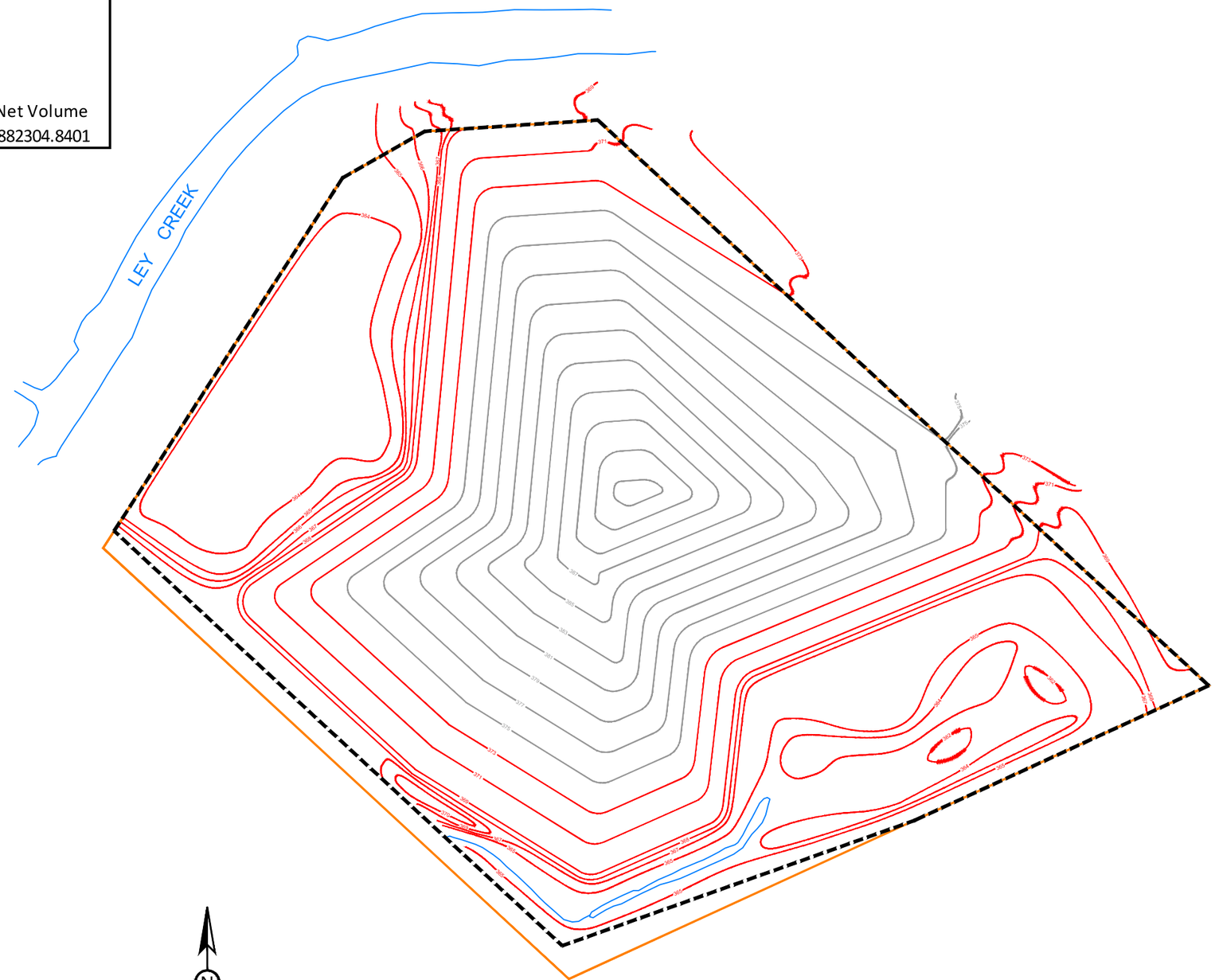
S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\STORMWATER CALCULATIONS\NORTH LANDFILL 1.DWG

NORTH LANDFILL PROPOSED
Using conversion factor of 1.
Volume of PROPOSED based on a planar tin.
Cubic Feet

Surface	Volume above 374	Volume at or below 374	Net Volume
PROPOSED	2395385.1297	-3277689.9698	-882304.8401

EXPLANATION

- LEY CREEK BOUNDARY
- PROPERTY BOUNDARY
- PROJECT LIMITS
- PROPOSED CONTOUR ABOVE 374'
- PROPOSED CONTOUR AT OR BELOW 374'



