REMOVAL ACTION WORK PLAN
COOPER CROUSE-HINDS, LLC
NORTH LANDFILL
TOWN OF SALINA, NY

Prepared for:

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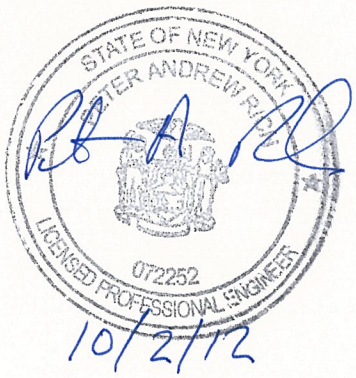
October 2, 2012 Revised

CERTIFICATION

I, the undersigned, certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly prepared this Removal Action Work Plan for the Cooper Crouse-Hinds North Landfill located in the Town of Salina, New York, in accordance with the Division of Environmental Remediation (DER) Draft DER-10 Technical Guidance for Site Investigation and Remediation (December 2002). Based upon my personal activities and my direct supervision of the persons directly responsible for preparing this Removal Action Work Plan, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

For Tetra Tech GEO:

(Professional Seal)



Peter A. Rich
Printed Name of Certifying Engineer

Signature of Certifying Engineer

October 2, 2012
Date of Certification

072252
Registration Number

NY
Registration State

Tetra Tech GEO
Company

Principal Engineer
Title

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1.0 INTRODUCTION

The NYSDEC-approved Remedial Design/Remedial Action (RD/RA) Work Plan (dated March 16, 2012) for the Cooper Crouse Hinds, LLC (CC-H) North Landfill and South Landfill (Site) presents the process to design and implement the final remedy for closure as specified in the Record of Decision (ROD) issued March 31, 2011. An element of the ROD is the removal of isolated sources of elevated PCB, VOC and non-aqueous phase liquid (NAPL) Oil concentrations within the North Landfill for disposal at approved off-site landfills. This Removal Action Work Plan presents the methods and procedures that will be implemented to execute the excavation and disposal of these three source areas. In addition, this plan also describes tree brush clearing activities for the North and South Landfills to facilitate the removal action, monitoring well abandonments and to allow better topographic control for planned aerial photogrammetric mapping.

1.1 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.

Removal Action activities will only occur on the North Landfill. 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 followed by Ley Creek. Approximately 2.6 acres of the wetlands are on CC-H property and approximately 2 acres are on Plaza East property.

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 further west 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).

Ley Creek is located between 80 feet and 120 feet west of the western property boundary of the North Landfill (Figure 2). Ley Creek is part of the Onondaga Lake drainage basin and flows to the south/southwest towards Onondaga Lake. 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 North and South Landfills is 374 feet AMSL.

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 from 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. From there the flow is directed to the southwest along Stream B and into Wetland C on the South landfill property.

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 wetland property owned by Plaza East, LLC, which is adjacent to Ley Creek. Wetland B is identified on National Wetland Inventory (NWI) maps (ID No. PFO1/SS1E). Based on the NYSDEC wetlands maps, the wetlands located on the North Landfill 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. A silt fence with hay bales was installed in 2010 along the CC-H/Plaza East property line through Wetland B for erosion control.

1.2 Remedial Objectives

The remedial objectives for this Removal Action in the North Landfill includes removal of:

1. Areas containing concentrations of polychlorinated biphenyls (PCBs) greater than 50 ppm;

2. Areas containing concentrations of total volatile organic compounds (VOCs) greater than 50 ppm; and
3. Areas containing fill that is visibly saturated with oil (NAPL).

2.0 TREE AND BRUSH CLEARING

In preparation for site work activities, brush and trees will be cleared from both the North and South Landfill areas. The intent is to limit these activities to clearing only, without grubbing, so that soil disturbance is minimal. This limitation on the scope of work is specifically constrained to avoid the requirements of coverage (activities involving soil disturbances of one (1) or more acres) under State Pollutant Discharge Elimination System (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). No Notice of Intent (NOI) will be filed with the NYSDEC. A Storm Water Pollution Prevention Plan (SWPPP) is not required for the limited landscaping activities of this project.

2.1 Scope of Clearing Activities

All trees will be cut to grade leaving less than one-foot tall stumps and felled away from wetlands, streams, and site boundaries. The felled trees will be limbed and bucked. All limbs and trunks will be chipped on site and spread evenly and level on the ground surrounding the stump or other designated areas. No chips will be placed on slopes where they may be washed into streams or wetlands. The Field Engineer will approve all chip placements. As an option, logs larger in diameter than can be economically chipped and left on site may be cut to length for handling and removed from the site for off-site disposal. No on-site burning of any type will be allowed.

All brush will be cut to grade with minimal soil disturbance. A brush saw or other approved tool will be used on brush stalks exceeding one-half inch diameter. All brush will be chipped or mulched and spread as described above.

All remaining brush, weeds, and grasses will be mowed down using a rotary mower with a mulching blade or other approved equipment. The mower height will be set to approximately three inches, except where site topography requires a variance. The Field Engineer will note and record any variances.

2.2 Site Access

The tree and brush clearing work areas are shown on Figure 4 will be staked by the Field Engineer prior to the start of work. The work areas as shown on Figure 4 are of three types with different means of access:

- *Main Landfill Areas:* These are the areas at the North and South Landfills which are accessible by the gates off of Seventh North Street without concern to any wetlands or streams.
- *East Boundary Areas:* These are areas along the CSX railroad right-of-way which should be dry and accessible but are isolated from the main landfill areas by wetlands or streams.
    - *North Landfill* - Access to the East Boundary area at the North Landfill is by a driveway off of Seventh North Street at the southeast corner. Access to this area should not infringe on the stream or wetland areas.

- *South Landfill* - Access to the East Boundary area at the South Landfill is by crossing the intermittent streambed at the northeast corner of the South Landfill. If this access is too wet, an alternative method of access will be discussed with the contractor and approved by the Field Engineer.

- *Mapped Wetland Areas:* These areas at the North and South Landfills will be accessed to the extent possible for vegetation removal. It is expected that trees within the mapped wetland areas are within the "normally dry" portion and can be cut and removed. The Field Engineer will direct where the accessible area boundary is on a daily basis. Work in this area will be flexibly scheduled to maximize access for vegetation removal, completing work in these areas during dry weather periods. Any questions concerning area access will be addressed by the Field Engineer.

2.3 Decontamination

Trucks and trailers transporting equipment will be inspected at the decontamination pads near the entry aprons to the North and South Landfills (Figures 9 and 10) and the tires rinsed down with clean water if necessary. Each vehicle exiting the site will stop at the entry apron decontamination pad and the driver will do a walk-around inspection to verify no site soil or waste will be tracked off site. Clean city water in spray units will be available at the decontamination pad at all times. Decontamination water will be collected and treated prior to discharge to the sanitary sewer system (see Section 4.5.1).

3.0 MONITORING WELL ABANDONMENT

Four existing monitoring wells and one observation well are located within or in close proximity to the excavations planned for the Removal Action. These wells will be properly abandoned prior to excavation activities. The wells occur in Removal Action Areas 2 and 3 (Figures 7 and 8) and are listed in the table below along with construction details.

Removal Action Area	Well ID	Ground Surface Elevation (ft msl)	Top of Casing Elevation (ft msl)	Waste Thickness (ft)	Landfill Base Elevation (ft msl)	Well Diameter (in)	Well Depth (ft)	Screen Length (ft)
Area 2	MW-11A	373.00	375.08	11	362.00	2.0	14	10
Area 2	MW-11B	372.90	374.94	11	361.90	2.0	32	10
Area 3	MW-6A	370.12	372.12	5	365.10	2.0	11.5	5
Area 3	MW-6B	370.42	372.92	5	365.40	2.0	59	5
Area 3	OW-1	372.70	375.87	8.5	364.20	1.0	12	10

All wells will be properly abandoned by grouting in-place following guidance provided in the *Groundwater Monitoring Well Decommissioning Procedures* addendum to the Commissioner's Policy CP-43 Groundwater Monitoring Well Decommissioning Policy. Grouting in-place involves filling the casing with a cement-bentonite grout to a level of five feet below the land surface, cutting the well casing at the five-foot depth, and removing the top portion of the casing and associated well materials from the ground.

Eventually, all monitoring wells at the North and South Landfills will be abandoned over the course of the next couple of years in preparation for construction activities (waste consolidation and capping) at the landfills. Any wells that are abandoned will be done in accordance with the referenced guidance. Well replacements will be proposed as part of closure designs and plans and will be installed at approved locations after landfill capping activities are completed.

4.0 REMOVAL ACTION

This Removal Action involves the excavation of soil and landfill waste containing elevated concentrations of PCBs, VOCs and NAPL oil in areas identified by prior site remedial investigations (Figure 5), loading the soil and waste into trucks suitable for hauling TSCA, hazardous and non-hazardous waste, transporting the soil and waste to an appropriate off-site landfill, placement of the exported soil and waste in the destination landfill for ultimate disposal and backfilling the excavated areas with soil and possibly Portland cement for stabilization of the remaining area for cap construction.

This Removal Action will comply with all applicable Federal, State, and local laws, regulations, and requirements. The site activities will not result in an uncontrolled or unapproved discharge of contaminants.

4.1 Removal Action Area Delineation

For this Removal Action, the areas of concern are:

- Area 1: Elevated VOC areas (2) and an elevated PCB area located at the northeast corner of the North Landfill (Figure 6).
- Area 2: Elevated VOC area located along the eastern edge of the North Landfill (Figure 7).
- Area 3: Visible NAPL-saturated Oil area located along the western edge of the North Landfill (Figure 8).

The horizontal and vertical delineation of the elevated PCB, VOC, and NAPL Oil areas is shown on Figures 6, 7, and 8. The boundaries of the areas were established in consultation with NYSDEC and at the midpoint between elevated and non-elevated soil sampling results collected from previous test pits and test borings. In Area 2 additional pre-excavation soil sampling will be conducted at the four (4) borehole locations indicated on Figure 7 to refine the eastern boundary of the Removal Action area. Boreholes will extend to the base of waste (8 to 12 feet below ground surface) and two samples will be collected from each borehole based on PID screening and submitted to the laboratory for analysis of VOCs (EPA Method 8260). If the size of the excavation area changes based on the sampling results, an addendum will be submitted to NYSDEC for approval prior to excavation.

Because the boundaries have been conservatively established, NYSDEC agreed that post-excavation sampling was not required (except at the Plaza East landfill property boundary shown on Figure 6) if the full extent of the delineated areas was removed. Table 1 indicates the estimated quantities of soil and waste to be removed. Prior to the Removal Actions, the survey coordinates of the areas (Table 2) will be surveyed and staked in the field as shown on Figures 6A, 7A and 8A.

4.2 Off-Site Disposal

4.2.1 Off-Site Disposal Facilities

It is expected that all soils and waste with PCBs less than 50 PPM will be sent to the Seneca Meadows Landfill in Waterloo, NY or to an equivalent approved facility. Soils and waste with PCBs over 50 PPM will be sent to the Model City Landfill in Youngstown, NY or to an equivalent approved facility. To gain landfill entry, a waste profile and the required representative sampling and laboratory analyses will be completed. The Generators Industrial Waste Profile for the Seneca Meadows Landfill, as one example, is contained in Appendix A. The Generator's Hazardous Waste Profile Sheet and LDR Notification or Certification Form for New York Regulated PCB Waste is contained in Appendix B. The laboratory analyses required for landfill review to be included with each waste profile are:

- TCLP Volatiles (Method 8260)
- TCLP Semi-Volatiles (Method 8270)
- TCLP Metals (8 RCRA - Methods 7060, 7080, 7130, 7190, 7420, 7470, 7740, 7760)
- TCLP Pesticides/Herbicides (Method 8081 and 8151)
- PCBs (Method 8082)
- Reactivity (Sulfide Method 7.3.4.1 and Cyanide 7.3.4.2)
- pH (Method 9045)
- Paint Filter Test (Method 9095)
- Flashpoint (Method 1030)

Existing laboratory soil sample data from the site investigations will be used for landfill profile submittal purposes to the extent acceptable by the destination off-site landfill and regulatory requirements.

The Madison West Landfill in Canastota, NY may also accept non-hazardous waste under certain conditions. It is closer to the site (31 miles one-way versus 44 miles one way to Seneca Meadows). However, the Madison West Landfill can only accept Onondaga County non-hazardous soils for use as cover material. The soils must be PCB-free, and a 60+ day application period to gain landfill committee approval is required. Use of this landfill and others will be considered following laboratory waste profile results.

4.2.2 Transportation Route

Both suggested destination off-site landfills are west of the North Landfill. Exiting the North 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 landfills. 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 appropriate destination landfills.

4.3 Removal Action Excavation

4.3.1 Methods

A track backhoe and track front end loader will be used for excavation and loading. Dump trucks licensed and/or certified as non-hazardous (hazardous when necessary) waste haulers will be used to transport the excavated material to approved landfill locations.

Existing access roads to each Removal Action area are shown on Figure 9. Prior to mobilization, these roadways will be inspected to verify adequate bearing strength is present for a fully loaded dump truck. Any soft spots will be reinforced with coarse gravel from a clean commercial source. The entrance roadway at the North Landfill south gate (Figure 9) will be improved to comply with New York Standards and Specifications for Erosion and Sediment Control (Appendix C). During Removal Action activities, signage will be placed along 7th North Street to alert drivers from both directions that truck traffic is entering and leaving the North Landfill and if necessary flag people will be used for safety purposes.

During excavation, unstable walls will be cut back to a stable slope. Cut back material will be sent to the appropriate landfill if within the Removal Action area, or used as backfill material on site.

4.3.2 Layout and Dewatering Pads

Saturated soils will be encountered at each Removal Action excavation area. The water content of the excavated soil and waste will require that some or all excavated material be stockpiled on a designated dewatering pad shown on Figure 9 prior to being loaded onto haul trucks. A dewatering pad will be located on the adjacent high ground within backhoe reach of each excavation area. Possible dewatering pad locations are shown on Figure 9. The size and orientation of the pad will be adjusted in the field based on the amount of saturated soil and the amount of dewatering time required. These two variables are weather dependent and will also depend on the reach of the contractor's equipment. If necessary, to promote drainage, the dewatering pad will be constructed of coarse gravel from a clean commercial source and be three to six inches in thickness. The dewatering pads will remain on the site for reuse/relocation during future North landfill reconstruction and capping work.

4.3.3 Backfill

All three Removal Action areas are within the North Landfill footprint that will be reconstructed and capped as part of the ROD-selected remedial alternative included in the approved final site remedy. As the reconstruction and capping is expected to occur within 1-2 years of the Removal Action, it is planned that no imported backfill material will be placed into any of the Removal Action excavations. At the conclusion of the Removal Action, all excavation walls will be back-sloped away from the center at a 1:1 slope to make the excavations safe. Relatively clean excavated soil or fill may be placed back into the excavation. No placement of any excavated material below the water table will occur except for clean backfill material.

At the NAPL Oil Removal Action area (Area 3, Figure 8), the visual sorting of oil saturated soil may result in oil-free soils being stockpiled around the excavation perimeter. Bags of Portland cement may be added to the base of the excavation to stabilize soils remaining in place. At the conclusion of the NAPL Oil area Removal Action, it is permissible to place oil-free soils/fill back into the excavation no deeper than one-foot above the shallow water table. To facilitate this placement, it may be necessary to first place imported clean fill material within the excavation. A possible commercial source for this imported clean fill material is:

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

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

4.4 Post-Excavation Sampling

The Removal Action areas have been delineated based on review and input from NYSDEC. Therefore post-excavation sampling is not required if the Removal Action areas delineated are completely removed. Only limited sampling will occur in Area 1 (Figure 7) in excavations that abut the Plaza East landfill property boundary to document levels of VOCs and PCBs that may remain in place. Two samples will be collected from the north wall of the VOC excavation area and submitted for laboratory analysis of VOCs (EPA Method 8260). Two samples will be collected from the north wall of the PCB excavation area and submitted for laboratory analysis of PCBs (EPA Method 8082). The samples collected will be submitted to Pace Analytical in Greensburg, PA, a NYSDOH ELAP-certified laboratory.

4.5 Site Controls

4.5.1 Water Management

Decontamination water and construction water will be collected and treated prior to appropriate discharge under permitted limits to the Onondaga County Waste Water Treatment Plant (County). Construction water includes water from dewatered soil or sediment. To minimize generation of construction water, groundwater or surface water

will not be pumped from open excavations without approval of the onsite Engineer. Decontamination pads (Figure 10) and dewatering pads (Figure 11) will be constructed with sumps so that decontamination water and construction water may be collected for treatment. Construction and decontamination water will be pumped to a 20,000-gallon frac tank to allow for settlement of suspended solids and removal of any sheen on the water surface with adsorbent pads or booms. The collected water will be treated with carbon filtration and stored in a second 20,000-gallon frac tank. The treated water will be sampled by Engineer to confirm compliance with the following discharge limits:

Parameter	**OCDWEP Allowable Effluent Concentration Limitation**
Total Cadmium (Cd)	3.0 mg/l
Total Chromium (Cr)	12.0 mg/l
Total Copper (Cu)	7.5 mg/l
Total Nickel (Ni)	7.5 mg/l
Total Zinc (Zn)	7.5 mg/l
Total Mercury (Hg)	0.006 mg/l
Total Lead (Pb)	1.5 mg/l
Oil & Grease	150 mg/l
pH	5.5-10.5 Standard Units
Total Toxic Organics (TTO's)[1]	0.5 mg/l
PCB's[2]	1.0 mg/l
Methyl Tertiary Butyl Ether (MTBE)	Discharge limit included under TTO limit

Once the County has approved that the treated water meets discharge limits, the water will be discharged to a sanitary sewer manhole located at the Crouse-Hinds facility. The water will pass through a filter with a maximum pore size of 25 microns (25mm). The water will be metered so as to determine the quantity discharged to the County Sanitary Sewer System.

4.5.2 NAPL Oil Management

[1] Total Toxic Organics is currently defined by the County, as Control Authority, to be the sum of the detectable concentrations of parameters detected by USEPA Method 8260 (including Xylenes).

[2] Polychlorinated biphenyl's (PCB's) are those parameters detected by USEPA Method 608.

At the NAPL Oil area, excess soil pore oil (free product) may collect at a low point down gradient from any stockpiled soil. To allow collection of this oil, plastic sheeting will be placed on the ground surface between the stockpiled soil and the silt fence. A trough or sump will be placed at the plastic sheeting low point to allow pooling oil to be collected using absorbent pads or booms. Oil absorbent booms will also be available to absorb oil collecting along the silt fence. All spent oil collection material will be placed in 55-gallon DOT drums, sampled for classification, and properly disposed of offsite. Manifests for the oil material disposal will be included in the Removal Action documentation report. Oil absorbent materials to be available by the remediation contractor include, but are not limited to:

- Over 5,000 square feet of 3-mil plastic sheeting
- Oil-only absorbent pads with over 100 gallons of oil absorbent capacity
- Several hundred lineal feet of 3 to 6 inch diameter cylindrical oil absorbent booms
- 55-gallon DOT drums with lids
- Source for delivery of straw bales within 1 hour of site
- Wire mesh reinforced silt fence including stakes every 20 feet – in addition to Removal Action boundary reinforced silt fence and stakes
- Restocking of these items will be on an as-needed basis as required by the Field Engineer or Project Manager

4.5.3 Stormwater Management

Low profile soil diversion berms will be constructed by grading uphill from the excavation areas to divert runoff during excavation and after. The excavations themselves will provide a detention basin for any storm water that collects in the excavation area.

Wire mesh reinforced silt fence with hay bales or filter socks will be used to catch silt and soil in stormwater that migrates away from the excavation areas. A line of reinforced silt fence will be placed a distance of approximately two to ten from the excavation edge along all the excavation perimeter areas that are at a lower elevation than the excavation itself. Water potentially carrying soil and silt will be filtered by this reinforced silt fence with hay bales. Once the excavation is complete, soils and silt along the silt fence will be either left in place, removed or back cut as previously described and either landfilled off site or pulled back into the excavation as directed by the Field Engineer or Project Manager based on waste classification.

The planned excavations are located at the site interior and the use of reinforced silt fence with hay bales as described above will provide adequate protection and keep all soils and water on site and in the excavation area. Details of reinforced silt fencing, hay bale dikes and filter socks are shown in Appendix D. Any silt fence or hay bale dikes in place at the conclusion of the Removal Action that are judged by the Field Engineer or Project Manager to aid in local soil erosion and storm water control will be left in place for reuse for the subsequent North Landfill reconstruction or removed and disposed of off-site.

4.5.4 Soil and Sediment Erosion Control

Soil and sediment control on site will be adequate using the excavation back sloping and reinforced silt fence with hay bales described above. These methods will ensure adequate protection of terrestrial and aquatic habitats potentially affected by runoff or discharge from the Removal Action areas into nearby Stream A or Wetlands A and B.

4.5.5 Dust and Odor Control

The planned Removal Action areas are small in size relative to the entire North Landfill area and lie within the interior of the landfill. The shallow water table may be encountered within the top five feet of the excavation and surface water is available in nearby wetlands. The Field Engineer or on-site Health and Safety Officer will monitor dust levels that can easily be controlled using on-site water from the wetlands sprayed with a hand-held spraying unit or water pump. Odors and organic vapors from the VOC source areas will be monitored by the Field Engineer or on-site Health and Safety Officer using a photo-ionization detector up- and downwind of the excavation area as part of the work zone safety program. The distance from the Removal Action areas to any off-site human receptors should be sufficient such that local protection of the site workers by health and safety vapor monitoring will be adequate to also protect any off-site human receptors.

