



PAOC 18 INTERIM MEASURES WORK PLAN

**COMPANY VEHICLE OPERATIONS
YPSILANTI, MICHIGAN
U.S. EPA ID MIK468293311**

**Prepared For: Revitalizing Auto Communities Environmental Response
Trust (RACER)**

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LIST OF ACRONYMS

AFR	Area for Remediation
AMSL	Above Mean Sea Level
AOC	Area of Contamination
bgs	Below Ground Surface
CFR	Code of Federal Regulations
cis-DCE	cis-1,2-dichloroethene
COC	Constituents of Concern
CRA	Conestoga-Rovers & Associates, Inc.
CVO	Company Vehicle Operations
CVOCs	Chlorinated Volatile Organic Compounds
cyd	Cubic Yards
DNAPL	Dense Non-Aqueous Phase Liquid
EOS™	Edible Oil Substrate
EQ	The Environmental Quality Company
FAV	Final Acute Value
FMC	FMC Environmental Solutions
GM	General Motors
gpm	Gallons per Minute
GPS	Global Positioning System
GSI	Groundwater Surface Water Interface
GSIPC	Groundwater Surface Water Interface Protection Criteria
IMWP	Interim Measures Work Plan
Kaiser-Frazer	The Kaiser-Frazer Company
LDRs	Land Disposal Restrictions
MDEQ	Michigan Department of Environmental Quality
MDI	Michigan Disposal, Inc.
MDOT	Michigan Department of Transportation
OMM	Operation Maintenance and Monitoring
PAOC	Potential Area of Concern
PID	Photoionization Detector
PCB	Polychlorinated Biphenyl
ppm	Parts Per Million
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAM	Quality Assurance Manual
QAPP	Quality Assurance Project Plan
QC	Quality Control
RACER	Revitalizing Auto Communities Environmental Response Trust

RCRA	Resource Conservation and Recovery Act
RLs	Regulatory Levels
S ³ TM	Sampling Strategies and Statistics Training Materials
SIM	Selective Ion Monitoring
Site	CVO, Ypsilanti, Michigan
SOP	Standard Operating Procedures
SWPV	Soil-Water Partitioning Value
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
UTS	Universal Treatment Standards
VC	Vinyl Chloride
VOC	Volatile Organic Compound
UHCs	Underlying Hazardous Constituents
U.S. EPA	United States Environmental Protection Agency
WDI	Waste Disposal, Inc.
WRAP	Willow Run Assembly Plant
YCUA	Ypsilanti Community Utilities Authority

1.0 INTRODUCTION

On behalf of Revitalizing Auto Communities Environmental Response Trust (RACER), Conestoga-Rovers & Associates, Inc. (CRA) in consultation with The Environmental Quality Company (EQ), have prepared this Interim Measures Work Plan (IMWP) for the Willow Run Company Vehicle Operations (CVO) site located in Ypsilanti, Michigan (Site) for the remediation of volatile organic compound (VOC) and polychlorinated biphenyl (PCB) impacts at a portion of the Site. Specifically, this IMWP addresses impacts located within Potential Area of Concern (PAOC) 18. Soil and groundwater impacts, including the presence of dense non-aqueous phase liquid (DNAPL) within the area, are the result of historic filling practices with industrial waste.

1.1 SITE LOCATION

The Site is located at 2901 Tyler Road in Ypsilanti, Michigan. It is bordered to the north and east by Tyler Pond, to the west by the Willow Run Business Center and to the south by Tyler Road.

1.2 SITE HISTORY

The CVO Site consists of the eastern 22 acres of the former Willow Run Assembly Plant (WRAP). The Site has had many owners. The Kaiser-Frazer Company (Kaiser-Frazer) leased the area from the War Asset Administration in November 1945 and purchased the facility in December 1948. Kaiser-Frazer is thought to have constructed an administration building to house design and engineering facilities on the WRAP site. Kaiser-Frazer owned the property until its sale to General Motors (GM) in December 1954. The original building at the WRAP was used by GM as a parts storage warehouse until 1955. In 1956, light truck assembly began at the plant. From 1956 to July 1993, operations were typical of an automotive assembly plant including, sheet metal assembly by welding solder applications, metal finishing, and washing, electro-deposition painting operations, and interior assembly. These operations were not conducted on the CVO portion of the former WRAP. Following assembly operations, vehicles were distributed to dealers by both truck and railway systems. Production operations ceased in July of 1993 and deactivation and decommissioning operations proceeded to prepare the facility for an eventual sale in 1997. GM retained ownership of the CVO property, which was used to store and maintain GM owned company vehicles until 2010.

The Site is currently owned by RACER Properties LLC and operated by RACER. RACER was created in March 2011 by the United States Bankruptcy Court to clean up and position for redevelopment properties and other facilities owned by the former General Motors Corporation before its 2009 bankruptcy.

PAOC 18 is located at the northern boundary of the Site along the bank of Tyler Pond as shown on Figure 1.1. Tyler Pond is a manmade impoundment of Willow Run Creek. In the 1990s it was determined that historic filling practices have impacted Site soils and groundwater. VOCs, specifically chlorinated volatile organic compounds (CVOCs) and PCBs are the primary constituents of concern in PAOC 18. In 2004, stained soils and DNAPL were observed in PAOC 18 along the southern bank of Tyler Pond. The main constituents detected in the DNAPL are trichloroethylene (TCE) (approximately 40%) and PCBs (up to 1.5%). A sheet pile wall was installed in October 2004 to prevent DNAPL from migrating into Tyler Pond. The groundwater in this area has been significantly impacted such that concentrations of CVOCs in groundwater have been detected above the groundwater surface water interface (GSI) criteria based on acute toxicity in groundwater.

Historically, waste material (including paint sludge and various drummed wastes) were dumped in various locations within the CVO Site during the 1940s and 1950s. This includes between the CVO fence line and Tyler Pond. In February of 1994, an estimated 90 cubic yards of visible surface waste material, including 30 drum remnants were removed from this area. Waste and soils were removed until visually clean underlying soils were exposed. In the early 2000s, chemical oxidation treatments were applied to this area to treat VOC impacted groundwater. Site investigations in the mid-2000s identified DNAPL, stained soils and additional buried debris present in this area. Several interim remedial actions have been implemented since 2004, when DNAPL was first identified. These interim remedial actions were designed and completed to avoid recontamination of Tyler Pond, which was dredged in the late 1990s to remove PCB impacted sediments. Appendix A provides additional information on the interim remedial actions completed.

1.3 PROJECT OVERVIEW

The Site is currently under MDEQ led Resource Conservation and Recovery Act (RCRA) Corrective Action due to the submission of a RCRA Part A Permit application in 1980 by GM. The RCRA history of the Site is summarized in the Site Summary Report (CRA, 2012), provided under separate cover. The United States Environmental Protection Agency (U.S. EPA) identification number (ID) associated with the November 1980

RCRA Part A permit application, subsequent waste activities for the former WRAP (which included the CVO property) and RCRA Corrective Action is MID005356795. This U.S. EPA ID is not currently used for any activity at the CVO Site. Currently the CVO Site has large quantity generator status and uses U. S. EPA ID MIK468293311 for any waste shipments related to the environmental remediation work.

RCRA Corrective Action addresses impacts due to the release of hazardous substances. This interim measure addresses source removal at one area at the Site and will be completed as a portion of the overall RCRA corrective action at the Site. There are several other areas that will be addressed under the RCRA Corrective Action at the Site by additional interim measures and/or deed restrictions which include a source area near the Haulaway building for impacted groundwater, impacted groundwater along the southern and northern property boundaries.

1.4 SITE SOURCES

As discussed in Section 1.2 historic filling practices have impacted Site soils and groundwater. Several aerial photographs of the Site from 1940 to 1998 were reviewed; these included 1940, 1949, 1952, 1955, 1956, 1963, 1969, 1978, 1980, 1985, 1990, 1994, 1995, and 1998. In reviewing the aerial photographs, several areas of soil disturbances, filling and open pits were observed on the CVO property. Copies of these aerial photographs are provided in Appendix B.

The 1949 aerial photograph shows an excavated area along with material piles just northeast of where the Haulaway building now stands. This photo shows excavated pits dark in color suggesting the presence of liquids. There is also evidence of filling activities along the south shore of Tyler Pond from Outfall #11, the northwest corner of the CVO Site, to the east. The evidence of filling activities stops approximately 150 feet east of where Outfall #12 was located. This includes the PAOC 18 area. These filling activities increased in scope as evidenced by historical photos from 1949 through 1952. The 1955 photo does not indicate evidence of recent significant excavation or fill activities along Tyler Pond. It appears that vegetation covered most of the area between Outfall #11 and Outfall #12 indicating that minimal disturbance of the soils occurred after 1955. Some remnants of fill or excavation activities are noticeable to the south and southwest of Outfall #12, which is consistent with where the top of the hill/fence line is located today within the PAOC 18 area.

The later aerial photographs identify the continuing redevelopment of the Site and the soil disturbances identified in those are associated with known site

improvements/construction activities such as the installation of Outfalls 12, 13 and 14 (late 1969), the construction of the second utility trestle that traverses Tyler Pond to the former Ypsilanti Community Utilities Authority (YCUA) wastewater treatment facility (1980) and the construction areas for the Tyler Pond Remediation effort completed by a potential responsible parties group pursuant to a consent agreement with the State of Michigan (mid to late 1998).

Based on the review of aerial photos, it appears the filling and apparent waste operations in the vicinity of the Site occurred prior to 1963, with the majority of the filling activities taking place prior to 1955. By 1963 the entire Site area, including the eastern most section but not the bank of Tyler Pond, was completely paved.

1.5 APPLICABLE REGULATIONS

The selected interim measure involves excavation and off-Site disposal of impacted soils as well as soil reuse and import of fill material. This section describes regulations as they apply to the selected interim measure and include regulations related to waste characterization, cleanup and soil reuse.

1.5.1 TOXIC SUBSTANCES CONTROL ACT EVALUATION

As previously discussed, the historical dumping which contaminated the CVO property took place in the 1940s and 1950s. Based on the information presented in Sections 1.2 and 1.4, the PCBs were released into the environment prior to April 18, 1978 and according to 40 Code of Federal Regulations (CFR) 761.50(b)(3)(i)(A) are presumed not to present an unreasonable risk of injury to health or the environment unless the U.S. EPA Regional Administrator makes a finding that that such a risk exists. Data from PAOC 18 suggests that the PCBs are not mobile (i.e. PCBs have not been detected in the groundwater recovered from the sheet pile wall area French Drain); however, PCBs are present at significant levels in soils and DNAPL in PAOC 18. The driver for this interim measure is the mobility of CVOs in groundwater in this area, not the PCBs; although the presence of PCBs commingled with CVOs does present additional challenges to remedial efforts.

Based on review of the regulations including 40 CFR 761.50(b)(3)(i) and the age of the release, this interim measure (cleanup) may not need to comply with 40 CFR 761.61 (although the disposal of any waste material does) unless the U.S. EPA Regional Administrator makes a finding that an unreasonable risk exists. If the U.S. EPA

Regional Administrator makes a finding that an unreasonable risk exists, the cleanup will be limited to the material with PCBs greater than 50 ppm. Soils remaining after the cleanup of PCBs greater than 50 ppm will not be subject to TSCA regulations or restrictions.

For waste disposal any soil material within the Area for Remediation (AFR) with pre-conditioning or pre-excavation PCB concentrations greater than 50 parts per million (ppm) will be disposed at Toxic Substances Control Act (TSCA) permitted facility. The required disposal facility for soils with PCB concentrations below 50 ppm will be determined by VOC concentration present in the soil, as detailed in Section 3.5, but is not required to be a TSCA permitted facility.

This IMWP proposes several deviations from 40 CFR 761.61. The proposed modifications and the implementation of the proposed interim measure will address any risk posed by PCBs at the Site and will result in conditions that are protective of human health and the environment. These modifications include cleanup levels and a modified sampling program. The proposed cleanup level is presented in Section 2.3. The proposed sampling program is presented in Section 3.4.3.

1.5.2 RCRA WASTE EVALUATION

1.5.2.1 NON-LISTED WASTE EVALUATION

Due to the historic nature and unknown source of the waste material, the impacted soil, groundwater and DNAPL are not “listed” hazardous wastes. Information to support this demonstration was communicated to the Michigan Department of Environmental Quality (MDEQ) via email. MDEQ concurrence was obtained via email. A copy of the submittal to the MDEQ and their concurrence is provided in Appendix C.

1.5.2.2 CHARACTERISTICALLY HAZARDOUS WASTE EVALUATION

All solid wastes must be evaluated to determine if they are characteristically hazardous. A Toxicity Characteristic Leaching Procedure (TCLP) test is typically conducted and the results (mg/L) are compared to Regulatory Levels (RLs) listed in Table 1 of 40 CFR 261.24. If the results are equal to or greater than these RLs then the waste exhibits the toxicity characteristic for that substance and is a characteristically hazardous waste.

A totals analysis (not TCLP) can be used to determine that a waste does not exhibit a toxicity characteristic, and therefore is not a hazardous waste. For liquids the totals concentrations are compared directly to the RLs in Table 1 of 40 CFR 261.24. For solids, the RLs in Table 1 of 40 CFR 261.24 can be converted into totals concentrations from which, theoretically, there is insufficient mass of that constituent present to result in a leaching concentration above the RLs. This conversion reflects the 20 to 1 weight ratio of extraction fluid to solid in the TCLP test. The following table shows the conversion for TCE and vinyl chloride (VC).

Constituent	Toxicity Characteristic RL mg/L (ug/L)*	20 x Toxicity Characteristic RL (ug/kg)*
TCE	0.5 (500)	10,000
VC	0.2 (200)	4,000

*Values are shown in ug/kg as those are the units in which the Remediation Requirements are discussed in Section 2.

A totals waste analysis is more cost effective and requires less time to complete than a TCLP analysis. Therefore, totals analysis will be used for a significant portion of the waste characterization analysis for VOCs completed during this interim measure.

1.5.2.3 LAND DISPOSAL RESTRICTIONS

If a waste is determined to be a hazardous waste, the waste must be evaluated for Underlying Hazardous Constituents (UHCs). A UHC is any constituent listed in 40 CFR 268.48, Universal Treatment Standards (UTS), above the corresponding listed concentration. The UTS are also referred to as the Land Disposal Restrictions (LDRs) since concentrations greater than those listed in 40 CFR 268.48 require treatment prior to land disposal of that waste.

Alternative Soil Treatment Standards are established in 40 CFR 268.49. Constituents in contaminated soils at concentrations below the Alternative Soil Treatment Standard for that constituent do not require any reduction prior to land disposal of that waste. The following table shows the UTS and Alternative Soil Treatment Standards (10 x UTS) for the primary constituents of concern for this IMWP.

Constituent	UTS (non-wastewater) mg/kg (ug/kg)*	Alternative Soil Treatment Standard (10 x UTS) (ug/kg)*
TCE	6 (6,000)	60,000
VC	6 (6,000)	60,000
Xylenes	30 (30,000)	300,000
PCBs	10 (10,000)	100,000

*Values are shown in ug/kg as those are the units in which the Remediation Requirements are discussed in Section 2.

Therefore, soils that are characteristically hazardous and below the Alternate Soil Treatment Standards can be directly land disposed at a Subtitle C hazardous waste landfill without treatment.

1.5.2.4 POINT OF GENERATION AND AREA OF CONTAMINATION

The point of generation is the concept that a material must be characterized (hazardous or non-hazardous) and, if applicable, UHCs or LDRs evaluated after the point the material becomes a waste (i.e., after the point of generation). The point of generation of remediation waste is typically considered to be when the material is actively managed. Actively managed may include excavation for soils, pumping for groundwater or dredging for sediments.

The Area of Contamination (AOC) concept was discussed in the preamble to the National Contingency Plan (55 FR 8758-8760, March 8, 1990) as well as several federal guidance documents including "Management of Remediation Wastes Under Resource RCRA", October 4, 1998 (EPA530-F-98-026). The AOC concept allows for the consolidation and in-situ treatment of hazardous waste within the AOC without creating a new point of generation and therefore does not trigger LDRs. The point of generation becomes the point at which the waste leaves the AOC.

Michigan Rule 299.9524(2) identifies the AOC concept and allows a work plan approved by the MDEQ pursuant to R299.9524 to use the AOC concept. For the purposes of this IMWP, the AOC is defined as the AFR. Therefore, the conditioning described in Sections 3.4 and 3.5 has been designed to occur prior to the point of waste generation.

1.5.3 SOIL RELOCATION

Section 324.20120c of the Michigan Natural Resources and Environmental Protection Act (Act 451 of 1994, as amended) addresses soil relocation both on and off-Site.

1.5.3.1 ON-SITE SOIL REUSE

Section §324.20120c(2) provides for an owner or operator to relocate contaminated soil on-Site subject to certain conditions provided the relocation does not further exacerbate contamination at the site.

1.5.3.2 SOIL RELOCATION FROM OFF SITE (BACKFILL)

Section §324.20120c(5) provides soil to be relocated off site if the soil does not present a threat to public health, safety or welfare or the environment. Therefore, backfill materials imported to the Site will be purchased from a Michigan Department of Transportation (MDOT) certified source or will meet generic MDEQ Part 201 non-residential criteria for VOCs, SVOCs and PCBs and/or regional background soil concentrations for metals if obtained from a noncommercial fill source. If the backfill is obtained from a noncommercial fill source, adherence to the above criteria will be determined by statistical sampling (MDEQ Sampling Strategies and Statistics Training Materials (S3TM) guidance, August 2002) using a sampling grid and collection of discrete samples from 25% of the sampling grids. Table 1.1 provides a summary of the soil sampling program including sampling frequency and analysis.

1.6 FUTURE LAND USE

RACER plans to sell the property for non-residential use.

1.7 SITE GEOLOGY

The Site-wide geology consists of a fill and upper sand unit in the upper 15 to 20 feet. The fill unit varies from fill sands and clays to construction debris and historical waste material. The upper sand unit generally consists of fine to medium grained sands with silts and gravels. Below this unit is a regionally extensive clay unit that extends to approximately 65 feet below ground surface (bgs) at the top of the bank. The soil boring logs for the two deep wells installed in 2012 are provided in Appendix D of this IMWP.

In the area of PAOC 18 (i.e., partially located on the bank of Tyler Pond), the ground surface elevation drops approximately 16 vertical feet over 50 linear feet, to the pond's

edge. At the top of the bank is a flat asphalt parking lot. Depending on the location on the bank, the clay confining unit is between 1 to 17 feet bgs.

The clay within the PAOC 18 area undulates and significant low spots have been identified.

Boring logs from the CRA investigations were used to create stratigraphic cross sections throughout the Site. Figure 1.2 presents the cross-section location map. Figures 1.3 and 1.4 present two cross sections through the PAOC 18 area.

1.8 SITE HYDROGEOLOGY

The upper fill and sand units contain limited groundwater that is typically encountered in unconfined conditions at shallow depths (i.e., 8 to 10 feet). The saturated zone is about 5-7 feet thick at the top of the bank and groundwater is essentially at ground surface at the bottom of the bank. The water on the bank is in semi-confined conditions as clay was placed on the slope to stabilize it and minimize precipitation infiltration following installation of the sheet pile wall.

During the very dry weather conditions observed in June and July 2012, the water level within the PAOC 18 area was significantly depressed. During wet spring months, a rise in groundwater elevation has also been observed.

Storm water runoff from paved areas and building roofs are collected by a storm water sewer system that flows into Tyler Pond through a series of outfalls. An active storm sewer is located within PAOC 18 and will be rerouted prior to excavation. An inactive and partially damaged storm sewer is also present in the area which will be removed during the excavation.

Subsurface groundwater flow conditions at the Site are influenced by utility corridors, various fill areas, and Tyler Pond which is a discharge boundary for part of the groundwater unit. Subsurface utilities include storm sewers, sanitary sewers and a former sludge line. A hydraulic divide exists across the central portion of the property, generally running parallel to Tyler Pond. Groundwater to the south/southwest of the divide flows to the south/southeast, while groundwater to the north/northeast of the divide flows towards Tyler Pond. A groundwater contour map was generated from groundwater levels recorded on September 26, 2011 (Figure 1.5). The groundwater contours shown on this figure are consistent with historical groundwater contour maps.

2.0 OBJECTIVE

As discussed in Section 1.2, the groundwater in PAOC 18 has been significantly impacted with CVOCs. Some of these constituents are above the final acute value (FAV) (R323.1057 [Toxic Substances] of the Part 4 Water Quality Standards pursuant to Part 31 of 1994 PA 451, as amended) for the groundwater to surface water pathway at a monitoring well located immediately adjacent to the Pond. Therefore, the evaluation of remedial alternatives in this area is focused on reducing the concentrations of CVOCs in groundwater venting to Tyler Pond.

2.1 BASIS FOR REMEDY SELECTION

Several approaches for remediating this area have been reviewed over several years including:

- In-situ injections to treat groundwater – Several injections were completed in the early 2000s that were ineffective as the DNAPL and debris source material had not been identified at the time.
- Enhanced biodegradation – An injection of Edible Oil Substrate (EOS™) was completed in 2007. Although effective along the boundaries, without removal of source material (DNAPL and debris) recontamination of groundwater in this area continues. However, as the appropriate bacteria are present, this process can be an effective polishing step following removal of source material.
- Excavation and disposal – This provides the greatest removal of source material but uncertainty of waste streams (hazardous and/or TSCA and some requiring disposal in Texas) is cost prohibitive and efficiency challenged.
- Encapsulation – This provides no removal of source material and the required long term Operation Maintenance and Monitoring (OMM) is undesirable and expensive.
- Immobilization – This provides no removal of source material and is unclear if it would eliminate groundwater impacts as immobilization of the free phase DNAPL may be difficult. Required long term OMM is also a deterrent.
- Soil heating – This provides no removal of source material and is cost prohibitive, and debris may decrease effectiveness.
- Multiphase recovery – This provides no removal of source material and full recovery of DNAPL is not likely. Therefore, groundwater will continue to be impacted when migrating through the area.

Based on these reviewed technologies/approaches, RACER and MDEQ determined that excavation and disposal was the best technical option for removing the source material. Following that decision and due to RACER's funding restrictions, various options within this approach were reviewed to evaluate a manner in which cost uncertainty associated with waste stream variability could be decreased. The selected option involves conditioning soils to reduce the VOC concentrations prior to the point of waste generation followed by disposal at an appropriately permitted disposal facility.

Following implementation of this source removal, groundwater will be evaluated to determine if the source removal has sufficiently reduced the concentrations of CVOCs in groundwater venting to Tyler Pond to meet FAV and/or mixing zone based GSI criteria.

2.2 AREA FOR REMEDIATION

The AFR within PAOC 18 is shown on Figure 2.1. The excavation will not expand beyond the aerial limits as shown on Figure 2.1. RACER understands that residual contamination outside the AFR may remain following the remediation and at a minimum the remaining contamination will be appropriately addressed through deed restrictions and/or monitoring. This decision has been made for cost control purposes.

2.2.1 SOIL CHARACTERIZATION DATA

Review of the soil data from PAOC 18, identified several VOCs in soil that exceeded the generic MDEQ GSI Protection Criteria (GSIPC). These compounds are listed in Tables 2.1 through 2.5. Figure 2.1 presents the location of all the data points provided in Tables 2.1 through 2.5.

These tables are segregated by elevation and include all VOCs for which concentrations are greater than the generic GSIPC in at least one soil sample. The primary constituents, based on concentration and distribution, are TCE, cis-1,2-dichloroethene (cis-DCE), and VC. The distribution of these constituents of concern (COCs) is such that soil remediation for these three compounds will facilitate the remediation of the remaining VOCs with concentrations above GSIPC. The tables include survey information (location and depth) for each sample location.

The presence of PCBs, although not the regulatory driver to perform this interim measure, must be considered because they are commingled with VOCs and will be

substantially removed from the Site as a result of this interim measure. Therefore, Tables 2.1 through 2.5 also include total PCB data.

2.2.2 DNAPL DATA

The DNAPL observed in PAOC 18 is dark brown to black, with a low viscosity, and is easily pumped using whaler, peristaltic or pneumatic pumps. The DNAPL accumulates in low spots or "bowls" in the confining clay in the western area of PAOC 18. Table 2.6 provides analytical results for DNAPL samples collected within PAOC 18. Between 2004 and 2012 approximately 1750 gallons of DNAPL have been recovered from PAOC 18 via periodic pumping.

2.3 REMEDIATION REQUIREMENTS

The Remediation Requirements for VOCs were developed to mitigate potential for contamination to migrate to surface water by reducing the concentrations in soils within the AFR to the concentrations listed below with no observed DNAPL remaining. The PCB Remediation Requirement criteria is based on the disposal of TSCA regulated PCBs.

<u>Constituent</u>	<u>Soil Criteria (ug/kg)</u>
TCE	10,000
cis-DCE	16,900
VC	343
PCBs	50,000

The VOC concentrations above were determined by first calculating Mixing Zone-Based GSI values. Using the calculated Mixing Zone-Based GSI values, the equation for the soil-water partitioning value (SWPV) and guidance in the March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document - Attachment 9 was used to calculate the GSIPC (i.e., Remediation Requirements). Appendix E provides more details on these calculations.

Although the PCB Remediation Requirement is 50 ppm, it should be noted that due to the widespread CVOC impacts within the AFR, soils with PCB concentrations below 50 ppm will be removed where they are commingled with soil impacted by CVOCs over the Remediation Requirements. With this removal, it is anticipated that the majority of material with PCBs greater than 1 ppm will be removed from within the AFR and concentrations greater than 16 ppm (MDEQ non-residential direct contact criteria) are not expected to remain. PCB verification sampling will only be completed for areas

identified with PCBs greater than 50 ppm. Appendix E provides additional details to demonstrate that this 50 ppm PCB clean up level will not present an unreasonable risk.

2.3.1 COC DISTRIBUTION

The soil data for the COCs (TCE, cis-DCE, and VC) were used to create a 3D visualization of the distribution of contaminants in the AFR. In preparing the 3D visualization, the three COCs were compared against the calculated Remediation Requirements, 20 x Toxicity Characteristic RL, and the Alternative Soil Treatment Standards, as defined in Section 1.5.2. These exceedances are shown by different colors in the 3D visualization. Figures 2.2 through 2.21 depict one foot interval views of the 3D visualization showing the extent of VOCs (by color) for elevations between 715-695 feet Above Mean Sea Level (AMSL).

In-situ concentrations of PCBs in soils within PAOC 18 range from non-detect (< 1 ppm) to 360 ppm. The maximum concentration of PCBs in soil was detected in a waste characterization sample of containerized soil after a drilling event, at a concentration of 648 ppm. Figures 2.22 through 2.26 show the 1, 25, 50 and 100 ppm PCB contours, using the soil analytical data collected to date. These figures represent a summary of the PCB concentrations in five foot elevation lifts within PAOC 18.

The distribution of VOCs and PCBs in the AFR depicted by these methods form the basis of the approach for the Scope of Work described in Section 3.

2.4 SCHEDULE

Intrusive on-Site work is anticipated to require approximately three months to complete.

3.0 SCOPE OF WORK - SOIL MEDIA

3.1 SEQUENCE

The sequence of soil removal within PAOC 18 is listed below:

Task A – Clean Cover and Reusable Overburden

Task B – Non-hazardous Soil

Task C – PCB Impacted Soil (TSCA)

Task D – VOC Impacted Soil

3.2 TASK A -CLEAN COVER AND REUSABLE OVERBURDEN

Approximately 21,000 square feet (600 cubic yards [cyd]) of asphalt and underlying gravel base will be pulverized with a Reclaimer to a total depth of 9 inches. This material will be stockpiled for later reuse as gravel base under asphalt to be placed as a final cover over the area.

On the bank of Tyler Pond, the clean cover includes a 6-inch clay cap that was covered with topsoil and seeded during the sheet pile wall installation. This will be removed for reuse as clean cover or for off Site disposal.

For the purposes of this project, reusable overburden is defined as soils meeting the Remediation Requirements identified in Section 2.3. The reusable overburden will be removed and stockpiled for reuse as backfill using excavating equipment equipped with Global Positioning System (GPS) instruments, as identified by existing data and the 3D model. Generally this is expected to be the top 5 to 8 feet of soil under the parking lot. The depth of the reusable overburden is not consistent across the area. Areas of soil identified by the existing data and the 3D model to be above the Remediation Requirements within the top 5 to 8 feet of soil will not be excavated but will remain in the excavation for handling as part of subsequent tasks. If buried debris, staining, strong odors, or elevated photoionization detector (PID) readings, not consistent with reusable overburden are observed within this zone, the impacted material will not be excavated. The boundary between reusable overburden and potentially impacted material will be based on existing data, the 3D model, and any visual or olfactory signs of impacts observed during excavation. In general, reusable overburden will be stockpiled on the east and west sides of the AFR on and under 6 mm plastic sheeting.

3.2.1 SOIL SAMPLING

If buried debris, staining, strong odors, or elevated PID readings, not consistent with the reusable overburden material are observed and left in the excavation, additional samples will be collected to determine if the material meets the Remediation Requirements or the material may be consolidated and handled as discussed in subsequent tasks.

The stockpiled reusable overburden will be tested to confirm it meets the Remediation Requirements prior to use as backfill. Compliance with the Remediation Requirements will be demonstrated by the collection of one grab sample from the excavated and stockpiled material for approximately every 100 cyd. Table 1.1 provides a summary of the soil sampling program including sampling frequency and analysis.

3.3 TASK B -NON-HAZARDOUS SOIL

Using excavating equipment equipped with GPS instruments, areas with continuous and significant volumes of the soils that do not meet the Remediation Requirements but are below 20 x Toxicity Characteristic RLs, based on existing data and 3D model, will be excavated, transported and disposed at a non-hazardous (subtitle D) landfill. Currently identified areas with materials that do not meet Remediation Requirements but are below 20 x Toxicity Characteristic RLs do not include any known concentrations of PCBs greater than 50 ppm and are not in the DNAPL saturated zones. Generally Task B soils are expected to be near the outer limits of the AFR.

The soils within the areas identified as non-hazardous soil, will be turned over in the excavation to visually observe if material (i.e. debris, staining, strong odors, or elevated PIDs) inconsistent with the non-hazardous soil is present. If buried debris, staining, strong odors, or elevated PID readings, not consistent with this non-hazardous soil are observed within this zone, the impacted material will not be excavated with the non-hazardous soils.

For the purposes of this project continuous and significant volumes means 200 cyd in a continuous area. Areas with smaller volumes of non-hazardous soil exceeding Remediation Requirements will be consolidated and handled as discussed in subsequent tasks as this is more efficient than surgical removal of these areas.

3.3.1 SOIL SAMPLING

If buried debris, staining, strong odors, or elevated PID readings, not consistent with the non-hazardous soil are observed and left in the excavation, additional soil samples will be collected to determine if the soils have concentrations of COCs below 20 x Toxicity Characteristic RLs or the material may be consolidated and handled as discussed in subsequent tasks.

Compliance with non-hazardous waste disposal requirements (less than 20 x Toxicity Characteristic RLs) will be demonstrated by a minimum 1 discrete sample randomly collected per 100 cyd of soil in a continuous area. This sampling is expected to be completed prior to removal from the AFR but may be collected from stockpiled material. Table 1.1 provides a summary of the soil sampling program including sampling frequency and analysis.

3.4 TASK C - PCB IMPACTED SOIL (TSCA)

This section describes the means and methods to be used for CVOC impacted soils with PCBs greater than 50 ppm. Appendix F consolidates all PCB discussions and approaches included in this IMWP into one appendix for ease of U.S. EPA review.

Following Tasks A and B, the areas with known PCB concentrations greater than 50 ppm will be removed. Completing the removal of PCB impacted material at this stage will help prevent the potential for cross-contamination of areas with PCB concentrations less than 50 ppm during Task D and will also assist with locating free phase DNAPL. With the removal of this material, a low lying area (sump) will be created to allow for DNAPL accumulation, and removal, if present. By extracting accumulated liquids from the sump, which would be constructed into the existing clay, water control can be maintained throughout the excavation. This will assist with maintaining a dry excavation area and protects the pond from receiving impacted water that has passed through the excavation area.

3.4.1 VOLUME OF PCB IMPACTED SOIL (TSCA)

Figures 2.23 through 2.25 identify the areas where PCBs have been identified above 50 ppm. The volume of soil with PCB concentrations greater than 50 ppm needs to be further defined but at present is estimated between 550 – 1,000 cyd. This assumes that for the areas identified as greater than 50 ppm on Figures 2.23 through 2.25 the entire

5 foot interval is above 50 ppm. Additional proposed field characterization work described in Section 3.4.3 is scheduled to be performed in March 2013 and will assist in better defining the outer limits of the area containing PCBs over 50 ppm.

Figures 3.1, 3.2 and 3.3 show the expected extent of the TSCA (> 50 ppm) impacted soils, aerially and vertically. The aerial coverage is shown on Figures 3.1 and 3.2. The vertical coverage is shown on the bottom of Figure 3.2 with existing analytical data along the cross section lines. Figure 3.3 shows a cross section along A – A' from Figure 3.1, this shows the PCB distribution along with the approach for excavated soil surrounding the TSCA regulated soils (>50 ppm) (i.e. reuse or condition and dispose).

3.4.2 PCB SOIL EXCAVATION, MATERIAL HANDLING AND DISPOSAL

Although CVOCs are the primary regulatory driver to perform this interim measure the presence of PCBs must be considered in carrying out the interim measure. The impacts at the Site show the commingled nature of the CVOCs and PCBs due to the historic fill activities. Almost all of the soils with PCBs greater than 50 ppm exhibit CVOC concentrations that could make them RCRA characteristically hazardous wastes at the point of generation. Therefore, to minimize costs and the risks associated with long distance transportation of soils (i.e. to RCRA/TSCA incinerator in Texas) conditioning of the soils to remove hazardous waste characteristics within the AFR (AOC) prior to excavation and disposal is planned.

Using excavating equipment equipped with GPS instruments, soils with PCBs greater than 50 ppm as identified by existing data and the additional characterization data which will be collected as described in Section 3.4.3 will be conditioned and excavated for off-Site disposal at a TSCA permitted facility. The additional characterization sampling plan was designed such that the results of the investigation could be translated into physical limits (floor, ceiling, sidewall) that can be used by the excavator equipped with GPS instruments to accurately remove the soils impacted with PCBs greater than 50 ppm.

Appendix G provides details on how the soils will be conditioned. The conditioning of soils will reduce VOC concentrations; it is neither designed nor practical to significantly reduce PCB concentrations using this approach. U.S. EPA has identified a concern with the potential for PCBs to be volatilized due to an increase in soil temperature during the conditioning. A detailed evaluation of the potential for volatilization of PCBs during conditioning and the planned monitoring methods are presented in Appendix H.

The conditioning approach for areas with PCB concentrations greater than 50 ppm will not be handled any differently than the soils with PCBs less than 50 ppm, with the exception of the PCB verification sampling. Mixing of soils impacted with PCBs greater than 50 ppm associated with the conditioning will not impact the ultimate disposal facility for the soils based on their PCB concentrations; the soils will be disposed at a TSCA permitted disposal facility based on the premixing greater than 50 ppm concentration. The post-conditioned VOC concentrations will be used to determine whether the disposal facility must be a RCRA hazardous waste facility or not, in addition to TSCA permitted. Therefore the soils with PCB concentrations greater than 50 ppm, as determined by pre-mixing data, will be disposed at a TSCA permitted landfill or TSCA permitted incinerator based on the resulting post conditioning VOC concentrations. Additional details associated with the conditioning approach are provided in Appendix G.

The identified areas within the AFR with PCB concentrations greater than 50 ppm, as discussed in Section 3.4, will be demarcated based on surveyed locations in the field. Based on the size of these areas, a grid system as described in Appendix G will be used to condition the soils. Based on the post conditioning concentration of the VOCs, the ultimate disposal facility for these soils will be as follows:

- Wayne Disposal, Inc. (WDI) for TSCA direct landfill if VOCs are less than 20 x Toxicity Characteristic RLs
- WDI for RCRA/TSCA direct landfill if VOCs are greater than 20 x Toxicity Characteristic RLs, and below Alternative Soil Treatment Standards and the concentration of PCBs are less than 100 ppm
- Veolia, Port Arthur, Texas – for high temperature incineration if either of the following conditions exist
 - o VOCs are greater than 20 x Toxicity Characteristic RLs and below Alternative Soil Treatment Standards and the concentration of PCBs are greater than 100 ppm
 - o VOCs are greater than 20 x Toxicity Characteristic RLs, and above Alternative Soil Treatment Standards and the concentration of PCBs are greater than 50 ppm

3.4.3 PCB SOIL SAMPLING

3.4.3.1 ADDITIONAL CHARACTERIZATION SAMPLING

Additional characterization data is required to better define the extent of soil requiring disposal at a TSCA permitted facility. Pre-excavation sampling allows for more efficient handling of the non-TSCA material above and adjacent to the TSCA regulated intervals.

Figure 3.1 and Table 3.1 provides a summary of the additional characterization sampling program. Samples will be collected at predetermined elevations as detailed in Table 3.1 to define the floor, side walls and ceiling of the areas where PCBs have been detected at or above 50 ppm. Figure 3.1 includes a cross section of the PCB areas that shows the vertical layout of the intervals impacted at concentrations greater than 50 ppm. This detail also identifies the vertical location of floor, side wall and ceiling sampling locations. Side wall samples will be collected along the midpoint of the 2.5 foot or 5 foot vertical interval.

The locations identified on Figure 3.1 and in Table 3.1 are approximately 10 – 15 feet apart along the estimated extent of 50 ppm contour. Floor and ceiling samples within the greater than 50 ppm contour line are approximately 15 feet apart. This spacing provides for sufficient delineation along with existing data to be protective of health and the environment, because all locations with over 50 ppm will be excavated including some areas of less than 50 ppm.

3.4.3.2 VERIFICATION SAMPLING

Results from the characterization sampling described in Section 3.4.3.1 will be used as verification samples for the removal of PCB material at concentrations greater than 50 ppm if all results are below the 50 ppm clean up criteria. If results from the characterization sampling show concentrations exceeding 50 ppm, additional sampling, (pre or post excavation), consistent with the approach used in the characterization sampling, will be completed where appropriate to verify the concentrations greater than 50 ppm have been removed.

If pre-excavation sampling is unable to verify below 50 ppm at a location, then additional soil (either vertically or laterally) will be removed during the excavation in that area prior to collecting additional verification samples.

3.5 TASK D - CVOC IMPACTED SOIL

This section describes the means and methods to address CVOC impacted soils with PCBs less than 50 ppm.

3.5.1 VOLUME OF IMPACTED SOIL

As discussed in Section 2.3.1 a 3D visualization was created using the data collected to date for PAOC 18. The volume of CVOC impacted soils with PCBs less than 50 ppm is estimated between 8,000 and 12,000 cyd. Figures 2.2 through 2.21 show the results of the visualization in one foot lifts.

3.5.2 CVOC SOIL REMEDIATION, MATERIAL HANDLING AND DISPOSAL

The soil remaining to be removed to meet Remediation Requirements after Tasks A, B and C are completed will generally consist of soils with total CVOC concentrations exceeding 20 x Toxicity Characteristic RLs and Alternative Soil Treatment Standards levels intermixed with smaller areas of soils that only exceed the Remediation Requirements. The small volumes of these soils that only exceed the Remediation Requirements (i.e. aurally small, or vertically thin areas) will not be excavated separately but will be handled along with the more contaminated material, due to the difficulty and/or inefficiency of surgically removing these small volumes.

The general approach for these remaining soils will be to condition the soils to reduce the VOC concentrations prior to the point of generation so that LDRs are not triggered. Conditioning will involve in-place mixing of oxidants and activator within the 20 foot by 20 foot by 10 foot deep cells within the excavation area (approximately 150 cyd of soil). Activities will take place in-situ and within the AOC as discussed in Section 1.3.2. This approach leaves several disposal options available and decreases the volume that may require incineration. It will also minimize the time in which soil will need to be staged outside the AFR while awaiting final waste characterization confirmation.

The conditioning reagents include Klozur persulfate manufactured by FMC Environmental Solutions (FMC), using lime as the activator and potassium permanganate manufactured by Carus. Appendix H provides additional details on the conditioning approach including the material safety data sheets for these reagents.

Addition of activator and oxidant will increase the temperature of soil. As discussed in Appendix H, to minimize volatilization potential, oxidant will not be added to soil when soil temperatures are greater than 125° F. Due to the use of chemicals to condition the soils, it is understood that a MDEQ review is required to obtain a groundwater discharge permit exemption under the Part 22. This IMWP has been prepared to include the necessary information for this review. To protect the pond from adverse conditions related to impacted groundwater or water with residual oxidant, groundwater will be pumped from within the remedial excavation such that water cannot migrate past the existing sheeting towards the pond. It is expected that a sump will be constructed into clay at a base elevation of approximately 695 feet AMSL. This elevation is approximately five feet below the existing water elevation of the pond (~ 700 feet AMSL) and 6.5 feet below the top of the sheet pile wall at the base of the bank (~ 701.5 feet AMSL). Maintaining water levels at or below 700 feet AMSL during on-Site and conditioning activities will prevent migration of impacted groundwater and/or water containing oxidants to the pond.

A map will be prepared daily that shows the location of cells that were mixed that day along with lab results. This process will track the success of on-Site conditioning on a daily basis and ensure that only soil that meets disposal criteria is removed from the AFR.

Conditioned soil will remain in the excavation area until on-Site laboratory analyses of soil samples verify that the soil meets one of the following conditions:

- a) Contains total VOC concentrations less than 20 x Toxicity Characteristic RLs and can be disposed at a non-hazardous landfill subtitle D landfill
- b) Cannot be reasonably conditioned to below non-hazardous disposal requirements

If soils meet item a, above, they will be loaded into trucks for disposal or staged near the southern limit of the remedial excavation area, if needed for better logistical control of export to the landfill. Post-conditioning verification sample results will be submitted to disposal facilities for approval prior to scheduling shipment. Waste characterization profiles for each type of waste will be prepared and submitted to the landfills prior to beginning the excavation. The post-conditioning verification results will be required by

the landfill to identify that soil meets the profile requirements. Republic's Carlton Farms Landfill is the planned subtitle D landfill for disposal of non-hazardous soils.

For soil cells that cannot be reduced to non-hazardous disposal criteria with reasonable effort (item b above), sample results will be compared to the Alternative Soil Treatment Standards and, if achieved, will be disposed at WDI, a subtitle C hazardous waste landfill. RCRA-impacted soils that exceed the Alternative Soil Treatment Standards will be evaluated and profiled for treatment at Michigan Disposal, Inc. (MDI), a Part B RCRA treatment facility for treatment prior to disposal. If WDI and MDI cannot accept the waste, soils will be sent to Veolia in Port Arthur, Texas following similar waste profile verification process. If needed for waste profiling, additional samples will be collected and submitted for off-Site laboratory analysis for TCLP or total VOCs, SVOCs, PCB or metals.

Non-hazardous and hazardous soil will be staged in piles a minimum distance of 25 feet apart to prevent mixing of soils that are stored for different disposal criteria. Stockpiled soils will be covered with 6 mm plastic sheeting such that precipitation will not come in contact with the stockpiled soil. Geotextile fabric will be placed in catch basins to protect against any sediment/soil entering the storm system. Loose soils on pavement will be cleaned immediately.

Following soil removal above the clay surface, the clay will be excavated to remove known impacts or other evidence of impacts such as stained soils, or elevated PID readings. Where DNAPL has accumulated, sufficient clay will be removed so that all visual/olfactory evidence of impacts are removed and then a bottom sample will be collected.

3.5.3 SOIL SAMPLING

This subsection describes the sampling that will be completed to verify the effectiveness of the conditioning and the boundaries of the impacted area.

3.5.3.1 POST CONDITIONING WASTE CHARACTERIZATION SAMPLING

When testing and observations described in the conditioning approach (Appendix H) indicate that an entire cell (~150 cyds of material), will meet disposal requirements, two randomly collected grab samples from each cell (one from upper 5 feet and one from the lower 5 feet) will be submitted to the on-Site lab for VOC analysis. If both samples have

total VOC concentrations less than landfill disposal requirements, lab results will be submitted to appropriate landfill for approval to accept soil. If either sample result exceeds waste disposal criteria limits, the soil in that cell will be reconditioned with water for dust control and/or additional oxidant and retested. In addition, a sample may also be collected and submitted to an off-Site lab for TCLP VOC analysis to help determine final landfill selection.

As discussed above, each cell will also be sampled and analyzed for PCBs for verification of disposal facility. As with VOC sampling, once a cell is thoroughly mixed, two randomly collected grab samples (one from upper 5 feet and one from the lower 5 feet) will be collected and submitted to a lab for PCB analysis. The purpose of this sampling and analysis for PCBs is not to demonstrate that the PCB Remediation Requirement of 50 ppm has been met. The purpose of this sampling and analysis is verification that the material meets the criteria for acceptance at the selected landfill.

3.5.3.2 SIDEWALL/FLOOR SAMPLING

Since the purpose of the interim measure is to reduce groundwater concentrations by reducing soil concentrations to below Remediation Requirements, the side wall and floor verification sampling associated with CVOC impacts will be completed using the MDEQ S3TM verification of soil remediation guidance, with some modifications. Conditioning and removal will continue until the side wall and floor samples indicate that remaining soils meet the Remediation Requirements within the AFR or the boundaries of the AFR are met.