N

0 160 320
SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
PROPOSED TOPOGRAPHY FLOOD STORAGE

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	11/25/13

FIGURE: 4

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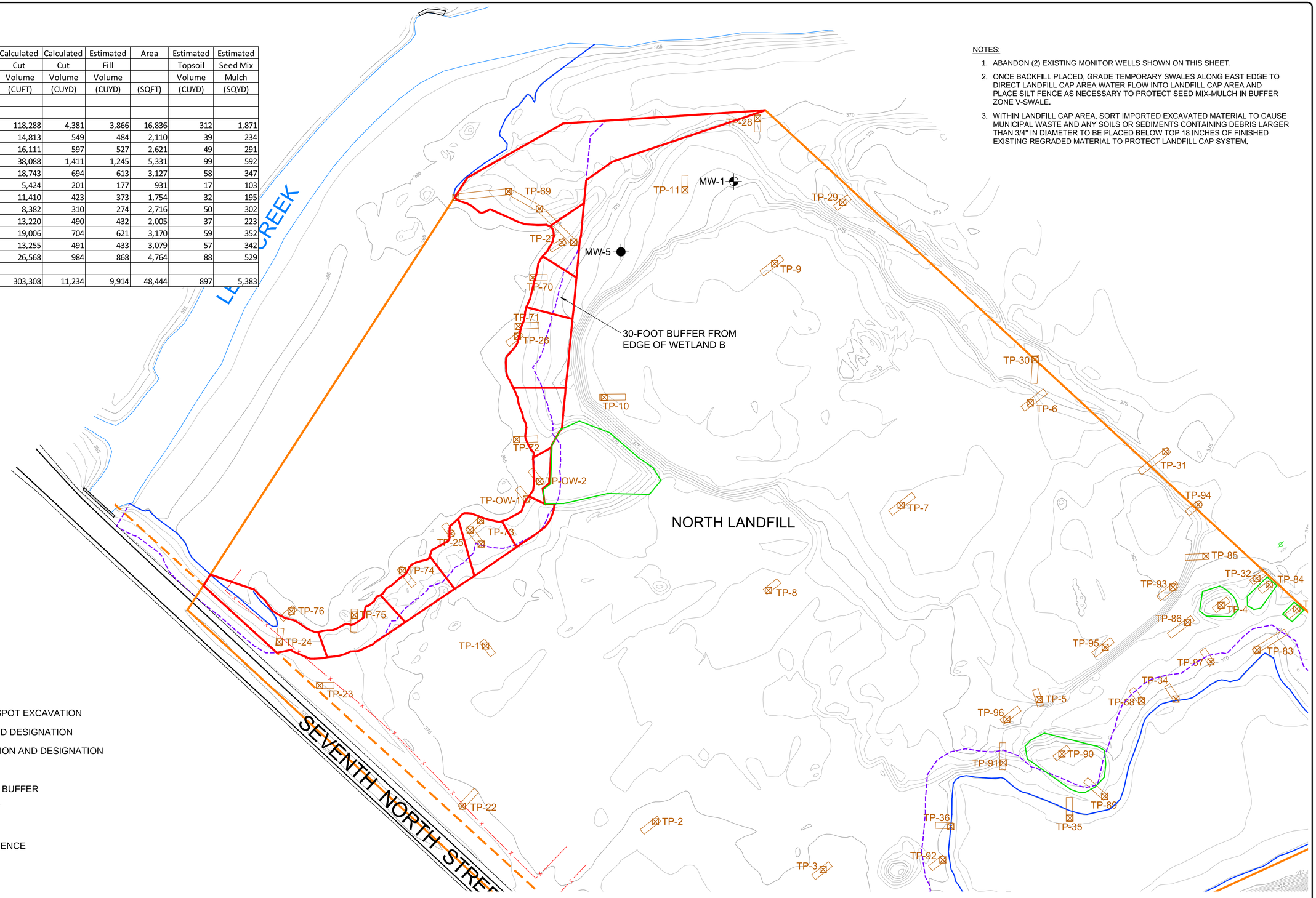
ATTACHMENT D