4.6 Decontamination

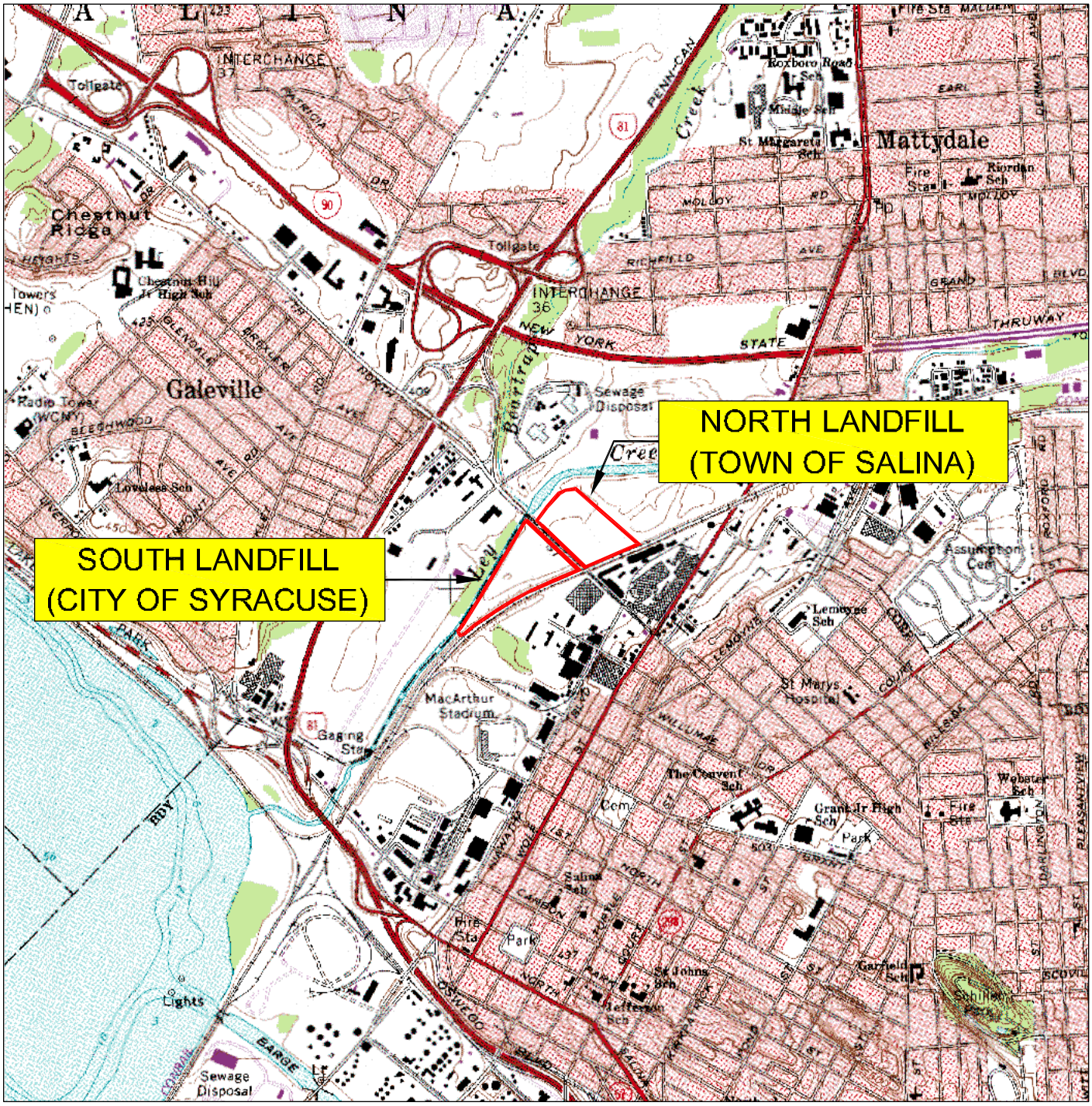
Excavation equipment will remain on-site for the duration of the Removal Action. At the conclusion of the removals, the excavation equipment will be decontaminated at the Removal Action area before being loaded onto trailers for transport off-site. Trucks and trailers transporting the excavation equipment will be inspected at the decontamination pad near the entry apron to the North Landfill (Figures 9 and 10) and the tires rinsed down with clean water if necessary. Dump trucks hauling material will be inspected at the Removal Action area and the tires rinsed with water to remove any soil or waste. Each dump truck load will stop at the entry apron decontamination pad and the truck driver will do a walk-around inspection to verify no site soil or waste will be tracked off site. Clean city water in spray units will be available at the decontamination pad at all times. The Field Engineer will photograph the 7th North Street entry drive to the landfill at the end of each work day to document that no site soil or waste is being tracked off-site onto 7th North Street.

4.7 Site Restoration

Site restoration will be limited to backfilling the excavations with on-site fill material or back sloping the excavation to a safe side slope for safety and stability. At the NAPL Oil area excavation bags of Portland cement may be added to the base of the excavation to stabilize soils remaining in place. Replacement of any stockpiled oil-free soil back into the excavation will be no deeper than one foot above the shallow water table. Imported clean fill will only be brought on site, if necessary, to be placed into the NAPL Oil excavation below the shallow water table, to support the oil-free soil. This limited site restoration is based on the planned final remedy reconstruction of the North Landfill to follow in 1-2 years (after the South Landfill is properly capped and closed.

5.0 HEALTH AND SAFETY

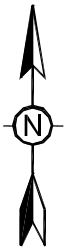
The Health and Safety Plan for this work is included in Appendix E. Due to the nature of the site (former landfill) and the nature and extent of potential contaminants in surface soil, all on-site personnel must have current OSHA 40-hour HAZWOPER Training.



National Geodetic Vertical Datum of 1929
Contour Interval 10 Feet

SCALE
0 5000
FEET

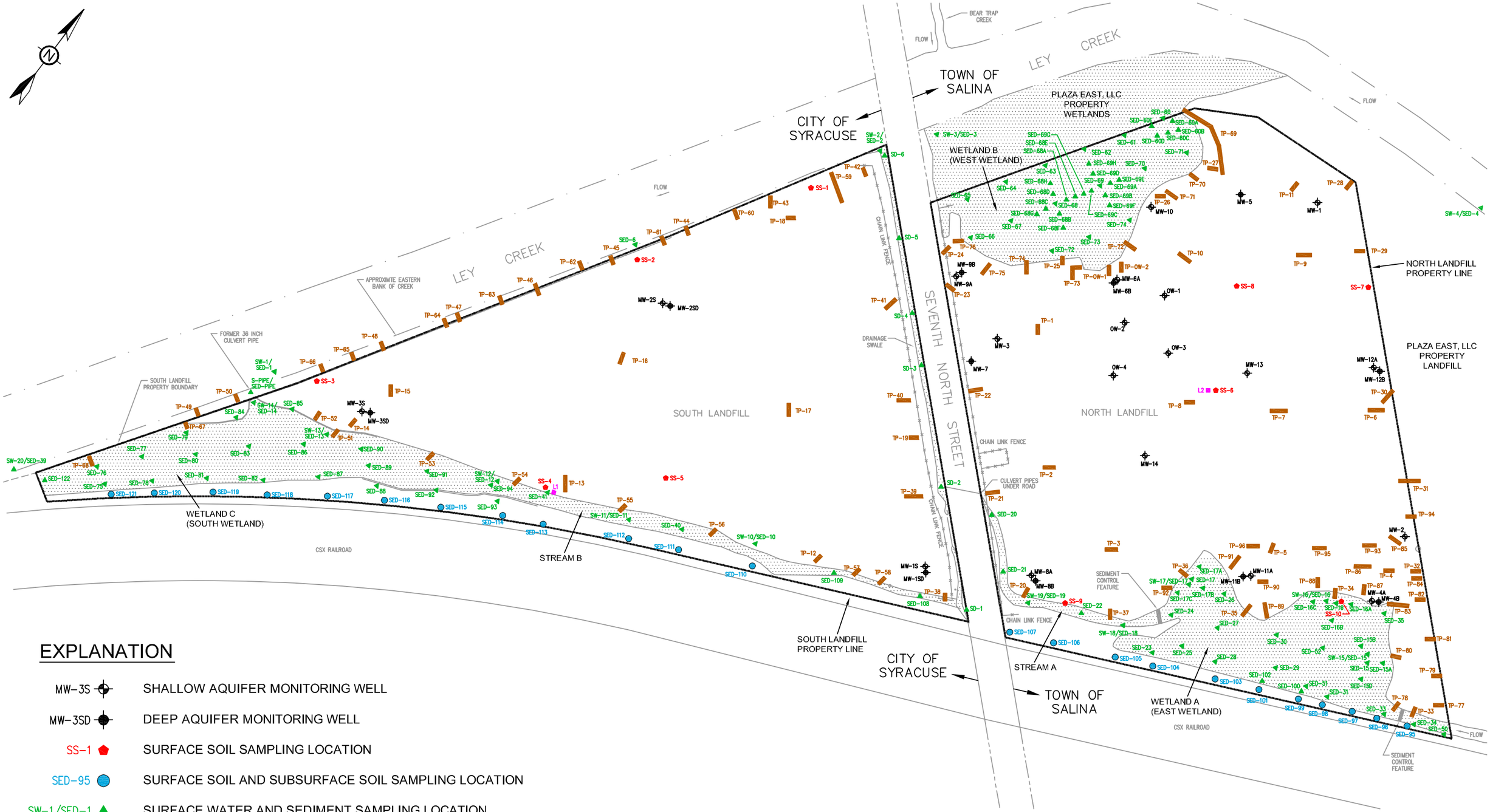
QUADRANGLE LOCATION



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-13	TEST PIT LOCATION
L1	LEACHATE SAMPLING LOCATION

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SITE PLAN

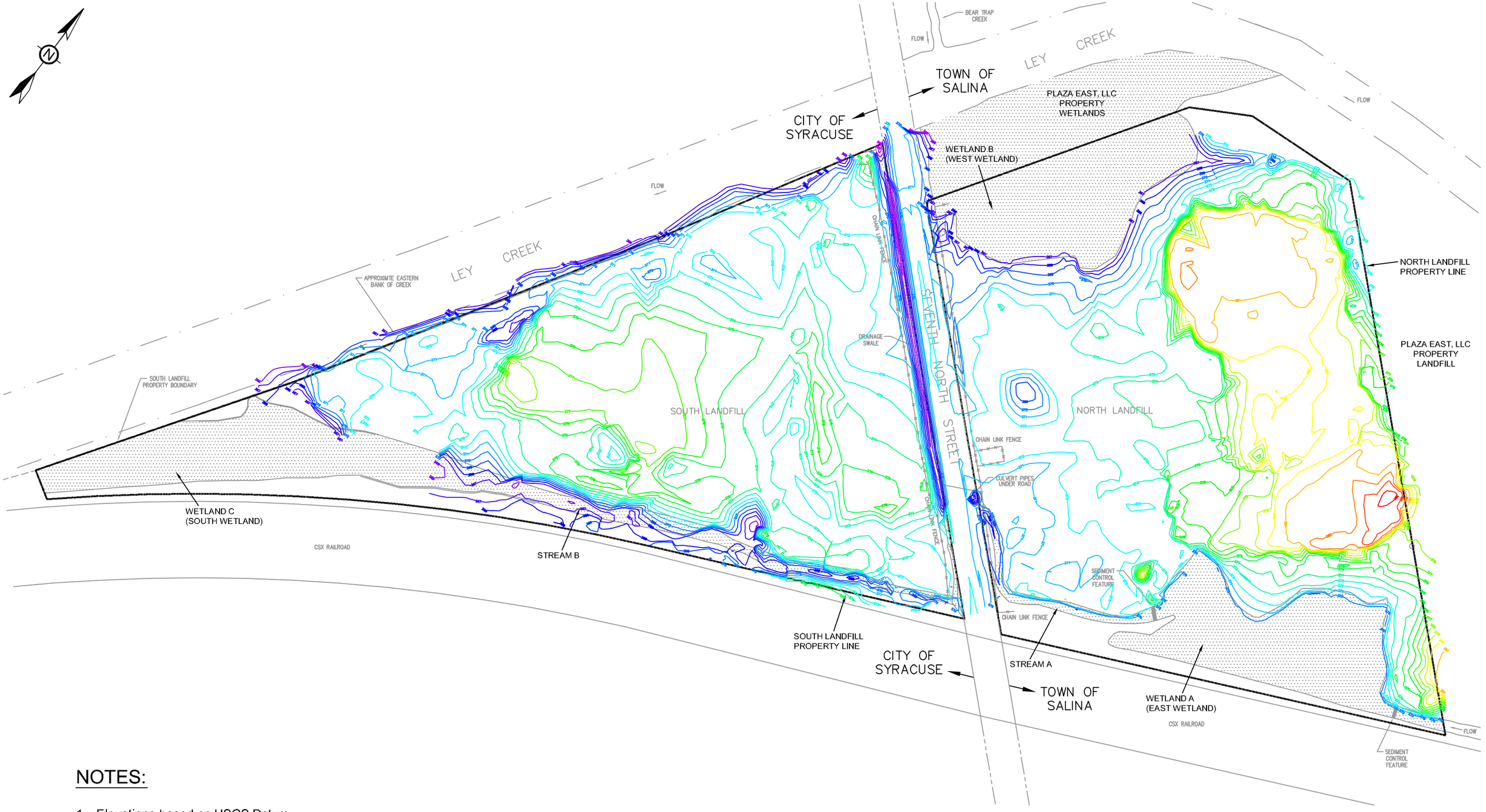
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/23/10

FIGURE: 2

S:\CAD\COOPER\SYRACUSE\12-11-09\2202036FIG2.DWG



NOTES:

1. Elevations based on USGS Datum.
2. Boundaries on south side of Seventh North Street based on best available records and deed to Crouse Hinds bk. 1350 pg. 623.

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SITE TOPOGRAPHIC MAP

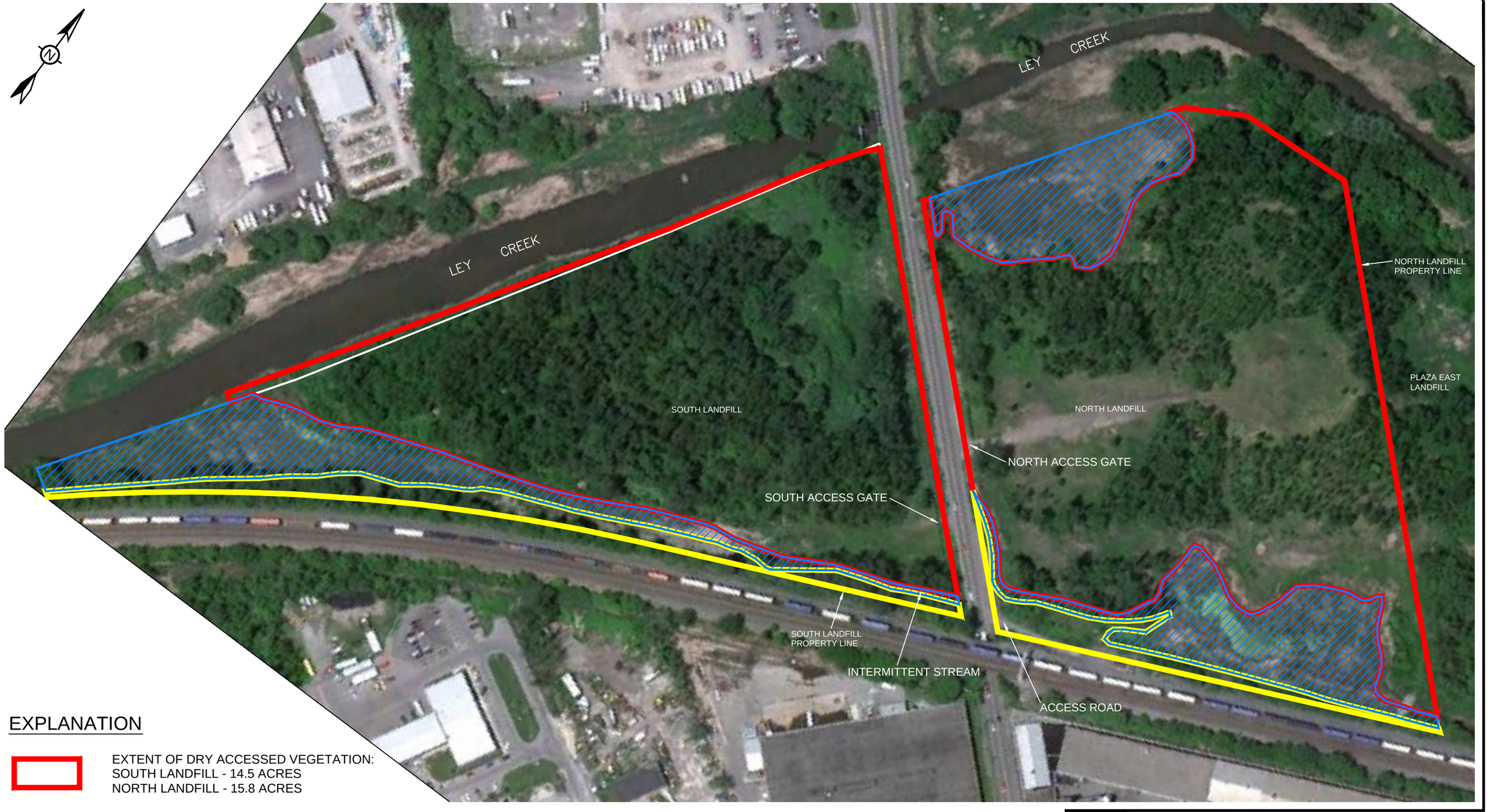
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/23/10

FIGURE: 3

S:\CAD\COOPER\SYRACUSE\12-11-09\2202036FIG3.DWG



EXPLANATION

EXTENT OF DRY ACCESSED VEGETATION:
SOUTH LANDFILL - 14.5 ACRES
NORTH LANDFILL - 15.8 ACRES

EXTENT OF MAPPED WETLAND AREA:
SOUTH LANDFILL - 3.1 ACRES
NORTH LANDFILL - 4.6 ACRES

EAST BOUNDARY AREA:
SOUTH LANDFILL - 1.8 ACRES
NORTH LANDFILL - 1.08 ACRES

0 180 360
SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
CLEARING AREAS AND ACCESS

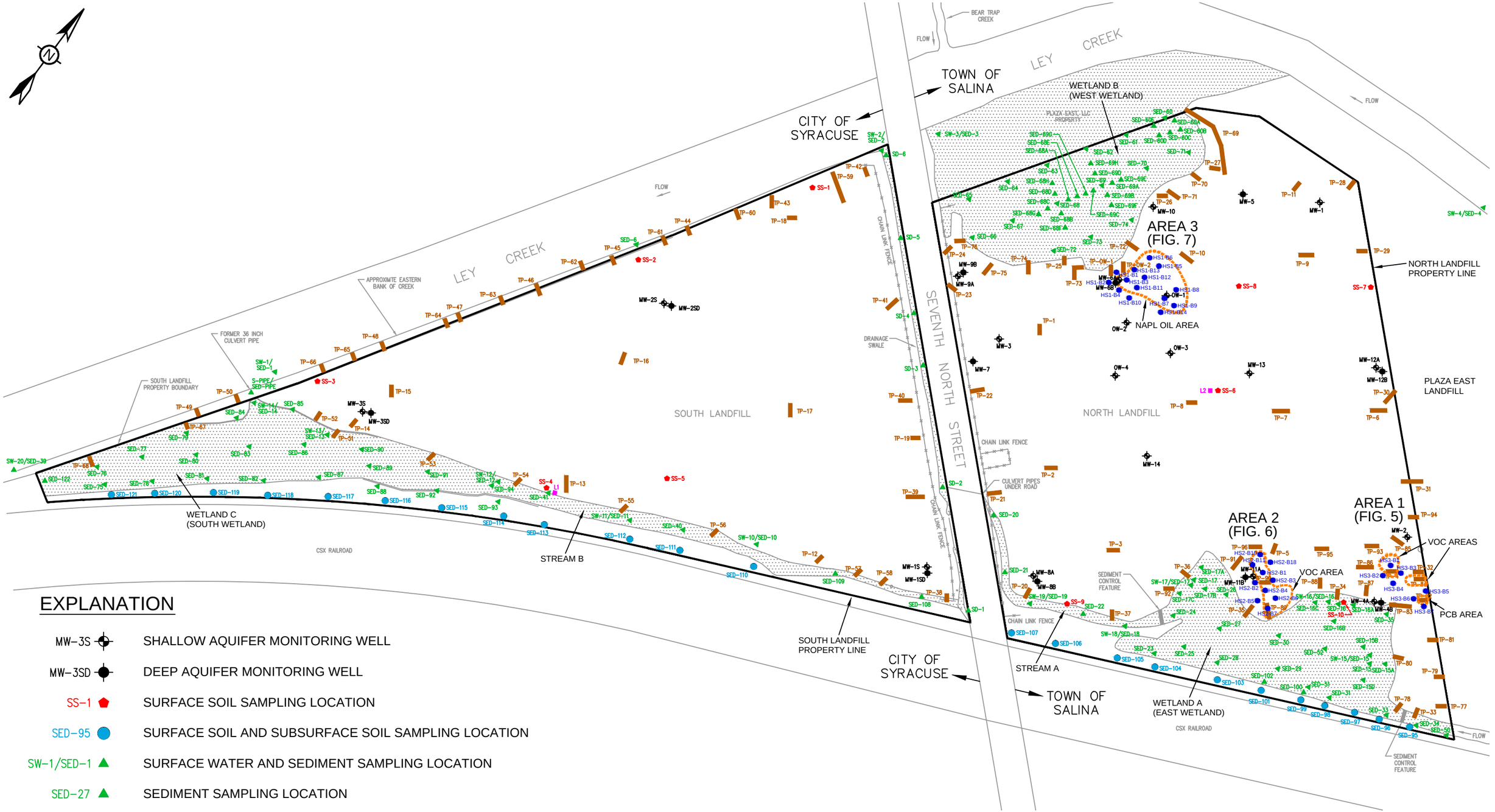
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/1/12

FIGURE: 4

S:\CAD\COOPER\SYRACUSE\9-12-11\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
- HS1-B1 — NOVEMBER 2010 BOREHOLES
- DELINEATED REMOVAL ACTION AREAS

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY REMOVAL ACTION DELINEATION AREAS