One side wall sample will be collected every 45 linear feet along the extent of the excavation. The depth of the side wall sample will be biased to the most likely impacted area within the top ten feet and bottom ten feet of the excavation, if applicable.

Due to the size of the anticipated excavation floor (approximately 36,000 square feet), a randomized sampling approach is anticipated using a grid interval of 25-27 feet as determined by the MDEQ S3TM guidance. A random number generator will be used to determine which grids will be sampled. This is expected to result in the collection of 15 samples, as identified on Table 1.1.

If any excavations require immediate backfill (e.g., adjacent to the sheet pile wall), biased floor samples will be collected in accordance with the MDEQ S3TM such that at least one sample per side wall and one floor sample will be collected and analyzed.

The sidewall and floor samples will be collected and analyzed for VOCs and PCBs. The analysis for VOCs at the limit of the excavation will be used to evaluate if the Remediation Requirements have been met for these constituents and if any further excavation is required. The analysis for PCBs at the limits of the full excavation are not expected to be above the Remediation Requirements and are intended to provide a basis for documenting what concentrations remain in place. It is anticipated that the majority of material with PCBs greater than 1 ppm will be removed from within the AFR and concentrations greater than 16 ppm (MDEQ non-residential direct contact criteria) are not expected to remain. The concentrations remaining in place will be used to evaluate what exposure controls, if any, are required in the final remedy. It is proposed that if all extent of excavation PCB concentrations are below 16 ppm, the MDEQ non-residential direct contact criteria, then no restrictions would be placed on the Site specifically for PCBs as the Site will be restricted to non-residential use and groundwater use will be prohibited.

3.6 SOIL SAMPLE ANALYSIS

Progress soil samples collected for VOC analysis will be labeled and transferred under chain-of-custody procedures to an independent on-Site laboratory.

Waste characterization (total analysis) and verification soil samples for VOC, and/or PCB analysis will be labeled and transferred under chain-of-custody procedures to an independent on-Site laboratory or off-Site laboratory for analysis.

Samples collected for additional analyses (i.e. TCLP) or additional parameters (i.e. metals, SVOCs) will be labeled and transferred under chain-of-custody procedures to an independent off-Site laboratory for analysis.

On-Site Laboratory

The on-Site laboratory will be housed in a customized analytical trailer that will be located well outside of the exclusion zone, likely near the Haulaway Building. Analysis for VOC compounds will be completed in accordance with U.S. EPA Method SW-846 5035/8260. Analysis for total PCBs will be completed in accordance with U.S. EPA Method 8082. All compounds will be reported on a dry weight basis.

The on-Site laboratory will adhere to the general specifications and requirements detailed in the Site-specific Quality Assurance Project Plan (QAPP). This QAPP will be revised to address this event by incorporating laboratory specific information such as report limits, method detection limits (MDL), standard operating procedures (SOP) and laboratory quality assurance manual (QAM). The revised QAPP will be submitted to the MDEQ. The on-Site laboratory SOPs and QAM will be included in the revised QAPP. The on-Site laboratory will maintain current certification for the parameters identified that is consistent with the National Environmental Accreditation Conference standards and complete all analysis in compliance with this certification.

Initially and for waste characterization samples, the on-Site laboratory may perform automatic dilutions, resulting in an elevated reporting limit of 1 mg/kg (for most compounds). This will reduce the number of dilutions needed to complete sample analysis while still meeting conditioning and waste profile data quality objectives relative to Alternative Soil Treatment Standards and 20 times RCRA TCLP standards.

The contaminants of concern at the Site have been derived from previous testing on the Site, expanded to include the entire TCLP RCRA VOC list. This combination has resulted in a list of 22 Site-specific compounds to be analyzed for by the on-Site laboratory as shown in following table with target detection limits and screening or dilution report limits.

<i>Compound</i>	<i>Target Report Limit (µg/kg)³</i>	<i>Dilution Report Limit (mg/kg)</i>	<i>20 x Toxicity Characteristic RL(ug/kg)</i>	<i>Alternative Soil Treatment Standards (10 x UTS)(ug/kg)</i>
1,1-Dichloroethene ²	50	1	14,000	60,000
1,2,4-Trichlorobenzene ¹	50	1	n/a	190,000
1,2-Dichlorobenzene ¹	50	1	n/a	60,000
1,2-Dichloroethane ²	50	1	10,000	60,000
1,3-Dichlorobenzene ¹	50	1	n/a	60,000
1,4-Dichlorobenzene ^{1,2}	50	1	150,000	60,000
Acetone ¹	1000	2	n/a	1.6x10 ⁶
Benzene ^{1,2}	50	1	10,000	100,000
Carbon Tetrachloride ²	50	1	10,000	60,000
Chlorobenzene ²	50	1	2x10 ⁶	60,000
Chloroform ²	50	1	120,000	60,000
cis-1,2-Dichloroethene ¹	50	1	n/a	n/a
Ethylbenzene ¹	50	1	n/a	100,000
Isopropylbenzene ¹	250	1	n/a	n/a
Methyl ethyl ketone (MEK) ²	750	2	4x10 ⁶	360,000
Methylene chloride ¹	100	4	n/a	300,000
Tetrachloroethene ²	50	1	14,000	60,000
Toluene ¹	50	1	n/a	100,000
trans-1,2-Dichloroethene ¹	50	1	n/a	300,000
Trichloroethene ^{1,2}	50	1	10,000	60,000
Vinyl Chloride ^{1,2}	40	1	4,000	60,000
Xylenes (Total) ¹	150	3	n/a	300,000
Total PCBs ⁴	330	10	n/a	100,000

Notes:

1. Sourced from previous testing at site
2. Sourced from RCRA TCLP VOCs.
3. The Target Quantitation Limits are based on dry weight sample analysis and incorporated a nominal factor of 20 percent moisture.
4. PCBs are included in this table as an on-Site laboratory may be used for their analysis.

The laboratory equipment and instrumentation will be of sufficient quality to adhere to the specifications established within the cited methods and QAPP. All method quality control (QC) procedures established in the Site-specific QAPP will be followed including: multi-point (7+) initial internal standard calibration curve with low standard defining the reporting limit, daily tune compliance, continuing calibration every 10 injections and at the end of the sequence, analysis of all samples within calibrated range, analysis of system monitoring compounds (surrogates) in all samples and QC samples, and batch QC samples (method blanks, laboratory control samples, and matrix

spike/matrix spike duplicates daily or on a 1 per 20 sample basis (whichever is more frequent). It is anticipated that the on-Site laboratory will be able to analyze up to 20 investigative samples per day plus associated QC samples and any sample re-analyses. All of the daily analyzed samples (up to the laboratory capacity) will undergo secondary review by the on-Site laboratory company prior to reporting to both designated staff of EQ and CRA as final data. The turnaround time for priority samples will be between 2 to 4 hours; this data will be considered preliminary data until it is provided in the daily final report. While on-Site, the on-Site laboratory will provide on-Site reporting through its on-board laboratory information management system. The on-Site laboratory will submit both a hard copy rush report and an Excel electronic data deliverable of the sample and batch QC results (with control limits), including surrogate performance (percent recoveries and control limits), once daily.

Within seven days of completion of field work, the on-Site laboratory will deliver a final Level IV (CLP-like deliverables) report including all deliverables identified in the Site-specific QAPP plus the sample raw data, calibration summary and calibration raw data in an electronic PDF file.

4.0 SCOPE OF WORK - NON-SOIL MEDIA

4.1 SITE PREPARATION

Site preparation will include construction of a groundwater recovery, storage and treatment system, construction of a decontamination facility, reroute of a storm water line, relocation or removal of the power pole, removal of chain link fencing, installation of temporary fencing and installation of erosion control measures. In addition, applicable permits (i.e. erosion control) will be obtained and administration and sanitary facilities will be constructed prior to working in the impacted soil area. The groundwater recovery storage and treatment system is described in Sections 4.3 and 4.4. The storm water line reroute and relocation or removal of the power pole are described in Sections 4.8.1 and 4.8.2, respectively.

A decontamination pad will be constructed with a 20 mm plastic liner and plywood. It will be 20 feet by 30 feet wide and constructed to accommodate the largest piece of equipment (hydraulic excavator). The pad will be constructed by laying geotextile over the asphalt parking area and over temporary berms. Berms will be constructed with straw bales on the side and wood on the ends. The wood can be removed to allow equipment to move in and out. A sump will be constructed in the lowest part of the pad. The geotextile will provide a cushion above the asphalt. The liner will be laid over the geotextile. Plywood will be used on top of the liner to prevent tracked equipment from damaging the liner.

When equipment is moved from the PCB area (PCBs greater than 50 ppm) to the non-PCB areas (PCBs less than 50 ppm) an additional steam pressure wash in accordance with TSCA decontamination procedures will occur. The steam pressure wash will be completed with equipment resting on plywood in the PCB area. The relatively small volume of wash water will be allowed to percolate into the PCB area and will be captured by the French drain or sump(s) installed if not absorbed by the soils.

When equipment needs to be removed from the site or to handle clean soils, it will first be mechanically cleaned and scraped to remove all visible soil. Then, in the decontamination pad, the equipment will be pressure steam washed in accordance with TSCA decontamination procedures. The water collected will be processed in the on-Site water treatment system.

The chain link fence along the top of slope and west side of work area will be removed. A temporary fence will be constructed along the north side of the existing sheet pile and connected to remaining fence along top of slope to enclose the remediation area and

provide security along the pond. All exterior fence lines and gates will remain. The internal chain link fencing on the west side of the AFR will not be replaced during Site restoration.

Good housekeeping practices including maintaining clean surfaces for access and haul routes and monitoring and maintenance of storm water controls will be completed daily, as needed. Trucks used for transport to disposal facilities will not be allowed in the AFR, but will be loaded adjacent to the southwest corner of the AFR. Workers will keep loading and work areas free of soil, mud and debris to avoid tracking of material.

4.2 AIR MONITORING

Throughout the project, air monitoring will be performed to ensure protection of personnel working in the exclusion zone. Breathing zone monitoring will be performed for particulates, oxygen, volatile organic vapors, and specific compounds including TCE, VC, and benzene. Water will be used to control dust and for soil conditioning. A perimeter air monitoring plan will be prepared that will include monitoring for VOCs and dust. The Ambient Air Quality Monitoring Report is provided in Appendix I. Site Specific Health and Safety Plans will be prepared by EQ and CRA for monitoring their workers in the work area. Engineering controls such as water misting will be used to prevent dust generation from the work area.

When EQ is working in the exclusion zone, a PID will monitor breathing zone air continuously. When sustained PID readings are greater than 1 ppm, dragger tubes for VC, TCE, and benzene will be used at least hourly to assess these specific compounds. When PID readings are greater than 1 ppm in the breathing zone, personnel in the exclusion zone will work in Level C PPE. In addition, when adding oxidant to soils, workers will wear Level C PPE. VC is the COC with the lowest action limit. At the onset of soil conditioning, personal sampling pumps will be used by workers conducting the soil conditioning for the analysis of VOCs to ensure that Level C is adequate. Cartridges will be changed every 2 hours until laboratory results from the personal sampling pumps are available. Evaluation of the personal sampling pump results may lead to a change in PPE (either reduced frequency of cartridge changes for the APRs or change to Level B PPE.)

4.3 EXCAVATION WATER COLLECTION

Initially, the existing French Drain and existing sump will be used to recover and remove groundwater from the AFR. As the remedial excavation progresses to the removal of the TSCA impacted soils, a sump will be constructed in the lower surface elevation area (approximately 695 feet AMSL) of the existing clay. Water will be pumped from this lower sump location to prevent groundwater or water with oxidant from migrating around or over the existing sheet pile wall. It is assumed that the clay bottom will prevent flow of water with oxidant under the sheeting. As work progresses, it may be necessary to add or move the sump location for removal of water such that it cannot infiltrate around or over the existing sheet pile wall. Where DNAPL is observed additional separation techniques will be used as discussed in Section 4.5.

During relatively dry periods when groundwater or precipitation is not actively collecting or recharging into the excavation area, the stored water (with oxidant addition) may be used to aid moisture conditioning of impacted soil. This will occur only within the excavation area. Any use of stored water will be limited to the amount necessary to hydrate the impacted soil to prevent run off toward the sump and at concentrations described in Section 4.4.

During relatively wet periods when more constant pumping of the sump(s) is required due to excessive rainfall and/or recharge, water will be treated through the water treatment system described in Section 4.4.

4.4 WATER TREATMENT

Water removed from the excavation and decontamination areas will be pumped to one or more 20,000 gallon frac tank(s), which will be used to store and provide surge relief so that water recovery from the excavation can, at a minimum, match the infiltration of water into the excavation area. Oxidant (potassium permanganate or sodium persulfate) will be added to the water in the frac tank(s) to oxidize the VOCs. Periodic testing of water stored in the frac tank by the on-Site lab will gauge if additional oxidant is required. In addition, samples will be collected for PCB analysis. By minimizing the sediment load through proper sump construction and bag filtration, PCBs should not be present in the stored water.

During relatively wet periods when more constant pumping of the sump(s) is required due to excessive rainfall and/or recharge, the accumulated water will be treated through a water treatment system for permitted discharge to the POTW. The water treatment

system will consist of two multi-bag filter housings and two 1,500 lb activated carbon pressure filtration vessels. This size is able to support up to 100 gallons per minute (gpm) and maintain 7.5 minutes of Empty Bed Contact Time. Although designed for a flow rate up to 100 gpm, the planned discharge rate to the sanitary sewer will be 50 gpm or less. Monitoring and reporting requirements in the YCUA discharge permit will be strictly followed. Although PCBs and phenolics have not been observed in water during previous monitoring of the current on-Site system, samples will be collected and analyzed to ensure the PCBs are not detected (detection level of 0.0002 mg/L) and phenolics below 1.0 mg/L prior to discharge to the YCUA system.

When PCBs are below discharge criteria and water is needed for the soil conditioning, water previously tested and shown to meet drinking water standards for VOCs will be used for moisture conditioning of the soils.

4.5 DNAPL

When visible DNAPL is observed in the excavation area, it will be removed by pumping (diaphragm pump), bailing, and/or use of absorbents pads, if feasible. When DNAPL is pumped or bailed from the excavation, the water/DNAPL mixture will be pumped through weir tanks to facilitate separation of DNAPL from water. The tanks will allow for drainage of DNAPL from the bottom into drums. Water from the weir tanks will then be pumped through a bag filter to the frac tank(s) for storage and treatment of water pumped from excavation as discussed in Section 4.4. The DNAPL will be stored in drums utilizing proper secondary containment. The secondary containment storage area will be covered with a tarp to prevent precipitation from accessing the containment area. Based on known DNAPL PCB concentrations, this material is expected to require incineration at the Veolia facility in Port Arthur, Texas. An existing waste profile approval is in place for disposal of drummed DNAPL with Veolia.

4.6 STORM WATER

Erosion control devices will be installed including silt fence on the outside boundaries of the east and west slopes and will be connected to the existing sheeting. Inlet protection (geotextile) will be installed in storm catch basins (CB-11, CB-15) and others in the staging area. Soil will not be staged within 25 feet of any active catch basin. Plastic sheeting (6 mm) will be maintained under and over any soil staged in the parking lot area. Covers will be weighed down with straw bales, sand bags, wood scraps, and stones.

Precipitation that falls directly within the remediation area will be collected by the groundwater recovery and treatment system. The existing underground storm sewer system will be modified as described in Section 4.8.1.

4.7 BURIED DRUMS AND CONTAINERS

Any drums or containers identified with liquid product will be segregated and stored in overpack drums for sampling, profiling and proper disposal. The overpack drums will be stored in a controlled containment area, and covered with a tarp to prevent run on and run off pending sample results and logistics to arrange appropriate disposal.

4.8 UTILITIES

Active utilities within the AFR include storm sewers that drain the parking lot and a power pole owned by DTE Energy.

4.8.1 STORM SEWERS

Storm Sewer B, as identified on Figure 4.1, conveys storm water from the parking lot to Tyler Pond through the AFR. The sewer will be maintained or rerouted (temporarily or permanently) to control storm water in the catchment area of Storm Sewer B during the interim measure.

4.8.2 DTE POWER POLE

Prior to the start of work, the power pole will either be temporarily or permanently relocated per DTE Energy requirements. DTE is currently determining the approach.

4.9 PART 22 RULES PERMIT EXEMPTION REQUIREMENTS

Additional monitoring and contingency procedures, required to obtain a groundwater discharge permit exemption are discussed in the following sections.

4.9.1 MONITORING

Monitoring will be completed within the AFR, specifically from the south side of the sheet pile wall near the bank of the pond, to determine the effectiveness of the soil conditioning and to ensure that contaminants and residuals of the oxidants will not enter the pond. Due to the nature (open excavation) of the interim measure including application of the reagents and excavation of the conditioned soils, some of the monitoring will not involve chemical analysis. Monitoring phases will be implemented as follows:

Baseline Monitoring – will be performed prior to the remediation activities to establish baseline conditions. It should be noted that numerous investigations have been completed within PAOC 18 area over the past years, therefore baseline concentrations for contaminants of concern and potential daughter products in groundwater are identified. The baseline groundwater monitoring however will be completed to evaluate dissolved metals and field parameters to allow a determination of what components may be due to the soil conditioning versus naturally occurring or pre-remedial conditions.

Groundwater samples will be collected from two existing GSI wells GS-6 and GS-8 as well as the French Drain sump. Groundwater samples will be collected and analyzed for dissolved metals. Table 4.1 identifies the groundwater sampling locations and parameters.

Co-Implementation Monitoring – refers to any monitoring completed during the remedial activities. As stated in Section 3.5.2, groundwater and/or storm water from the remedial excavation will be pumped using the existing French Drain and at least one sump installed in the excavation. This will assist in maintaining a dry excavation area and protecting the pond from receiving impacted water that has passed through the excavation area. Co-implementation monitoring will therefore involve visually monitoring the general progress of the excavation and to ensure that water in the excavation is pumped or removed so that it cannot infiltrate around or over the existing sheet pile wall.

Post Implementation or Remedial Evaluation Monitoring – will be performed to determine the effectiveness of the treatment and to monitor the residual products from the oxidation process. Samples will be collected from new GSI wells installed post excavation near the locations of existing GSI wells GS-6 and GS-8. Groundwater samples will also be collected from the reinstalled French Drain sump. Table 4.1 summarizes the sampling parameters.

Two groundwater sampling events will be completed following completion of the interim measure. The first sampling event will be completed six weeks following the completion of the remediation events and the second sampling event will be completed two to three months after the first sampling event (prior to the winter freeze).

The analytical results from the post remediation sampling activities will be compared to the baseline concentrations to determine changes to chemical or biological conditions, if any.

4.9.2 CONTINGENCY PLANNING

As stated in Section 4.9.1, during the implementation of the IMWP, monitoring and preventing discharge of contaminated groundwater or water containing oxidant to the pond will be completed by visual observation and pumping. Sump(s) will be created within the excavation to remove water from the excavation. Initially one sump will be constructed in the excavation. If pumping at one location is not sufficient to prevent water from migrating over or around the sheet pile wall, additional sumps will be constructed and additional pumps used. Adjacent to the pond and inside the sheet pile wall the existing French Drain and sump system will be used to recover and remove groundwater/storm water from the excavation that is near the pond. This system has been used for the past three years to prevent groundwater from overflowing the sheet pile wall and discharging to the pond. This system will be removed and replaced during the interim measure. EQ will maintain sufficient water storage and/or water treatment to facilitate the pumping rate required to prevent discharge of contaminated groundwater or water containing oxidant to the pond.

Following completion of the interim measure, monitoring data from wells adjacent to the pond and from water recovered from the French Drain system will be evaluated as discussed in Section 4.9.1. If concentrations pose a risk to health or the environment, the French Drain system will remain in operation recovering water during non-freezing periods of the year until concentrations can be brought back within limits or the MDEQ agree to discontinue the water recovery. In addition, an injection gallery will be installed within the excavation area when the area is backfilled. This gallery, described in Section 5.2, will allow for post-remediation addition of amendments or recovery of water, if needed.

5.0 BACKFILL AND SITE RESTORATION

5.1 BACKFILL

Prior to backfill, two feet of clean imported clay will be placed at the bottom of the excavation where native clay is exposed. This layer will act as a barrier to decrease the potential for contamination of clean backfill material and groundwater from any VOCs remaining in the native clay via back diffusion.

Reusable overburden compliant with the Remediation Requirements will be used as backfill and will be placed above the water table under asphalt cover. Additional imported backfill needed to bring the excavation to above the water table and/or the desired grade, will be consistent with the type of material removed (i.e. silty sands/sands). Imported backfill materials will be evaluated as discussed in Section 1.5.3.2.

5.2 INJECTION GALLERY

A network of 4-inch horizontal wells will be installed while backfilling the excavation to create an injection gallery for potential future use by RACER. Figure 4.1 provides further details on the approximate locations, depths, lengths, and installation details of the horizontal wells.

5.3 FRENCH DRAIN

In 2010 a French drain was installed within the sheet pile wall area to collect groundwater daylighting along the bottom of the bank within the sheet pile wall and venting to Tyler Pond. The French drain consists of 4-inch perforated high-density polyethylene pipe that runs to a central sump. The sump pump is level controlled and pumps the collected water to a frac tank currently located in the southwest portion of PAOC 18 in the parking lot. The French drain will remain in place for as long as possible during the excavation to provide groundwater containment and protection of the pond. Following excavation of the impacted material, the French drain system will be reinstalled to allow for groundwater recovery/monitoring following completion of the interim measure. Reinstallation of the French drain is desired as a short term measure to allow for monitoring to ensure that the remedial measure has decreased the groundwater concentrations, as intended, and also as a contingency in the case of continued FAV exceedances.

5.4 SITE RESTORATION

The bank of Tyler Pond will be restored to its pre-excavation slope and finished with topsoil and seeded with a native mix. Erosion blanket will immediately be stapled over the seed and topsoil on the slope. The asphalt parking lot will be restored such that grades will match existing conditions and drain to Site catch basins.

6.0 PROPOSED RESTRICTIVE COVENANT

RACER plans to restrict land use at the entire Site to non-residential uses and to prohibit direct groundwater use (i.e. potable or other direct uses such as gardening) over the entire Site. Additional restrictions may be applied to portions of the Site based on final corrective measures completed.

If PCB sampling at the limits of the full excavation indicates that concentrations of PCBs greater than 16 ppm, the MDEQ non-residential direct contact criteria, remain present, then additional restrictions, as appropriate, will be implemented to limit exposure.

7.0 NOTIFICATIONS AND CERTIFICATIONS

7.1 RCRA

7.1.1 RCRA CERTIFICATION

Based on my knowledge of the conditions of the property described in the remedial action plan and my inquiry of the person or persons who manage the system referenced in the operator's certification, or those persons directly responsible for gathering the information, 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 knowing violations.



Grant Trigger
Michigan Cleanup Manager
Revitalizing Auto Communities
Environmental Response Trust

2-27-13

Date

7.2 TSCA

7.2.1 TSCA NOTIFICATION

A Notification of PCB Waste Activity Form (U.S. EPA Form 7710-53) must be completed and submitted to the U.S. EPA consistent with 40 CFR 761.205 prior to initiating any removal activities. This notification is attached in Appendix J.

7.2.2 TSCA CERTIFICATION

Consistent with 40 CFR 761.61 (a)(3)(i) (E), the signatories to this document certify that:

- All sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the Site are on file at the following

location and are available for U.S. EPA and MDEQ inspection:

Conestoga-Rovers & Associates
14996 Sheldon Road
Suite 200
Plymouth, Michigan 48170
(734) 453-5123
Attn: Beth Landale

CRA, as the Engineer, represents RACER and will act as the party implementing the cleanup plan in accordance with §761.61.



RACER Representative Signature

2-27-13

Date

Grant Trigger

Printed Name

Cleanup Manager - Michigan

Position



CRA Representative Signature

2-27-13

Date

Beth Landale

Printed Name

Project Manager

Position

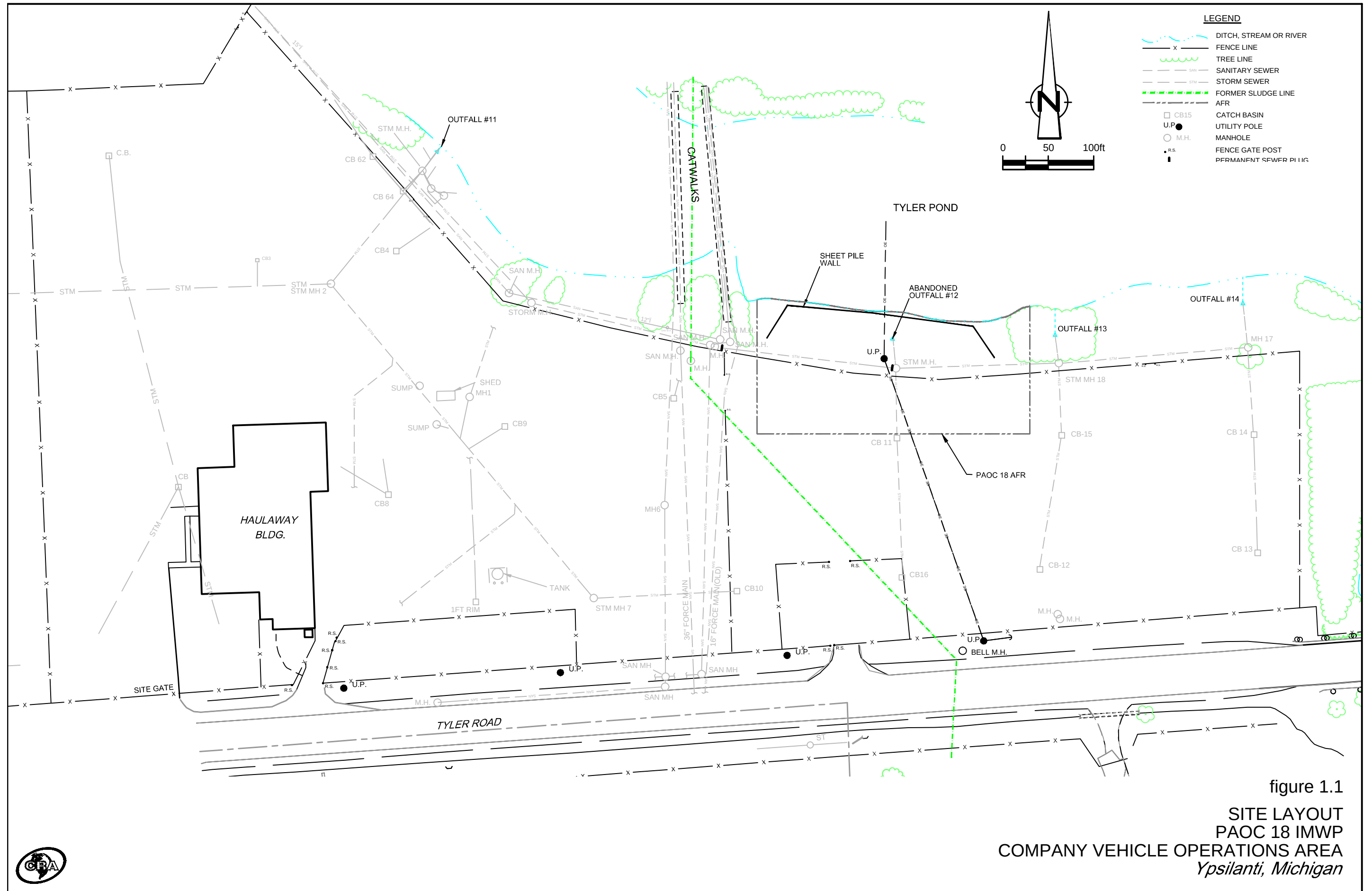
8.0 REFERENCES

CRA, July 2012. Site Summary Report, Former General Motors Company Vehicle Operations Property, Ypsilanti, Michigan

MDEQ, August 2002. Sampling Strategies and Statistics Training Materials For Part 201 Cleanup Criteria.

U.S. EPA, October 4, 1998. Management of Remediation Wastes Under Resource Conservation and Recovery Act (RCRA)", (EPA530-F-98-026)

FIGURES



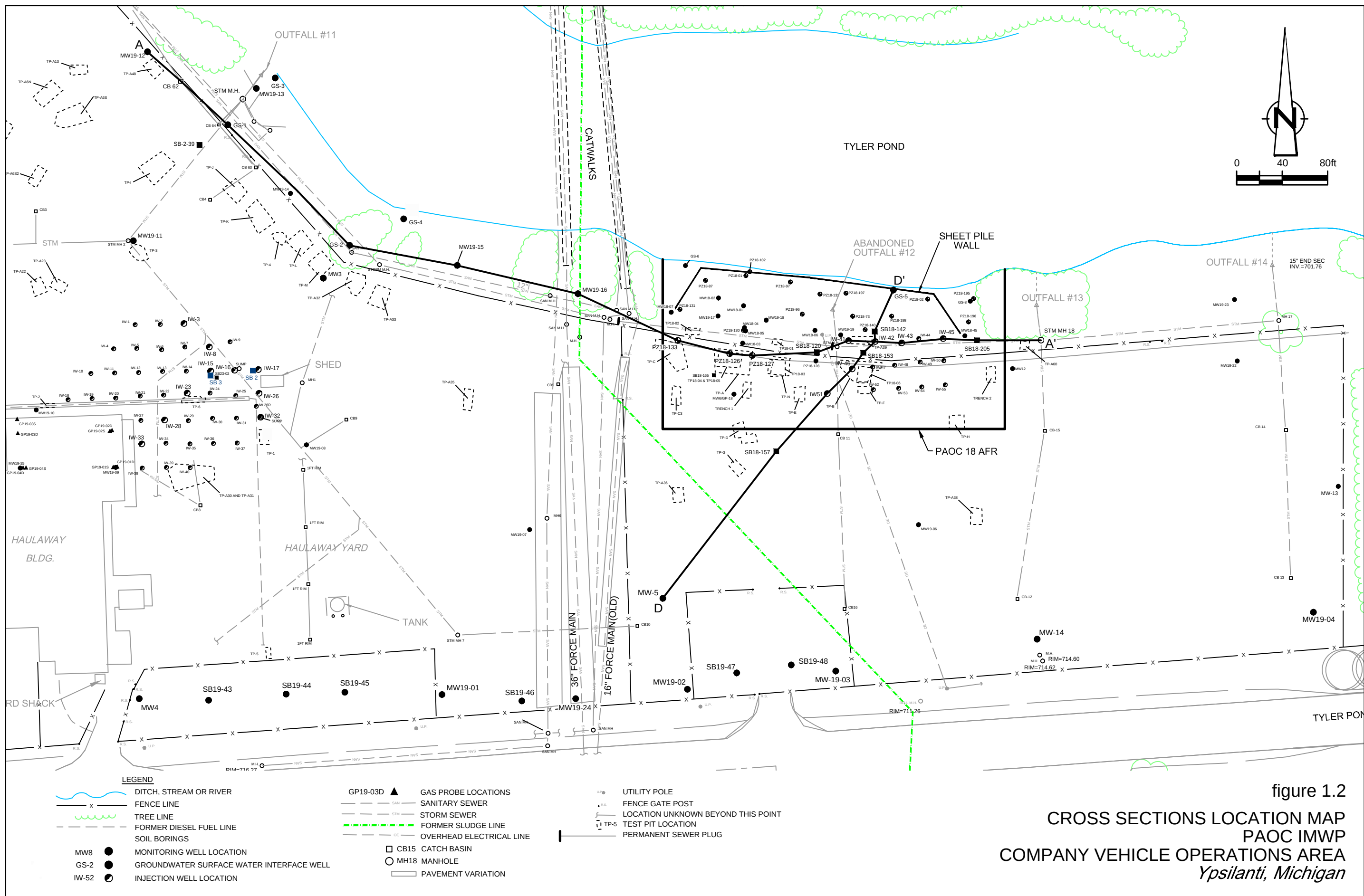
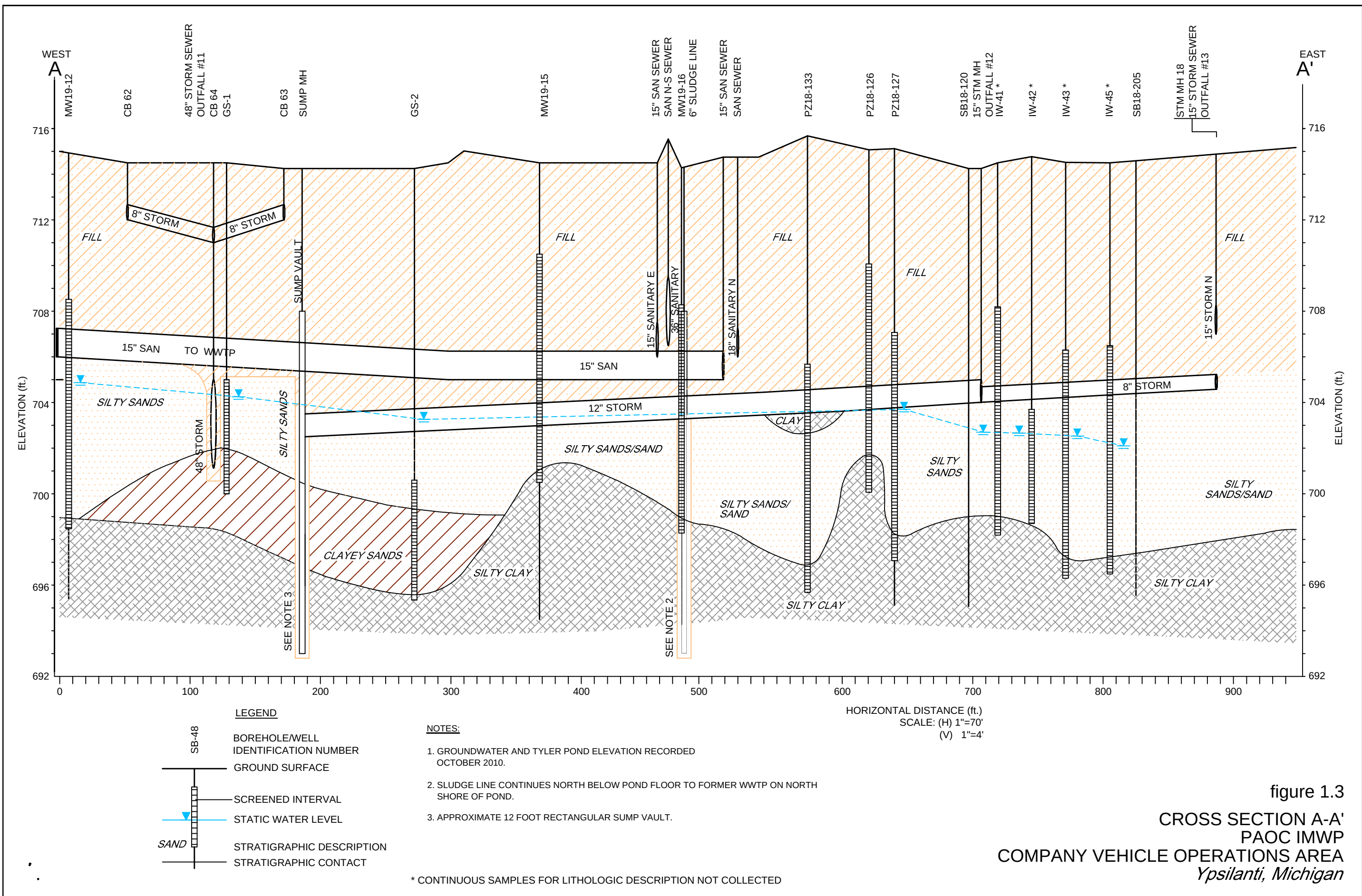
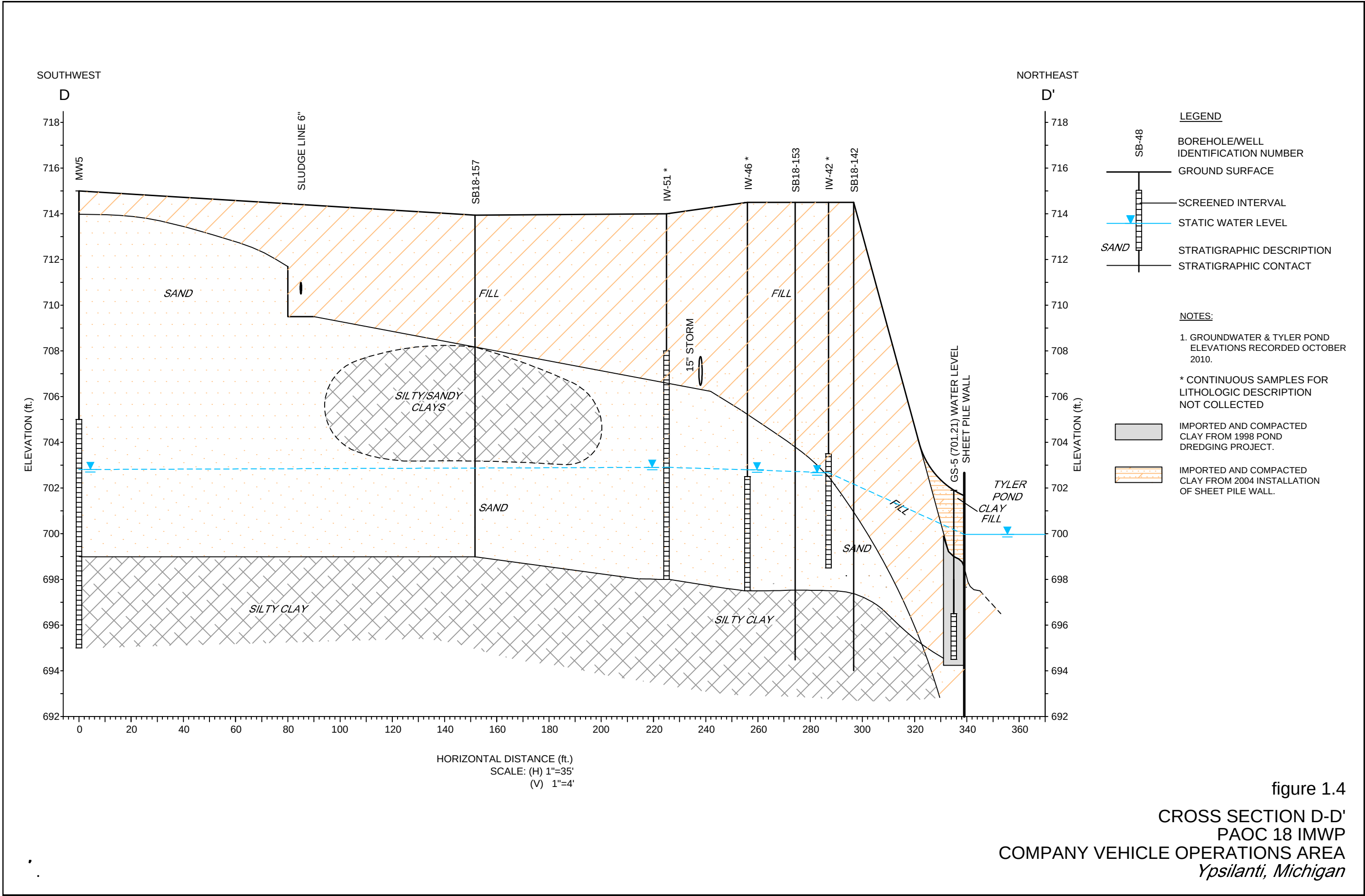
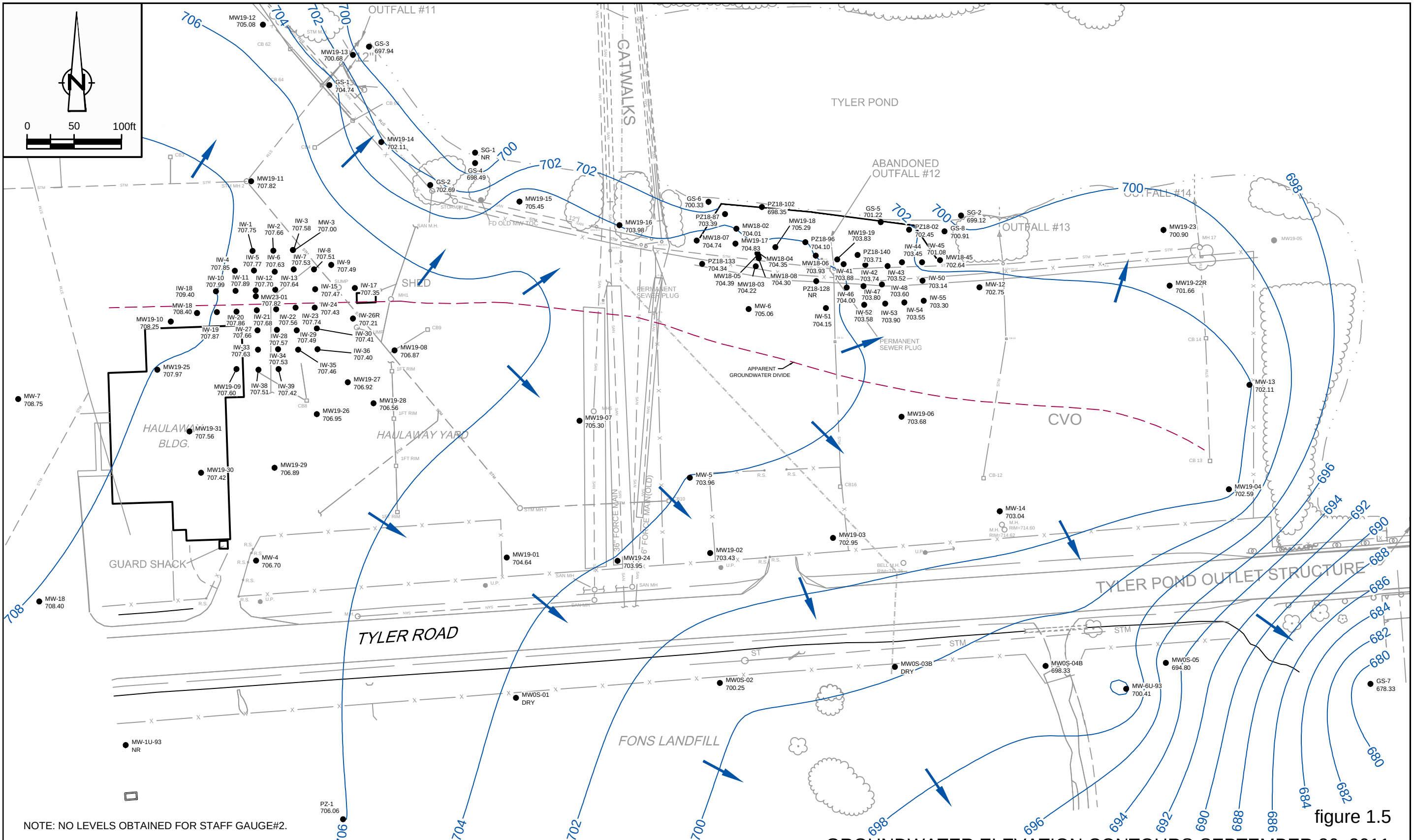


figure 1.2
CROSS SECTIONS LOCATION MAP
PAOC IMWP
COMPANY VEHICLE OPERATIONS AREA
Ypsilanti, Michigan







NOTE: NO LEVELS OBTAINED FOR STAFF GAUGE#2.