REVISED 95% DESIGN SHEETS 7A, 11, and 13

Test Pit	Excavation Sequence	Base of Excavation Elevation (FT MSL)	Calculated Cut Volume (CUFT)	Calculated Cut Volume (CUYD)	Estimated Fill Volume (CUYD)	Area (SQFT)	Estimated Topsoil Volume (CUYD)	Estimated Seed Mix Mulch (SQYD)
TP-69	701	361	118,288	4,381	3,866	16,836	312	1,871
TP-27	702	359	14,813	549	484	2,110	39	234
TP-70	703	361.3	16,111	597	527	2,621	49	291
TP-26	704	360	38,088	1,411	1,245	5,331	99	592
TP-72	705	361.1	18,743	694	613	3,127	58	347
TP-OW-2	706	360.7	5,424	201	177	931	17	103
TP-OW-1	707	360.3	11,410	423	373	1,754	32	195
TP-73	708	364	8,382	310	274	2,716	50	302
TP-25	709	360	13,220	490	432	2,005	37	223
TP-74	710	361.4	19,006	704	621	3,170	59	352
TP-75	711	361.8	13,255	491	433	3,079	57	342
TP-24	712	360.5	26,568	984	868	4,764	88	529
Total			303,308	11,234	9,914	48,444	897	5,383

NOTES:

1. ABANDON (2) EXISTING MONITOR WELLS SHOWN ON THIS SHEET.
2. ONCE BACKFILL PLACED, GRADE TEMPORARY SWALES ALONG EAST EDGE TO DIRECT LANDFILL CAP AREA WATER FLOW INTO LANDFILL CAP AREA AND PLACE SILT FENCE AS NECESSARY TO PROTECT SEED MIX-MULCH IN BUFFER ZONE V-SWALE.
3. WITHIN LANDFILL CAP AREA, SORT IMPORTED EXCAVATED MATERIAL TO CAUSE MUNICIPAL WASTE AND ANY SOILS OR SEDIMENTS CONTAINING DEBRIS LARGER THAN 3/4" IN DIAMETER TO BE PLACED BELOW TOP 18 INCHES OF FINISHED EXISTING REGRADED MATERIAL TO PROTECT LANDFILL CAP SYSTEM.



EXPLANATION

- EXCAVATION LIMITS
- NOVEMBER 2012 HOT SPOT EXCAVATION
- TP-48 TEST PIT LOCATION AND DESIGNATION
- MW-1 MONITOR WELL LOCATION AND DESIGNATION
- WETLAND BOUNDARY
- LEY CREEK / WETLAND BUFFER
- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE