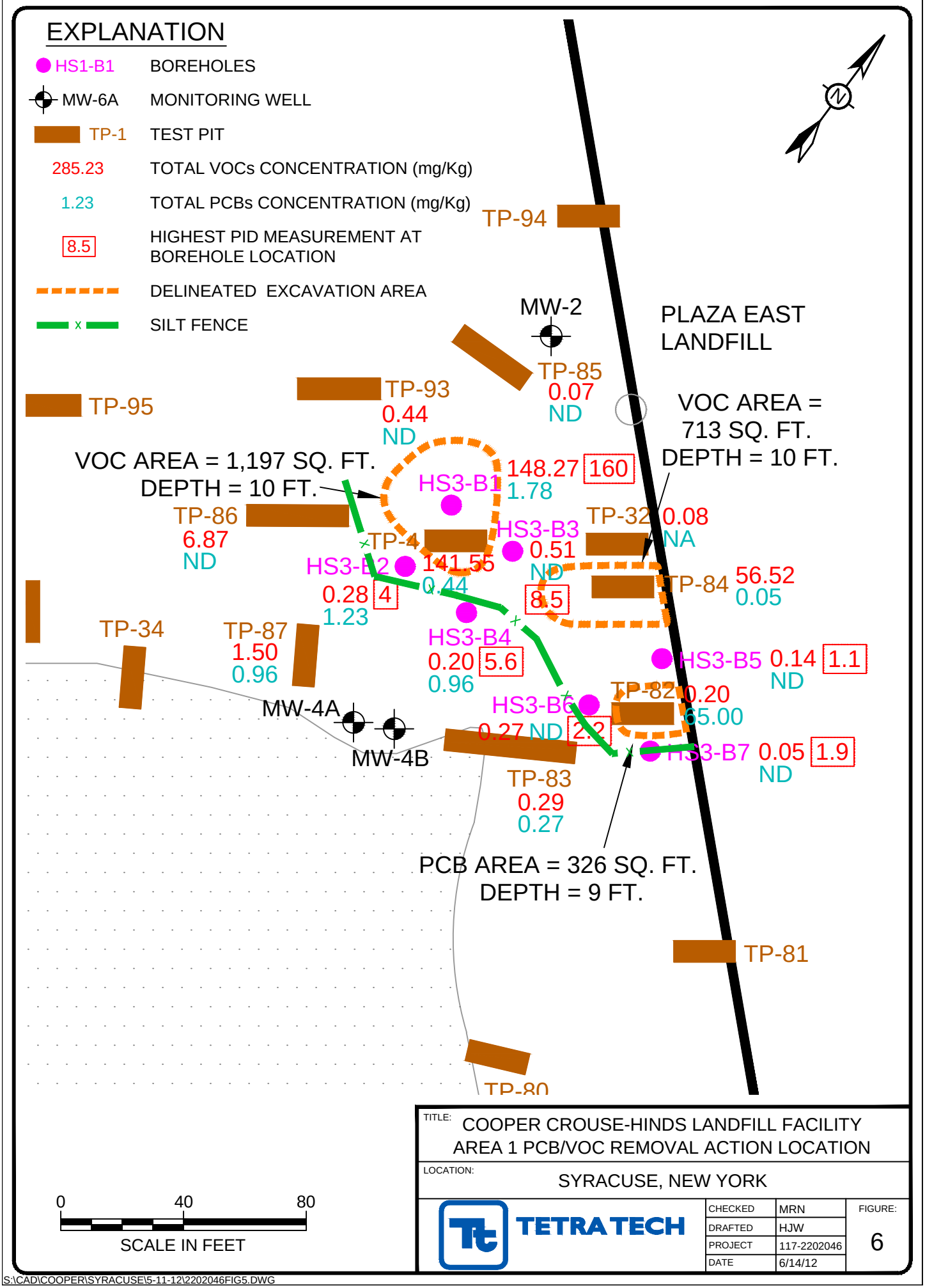
LOCATION: SYRACUSE, NEW YORK

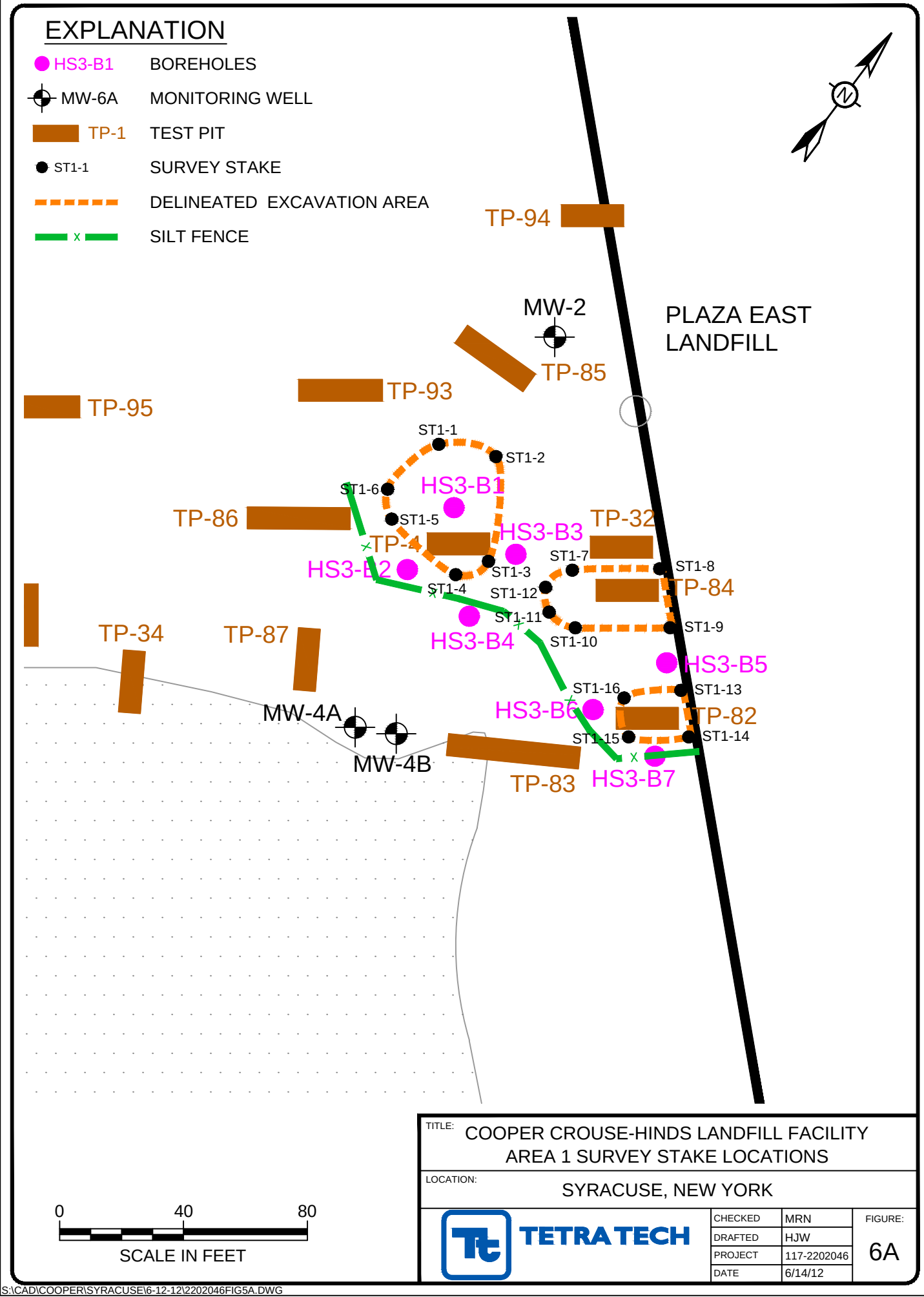
TETRA TECH

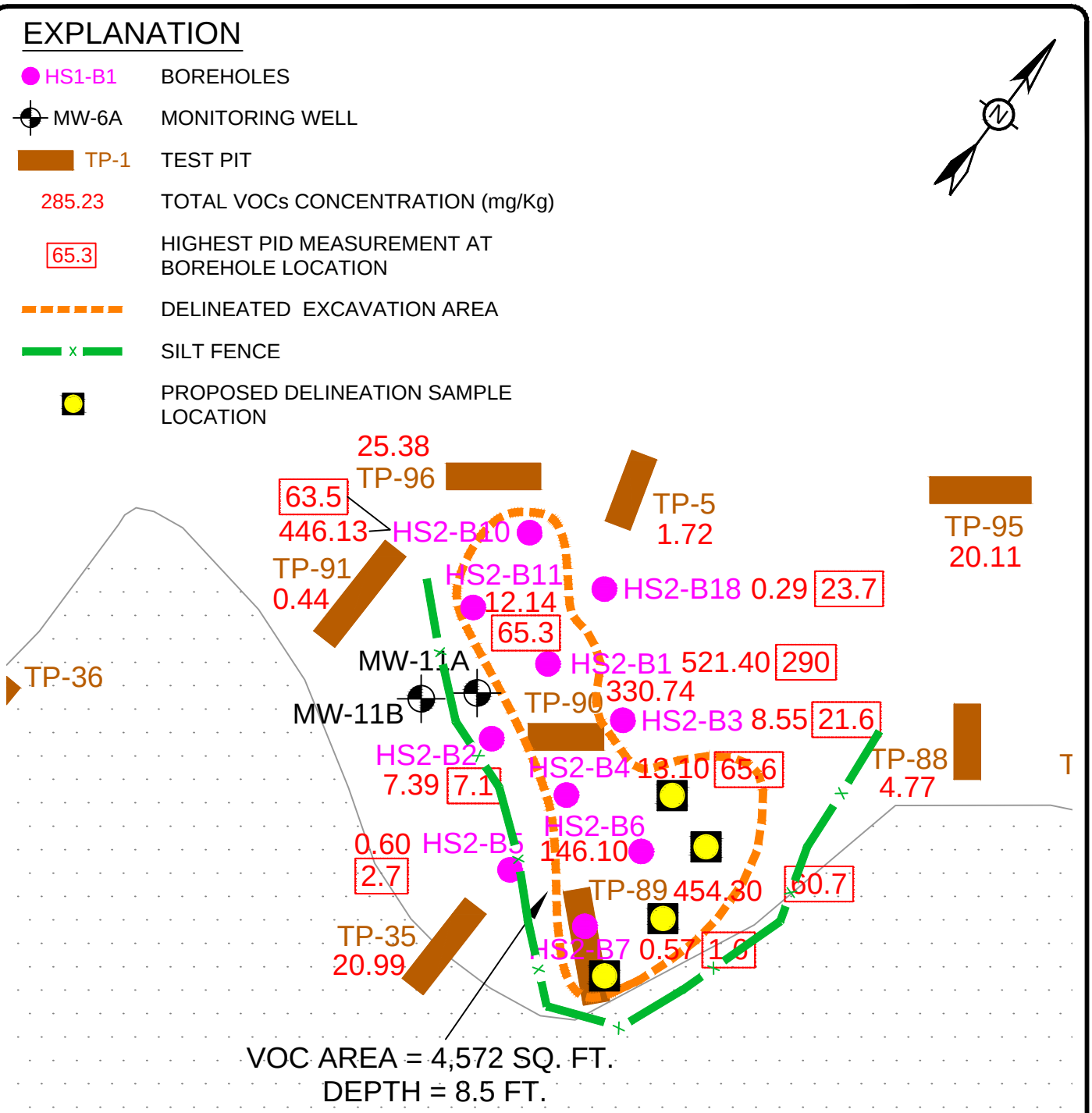
CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/14/12

FIGURE: 5

S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG1.DWG


EXPLANATION
HS1-B1 BOREHOLES
MW-6A MONITORING WELL
TP-1 TEST PIT
285.23 TOTAL VOCs CONCENTRATION (mg/Kg)
1.23 TOTAL PCBs CONCENTRATION (mg/Kg)
8.5 HIGHEST PID MEASUREMENT AT BOREHOLE LOCATION
DELINEATED EXCAVATION AREA
SILT FENCE
N
PLAZA EAST LANDFILL
TP-94
MW-2
TP-85 0.07 ND
TP-93 0.44 ND
TP-95
VOC AREA = 713 SQ. FT. DEPTH = 10 FT.
VOC AREA = 1,197 SQ. FT. DEPTH = 10 FT.
HS3-B1 148.27 160 1.78
TP-86 6.87 ND
TP-4
HS3-B3 0.51 ND
TP-32 0.08 NA
HS3-B2 141.55 0.44 0.28 4 1.23
8.5
TP-84 56.52 0.05
TP-34
TP-87 1.50 0.96
HS3-B4 0.20 5.6 0.96
HS3-B5 0.14 ND 1.1
MW-4A
TP-82 0.20 65.00
HS3-B6 0.27 ND 2.2
HS3-B7 0.05 ND 1.9
MW-4B
TP-83 0.29 0.27
PCB AREA = 326 SQ. FT. DEPTH = 9 FT.
TP-81
TP-80
0 40 80
SCALE IN FEET
TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY AREA 1 PCB/VOC REMOVAL ACTION LOCATION
LOCATION: SYRACUSE, NEW YORK
TETRA TECH
CHECKED MRN
DRAFTED HJW
PROJECT 117-2202046
DATE 6/14/12
FIGURE: 6
S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG5.DWG


EXPLANATION
HS3-B1 BOREHOLES
MW-6A MONITORING WELL
TP-1 TEST PIT
ST1-1 SURVEY STAKE
DELINEATED EXCAVATION AREA
SILT FENCE
TP-94
MW-2
PLAZA EAST LANDFILL
TP-85
TP-93
TP-95
ST1-1
ST1-2
ST1-6
HS3-B1
TP-86
ST1-5
TP-32
HS3-B3
TP-4
ST1-7
ST1-8
HS3-B2
ST1-3
TP-84
ST1-4
ST1-12
ST1-11
ST1-9
TP-34
TP-87
HS3-B4
ST1-10
HS3-B5
ST1-16
ST1-13
MW-4A
HS3-B6
TP-82
ST1-15
ST1-14
MW-4B
TP-83
HS3-B7
0
40
80
SCALE IN FEET
TITLE:
COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 1 SURVEY STAKE LOCATIONS
LOCATION:
SYRACUSE, NEW YORK
TETRA TECH
CHECKED MRN
DRAFTED HJW
PROJECT 117-2202046
DATE 6/14/12
FIGURE:
6A
S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG5A.DWG



TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 2 VOC REMOVAL ACTION LOCATION

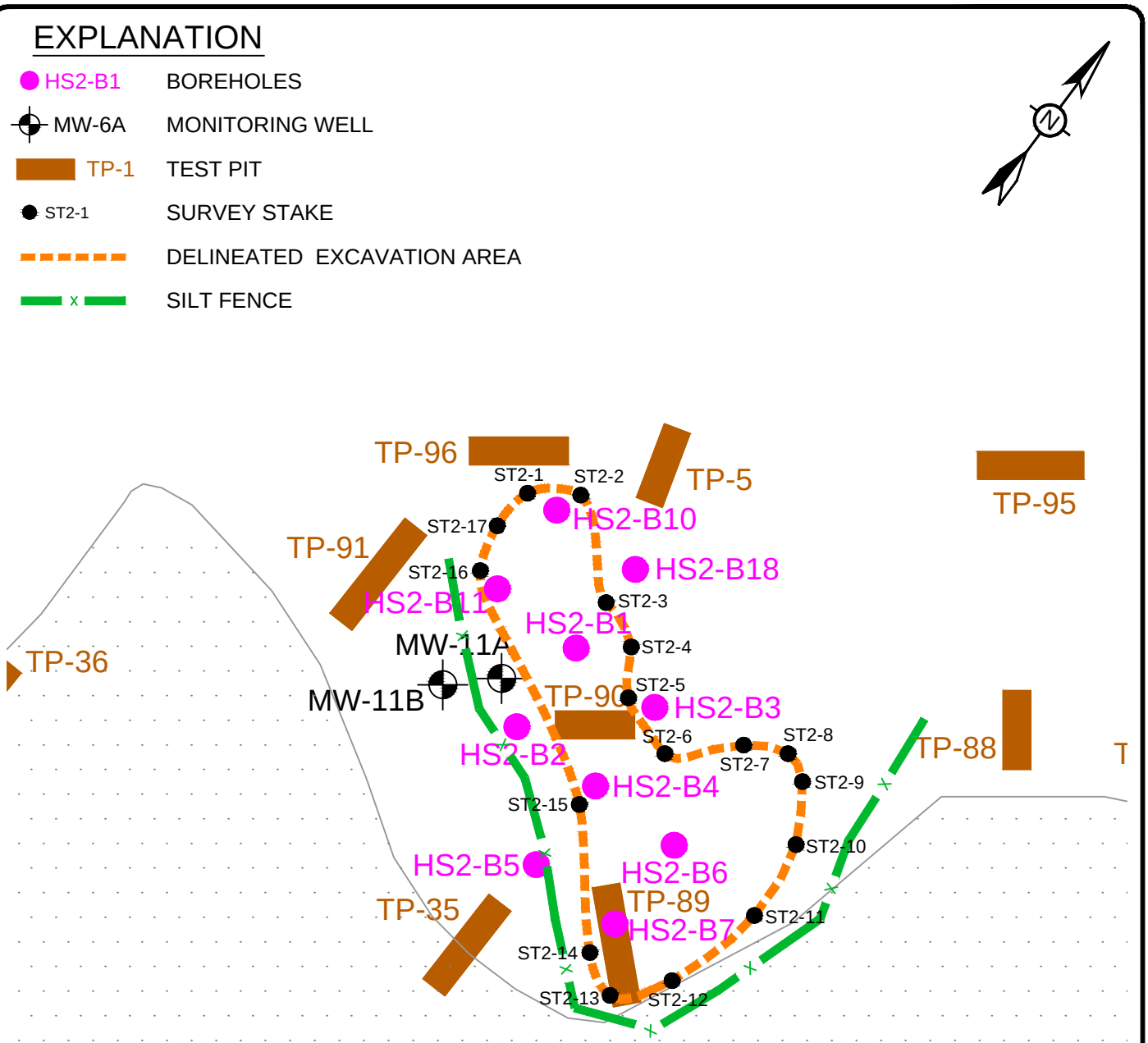
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/2/12

FIGURE: 7

S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG6.DWG



TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 2 SURVEY STAKE LOCATIONS

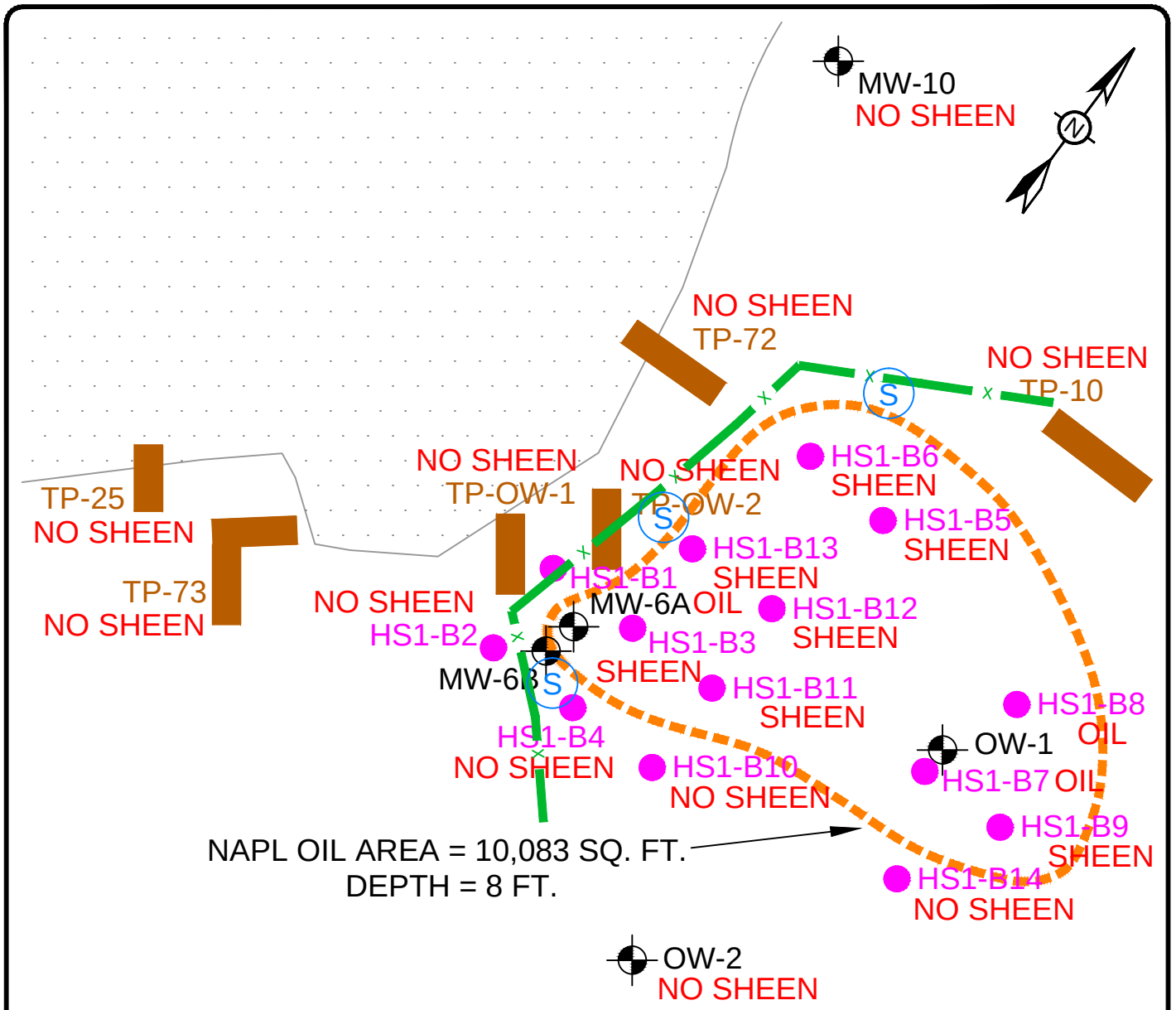
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/14/12

FIGURE: 7A

S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG6A.DWG



TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 3 NAPL OIL REMOVAL ACTION LOCATION