LEGEND

- 708 — GROUNDWATER CONTOUR
- DITCH, STREAM OR RIVER
- - - - - FENCE LINE
- ~ ~ ~ ~ ~ TREE LINE
- U.P. 702.95 FORMER SLUDGE LINE
- - - - - APPARENT GROUNDWATER DIVIDE
- U.P. 702.95 UTILITY POLE
- U.P. 702.95 GROUNDWATER ELEVATION (AMSL)

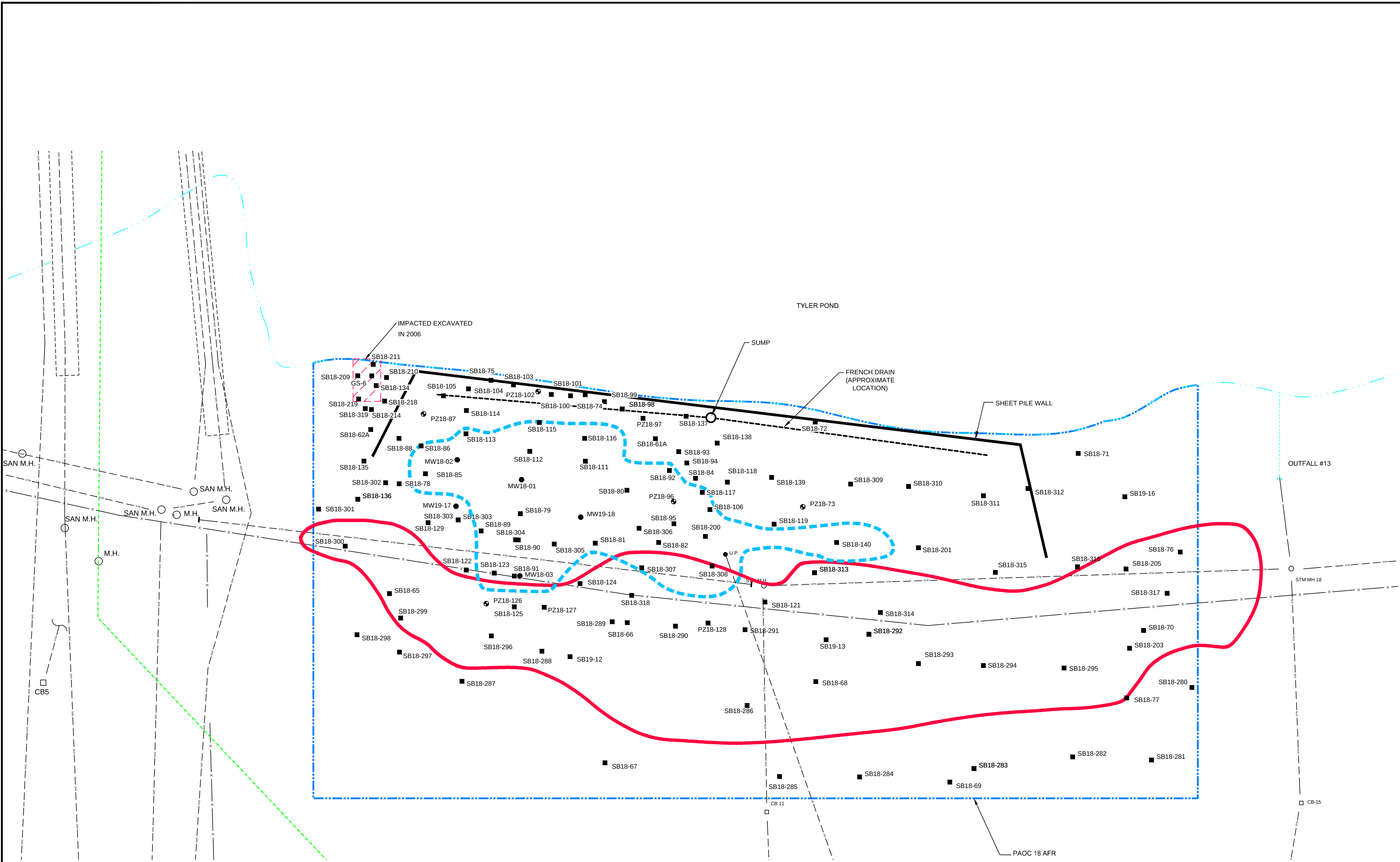
GROUNDWATER ELEVATION CONTOURS-SEPTEMBER 26, 2011

PAOC 18 IMWP

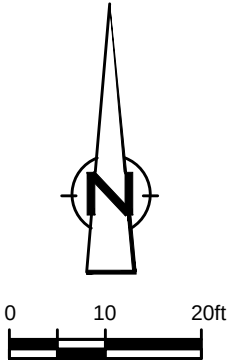
COMPANY VEHICLE OPERATIONS AREA

Ypsilanti, Michigan





No	Revision	Date	Initial



LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STW STORM SEWER
- PERMANENT SEWER PLUG
- SAN SANITARY SEWER
- OE OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- SB18-287 SOIL BORING LOCATION (WITH SOIL ANALYTICAL)
- MW18-18 MONITORING WELL LOCATION (WITH SOIL ANALYTICAL)
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- AFR

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS

Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

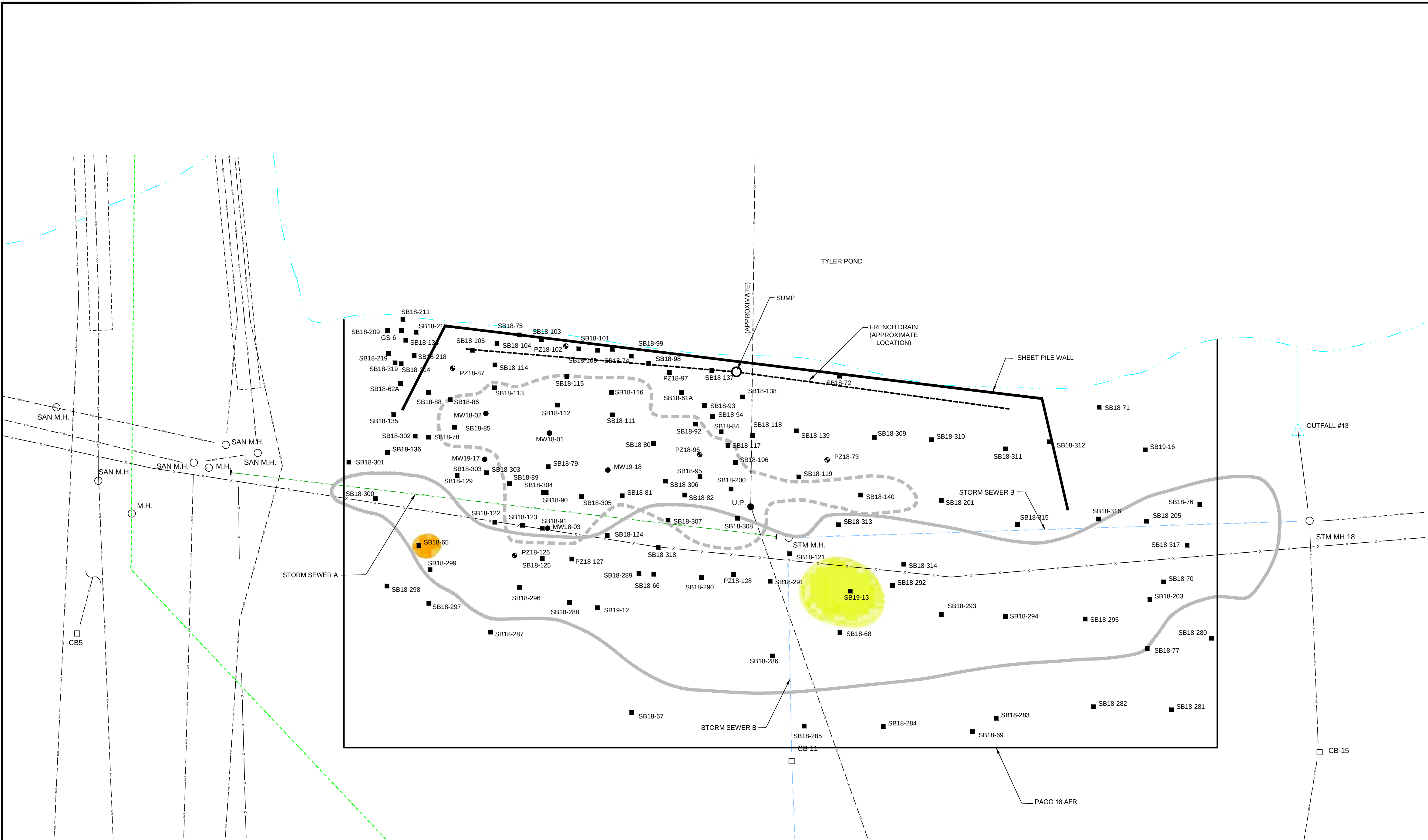
AREA FOR REMEDIATION
PAOC 18 IMWP



CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: JANUARY 2013
Scale: 1:20	Project N ^o : 017303-T01	Report N ^o : 025
		Drawing N ^o : 2.1



No	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

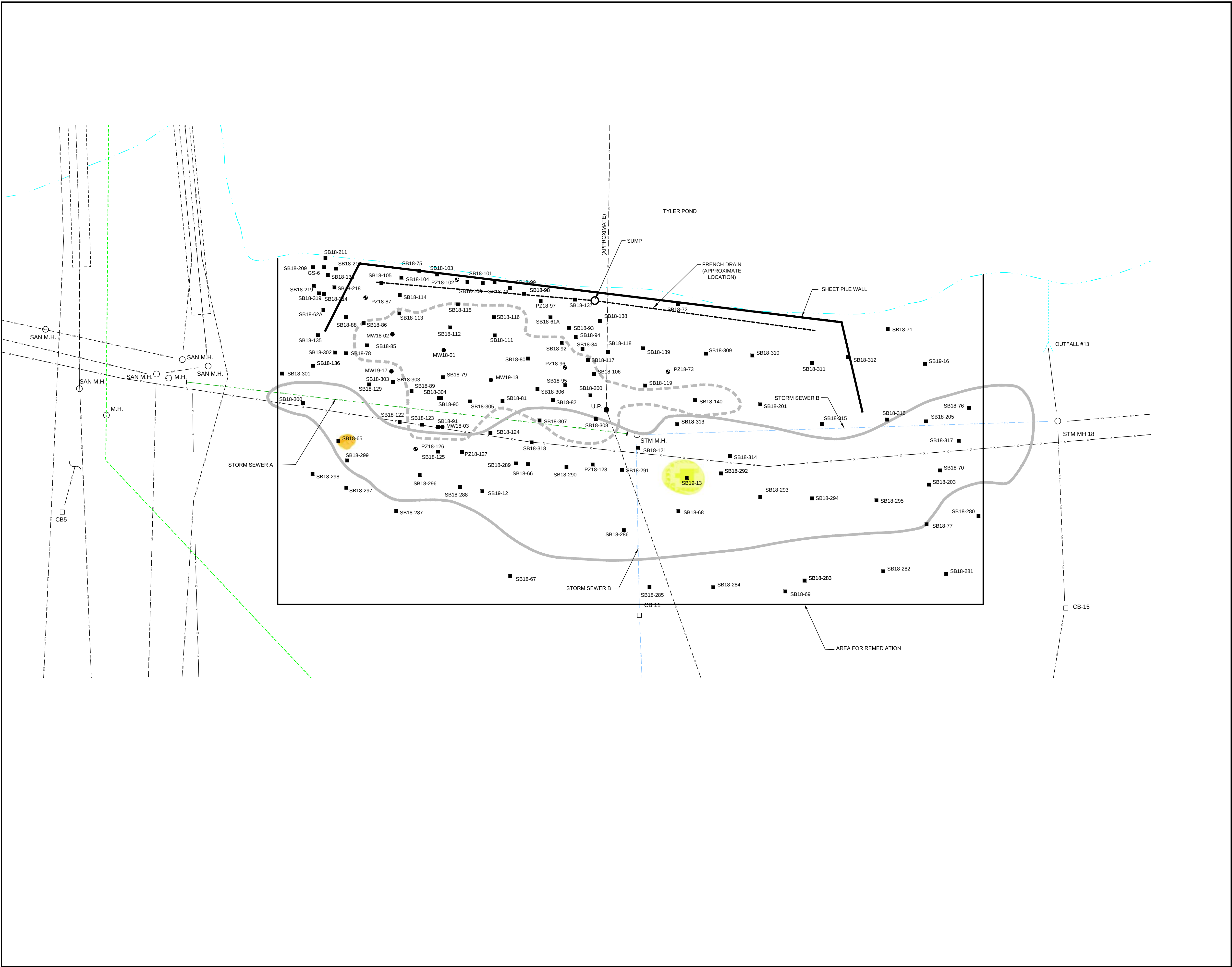
ELEVATION INTERVAL 714 - 715 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.2



No	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- STORM SEWER
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

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Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

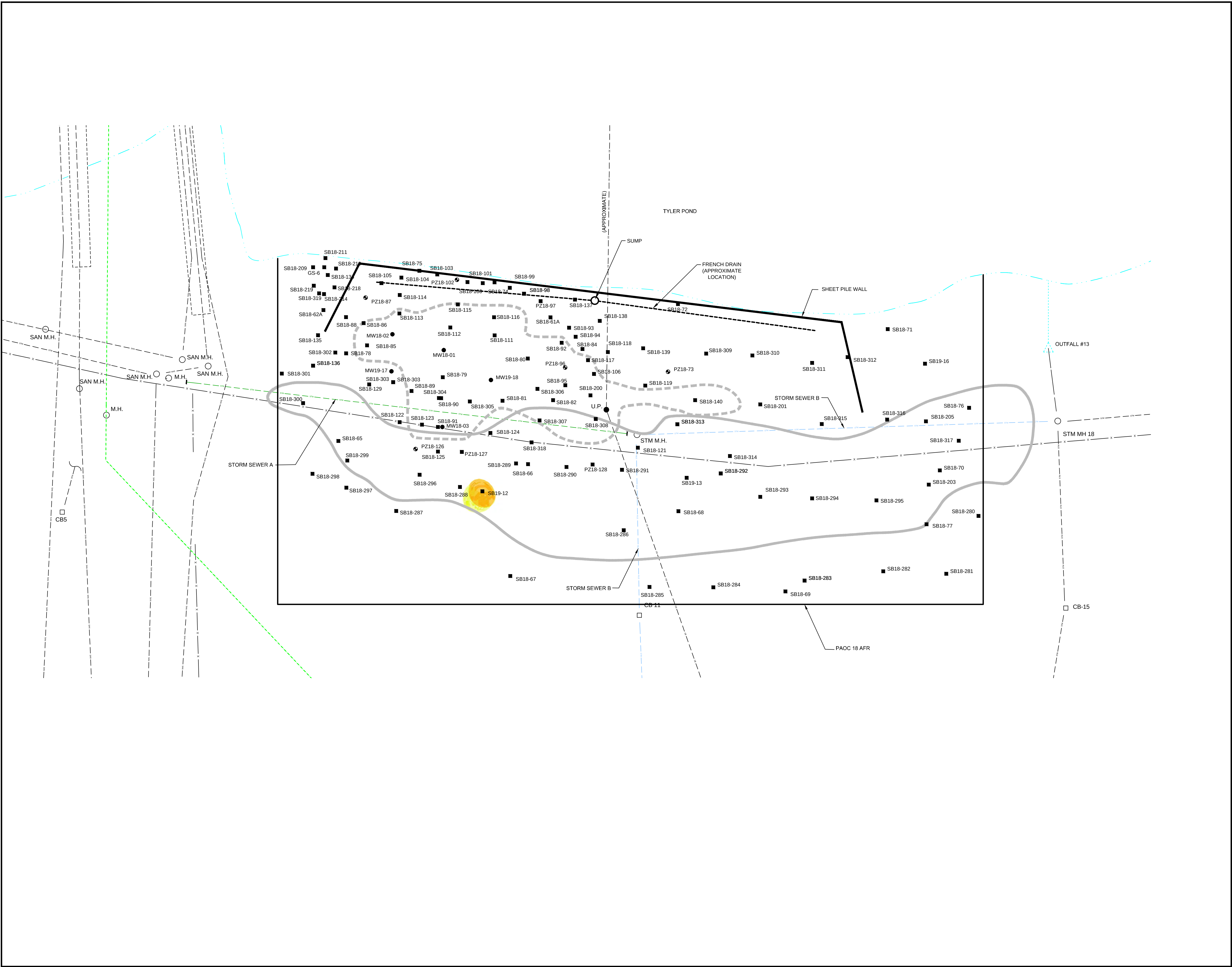
ELEVATION INTERVAL 713 - 714 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.3



No	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

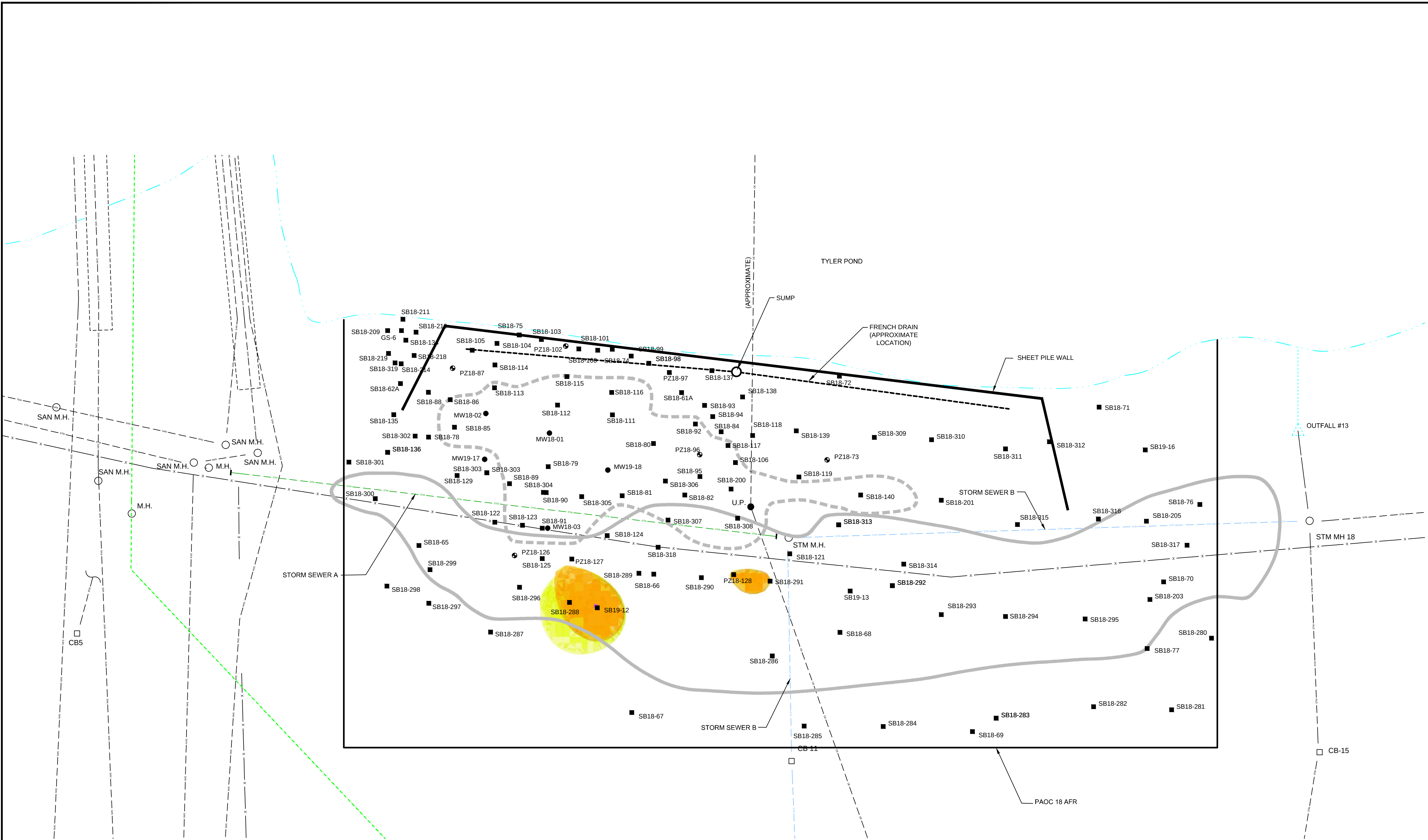
ELEVATION INTERVAL 712 - 713 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

 **CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.4



No	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- STORM SEWER
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

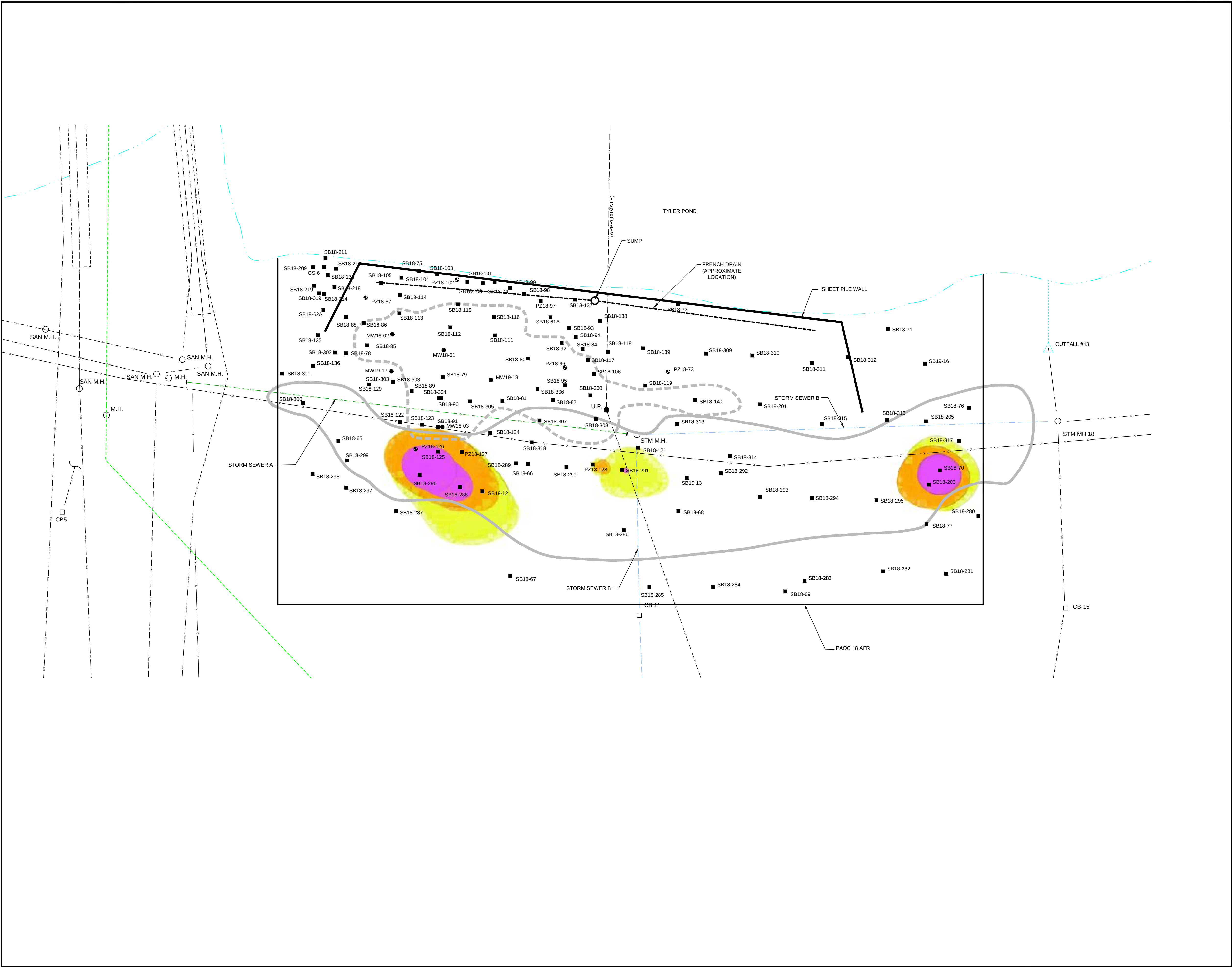
ELEVATION INTERVAL 711 - 712

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.5



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- STORM SEWER
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

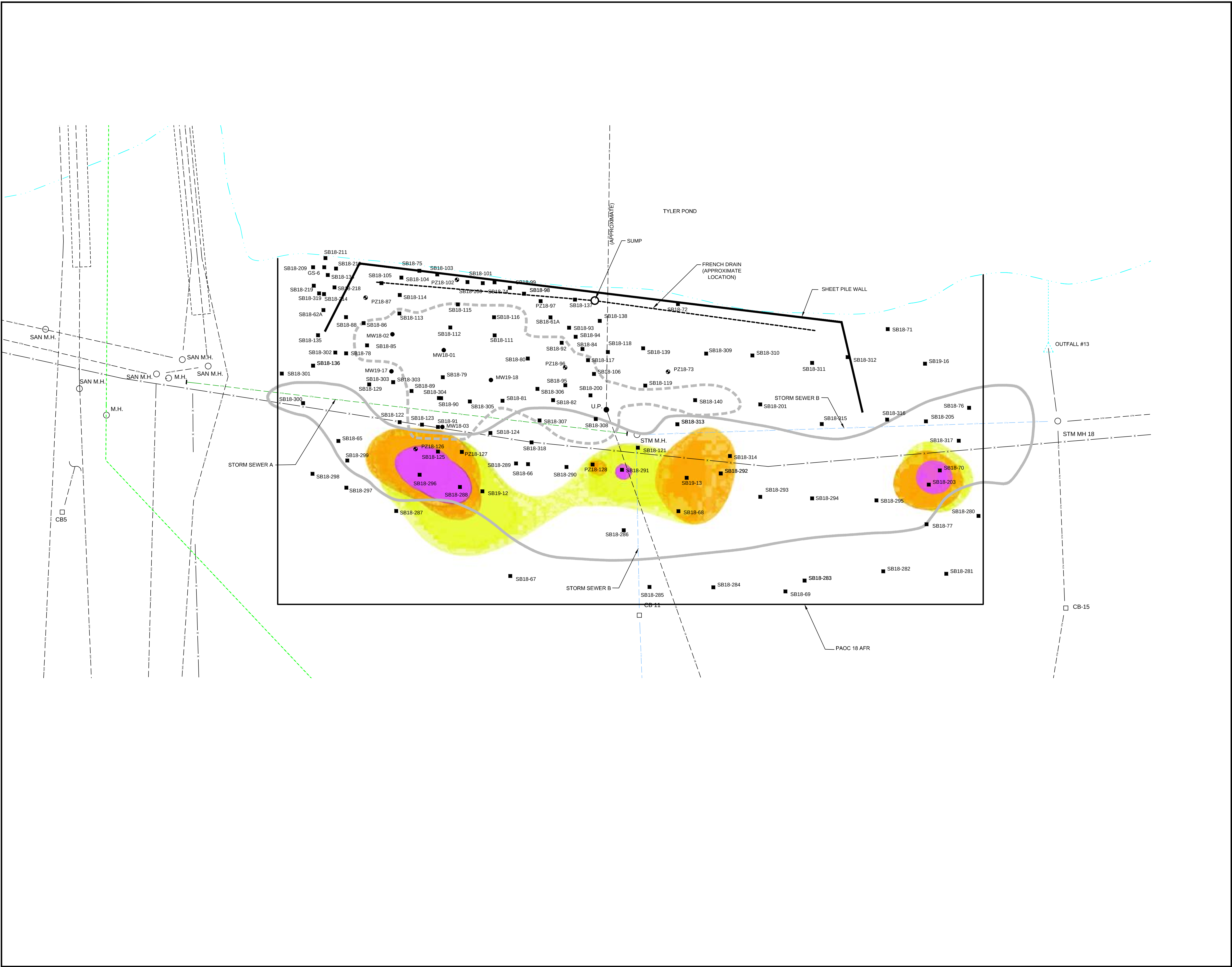
ELEVATION INTERVAL 709 - 710 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

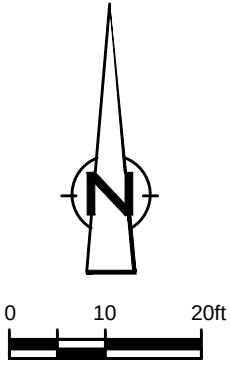
CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.7



Nº	Revision	Date	Initial



LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS

Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

ELEVATION 708 - 709 AMSL

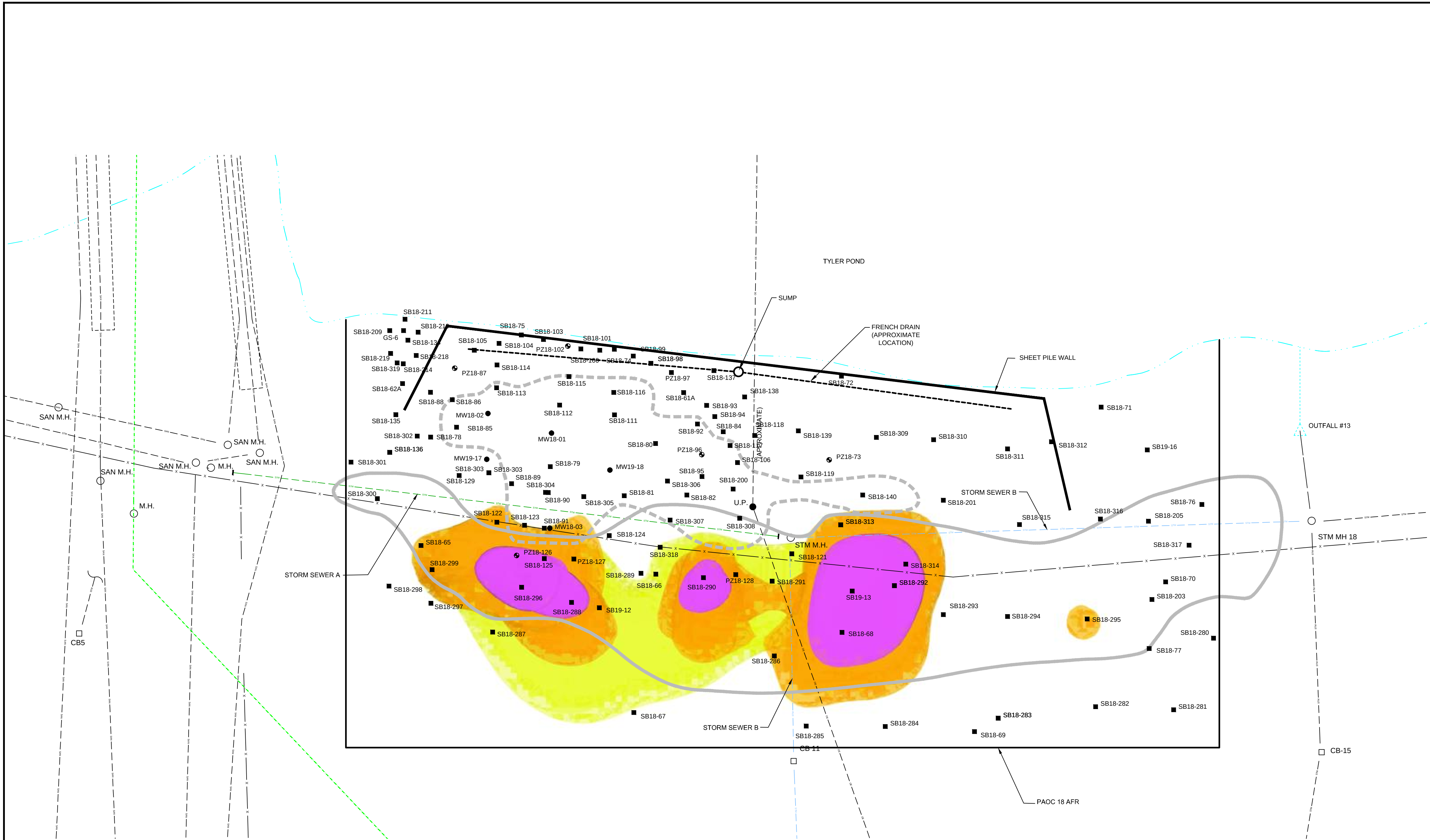
VOC EXTENT OF IMPACTS
PAOC 18 IMWP



CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.8



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS			
Status		Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

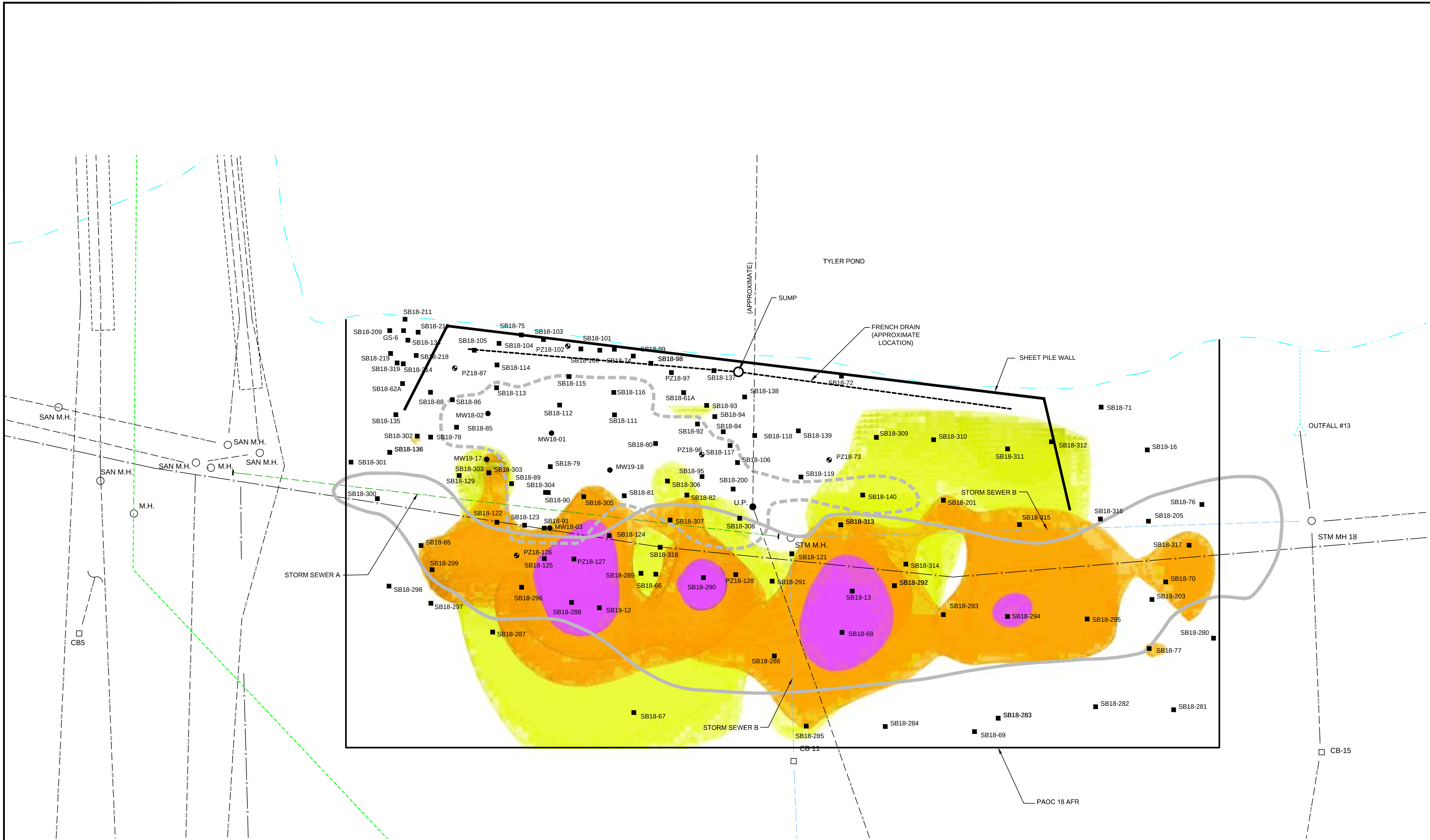
ELEVATION INTERVAL 706 - 707 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.10



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS			
Status		Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

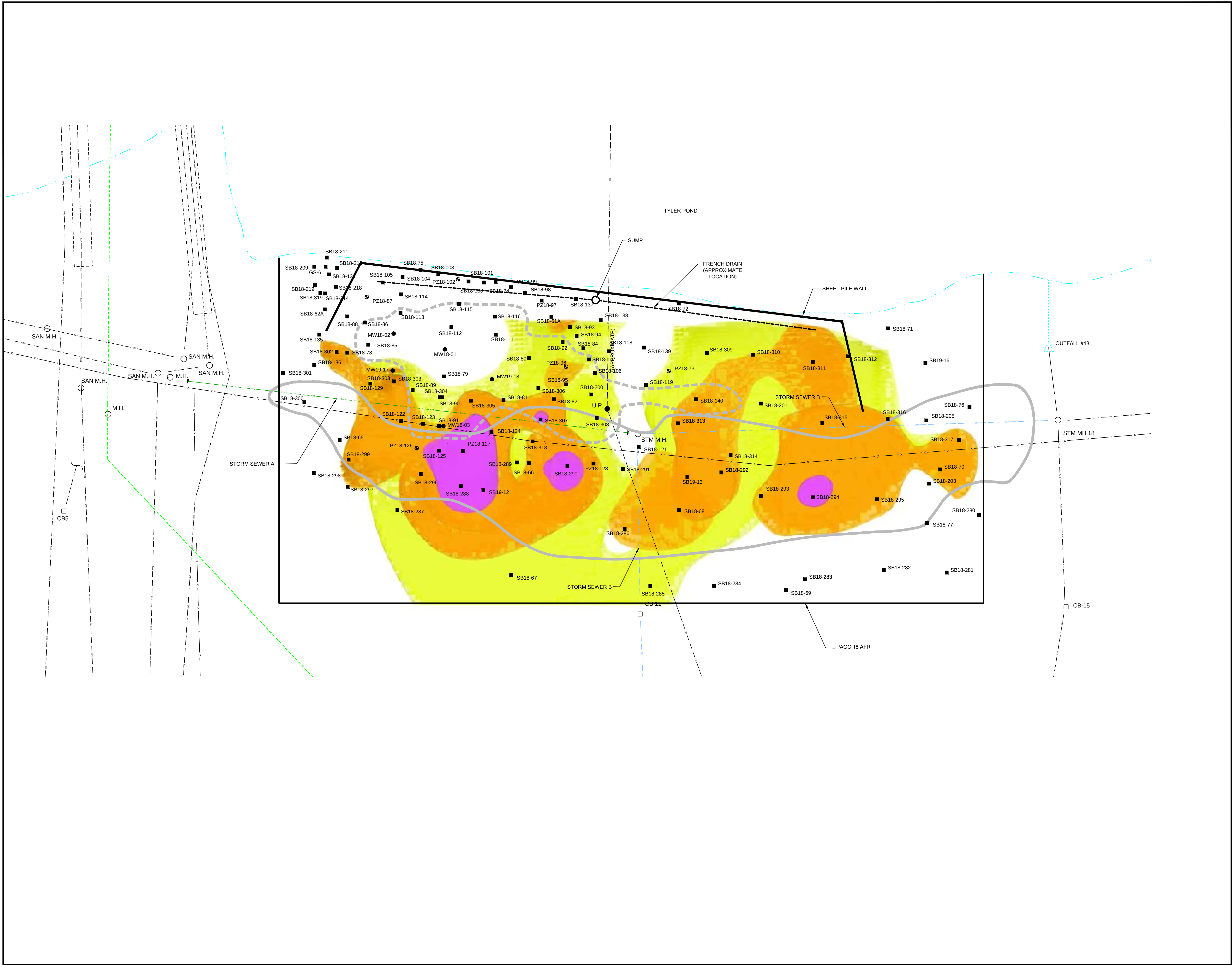
ELEVATION INTERVAL 704 - 705 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.12



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STW - STORM SEWER
- PERMANENT SEWER PLUG
- SAN - SANITARY SEWER
- OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION

IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS

IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL

IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

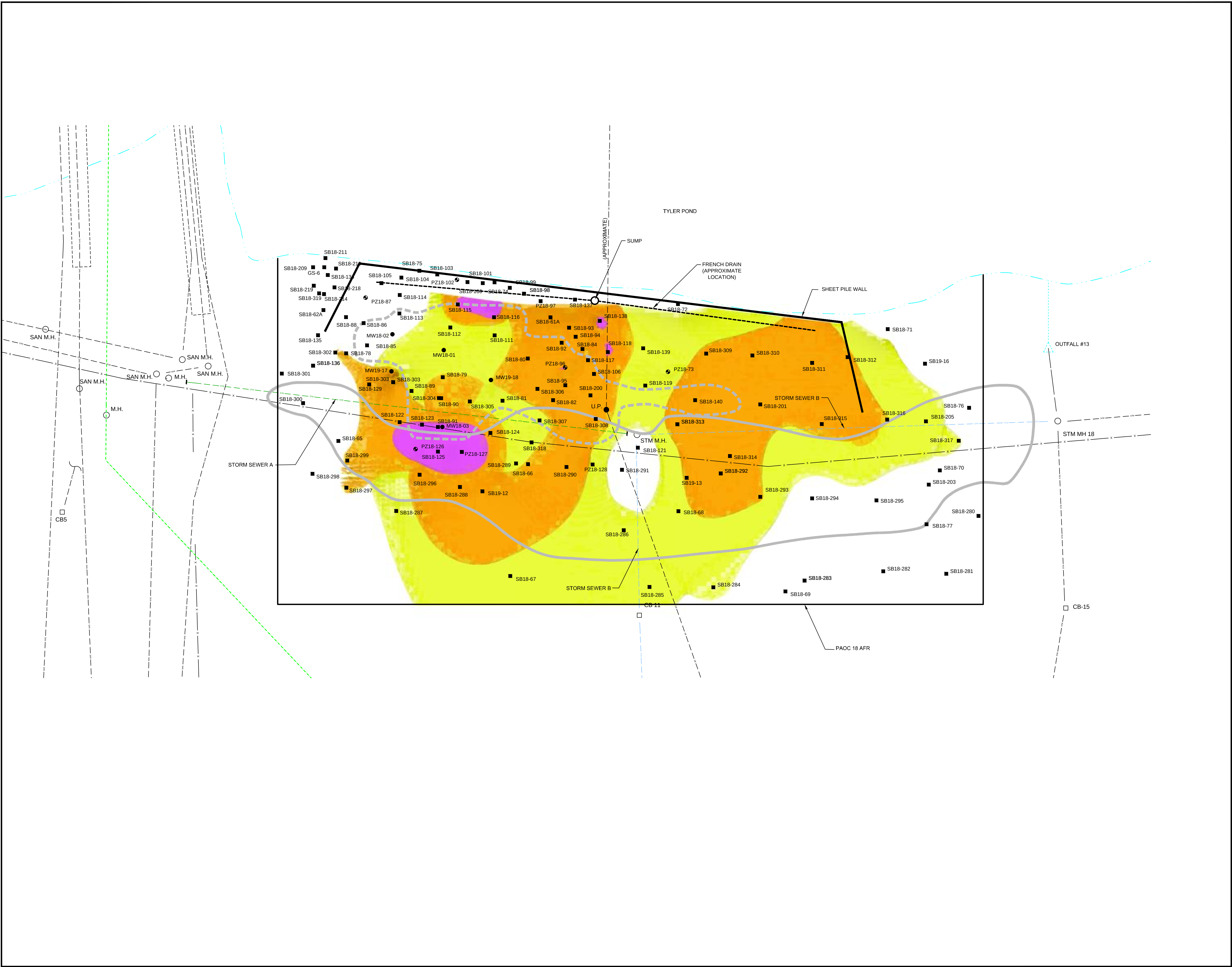
ELEVATION INTERVAL - 703 - 704 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

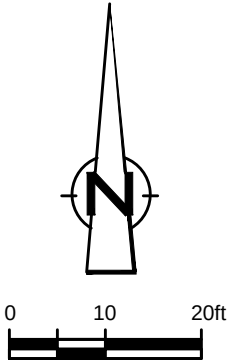
CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.13



Nº	Revision	Date	Initial



LEGEND

DITCH, STREAM OR RIVER

X

FENCE LINE

FORMER SLUDGE LINE

STW

STORM SEWER

PERMANENT SEWER PLUG

SAN

SANITARY SEWER

OE

OVERHEAD ELECTRICAL LINE

CB15

CATCH BASIN

MH18

MANHOLE

DNAPL DELINEATION

BURIED REFUSE DELINEATION

IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS

IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL

IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

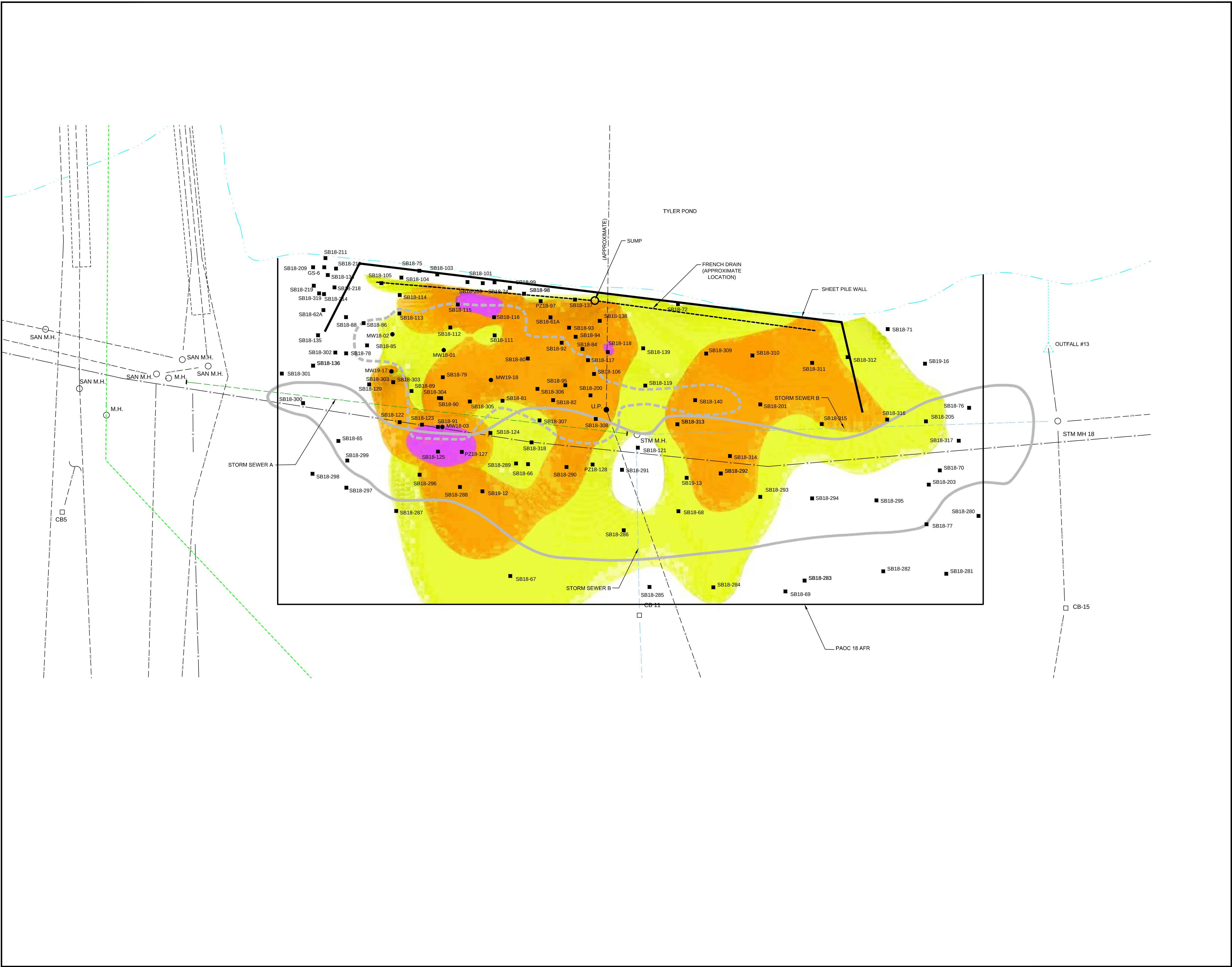
ELEVATION INTERVAL - 701 - 702 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