0 50 100 150
SCALE IN FEET

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

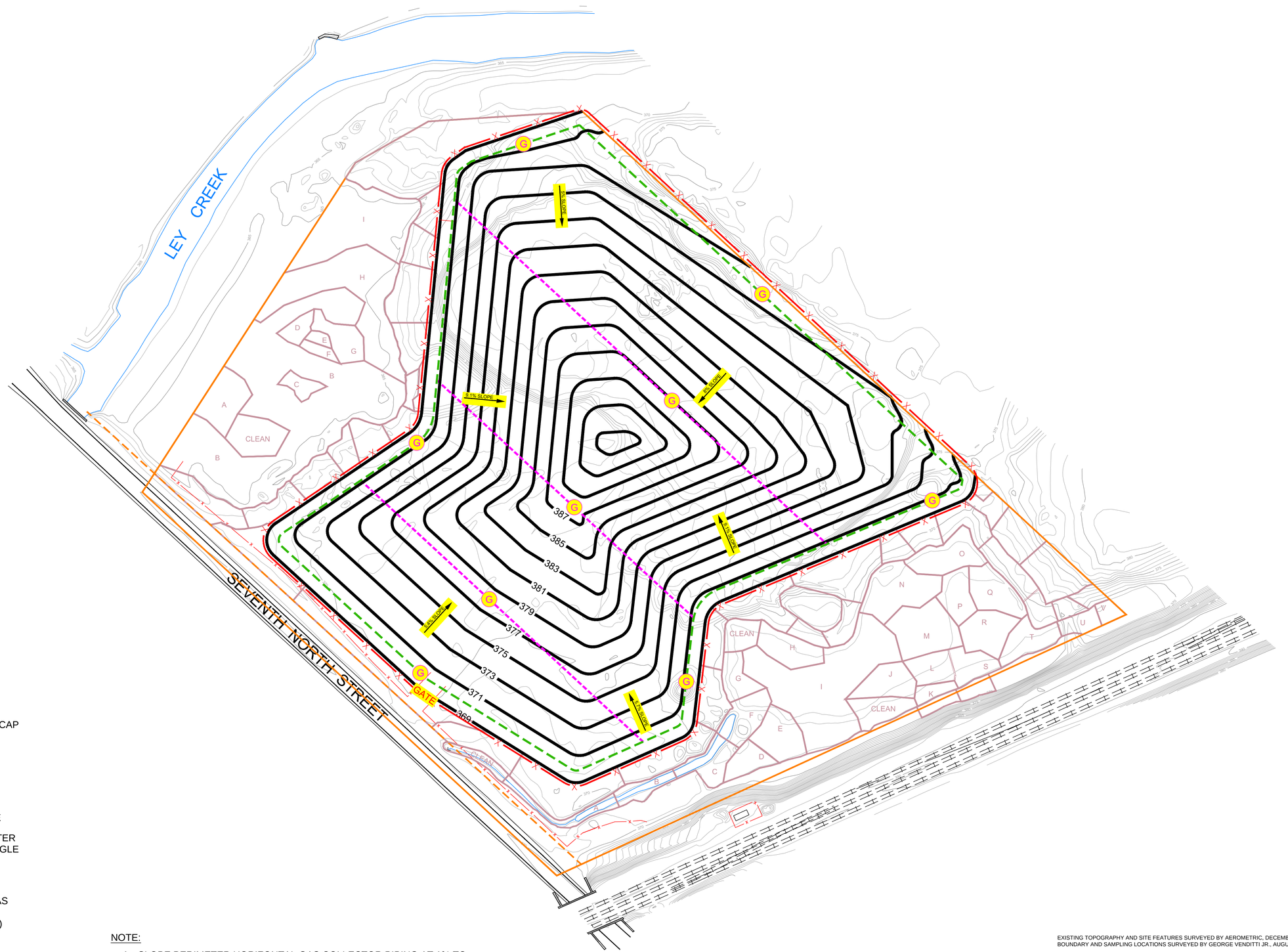
TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
WETLAND B 30' BUFFER ZONE EXCAVATIONS

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	SHEET:
DRAFTED	HJW	7A
PROJECT	117-2202046	
DATE	12/11/13	

S:\SADACOOPER\SYRACUSE\CLOSURE DESIGN\100% FINAL DESIGN\SHEET 7A - WETLAND B TEST PIT EXCAVATIONS.DWG



EXPLANATION

- PROPOSED FINAL LANDFILL CAP
- EXCAVATION LIMITS
- PROPERTY BOUNDARY
- EASEMENT
- EXISTING CHAIN LINK FENCE
- NEW LANDFILL CAP PERIMETER CHAIN LINK FENCE WITH SINGLE GATE
- LANDFILL GAS VENT RISER
- PERIMETER HORIZONTAL GAS COLLECTOR TRENCH UP TO 5' DEEP (BELOW MEMBRANE)
- DECK HORIZONTAL GAS COLLECTOR TRENCH

NOTE:

1. SLOPE PERIMETER HORIZONTAL GAS COLLECTOR PIPING AT 1% TO VENTS (LOW POINT) FROM MIDPOINT BETWEEN PERIMETER HORIZONTAL GAS COLLECTOR PIPING VENTS (HIGH POINT).

0 70 140 210
SCALE IN FEET

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
NORTH LANDFILL FINAL SURFACE PLAN

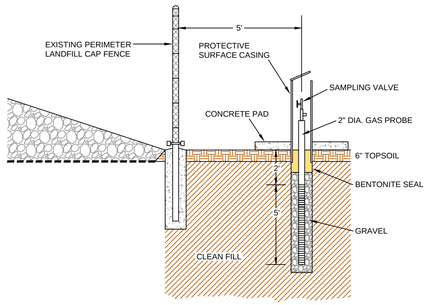
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