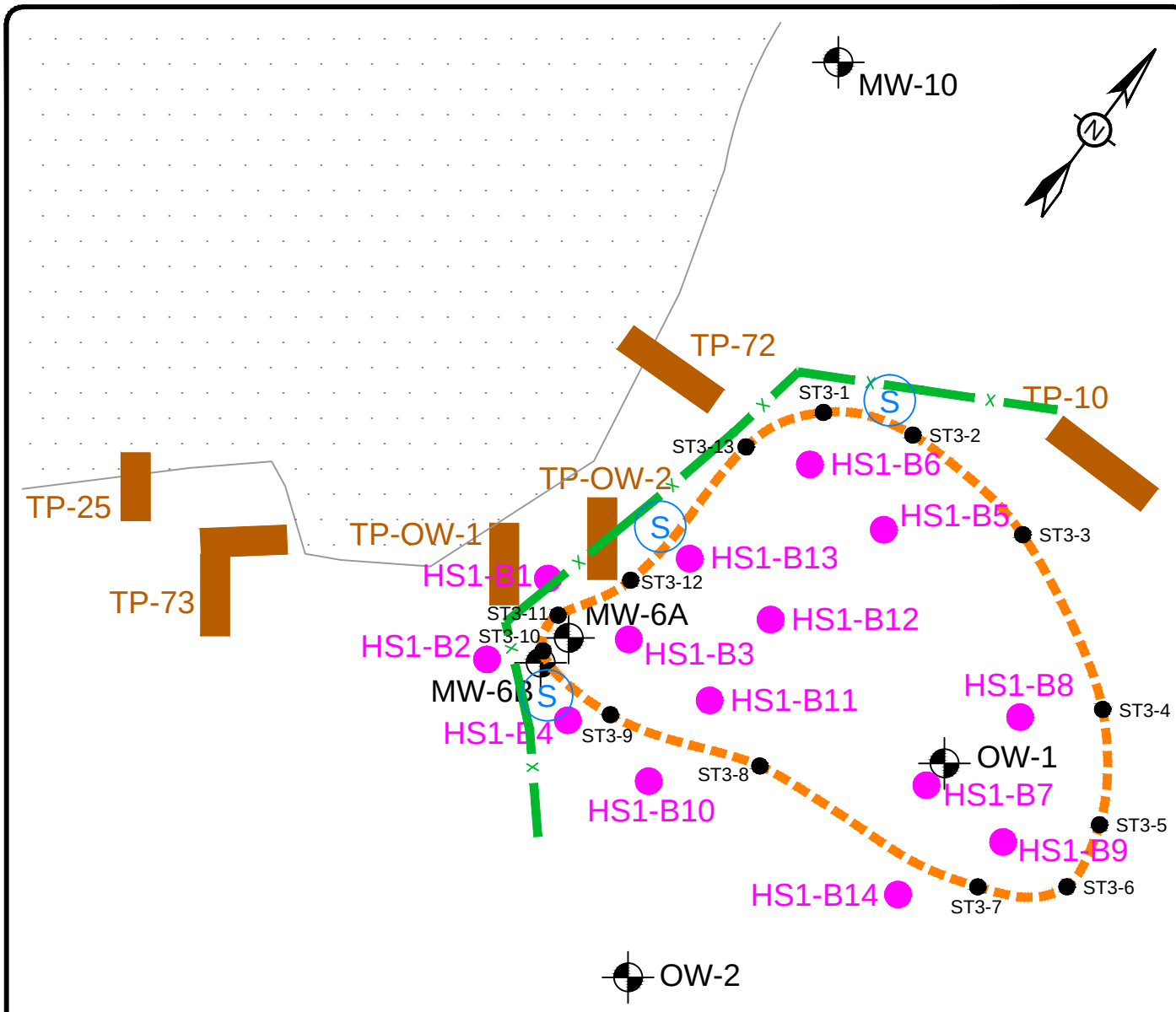
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/13/12

FIGURE: 8

S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG7.DWG



EXPLANATION

HS1-B1	BOREHOLES
MW-6A	MONITORING WELL
TP-1	TEST PIT
ST3-1	SURVEY STAKE
	DELINEATED AREA
x	SILT FENCE
S	OIL SUMP

0 40 80

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 3 SURVEY STAKE LOCATIONS

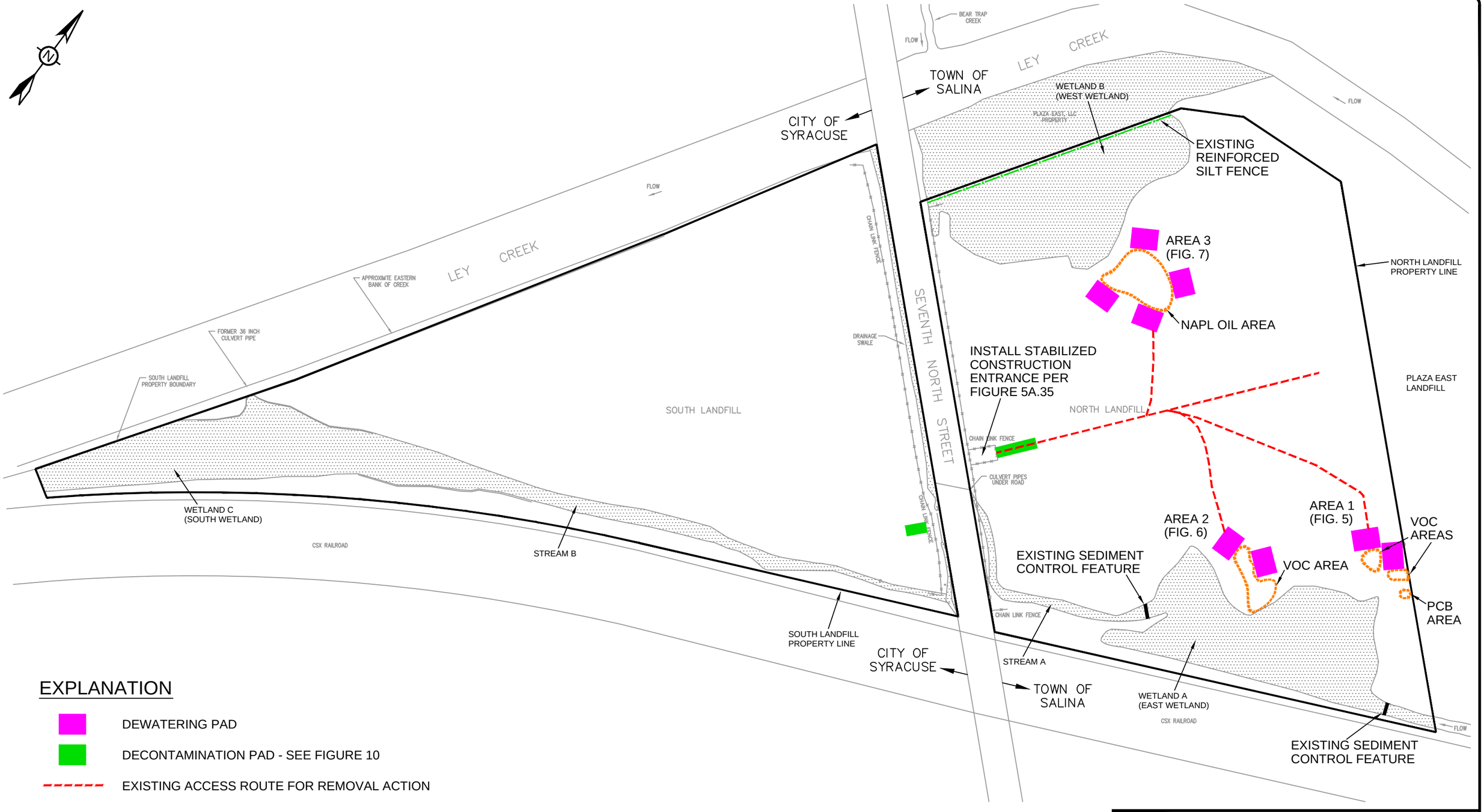
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/14/12

FIGURE: 8A

S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG7A.DWG



EXPLANATION

- DEWATERING PAD
- DECONTAMINATION PAD - SEE FIGURE 10
- EXISTING ACCESS ROUTE FOR REMOVAL ACTION

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
REMOVAL ACTION DEWATERING PAD LOCATIONS

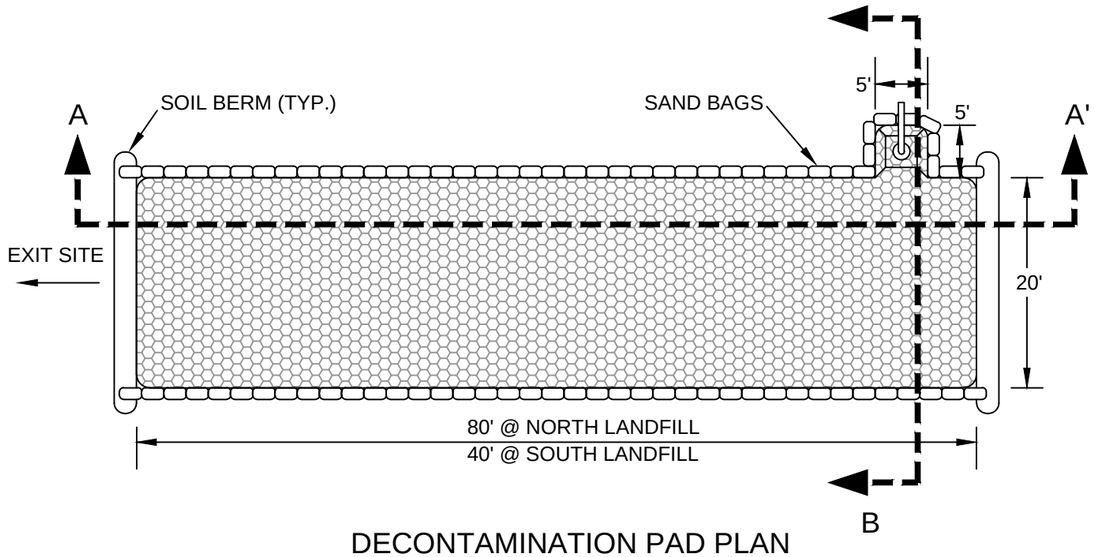
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

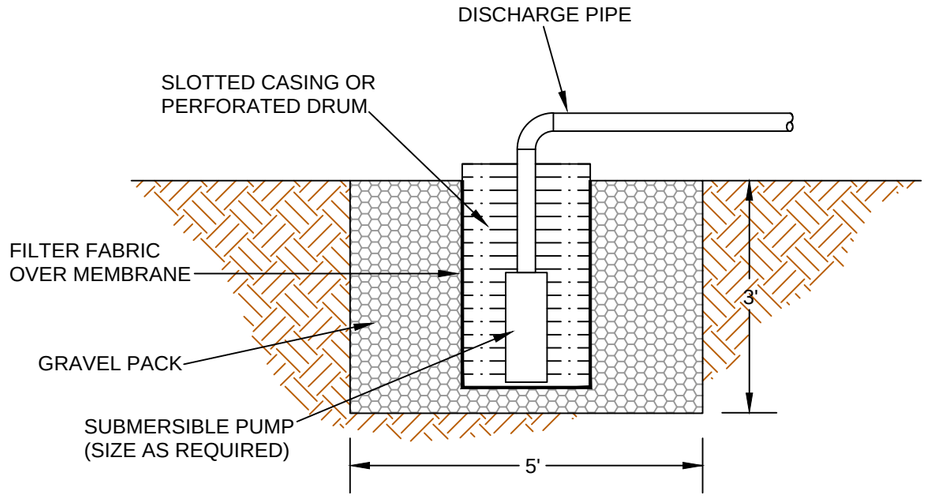
CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/2/12

FIGURE: 9

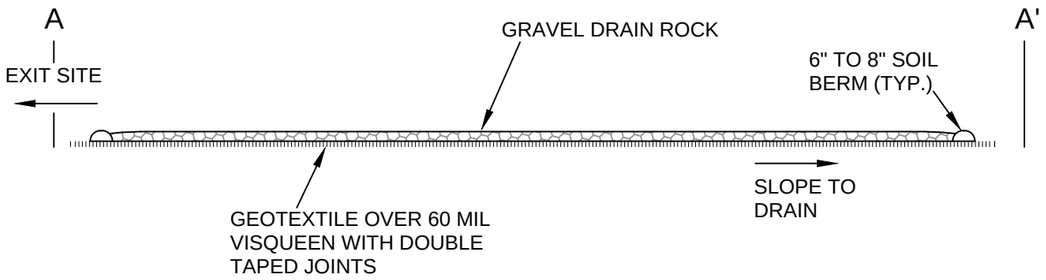
S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG8.DWG



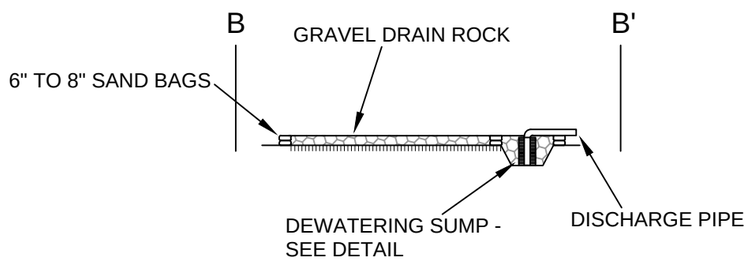
DECONTAMINATION PAD PLAN



DECONTAMINATION PAD SUMP DETAIL



DECONTAMINATION PAD PROFILE



DECONTAMINATION 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.

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
DECONTAMINATION PAD DETAIL

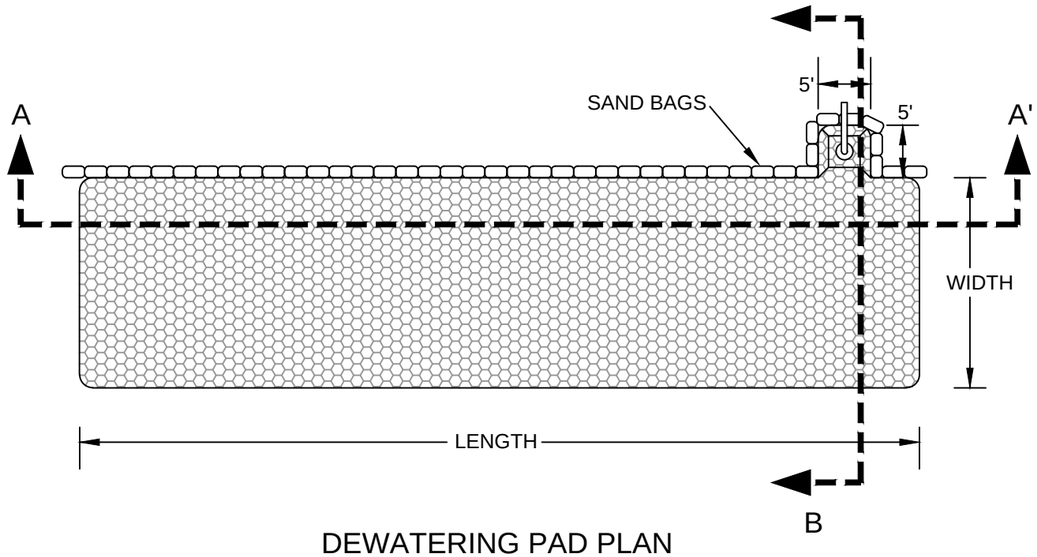
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

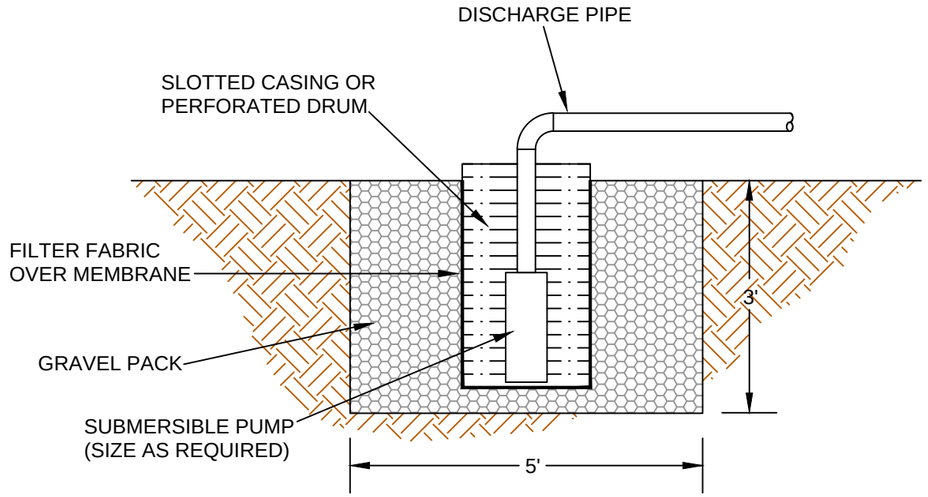
CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	9/27/12

FIGURE: 10 REV. 1

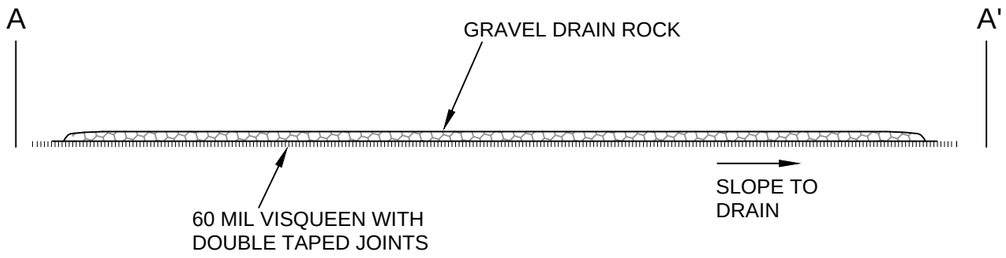
S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG10REV1.DWG



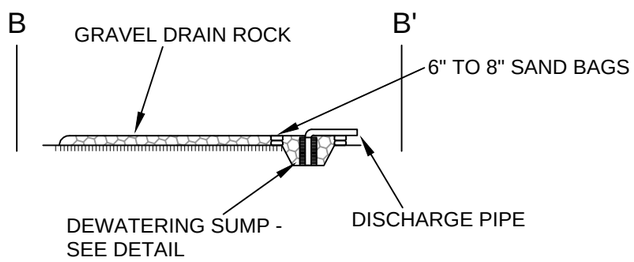
DEWATERING PAD PLAN



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

LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	9/27/12

FIGURE: 11

S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG11.DWG

Table 1. Removal Action Area Soil Quantities

Removal Action Areas		Reference Figure	Surface Elevation	Water Table Elevation	Excavation Depth	Unsaturated Soil Thickness	Saturated Soil Thickness	Excavation Area	Excavation Volume	
			ft msl	ft msl	ft	ft	ft	sq ft	cu yds	tons
Area 1	VOC (HS3-B1)	5	376.4	371	10	5.4	4.6	1,197	443	658
	VOC (TP-84)	5	376.9	371	10	5.9	4.1	713	264	392
	PCB (TP-82)	5	373.8	371	9	2.8	6.2	326	109	161
Area 2	VOC (TP-90)	6	373.9	370	8.5	3.9	4.6	4,572	1,439	2,137
Area 3	NAPL Oil (HS1-B12)	7	372.7	367	8	5.7	2.3	10,083	2,988	4,437
Total								16,891	5,243	7,786

Table 2. Survey Coordinates for Removal Action Areas

Based on New York State Plane Grid Coordinates, Central Zone - 3102

AREA 1 STAKE	NORTHING	EASTING
ST1-1	1124658.75	933900.15
ST1-2	1124666.94	933917.11
ST1-3	1124638.81	933935.96
ST1-4	1124628.92	933930.26
ST1-5	1124630.41	933902.97
ST1-6	1124637.17	933896.01
ST1-7	1124653.14	933959.05
ST1-8	1124670.83	933981.03
ST1-9	1124657.86	933995.34
ST1-10	1124639.08	933971.21
ST1-11	1124637.89	933961.45
ST1-12	1124643.50	933955.64
ST1-13	1124644.05	934010.49
ST1-14	1124633.76	934021.72
ST1-15	1124621.86	934006.40
ST1-16	1124630.88	933997.52

AREA 2 STAKE	NORTHING	EASTING
ST2-1	1124504.96	933694.19
ST2-2	1124512.87	933705.14
ST2-3	1124495.29	933726.99
ST2-4	1124490.30	933738.93
ST2-5	1124479.67	933746.28
ST2-6	1124474.17	933762.30
ST2-7	1124488.17	933776.75
ST2-8	1124493.37	933786.99
ST2-9	1124490.01	933794.21
ST2-10	1124476.38	933802.74
ST2-11	1124455.70	933805.46
ST2-12	1124429.81	933799.11
ST2-13	1124417.18	933789.00
ST2-14	1124422.62	933778.27
ST2-15	1124450.65	933753.08
ST2-16	1124482.09	933696.80
ST2-17	1124493.72	933693.19

AREA 3 STAKE	NORTHING	EASTING
ST3-1	1124842.87	933171.61
ST3-2	1124852.02	933192.47
ST3-3	1124849.26	933228.98
ST3-4	1124827.30	933271.06
ST3-5	1124804.34	933287.95
ST3-6	1124787.30	933290.99
ST3-7	1124773.77	933273.64
ST3-8	1124764.31	933212.82
ST3-9	1124751.65	933175.93
ST3-10	1124753.89	933153.12
ST3-11	1124763.13	933150.65
ST3-12	1124780.94	933159.49
ST3-13	1124824.44	933161.76

Generator's Industrial Waste Profile for the Seneca Meadows Landfill

Seneca Meadows, Inc.
1786 Salcman Road
Waterloo, NY 13165
NYS DEC Facility #50S08
Telephone: 315-539-5624
Industrial Waste Fax: 315-539-0557
E-mail: rprincipio@iesi.com

File Number: _____

Generators Industrial Waste Profile
Non Hazardous Waste Only

This form is for disposal of Non Hazardous Waste at the Seneca Meadows Landfill only
NYSDEC Permit #8-4532-00023/00001-0

This form must be completed by the generator only

Generator's Name:			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		
EPA ID#:	State ID#:		

Facility Generating Waste:

Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Authorized Hauler (Primary):

Name:	NYS Permit #:		
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Authorized Hauler (Secondary):

Name:	NYS Permit #:		
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Waste Characterization:

Name of waste:	Description of waste:
Process that generated waste:	

Does this facility generate any hazardous waste? ☐ YES ☐ NO

If hazardous wastes are generated, does management feel that adequate controls are in place to control/separate waste streams? (if answer is no, a detailed explanation must be attached) ☐ YES ☐ NO

Certification of Representative Sample

Seneca Meadows File Number: _____

Generator's name:	
Waste name:	
Sampler's name:	
Sample date:	Sample time:

NOTE: This sample must be received by the lab within 24 hours

It is critical that the testing laboratory receive a representative sample of the waste stream that you intend to dispose of at Seneca Meadows Landfill. Please follow the instructions very carefully.

Sample Collection Process:

- Must be done by your consultant or selected laboratory representative
- Sample must be kept cold (placed in ice pack)
- Amount of samples required is one (1) container. However, we may require a semi-annual testing of the waste stream sample if the quantity exceeds 5,000 (thousand) tons per year

Samples required – One time only approvals:

1 – 200 tons	One (1) sample required
201 – 500 tons	Two (2) samples required
501 – 1,000 tons	Three (3) samples required
1,001 – 2,000 tons	Four (4) samples required
Over 2,000 tons	Determined by Seneca Meadows

Lab Selection:

We will have our waste stream analysis completed by:

Laboratory Name:			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Sample Certification:

I hereby certify that I personally collected a representative sample of waste stream at the location, time and date as listed above.