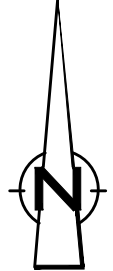
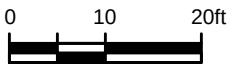
 **CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.15



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM - STORM SEWER
- PERMANENT SEWER PLUG
- SAN - SANITARY SEWER
- OVERHEAD ELECTRICAL LINE
- CB15 - CATCH BASIN
- MH18 - MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION

- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS		
Status	Date	Initial

**COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN**

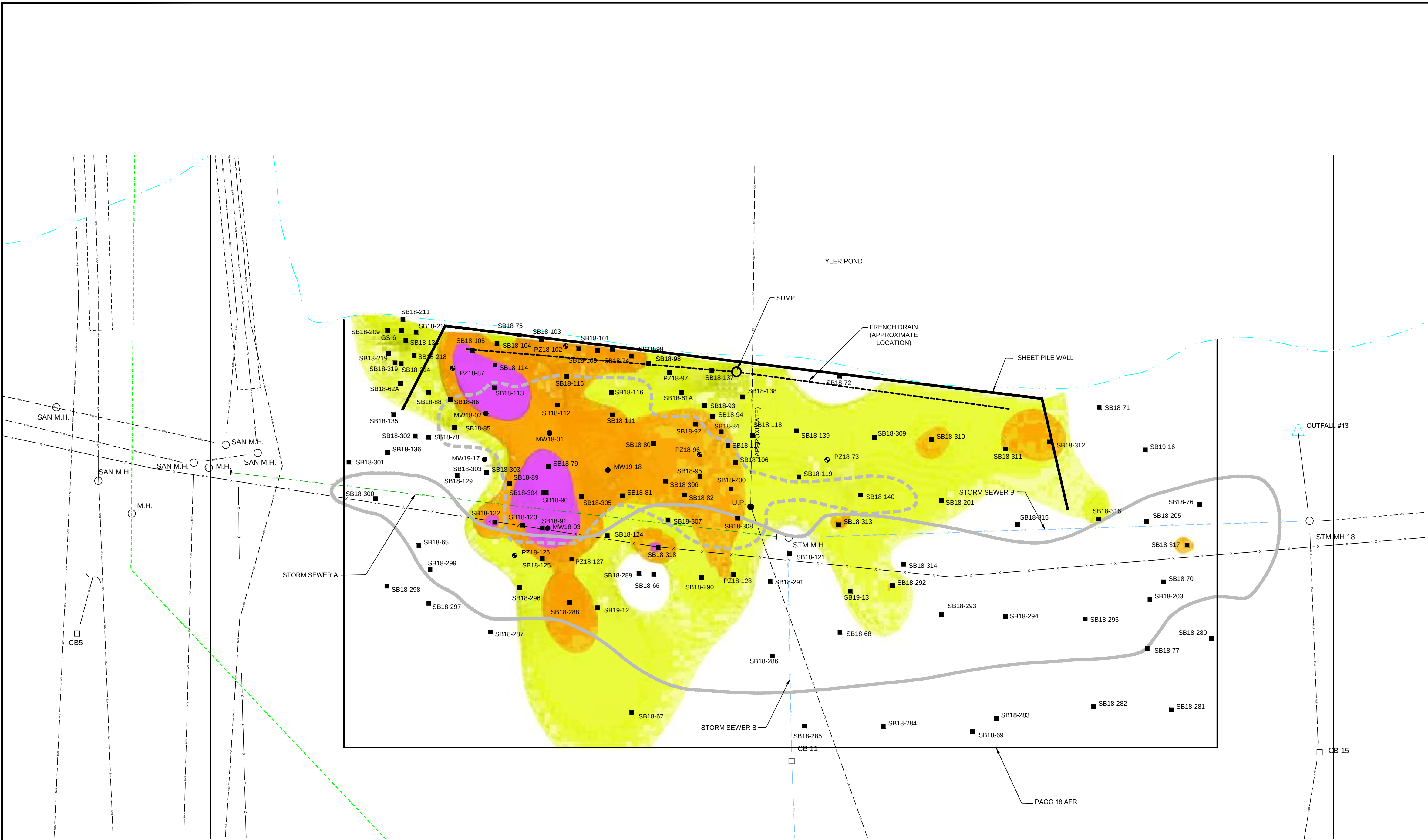
ELEVATION INTERVAL - 700 - 701 AMSL

**VOC EXTENT OF IMPACTS
PAOC 18 IMWP**

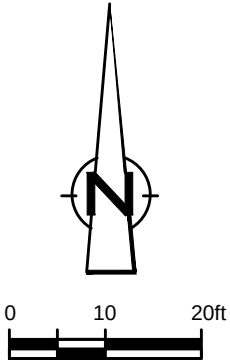
**CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.16



Nº	Revision	Date	Initial



LEGEND

DITCH, STREAM OR RIVER

X

FENCE LINE

FORMER SLUDGE LINE

STM

STORM SEWER

PERMANENT SEWER PLUG

SAN

SANITARY SEWER

OE

OVERHEAD ELECTRICAL LINE

CB15

CATCH BASIN

MH18

MANHOLE

DNAPL DELINEATION

BURIED REFUSE DELINEATION

IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS

IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL

IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

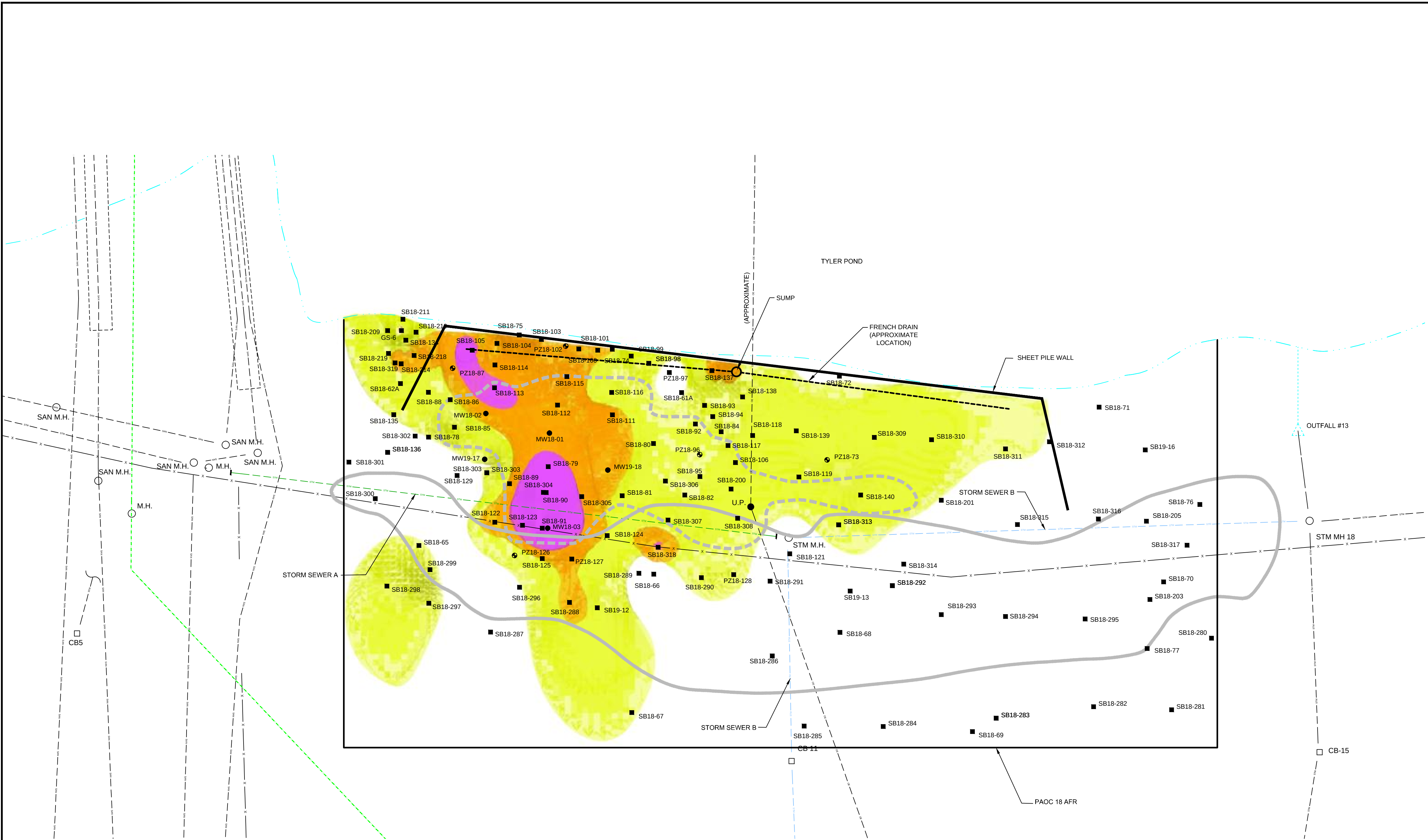
ELEVATION INTERVAL 698 - 699 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

 **CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.18



No	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- STORM SEWER
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS			
Status		Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

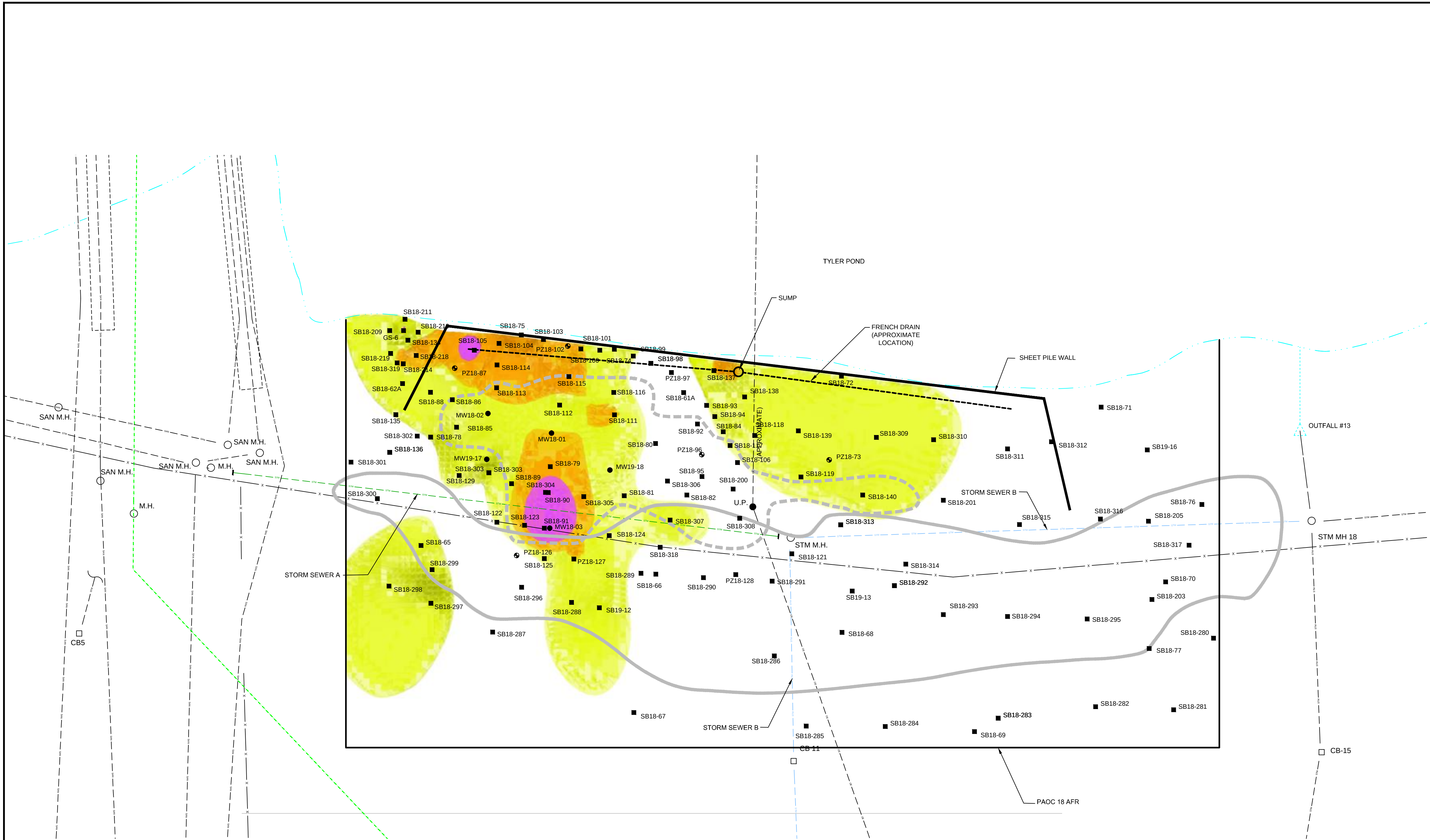
ELEVATION 697 - 698 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

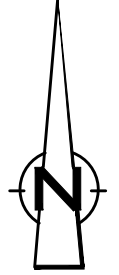
CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.19



No	Revision	Date	Initial




LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- STORM SEWER
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS			
Status		Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

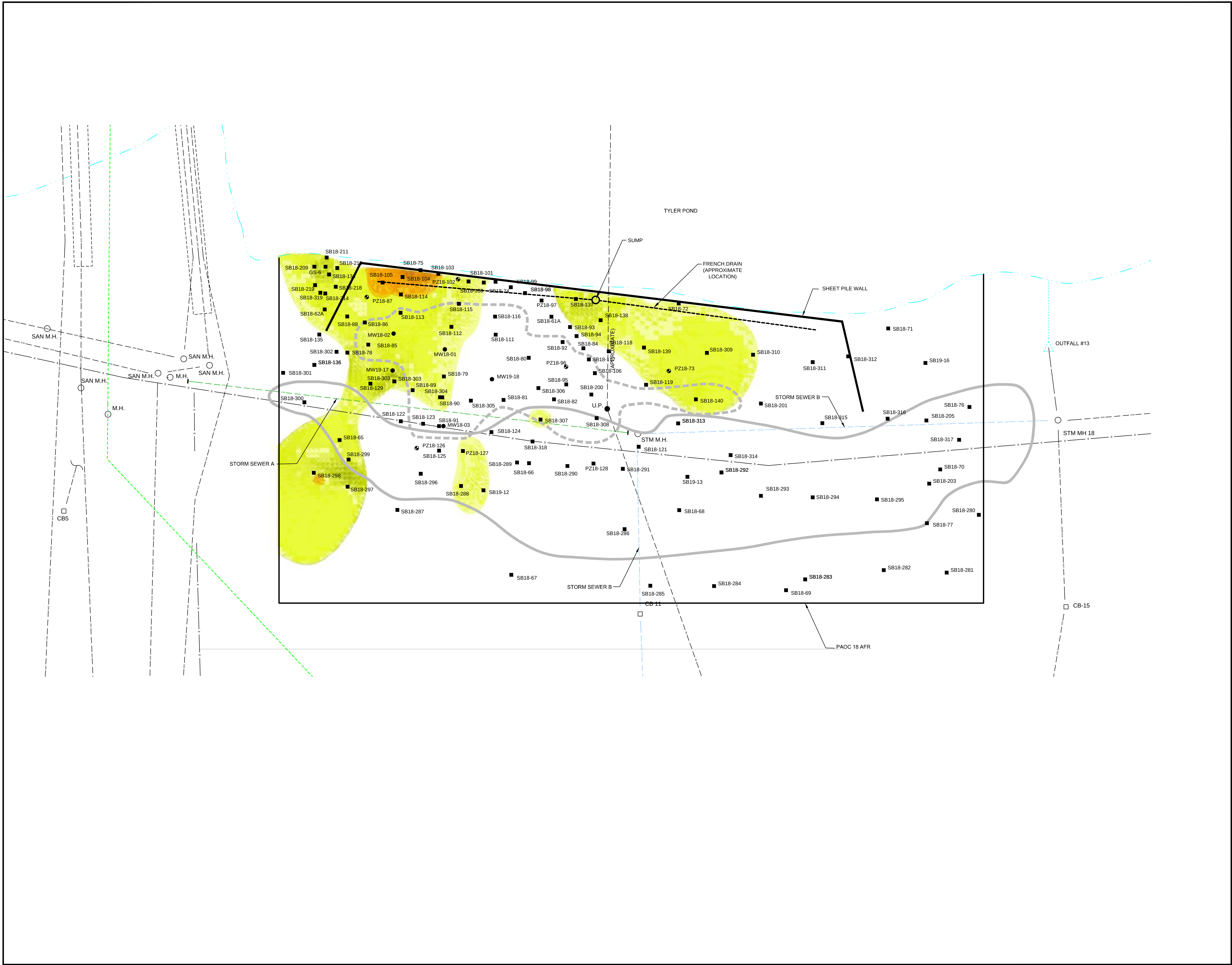
ELEVATION INTERVAL - 696 - 697 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

 **CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.20



No	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM
- STORM SEWER
- PERMANENT SEWER PLUG
- SAN
- SANITARY SEWER
- OE
- OVERHEAD ELECTRICAL LINE
- CB15
- CATCH BASIN
- MH18
- MANHOLE
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- IMPACTED SOIL EXCEEDING REMEDIATION REQUIREMENTS
- IMPACTED SOIL EXCEEDING 20 x TOXICITY CHARACTERISTIC REGULATORY LEVEL
- IMPACTED SOIL EXCEEDING ALTERNATIVE SOIL TREATMENT STANDARDS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS			
Status		Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

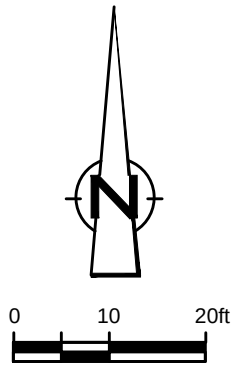
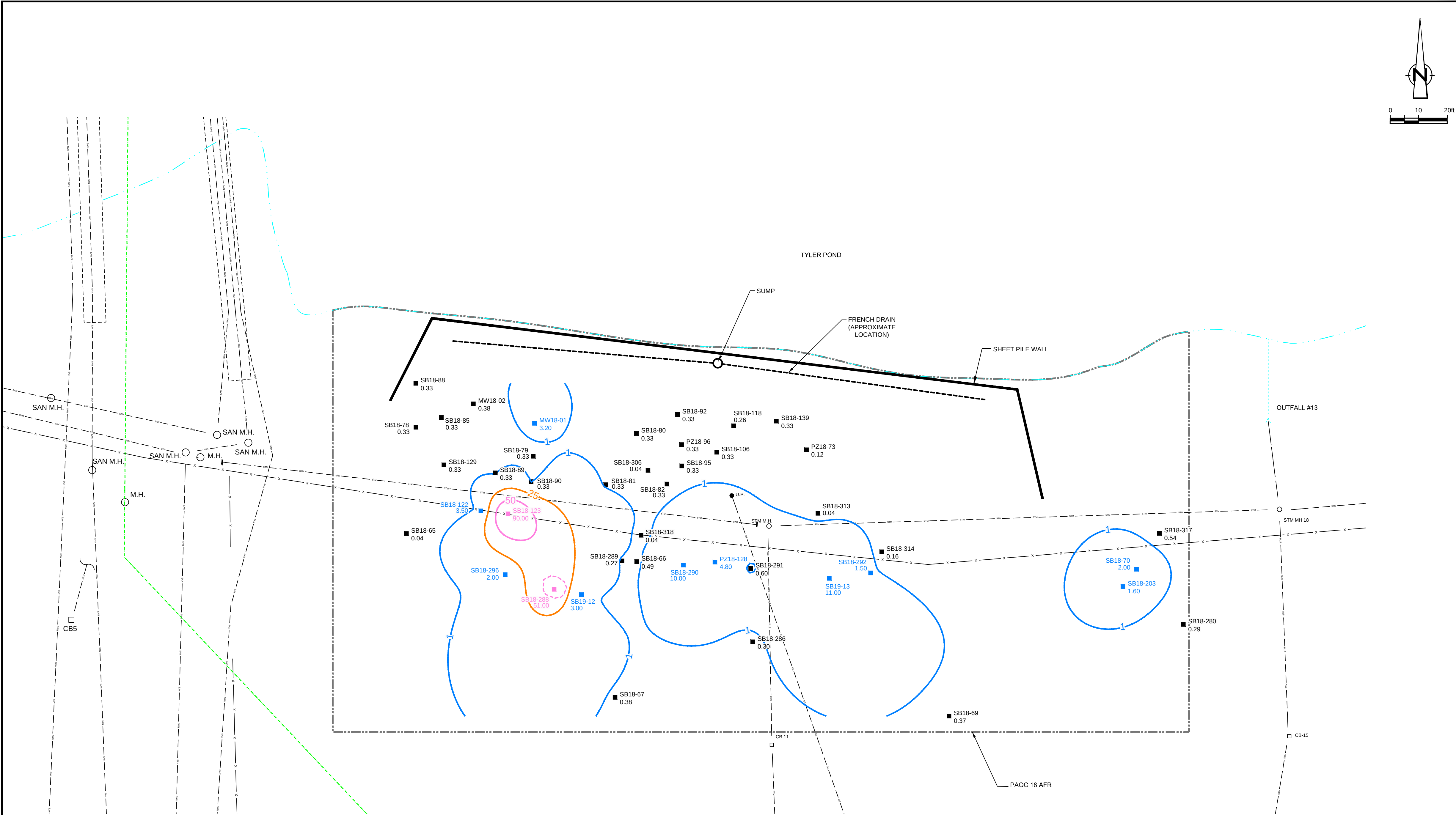
ELEVATION INTERVAL - 695 - 696 AMSL

VOC EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.21



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STORM SEWER
- PERMANENT SEWER PLUG
- SANITARY SEWER
- OVERHEAD ELECTRICAL LINE
- CATCH BASIN
- MANHOLE
- AFR

SB18-287 0.35 ■ LOCATION WITH PCB CONCENTRATION < 1 PPM
SB18-290 8.70 ■ LOCATION WITH PCB CONCENTRATION BETWEEN 1 & 25 PPM
SB18-305 36.00 ■ LOCATION WITH PCB CONCENTRATION BETWEEN 25 & 50 PPM
SB18-288 51.00 ■ LOCATION WITH PCB CONCENTRATION > 50 PPM

ESTIMATED 1 PPM PCB ISOCONTOUR
ESTIMATED 25 PPM PCB ISOCONTOUR
ESTIMATED 50 PPM PCB ISOCONTOUR
ESTIMATED 100 PPM PCB ISOCONTOUR
PCBs WERE NOT DETECTED AT SB18-288 BUT THE REPORTING LIMIT WAS 51 PPM

NOTES:
1. THE NUMBER ADJACENT TO THE LOCATION ID IS THE DETECTED PCB CONCENTRATION IN PPM OR THE REPORTING LIMIT (IF NOT DETECTED) IN PPM.
2. SB18-288 WAS NOT DETECTED BUT THE REPORTING LIMIT WAS 51 PPM.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

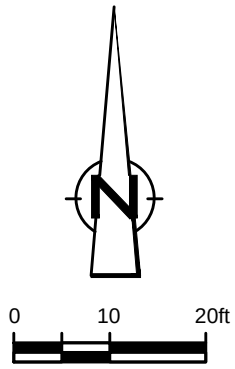
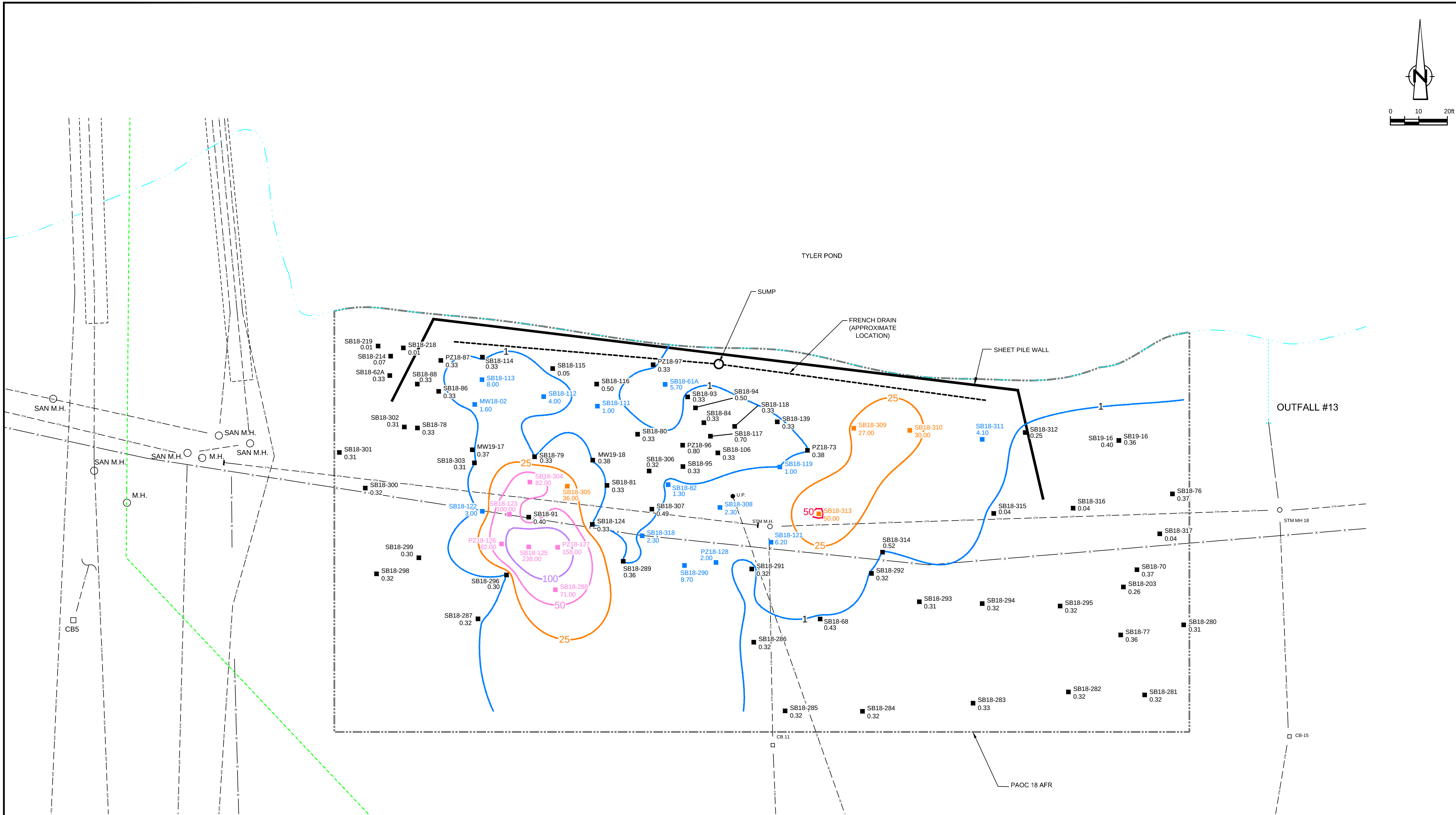
ELEVATION INTERVAL 710 - 705 AMSL

PCB EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.23



No	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM STORM SEWER
- PERMANENT SEWER PLUG
- SAN SANITARY SEWER
- OE OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- AFR

SB18-287 0.32 ■ LOCATION WITH PCB CONCENTRATION < 1 PPM
SB18-292 8.70 ■ LOCATION WITH PCB CONCENTRATION BETWEEN 1 & 25 PPM
SB18-305 36.00 ■ LOCATION WITH PCB CONCENTRATION BETWEEN 25 & 50 PPM
SB18-288 71.00 ■ LOCATION WITH PCB CONCENTRATION > 50 PPM

ESTIMATED 1 PPM PCB ISOCONTOUR
ESTIMATED 25 PPM PCB ISOCONTOUR
ESTIMATED 50 PPM PCB ISOCONTOUR
ESTIMATED 100 PPM PCB ISOCONTOUR

NOTE: THE NUMBER ADJACENT TO THE LOCATION ID IS THE DETECTED PCB CONCENTRATION IN PPM OR THE REPORTING LIMIT (IF NOT DETECTED) IN PPM.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

**COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN**

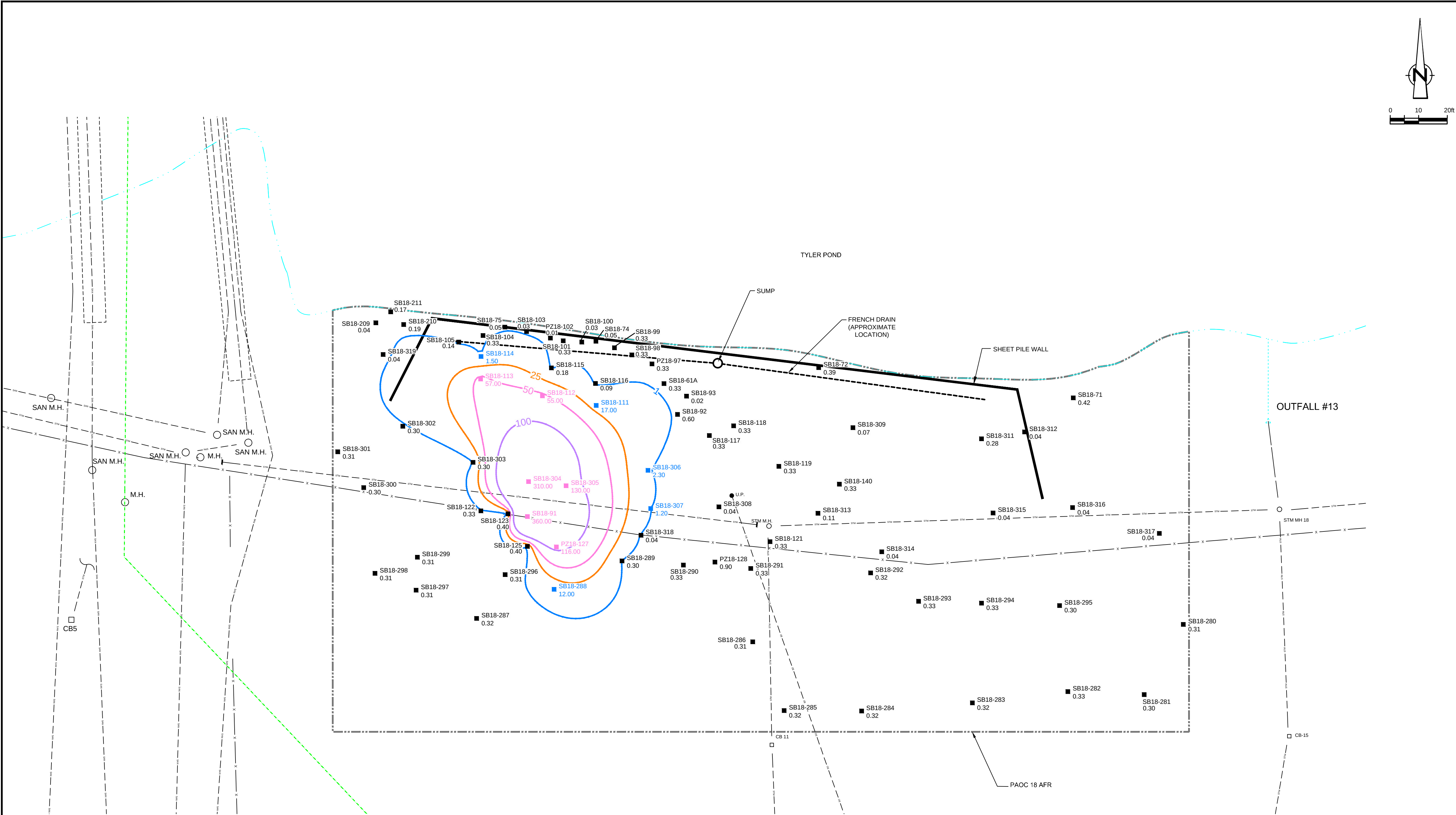
ELEVATION INTERVAL 705 - 700 AMSL

**PCB EXTENT OF IMPACTS
PAOC 18 IMWP**

**CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project N°: 017303-T01	Report N°: 025
		Drawing N°: 2.24



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STORM SEWER
- PERMANENT SEWER PLUG
- SANITARY SEWER
- OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- AFR
- SB18-287 0.32 LOCATION WITH PCB CONCENTRATION < 1 PPM
- SB18-290 8.70 LOCATION WITH PCB CONCENTRATION BETWEEN 1 & 25 PPM
- SB18-305 36.00 LOCATION WITH PCB CONCENTRATION BETWEEN 25 & 50 PPM
- SB18-288 71.00 LOCATION WITH PCB CONCENTRATION > 50 PPM
- ESTIMATED 1 PPM PCB ISOCONTOUR
- ESTIMATED 25 PPM PCB ISOCONTOUR
- ESTIMATED 50 PPM PCB ISOCONTOUR
- ESTIMATED 100 PPM PCB ISOCONTOUR

NOTE: THE NUMBER ADJACENT TO THE LOCATION ID IS THE DETECTED PCB CONCENTRATION IN PPM OR THE REPORTING LIMIT (IF NOT DETECTED) IN PPM.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

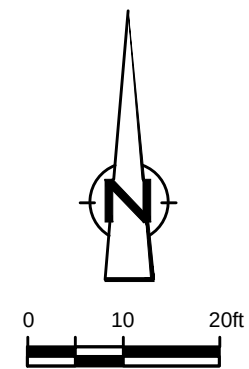
ELEVATION INTERVAL 700 - 695 AMSL

PCB EXTENT OF IMPACTS
PAOC 18 IMWP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 2.25

[illegible]

LEGEND

-
- Legend:
- DITCH, STREAM OR RIVER
 - X — FENCE LINE
 - - - - - FORMER SLUDGE LINE
 - STIM — STORM SEWER
 - PERMANENT SEWER PLUG
 - SAN — SANITARY SEWER
 - OE — OVERHEAD ELECTRICAL LINE
 - CB15 CATCH BASIN
 - MH18 MANHOLE
 - AFR AFR
- Source: USGS, aerial photography, and other data.
- SB18-267
19 LOCATION WITH PCB CONCENTRATION < 1 PPBM

NOTE: THE NUMBER ADJACENT TO THE LOCATION ID IS THE DETECTED PCB CONCENTRATION IN PPM OR THE REPORTING LIMIT (IF NOT DETECTED) IN PPM.

SCALE VERIFICATION
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.


Approved	
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DRAWING STATUS		
Status	Date	Initial

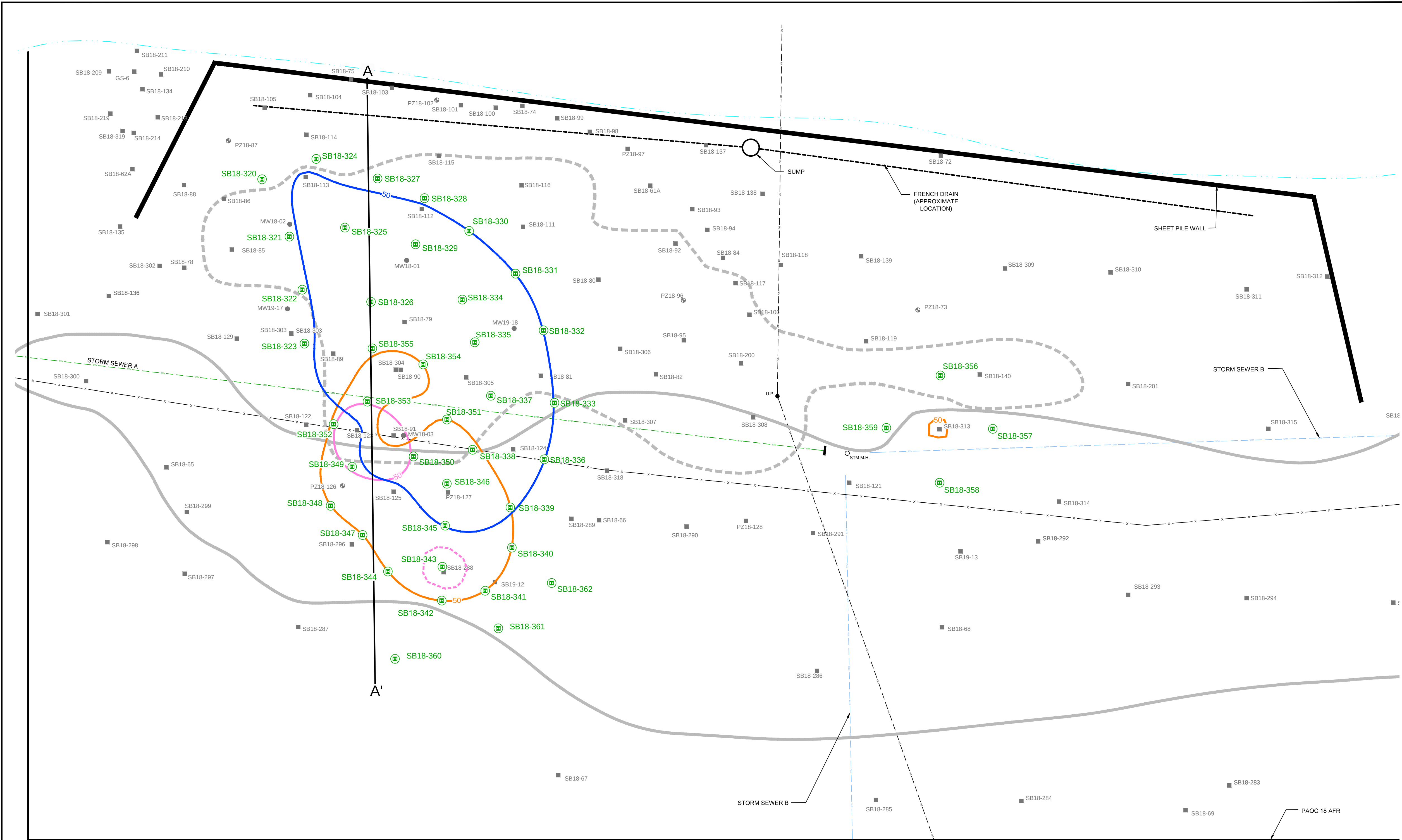
COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

ELEVATION INTERVAL 695 - 690 AMSL

PCB EXTENT OF IMPACTS
PAOC 18 IMWP**CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012	
Scale: 1:20	Project N ^o : 017303-T01	Report N ^o : 025	Drawing N ^o : 2.26



Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STW STORM SEWER
- PERMANENT SEWER PLUG
- SAN SANITARY SEWER
- OE OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- PREVIOUS SAMPLING LOCATIONS
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- ESTIMATED 50 PPM PCB ISOCONTOUR ELEVATION INTERVAL 705-710
- ESTIMATED 50 PPM PCB ISOCONTOUR ELEVATION INTERVAL 700-705
- ESTIMATED 50 PPM PCB ISOCONTOUR ELEVATION INTERVAL 695-700
- SB18-XXX (M) PROPOSED SOIL BORING LOCATION
- PCBs were NOT DETECTED AT SB18-288 BUT THE REPORTING LIMIT WAS 51 PPM

NOTE:
PCBs WERE DETECTED AT 50 PPM AT SB18-313. SAMPLING LOCATIONS AROUND THIS LOCATION ARE PROPOSED TO DETERMINE IF ANY PCBs GREATER THAN 50 PPM ARE PRESENT.

SCALE VERIFICATION		
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.		

Approved		

DRAWING STATUS		
Status	Date	Initial

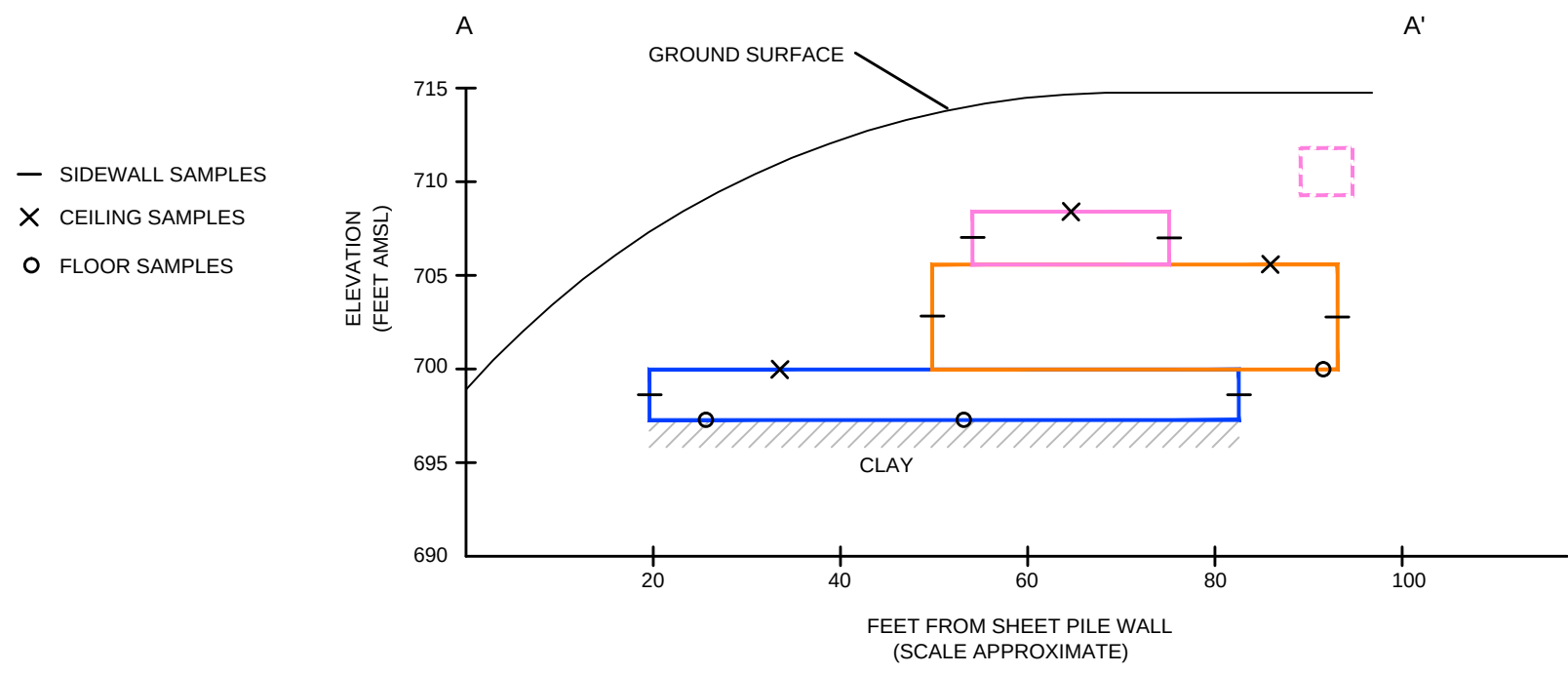
COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

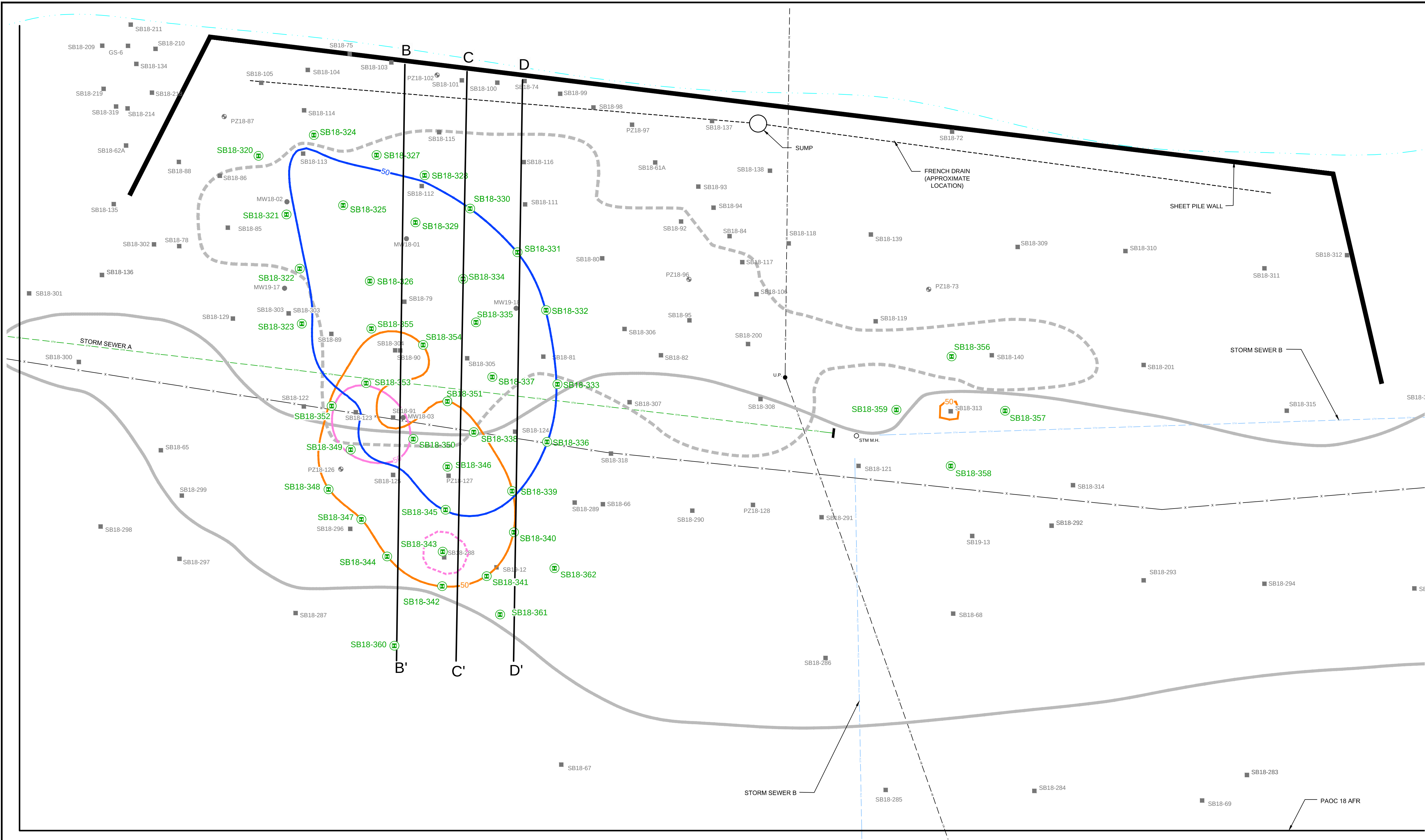
SAMPLING PLAN

ADDITIONAL PCB CHARACTERIZATION
PAOC 18 IMWP

Source Reference:

Project Manager: B. LANDALE	Reviewed By: D. BECK	Date: JANUARY 2013
Scale: 1:10	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 3.1





Nº	Revision	Date	Initial

LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STW STORM SEWER
- PERMANENT SEWER PLUG
- SAN SANITARY SEWER
- OE OVERHEAD ELECTRICAL LINE
- CB15 CATCH BASIN
- MH18 MANHOLE
- PREVIOUS SAMPLING LOCATIONS
- DNAPL DELINEATION
- BURIED REFUSE DELINEATION
- ESTIMATED 50 PPM PCB ISOCONTOUR ELEVATION INTERVAL 705-710
- ESTIMATED 50 PPM PCB ISOCONTOUR ELEVATION INTERVAL 700-705
- ESTIMATED 50 PPM PCB ISOCONTOUR ELEVATION INTERVAL 695-700
- SB18-XXX PROPOSED SOIL BORING LOCATION
- PCBs WERE NOT DETECTED AT SB18-288 BUT THE REPORTING LIMIT WAS 51 PPM

NOTE:
PCBs WERE DETECTED AT 50 PPM AT SB18-313. SAMPLING LOCATIONS AROUND THIS LOCATION ARE PROPOSED TO DETERMINE IF ANY PCBs GREATER THAN 50 PPM ARE PRESENT.