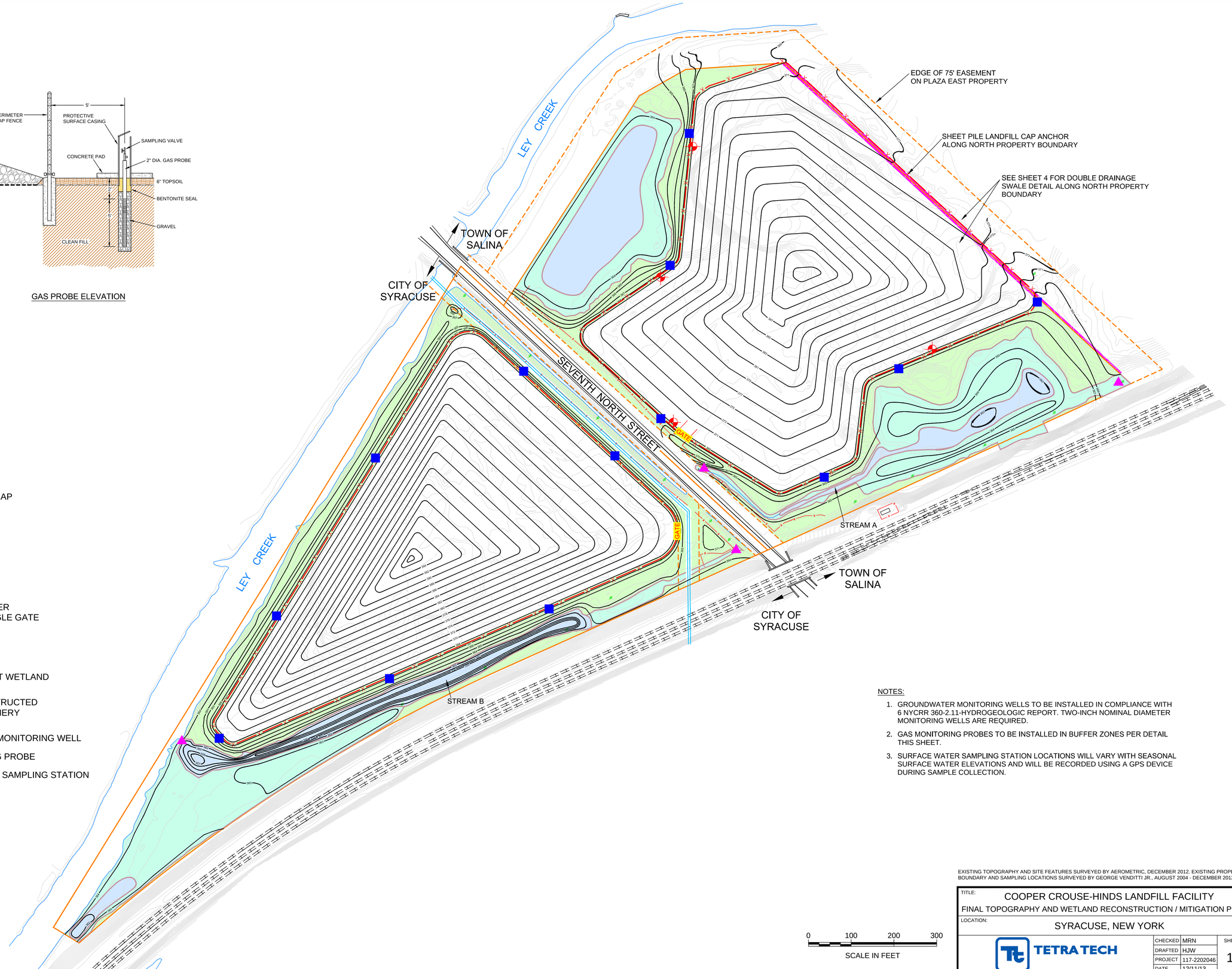
CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	12/11/13

SHEET: 11

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\100% FINAL DESIGN\SHEET 11 - NORTH LANDFILL FINAL SURFACE PLAN.DWG



GAS PROBE ELEVATION



EXPLANATION

- PROPOSED FINAL LANDFILL CAP
- PROPERTY BOUNDARY
- EASEMENT
- WATER MAIN
- EXISTING CHAIN LINK FENCE
- ELECTRIC UTILITY POLE
- NEW LANDFILL CAP PERIMETER CHAIN LINK FENCE WITH SINGLE GATE
- BUFFER ZONE
- RECONSTRUCTED EMERGENT WETLAND
- OPEN WATER WITH RECONSTRUCTED EMERGENT WETLAND PERIPHERY
- PROPOSED GROUNDWATER MONITORING WELL
- PROPOSED GAS MONITORING PROBE
- PROPOSED SURFACE WATER SAMPLING STATION

NOTES:

1. GROUNDWATER MONITORING WELLS TO BE INSTALLED IN COMPLIANCE WITH 6 NYCRR 360-2.11-HYDROGEOLOGIC REPORT. TWO-INCH NOMINAL DIAMETER MONITORING WELLS ARE REQUIRED.
2. GAS MONITORING PROBES TO BE INSTALLED IN BUFFER ZONES PER DETAIL THIS SHEET.
3. SURFACE WATER SAMPLING STATION LOCATIONS WILL VARY WITH SEASONAL SURFACE WATER ELEVATIONS AND WILL BE RECORDED USING A GPS DEVICE DURING SAMPLE COLLECTION.