Signature: _____ Date: _____

Laboratory: _____

Generator Witness: _____

General Information

Seneca Meadows File Number: _____

Physical Characteristic:

☐ Solid ☐ Sludge Minimum % of solids _____ for waste stream

NOTE: Acceptable level of solids must exceed 20% and have no free liquids

Odor:

☐ None ☐ Mild ☐ Strong

Transportation:

☐ Roll Off ☐ Trailer ☐ Packer
☐ Other _____

NOTE: No drums are acceptable

☐ One time only ☐ On going

Approximate amount: _____ tons Amount of monthly _____ tons

What is the maximum tonnage for any given day: _____ tons

Briefly describe any special handling that could be required for this waste item:
(dust, protective clothing…)

Generators certification to Seneca Meadows landfill

(Please Initial)

I / we hereby certify that all of the information that we have presented to Seneca Meadows, Inc. on this form or any attachments is an accurate representation of our waste stream. _____

I / we hereby certify that the laboratory can contact Seneca Meadows, Inc. directly to discuss this waste stream. _____

I / we hereby certify that the waste stream that we are applying for disposal at Seneca Meadows, Inc. is not a listed or known hazardous waste. In addition, none of the components of the process, or any residue generated are known to be a hazardous, radioactive, or contain regulated concentrate of polychlorinated biphenyles (PCBs) waste streams. _____

I / we hereby agree that any charges in this waste stream, either in process method, changes of any of the components, or laboratory data received, that we will notify Seneca Meadows, Inc. in writing within 24 hours of our findings (*Fax is the preferred method of notification*). _____

Name: _____ Signature: _____

Title: _____ Date: _____

Industrial Waste Characterization Information

Section One - General project information (please complete in full)
If not applicable, denote with "NA"

Site / Project Engineering Company:			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

General Contractor:			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Seneca Meadows Customer to be Billed:			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Site Owner:			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Is the material a listed hazardous waste? ☐ YES ☐ NO

Description of the waste: _____

NYSDEC Waste Type Code: N - _____ Comments: _____

Section Two - Site information (please complete in full)
If not applicable, denote with "NA"

Was the site ever suspected of having hazardous materials? ☐ YES ☐ NO

If so, what was the source of the potential hazardous materials? _____

Which compounds were suspected? _____

Has testing been performed to quantify these compounds? ☐ YES ☐ NO

Who prepared the sampling and analysis program?

Company Name:			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Was the program reviewed by the NYSDEC and NYDOH officials prior to installation? ☐ YES ☐ NO

Was the program approved? ☐ YES ☐ NO

Please attach any available analytical data (*including Chain of Custody Record*)

What conclusions were made regarding the laboratory data?

Is the site a registered Superfund Site? ☐ YES ☐ NO

If so, place Site Registration Number here: _____

Will copies of the scale manifest / tickets be required? ☐ YES ☐ NO

NOTE: Seneca Meadows, Inc. may have to charge a nominal administrative fee for providing this information at a later date, if not notified appropriately herein

Additional comments, handling precautions or supplemental information:

Generator's Hazardous Waste Profile Sheet and LDR Notification or Certification Form for New York Regulated PCB Waste

Generator's Hazardous Waste Profile Sheet

WASTE MANAGEMENT

Service Agreement on file? ❑ Yes ❑ No Profile Number

❑ Check here if there are multiple generating locations for this waste. Attach additional locations.

❑ Check here if a Certificate of Destruction or Disposal is required

Requested Disposal Facility _____

❑ Renewal for Profile Number _____ Waste Approval Expiration Date _____

A. Waste Generator Facility Information (must reflect location of waste generation/origin)

1. Generator Name: _____
2. Site Address: _____
3. City/ZIP: _____
4. State: _____
5. County: _____
6. Contact Name/Title: _____
7. Email Address: _____
8. Phone: _____
9. FAX: _____
10. NAICS Code: _____
11. Generator USEPA ID #: _____
12. State ID# (if applicable): _____

B. Customer Information ❑ same as above

P. O. Number: _____

1. Customer Name: _____
2. Billing Address: _____
3. City, State and ZIP: _____
4. Contact Name: _____
5. Contact Email: _____
6. Phone: _____ FAX: _____
7. Transporter Name: _____
8. Transporter ID # (if appl.): _____
9. Transporter Address: _____
10. City, State and ZIP: _____

C. Waste Stream Information

❑ USEPA Hazardous ❑ State Hazardous ❑ TSCA ❑ Non-Hazardous

1. Description
   a. Name of Waste: _____
   b. Process Generating Waste:
   c. Color: _____
   d. Strong Odor (describe): _____
   e. Physical State at 70°F: ❑ Solid ❑ Liquid ❑ Gas ❑ Sludge ❑ Other: _____
   f. Layers? ❑ Single layer ❑ Multi- layer
   g. Free Liquid Range (%) _____ to _____ Specific Gravity: _____ Viscosity: _____ BTU/lb: _____
   h. pH Range: _____ to _____
   i. Liquid Flash Point: ❑ < 73°F ❑ 73°-99°F ❑ 100°-139°F ❑ 140°-199°F ❑ > 200°F ❑ N/A
2. Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to question f ❑ Yes ❑ No
   a. If yes, identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U)

   _____
   b. If a characteristic hazardous waste, do underlying hazardous constituents(UHCs) apply-(40 CFR 268.48)? ❑ Yes ❑ No (if yes, list in Section C.2.j)
   c. Is the waste subject to RCRA Subpart CC Controls-(40 CFR 264.1083 & 265.1084)? ❑ Yes ❑ No ❑ ? Click for Add'l Info
      If no, does the waste meet the organic LDR Exemption? ❑ Yes ❑ No
      If no, does the waste contain <500 ppm volatile organic (VOC's)? ❑ Yes ❑ No
      Volatile organic concentration _____ ppm
   d. Is the waste predominately debris subject to the Alternate Debris Standards (40 CFR 268.45)? ❑ Yes ❑ No
   e. Is the waste predominately soil subject to the Alternate Soil Treatment Standards-(40 CFR 268.49)? ❑ Yes ❑ No
      If yes, will Underlying Hazardous Constituents apply? (list in C.2.j) ❑ Yes ❑ No
   f. Does the waste represented by this profile contain asbestos? ❑ Yes ❑ No
      If yes, ❑ Friable ❑ Non-Friable
   g. Does the waste represented by this profile contain benzene? ❑ Yes ❑ No
      Is this subject to Benzene Operations Waste NESHAP (40 CFR Part 61 Subpart FF)? ❑ Yes ❑ No
      If yes, complete Beneze Waste Operations NESHAP (BWON) questionaire

WASTE MANAGEMENT

Generator's Hazardous Waste Profile Sheet

Profile Number

C. Waste Stream Information (continued)

h. Is this profile for remediation waste from a facility that is a major source of Hazardous Air Pollutants (Site Remediation NESHAP, 40 CFR 63 subpart GGGGG)? ❑ Yes ❑ No

If yes, does the waste contain <500 ppm VOHAPs at the point of determination? ❑ Yes ❑ No

i. Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? (if yes, list in Chemical Composition - C.2.j) ❑ Yes ❑ No

Were the PCBs imported into the U.S.? ❑ Yes ❑ No

Are PCBs regulated under the "Self-Implementing Remediation Section of (Mega) Rule?" 40CFR 761,61(a) ❑ Yes ❑ No

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis): ❑ (See Attached - for entering additional constituents)

Constituents *(Total Composition Must be > 100%)*	Lower Range	Unit of Measure	Upper Range	Unit of Measure
1.				
2.				
3.				
4.				
5.				
6.				

k. Check any that apply: ❑ Pyrophoric ❑ Water Reactive ❑ OSHA Carcinogen ❑ Shock Sensitive ❑ Oxidizer ❑ Infectious

l. Is the waste subject to controls as a Group 1 wastewater or residual under the Hazardous Organic NESHAP? ❑ Yes ❑ No

If yes, is it a Table 8 _____ or Table 9 _____ compound?

m. Does the waste represented by this waste profile sheet contain radioactive material? ❑ Yes ❑ No

Is disposal regulated by the Nuclear Regulatory Commission? ❑ Yes ❑ No

If NORM, identify isotopes and concentration, _____ pCi/g

n. Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated clean-up? ❑ Yes ❑ No

If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site clean-up for activity.

For state mandated clean-up, provide relevant documentation.

o. Is this a State Hazardous Waste? ❑ Yes ❑ No If yes, please list applicable codes _____

If NY waste codes B001-B007 apply, please complete question C.2.c on page 1.

D. DOT Information and Shipping Volume

1. Quantity of Waste

a. ❑ Event ❑ Base/Ongoing (check one)

b. Estimated Annual Quantity: _____ ❑ Tons ❑ Yards ❑ Drums ❑ Other (specify) _____

c. Shipping Frequency: Units: _____ Per: ❑ Month ❑ Quarter ❑ Year ❑ One Time ❑ Other _____

2. Shipping Information

a. Packaging:

❑ Roll off/End dump: _____ ❑ Other: _____

❑ Drum Type/Size: _____ ❑ Vacuum Box

❑ Tanker ❑ Super Sack ❑ Tote Bin ❑ Cubic Yard Boxes

b. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip c, d and e) ❑ Yes ❑ No

c. Reportable Quantity (lbs.; kgs.): _____ d. Primary/Subsidiary Hazard Class(es)/ID#: _____

e. USDOT Shipping Name: _____ PG: _____

E. Generator Certification (Please read and certify by signature below)

I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this wastestream. Any sample submitted is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. I authorize WMI to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. If approved for management, Contractor has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile. All relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste will be disclosed to the contractor. All changes which occur in the character of the waste will be identified by the Generator and be disclosed to the Contractor prior to providing the waste to the Contractor.

Certification Signature: _____ Title: _____

Name (Type or Print): _____ Company Name: _____ Date: _____

❑ Check if additional information is attached. Indicate the number of attached pages ____

LDR NOTIFICATION OR CERTIFICATION FORM
For New York Regulated PCB Waste

This form is required for wastes containing 50 ppm PCB or greater. The following profiled waste on the manifest number below is listed hazardous waste ("B-coded") in NY. ***Note****: Small capacitors and fully drained, non-capacitor50-500 ppm PCB articles [as defined in 6 NYCRR 371.4(e)(3)] are not regulated by NY State as B-listed hazardous wastes.*
Please complete items 1.- 8. and send with the first shipment of waste/profile.

1.) Generator Name _____

2.) Manifest Number _____ **3.) CWM Profile#** _____

4.) Please check *all* boxes that apply.

NY Waste Code	Identity/Type of PCB Waste	
B001	☐ Concentrated PCB Oil	
B002	☐ Oil/liquid 50-499 ppm PCBs	
B003	☐ Oil/liquid 500 ppm or greater PCBs	
B004	Manufactured PCB Articles 50-499 ppm:	☐ transformers ☐ motors ☐ switches ☐ cable ☐ pumps ☐ pipe ☐ other (specify):
B005	Manufactured PCB Articles (other than transformers) 500 ppm or greater:	☐ motors ☐ switches ☐ cable ☐ pumps ☐ pipe ☐ other (specify):
B006	PCB Transformers 500 ppm or greater	☐ full ☐ drained ☐ drained & flushed
B007	Other PCB Wastes:	☐ soil ☐ sludge ☐ clothing ☐ rags ☐ wood ☐ other (specify):

5.) Check *one* box as appropriate.

CERTIFICATION - WASTE MEETS LAND DISPOSAL TREATMENT STANDARDS

☐ I am the generator of the waste as identified above, that is restricted under 6 NYCRR Part 376. I have determined that this waste **meets** the applicable treatment standards set forth in 6 NYCRR 376.4(f) and, therefore, it can be landfilled without further treatment. Waste does not include solidified B002 material (liquid with PCBs 50-500ppm).

I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 6 NYCRR Part 376, section 376.4(f). I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

NOTIFICATION – WASTE <u>DOES NOT</u> MEET LAND DISPOSAL TREATMENT STANDARDS

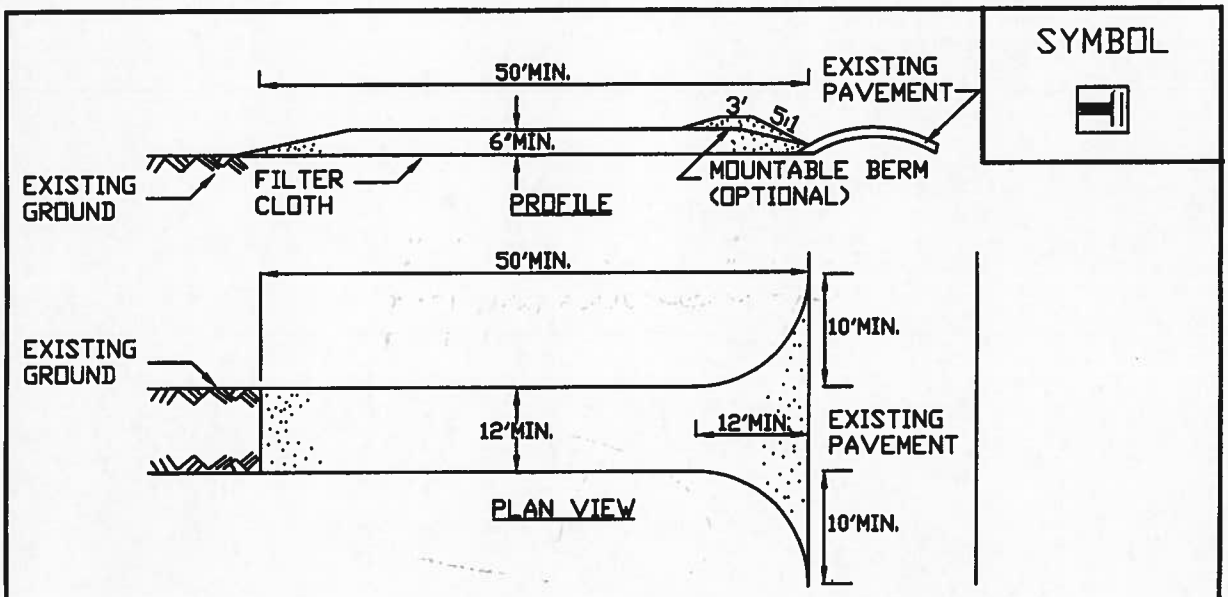
☐ I am the generator of a waste restricted under 6 NYCRR Part 376 as identified above. I notify that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that the waste **does not** comply with the treatment standards specified in 6 NYCRR Part 376.4 (f). This waste must be treated to the applicable standards set forth in 6 NYCRR 376.4 (f) prior to land disposal.

6.) Signature _____

7.) Title _____ **8.) Date** _____

North Landfill Entrance Roadway Improvement

Figure 5A.35
Stabilized Construction Entrance

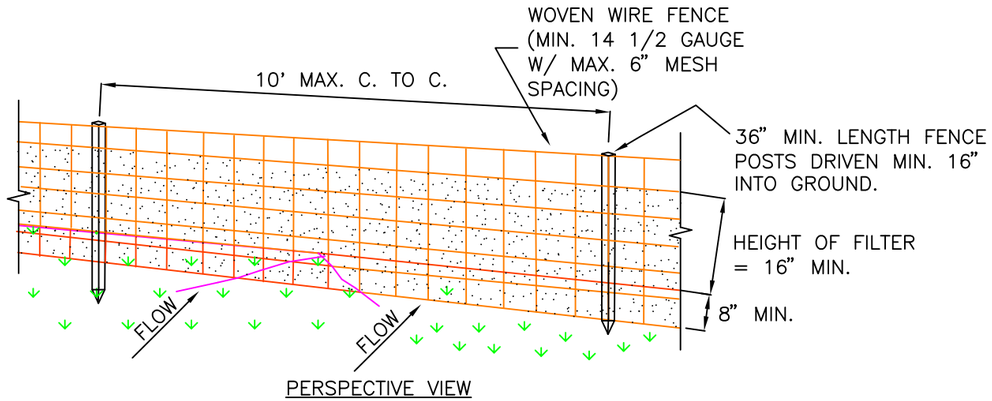


CONSTRUCTION SPECIFICATIONS

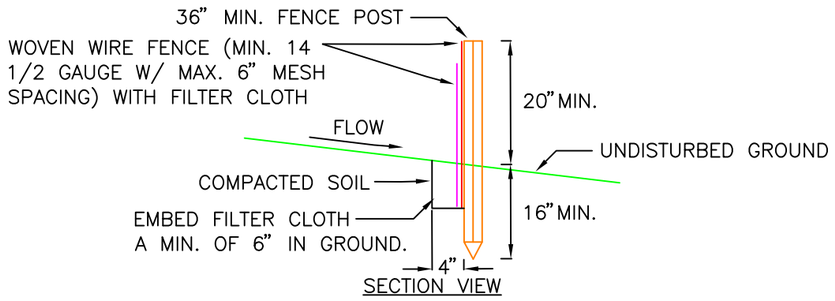
1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STABILIZED CONSTRUCTION ENTRANCE

Details of Reinforced Silt Fencing, Hay Bale Dikes and Filter Socks



PERSPECTIVE VIEW

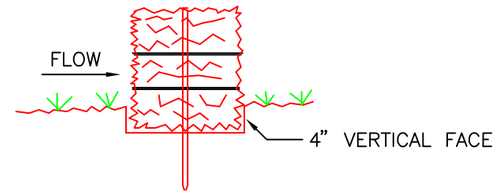


SECTION VIEW

CONSTRUCTION SPECIFICATIONS

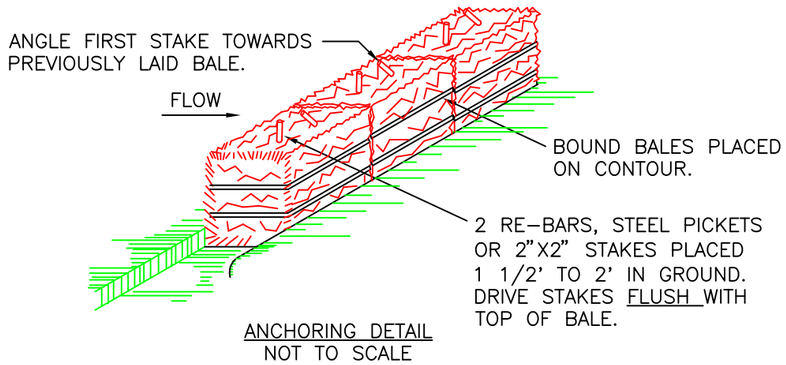
1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 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 LANDFILL FACILITY
SILT FENCE AND STRAW BALE DIKE DETAILS

LOCATION: SYRACUSE, NEW YORK

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202036
DATE	8/9/10

FIGURE: 5

S:\CAD\Cooper\Syracuse\8-5-10\2202036Fig5.dwg

SWPPP Cut Sheet:

Filtrexx® Sediment Control

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Sediment control is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for **perimeter control** of sediment and other soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities.

APPLICATION

Filtrexx® Sediment control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Sediment control is effective when installed perpendicular to sheet or low concentrated flow. Acceptable applications include:

- Site perimeters
- Above and below disturbed areas subject to sheet runoff, interrill and rill erosion
- Above and below exposed and erodable slopes
- Around area drains or inlets located in a 'sump'
- On compacted soils where trenching of silt fence is difficult or impossible
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation.
- On frozen ground where trenching of silt fence is impossible.
- On paved surfaces where trenching of silt fence is impossible.

INSTALLATION

1. Sediment control used for perimeter control of sediment and soluble pollutants in storm runoff shall meet Filtrexx® Soxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be Filtrexx® Certified™ as determined by Filtrexx® International, LLC (440-926-2607 or visit website at www.filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (current listing can be found at www.filtrexx.com). Look for the Filtrexx® Certified™ Seal.
3. Sediment control will be placed at locations indicated on plans as directed by the Engineer.
4. Sediment control should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e., 2:1 slopes), a second Sediment control shall be constructed at the top of the slope.
5. Effective Soxx™ height in the field should be as follows: 8" Diameter Sediment control = 6.5" high, 12" Diameter Sediment control = 9.5" high, 18" Diameter SiltSoxx™ = 14.5" high, 24" Diameter Sediment control = 19" high.
6. Stakes shall be installed through the middle of the Sediment control on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) hard wood stakes. In the event staking is not possible, i.e., when Sediment control is used on pavement, heavy concrete blocks shall be used behind the Sediment control to help stabilize during rainfall/runoff events.
7. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
8. Loose compost may be backfilled along the upslope side of the Sediment control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
9. If the Sediment control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for establishment of permanent vegetation. The Engineer will specify seed requirements.

10. Filtrexx® Sediment control is not to be used in perennial, ephemeral, or intermittent streams.

See design drawing schematic for correct Filtrexx® Sediment control installation (Figure 1.1).