SCALE VERIFICATION		
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.		

Approved		

DRAWING STATUS		
Status	Date	Initial

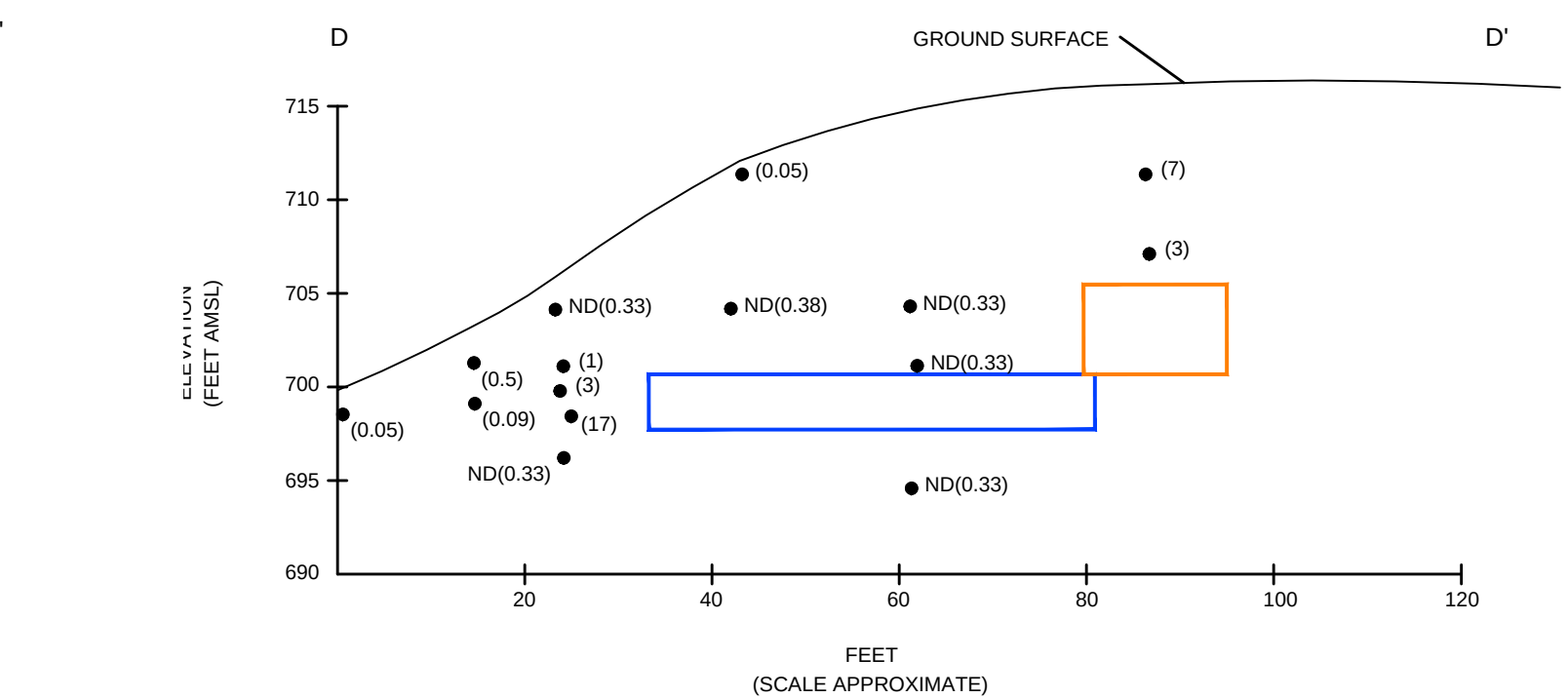
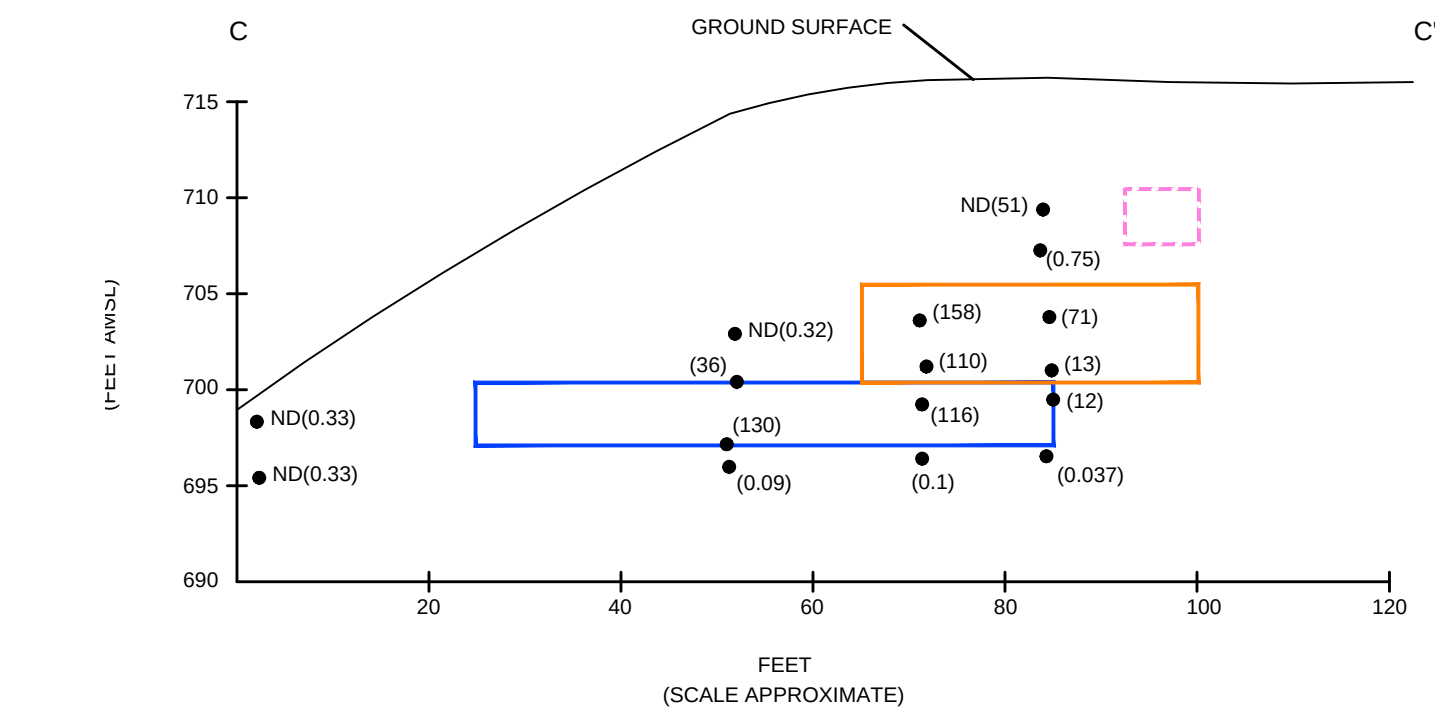
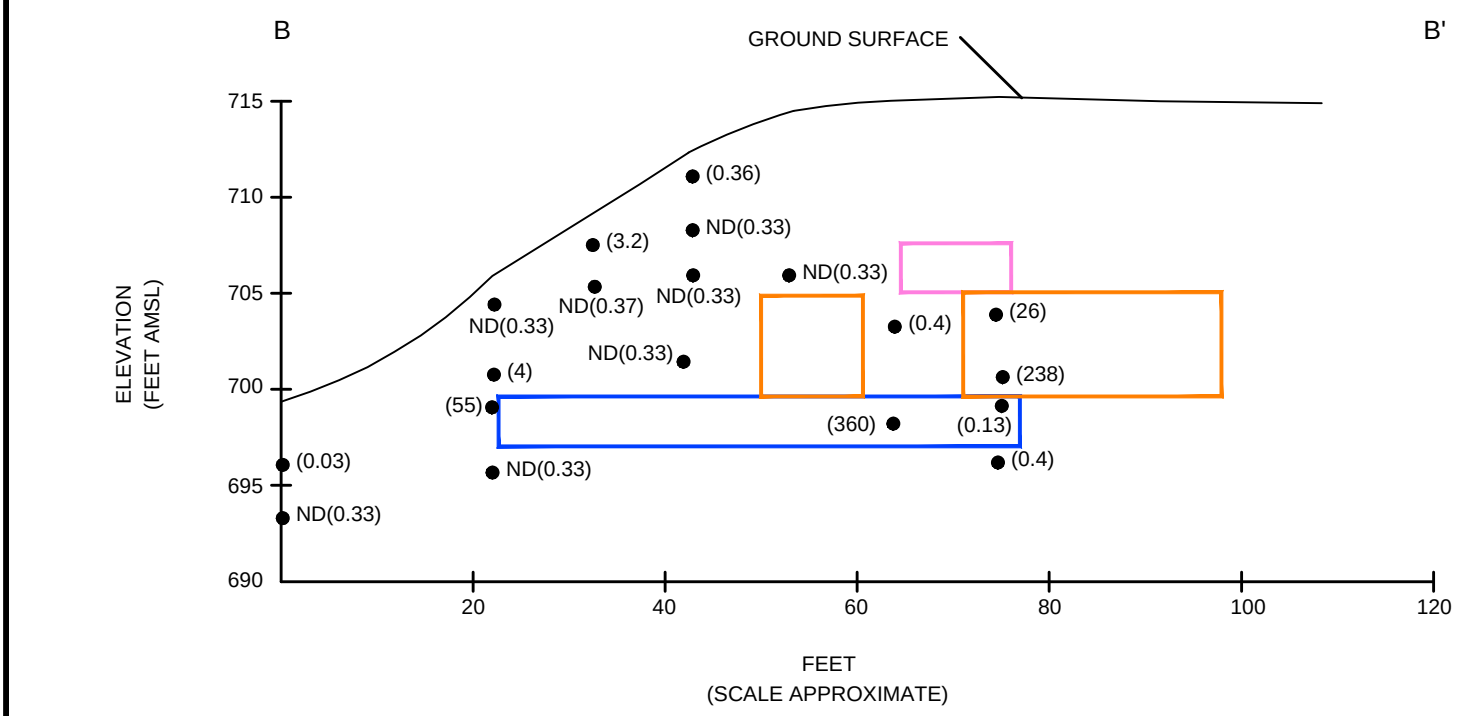
COMPANY VEHICLE OPERATIONS AREA YPSILANTI, MICHIGAN

TSCA AREA CROSS SECTIONS PAOC 18 IMWP

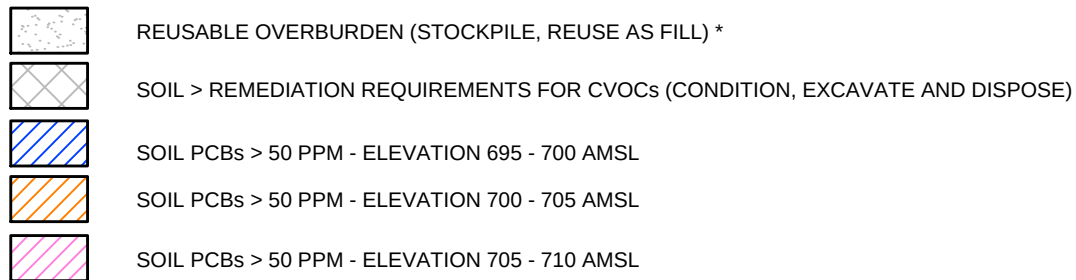
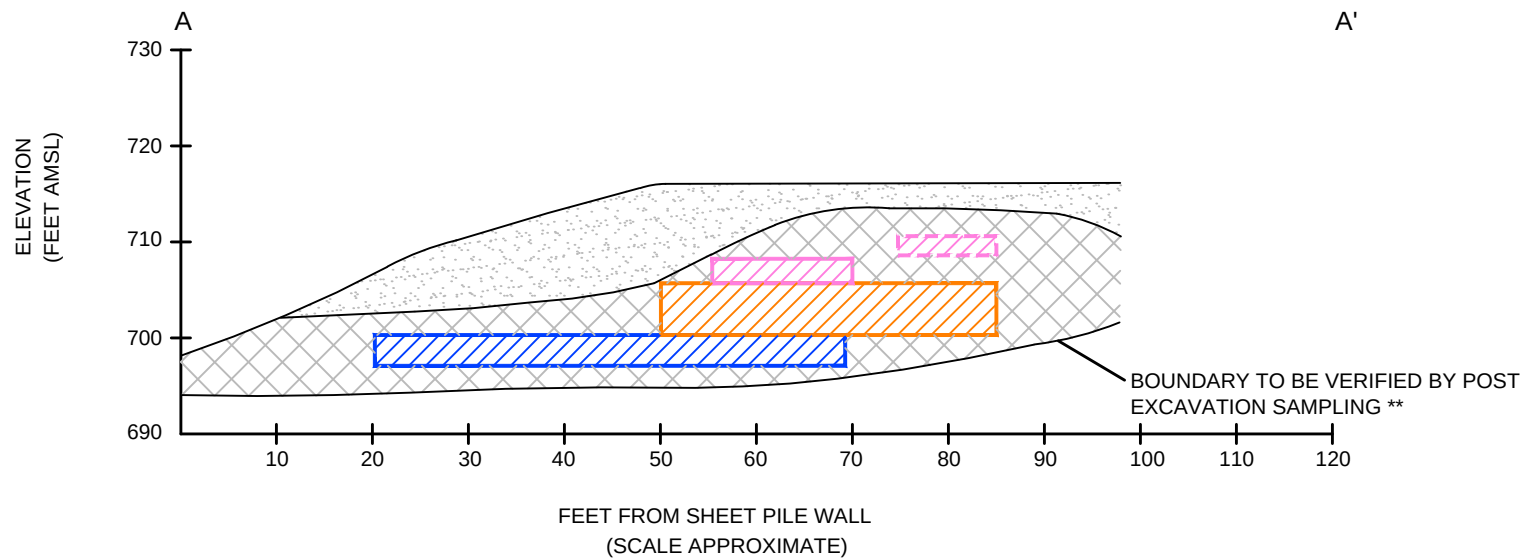
CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: D. BECK	Date: FEBRUARY 2013
Scale: 1:10	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 3.2



- LEGEND**
- (4) PREVIOUS PCB SAMPLE LOCATION (CONCENTRATION IN PPM)
 - ND(0.33) NOT DETECTED (REPORTING LIMIT IN PPM)



NOTES

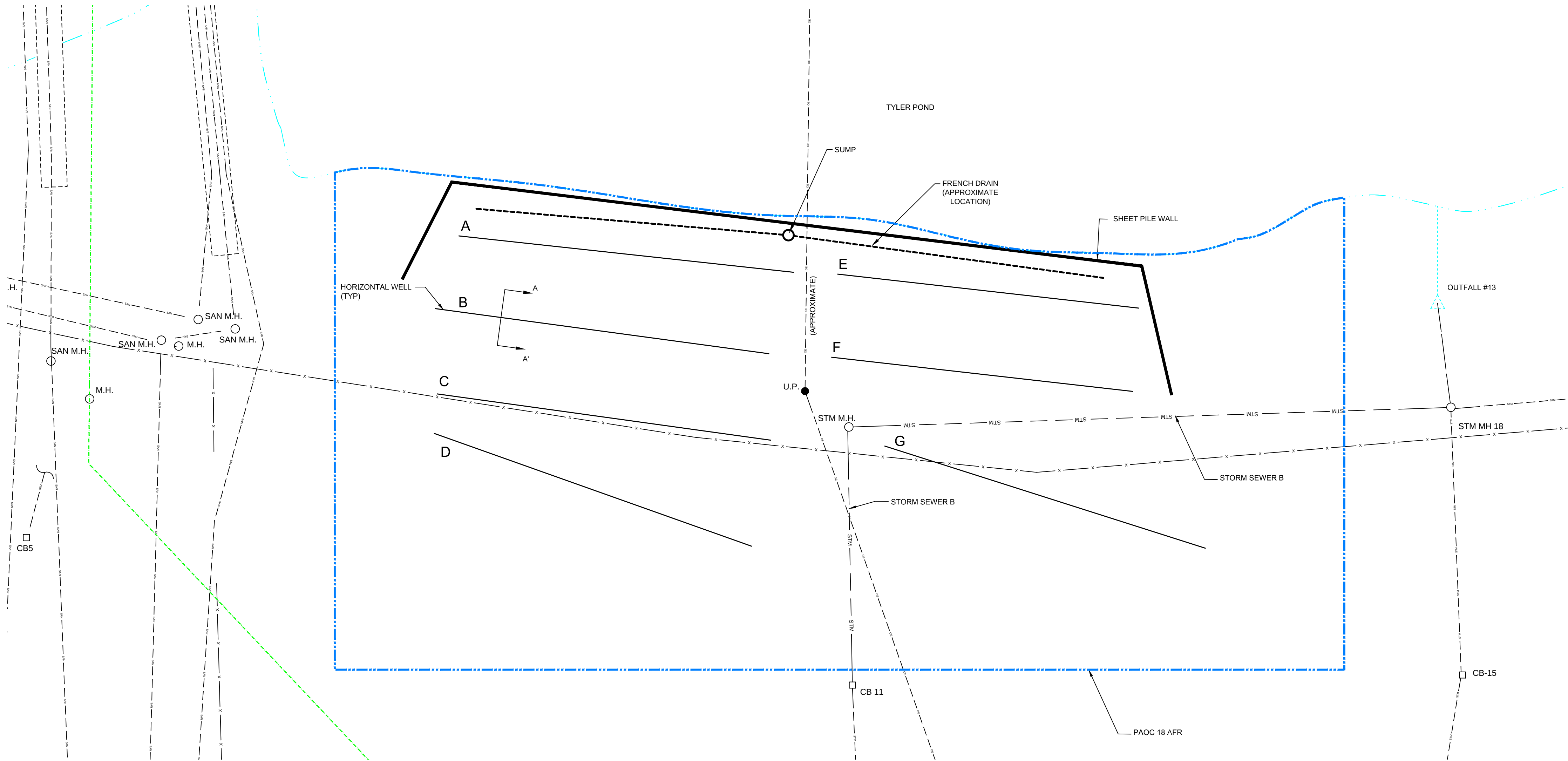
* SAMPLES WILL BE COLLECTED AND ANALYZED FOR VOCs AND PCBs TO CONFIRM SOILS CAN BE REUSED AS FILL (< REMEDIATION REQUIREMENTS)

** SAMPLES WILL BE COLLECTED AND ANALYZED FOR VOCs AND PCBs TO CONFIRM REMEDIATION REQUIREMENTS HAVE BEEN MET. SAMPLING WILL BE BASED ON MDEQ S³™ VERIFICATION OF SOIL REMEDIATION GUIDANCE, WITH SOME MODIFICATIONS.

figure 3.3

EXTENT OF SOIL IMACTS (REUSE VS. EXCAVATE) - TSCA PCB AREA
PAOC 18 IMWP
COMPANY VEHICLE OPERATIONS AREA
Ypsilanti, Michigan



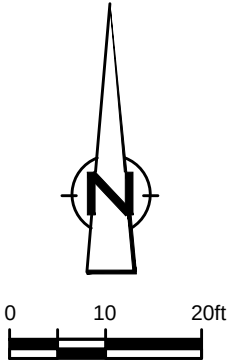


HORIZONTAL WELL DIMENSIONS

LENGTH(FT)	NO. OF RISERS	APPROX. DEPTH(FT)	SURFACE COMPLETION
A 100	6	7	3 FT PVC STICK-UP WITH CAP
B 100	6	12	3 FT PVC STICK-UP WITH CAP
C 100	6	15	3 FT PVC STICK-UP WITH CAP
D 100	6	15	FLUSH MOUNT WELL CASING
E 90	5	7	3 FT PVC STICK-UP WITH CAP
F 90	5	12	3 FT PVC STICK-UP WITH CAP
G 100	6	15	FLUSH MOUNT WELL CASING

* RISERS APPROXIMATELY EVERY 30 FEET

Nº	Revision	Date	Initial



LEGEND

- DITCH, STREAM OR RIVER
- FENCE LINE
- FORMER SLUDGE LINE
- STM STORM SEWER
- PERMANENT SEWER PLUG
- SAN SANITARY SEWER
- OE OVERHEAD ELECTRICAL LINE
- AFR
- CB15 CATCH BASIN
- MH18 MANHOLE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS

Status	Date	Initial

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

INJECTION GALLERY
PAOC 18 IMWP



CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: B. LANDALE	Reviewed By: L. JERDON	Date: DECEMBER 2012
Scale: 1:20	Project Nº: 017303-T01	Report Nº: 025
		Drawing Nº: 4.1

TABLES

TABLE 1.1
IMWP SAMPLING SUMMARY
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Task/Type		Sample Frequency/ # of Samples	Analysis	Laboratory	Sample Collection
FOR REUSE					
Task A - Reusable Overburden		1 /100 cyd	VOCs & PCBs	on site or off site	Collect grab sample after each 100 cyd has been stockpiled/graded
Soil Relocation - noncommercial fill source to be used as backfill		TBD - volume/area dependent	VOCs, SVOCs, PCBs, Metals	off site	-discrete sampling -will use a random sampling approach using a grid and collect samples from 25% of the grid system
FOR WASTE DISPOSAL					
Task B - Non-haz soil (excavation for landfill disposal)		1/ 100 cyd (in a continuous area)	VOCs & PCBs	on site or off site	Metals and SVOC data to be supplied based on previous work
Tasks C & D - Conditioned Soils	TSCA soils	2/150 CYD	VOCs & PCBs	on site or off site	PCBs collected to determine if < 100 ppm average for LDRs if VOCs cannot be reduced below haz limits
	Non-TSCA Soils	2/150 CYD	VOCs & PCBs	on site or off site	PCBs collected to verify non-TSCA outside the areas previously defined as TSCA for landfill assurance
FURTHER CHARACTERIZATION					
PCB TSCA Areas		n/a	PCBs	on site or off site	See Table 3.1
FOR VERIFICATION					
PCB TSCA Areas		n/a	PCBs	on site or off site	--110 - 130 additional characterization samples will be used for verification (Table 3.1) (excavate to extent defined by characterization samples)
Extent of Excavation	side walls	1/45 linear feet	VOCs & PCBs	on site or off site	discrete and biased follows small excavation linear feet for S3TM -based on excavation size =~12 samples (does not include along water as boundary
	floor	15 samples	VOCs & PCBs	on site or off site	-Based on grid size of 25 - 27 feet, 60 grids over entire AFR, 25% to be sampled

TABLE 2.1
VOC AND PCB ANALYTICAL DATA TABLES - 710 - 715 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	x	y	Start	End	Ground	Depth	Sample Date	1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
			Elevation	Elevation	Elevation			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
MW19-17	13344553.37	268424.03	713.42	711.42	713.42	0-2 ft BGS	11/11/2003	220 UJ	89 UJ	45 UJ	89 UJ	89 UJ	670 UJ	45 UJ	45 UJ	13 J	220 UJ	220 UJ	27 J	45 UJ	1600 J	89 UJ	88 J	152 J
MW19-18	13344595.65	268420.37	712.32	710.32	712.32	0-2 ft BGS	11/11/2003	220 U	87 U	44 U	87 U	87 U	150 J	44 U	44 U	44 U	220 U	220 U	87 U	44 U	1300	87 U	440 U	53 J
PZ18-128	13344638.9	268384.48	712.66	710.16	715.16	2.5-5 ft BGS	09/02/2004	-	-	-	-	-	-	-	18400	500 U	-	3000 U	300 J	-	13100	500 U	-	70 J
SB18-106	13344639.538	268422.947	711.236	709.236	711.236	0-2 ft BGS	08/25/2004	-	-	-	-	-	-	-	20 J	50 U	-	300 U	50 U	-	130	50 U	-	250 J
SB18-123	13344566.39	268401.39	714.73	712.23	714.73	0-2.5 ft BGS	09/01/2004	-	-	-	-	-	-	-	60	9 J	-	300 U	20 J	-	3150	50 U	-	400
SB18-123	13344566.39	268401.39	712.23	709.73	714.73	2.5-5 ft BGS	09/01/2004	-	-	-	-	-	-	-	130	50 U	-	300 U	50 U	-	5440	50 U	-	2100
SB18-136	13344520.054	268426.44	713.66	711.16	713.66	0-2.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	20 J	50 U	-	-
SB18-203	13344781.84	268375.89	712.15	709.15	715.15	3-6 ft BGS	06/02/2005	200 U	80 U	40 U	80 U	80 U	600 U	40 U	61	40 U	200 U	200 U	80 U	40 U	480	32 U	120 U	1600 U
SB18-203	13344781.84	268375.89	715.15	712.15	715.15	0-3 ft BGS	06/02/2005	190 U	74 U	37 U	74 U	74 U	560 U	37 U	61	37 U	190 U	190 U	74 U	37 U	600	30 U	110 U	330 U
SB18-296	13344565.37	268380.09	712.8	710.3	715.30	2.5-5 ft BGS	04/04/2012	150 J	190 U	93 U	190 U	190 U	1400 U	29 J	3900	93 U	470 U	470 U	190 U	30 J	430	75 U	280 U	290 U
SB18-296	13344565.37	268380.09	715.3	712.8	715.30	0-2.5 ft BGS	04/04/2012	88 J	280 U	140 U	280 U	280 U	2100 U	140 U	5500	140 U	700 U	700 U	280 U	35 J	1800	110 U	420 U	360 U
SB18-313	13344674.99	268401.57	714.75	712.25	714.75	0-2.5 ft BGS	04/05/2012	15 JB	100 U	50 U	100 U	100 U	7800	50 U	24 J	50 U	250 U	250 U	100 U	50 U	3100	40 U	150 U	7300
SB18-313	13344674.99	268401.57	712.25	709.75	714.75	2.5-5 ft BGS	04/05/2012	52 JB	130 U	64 U	130 U	19 JB	13000	64 U	29 J	64 U	320 U	320 U	130 U	64 U	8000	51 U	15 JB	6400
SB18-314	13344697.31	268388.08	715.24	712.74	715.24	0-2.5 ft BGS	04/05/2012	220 U	89 U	45 U	5.7 JB	9.6 JB	2700	45 U	21 J	45 U	220 U	220 U	89 U	45 U	1000	36 U	130 U	920
SB18-314	13344697.31	268388.08	712.74	710.24	715.24	2.5-5 ft BGS	04/05/2012	18 JB	88 U	44 U	88 U	88 U	16000	44 U	830	44 U	220 U	220 U	88 U	13 J	7600	35 U	130 U	2000
SB18-315	13344736.35	268401.68	712.15	709.65	714.65	2.5-5 ft BGS	04/05/2012	220 U	89 U	44 U	89 U	89 U	1700	44 U	44 U	44 U	220 U	220 U	89 U	44 U	1100	35 U	130 U	350 U
SB18-315	13344736.35	268401.68	714.65	712.15	714.65	0-2.5 ft BGS	04/05/2012	470 U*	190 U*	94 U*	190 U*	190 U*	8300 *	94 U*	94 U*	94 U*	470 U*	470 U*	190 U*	94 U*	1300 *	75 U*	280 U*	370 U
SB18-65	13344530.8	268394.457	715.55	713.55	715.55	0-2 ft BGS	05/19/2004	1500 U	620 U	310 U	620 U	620 U	4600 U	310 U	190 J	310 U	1500 U	360 J	620 U	310 U	11000	620 U	3100 U	380 U
SB18-66	13344611.49	268384.61	715.09	713.09	715.09	0-2 ft BGS	05/19/2004	260 U	100 U	51 U	100 U	100 U	770 U	51 U	27 J	51 U	260 U	260 U	100 U	51 U	240	100 U	510 U	13 J
SB18-67	13344603.9	268337.053	714.36	712.36	714.36	0-2 ft BGS	05/19/2004	260 U	100 U	52 U	100 U	100 U	790 U	52 U	30 J	52 U	260 U	74 J	100 U	52 U	440	100 U	520 U	18 J
SB18-68	13344675.44	268364.636	714.9	712.9	714.9	0-2 ft BGS	05/19/2004	260 U	110 U	53 U	110 U	110 U	790 U	53 U	320	53 U	260 U	260 U	110 U	53 U	1600	110 U	530 U	1100
SB18-69	13344720.9	268330.506	714.68	712.68	714.68	0-2 ft BGS	05/19/2004	29 J	98 U	49 U	98 U	98 U	730 U	49 U	49 U	49 U	240 U	240 U	98 U	49 U	58	98 U	490 U	350 U
SB18-70	13344786.5658	268381.9617	715.1	713.1	715.1	0-2 ft BGS	05/19/2004	970 U	390 U	190 U	390 U	390 U	2900 U	190 U	190 U	5400	1500	270 J	78 J	190 U	190 U	390 U	13000	280 J
SB18-76	13344799.02	268408.553	714.51	712.51	714.51	0-2 ft BGS	05/24/2004	250 U	100 U	50 U	100 U	100 U	750 U	50 U	50 U	50 U	250 U	250 U	100 U	50 U	64	100 U	500 U	360 U
SB18-77	13344780.89	268359.076	714.68	712.68	714.68	0-2 ft BGS	05/24/2004	260 U	100 U	51 U	100 U	100 U	770 U	51 U	35 J	51 U	260 U	260 U	100 U	51 U	550	100 U	510 U	21 J
SB18-78	13344534.14	268431.713	711.926	709.426	711.926	0-2.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	6 J	50 U	-	330 U
SB18-79	13344575.235	268421.576	712.784	710.284	712.784	0-2.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	8 J	50 U	-	300 U	50 U	-	40 J	50 U	-	360
SB18-81	13344600.626	268411.557	713.179	710.679	713.179	0-2.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 J	50 U	-	30 J
SB18-82	13344622.103	268411.808	713.273	710.773	713.273	0-2.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	9 J	50 U	-	100 J
SB18-95	13344627.301	268418.162	712.498	709.998	712.498	0-2.5 ft BGS	08/25/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	30 J	50 U	-	600
SB19-12	13344592.08	268373.07	712.06	710.06	715.06	3-5 ft BGS	11/21/2003	7200 J	4900 U	2400 U	4900 U	4900 U	36000 U	2400 U	89000	4800	1300 J	12000 U	760 J	2400 U	64000	1900 J	49000	7000
SB19-13	13344678.93	268378.79	713.2	711.2	715.2	2-4 ft BGS	11/21/2003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280 J
SB19-13	13344678.93	268378.79	715.2	713.2	715.2	0-2 ft BGS	11/21/2003	950 U	380 U	190 U	380 U	380 U	2900 U	81 J	5500	240	76 J	950 U	210 J	130 J	120 J	2500	1900	190 J

Notes

Elevation is feet above mean sea level

U - Not present at or above the associated reporting limit value.

J - The associated value is an estimated concentration.

UJ - The associated value is an estimated reporting limit.

-- Constituent not analyzed

	Denotes exceedance of Remediation Requirement for COC
	Denotes exceedance of 20 x Toxicity Characteristic Regulatory Levels for COC
	Denotes exceedance of Soil Alternative Treatment Standard for COC

TABLE 2.2
VOC AND PCB ANALYTICAL DATA TABLES - 705 - 710 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	x	y	Start	End	Ground	Depth	Sample Date	1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
			Elevation	Elevation	Elevation			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
MW18-01	13344575.69	268433.12	709.78	707.78	709.78	0-2 ft BGS	05/17/2004	120 J	100 U	50 U	100 U	100 U	760 U	50 U	67	50 U	250 U	250 U	100 U	50 U	390	100 U	55 J	3200
MW18-01	13344575.69	268433.12	706.78	704.78	709.78	3-5 ft BGS	05/17/2004	230 U	94 U	47 U	94 U	94 U	700 U	47 U	150	47 U	230 U	230 U	94 U	47 U	510	94 U	470 U	370 U
MW18-02	13344554.25	268439.94	705.8	703.8	708.8	3-5 ft BGS	05/17/2004	250 U	100 U	50 U	100 U	100 U	760 U	50 U	50 U	50 U	250 U	250 U	100 U	50 U	220	100 U	500 U	380 U
PZ18-128	13344638.9	268384.48	710.16	707.66	715.16	5-7.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	64300	2600	-	3000 U	1600	-	36300	500 U	-	4800
PZ18-128	13344638.9	268384.48	707.66	705.16	715.16	7.5-10 ft BGS	09/02/2004	-	-	-	-	-	-	-	20000	40000	-	50000 U	20000	-	7000 J	10000 U	-	400
PZ18-73	13344670.96	268423.831	709.65	707.65	709.65	0-2 ft BGS	05/24/2004	280 U	110 U	57 U	110 U	110 U	850 U	57 U	57 U	57 U	280 U	280 U	110 U	57 U	180	110 U	570 U	120 J
PZ18-96	13344627.2	268425.64	707.88	705.38	710.38	2.5-5 ft BGS	08/25/2004	-	-	-	-	-	-	-	40 J	50 U	-	300 U	50 U	-	80	50 U	-	330 U
PZ18-96	13344627.2	268425.64	710.38	707.88	710.38	0-2.5 ft BGS	08/25/2004	-	-	-	-	-	-	-	80	50 U	-	300 U	50 U	-	120	50 U	-	330 U
SB18-106	13344639.538	268422.947	707.236	705.236	711.236	4-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	590	50 U	-	300 U	50 U	-	540	50 U	-	330 U
SB18-106	13344639.538	268422.947	709.236	707.236	711.236	2-4 ft BGS	08/25/2004	-	-	-	-	-	-	-	20 J	50 U	-	300 U	50 U	-	30 J	50 U	-	330 U
SB18-118	13344645.41	268432.23	704.85	702.85	706.85	2-4 ft BGS	08/31/2004	-	-	-	-	-	-	-	2370	50 U	-	300 U	50 U	-	170	50 U	-	260 J
SB18-122	13344556.89	268402.44	707.18	704.68	714.68	7.5-10 ft BGS	09/01/2004	-	-	-	-	-	-	-	5200	500 U	-	3000 U	500 U	-	32400	500 U	-	3500
SB18-123	13344566.39	268401.39	707.23	704.73	714.73	7.5-10 ft BGS	09/01/2004	-	-	-	-	-	-	-	300	200 U	-	1000 U	200 U	-	4600	200 U	-	90000
SB18-123	13344566.39	268401.39	709.73	707.23	714.73	5-7.5 ft BGS	09/01/2004	-	-	-	-	-	-	-	200 U	200 U	-	1000 U	200 U	-	5000	200 U	-	3000
SB18-129	13344543.94	268418.5	706.29	703.79	713.79	7.5-10 ft BGS	09/02/2004	-	-	-	-	-	-	-	4350	50 U	-	300 U	20 J	-	20 J	190	-	330 U
SB18-135	13344522.187	268439.386	707.413	704.913	709.913	2.5-5 ft BGS	09/09/2004	-	-	-	-	-	-	-	10 J	50 U	-	300 U	50 U	-	430	50 U	-	-
SB18-135	13344522.187	268439.386	709.913	707.413	709.913	0-2.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 U	50 U	-	-
SB18-136	13344520.054	268426.44	708.66	706.16	713.66	5-7.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	190	50 U	-	-
SB18-136	13344520.054	268426.44	711.16	708.66	713.66	2.5-5 ft BGS	09/09/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 U	50 U	-	-
SB18-139	13344660.406	268433.854	706.556	704.056	706.556	0-2.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	250	50 U	-	300 U	50 U	-	50	50 U	-	330 U
SB18-203	13344781.84	268375.89	709.15	706.15	715.15	6-9 ft BGS	06/02/2005	4000 U	1600 U	800 U	1600 U	1600 U	12000 U	800 U	25000	210 J	4000 U	4000 U	1600 U	800 U	7900	640 U	440 J	1600 U
SB18-280	13344802.99	268362.60	709.46	706.96	714.46	5-7.5 ft BGS	04/02/2012	16 J	96 U	48 U	96 U	96 U	720 U	48 U	48 U	48 U	240 U	240 U	96 U	48 U	220	38 U	140 U	-
SB18-280	13344802.99	268362.60	706.96	704.46	714.46	7.5-10 ft BGS	04/02/2012	220 U	89 U	45 U	89 U	89 U	670 U	45 U	45 U	45 U	220 U	220 U	89 U	45 U	2100	36 U	130 U	290 U
SB18-280	13344802.99	268362.60	706.96	704.46	714.46	7.5-10 ft BGS	04/02/2012	220 U	87 U	44 U	87 U	87 U	310 J	44 U	11 J	44 U	220 U	220 U	87 U	44 U	3000	35 U	130 U	290 U
SB18-281	13344789.29	268338.01	709.23	706.73	714.23	5-7.5 ft BGS	04/02/2012	230 U	91 U	45 U	91 U	91 U	680 U	45 U	45 U	45 U	230 U	230 U	91 U	45 U	63	36 U	140 U	-
SB18-281	13344789.29	268338.01	706.73	704.23	714.23	7.5-10 ft BGS	04/02/2012	230 U	93 U	46 U	93 U	93 U	220 J	46 U	46 U	46 U	230 U	230 U	93 U	46 U	1700	37 U	140 U	-
SB18-282	13344762.53	268339.07	709.63	707.13	714.63	5-7.5 ft BGS	04/02/2012	250 U	100 U	50 U	100 U	100 U	210 J	50 U	50 U	50 U	250 U	250 U	100 U	50 U	150	40 U	150 U	-
SB18-282	13344762.53	268339.07	707.13	704.63	714.63	7.5-10 ft BGS	04/02/2012	240 U	95 U	48 U	95 U	95 U	230 J	48 U	48 U	48 U	240 U	240 U	95 U	48 U	3200	38 U	140 U	-
SB18-283	13344729.06	268335.14	707.28	704.78	714.78	7.5-10 ft BGS	04/02/2012	270 U	110 U	54 U	110 U	110 U	800 U	54 U	54 U	54 U	270 U	270 U	110 U	54 U	640	43 U	160 U	-
SB18-283	13344729.06	268335.14	709.78	707.28	714.78	5-7.5 ft BGS	04/02/2012	220 U	89 U	45 U	89 U	89 U	230 J	45 U	45 U	45 U	220 U	220 U	89 U	45 U	29 J	36 U	130 U	-
SB18-284	13344690.27	268332.26	709.16	706.66	714.16	5-7.5 ft BGS	04/02/2012	250 U	100 U	50 U	100 U	100 U	760 U	50 U	50 U	50 U	250 U	250 U	100 U	50 U	230	40 U	150 U	-
SB18-285	13344663.13	268332.43	708.77	706.27	713.77	5-7.5 ft BGS	04/02/2012	240 U	95 U	48 U	95 U	95 U	710 U	48 U	48 U	48 U	240 U	240 U	95 U	48 U	1400	38 U	140 U	-
SB18-286	13344652.15	268356.52	709.54	707.04	714.54	5-7.5 ft BGS	04/02/2012	260 U	110 U	53 U	110 U	110 U	790 U	53 U	61	53 U	260 U	260 U	110 U	53 U	300	42 U	160 U	-
SB18-286	13344652.15	268356.52	707.04	704.54	714.54	7.5-10 ft BGS	04/02/2012	2300 U	900 U	450 U	900 U	900 U	6800 U	450 U	2600	450 U	2300 U	2300 U	900 U	450 U	14000	360 U	1400 U	300 U
SB18-287	13344555.40	268364.72	707.87	705.37	715.37	7.5-10 ft BGS	04/04/2012	200 U	82 U	41 U	82 U	82 U	240 JB	140	850	33 J	12 J	200 U	320	140	1200	640	180	-
SB18-287	13344555.40	268364.72	710.37	707.87	715.37	5-7.5 ft BGS	04/04/2012	210 U	85 U	43 U	85 U	85 U	270 JB	43 U	43 U	43 U	210 U	210 U	85 U	43 U	43 U	34 U	130 U	-
SB18-288	13344582.51	268374.91	707.61	705.11	715.11	7.5-10 ft BGS	04/04/2012	100000 U	41000 U	20000 U	41000 U	41000 U	310000 U	20000 U	750000	82000	4400 J	100000 U	45000	20000 U	11000 J	35000	560000	750
SB18-288	13344582.51	268374.91	710.11	707.61	715.11	5-7.5 ft BGS	04/04/2012	190000 U	76000 U	38000 U	76000 U	76000 U	570000 U	38000 U	1100000	180000	9800 J	190000 U	81000	38000 U	38000 U	22000 J	1300000	51000 U
SB18-289	13344606.35	268384.89	707.61	705.11	715.11	7.5-10 ft BGS	04/04/2012	1100 U	460 U	230 U	460 U	460 U	3400 U	71 J	230 U	3200	2700	1100 U	270 J	230 U	1100	180 U	26000	270
SB18-289	13344606.35	268384.89	710.11	707.61	715.11	5-7.5 ft BGS	04/04/2012	220 U	87 U	43 U	87 U	87 U	320 JB	43 U	1100	18 J	220 U	220 U	43 U	32 J	1100	35 U	99 J	-
SB18-290	13344627.83	268383.43	707.48	704.98	714.98	7.5-10 ft BGS	04/03/2012	1300000 U	520000 U	260000 U	520000 U	520000 U	3900000 U	120000 J	14000000	800000	110000 JB	1300000 U	680000	260000 U	1800000	780000	5300000	10000
SB18-290	13344627.83	268383.43	709.98	707.48	714.98	5-7.5 ft BGS	04/03/2012	31 J	81 U	41 U	81 U	81 U	610 U	59	250	250	58 JB	200 U	71 J	41 U	14 J	29 J	340	-
SB18-291	13344651.43	268382.22	710.03	707.53	715.03	5-7.5 ft BGS	04/02/2012	47000 U	19000 U	9500 U	19000 U	19000 U	140000 U	9500 U	3800 J	190000	52000	47000 U	75000	9500 U	3800 J	7600 U	1200000	600
SB18-291	13344651.43	268382.22	707.53	705.03	715.03	7.5-10 ft BGS	04/02/2012	2000 U	780 U	390 U	780 U	780 U	5900 U	240 J	950	8400	18000	2000 U	4000	390 U	390 U	3600	50000	100
SB18-292	13344693.41	268380.67	710.3	707.8	715.30	5-7.5 ft BGS	04/02/2012	240 U	94 U	47 U	94 U	94 U	710 U	47 U	190	47 U	240 U	240 U	94 U	47 U	720	38 U	140 U	-
SB18-292	13344693.41	268380.67	707.8	705.3	715.30	7.5-10 ft BGS	04/02/2012	570000 U	230000 U	110000 U	230000 U	230000 U	1700000 U	110000 U	5900000	200000	570000 U	570000 U	130000 J	41000 J	3000000	91000 U	1600000	1400
SB18-292	13344693.41	268380.67	707.8	705.3	715.30	7.5-10 ft BGS	04/02/2012	800000 U	320000 U	160000 U	320000 U	320000 U	2400000 U	160000 U	6600000	310000	800000 U	800000 U	170000 J	40000 J	5900000	130000 U	2300000	1500
SB18-293	13344710.21	268370.70	710.15	707.65	715.15	5-7.5 ft BGS	04/02/2012	220 U	89 U	44 U	89 U	89 U	660 U	44 U	100	21 J	220 U	220						