0 100 200 300

SCALE IN FEET

EXISTING TOPOGRAPHY AND SITE FEATURES SURVEYED BY AEROMETRIC, DECEMBER 2012. EXISTING PROPERTY BOUNDARY AND SAMPLING LOCATIONS SURVEYED BY GEORGE VENDITTI JR., AUGUST 2004 - DECEMBER 2012.

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY

FINAL TOPOGRAPHY AND WETLAND RECONSTRUCTION / MITIGATION PLAN

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN	SHEET:
DRAFTED	HJW	13
PROJECT	117-2202046	
DATE	12/11/13	

S:\CAD\COOPER\SYRACUSE\CLOSURE DESIGN\100% FINAL DESIGN\SHEET 13 - FINAL TOPOGRAPHY AND WETLAND RECONSTRUCTION-MITIGATION PLAN.DWG

APPENDIX F

INSPECTION FORMS

Construction Storm Water Inspection Report

Project Name and Location: Landfill Cap Construction, Cooper Crouse-Hinds, LLC Facility, South Landfill, Seventh North Street, City of Syracuse, Onondaga County, New York

Permit: SPDES General Permit GP-0-10-001

Date of this report:_____ Time of Entry _____ Time of Exit _____

Weather Conditions: _____

On-Site Representative: _____

Inspector Name: _____

Yes	No	N/A	
			Copy of NOI posted for public viewing
			Up-to-date and signed SWPPP on site
			Copy of SPDES General Permit on site
			Litter containers on site and maintained
			Access driveways in good condition
			50'/30' Buffer Zone vegetated and free of grubbed area soil and sediment
			Silt fence complete, vertical, and in good condition
			Local storm water convergence points contained using silt fence, straw bale dikes, and chipped mulch
			Any need for collected soil or sediment relocation?
			Any pooled water on site?
			Any need for additional silt fence?
			Any need for additional straw bale dike?
			Any need for additional wet swale for local storm water detention?
			Wetland C in good condition?
			Stream B in good condition

			Drain along Seventh North Street in good condition?
			East zone along RR right-of-way in good condition?
			Ley Creek east bank in good condition?

Notes on inspection:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Number of photographs taken: _____

Contractor contact information for remedies/repairs as required by this inspection:

Name: _____

Address:

_____
_____

Telephone: _____

Email: _____

CC this report to:

Tom.Bonk@cooperindustries.com

Nelson.Olavarria@cooperindustries.com

Mike.Noel@tetratech.com

Construction Storm Water Inspection Report

Project Name and Location: Landfill Cap Construction, Cooper Crouse-Hinds, LLC Facility, North Landfill, Seventh North Street, Town of Salina, Onondaga County, New York

Permit: SPDES General Permit GP-0-10-001

Date of this report:_____ Time of Entry _____ Time of Exit _____

Weather Conditions: _____

On-Site Representative: _____

Inspector Name: _____

Yes	No	N/A	
			Copy of NOI posted for public viewing
			Up-to-date and signed SWPPP on site
			Copy of SPDES General Permit on site
			Litter containers on site and maintained
			Access driveways in good condition
			30' Buffer Zone vegetated and free of grubbed area soil and sediment
			Silt fence complete, vertical, and in good condition
			Local storm water convergence points contained using silt fence, straw bale dikes, and chipped mulch
			Any need for collected soil or sediment relocation?
			Any pooled water on site?
			Any need for additional silt fence?
			Any need for additional straw bale dike?
			Any need for additional wet swale for local storm water detention?
			Wetland A in good condition?
			Stream A in good condition

			Wetland B in good condition?
			East zone along RR right-of-way in good condition?

Notes on inspection:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Number of photographs taken: _____

Contractor contact information for remedies/repairs as required by this inspection:

Name: _____

Address:

_____
_____

Telephone: _____

Email: _____

CC this report to:

Tom.Bonk@cooperindustries.com

Nelson.Olavarria@cooperindustries.com

Mike.Noel@tetratech.com