INSPECTION AND MAINTENANCE

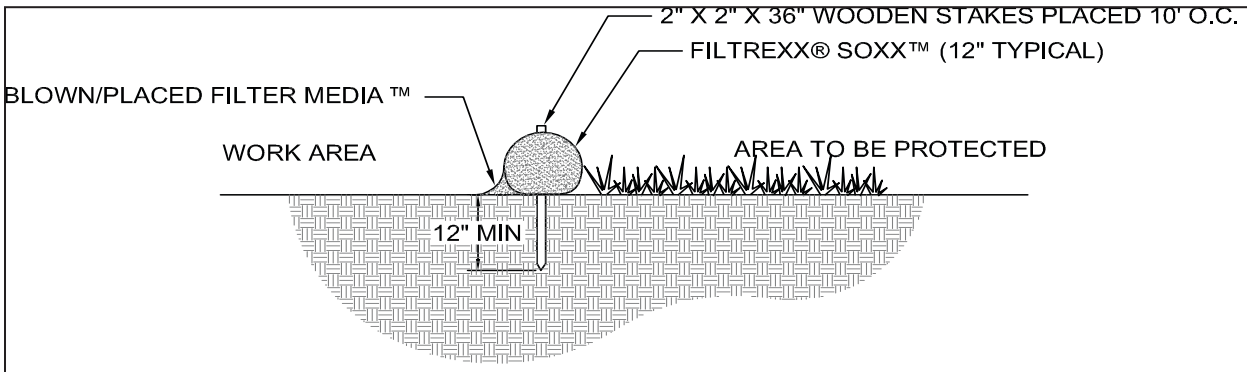
Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Sediment control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary. Sediment control shall be inspected until area above has been permanently stabilized and construction activity has ceased

1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Sediment control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, Sediment control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

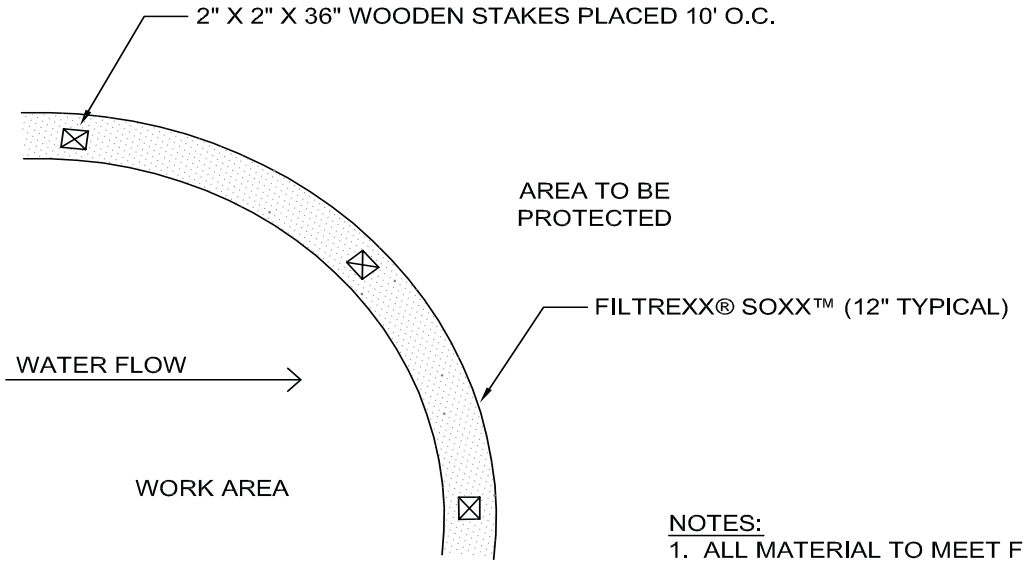
Slope Percent	Maximum Slope Length Above Sediment Control in Feet (meters)*				
	8 in (200 mm) Sediment control	12 in (300 mm) Sediment control	18 in (450 mm) Sediment control	24 in (600mm) Sediment control	32 in (800mm) Sediment control
	6.5 in (160 mm)**	9.5 in (240 mm) **	14.5 in (360 mm) **	19 in (480 mm) **	26 in (650 mm) **
2 (or less)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.



SECTION NTS



PLAN NTS

NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. FILTER MEDIA™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

FILTREXX® SEDIMENT CONTROL

NTS

Health & Safety Plan

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

August 1, 2012

TABLE OF CONTENTS

ATTACHMENTS

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:	08-01-2012
Hazard Assessment Certification:*		Date:	
* This certifies that Tetra Tech GEO 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:	08-01-2012
Proposed Dates of Work:	08-01-2012 through 12-31-2012		
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		
Todd Thomson		Senior Technician/ H&S Officer		
Ashley Weimer		Staff Geologist/ H&S Officer Alternate		

* Designated Site Safety Coordinator
** Designated Site Supervisor

C. PROJECT TASKS/ACTIVITIES

1.	Soil borings	5.	
2.	Soil sampling	6.	
3.	Soil excavation & hauling	7.	
4.	Tree & brush clearing	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. Brush and tall grass covers most of the site. 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.

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 Borings

Soil Sampling

Soil Excavation

Brush Clearing

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	Clear Brush, 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 Cooper 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 soil borings and excavations are shown on drawings.

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

B. DECONTAMINATION EQUIPMENT & SUPPLIES

Drums to be furnished by driller to decon split spoons. One drum to be used for placement of spent gloves, trash, and cleaning supplies. TSP or Alconox plus potable water from CC-H plant to be used to decon split spoons. Excavation contractor to furnish drums for spent decon materials and PPE. 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 GEO 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!!*

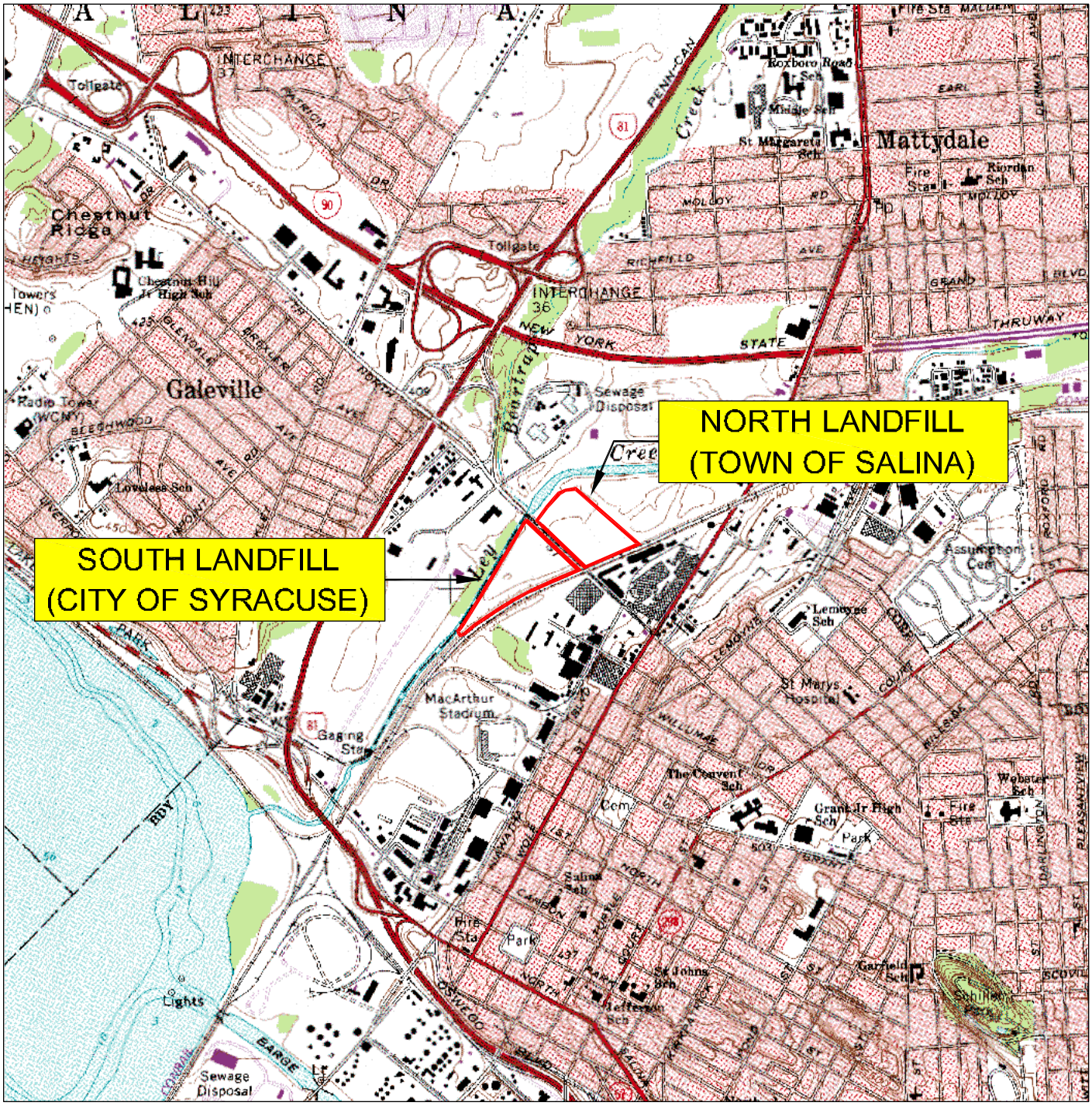
Injury/Illness: Perform first aid, following appropriate blood borne pathogens precautions. Call emergency medical services if injury is serious. Do not unnecessarily move if broken bones are suspected, unless life is endangered. If person is safe to move (minor cuts, burns, etc.), transport the person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

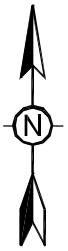
NOTE: All emergency situations must be reported to the office and require a follow-up accident or near-miss investigation report.



National Geodetic Vertical Datum of 1929
Contour Interval 10 Feet

SCALE
0 5000
FEET

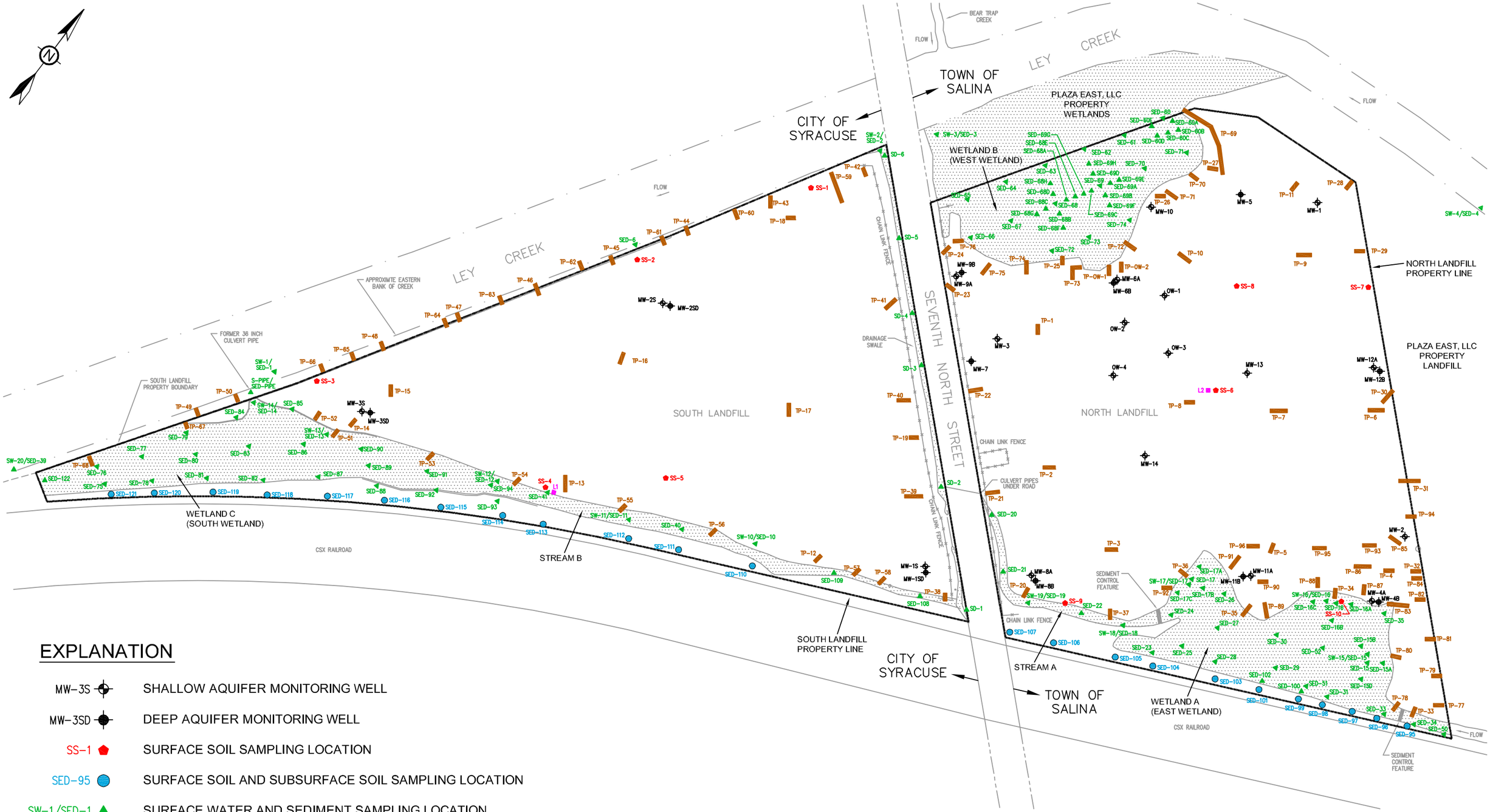
QUADRANGLE LOCATION



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-13	TEST PIT LOCATION
L1	LEACHATE SAMPLING LOCATION

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SITE PLAN

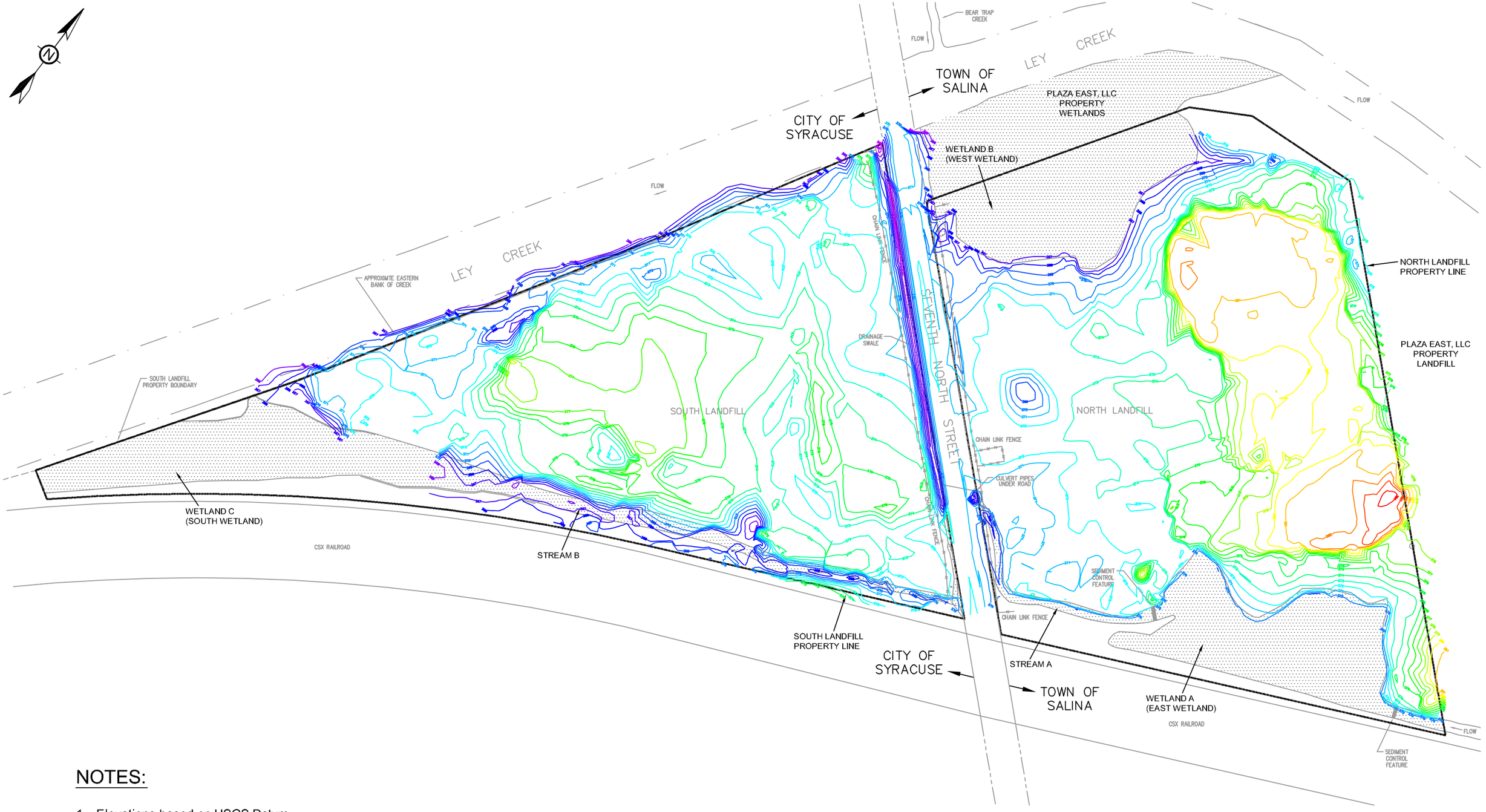
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/23/10

FIGURE: 2

S:\CAD\COOPER\SYRACUSE\12-11-09\2202036FIG2.DWG



NOTES:

1. Elevations based on USGS Datum.
2. Boundaries on south side of Seventh North Street based on best available records and deed to Crouse Hinds bk. 1350 pg. 623.

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY SITE TOPOGRAPHIC MAP

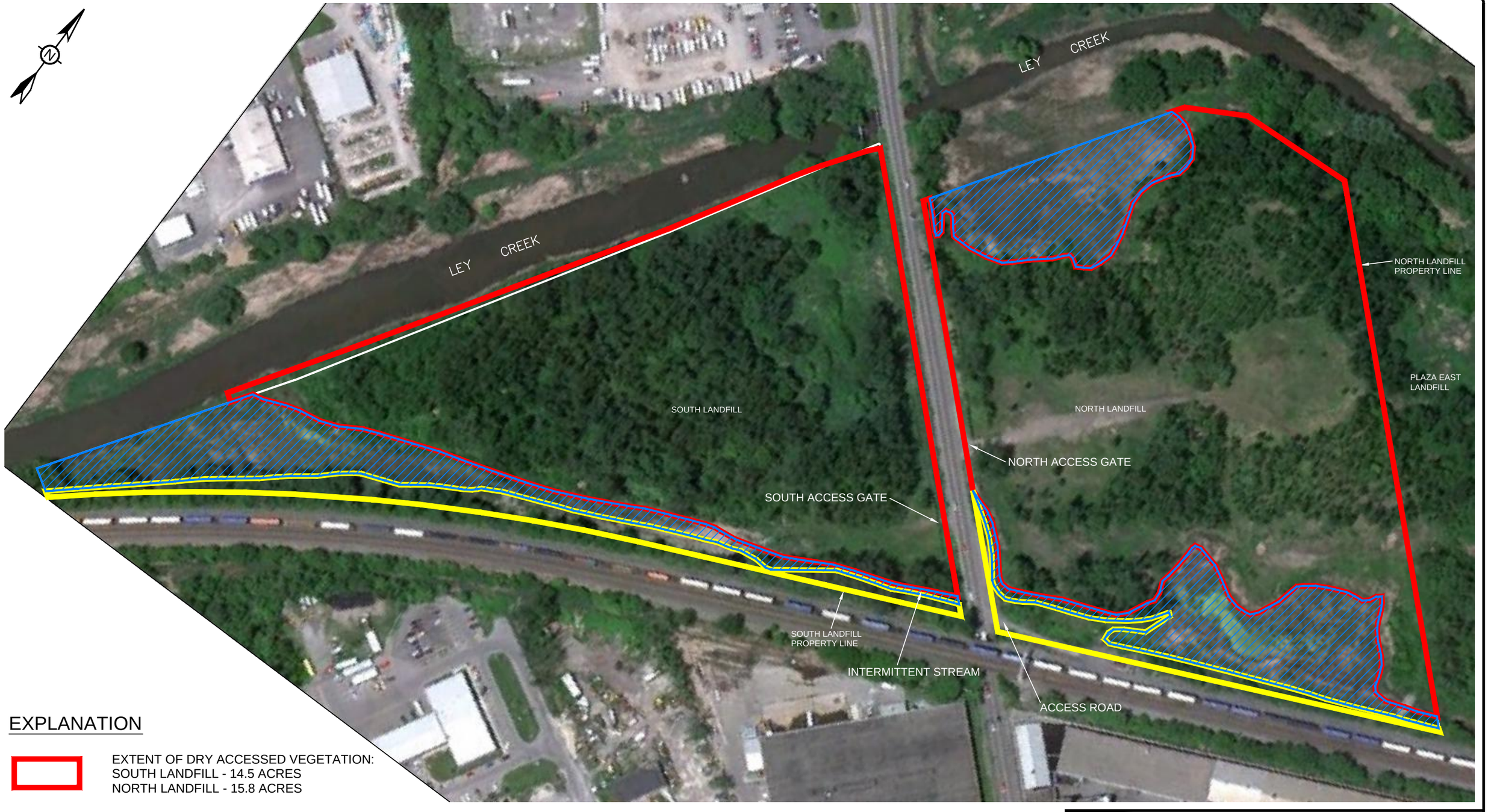
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/23/10

FIGURE: 3

S:\CAD\COOPER\SYRACUSE\12-11-09\2202036FIG3.DWG



EXPLANATION

EXTENT OF DRY ACCESSED VEGETATION:
SOUTH LANDFILL - 14.5 ACRES
NORTH LANDFILL - 15.8 ACRES

EXTENT OF MAPPED WETLAND AREA:
SOUTH LANDFILL - 3.1 ACRES
NORTH LANDFILL - 4.6 ACRES

EAST BOUNDARY AREA:
SOUTH LANDFILL - 1.8 ACRES
NORTH LANDFILL - 1.08 ACRES

0 180 360
SCALE IN FEET

TITLE: COOPER CROUSE-HINDS, LLC LANDFILL FACILITY
CLEARING AREAS AND ACCESS

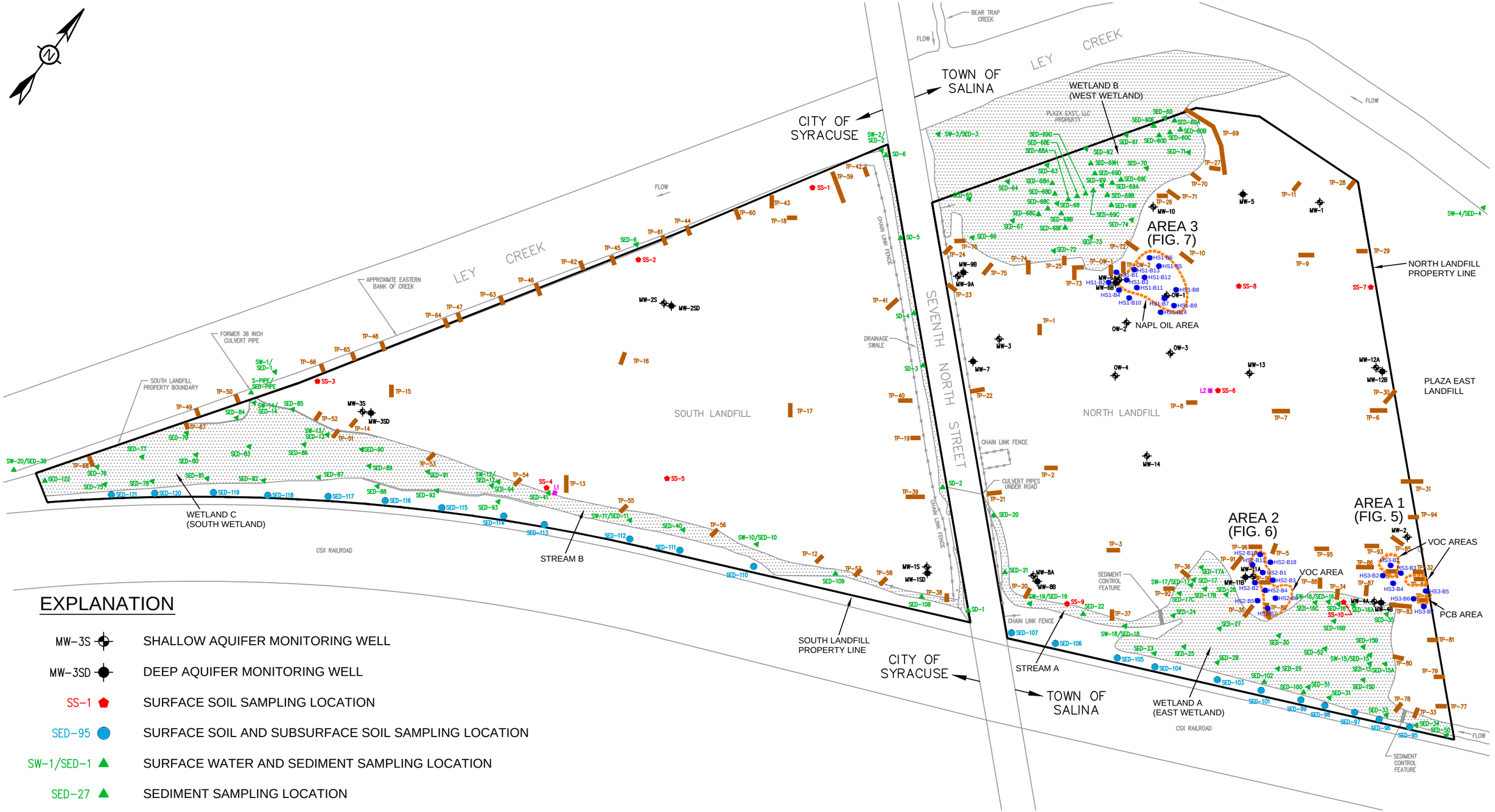
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/1/12