TABLE 2.2
VOC AND PCB ANALYTICAL DATA TABLES - 705 - 710 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	x	y	Start	End	Ground	Depth	Sample Date	1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
			Elevation	Elevation	Elevation			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SB18-298	13344519.80	268380.52	710.76	708.26	715.76	5-7.5 ft BGS	04/04/2012	220 U	86 U	43 U	86 U	86 U	650 U	43 U	43 U	43 U	220 U	220 U	86 U	43 U	88	35 U	130 U	-
SB18-298	13344519.80	268380.52	708.26	705.76	715.76	7.5-10 ft BGS	04/04/2012	230 U	90 U	45 U	90 U	90 U	680 U	45 U	45 U	45 U	230 U	230 U	90 U	45 U	1500	36 U	140 U	-
SB18-299	13344534.61	268386.17	710.76	708.26	715.76	5-7.5 ft BGS	04/04/2012	240 U	95 U	47 U	95 U	95 U	250 J	47 U	47 U	47 U	240 U	240 U	95 U	47 U	260	38 U	140 U	-
SB18-299	13344534.61	268386.17	708.26	705.76	715.76	7.5-10 ft BGS	04/04/2012	1900 U	750 U	380 U	750 U	750 U	5700 U	380 U	2600	380 U	1900 U	730 J	750 U	150 J	16000	300 U	1100 U	-
SB18-300	13344515.82	268410.58	708.26	705.76	715.76	7.5-10 ft BGS	04/04/2012	220 U	90 U	45 U	90 U	90 U	670 U	45 U	45 U	45 U	220 U	220 U	90 U	45 U	460	36 U	130 U	-
SB18-300	13344515.82	268410.58	710.76	708.26	715.76	5-7.5 ft BGS	04/04/2012	230 U	92 U	46 U	92 U	92 U	250 J	46 U	46 U	46 U	230 U	230 U	92 U	46 U	980	37 U	140 U	-
SB18-301	13344506.75	268423.10	707.28	704.78	714.78	7.5-10 ft BGS	04/04/2012	240 U	96 U	48 U	96 U	96 U	720 U	48 U	240	48 U	240 U	240 U	96 U	20 J	3100	38 U	140 U	-
SB18-301	13344506.75	268423.10	709.78	707.28	714.78	5-7.5 ft BGS	04/04/2012	220 U	87 U	44 U	87 U	87 U	650 U	44 U	44 U	44 U	220 U	220 U	87 U	44 U	44 U	35 U	130 U	-
SB18-302	13344529.54	268432.06	707.42	704.92	712.42	5-7.5 ft BGS	04/04/2012	210 U	86 U	43 U	86 U	86 U	640 U	43 U	43 U	43 U	210 U	210 U	86 U	18 J	690	34 U	130 U	-
SB18-303	13344554.11	268419.44	709.52	707.02	714.52	5-7.5 ft BGS	04/04/2012	240 U	98 U	49 U	98 U	98 U	400 J	49 U	49 U	49 U	240 U	100 JB	98 U	49 U	170	39 U	150 U	-
SB18-303	13344554.11	268419.44	707.02	704.52	714.52	7.5-10 ft BGS	04/04/2012	910 U	360 U	180 U	360 U	360 U	2700 U	180 U	1000	180 U	910 U	380 JB	360 U	250	6500	150 U	550 U	-
SB18-304	13344573.58	268412.69	709.75	707.25	714.75	5-7.5 ft BGS	04/04/2012	280 U	110 U	55 U	110 U	110 U	480 J	55 U	55 U	55 U	280 U	120 JB	110 U	55 U	560	44 U	170 U	-
SB18-304	13344573.58	268412.69	707.25	704.75	714.75	7.5-10 ft BGS	04/04/2012	410 U	170 U	83 U	170 U	170 U	1200 U	83 U	460	83 U	410 U	170 JB	170 U	83 U	3100	66 U	250 U	-
SB18-305	13344586.72	268411.24	709.57	707.07	714.57	5-7.5 ft BGS	04/04/2012	220 U	87 U	43 U	87 U	87 U	650 U	43 U	43 U	43 U	220 U	92 JB	87 U	43 U	840	35 U	130 U	-
SB18-305	13344586.72	268411.24	707.07	704.57	714.57	7.5-10 ft BGS	04/04/2012	1400 U	550 U	280 U	550 U	550 U	4200 U	280 U	280 U	280 U	1400 U	600 JB	550 U	280 U	11000	220 U	830 U	-
SB18-306	13344615.45	268416.60	710.35	707.85	712.85	2.5-5 ft BGS	04/05/2012	240 U	95 U	47 U	95 U	95 U	1200	47 U	47 U	47 U	240 U	240 U	95 U	47 U	12 J	38 U	140 U	37 U
SB18-306	13344615.45	268416.60	707.85	705.35	712.85	5-7.5 ft BGS	04/05/2012	20 JB	95 U	48 U	95 U	95 U	710 U	48 U	48 U	48 U	240 U	240 U	95 U	48 U	48 U	38 U	140 U	-
SB18-307	13344616.36	268403.22	709.91	707.41	714.91	5-7.5 ft BGS	04/05/2012	310 U	120 U	62 U	120 U	120 U	920 U	62 U	42 J	62 U	310 U	310 U	120 U	62 U	350	49 U	180 U	-
SB18-307	13344616.36	268403.22	707.41	704.91	714.91	7.5-10 ft BGS	04/05/2012	190 JB	87 U	43 U	87 U	87 U	270 J	43 U	43 U	43 U	220 U	220 U	87 U	43 U	390	35 U	130 U	-
SB18-307	13344616.36	268403.22	709.91	707.41	714.91	5-7.5 ft BGS	04/05/2012	12 JB	95 U	47 U	95 U	95 U	710 U	47 U	110	47 U	240 U	240 U	95 U	47 U	920	38 U	140 U	-
SB18-308	13344640.26	268403.80	707.19	704.69	714.69	7.5-10 ft BGS	04/05/2012	1800 B	110 U	54 U	110 U	110 U	820 U	54 U	4000	54 U	270 U	270 U	110 U	33 J	4300	44 U	160 U	-
SB18-308	13344640.26	268403.80	709.69	707.19	714.69	5-7.5 ft BGS	04/05/2012	280 U	110 U	55 U	110 U	110 U	830 U	55 U	55 U	55 U	280 U	280 U	110 U	55 U	17 J	44 U	170 U	-
SB18-313	13344674.99	268401.57	709.75	707.25	714.75	5-7.5 ft BGS	04/05/2012	230 U	92 U	46 U	92 U	92 U	690 U	46 U	410	46 U	230 U	230 U	92 U	46 U	3000	37 U	140 U	38 U
SB18-313	13344674.99	268401.57	707.25	704.75	714.75	7.5-10 ft BGS	04/05/2012	64 JB	170 U	87 U	170 U	170 U	1300 U	87 U	2600	87 U	440 U	440 U	170 U	87 U	21000	70 U	260 U	37 U
SB18-314	13344697.31	268388.08	710.24	707.74	715.24	5-7.5 ft BGS	04/05/2012	250 U	98 U	49 U	98 U	98 U	740 U	49 U	850	49 U	250 U	250 U	98 U	49 U	2000	35 J	150 U	37 U
SB18-314	13344697.31	268388.08	707.74	705.24	715.24	7.5-10 ft BGS	04/05/2012	420 JB	1600 U	780 U	1600 U	1600 U	12000 U	780 U	49000	780 U	3900 U	3900 U	1600 U	780 U	110000	630 U	250 JB	63
SB18-314	13344697.31	268388.08	707.74	705.24	715.24	7.5-10 ft BGS	04/05/2012	560 JB	1700 U	830 U	1700 U	1700 U	12000 U	830 U	150000	830 U	4200 U	4200 U	1700 U	590 J	200000	670 U	220 JB	160
SB18-315	13344736.35	268401.68	709.65	707.15	714.65	5-7.5 ft BGS	04/05/2012	230 U	93 U	46 U	93 U	93 U	700 U	46 U	46 U	46 U	230 U	230 U	93 U	46 U	220	37 U	140 U	-
SB18-315	13344736.35	268401.68	707.15	704.65	714.65	7.5-10 ft BGS	04/05/2012	220 U	87 U	43 U	87 U	87 U	650 U	43 U	43 U	43 U	220 U	220 U	87 U	43 U	450	35 U	130 U	-
SB18-316	13344764.18	268403.57	707.26	704.76	714.76	7.5-10 ft BGS	04/05/2012	270 U	110 U	53 U	110 U	110 U	800 U	53 U	50 J	53 U	270 U	270 U	110 U	53 U	170	43 U	160 U	-
SB18-316	13344764.18	268403.57	709.76	707.26	714.76	5-7.5 ft BGS	04/05/2012	250 U	100 U	50 U	100 U	100 U	760 U	50 U	21 J	50 U	250 U	250 U	100 U	50 U	200	40 U	150 U	-
SB18-317	13344794.59	268394.54	707.85	705.35	715.35	7.5-10 ft BGS	04/05/2012	210 U	83 U	42 U	83 U	83 U	620 U	22 J	42 U	48	9.4 J	210 U	83 U	42 U	42 U	38	59 J	190 U
SB18-317	13344794.59	268394.54	710.35	707.85	715.35	5-7.5 ft BGS	04/05/2012	290 U	110 U	57 U	110 U	110 U	860 U	57 U	57 U	190	75 J	290 U	25 J	57 U	57 U	46 U	340	540
SB18-318	13344612.97	268393.86	709.67	707.17	714.67	5-7.5 ft BGS	04/05/2012	250 U	100 U	50 U	100 U	100 U	750 U	50 U	50 U	50 U	250 U	110 JB	100 U	50 U	810	40 U	150 U	-
SB18-318	13344612.97	268393.86	707.17	704.67	714.67	7.5-10 ft BGS	04/05/2012	1300 U	500 U	250 U	500 U	500 U	3800 U	150 J	3400	6800	14000	500 JB	2000	250 U	1100	710	7300	42 U
SB18-65	13344530.8	268394.457	706.55	704.55	715.55	9-11 ft BGS	05/19/2004	2400 U	960 U	480 U	960 U	960 U	7200 U	480 U	600	480 U	2400 U	600 J	960 U	480 U	19000	960 U	4800 U	37 U
SB18-66	13344611.49	268384.61	707.09	705.09	715.09	8-10 ft BGS	05/19/2004	2500 U	1000 U	500 U	1000 U	1000 U	7500 U	250 J	500 U	18000	13000	2500 U	1400	500 U	240 J	850 J	16000	490
SB18-67	13344603.9	268337.053	708.36	706.36	714.36	6-8 ft BGS	05/19/2004	300 U	120 U	59 U	120 U	120 U	890 U	59 U	57 J	59 U	300 U	75 J	120 U	59 U	1300	120 U	590 U	380 U
SB18-69	13344720.9	268330.506	710.68	708.68	714.68	4-6 ft BGS	05/19/2004	260 U	100 U	52 U	100 U	100 U	780 U	52 U	52 U	52 U	260 U	260 U	100 U	52 U	64	100 U	520 U	370 U
SB18-70	13344786.5658	268381.9617	710.1	709.1	715.1	5-6 ft BGS	05/19/2004	2600000 U	1000000 U	190000 J	1000000 U	1000000 U	7700000 U	510000 U	350000 J	330000 J	2600000 U	760000 J	320000 J	510000 U	12000000	1000000 U	2100000 J	2000
SB18-78	13344534.14	268431.713	706.926	704.426	711.926	5-7.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	110	50 U	-	300 U	50 U	-	2920	50 U	-	330 U
SB18-78	13344534.14	268431.713	709.426	706.926	711.926	2.5-5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	10 J	50 U	-	330 U
SB18-79	13344575.235	268421.576	710.284	707.784	712.784	2.5-5 ft BGS	08/23/2004	-	-	-	-	-	-	-	8 J	50 U	-	300 U	50 U	-	60	50 U	-	330 U
SB18-79	13344575.235	268421.576	707.784	705.284	712.784	5-7.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	30 J	50 U	-	330 U
SB18-80	13344611.374	268429.5	708.3	705.8	708.3	0-2.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	20 J	50 U	-	330 U
SB18-81	13344600.626	268411.557	708.179	705.679	713.179	5-7.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	60	50 U	-	330 U
SB18-81	13344600.626	268411.557	710.679	708.179	713.179	2.5-5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 J	50 U	-	160 J
SB18-82	13344622.103	268411.808	708.273	705.773	713.273	5-7.5 ft BGS																		

TABLE 2.2
VOC AND PCB ANALYTICAL DATA TABLES - 705 - 710 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

			Start	End	Ground			1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
Location Name	x	y	Elevation	Elevation	Elevation	Depth	Sample Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

Notes
Elevation is feet above mean sea level
U - Not present at or above the associated reporting limit value.
J - The associated value is an estimated concentration.
UJ - The associated value is an estimated reporting limit.
- - Constituent not analyzed

Denotes exceedance of Remediation Requirement for COC
Denotes exceedance of 20 x Toxicity Characteristic Regulatory Levels for COC
Denotes exceedance of Soil Alternative Treatment Standard for COC

TABLE 2.3
VOC AND PCB ANALYTICAL DATA TABLES - 700 - 705 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	x	y	Start	End	Ground	Depth	Sample Date	1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
			Elevation	Elevation	Elevation			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
MW18-02	13344554.25	268439.94	708.8	706.8	708.8	0-2 ft BGS	05/17/2004	110 J	120 U	58 U	120 U	120 U	870 U	58 U	58 U	58 U	290 U	290 U	120 U	58 U	76	120 U	580 U	1600
MW19-17	13344553.37	268424.03	705.42	703.42	713.42	8-10 ft BGS	11/11/2003	3800 U	1500 U	760 U	1500 U	1500 U	11000 U	760 U	6200	760 U	3800 U	3800 U	1500 U	760 U	22000	1500 U	7600 U	370 U
MW19-18	13344595.65	268420.37	704.82	702.82	712.32	7.5-9.5 ft BGS	11/11/2003	770 U	310 U	150 U	310 U	310 U	2300 U	150 U	290	150 U	770 U	770 U	310 U	150 U	4200	310 U	1500 U	380 U
PZ18-126	13344563.644	268391.005	705.074	702.574	715.074	10-12.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	368000	14000	-	30000 U	15000	-	19000	5000 U	-	82000
PZ18-126	13344563.644	268391.005	702.574	700.074	715.074	12.5-15 ft BGS	09/02/2004	-	-	-	-	-	-	-	96000	5000 U	-	30000 U	2000 J	-	583000	5000 U	-	11500
PZ18-127	13344583.31	268389.79	702.66	700.16	715.16	12.5-15 ft BGS	09/02/2004	-	-	-	-	-	-	-	565000	17000	-	30000 U	11000	-	867000	5000 U	-	110000
PZ18-127	13344583.31	268389.79	705.16	702.66	715.16	10-12.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	300000	36000 J	-	500000 U	54000 J	-	14700000	100000 U	-	158000
PZ18-128	13344638.9	268384.48	705.16	702.66	715.16	10-12.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	23000	47000	-	30000 U	22000	-	2000 J	13000	-	1000
PZ18-128	13344638.9	268384.48	702.66	700.16	715.16	12.5-15 ft BGS	09/02/2004	-	-	-	-	-	-	-	350	30 J	-	300 U	40 J	-	40 J	3280	-	2000
PZ18-73	13344670.96	268423.831	704.65	702.65	709.65	5-7 ft BGS	05/24/2004	1000 U	410 U	200 U	410 U	410 U	3000 U	200 U	6000	200 U	1000 U	1000 U	410 U	200 U	1800	410 U	2000 U	380 U
PZ18-87	13344542.35	268455.37	704.54	702.54	704.54	0-2 ft BGS	08/24/2004	-	-	-	-	-	-	-	7450	50 U	-	300 U	20 J	-	60	440	-	330 U
PZ18-96	13344627.2	268425.64	702.38	702.38	710.38	8-8 ft BGS	08/25/2004	-	-	-	-	-	-	-	630000	30000	-	50000 U	90000	-	10000 U	80000	-	800
PZ18-97	13344616.82	268453.9	702.15	699.15	702.15	0-3 ft BGS	08/25/2004	-	-	-	-	-	-	-	51300	500 U	-	3000 U	200 J	-	3200	3000	-	330 U
SB18-106	13344639.538	268422.947	705.236	703.236	711.236	6-8 ft BGS	08/25/2004	-	-	-	-	-	-	-	1680	50 U	-	300 U	50 U	-	1030	50 U	-	330 U
SB18-111	13344597.294	268439.355	705.47	702.97	705.47	0-2.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	140	50 U	-	300 U	50 U	-	270	50 U	-	330 U
SB18-111	13344597.294	268439.355	702.97	700.47	705.47	2.5-5 ft BGS	08/26/2004	-	-	-	-	-	-	-	150	270	-	300 U	150	-	50 U	410	-	1000
SB18-112	13344578.426	268442.702	705.591	703.091	705.591	0-2.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	240	50 U	-	300 U	50 U	-	770	50 U	-	330 U
SB18-112	13344578.426	268442.702	703.091	700.591	705.591	2.5-5 ft BGS	08/26/2004	-	-	-	-	-	-	-	13000	500 U	-	3000 U	500 U	-	1300	500 U	-	4000
SB18-113	13344556.765	268448.629	704.918	702.418	704.918	0-2.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	70	50 U	-	300 U	50 U	-	130	50 U	-	330 U
SB18-113	13344556.765	268448.629	702.418	699.918	704.918	2.5-5 ft BGS	08/26/2004	-	-	-	-	-	-	-	50 U	70	-	300 U	100	-	50 U	140	-	8000
SB18-114	13344556.935	268456.523	701.961	699.461	701.961	0-2.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	1700	50 U	-	300 U	50 U	-	880	10 J	-	330 U
SB18-115	13344581.6	268452.517	702.055	699.555	702.055	0-2.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	-	1000 U	-	5000 U	800 J	-	116000	15000	-	50 J
SB18-116	13344597.04	268447.074	702.915	700.415	702.915	0-2.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	52000	1000	-	5000 U	900 J	-	73000	2000	-	500
SB18-117	13344636.95	268428.81	704.23	702.23	708.23	4-6 ft BGS	08/31/2004	-	-	-	-	-	-	-	44100	700	-	3000 U	2500	-	100 J	2400	-	330 U
SB18-117	13344636.95	268428.81	702.23	700.5300002	708.23	6-7.7 ft BGS	08/31/2004	-	-	-	-	-	-	-	64500	1000	-	3000 U	4400	-	500 U	8200	-	700
SB18-118	13344645.41	268432.23	706.85	704.85	706.85	0-2 ft BGS	08/31/2004	-	-	-	-	-	-	-	20 J	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-119	13344661.3	268418	705.18	702.68	712.68	7.5-10 ft BGS	08/31/2004	-	-	-	-	-	-	-	8600	500 U	-	3000 U	60 J	-	9100	500 U	-	330 U
SB18-119	13344661.3	268418	702.68	700.18	712.68	10-12.5 ft BGS	08/31/2004	-	-	-	-	-	-	-	2020	50 U	-	300 U	50 U	-	50 U	670	-	1000
SB18-121	13344658.18	268391.61	702.48	699.98	714.98	12.5-15 ft BGS	08/31/2004	-	-	-	-	-	-	-	2250	50 U	-	300 U	50 U	-	3430	50 U	-	330 U
SB18-121	13344658.18	268391.61	704.98	702.48	714.98	10-12.5 ft BGS	08/31/2004	-	-	-	-	-	-	-	2750	50 U	-	300 U	50 U	-	6430	50 U	-	6200
SB18-122	13344556.89	268402.44	702.18	699.68	714.68	12.5-15 ft BGS	09/01/2004	-	-	-	-	-	-	-	53000	1200	-	3000 U	1300	-	19500	500 U	-	330 U
SB18-122	13344556.89	268402.44	704.68	702.18	714.68	10-12.5 ft BGS	09/01/2004	-	-	-	-	-	-	-	18400	800	-	3000 U	500 U	-	56300	500 U	-	3000
SB18-123	13344566.39	268401.39	704.73	702.23	714.73	10-12.5 ft BGS	09/01/2004	-	-	-	-	-	-	-	25500	1500	-	3000 U	600	-	5200	600	-	3200
SB18-123	13344566.39	268401.39	702.23	699.73	714.73	12.5-15 ft BGS	09/01/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100000
SB18-124	13344595.48	268397.84	701.84	699.34	714.34	12.5-15 ft BGS	09/01/2004	-	-	-	-	-	-	-	400	200 U	-	1000 U	200 U	-	6900	300	-	330 U
SB18-124	13344595.48	268397.84	704.34	701.84	714.34	10-12.5 ft BGS	09/01/2004	-	-	-	-	-	-	-	13000	500 U	-	3000 U	500 U	-	68500	500 U	-	330 U
SB18-125	13344573.19	268389.95	705.14	702.64	715.14	10-12.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	-	7400	-	3000 U	7700	-	249000	1800	-	26000
SB18-125	13344573.19	268389.95	702.64	700.14	715.14	12.5-15 ft BGS	09/02/2004	-	-	-	-	-	-	-	800000	45000 J	-	500000 U	87000 J	-	10800000	100000 U	-	238000
SB18-135	13344522.187	268439.386	702.413	699.913	709.913	7.5-10 ft BGS	09/09/2004	-	-	-	-	-	-	-	540	30 J	-	300 U	50 U	-	3400	190	-	-
SB18-135	13344522.187	268439.386	704.913	702.413	709.913	5-7.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	1820	50 U	-	300 U	20 J	-	8530	140	-	-
SB18-136	13344520.054	268426.44	706.16	703.66	713.66	7.5-10 ft BGS	09/09/2004	-	-	-	-	-	-	-	1550	50 U	-	300 U	50 U	-	1300	50 U	-	-
SB18-136	13344520.054	268426.44	703.66	701.16	713.66	10-12.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	1960	50 U	-	300 U	50 U	-	1400	50 U	-	-
SB18-138	13344641.99	268445.487	702.9514	700.4514	702.9514	0-2.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	630000	800 J	-	10000 U	4000	-	126000	32000	-	-
SB18-139	13344660.406	268433.854	701.556	699.056	706.556	5-7.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	9130	50 U	-	300 U	50 U	-	20 J	3490	-	330 U
SB18-139	13344660.406	268433.854	704.056	701.556	706.556	2.5-5 ft BGS	09/09/2004	-	-	-	-	-	-	-	20 J	130	-	300 U	10 J	-	50 U	100	-	330 U
SB18-201	13344710.21	268410.02	705.3	704.3	713.8	8.5-9.5 ft BGS	06/06/2005	2100 U	860 U	430 U	860 U	860 U	6400 U	430 U	6800	430 U	2100 U	2100 U	860 U	430 U	12000	340 U	1300 U	-
SB18-203	13344781.84	268375.89	706.15	703.15	715.15	9-12 ft BGS	06/02/2005	400 U	160 U	80 U	160 U	160 U	1200 U	80 U	1600	80 U	400 U	400 U	160 U	80 U	2400	64 U	240 U	260 UJ
SB18-214	13344524.71	268456.88	702.1	701.1	703.1	1-2 ft BGS	08/11/2005	-	-	-	-	-	-	-	-	40 U	-	-	80 U	-	-	-	15 J	65 J
SB18-218	13344529.17	268459.76	702	700	702	0-2 ft BGS	08/16/2005	-	-	-	-	-	-	-	-	28 J	-	-	18 J	-	-	-	98 J	7.9 J
SB18-218	13344529.17	268459.76	702	700	702	0-2 ft BGS	08/16/2005	-	-	-	-	-	-	-	-	28 J	-	-	28 J	-	-	-	100 J	14 J
SB18-219	13344520.35	268460.45	701.8	699.8	701.8	0-2 ft BGS	08/16/2005	-	-	-	-	-	-	-	-	17 J	-	-	13 J	-	-	-	50 J	9.1 J
SB18-280	13344802.99	268362.60	701.96	699.46	714.46	12.5-15 ft BGS	04/02/2012	230 U	94 U	47 U	94 U	94 U	200 J	47 U	59	47 U	230 U	230 U	94 U	47 U	420	38 U	140 U	310 U
SB18-280	1334480																							

TABLE 2.3
VOC AND PCB ANALYTICAL DATA TABLES - 700 - 705 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

			Start	End	Ground				1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
Location Name	x	y	Elevation	Elevation	Elevation	Depth	Sample Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SB18-283	13344729.06	268335.14	702.28	699.78	714.78	12.5-15 ft BGS	04/02/2012	35 J	99 U	50 U	99 U	99 U	99 U	740 U	50 U	50 U	50 U	250 U	250 U	99 U	50 U	50 U	40	150 U	330 U
SB18-284	13344690.27	268332.26	704.16	701.66	714.16	10-12.5 ft BGS	04/02/2012	240 U	97 U	48 U	97 U	97 U	97 U	730 U	48 U	48 U	48 U	11 J	240 U	97 U	48 U	89	39 U	150 U	320 U
SB18-284	13344690.27	268332.26	706.66	704.16	714.16	7.5-10 ft BGS	04/02/2012	560 U	220 U	110 U	220 U	220 U	220 U	1700 U	110 U	160	36 J	210 J	560 U	220 U	110 U	5300	90 U	250 J	-
SB18-284	13344690.27	268332.26	701.66	699.16	714.16	12.5-15 ft BGS	04/02/2012	220 U	87 U	43 U	87 U	87 U	87 U	650 U	43 U	43 U	43 U	220 U	220 U	87 U	43 U	43 U	1300	130 U	300 U
SB18-285	13344663.13	268332.43	701.27	698.77	713.77	12.5-15 ft BGS	04/02/2012	250 U	100 U	50 U	100 U	100 U	100 U	750 U	50 U	110	50 U	250 U	250 U	100 U	13 J	250	40 U	150 U	320 U
SB18-285	13344663.13	268332.43	706.27	703.77	713.77	7.5-10 ft BGS	04/02/2012	740 J	720 U	360 U	720 U	720 U	720 U	5400 U	360 U	210 J	360 U	1800 U	1800 U	720 U	88 J	12000	290 U	1100 U	-
SB18-285	13344663.13	268332.43	703.77	701.27	713.77	10-12.5 ft BGS	04/02/2012	480 U	190 U	97 U	190 U	190 U	190 U	1400 U	97 U	5600	97 U	480 U	480 U	190 U	170	97 U	4000	290 U	-
SB18-286	13344652.15	268356.52	704.54	702.04	714.54	10-12.5 ft BGS	04/02/2012	980 U	390 U	200 U	390 U	390 U	390 U	2900 U	200 U	1000	200 U	980 U	980 U	390 U	200 U	7200	160 U	590 U	320 U
SB18-286	13344652.15	268356.52	702.04	699.54	714.54	12.5-15 ft BGS	04/02/2012	230 U	92 U	46 U	92 U	92 U	92 U	690 U	46 U	3400	46 U	230 U	230 U	92 U	190	11 J	1400	140 U	320 U
SB18-287	13344555.40	268364.72	702.87	700.37	715.37	12.5-15 ft BGS	04/04/2012	960 U	380 U	190 U	380 U	380 U	380 U	2900 U	190 U	8600	190 U	960 U	960 U	380 U	290	1200	670	580 U	320 U
SB18-287	13344555.40	268364.72	705.37	702.87	715.37	10-12.5 ft BGS	04/04/2012	510 U	200 U	100 U	200 U	200 U	200 U	1500 U	380	4200	100 U	510 U	510 U	680	760	3700	2700	310 U	-
SB18-288	13344582.51	268374.91	705.11	702.61	715.11	10-12.5 ft BGS	04/04/2012	440000 U	180000 U	88000 U	180000 U	180000 U	180000 U	1300000 U	88000 U	3900000	85000 J	440000 U	440000 U	82000 J	88000 U	3300000	77000	510000	71000
SB18-288	13344582.51	268374.91	702.61	700.11	715.11	12.5-15 ft BGS	04/04/2012	2700 J	2400 U	1200 U	2400 U	1800 J	1800 U	800 J	14000	12000	3400 J	6000 U	8200	750 J	1200 U	50000	70000	13000	
SB18-289	13344606.35	268384.89	705.11	702.61	715.11	10-12.5 ft BGS	04/04/2012	2700 U	1100 U	540 U	1100 U	1100 U	1100 U	2300 JB	760	4100	16000	12000	2700 U	1800	540 U	2600	430 U	48000	360
SB18-289	13344606.35	268384.89	702.61	700.11	715.11	12.5-15 ft BGS	04/04/2012	4800 U	1900 U	970 U	1900 U	1900 U	1900 U	14000 U	640 J	4000	10000	38000	4800 U	9600	970 U	2800	2500	51000	320 U
SB18-290	13344627.83	268383.43	704.98	702.48	714.98	10-12.5 ft BGS	04/03/2012	530000 U	210000 U	110000 U	210000 U	210000 U	210000 U	1600000 U	40000 J	6500000	110000	61000 JB	530000 U	240000	110000 U	200000	200000	640000	8700
SB18-290	13344627.83	268383.43	704.98	702.48	714.98	10-12.5 ft BGS	04/03/2012	510000 U	200000 U	100000 U	200000 U	200000 U	200000 U	1500000 U	38000 J	5800000	94000 J	51000 JB	510000 U	210000	100000 U	230000	170000	560000	8300
SB18-290	13344627.83	268383.43	702.48	699.98	714.98	12.5-15 ft BGS	04/03/2012	540 J	950 U	470 U	950 U	950 U	950 U	7100 U	880	28000	160 J	1200 JB	2400 U	1500	470 U	470 U	17000	400 J	2000
SB18-291	13344651.43	268382.22	705.03	702.53	715.03	10-12.5 ft BGS	04/02/2012	440 U	180 U	89 U	180 U	180 U	180 U	1300 U	27 J	870	15 J	56 J	440 U	180 U	22 J	5300	390	130 J	320 U
SB18-291	13344651.43	268382.22	702.53	700.03	715.03	12.5-15 ft BGS	04/02/2012	240 U	95 U	48 U	95 U	95 U	95 U	200 J	610	48 U	390	3200	240 U	1500	48 U	48 U	38 U	2600	110
SB18-292	13344693.41	268380.67	705.3	702.8	715.30	10-12.5 ft BGS	04/02/2012	4700 U	1900 U	950 U	1900 U	1900 U	1900 U	14000 U	950 U	79000	850 J	4700 U	4700 U	1200 J	950 U	300 J	26000	6000	38
SB18-292	13344693.41	268380.67	702.8	700.3	715.30	12.5-15 ft BGS	04/02/2012	920 J	2000 U	980 U	2000 U	2000 U	2000 U	15000 U	980 U	32000	3700	230 J	4900 U	3500	300 J	980 U	39000	22000	320 U
SB18-293	13344710.21	268370.70	705.15	702.65	715.15	10-12.5 ft BGS	04/02/2012	2400 U	960 U	480 U	960 U	960 U	960 U	7200 U	480 U	4900	480 U	2400 U	2400 U	960 U	480 U	20000	380 U	1400 U	-
SB18-293	13344710.21	268370.70	702.65	700.15	715.15	12.5-15 ft BGS	04/02/2012	6000 U	2400 U	1200 U	2400 U	2400 U	2400 U	18000 U	1200 U	60000	830 J	240 J	6000 U	880 J	290 J	1200 U	5300	4400	310 U
SB18-294	13344732.28	268370.08	702.56	700.06	715.06	12.5-15 ft BGS	04/02/2012	220 U	89 U	44 U	89 U	89 U	89 U	210 J	44 U	550	44 U	220 U	220 U	89 U	32 J	1500	35 U	18 J	320 U
SB18-294	13344732.28	268370.08	705.06	702.56	715.06	10-12.5 ft BGS	04/02/2012	12000 U	4700 U	2400 U	4700 U	4700 U	4700 U	35000 U	2400 U	3700	2400 U	12000 U	12000 U	4700 U	2400 U	120000	1900 U	7100 U	310 U
SB18-295	13344759.64	268369.23	702.54	700.04	715.04	12.5-15 ft BGS	04/02/2012	220 U	90 U	45 U	90 U	90 U	90 U	670 U	45 U	330	45 U	220 U	220 U	90 U	21 J	71	110	130 U	320 U
SB18-295	13344759.64	268369.23	705.04	702.54	715.04	10-12.5 ft BGS	04/02/2012	1800 U	730 U	370 U	730 U	730 U	730 U	5500 U	370 U	1000	370 U	1800 U	1800 U	730 U	370 U	17000	290 U	1100 U	-
SB18-296	13344565.37	268380.09	702.8	700.3	715.30	12.5-15 ft BGS	04/04/2012	15000 U	6000 U	3000 U	6000 U	6000 U	6000 U	45000 U	3000 U	110000	4900	810 J	15000 U	9200	3000 U	3000 U	8200	25000	300 U
SB18-296	13344565.37	268380.09	705.3	702.8	715.30	10-12.5 ft BGS	04/04/2012	22000 U	9000 U	4500 U	9000 U	9000 U	9000 U	67000 U	4500 U	130000	12000	1800 J	22000 U	12000	4500 U	4500 U	12000	72000	22
SB18-297	13344534.20	268374.63	705.58	703.08	715.58	10-12.5 ft BGS	04/04/2012	960 U	380 U	190 U	380 U	380 U	380 U	2900 U	190 U	2200	190 U	960 U	960 U	380 U	220	7200	150 U	580 U	-
SB18-297	13344534.20	268374.63	703.08	700.58	715.58	12.5-15 ft BGS	04/04/2012	2000 U	800 U	400 U	800 U	800 U	800 U	1700 J	400 U	3800	400 U	2000 U	780 J	800 U	480	14000	320 U	1200 U	-
SB18-298	13344519.80	268380.52	705.76	703.26	715.76	10-12.5 ft BGS	04/04/2012	230 U	93 U	47 U	93 U	93 U	93 U	700 U	47 U	680	47 U	230 U	230 U	93 U	220	960	37 U	140 U	-
SB18-298	13344519.80	268380.52	703.26	700.76	715.76	12.5-15 ft BGS	04/04/2012	240 U	96 U	48 U	96 U	96 U	96 U	720 U	48 U	87	48 U	240 U	240 U	96 U	21 J	1400	38 U	140 U	320 U
SB18-299	13344534.61	268386.17	705.76	703.26	715.76	10-12.5 ft BGS	04/04/2012	1900 U	750 U	380 U	750 U	750 U	750 U	5600 U	380 U	4600	380 U	1900 U	1900 U	750 U	2100	13000	300 U	1100 U	-
SB18-299	13344534.61	268386.17	703.26	700.76	715.76	12.5-15 ft BGS	04/04/2012	2100 U	840 U	420 U	840 U	840 U	840 U	6300 U	420 U	4100	420 U	2100 U	2100 U	840 U	2400	17000	330 U	1300 U	290 U
SB18-299	13344534.61	268386.17	703.26	700.76	715.76	12.5-15 ft BGS	04/04/2012	3300 U	1300 U	660 U	1300 U	1300 U	1300 U	9900 U	660 U	4800	660 U	3300 U	3300 U	1300 U	2900	19000	530 U	2000 U	300 U
SB18-300	13344515.82	268410.58	705.76	703.26	715.76	10-12.5 ft BGS	04/04/2012	45 J	96 U	48 U	96 U	96 U	96 U	720 U	48 U	1500	48 U	240 U	240 U	96 U	530	1500	39 U	47 J	-
SB18-300	13344515.82	268410.58	703.26	700.76	715.76	12.5-15 ft BGS	04/04/2012	240 U	96 U	48 U	96 U	96 U	96 U	720 U	48 U	48 U	48 U	240 U	240 U	96 U	48 U	48 U	39 U	140 U	320 U
SB18-301	13344506.75	268423.10	704.78	702.28	714.78	10-12.5 ft BGS	04/04/2012	210 U	86 U	43 U	86 U	86 U	86 U	640 U	43 U	270	43 U	210 U	210 U	86 U	43 U	71	34 U	130 U	310 U
SB18-301	13344506.75	268423.10	702.28	699.78	714.78	12.5-15 ft BGS	04/04/2012	230 U	94 U	47 U	94 U	94 U	94 U	700 U	47 U	47 U	47 U	230 U	230 U	94 U	47 U	47 U	38 U	140 U	310 U
SB18-302	13344529.54	268432.06	702.42	699.92	712.42	10-12.5 ft BGS	04/04/2012	1200 U	460 U	230 U	460 U	460 U	460 U	1000 J	160 J	8100	230 U	1200 U	1200 U	460 U	6500	11000	370	690 U	310 U
SB18-302	13344529.54	268432.06	704.92	702.42	712.42	7.5-10 ft BGS	04/04/2012	2600 U	1000 U	520 U	1000 U	1000 U	1000 U	7900 U	520 U	2300	520 U	2600 U	2600 U	1000 U	1800	26000	420 U	1600 U	-
SB18-302	13																								

TABLE 2.3
VOC AND PCB ANALYTICAL DATA TABLES - 700 - 705 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	x	y	Start	End	Ground	Depth	Sample Date	1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
			Elevation	Elevation	Elevation			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SB18-311	13344732.27	268427.67	702.49	699.99	707.49	5-7.5 ft BGS	04/05/2012	1100 J	820 U	410 U	820 U	820 U	6200 U	210 J	13000	550	2100 U	2100 U	820 U	100 J	410 U	15000	130 J	4100
SB18-311	13344732.27	268427.67	704.99	702.49	707.49	2.5-5 ft BGS	04/05/2012	4400 U	1800 U	890 U	1800 U	1800 U	13000 U	890 U	38000	890 U	4400 U	4400 U	1800 U	320 J	890 U	4800	2700 U	44
SB18-312	13344747.36	268430.08	701.57	700.07	706.57	5-6.5 ft BGS	04/05/2012	150 J	610 U	310 U	610 U	610 U	4600 U	310 U	14000	66 J	1500 U	1500 U	610 U	140 J	310 U	1900	110 J	250
SB18-312	13344747.36	268430.08	704.07	701.57	706.57	2.5-5 ft BGS	04/05/2012	12000 U	4700 U	2400 U	4700 U	4700 U	36000 U	2400 U	90000	2400 U	12000 U	12000 U	4700 U	1100 J	630 J	4900	7100 U	60
SB18-313	13344674.99	268401.57	704.75	702.25	714.75	10-12.5 ft BGS	04/05/2012	35000 B	3600 U	1800 U	3600 U	610 JB	36000	1800 U	220000	5900 B	9000 U	9000 U	6400	1600 J	1800 U	11000	37000 B	50000
SB18-313	13344674.99	268401.57	702.25	699.75	714.75	12.5-15 ft BGS	04/05/2012	37000 B	370 JB	210 U	800 B	3900 B	1900 J	880	25000	20000 B	1800 B	1000 U	10000	370	210 U	26000	120000 B	1600
SB18-314	13344697.31	268388.08	702.74	700.24	715.24	12.5-15 ft BGS	04/05/2012	620 JB	3600 U	1800 U	3600 U	3600 U	27000 U	1800 U	220000	270 JB	8900 U	8900 U	1300 J	570 J	1800 U	26000	790 JB	26
SB18-314	13344697.31	268388.08	705.24	702.74	715.24	10-12.5 ft BGS	04/05/2012	600 JB	2900 U	1400 U	2900 U	2900 U	13000 J	1400 U	180000	250 JB	7200 U	7200 U	1200 J	350 J	390 J	1200 U	820 JB	520
SB18-315	13344736.35	268401.68	704.65	702.15	714.65	10-12.5 ft BGS	04/05/2012	9500 U	3800 U	1900 U	3800 U	3800 U	28000 U	1900 U	73000	1900 U	9500 U	9500 U	3800 U	1900 U	44000	5800	5700 U	40 U
SB18-315	13344736.35	268401.68	702.15	699.65	714.65	12.5-15 ft BGS	04/05/2012	3800 U*	1500 U*	770 U*	1500 U*	1500 U*	12000 U*	770 U*	31000 *	770 U*	3800 U*	3800 U*	550 J*	290 J*	420 J*	4400 *	2300 U*	38 U
SB18-316	13344764.18	268403.57	702.26	699.76	714.76	12.5-15 ft BGS	04/05/2012	6100 U	2400 U	1200 U	2400 U	2400 U	18000 U	1200 U	40000	1200 U	6100 U	6100 U	2400 U	320 J	7800	4600	3600 U	40 U
SB18-316	13344764.18	268403.57	704.76	702.26	714.76	10-12.5 ft BGS	04/05/2012	3500 U	1400 U	690 U	1400 U	1400 U	10000 U	690 U	21000	690 U	3500 U	3500 U	1400 U	160 J	14000	550 U	2100 U	42 U
SB18-317	13344794.59	268394.54	705.35	702.85	715.35	10-12.5 ft BGS	04/05/2012	6100 U	2500 U	1200 U	2500 U	2500 U	18000 U	1200 U	20000	1200 U	6100 U	6100 U	2500 U	1200 U	46000	980 U	3700 U	40 U
SB18-317	13344794.59	268394.54	705.35	702.85	715.35	10-12.5 ft BGS	04/05/2012	6000 U	2400 U	1200 U	2400 U	2400 U	18000 U	1200 U	24000	1200 U	6000 U	6000 U	2400 U	1200 U	54000	970 U	3600 U	41 U
SB18-317	13344794.59	268394.54	702.85	700.35	715.35	12.5-15 ft BGS	04/05/2012	2300 U	930 U	460 U	930 U	930 U	7000 U	460 U	21000	460 U	2300 U	2300 U	930 U	1200	120 J	370 U	1400 U	38 U
SB18-318	13344612.97	268393.86	704.67	702.17	714.67	10-12.5 ft BGS	04/05/2012	8500 U	3400 U	1700 U	3400 U	3400 U	26000 U	2200	1600 J	44000	47000	8500 U	50000	1700 U	1700 U	12000	290000	2300
SB18-318	13344612.97	268393.86	702.17	699.67	714.67	12.5-15 ft BGS	04/05/2012	380 JB	760 U	380 U	760 U	760 U	5700 U	1500	1600	13000	37000	810 JB	22000	380 U	380 U	12000	51000	1600
SB18-61A	13344621.04	268447.008	702.967	700.767	702.967	0-2.2 ft BGS	08/23/2004	-	-	-	-	-	-	-	46000	800 J	-	5000 U	2000	-	200 J	18000	-	5700
SB18-61A	13344621.04	268447.008	700.967	700.967	702.967	2-2 ft BGS	08/31/2004	-	-	-	-	-	-	-	265000	5000 U	-	30000 U	5000 U	-	5000 U	36000	-	100 J
SB18-62A	13344524.45	268450.092	705.811	703.311	705.811	0-2.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-68	13344675.44	268364.636	705.9	703.9	714.9	9-11 ft BGS	05/19/2004	110000 U	44000 U	22000 U	44000 U	44000 U	330000 U	22000 U	660000	21000 J	10000 J	30000 J	9300 J	22000 U	460000	44000 U	140000 J	430
SB18-70	13344786.5658	268381.9617	705.1	703.1	715.1	10-12 ft BGS	05/19/2004	5600 U	2200 U	1100 U	2200 U	2200 U	17000 U	1100 U	34000	1100 U	5600 U	1500 J	2200 U	1100 U	28000	2200 U	11000 U	370 U
SB18-76	13344799.02	268408.553	704.51	702.51	714.51	10-12 ft BGS	05/24/2004	280 U	110 U	56 U	110 U	110 U	840 U	56 U	29 J	56 U	280 U	280 U	110 U	56 U	600	110 U	560 U	370 U
SB18-77	13344780.89	268359.076	705.68	704.68	714.68	9-10 ft BGS	05/24/2004	1900 U	750 U	380 U	750 U	750 U	5700 U	380 U	1100	380 U	1900 U	1900 U	750 U	380 U	13000	750 U	3800 U	360 U
SB18-78	13344534.14	268431.713	704.426	701.926	711.926	7.5-10 ft BGS	08/23/2004	-	-	-	-	-	-	-	1500	500 U	-	3000 U	500 U	-	24700	500 U	-	330 U
SB18-79	13344575.235	268421.576	705.284	702.784	712.784	7.5-10 ft BGS	08/23/2004	-	-	-	-	-	-	-	70	50 U	-	300 U	50 U	-	1850	50 U	-	330 U
SB18-80	13344611.374	268429.5	705.8	703.3	708.3	2.5-5 ft BGS	08/23/2004	-	708.3	-	-	-	-	-	80	50 U	-	300 U	50 U	-	2600 J	50 U	-	330 U
SB18-80	13344611.374	268429.5	703.3	700.8	708.3	5-7.5 ft BGS	08/23/2004	-	-	-	-	-	-	-	10800	2700	-	1000 U	1100	-	70 J	3700	-	30 J
SB18-81	13344600.626	268411.557	705.679	703.179	713.179	7.5-10 ft BGS	08/23/2004	-	-	-	-	-	-	-	2660	50 U	-	300 U	50 U	-	3090	50 U	-	330 U
SB18-82	13344622.103	268411.808	705.773	703.273	713.273	7.5-10 ft BGS	08/23/2004	-	-	-	-	-	-	-	8400	500 U	-	3000 U	500 U	-	5600	500 U	-	1300
SB18-84	13344634.613	268433.549	703.634	703.634	706.634	3-3 ft BGS	08/23/2004	-	-	-	-	-	-	-	1090	50 U	-	300 U	50 U	-	1740	50 U	-	330 U
SB18-86	13344541.562	268444.561	704.826	702.326	707.326	2.5-5 ft BGS	08/24/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	30 J	50 U	-	330 U
SB18-88	13344534.079	268447.11	704.578	702.078	707.078	2.5-5 ft BGS	08/24/2004	-	-	-	-	-	-	-	440	50 U	-	300 U	50 U	-	60	50 U	-	330 U
SB18-91	13344573.189	268400.418	704.976	702.476	714.976	10-12.5 ft BGS	08/24/2004	-	-	-	-	-	-	-	40 J	50 U	-	300 U	50 U	-	450	50 U	-	400
SB18-93	13344628.913	268442.608	704.197	703.197	704.197	0-1 ft BGS	08/24/2004	-	-	-	-	-	-	-	40000	1000	-	5000 U	1000	-	600 J	7000	-	330 U
SB18-94	13344631.703	268438.758	703.608	703.608	705.108	1.5-1.5 ft BGS	08/24/2004	-	-	-	-	-	-	-	20 J	50 U	-	300 U	50 U	-	190	50 U	-	120 J
SB18-94	13344631.703	268438.758	700.608	700.608	705.108	4.5-4.5 ft BGS	08/24/2004	-	-	-	-	-	-	-	12100	1200	-	3000 U	700	-	700	5700	-	500
SB18-95	13344627.301	268418.162	704.998	702.498	712.498	7.5-10 ft BGS	08/25/2004	-	-	-	-	-	-	-	8100	500 U	-	3000 U	500 U	-	9200	500 U	-	330 U
SB19-16	13344780.25	268427.29	701.71	699.71	705.71	4-6 ft BGS	11/14/2003	850 U	340 U	170 U	340 U	340 U	2500 U	170 U	5000	170 U	850 U	850 U	340 U	170 U	170 U	220 J	1700 U	400 U
SB19-16	13344780.25	268427.29	705.71	703.71	705.71	0-2 ft BGS	11/14/2003	320 U	130 U	63 U	130 U	130 U	950 U	63 U	63 U	63 U	320 U	320 U	130 U	63 U	37 J	130 U	630 U	360 U

Notes

Elevation is feet above mean sea level

U - Not present at or above the associated reporting limit value.