FIGURE: 4

S:\CAD\COOPER\SYRACUSE\9-12-11\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
- HS1-B1 — NOVEMBER 2010 BOREHOLES
- DELINEATED REMOVAL ACTION AREAS

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY REMOVAL ACTION DELINEATION AREAS

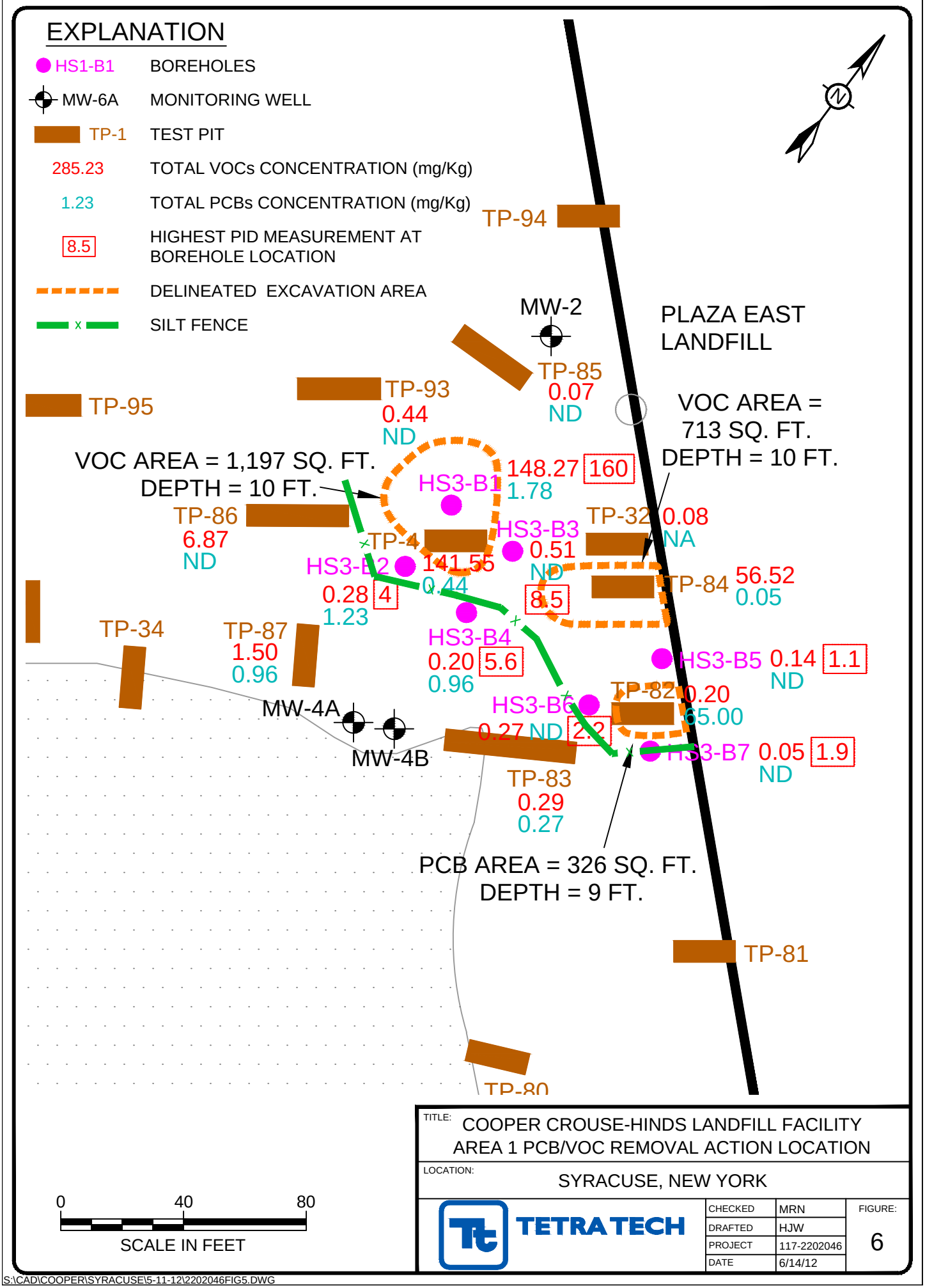
LOCATION: SYRACUSE, NEW YORK

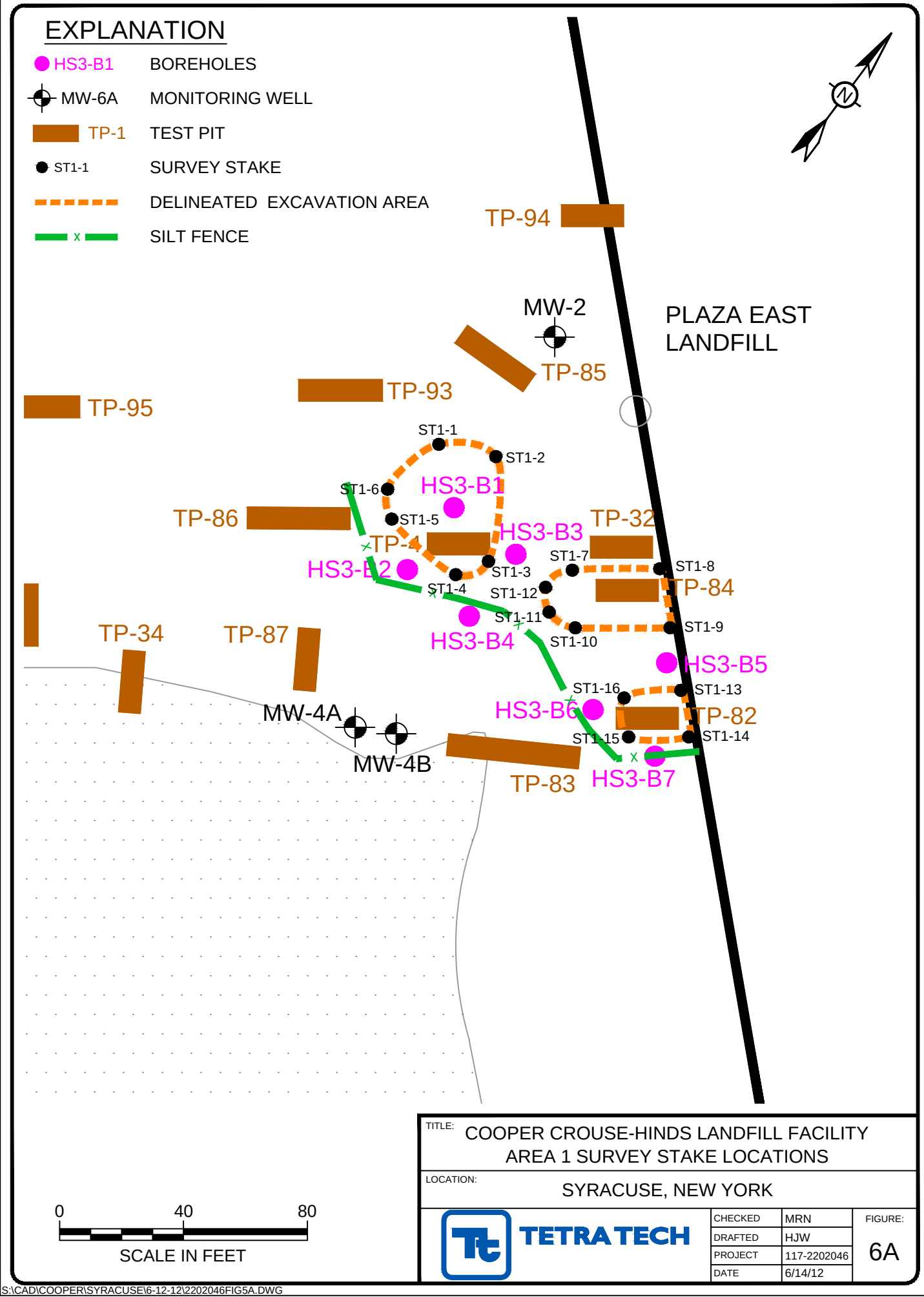
TETRA TECH

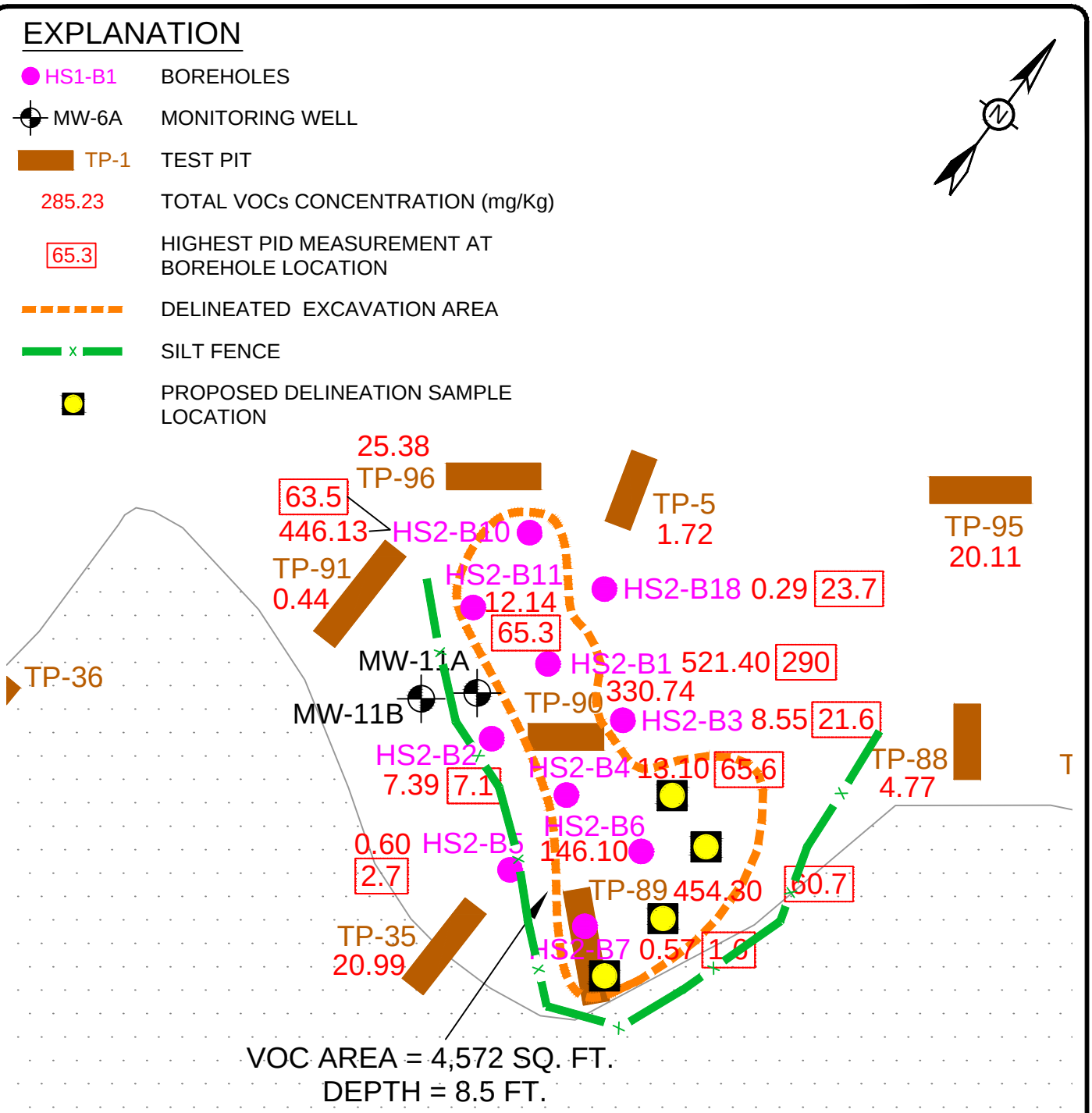
CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/14/12

FIGURE: 5

S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG1.DWG


EXPLANATION
HS1-B1 BOREHOLES
MW-6A MONITORING WELL
TP-1 TEST PIT
285.23 TOTAL VOCs CONCENTRATION (mg/Kg)
1.23 TOTAL PCBs CONCENTRATION (mg/Kg)
8.5 HIGHEST PID MEASUREMENT AT BOREHOLE LOCATION
DELINEATED EXCAVATION AREA
SILT FENCE
N
PLAZA EAST LANDFILL
TP-94
MW-2
TP-85 0.07 ND
TP-93 0.44 ND
TP-95
VOC AREA = 713 SQ. FT. DEPTH = 10 FT.
VOC AREA = 1,197 SQ. FT. DEPTH = 10 FT.
HS3-B1 148.27 160 1.78
TP-86 6.87 ND
TP-4
HS3-B3 0.51 ND
TP-32 0.08 NA
HS3-B2 141.55 0.44 0.28 4 1.23
8.5
TP-84 56.52 0.05
TP-34
TP-87 1.50 0.96
HS3-B4 0.20 5.6 0.96
HS3-B5 0.14 ND 1.1
MW-4A
TP-82 0.20 65.00
HS3-B6 0.27 ND 2.2
HS3-B7 0.05 ND 1.9
MW-4B
TP-83 0.29 0.27
PCB AREA = 326 SQ. FT. DEPTH = 9 FT.
TP-81
TP-80
0 40 80
SCALE IN FEET
TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY AREA 1 PCB/VOC REMOVAL ACTION LOCATION
LOCATION: SYRACUSE, NEW YORK
TETRA TECH
CHECKED MRN
DRAFTED HJW
PROJECT 117-2202046
DATE 6/14/12
FIGURE: 6
S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG5.DWG


EXPLANATION
HS3-B1 BOREHOLES
MW-6A MONITORING WELL
TP-1 TEST PIT
ST1-1 SURVEY STAKE
DELINEATED EXCAVATION AREA
SILT FENCE
TP-94
MW-2
PLAZA EAST LANDFILL
TP-85
TP-93
TP-95
ST1-1
ST1-2
ST1-6
HS3-B1
TP-86
ST1-5
TP-32
HS3-B3
TP-4
ST1-7
ST1-8
HS3-B2
ST1-3
TP-84
ST1-4
ST1-12
ST1-11
ST1-9
TP-34
TP-87
HS3-B4
ST1-10
HS3-B5
ST1-16
ST1-13
MW-4A
HS3-B6
TP-82
ST1-15
ST1-14
MW-4B
TP-83
HS3-B7
0
40
80
SCALE IN FEET
TITLE:
COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 1 SURVEY STAKE LOCATIONS
LOCATION:
SYRACUSE, NEW YORK
TETRA TECH
CHECKED MRN
DRAFTED HJW
PROJECT 117-2202046
DATE 6/14/12
FIGURE:
6A
S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG5A.DWG



TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 2 VOC REMOVAL ACTION LOCATION

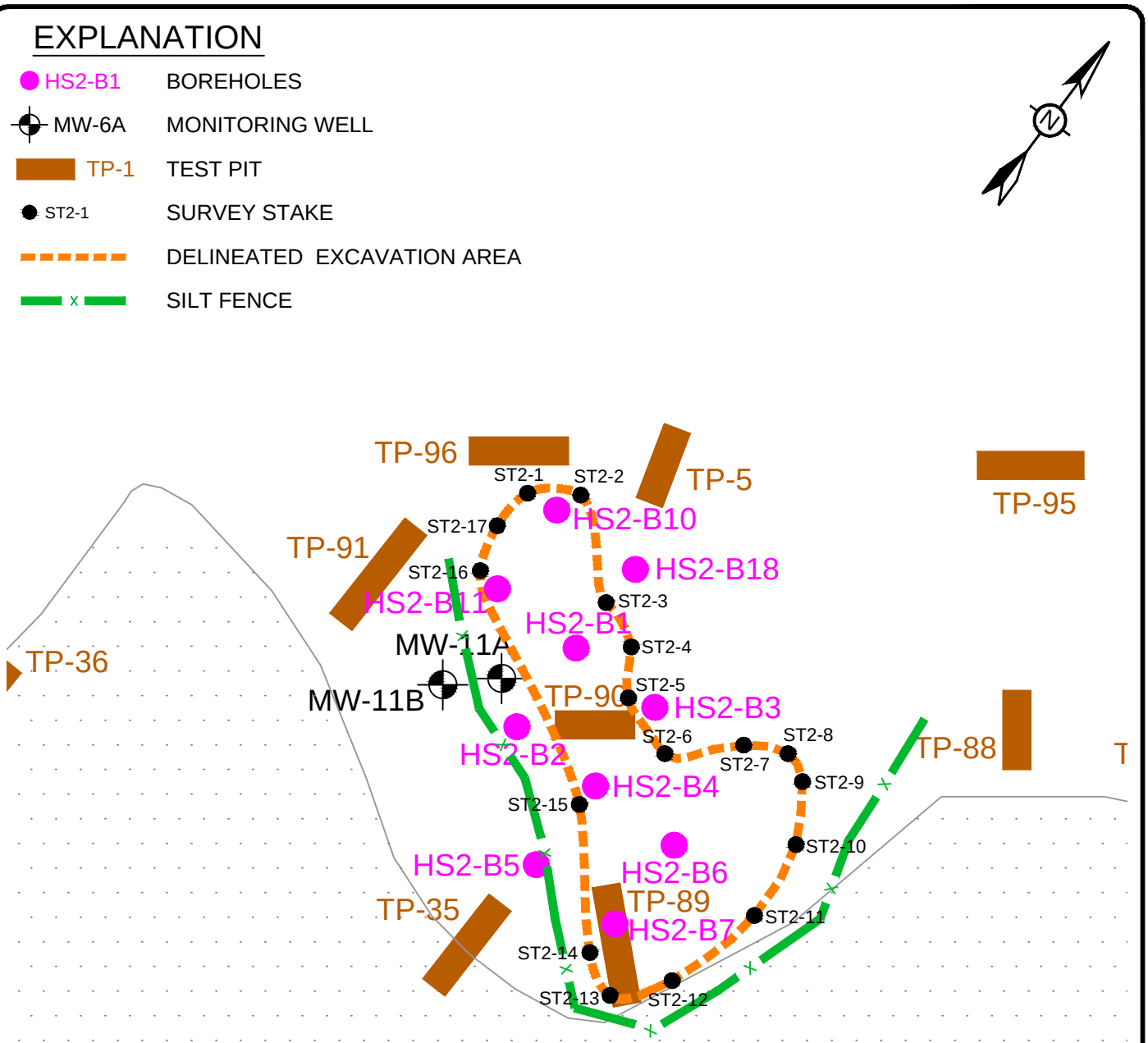
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/2/12

FIGURE: 7

S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG6.DWG



TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 2 SURVEY STAKE LOCATIONS

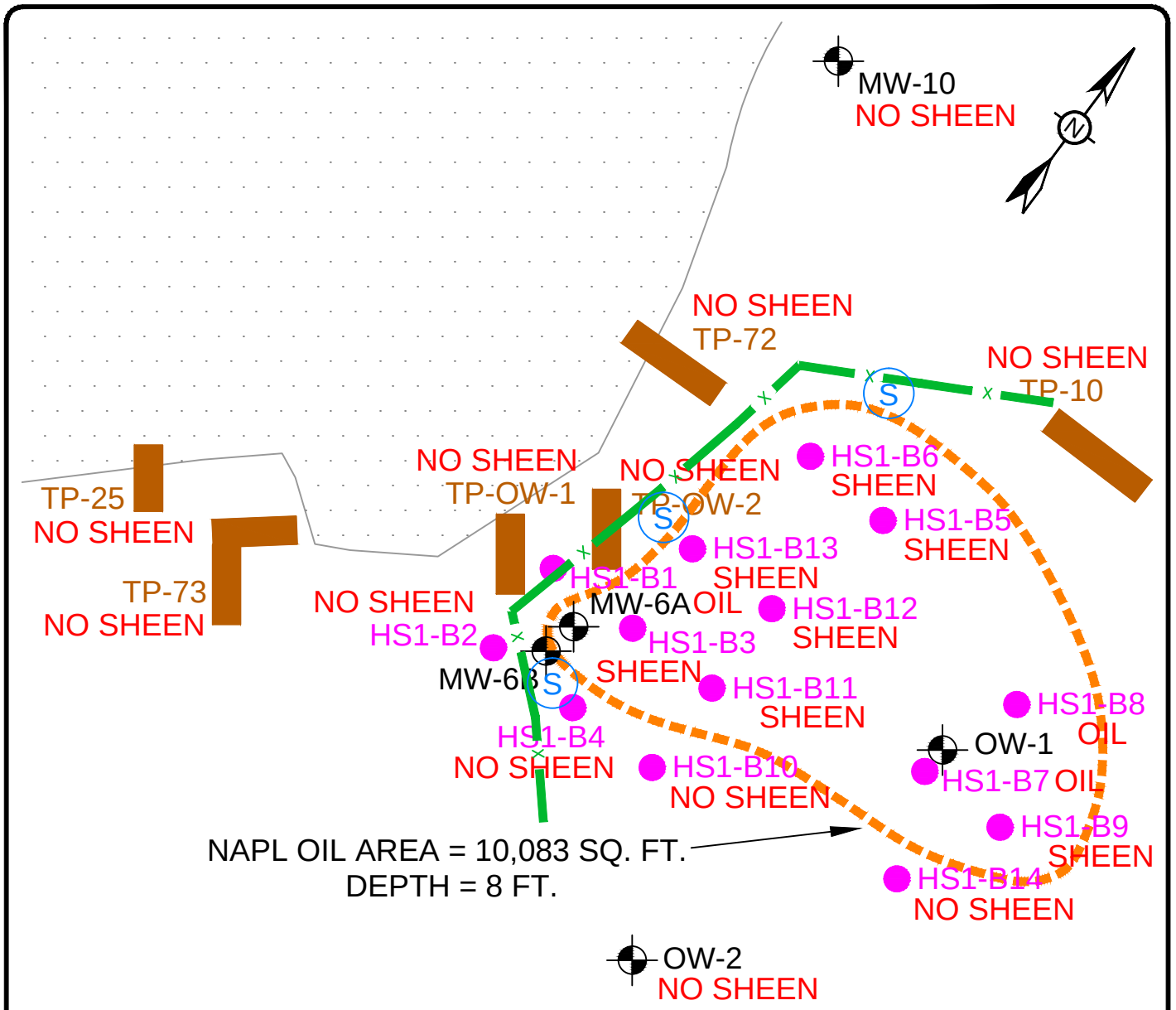
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/14/12