J - The associated value is an estimated concentration.

UJ - The associated value is an estimated reporting limit.

-- Constituent not analyzed

Denotes exceedance of Remediation Requirement for COC

Denotes exceedance of 20 x Toxicity Characteristic Regulatory Levels for COC

Denotes exceedance of Soil Alternative Treatment Standard for COC

TABLE 2.4
VOC AND PCB ANALYTICAL DATA TABLES - 695 - 700 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	x	y	Start	End	Ground	Depth	Sample Date	1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
			Elevation	Elevation	Elevation			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
GS-6	13344524.8	268468.29	697.2	696.7	699.7	2.5-3 ft BGS	05/24/2005	22000 U	9000 U	4500 U	9000 U	9000 U	67000 U	4500 U	4500 U	76000	44000	22000 U	49000	4500 U	4500 U	3600 U	400000	3300
PZ18-102	13344581.21	268462.96	698.6	698.6	699.4	0.8-0.8 ft BGS	08/25/2004	-	-	-	-	-	-	-	229000	5000 U	-	30000 U	2000 J	-	5000 U	11000	-	10 J
PZ18-127	13344583.31	268389.79	697.66	695.16	715.16	17.5-20 ft BGS	09/02/2004	-	-	-	-	-	-	-	20 J	50 U	-	300 U	50 U	-	230	2850	-	100 J
PZ18-127	13344583.31	268389.79	700.16	697.66	715.16	15-17.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	39200	500 U	-	3000 U	500 U	-	7000	1800	-	116000
PZ18-128	13344638.9	268384.48	700.16	697.66	715.16	15-17.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	140	40 J	-	300 U	40 J	-	70	4610	-	900
PZ18-128	13344638.9	268384.48	697.66	695.16	715.16	17.5-20 ft BGS	09/02/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	20 J	50 U	-	330 U
PZ18-97	13344616.82	268453.9	699.15	696.15	702.15	3-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	330	50 U	-	300 U	50 U	-	30 J	50 U	-	330 U
SB18-100	13344592.226	268461.564	699.162	697.162	699.162	0-2 ft BGS	08/25/2004	-	-	-	-	-	-	-	37400	200 J	-	1000 U	300	-	200	6500	-	30 J
SB18-101	13344585.737	268462.009	699.624	696.624	699.624	0-3 ft BGS	08/25/2004	-	-	-	-	-	-	-	50000	1000 U	-	5000 U	1000 U	-	1000 U	6000	-	330 U
SB18-103	13344572.873	268465.265	695.787	695.787	698.787	3-3 ft BGS	08/25/2004	-	-	-	-	-	-	-	63000	1000 U	-	5000 U	1000 U	-	1000 U	5000	-	30 J
SB18-104	13344557.614	268463.89	699.543	696.543	699.543	0-3 ft BGS	08/25/2004	-	-	-	-	-	-	-	25600	200 U	-	1000 U	200 U	-	200 U	1300	-	330 U
SB18-105	13344549.116	268461.56	700.633	697.633	700.633	0-3 ft BGS	08/25/2004	-	-	-	-	-	-	-	228000	5000 U	-	30000 U	5000 U	-	62000	5000 U	-	40 J
SB18-105	13344549.116	268461.56	697.633	694.633	700.633	3-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	288000	5000 U	-	30000 U	5000 U	-	124000	5000 J	-	140
SB18-111	13344597.294	268439.355	696.97	696.97	705.47	8.5-8.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	5700	500 U	-	3000 U	500 U	-	21400	4400	-	330 U
SB18-111	13344597.294	268439.355	697.97	697.97	705.47	7.5-7.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	1110000	30000	-	100000 U	60000	-	-	15000 J	-	17000
SB18-111	13344597.294	268439.355	700.47	697.97	705.47	5-7.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	500	8100	-	1000 U	500	-	200 U	1600	-	3000
SB18-112	13344578.426	268442.702	696.591	696.591	705.591	9-9 ft BGS	08/26/2004	-	-	-	-	-	-	-	290	50 U	-	300 U	50 U	-	1580	780	-	330 U
SB18-112	13344578.426	268442.702	700.591	698.091	705.591	5-7.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	160000	4000	-	10000 U	3000	-	-	3000	-	55000
SB18-113	13344556.765	268448.629	699.918	697.418	704.918	5-7.5 ft BGS	08/26/2004	-	-	-	-	-	-	-	250000	30000 U	-	100000 U	30000 U	-	3450000	30000 U	-	57000
SB18-113	13344556.765	268448.629	695.918	695.918	704.918	9-9 ft BGS	08/26/2004	-	-	-	-	-	-	-	520	50 U	-	60 J	50 U	-	3190 J	1430	-	15 J
SB18-114	13344556.935	268456.523	696.961	696.961	701.961	5-5 ft BGS	08/26/2004	-	-	-	-	-	-	-	-	1000 U	-	5000 U	600 J	-	1000 U	11000	-	1500
SB18-115	13344581.6	268452.517	697.055	697.055	702.055	5-5 ft BGS	08/26/2004	-	-	-	-	-	-	-	-	1000 U	-	5000 U	1000	-	40000	17000	-	180 J
SB18-116	13344597.04	268447.074	697.915	697.915	702.915	5-5 ft BGS	08/26/2004	-	-	-	-	-	-	-	55000	1000 U	-	5000 U	2000	-	-	1000 U	-	90 J
SB18-117	13344636.95	268428.81	699.0300002	699.0300002	708.23	9.2-9.2 ft BGS	08/31/2004	-	-	-	-	-	-	-	4160	50 U	-	20 J	50 U	-	10 J	4930	-	330 U
SB18-118	13344645.41	268443.23	700.85	700.85	706.85	6-6 ft BGS	08/31/2004	-	-	-	-	-	-	-	115000	5000 U	-	30000 U	5000 U	-	345000	21000	-	330 U
SB18-119	13344661.3	268418	700.18	697.68	712.68	12.5-15 ft BGS	08/31/2004	-	-	-	-	-	-	-	1210	50 U	-	300 U	50 U	-	740	210	-	330 U
SB18-119	13344661.3	268418	697.68	697.68	712.68	15-15 ft BGS	08/31/2004	-	-	-	-	-	-	-	4820	50 U	-	300 U	50 U	-	1830	2190	-	330 U
SB18-121	13344658.18	268391.61	699.98	697.48	714.98	15-17.5 ft BGS	08/31/2004	-	-	-	-	-	-	-	60	50 U	-	300 U	50 U	-	30 J	50 U	-	330 U
SB18-122	13344556.89	268402.44	697.18	694.68	714.68	17.5-20 ft BGS	09/01/2004	-	-	-	-	-	-	-	60	50 U	-	300 U	50 U	-	80	50 U	-	330 U
SB18-122	13344556.89	268402.44	699.68	697.18	714.68	15-17.5 ft BGS	09/01/2004	-	-	-	-	-	-	-	60000	10000 U	-	50000 U	10000 U	-	300000	10000 U	-	330 U
SB18-123	13344566.39	268401.39	697.23	694.73	714.73	17.5-20 ft BGS	09/01/2004	-	-	-	-	-	-	-	110	50 U	-	300 U	50 U	-	50	50 U	-	330 U
SB18-123	13344566.39	268401.39	699.73	697.23	714.73	15-17.5 ft BGS	09/01/2004	-	-	-	-	-	-	-	42400	300 U	-	1000 U	300 U	-	300	5800	-	400
SB18-125	13344573.19	268389.95	697.64	695.14	715.14	17.5-20 ft BGS	09/02/2004	-	-	-	-	-	-	-	20 J	50 U	-	300 U	50 U	-	120	50 U	-	400
SB18-125	13344573.19	268389.95	700.14	697.64	715.14	15-17.5 ft BGS	09/02/2004	-	-	-	-	-	-	-	930	50 U	-	300 U	50 U	-	830	2180	-	130 J
SB18-134	13344526.32	268465.0023	697.59	695.09	700.0885	2.5-5 ft BGS	09/09/2004	-	-	-	-	-	-	-	900	50 U	-	300 U	50 U	-	20 J	3650	-	-
SB18-134	13344526.32	268465.0023	700.09	697.59	700.0885	0-2.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	1130	50 U	-	300 U	50 U	-	50 U	1060	-	-
SB18-136	13344520.054	268426.44	701.16	698.66	713.66	12.5-15 ft BGS	09/09/2004	-	-	-	-	-	-	-	40 J	50 U	-	300 U	50 U	-	10 J	50 U	-	-
SB18-136	13344520.054	268426.44	696.16	693.66	713.66	17.5-20 ft BGS	09/09/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 U	50 U	-	-
SB18-136	13344520.054	268426.44	698.66	696.16	713.66	15-17.5 ft BGS	09/09/2004	-	-	-	-	-	-	-	100	50 U	-	300 U	50 U	-	50 U	190	-	-
SB18-137	13344631.417	268454.573	698.399	696.399	700.399	2-4 ft BGS	09/09/2004	-	-	-	-	-	-	-	93200	800 U	-	4000 U	800 U	-	3000	15200	-	-
SB18-137	13344631.417	268454.573	696.399	694.399	700.399	4-6 ft BGS	09/09/2004	-	-	-	-	-	-	-	9 J	50 U	-	300 U	50 U	-	50 U	3860	-	-
SB18-137	13344631.417	268454.573	700.399	698.399	700.399	0-2 ft BGS	09/09/2004	-	-	-	-	-	-	-	24100	300 U	-	1000 U	300 U	-	80 J	400	-	-
SB18-138	13344641.99	268445.487	700.4514	697.9514	702.9514	2.5-5 ft BGS	09/09/2004	-	-	-	-	-	-	-	1240	50 U	-	300 U	50 U	-	50 U	1760	-	-
SB18-140	13344682.496	268411.789	696.41	693.91	713.91	17.5-20 ft BGS	09/10/2004	-	-	-	-	-	-	-	50	50 U	-	300 U	50 U	-	40 J	3440	-	330 U
SB18-200	13344638	268413.86	696.27	695.27	713.27	17-18 ft BGS	06/06/2005	230 U	91 U	46 U	91 U	91 U	680 U	46 U	17 J	46 U	230 U	230 U	91 U	46 U	36 U	140 U	-	-
SB18-201	13344710.21	268410.02	696.8	695.8	713.8	17-18 ft BGS	06/06/2005	240 U	97 U	48 U	97 U	97 U	720 U	48 U	48 U	48 U	240 U	240 U	97 U	48 U	74	120	140 U	-
SB18-205	13344780.64	268402.81	697.02	696.02	715.02	18-19 ft BGS	06/06/2005	230 U	90 U	45 U	90 U	90 U	680 U	45 U	45 U	45 U	230 U	230 U	90 U	45 U	45 U	36 U	140 U	-
SB18-209	13344520.09	268468.32	697.3	696.3	699.3	2-3 ft BGS	08/11/2005	-	-	-	-	-	-	-	-	33 J	-	-	35 J	-	-	-	170	40.8 J
SB18-210	13344529.82	268467.74	697.7	696.7	699.2	1.5-2.5 ft BGS	08/11/2005	-	-	-	-	-	-	-	-	9.0 J	-	-	80 U	-	-	-	37 J	193 J
SB18-211	13344525.3	268472.18	696.7	695.7	698.2	1.5-2.5 ft BGS	08/11/2005	-	-	-	-	-	-	-	-	75	-	-	42 J	-	-	-	390	168 J
SB18-280	13344802.99	268362.60	697.46	696.96	714.46	17-17.5 ft BGS	04/02/2012	230 U	94 U	47 U	94 U	94 U	240 J	47 U	47 U	47 U	230 U	230 U	94 U	47 U	130	38 U	140 U	310 U
SB18-281	13344789.29	268338.01	699.23	696.73	714.23	15-17.5 ft BGS	04/02/2012	220 U	90 U	45 U	90 U	90 U	220 J	45 U	45 U	45 U	220 U	220 U	90 U	45 U	45 U	36 U	130 U	300 U
SB18-282	13344762.53	268339.07	699.63	697.13	714.63	15-17.5 ft BGS	04/02/201																	

TABLE 2.4
VOC AND PCB ANALYTICAL DATA TABLES - 695 - 700 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	x	y	Start	End	Ground	Depth	Sample Date	1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
			Elevation	Elevation	Elevation			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SB18-287	13344555.40	268364.72	697.87	695.37	715.37	17.5-20 ft BGS	04/04/2012	230 U	92 U	46 U	92 U	92 U	350 JB	46 U	46 U	46 U	230 U	230 U	92 U	46 U	46 U	87	140 U	320 U
SB18-287	13344555.40	268364.72	700.37	697.87	715.37	15-17.5 ft BGS	04/04/2012	240 U	96 U	48 U	96 U	96 U	390 JB	48 U	89	48 U	240 U	240 U	96 U	14 J	48 U	30 J	140 U	320 U
SB18-288	13344582.51	268374.91	697.61	695.11	715.11	17.5-20 ft BGS	04/04/2012	240 U	96 U	48 U	96 U	96 U	380 JB	48 U	45 J	48 U	240 U	240 U	96 U	48 U	14 J	1500	140 U	37
SB18-288	13344582.51	268374.91	700.11	697.61	715.11	15-17.5 ft BGS	04/04/2012	110000 U	44000 U	22000 U	44000 U	44000 U	330000 U	22000 U	940000	22000 U	110000 U	110000 U	44000 U	22000 U	22000 U	46000	6500 J	12000
SB18-289	13344606.35	268384.89	700.11	697.61	715.11	15-17.5 ft BGS	04/04/2012	230 U	93 U	46 U	93 U	93 U	360 JB	46 U	46 U	46 U	230 U	230 U	93 U	46 U	46 U	37 U	140 U	300 U
SB18-290	13344627.83	268383.43	697.48	694.98	714.98	17.5-20 ft BGS	04/03/2012	210 U	86 U	43 U	86 U	86 U	640 U	43 U	300	12 J	210 U	210 U	86 U	43 U	82	43	51 J	300 U
SB18-290	13344627.83	268383.43	699.98	697.48	714.98	15-17.5 ft BGS	04/03/2012	250 U	100 U	50 U	100 U	100 U	750 U	50 U	690	35 J	29 JB	250 U	47 J	50 U	710	1500	200	330 U
SB18-291	13344651.43	268382.22	700.03	697.53	715.03	15-17.5 ft BGS	04/02/2012	250 U	100 U	50 U	100 U	100 U	760 U	50 U	50 U	50 U	20 J	250 U	100 U	50 U	50 U	98	150 U	330 U
SB18-292	13344693.41	268380.67	700.3	697.8	715.30	15-17.5 ft BGS	04/02/2012	610 U	240 U	120 U	240 U	240 U	1800 U	120 U	4600	120 U	610 U	610 U	240 U	120 U	130	7200	45 J	320 U
SB18-292	13344693.41	268380.67	697.8	695.3	715.30	17.5-20 ft BGS	04/02/2012	230 U	92 U	46 U	92 U	92 U	320 J	46 U	46 U	46 U	230 U	230 U	92 U	46 U	46 U	37 U	140 U	300 U
SB18-293	13344710.21	268370.70	700.15	697.65	715.15	15-17.5 ft BGS	04/02/2012	250 U	100 U	50 U	100 U	100 U	280 J	50 U	24 J	50 U	250 U	250 U	100 U	50 U	50 U	40 U	150 U	330 U
SB18-294	13344732.28	268370.08	700.06	697.56	715.06	15-17.5 ft BGS	04/02/2012	250 U	98 U	49 U	98 U	98 U	740 U	49 U	23 J	49 U	250 U	250 U	98 U	49 U	82	39 U	17 J	330 U
SB18-295	13344759.64	268369.23	700.04	697.54	715.04	15-17.5 ft BGS	04/02/2012	230 U	91 U	45 U	91 U	91 U	680 U	45 U	45 U	45 U	230 U	230 U	91 U	45 U	45 U	36 U	140 U	300 U
SB18-296	13344565.37	268380.09	700.3	697.8	715.30	15-17.5 ft BGS	04/04/2012	230 U	93 U	47 U	93 U	93 U	520 J	47 U	160	13 J	230 U	230 U	93 U	47 U	16 J	330	88 J	310 U
SB18-296	13344565.37	268380.09	697.8	695.3	715.30	17.5-20 ft BGS	04/04/2012	230 U	93 U	47 U	93 U	93 U	460 J	47 U	47 U	9.1 J	230 U	230 U	93 U	47 U	47 U	37 U	9.9 J	310 U
SB18-297	13344534.20	268374.63	700.58	698.08	715.58	15-17.5 ft BGS	04/04/2012	770 U	310 U	150 U	310 U	310 U	780 J	150 U	5400	150 U	770 U	340 J	310 U	1600	46 J	120 U	460 U	310 U
SB18-297	13344534.20	268374.63	698.08	695.58	715.58	17.5-20 ft BGS	04/04/2012	240 U	95 U	48 U	95 U	95 U	330 J	48 U	48 U	48 U	240 U	240 U	95 U	48 U	48 U	780	140 U	310 U
SB18-298	13344519.80	268380.52	698.26	695.76	715.76	17.5-20 ft BGS	04/04/2012	1900 U	750 U	380 U	750 U	750 U	5600 U	380 U	24000	380 U	1900 U	1900 U	750 U	1000	380 U	1800	1100 U	310 U
SB18-298	13344519.80	268380.52	700.76	698.26	715.76	15-17.5 ft BGS	04/04/2012	240 U	97 U	48 U	97 U	97 U	720 U	48 U	270	48 U	240 U	240 U	97 U	56	48 U	39 U	140 U	310 U
SB18-299	13344534.61	268386.17	700.76	698.26	715.76	15-17.5 ft BGS	04/04/2012	46 J	93 U	47 U	93 U	93 U	700 U	47 U	47 U	47 U	230 U	230 U	93 U	47 U	11 J	37 U	140 U	310 U
SB18-300	13344515.82	268410.58	700.76	698.26	715.76	15-17.5 ft BGS	04/04/2012	230 U	90 U	45 U	90 U	90 U	680 U	45 U	45 U	45 U	230 U	230 U	90 U	45 U	45 U	36 U	140 U	300 U
SB18-301	13344506.75	268423.10	699.78	697.28	714.78	15-17.5 ft BGS	04/04/2012	240 U	94 U	47 U	94 U	94 U	710 U	47 U	47 U	47 U	240 U	240 U	94 U	47 U	47 U	38 U	140 U	310 U
SB18-302	13344529.54	268432.06	699.92	697.42	712.42	12.5-15 ft BGS	04/04/2012	230 U	91 U	45 U	91 U	91 U	300 J	45 U	45 U	45 U	230 U	97 JB	91 U	45 U	14 J	54	140 U	300 U
SB18-303	13344554.11	268419.44	699.52	697.02	714.52	15-17.5 ft BGS	04/04/2012	230 U	91 U	45 U	91 U	91 U	380 J	45 U	67	45 U	230 U	90 JB	91 U	45 U	57	42	140 U	300 U
SB18-304	13344573.58	268412.69	697.25	694.75	714.75	17.5-20 ft BGS	04/04/2012	40 JB	160 U	80 U	160 U	160 U	2800	80 U	900	80 U	400 U	190 JB	160 U	80 U	2900	1400	240 U	91
SB18-304	13344573.58	268412.69	699.75	697.25	714.75	15-17.5 ft BGS	04/04/2012	930000 U	370000 U	190000 U	370000 U	370000 U	2800000 U	190000 U	980000	190000 U	930000 U	400000 JB	370000 U	190000 U	7400000	150000 U	560000 U	310000
SB18-305	13344586.72	268411.24	697.07	694.57	714.57	17.5-20 ft BGS	04/04/2012	230 U	91 U	45 U	91 U	91 U	550 J	45 U	210	45 U	230 U	89 JB	91 U	45 U	840	36 U	140 U	90
SB18-305	13344586.72	268411.24	699.57	697.07	714.57	15-17.5 ft BGS	04/04/2012	40000 JB	57000 U	29000 U	57000 U	57000 U	430000 U	29000 U	1200000	29000 U	140000 U	140000 U	57000 U	29000 U	17000 J	20000 J	6200 J	130000
SB18-306	13344615.45	268416.60	697.85	695.35	712.85	15-17.5 ft BGS	04/05/2012	230 U	92 U	46 U	92 U	92 U	1700	46 U	46 U	8.8 J	9.1 J	230 U	92 U	46 U	11 J	37 U	28 J	38 U
SB18-306	13344615.45	268416.60	700.35	697.85	712.85	12.5-15 ft BGS	04/05/2012	3100 JB	1900 U	940 U	1900 U	1900 U	14000 U	940 U	50000	20000	17000	4700 U	6600	940 U	940 U	46000	100000	2300
SB18-307	13344616.36	268403.22	697.41	694.91	714.91	17.5-20 ft BGS	04/05/2012	1300 U	510 U	250 U	510 U	510 U	3800 U	280	16000	250 U	1300 U	550 JB	510 U	130 J	1500	2900	760 U	42 U
SB18-307	13344616.36	268403.22	699.91	697.41	714.91	15-17.5 ft BGS	04/05/2012	640 JB	1800 U	880 U	1800 U	1800 U	13000 U	500 J	63000	4000	11000	1800 JB	990 J	880 U	880 U	960	2900	1200
SB18-308	13344640.26	268403.80	699.69	697.19	714.69	15-17.5 ft BGS	04/05/2012	970 U	390 U	190 U	390 U	390 U	2900 U	86 J	16000	190 U	970 U	970 U	390 U	190 U	2200	5500	580 U	40 U
SB18-309	13344687.22	268431.58	700.55	699.55	707.55	7-8 ft BGS	04/05/2012	9800 U	3900 U	2000 U	3900 U	3900 U	29000 U	2000 U	110000	2000 U	9800 U	9800 U	3900 U	2000 U	15000	4000	5900 U	68
SB18-311	13344732.27	268427.67	699.99	697.99	707.49	7.5-9.5 ft BGS	04/05/2012	3500 U*	1400 U*	690 U*	1400 U*	1400 U*	10000 U*	690 U*	24000 *	690 U*	3500 U*	3500 U*	1400 U*	690 U*	11000 *	2300 *	2100 U*	280
SB18-312	13344747.36	268430.08	700.07	699.07	706.57	6.5-7.5 ft BGS	04/05/2012	7000 U	2800 U	1400 U	2800 U	2800 U	21000 U	1400 U	13000	1400 U	7000 U	7000 U	2800 U	1400 U	54000	660 J	4200 U	40 U
SB18-313	13344674.99	268401.57	699.75	697.25	714.75	15-17.5 ft BGS	04/05/2012	400 JB	530 U	270 U	46 JB	110 JB	1300 J	270 U	46000	220 JB	1300 U	1300 U	530 U	160 J	20000	4600	1300 B	110
SB18-313	13344674.99	268401.57	699.75	697.25	714.75	15-17.5 ft BGS	04/05/2012	170 JB	560 U	280 U	560 U	67 JB	1200 J	280 U	46000	79 JB	1400 U	1400 U	560 U	180 J	24000	4500	420 JB	71
SB18-314	13344697.31	268388.08	697.74	695.24	715.24	17.5-20 ft BGS	04/05/2012	13 JB	94 U	47 U	94 U	94 U	710 U	47 U	170	47 U	240 U	240 U	94 U	47 U	47 U	38 U	140 U	39 U
SB18-314	13344697.31	268388.08	700.24	697.74	715.24	15-17.5 ft BGS	04/05/2012	19 JB	97 U	49 U	9.3 JB	12 JB	730 U	49 U	650	8.9 JB	240 U	240 U	28 J	49 U	49 U	70	32 JB	40 U
SB18-315	13344736.35	268401.68	699.65	697.15	714.65	15-17.5 ft BGS	04/05/2012	240 U	97 U	48 U	97 U	97 U	720 U	48 U	81	48 U	240 U	240 U	97 U	48 U	48 U	39 U	140 U	40 U
SB18-316	13344764.18	268403.57	699.76	697.26	714.76	15-17.5 ft BGS	04/05/2012	3100 U	1300 U	630 U	1300 U	1300 U	9400 U	630 U	22000	630 U	3100 U	3100 U	1300 U	630 U	630 U	500 U	1900 U	40 U
SB18-317	13344794.59	268394.54	700.35	697.85	715.35	15-17.5 ft BGS	04/05/2012	1900 U	780 U	390 U	780 U	780 U	5800 U	390 U	2500	390 U	1900 U	1900 U	780 U	390 U	22000	310 U	1200 U	40 U
SB18-317	13344794.59	268394.54	697.85	695.35	715.35	17.5-20 ft BGS	04/05/2012	230 U	91 U	45 U	91 U	91 U	680 U	45 U	45 U	45 U	230 U	230 U	91 U	45 U	39 J	36 U	140 U	37 U
SB18-318	13344612.97	268393.86	699.67	697.17	714.67	15-17.5 ft BGS	04/05/2012	4700 U	1900 U	940 U	1900 U	1900 U	14000 U	330 J	9600	210 J	730 J	4700 U	1900 U	940 U	87000	960	1000 J	39 U
SB18-319	13344522.62	2684																						

TABLE 2.4
VOC AND PCB ANALYTICAL DATA TABLES - 695 - 700 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

			Start	End	Ground			1,2,4- Trichlorobenzene	1,2- Dichlorobenzene	1,2- Dichloroethane	1,3- Dichlorobenzene	1,4- Dichlorobenzene	Acetone	Benzene	cis-1,2- Dichloroethene	Ethylbenzene	Isopropyl benzene	Methylene chloride	Toluene	trans-1,2- Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes (total)	Total PCBs
Location Name	x	y	Elevation	Elevation	Elevation	Depth	Sample Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

Notes

Elevation is feet above mean sea level

U - Not present at or above the associated reporting limit value.

J - The associated value is an estimated concentration.

UJ - The associated value is an estimated reporting limit.

-- Constituent not analyzed

Denotes exceedance of Remediation Requirement for COC

Denotes exceedance of 20 x Toxicity Characteristic Regulatory Levels for COC

Denotes exceedance of Soil Alternative Treatment Standard for COC

TABLE 2.5
VOC AND PCB ANALYTICAL DATA TABLES - 690 - 695 AMSL
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHGIAN

Location Name	x	y	Start Elevation	End Elevation	Ground Elevation	Depth	Sample Date	1,2,4- Trichlorobenzene ug/kg	1,2- Dichlorobenzene ug/kg	1,2-Dichloroethane ug/kg	1,3- Dichlorobenzene ug/kg	1,4- Dichlorobenzene ug/kg	Acetone ug/kg	Benzene ug/kg	cis-1,2- Dichloroethene ug/kg	Ethylbenzene ug/kg	Isopropyl benzene ug/kg	Methylene chloride ug/kg	Toluene ug/kg	trans-1,2- Dichloroethene ug/kg	Trichloroethene ug/kg	Vinyl chloride ug/kg	Xylenes (total) ug/kg	Total PCBs ug/kg
PZ18-102	13344581.21	268462.96	693.4	693.4	699.4	6-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	30 J	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-100	13344592.226	268461.564	693.162	693.162	699.162	6-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	80	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-101	13344585.737	268462.009	696.624	693.624	699.624	3-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	80	50 U	-	300 U	50 U	-	50 U	50	-	330 U
SB18-103	13344572.873	268465.265	692.787	692.787	698.787	6-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	190	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-104	13344557.614	268463.89	694.543	692.543	699.543	5-7 ft BGS	08/31/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-104	13344557.614	268463.89	696.543	693.543	699.543	3-6 ft BGS	08/25/2004	-	-	-	-	-	-	-	229000	5000 U	-	30000 U	5000 U	-	5000 U	6000	-	330 U
SB18-105	13344549.116	268461.56	695.633	693.633	700.633	5-7 ft BGS	08/31/2004	-	-	-	-	-	-	-	120	50 U	-	300 U	50 U	-	50 U	710	-	330 U
SB18-121	13344658.18	268391.61	694.98	694.98	714.98	20-20 ft BGS	08/31/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-124	13344595.48	268397.84	694.34	694.34	714.34	20-20 ft BGS	09/01/2004	-	-	-	-	-	-	-	50 U	50 U	-	300 U	50 U	-	50 U	50 U	-	330 U
SB18-129	13344543.94	268418.5	693.79	693.79	713.79	20-20 ft BGS	09/02/2004	-	-	-	-	-	-	-	45000	5000 U	-	30000 U	4000 J	-	349000	5000 U	-	330 U
SB18-129	13344543.94	268418.5	696.79	694.79	713.79	17-19 ft BGS	09/02/2004	-	-	-	-	-	-	-	8760	160	-	300 U	400	-	-	540	-	330 U
SB18-280	13344802.99	268362.60	696.96	694.46	714.46	17.5-20 ft BGS	04/02/2012	230 U	92 U	46 U	92 U	92 U	690 U	46 U	46 U	46 U	230 U	230 U	92 U	46 U	46 U	37 U	140 U	300 U
SB18-287	13344555.40	268364.72	695.37	692.87	715.37	20-22.5 ft BGS	04/04/2012	230 U	93 U	47 U	93 U	93 U	440 JB	47 U	47 U	47 U	230 U	230 U	93 U	47 U	47 U	37 U	140 U	310 U
SB18-297	13344534.20	268374.63	693.08	690.58	715.58	22.5-25 ft BGS	04/04/2012	230 U	93 U	47 U	93 U	93 U	320 J	47 U	47 U	47 U	230 U	230 U	93 U	47 U	47 U	37 U	140 U	310 U
SB18-297	13344534.20	268374.63	695.58	693.08	715.58	20-22.5 ft BGS	04/04/2012	410 U	160 U	82 U	160 U	160 U	500 J	82 U	82 U	82 U	410 U	160 J	160 U	82 U	82 U	2800	250 U	310 U
SB18-298	13344519.80	268380.52	693.26	690.76	715.76	22.5-25 ft BGS	04/04/2012	240 U	96 U	48 U	96 U	96 U	720 U	48 U	18 J	48 U	240 U	240 U	96 U	48 U	48 U	38 U	140 U	320 U
SB18-298	13344519.80	268380.52	695.76	693.26	715.76	20-22.5 ft BGS	04/04/2012	1900 U	770 U	380 U	770 U	770 U	5800 U	380 U	16000	380 U	1900 U	1900 U	770 U	550	380 U	4700	1200 U	320 U
SB18-304	13344573.58	268412.69	692.25	689.75	714.75	22.5-25 ft BGS	04/04/2012	240 U	95 U	48 U	95 U	95 U	690 J	48 U	41 J	12 J	7.9 J	96 JB	95 U	48 U	350	38 U	35 J	67
SB18-304	13344573.58	268412.69	694.75	692.25	714.75	20-22.5 ft BGS	04/04/2012	51 JB	92 U	46 U	92 U	92 U	1700	46 U	310	46 U	230 U	91 JB	92 U	46 U	2000	37 U	13 J	95
SB18-306	13344615.45	268416.60	695.35	692.85	712.85	17.5-20 ft BGS	04/05/2012	230 U	94 U	47 U	94 U	94 U	450 J	47 U	47 U	8.7 J	230 U	230 U	94 U	47 U	47 U	37 U	13 J	39 U
SB18-307	13344616.36	268403.22	692.41	689.91	714.91	22.5-25 ft BGS	04/05/2012	240 U	94 U	47 U	94 U	94 U	710 U	47 U	47 U	10 J	240 U	100 JB	94 U	47 U	47 U	38 U	32 J	39 U
SB18-307	13344616.36	268403.22	694.91	692.41	714.91	20-22.5 ft BGS	04/05/2012	260 U	100 U	52 U	100 U	100 U	780 U	52 U	52 U	11 J	14 J	120 JB	100 U	52 U	52 U	42 U	16 J	28
SB18-308	13344640.26	268403.80	697.19	694.69	714.69	17.5-20 ft BGS	04/05/2012	230 U	92 U	46 U	92 U	92 U	690 U	46 U	46 U	46 U	230 U	230 U	92 U	46 U	46 U	37 U	140 U	38 U
SB18-313	13344674.99	268401.57	697.25	694.75	714.75	17.5-20 ft BGS	04/05/2012	9.3 JB	92 U	46 U	92 U	92 U	380 J	46 U	46 U	46 U	230 U	230 U	92 U	46 U	46 U	37 U	140 U	110
SB18-316	13344764.18	268403.57	697.26	694.76	714.76	17.5-20 ft BGS	04/05/2012	220 U	90 U	45 U	90 U	90 U	670 U	45 U	36 J	45 U	220 U	220 U	90 U	45 U	24 J	36 U	130 U	37 U
SB18-318	13344612.97	268393.86	697.17	694.67	714.67	17.5-20 ft BGS	04/05/2012	230 U	91 U	46 U	91 U	91 U	680 U	46 U	46 U	46 U	230 U	110 JB	91 U	46 U	46 U	36 U	9.9 J	38 U
SB18-75	13344565.26	268466.814	694.72	693.72	698.72	4-5 ft BGS	05/19/2004	240 U	96 U	48 U	96 U	96 U	720 U	48 U	710	48 U	240 U	54 J	96 U	48 U	48 U	1400	480 U	400 U

Notes

Elevation is feet above mean sea level

U - Not present at or above the associated reporting limit value.

J - The associated value is an estimated concentration.

UJ - The associated value is an estimated reporting limit.

-- Constituent not analyzed

Denotes exceedance of Remediation Requirement for COC

Denotes exceedance of 20 x Toxicity Characteristic Regulatory Levels for COC

Denotes exceedance of Soil Alternative Treatment Standard for COC

TABLE 2.6
DNAPL DATA
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Sample Location:		MW18-01	MW18-02	MW18-02
PAOC		18	18	18
NAPL Type		DNAPL	DNAPL	DNAPL
Sample ID:		L-17303-082504-BW-001	O-17303-052804-DR-358	L-17303-082504-BW-002
Sample Date:		8/25/2004	5/28/2004	8/25/2004
Parameters:	Units			
VOCs				
1,1,1-Trichloroethane	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,1,2,2-Tetrachloroethane	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,1,2-Trichloroethane	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,1-Dichloroethane	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,1-Dichloroethene	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,2,4-Trichlorobenzene	mg/kg	14000 J	8300 J	33000 J
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	ND(22000)	ND(26000)	ND(44000)
1,2-Dibromoethane (Ethylene Dibromide)	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,2-Dichlorobenzene	mg/kg	ND(22000)	ND(26000)	ND(44000)
1,2-Dichloroethane	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,2-Dichloropropane	mg/kg	ND(11000)	ND(14000)	ND(23000)
1,3-Dichlorobenzene	mg/kg	ND(22000)	ND(26000)	ND(44000)
1,4-Dichlorobenzene	mg/kg	ND(22000)	ND(26000)	ND(44000)
2-Butanone (Methyl Ethyl Ketone)	mg/kg	ND(45000)	ND(55000)	ND(91000)
2-Hexanone	mg/kg	ND(45000)	ND(55000)	ND(91000)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	mg/kg	ND(45000)	ND(55000)	ND(91000)
Acetone	mg/kg	ND(45000)	20000 J	ND(91000)
Benzene	mg/kg	ND(11000)	ND(14000)	ND(23000)
Bromodichloromethane	mg/kg	ND(11000)	ND(14000)	ND(23000)
Bromoform	mg/kg	ND(11000)	ND(14000)	ND(23000)
Bromomethane (Methyl Bromide)	mg/kg	ND(22000)	ND(26000)	ND(44000)
Carbon disulfide	mg/kg	ND(11000)	ND(14000)	ND(23000)
Carbon tetrachloride	mg/kg	ND(11000)	ND(14000)	ND(23000)
Chlorobenzene	mg/kg	ND(11000)	ND(14000)	ND(23000)
Chloroethane	mg/kg	ND(22000)	ND(26000)	ND(44000)
Chloroform (Trichloromethane)	mg/kg	ND(11000)	ND(14000)	ND(23000)
Chloromethane (Methyl Chloride)	mg/kg	ND(22000)	ND(26000)	8300 J
cis-1,2-Dichloroethene	mg/kg	14000	3700 J	ND(11000)
cis-1,3-Dichloropropene	mg/kg	ND(11000)	ND(14000)	ND(23000)
Cyclohexane	mg/kg	ND(45000)	ND(55000)	ND(91000)
Dibromochloromethane	mg/kg	ND(11000)	ND(14000)	ND(23000)
Dichlorodifluoromethane (CFC-12)	mg/kg	ND(22000)	ND(26000)	ND(44000)
Ethylbenzene	mg/kg	ND(11000)	ND(14000)	ND(23000)
Isopropylbenzene	mg/kg	ND(22000)	ND(26000)	ND(44000)
Methyl acetate	mg/kg	ND(22000)	ND(26000)	ND(44000)
Methyl cyclohexane	mg/kg	ND(11000)	ND(14000)	ND(23000)
Methyl Tert Butyl Ether	mg/kg	ND(45000)	ND(55000)	ND(91000)
Methylene chloride	mg/kg	ND(11000)	ND(14000)	9700 J B
Styrene	mg/kg	ND(11000)	ND(14000)	ND(23000)
Tetrachloroethene	mg/kg	ND(11000)	ND(14000)	ND(23000)
Toluene	mg/kg	ND(11000)	ND(14000)	ND(23000)
trans-1,2-Dichloroethene	mg/kg	ND(5600)	ND(6800)	ND(11000)
trans-1,3-Dichloropropene	mg/kg	ND(11000)	ND(14000)	ND(23000)
Trichloroethene	mg/kg	310000	390000	410000
Trichlorofluoromethane (CFC-11)	mg/kg	ND(22000)	ND(26000)	ND(44000)
Trifluorotrichloroethane (Freon 113)	mg/kg	ND(45000)	ND(55000)	ND(91000)
Vinyl chloride	mg/kg	ND(22000)	ND(26000)	ND(44000)
Xylene (total)	mg/kg	33000	ND(14000)	43000
TCLP VOCs				
1,1-Dichloroethene	mg/L	ND(12000)	--	ND(25000)
1,2-Dichloroethane	mg/L	ND(12000)	--	ND(25000)
2-Butanone (Methyl Ethyl Ketone)	mg/L	ND(25000)	--	ND(50000)
Benzene	mg/L	ND(12000)	--	ND(25000)
Carbon tetrachloride	mg/L	ND(12000)	--	ND(25000)
Chlorobenzene	mg/L	ND(12000)	--	ND(25000)
Chloroform (Trichloromethane)	mg/L	ND(12000)	--	ND(25000)
Tetrachloroethene	mg/L	ND(12000)	--	ND(25000)
Trichloroethene	mg/L	380000	--	460000
Vinyl chloride	mg/L	ND(12000)	--	ND(25000)

TABLE 2.6
DNAPL DATA
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Sample Location:	MW18-01	MW18-02	MW18-02
PAOC	18	18	18
NAPL Type	DNAPL	DNAPL	DNAPL
Sample ID:	L-17303-082504-BW-001	O-17303-052804-DR-358	L-17303-082504-BW-002
Sample Date:	8/25/2004	5/28/2004	8/25/2004
Parameters:	Units		
SVOCs			
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) e	mg/kg	--	--
2,4,5-Trichlorophenol	mg/kg	ND(100)	ND(200)
2,4,6-Trichlorophenol	mg/kg	ND(100)	ND(200)
2,4-Dichlorophenol	mg/kg	ND(100)	ND(200)
2,4-Dimethylphenol	mg/kg	ND(100)	ND(200)
2,4-Dinitrophenol	mg/kg	ND(480)	ND(960)
2,4-Dinitrotoluene	mg/kg	ND(100)	ND(200)
2,6-Dinitrotoluene	mg/kg	ND(100)	ND(200)
2-Chloronaphthalene	mg/kg	ND(100)	ND(200)
2-Chlorophenol	mg/kg	ND(100)	ND(200)
2-Methylnaphthalene	mg/kg	33 J	50 J
2-Methylphenol	mg/kg	ND(100)	ND(200)
2-Nitroaniline	mg/kg	ND(480)	ND(960)
2-Nitrophenol	mg/kg	ND(100)	ND(200)
3,3'-Dichlorobenzidine	mg/kg	ND(480)	ND(960)
3-Nitroaniline	mg/kg	ND(480)	ND(960)
4,6-Dinitro-2-methylphenol	mg/kg	ND(480)	ND(960)
4-Bromophenyl phenyl ether	mg/kg	ND(100)	ND(200)
4-Chloro-3-methylphenol	mg/kg	ND(100)	ND(200)
4-Chloroaniline	mg/kg	ND(100)	ND(200)
4-Chlorophenyl phenyl ether	mg/kg	ND(100)	ND(200)
4-Methylphenol	mg/kg	ND(100)	ND(200)
4-Nitroaniline	mg/kg	ND(480)	ND(960)
4-Nitrophenol	mg/kg	ND(480)	ND(960)
Acenaphthene	mg/kg	ND(100)	ND(200)
Acenaphthylene	mg/kg	ND(100)	ND(200)
Acetophenone	mg/kg	ND(100)	ND(200)
Anthracene	mg/kg	ND(100)	ND(200)
Atrazine	mg/kg	ND(100)	ND(200)
Benzaldehyde	mg/kg	ND(100)	ND(200)
Benzo(a)anthracene	mg/kg	ND(100)	ND(200)
Benzo(a)pyrene	mg/kg	ND(100)	ND(200)
Benzo(b)fluoranthene	mg/kg	ND(100)	ND(200)
Benzo(g,h,i)perylene	mg/kg	ND(100)	ND(200)
Benzo(k)fluoranthene	mg/kg	ND(100)	ND(200)
Biphenyl	mg/kg	ND(100)	ND(200)
bis(2-Chloroethoxy)methane	mg/kg	ND(100)	ND(200)
bis(2-Chloroethyl)ether	mg/kg	ND(100)	ND(200)
bis(2-Ethylhexyl)phthalate	mg/kg	ND(100)	ND(200)
Butyl benzylphthalate	mg/kg	ND(100)	ND(200)
Caprolactam	mg/kg	ND(100)	ND(200)
Carbazole	mg/kg	ND(100)	ND(200)
Chrysene	mg/kg	13 J	ND(200)
Dibenz(a,h)anthracene	mg/kg	ND(100)	ND(200)
Dibenzofuran	mg/kg	ND(100)	ND(200)
Diethyl phthalate	mg/kg	ND(100)	ND(200)
Dimethyl phthalate	mg/kg	ND(100)	ND(200)
Di-n-butylphthalate	mg/kg	58 J	82 J
Di-n-octyl phthalate	mg/kg	ND(100)	ND(200)
Fluoranthene	mg/kg	15 J	ND(200)
Fluorene	mg/kg	11 J	ND(200)
Hexachlorobenzene	mg/kg	ND(100)	ND(200)
Hexachlorobutadiene	mg/kg	ND(100)	ND(200)
Hexachlorocyclopentadiene	mg/kg	ND(480)	ND(960)
Hexachloroethane	mg/kg	ND(100)	ND(200)
Indeno(1,2,3-cd)pyrene	mg/kg	ND(100)	ND(200)
Isophorone	mg/kg	ND(100)	ND(200)
Naphthalene	mg/kg	65 J	52 J
Nitrobenzene	mg/kg	ND(100)	ND(200)
N-Nitrosodi-n-propylamine	mg/kg	ND(100)	ND(200)
N-Nitrosodiphenylamine	mg/kg	ND(100)	ND(200)
Pentachlorophenol	mg/kg	ND(100)	ND(200)
Phenanthrene	mg/kg	35 J	28 J
Phenol	mg/kg	ND(100)	ND(200)
Pyrene	mg/kg	12 J	ND(200)