FIGURE: 7A

S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG6A.DWG



TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 3 NAPL OIL REMOVAL ACTION LOCATION

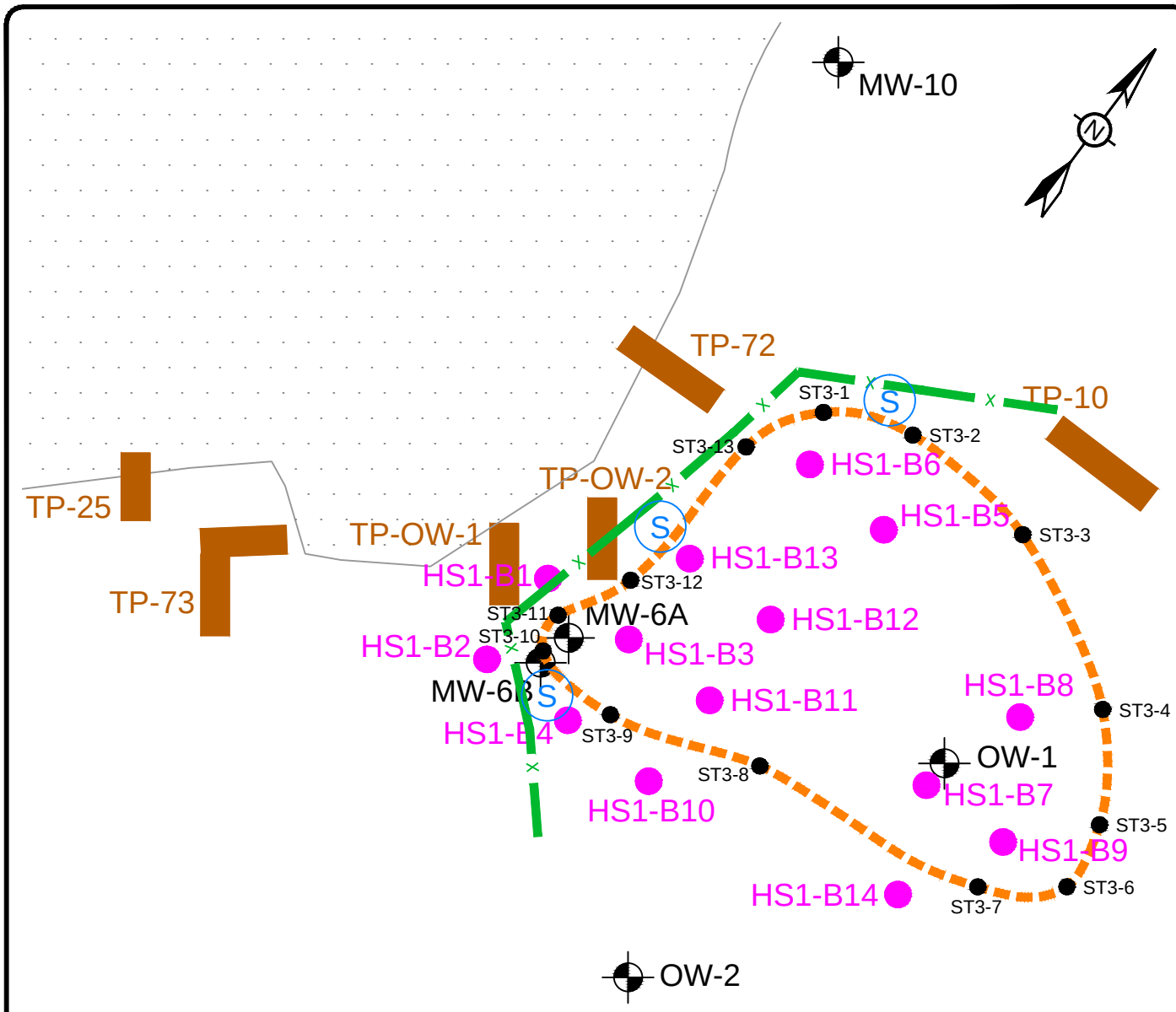
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/13/12

FIGURE: 8

S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG7.DWG



EXPLANATION

HS1-B1	BOREHOLES
MW-6A	MONITORING WELL
TP-1	TEST PIT
ST3-1	SURVEY STAKE
	DELINEATED AREA
x	SILT FENCE
S	OIL SUMP

0 40 80

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
AREA 3 SURVEY STAKE LOCATIONS

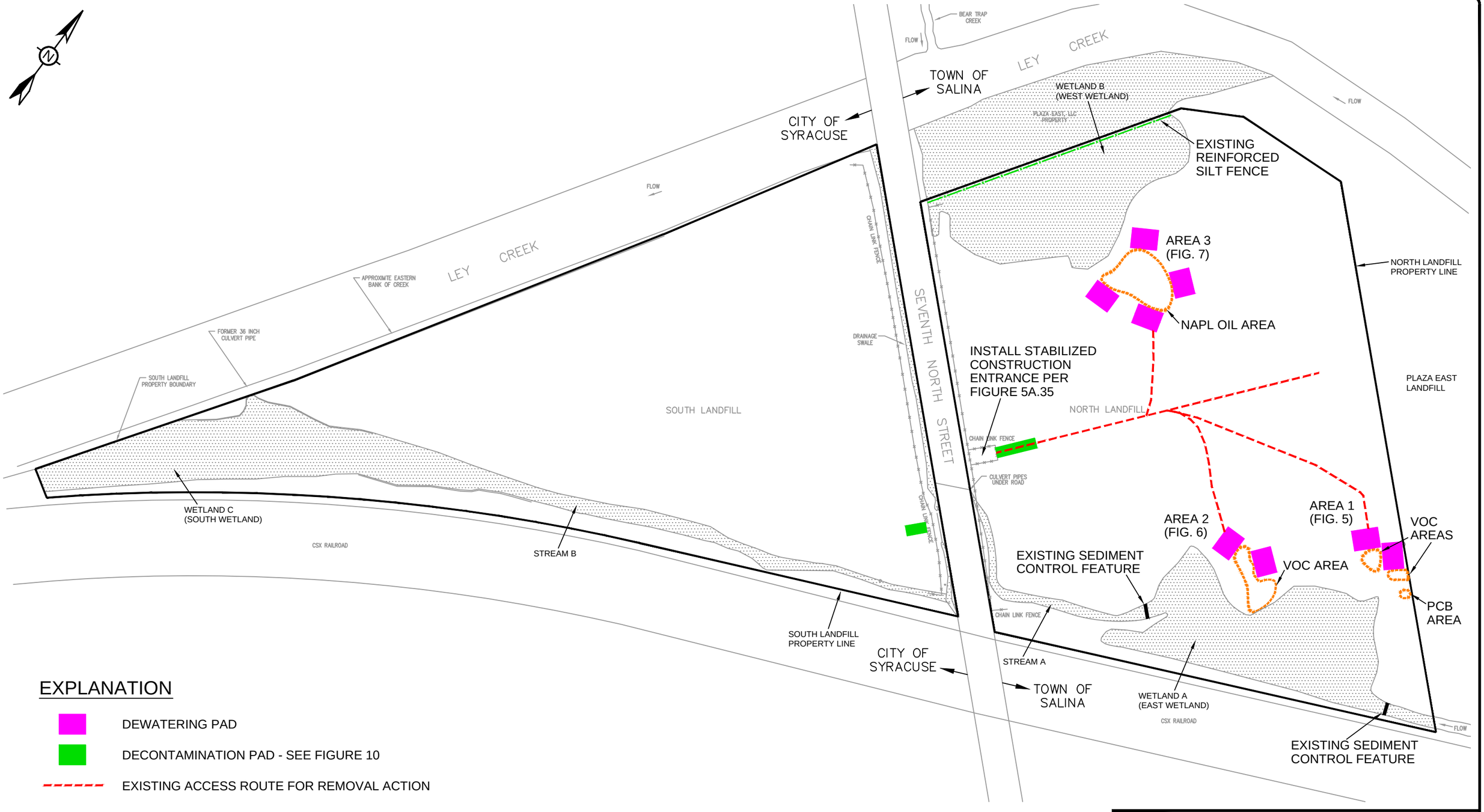
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	6/14/12

FIGURE: 8A

S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG7A.DWG



EXPLANATION

- DEWATERING PAD
- DECONTAMINATION PAD - SEE FIGURE 10
- EXISTING ACCESS ROUTE FOR REMOVAL ACTION

0 180 360

SCALE IN FEET

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY
REMOVAL ACTION DEWATERING PAD LOCATIONS

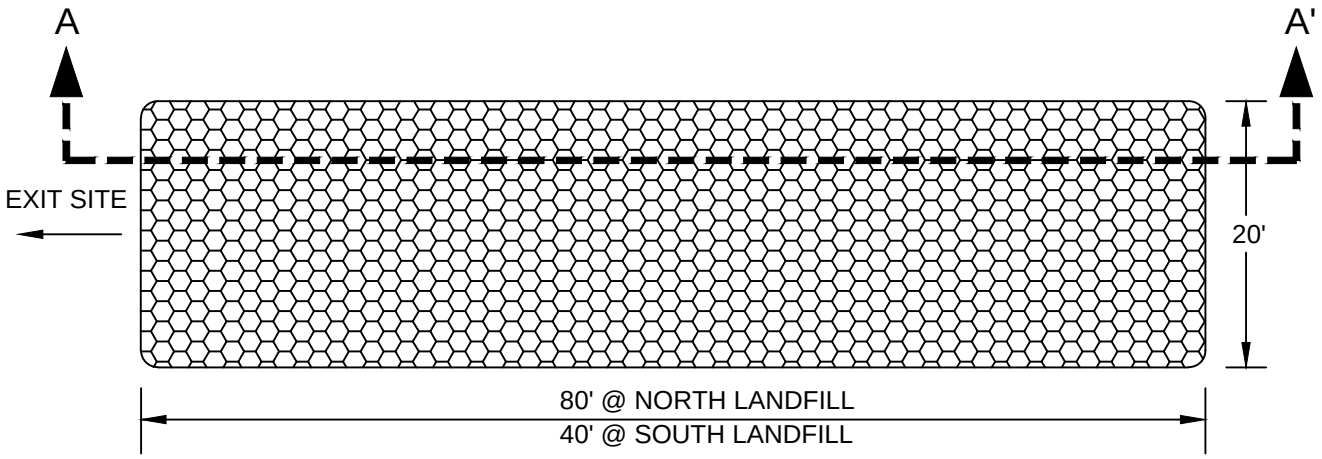
LOCATION: SYRACUSE, NEW YORK

TETRA TECH

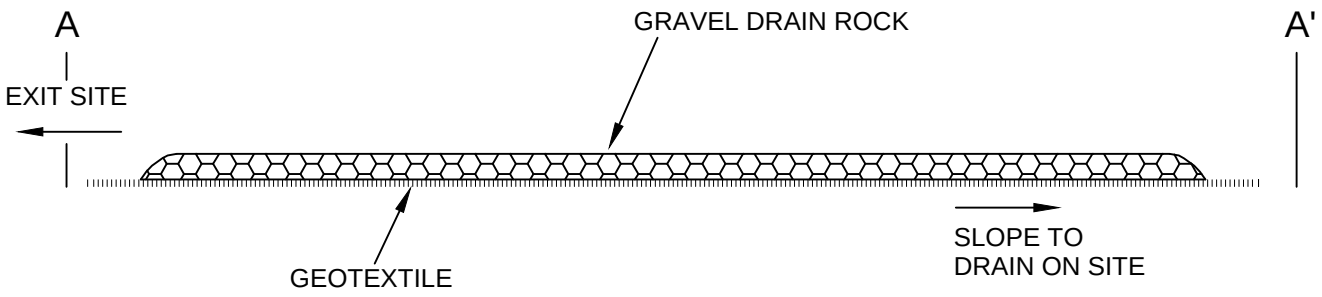
CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2202046
DATE	8/2/12

FIGURE: 9

S:\CAD\COOPER\SYRACUSE\5-11-12\2202046FIG8.DWG



DECONTAMINATION PAD PLAN



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.

TITLE: COOPER CROUSE-HINDS LANDFILL FACILITY DECONTAMINATION PAD DETAIL			
LOCATION: SYRACUSE, NEW YORK			
TETRA TECH	CHECKED	MRN	FIGURE: 10
	DRAFTED	HJW	
	PROJECT	117-2202046	
	DATE	8/2/12	

S:\CAD\COOPER\SYRACUSE\6-12-12\2202046FIG10.DWG

bing Maps

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

Via: US-11 / Wolf St

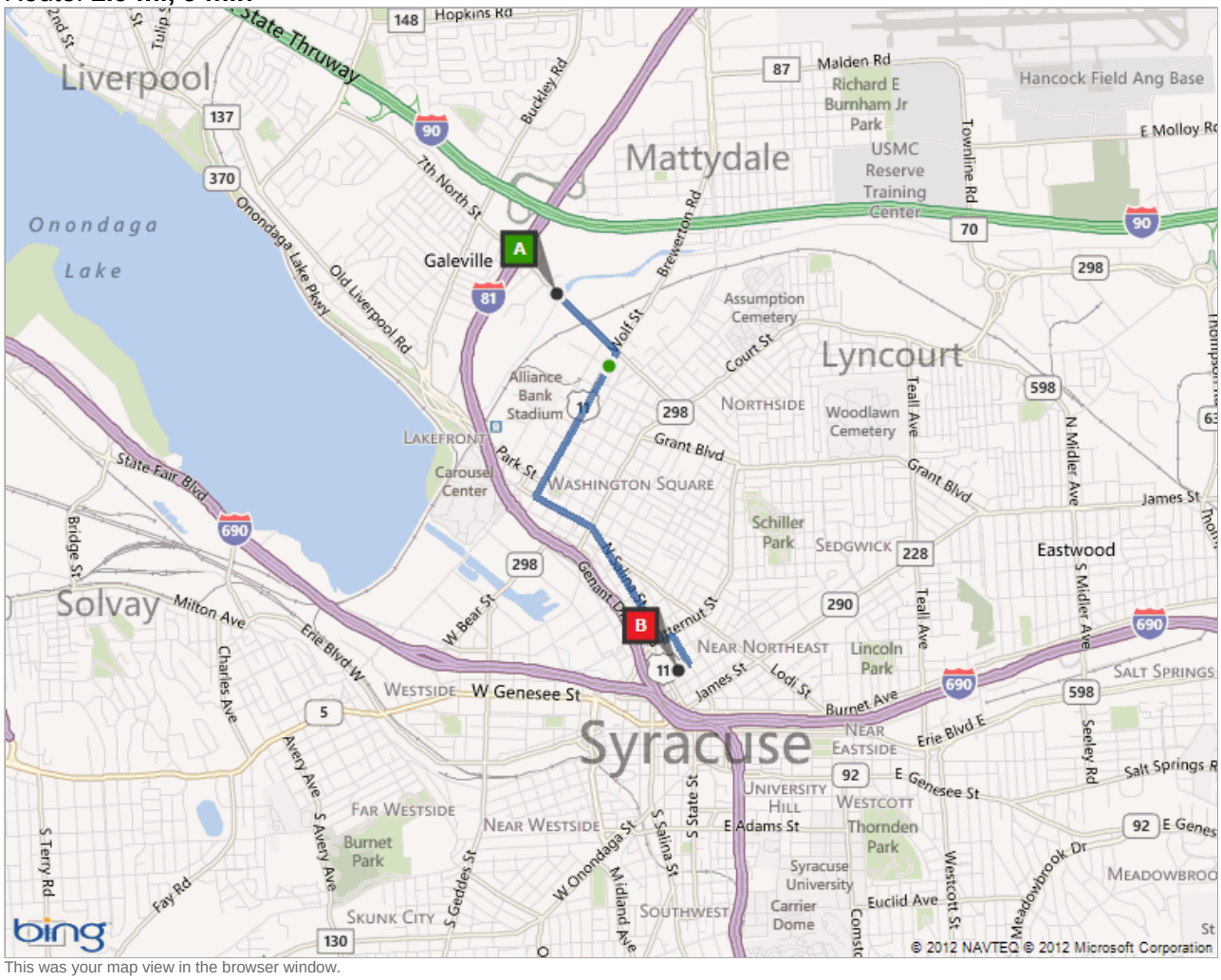
B **301 Prospect Ave, Syracuse, NY 13203**

Route: **2.9 mi, 9 min**

My Notes

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*	

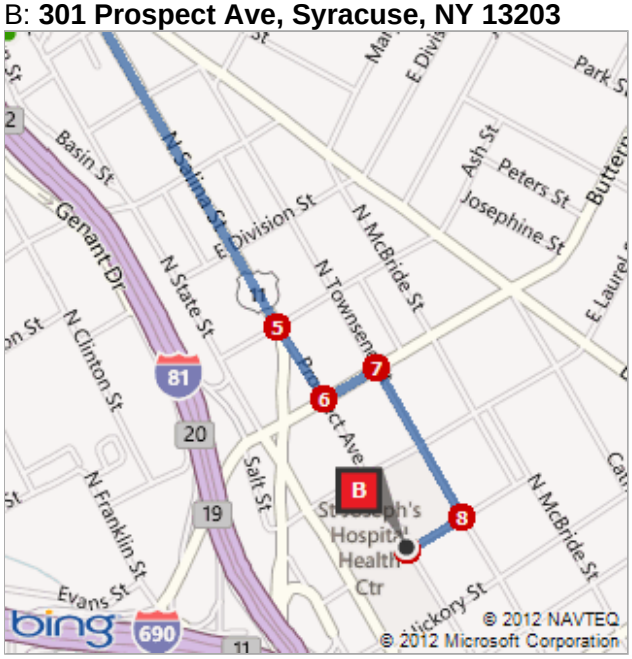
Route: **2.9 mi, 9 min**



This was your map view in the browser window.

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

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



	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:

_____

_____

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. These SWPs establish a pattern of general precautions and measures for reducing risks associated with field operations not conducted on hazardous waste sites. This list is not inclusive and may be amended as necessary.

- Be familiar with and knowledgeable of and adhere to all instructions in the construction health and safety plan (C-HASP), job safety analysis, job hazard analysis, work permit or other health and safety documentation.
- At a minimum, a safety meeting will be held at the start of each project to discuss the hazards of the site and site work. 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, fall protection, or other protective equipment is in use. Buddies should establish hand signals or other means of emergency communication in case radios break down or are unavailable.
- In order to assist each other in the event of an emergency, buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity.
- Do not bring nonessential vehicles and equipment onto 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; and other information related to safety matters.

- A portable eyewash station should be located in the support zone if corrosive materials are used or stored on the site.
- Smoking is not allowed on Tetra Tech projects sites, except in designated smoking areas.
- Do not bring matches and lighters in the exclusion zone or contamination reduction zone.
- 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.
- Anyone known to be under the influence of drugs or intoxicating substances that impair the employee's ability to safely perform assigned duties shall not be allowed on the job while in that condition.
- Horseplay, scuffling, and other acts that tend to have an adverse influence on the safety or well-being of the employees is prohibited.
- Work shall be well planned to prevent injuries in the handling of materials and when working with equipment.
- No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness, or other causes that might unnecessarily expose the employee or others to injury.
- Use proper lifting techniques. Heavy objects will be lifted using the large muscles of the leg instead of the smaller muscles of the back.
- Wear appropriate footwear and all other protective equipment required for work.
- Cleanse thoroughly after handling hazardous substances.
- Maintain all tools and equipment in good condition.
- First aid kits shall be located in a prominent location and stocked with basic first aid supplies.

Revision Date	Document Authorizer	Revision Details
10/1/2008	Chris McClain	NEW

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.

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.

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).

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.

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."

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

Revision Date	Document Authorizer	Revision Details
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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.

- 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 untreated 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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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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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.

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.

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.

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

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.

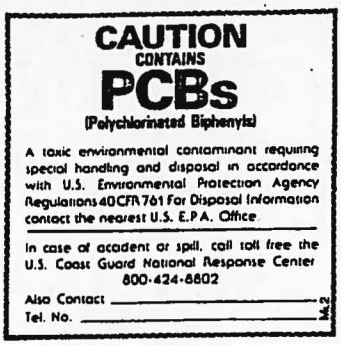
Personnel trained in emergency procedures and protected against attendant hazards should shut off sources of PCBs, clean up spills, control and repair leaks, and fight fires in PCB areas.

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

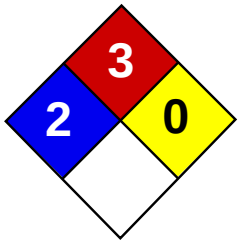
Reason for revision: Conversion to the 16 section format. Supersedes MSDS dated 10/88.

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



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., National 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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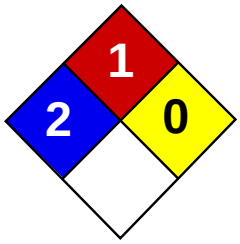
Last Updated: 11/01/2010 12:00 PM



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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