TABLE 2.6
DNAPL DATA
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Sample Location:		MW18-01	MW18-02	MW18-02
PAOC		18	18	18
NAPL Type		DNAPL	DNAPL	DNAPL
Sample ID:		L-17303-082504-BW-001	O-17303-052804-DR-358	L-17303-082504-BW-002
Sample Date:		8/25/2004	5/28/2004	8/25/2004
Parameters:	Units			
TCLP SVOCs				
1,4-Dichlorobenzene	mg/L	71 J	--	280
2,4,5-Trichlorophenol	mg/L	ND(80)	--	ND(100)
2,4,6-Trichlorophenol	mg/L	ND(80)	--	ND(100)
2,4-Dinitrotoluene	mg/L	ND(80)	--	ND(100)
2-Methylphenol	mg/L	ND(80)	--	ND(100)
3&4-Methylphenol	mg/L	ND(160)	--	ND(200)
Hexachlorobenzene	mg/L	ND(80)	--	ND(100)
Hexachlorobutadiene	mg/L	ND(80)	--	ND(100)
Hexachloroethane	mg/L	ND(80)	--	ND(100)
Nitrobenzene	mg/L	ND(80)	--	ND(100)
Pentachlorophenol	mg/L	ND(160)	--	ND(200)
Pyridine	mg/L	170	--	590
Metals				
Aluminum	mg/kg	232	255	240
Antimony	mg/kg	0.44 B	0.38 J	0.26 B
Arsenic	mg/kg	ND(1.0)	0.42 J	ND(1.0)
Barium	mg/kg	1.8 B	1.6 J	1.7 B
Beryllium	mg/kg	ND(0.50)	ND(0.50)	ND(0.50)
Cadmium	mg/kg	1.4	0.078 J	0.041 B
Calcium	mg/kg	210 B	ND(500)	80.8 B
Chromium Total	mg/kg	55.6	40.3 J	40.0
Cobalt	mg/kg	0.48 B	0.99 J	0.91 B
Copper	mg/kg	1.3 B J	0.69 J	0.69 B J
Cyanide (total)	mg/kg	--	0.31 J	--
Iron	mg/kg	1200	661	686
Lead	mg/kg	15.5	2.8	2.3
Magnesium	mg/kg	32.2 B J	ND(500)	6.5 B J
Manganese	mg/kg	4.0	5.0	3.8
Mercury	mg/kg	ND(0.10)	ND(0.10)	ND(0.10)
Nickel	mg/kg	0.87 B	1.2 J	1.3 B
Potassium	mg/kg	24.6 B J	ND(500)	24.2 B J
Selenium	mg/kg	0.50	0.43 J	0.30 B
Silver	mg/kg	ND(1.0)	ND(1.0)	ND(1.0)
Sodium	mg/kg	86.6 B	ND(500)	ND(500)
Thallium	mg/kg	0.50 B	ND(1.0)	0.37 B
Vanadium	mg/kg	0.27 B	0.54 J	0.41 B
Zinc	mg/kg	5.9	8.5	6.0
TCLP Metals				
Arsenic	mg/L	ND(0.50)	--	ND(0.50)
Barium	mg/L	ND(10.0)	--	ND(10.0)
Cadmium	mg/L	0.87	--	ND(0.10)
Chromium Total	mg/L	34.4	--	45.5
Lead	mg/L	9.6	--	2.8
Mercury	mg/L	ND(0.033)	--	ND(0.033)
Selenium	mg/L	ND(0.50)	--	ND(0.50)
Silver	mg/L	ND(0.50)	--	ND(0.50)
PCBs				
Aroclor-1016 (PCB-1016)	mg/kg	ND(10)	ND(5000)	ND(100)
Aroclor-1221 (PCB-1221)	mg/kg	ND(10)	ND(5000)	ND(100)
Aroclor-1232 (PCB-1232)	mg/kg	ND(10)	ND(5000)	ND(100)
Aroclor-1242 (PCB-1242)	mg/kg	ND(10)	ND(5000)	ND(100)
Aroclor-1248 (PCB-1248)	mg/kg	ND(10)	ND(5000)	ND(100)
Aroclor-1254 (PCB-1254)	mg/kg	ND(10)	ND(5000)	ND(100)
Aroclor-1260 (PCB-1260)	mg/kg	87	15000	1000
General Chemistry				
Heating value	Btu/lb	--	--	--
Ignitability	deg f	>180	--	>180
pH Corrosivity	S.U.	6.0	--	6.0
Reactive Cyanide	mg/kg	ND(200)	--	ND(200)
Reactive Sulfide	mg/kg	ND(500)	--	ND(500)
Specific gravity	mg/L	--	--	--
Viscosity	cp	--	--	--
Notes:				
B Method blank contamination				
J The associated value is an estimated quantity				
ND () Not detected above the value in parenthesis				
TCLP - Toxicity characteristic Leachate Procedure				
VOCs - Volatile Organic Compounds				
SVOCs - Semi Volatile Organic Compounds				
PCBs - Polychlorinated Biphenyls				

TABLE 3.1
ADDITIONAL PCB CHARACTERIZATION SAMPLING PLAN
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	Sample Elevation	Sample Reason	Hold Sample Analysis
SB18-320	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-321	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-322	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-323	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-324	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-325	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	~696	1 foot into clay - floor sample	No
SB18-326	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	~696	1 foot into clay - floor sample	No
SB18-327	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-328	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-329	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	~696	1 foot into clay - floor sample	No
SB18-330	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No

TABLE 3.1
ADDITIONAL PCB CHARACTERIZATION SAMPLING PLAN
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	Sample Elevation	Sample Reason	Hold Sample Analysis
SB18-331	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-332	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-333	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-334	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	~696	1 foot into clay - floor sample	No
SB18-335	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	~696	1 foot into clay - floor sample	No
SB18-336	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-337	702	Step out Ceiling Sample (if necessary)	Yes - pending 701 elevation sample
	701	Step out Ceiling Sample (if necessary)	Yes - pending 700 elevation sample
	700	Ceiling of 695-700 interval	No
	~696	1 foot into clay - floor sample	No
SB18-338	707	Step out Ceiling Sample (if necessary)	Yes - pending 706 elevation sample
	706	Step out Ceiling Sample (if necessary)	Yes - pending 705 elevation sample
	705	Ceiling of 700-705 interval	No
	702.5	Sidewall at 700-705 interval ²	No
	~696	1 foot into clay - floor sample	No
SB18-339	707	Step out Ceiling Sample (if necessary)	Yes - pending 706 elevation sample
	706	Step out Ceiling Sample (if necessary)	Yes - pending 705 elevation sample
	705	Ceiling of 700-705 interval	No
	702.5	Sidewall at 700-705 interval ²	No
	698	Sidewall at 695-700 interval ¹	No
SB18-340	~696	1 foot into clay - floor sample	No
	707	Step out Ceiling Sample (if necessary)	Yes - pending 706 elevation sample
	706	Step out Ceiling Sample (if necessary)	Yes - pending 705 elevation sample
	705	Ceiling of 700-705 interval	No
	702.5	Sidewall at 700-705 interval ²	No
	700	Ceiling of 695-700 interval	No
	698	Sidewall at 695-700 interval ¹	Yes - pending SB18-339 results
	~696	1 foot into clay - floor sample	Yes - pending SB18-339 results

TABLE 3.1
ADDITIONAL PCB CHARACTERIZATION SAMPLING PLAN
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	Sample Elevation	Sample Reason	Hold Sample Analysis
SB18-341	710	Ceiling of 705-710 interval	No
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 708.5 result
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 results
	705	Ceiling of 700-705 interval & floor of 705-710 interval	No
	702.5	Sidewall at 700-705 interval	No
	700	Floor of 700-705 interval	No
	698	Sidewall at 695-700 interval ¹	Yes - pending SB18-343 results
	~696	1 foot into clay - floor sample	Yes - pending SB18-343 results
SB18-342	710	Ceiling of 705-710 interval	Yes - pending SB18-343 708.5 result
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 708.5 result
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 results
	705	Ceiling of 700-705 interval & floor of 705-710 interval	No
	702.5	Sidewall at 700-705 interval	No
	700	Floor of 700-705 interval	No
SB18-343	710	Delineating ND @ 51 ppm at SB18-288 if determined valid value	Yes - pending SB18-343 707.5-710 result
	707.5-710	Check Non-detect at 51 ppm detection @ SB18-288	No
	707.5	Delineating ND @ 51 ppm at SB18-288 if determined valid value	Yes - pending SB18-343 707.5-710 result
	705	Floor of 705 -710 interval if needed	Yes - pending SB18-343 707.5 result
	700	Floor of 700-705 interval	No
	698	Sidewall at 695-700 interval ¹	Yes - pending SB18-345 results
SB18-344	~696	1 foot into clay - floor sample	Yes - pending SB18-345 results
	710	Ceiling of 705-710 interval	No
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 708.5 result
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 results
	705	Ceiling of 700-705 interval & floor of 705-710 interval	No
	702.5	Sidewall at 700-705 interval	No
	700	Floor of 700-705 interval	No
	698	Sidewall at 695-700 interval ¹	Yes - pending SB18-343 results
SB18-345	~696	1 foot into clay - floor sample	Yes - pending SB18-343 results
	710	Ceiling of 705-710 interval	No
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 708.5 result
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending SB18-343 results
	705	Ceiling of 700-705 interval & floor of 705-710 interval	No
	700	Floor of 700-705 interval	No
SB18-346	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
	710	Ceiling of 705-710 interval	Yes - pending 705-710 interval results nearby
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending 705-710 interval results nearby
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending 705-710 interval results nearby
	705	Ceiling of 700-705 interval	No
SB18-347	~696	1 foot into clay - floor sample	No
	710	Ceiling of 705-710 interval	Yes - pending 705-710 interval results nearby
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending 705-710 interval results nearby
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending 705-710 interval results nearby
	705	Ceiling of 700-705 interval & floor of 705-710 interval	No
	702.5	Sidewall at 700-705 interval	No
	700	Floor of 700-705 interval	No
	698	Sidewall at 695-700 interval ¹	Yes - pending 695-700 interval results nearby
SB18-348	~696	1 foot into clay - floor sample	Yes - pending 695-700 interval results nearby
	710	Ceiling of 705-710 interval	Yes - pending 705-710 interval results nearby
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending 705-710 interval results nearby
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending 705-710 interval results nearby
	705	Ceiling of 700-705 interval & floor of 705-710 interval	No
	702.5	Sidewall at 700-705 interval	No
	700	Floor of 700-705 interval	No
	698	Sidewall at 695-700 interval ¹	Yes - pending 695-700 interval results nearby
SB18-348	~696	1 foot into clay - floor sample	Yes - pending 695-700 interval results nearby

TABLE 3.1
ADDITIONAL PCB CHARACTERIZATION SAMPLING PLAN
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	Sample Elevation	Sample Reason	Hold Sample Analysis
SB18-349	709	Step out Ceiling Sample (if necessary)	Yes - pending 708 elevation sample
	708	Ceiling of 705-707.5 interval	No
	706.5	Side wall of bottom half of 705-710 interval	No
	700	Floor of 700-705 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-350	709	Step out Ceiling Sample (if necessary)	Yes - pending 708 elevation sample
	708	Ceiling of 705-707.5 interval	No
	706.5	Side wall of bottom half of 705-710 interval	No
	~696	1 foot into clay - floor sample	No
SB18-351	707	Step out Ceiling Sample (if necessary)	Yes - pending 706 elevation sample
	706	Step out Ceiling Sample (if necessary)	Yes - pending 705 elevation sample
	705	Ceiling of 700-705 interval	No
	702.5	Sidewall at 700-705 interval ²	No
	~696	1 foot into clay - floor sample	No
SB18-352	709	Step out Ceiling Sample (if necessary)	Yes - pending 708 elevation sample
	708	Ceiling of 705-707.5 interval	No
	706.5	Side wall of bottom half of 705-710 interval	No
	705	Ceiling of 700-705 interval	No
	702.5	Sidewall at 700-705 interval	No
	700	Floor of 700-705 interval	No
	698	Sidewall at 695-700 interval ¹	No
	~696	1 foot into clay - floor sample	No
SB18-353	708	Ceiling of 705-707.5 interval	No
	706.5	Side wall of bottom half of 705-710 interval	No
	~696	1 foot into clay - floor sample	No
SB18-354	705	Ceiling of 700-705 interval	No
	702.5	Sidewall at 700-705 interval	No
	~696	1 foot into clay - floor sample	No
SB18-355	705	Ceiling of 700-705 interval	No
	702.5	Sidewall at 700-705 interval	No
	~696	1 foot into clay - floor sample	No
SB18-356	705	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
	703.5	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm @ 702-705	No
	702	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
SB18-357	705	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
	703.5	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm @ 702-705	No
	702	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
SB18-358	705	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
	703.5	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm @ 702-705	No
	702	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
SB18-359	705	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
	703.5	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm @ 702-705	No
	702	determine if any concentrations greater than 50 near SB18-313 (detect at 50 ppm)	Yes - pending 703.5 results
SB18-360	710	Ceiling of 705-710 interval	Yes - pending results of SB18-340-344
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending results of SB18-340-344
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending results of SB18-340-344
	705	Ceiling of 700-705 interval & floor of 705-710 interval	Yes - pending results of SB18-340-344
	702.5	Sidewall at 700-705 interval	Yes - pending results of SB18-340-344
	700	Floor of 700-705 interval	Yes - pending results of SB18-340-344
	698	Sidewall at 695-700 interval ¹	Yes - pending results of SB18-340-344
	~696	1 foot into clay - floor sample	Yes - pending results of SB18-340-344

TABLE 3.1
ADDITIONAL PCB CHARACTERIZATION SAMPLING PLAN
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Location Name	Sample Elevation	Sample Reason	Hold Sample Analysis
SB18-361	710	Ceiling of 705-710 interval	Yes - pending results of SB18-340-344
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending results of SB18-340-344
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending results of SB18-340-344
	705	Ceiling of 700-705 interval & floor of 705-710 interval	Yes - pending results of SB18-340-344
	702.5	Sidewall at 700-705 interval	Yes - pending results of SB18-340-344
	700	Floor of 700-705 interval	Yes - pending results of SB18-340-344
	698	Sidewall at 695-700 interval ¹	Yes - pending results of SB18-340-344
	~696	1 foot into clay - floor sample	Yes - pending results of SB18-340-344
SB18-362	710	Ceiling of 705-710 interval	Yes - pending results of SB18-340-344
	708.5	Side wall of top half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending results of SB18-340-344
	706.5	Side wall of bottom half of 705-710 interval - delineating ND @ 51 ppm @ SB18-288	Yes - pending results of SB18-340-344
	705	Ceiling of 700-705 interval & floor of 705-710 interval	Yes - pending results of SB18-340-344
	702.5	Sidewall at 700-705 interval	Yes - pending results of SB18-340-344
	700	Floor of 700-705 interval	Yes - pending results of SB18-340-344
	698	Sidewall at 695-700 interval ¹	Yes - pending results of SB18-340-344
	~696	1 foot into clay - floor sample	Yes - pending results of SB18-340-344

Notes

All samples are for Total PCBs only

Boring locations will be staked using survey equipment and the surface elevation will be recorded at that time.

Elevations in feet AMSL

¹ Sidewall sample for 695-700 AMSL is at 698 as clay is encountered at 697 in that interval and current data shows clay is not impacted > 50 ppm

² Sidewall sample for 700-705 AMSL is at 702.5 half the height of the interval.

TABLE 4.1
MONITORING PROGRAM
PAOC 18 IMWP COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Analysis	Method	Monitoring Program		
		Baseline	Co-implementation	Post Remedial
VOCs				
TCL VOCs	SW-846 8260	--	--	X
Reagent Parameters				
Residual Persulfate	SW-846 9056	--	--	X
Sulfate	SW-846 9056	X	--	X
Residual Permanganate ¹	SW-846 9056	--	--	X
Field Parameters				
Oxidation Reduction Potential (ORP)	Field	X	--	X
Dissolved Oxygen	Field	X	--	X
pH	Field	X	--	X
Temperature	Field	X	--	X
Specific Conductivity	Field	X	--	X
Turbidity	Field	X	--	X
Metals (std list)				
Total and Dissolved TAL Metals ²	SW-846 6010	X	--	X

Notes

TAL - Target Analyte List

TCL - Total Contaminant List

¹ To be analyzed if Potassium Permanganate is used

² Dissolved sodium, potassium, and manganese will be analyzed as a part of the TAL metals list

APPENDIX A

INTERIM REMEDIAL ACTIONS COMPLETED TO PROTECT TYLER POND

APPENDIX A

INTERIM REMEDIAL ACTIONS COMPLETED TO PROTECT TYLER POND

Tyler Pond is a manmade impoundment of Willow Run Creek which was dredged in the mid to late 1990's by a potential responsible parties group pursuant to a consent agreement with the State of Michigan to remove PCB impacted sediments. Since DNAPL was observed at the Site in 2004 several interim remedial actions have been implemented to protect Tyler Pond from being recontaminated. These interim remedial actions include:

- DNAPL recovery (2004 – present)
- Sheet pile wall installation (2004)
- Enhanced bioremediation (2007)
- Groundwater recovery (2010 – present)

DNAPL Recovery

Following the identification of DNAPL in PAOC 18, additional 2-inch and 4-inch wells were installed for use in monitoring and recovering DNAPL. DNAPL recovery has been completed by pumping using an automated system through one recovery well and manual pumping and bailing. Since 2004 approximately 1750 gallons of DNAPL have been removed from PAOC 18 and incinerated at a TSCA permitted incinerator in Texas.

Sheet Pile Wall Installation

In the fall of 2004, a sheet pile wall was designed and installed to prevent the migration of DNAPL into Tyler Pond. Extensive investigation of the geology of the bank of the pond in PAOC 18 was completed to understand the potential migration pathways. It was determined that a large area of bank had been stabilized using imported clay during the Tyler Pond Remediation efforts in the late 1990's, as this area was used as an access point for equipment during the remediation. Imported clay was observed at the surface of the bank as well as along the edge of the water. The investigation did not indicate that DNAPL had reached Tyler Pond due to the presence of this imported clay. The sheet pile wall was designed and installed to ensure that DNAPL did not migrate to the Pond. It was installed at least five feet into the confining clay (native clay) and extended laterally past where DNAPL was identified.

Enhanced Bioremediation

The impacted groundwater in PAOC 18 was treated using Edible Oil Substrate (EOS™) to enhance the natural biodegradation occurring in the area. This was completed to decrease CVOC concentrations venting to the Pond as CVOCs are the primary constituents in the impacted groundwater.

Groundwater Recovery

A French drain was installed in 2010 and used to recover groundwater from within the sheet pile wall area. Due to the construction of the sheet pile wall, water built up behind the wall and groundwater was day lighting and overflowing the sheet pile wall. Water recovered from the French drain has elevated levels of CVOCs but PCBs have not been detected in the recovered water. The PCBs in this area are not dissolved in groundwater, but where they have been detected in groundwater samples, the water has been very turbid. Therefore, PCB impacted groundwater does not appear to be present nor available to recontaminate Tyler Pond.

Appendix H of the Site Summary Report (CRA, 2012), provides additional information on the interim remedial actions listed above.

CONCLUSION

The absence of PCBs in groundwater venting to the Pond, and the implementation of these interim remedial actions have protected Tyler Pond from recontamination.

APPENDIX B

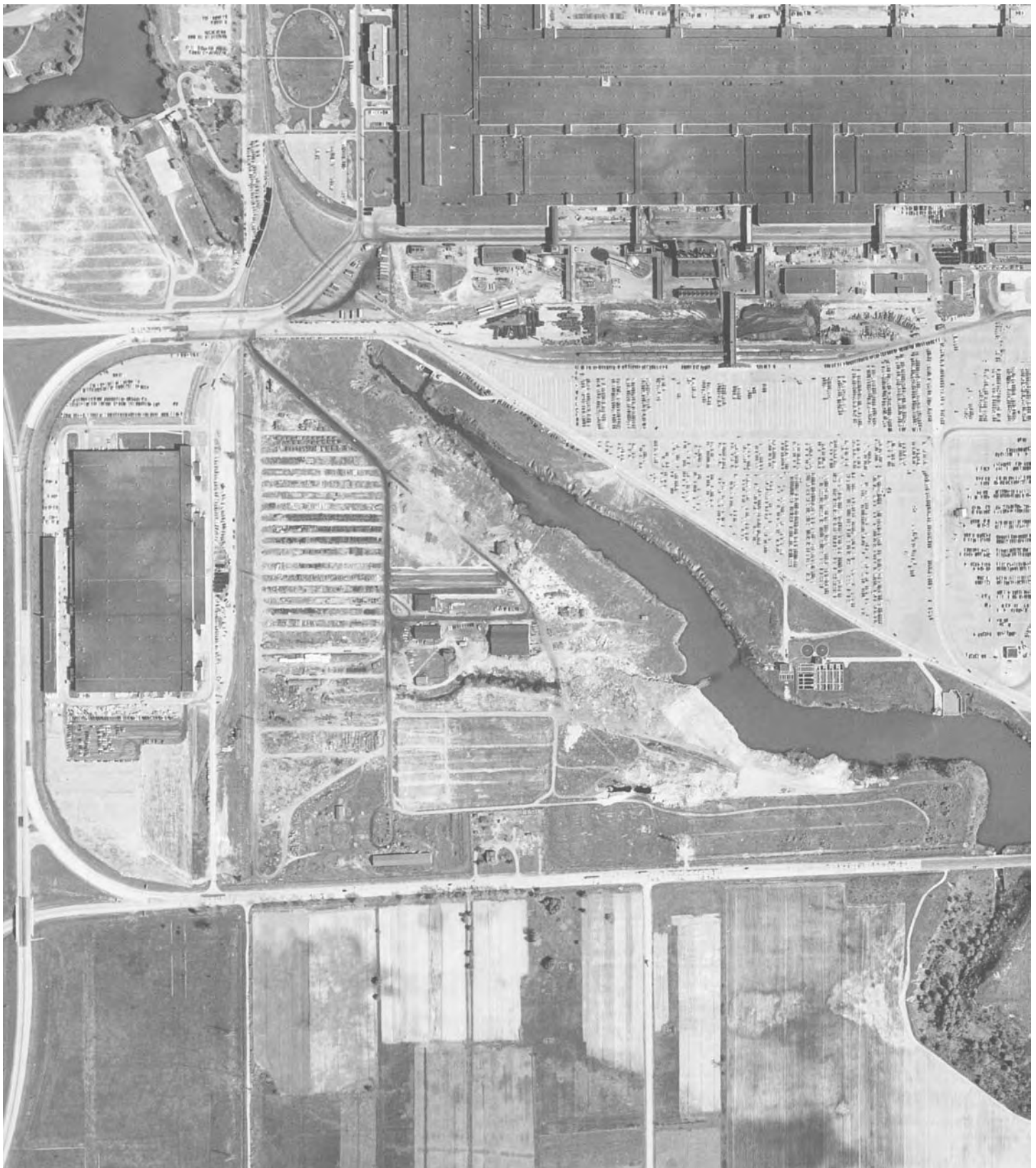
HISTORICAL AERIAL PHOTOGRAPHS

1940



10/27/1949





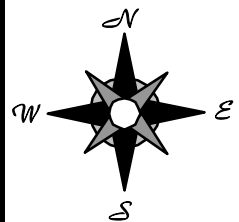
Ypsilanti, Michigan

1952

HIG Project Number: MAE-2191

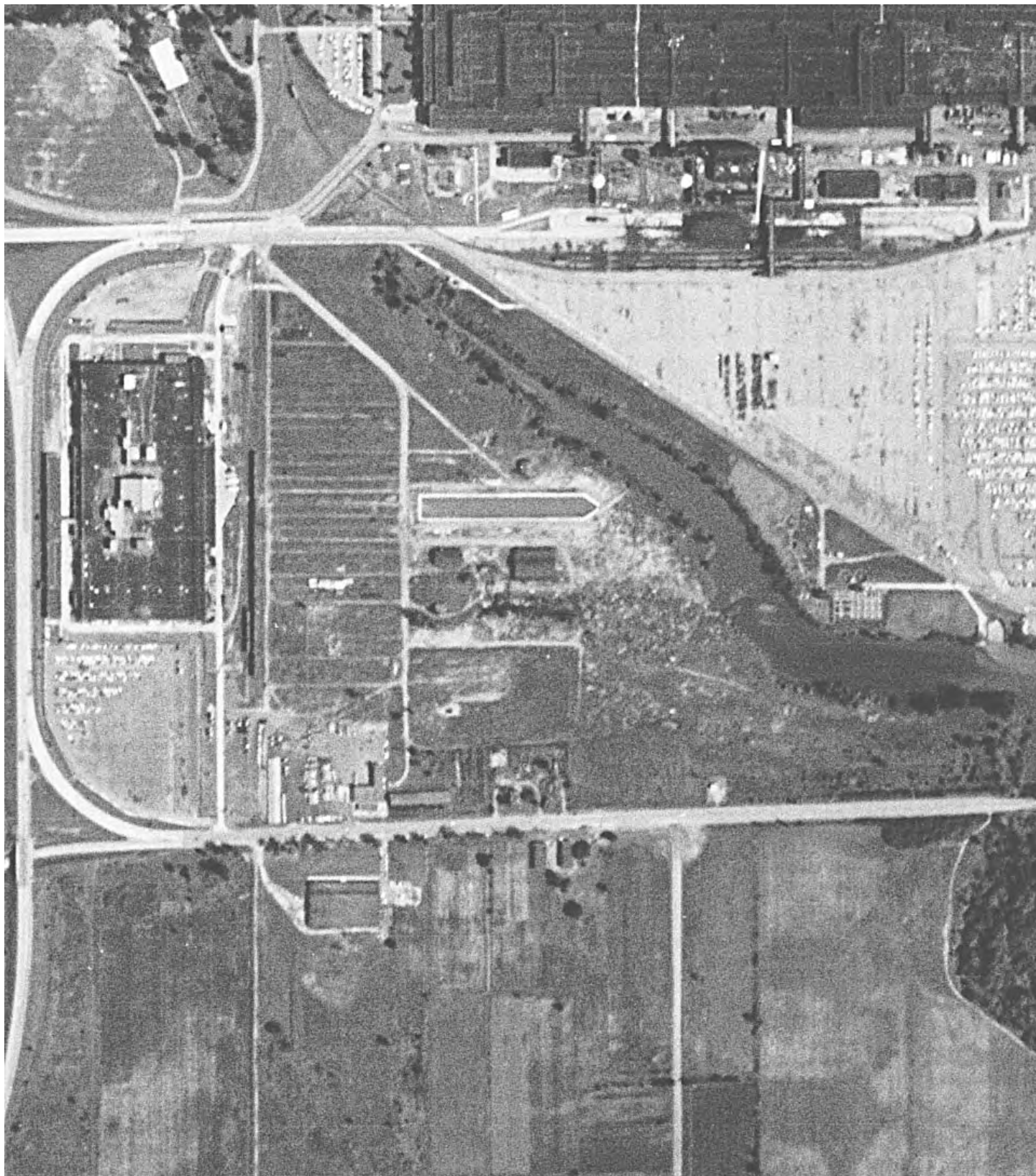
Client Project Number: 17303

Approximate Scale 1:6000 (1"=500')



9/6/1955





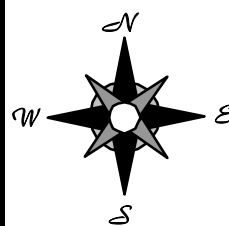
Ypsilanti, Michigan

1956

HIG Project Number: MAE-2191

Client Project Number: 17303

Approximate Scale 1:6000 (1"=500')



9/29/1963

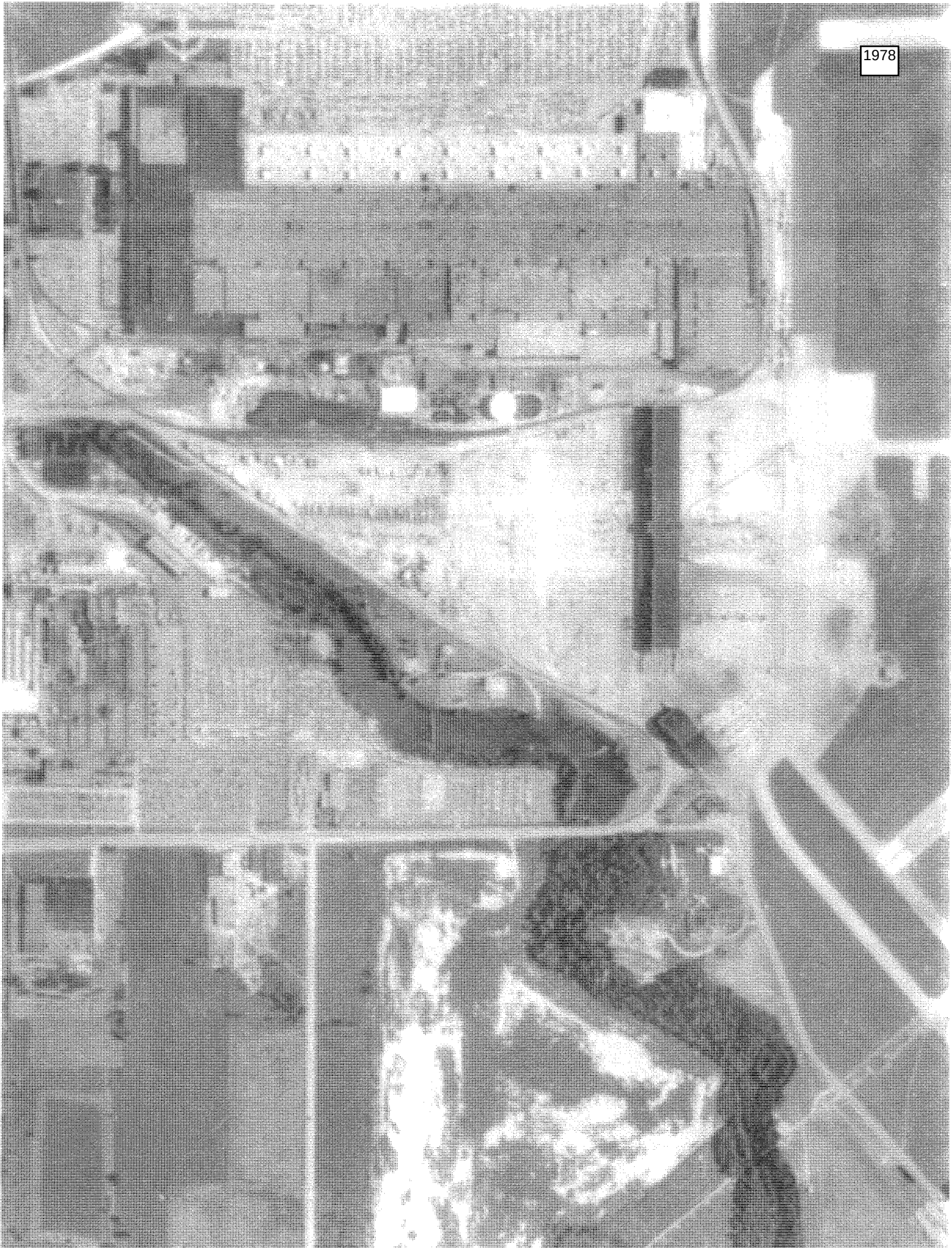


379

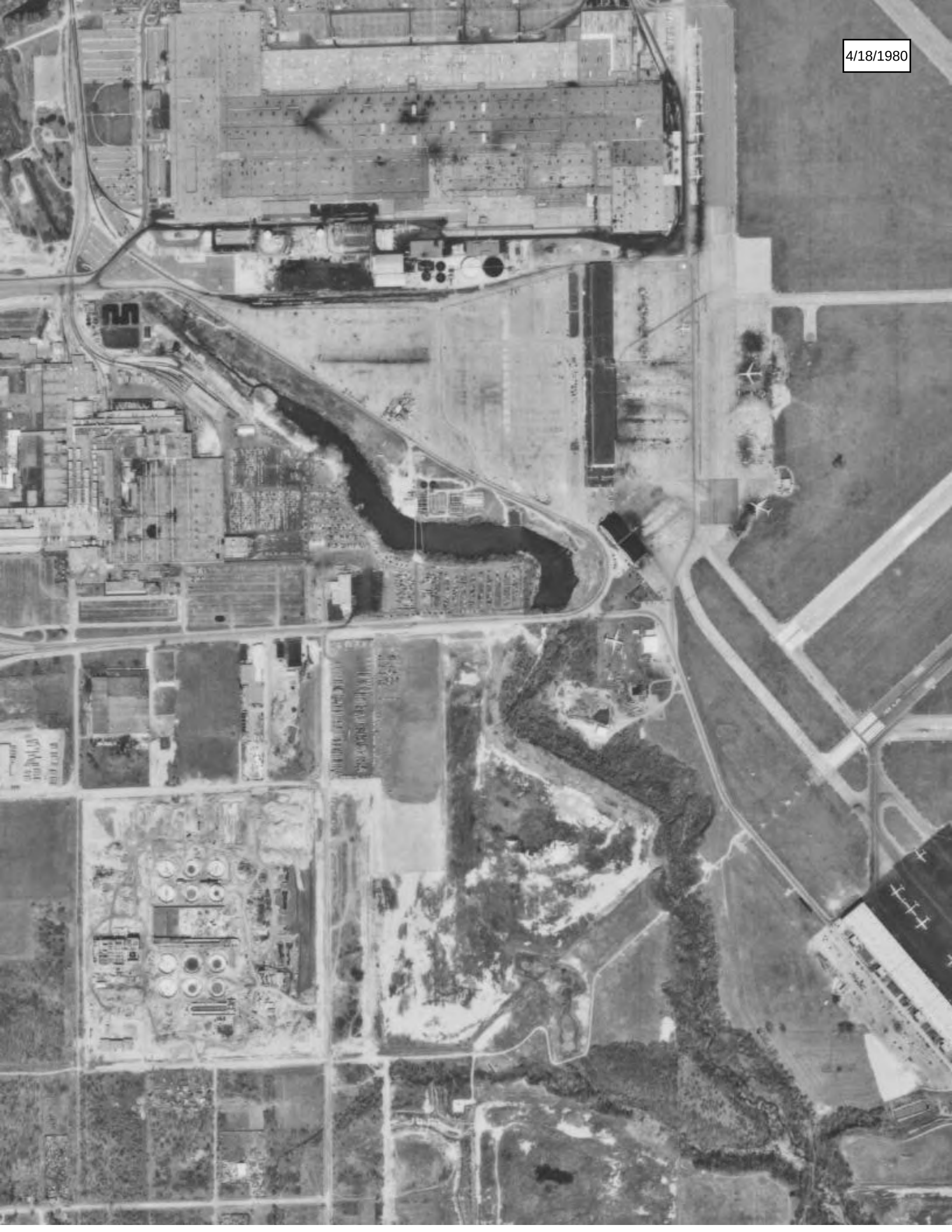
5/21/1969



1978



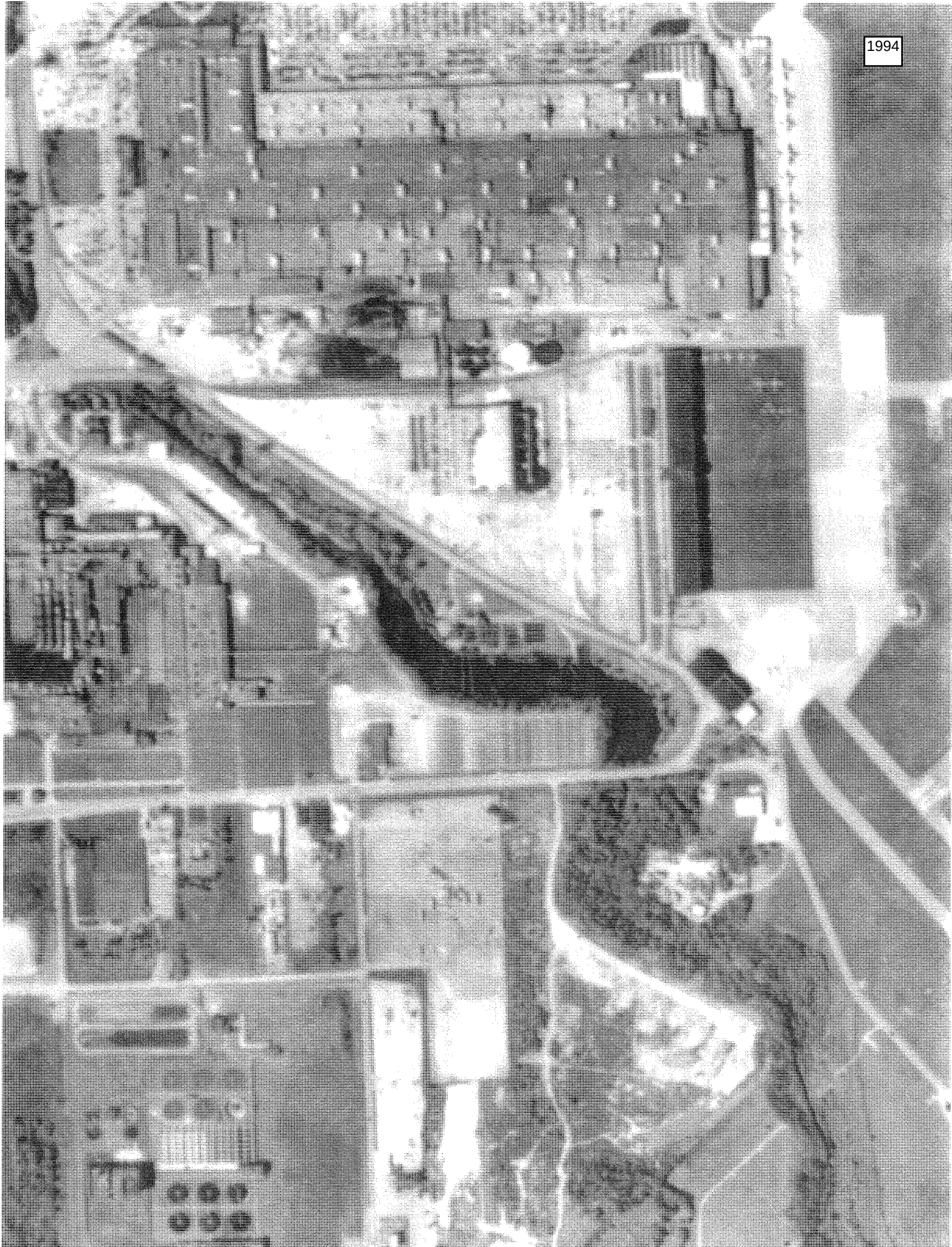
4/18/1980



4/29/1985







5/6/1995



1998



APPENDIX C

WASTE COMMUNICATION

Landale, Beth

From: McCabe, John (DEQ) [MCCABEJ@michigan.gov]
Sent: Friday, July 27, 2012 9:43 AM
To: Landale, Beth
Cc: Lund, Kevin (DEQ); Dave Favero <dfavero@racertrust.org> (dfavero@racertrust.org); Grant Trigger (gtrigger@racertrust.org)
Subject: RE: CVO Basis for Non Listed Waste Determination ~COR-017303~

Beth,

Thanks for taking the time to assemble all the supporting material for your argument. I reviewed it with some help from some of our staff better versed than I in the issue of determining whether remediation waste is listed or not and we determined that you have a good argument that the waste in question at the CVO is not listed and we can support that interpretation. Please include your supporting discussion in the work plan for the excavation to be performed at the CVO so we can document our concurrence in an approval letter. Any questions, let me know.

John

John M. McCabe
Environmental Quality Analyst
Hazardous Waste Section
Resource Management Division
Michigan Department of Environmental Quality
517-335-4789

From: Landale, Beth [mailto:blandale@croworld.com]
Sent: Thursday, July 26, 2012 2:19 PM
To: McCabe, John (DEQ)
Cc: Lund, Kevin (DEQ); Grant Trigger; Dave Favero; Project Email Hold
Subject: CVO Basis for Non Listed Waste Determination ~COR-017303~

Hi John,

The purpose of this email is to summarize our position as to why the impacted soils, groundwater and DNAPL at CVO are not a listed waste. The impacted material is a result of historical filling activities at the Site. The main constituents in the DNAPL, and resulting contamination are trichloroethylene, its daughter compounds, and polychlorinated biphenyls. Below presents a summary of the Site history and filling activities that were discovered during a review of historical aerial photographs. The area where excavation is a possibility is referred as PAOC 18. PAOC 18 is an area located along the south shoreline of Tyler Pond surrounding former Outfall #12, both on the bank of the pond and under a portion of the adjacent parking lot.

Site History

The CVO Site consisted of the eastern 22 acres of the former Willow Run Assembly Plant (WRAP). The Site has had many owners. The Kaiser-Frazer Company (Kaiser-Frazer) leased the area from the War Asset Administration in November 1945 and purchased the facility in December 1948. Kaiser-Frazer is thought to have constructed an administration building to house design and engineering facilities on the WRAP site. Kaiser-Frazer owned the property until its sale to GM in December 1954. The original building at the Willow Run Assembly Plant was used by GM as a parts storage warehouse until 1955. In 1956, light truck assembly began at the plant. From 1956 to July 1993, operations were typical of an automotive assembly plant including, sheet metal assembly by welding solder applications, metal finishing, and washing, electro-deposition painting operations, and interior assembly. These operations were not conducted on the CVO portion of the former Willow Run Assembly Plant. Following assembly operations, vehicles were distributed to dealers by both truck and railway systems. Production operations ceased in July of 1993 and deactivation and

decommissioning operations proceeded to prepare the facility for an eventual sale in 1997. GM retained ownership of the CVO property, which was used to store and maintain GM owned company vehicles until 2010.

Aerial Photograph Review

Several aerial photographs of the Site from 1940 to the recently present were reviewed. The photographs reviewed were from 1940, 1949, 1952, 1955, 1956, 1963, 1969, 1978, 1980, 1985, 1990, 1994, 1995, and 1998. In reviewing the aerial photographs, several areas of soil disturbances, filling and open pits were observed on the CVO property.

The 1949 aerial photographs show an excavated area along with material piles just northeast of where the Haulaway building now stands. These photos show excavated pits dark in color suggesting the presence of liquids. There is also evidence of filling activities along the south shore of Tyler Pond from the Outfall #11 area to the east. The evidence of filling activities stops approximately 150 feet east of where Outfall #12 is located. This includes the PAOC 18 area. These filling activities increased in scope as evidenced by historical photos from 1949 through 1952. The 1955 photo does not indicate evidence of recent significant excavation or fill activities along Tyler Pond. It appears that vegetation covered most of the area between Outfall #11 and Outfall #12 indicating that minimal disturbance of the soils has occurred recently to 1955. Some remnants of fill or excavation activities are noticeable to the south and southwest of Outfall #12, which is consistent with where the top of the hill/fence line is located today within the PAOC 18 area.

Based on the review of aerial photos, it appears the filling and apparent waste operations in the vicinity of the Site occurred prior to 1963, with the majority of the filling activities taking place prior to 1955. By 1963 the entire Site area, including the eastern most section, were completely paved.

Listed Waste Discussion

The first step in the RCRA hazardous waste characterization process is to evaluate contaminated media at the Site and determine whether it constitutes a 'listed' RCRA waste. The preamble to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) states that "it is often necessary to know the origin of the waste to determine whether it is a listed waste."

Based on the review of aerial photographs and buried refuse observed during previous removals, test pitting activities and boring installations at the Site, the DNAPL and resulting impacts are likely the result of historical dumping. Review of available files, have not lead to any indications of what was dumped (virgin product, spent solvent, or concentrations of the original material) or operations that would generate listed waste in that area.

RCRA hazardous waste that have been assigned EPA hazardous waste codes are listed in 40 CFR 261.30 through 261.33. Knowledge of the exact source of a waste is required for source-specific listed wastes ("K" waste codes). Some knowledge of the nature or sources of the waste is required even for listed wastes from non-specific sources, such as spent solvents ("F" waste codes) or commercial chemical products ("P" and "U" waste codes). P and U wastes cover only unused and unmixed commercial chemical products, particularly spilled or off-specification products. Not every waste containing a P or U chemical is a hazardous waste. There must be direct evidence of product use.

The EPA guidance document titled "Management of Remediation Waste Under RCRA" dated October 1998 provides clarification on determining when contamination results from listed hazardous waste. It states that....*"When a facility owner/ operator makes a good faith effort to determine if a material is a listed hazardous waste but cannot make such a determination because documentation regarding the source of contamination, contaminant, or waste is unavailable or inconclusive, EPA has stated that one may assume the source, contaminant or waste is not listed hazardous waste and, therefore, provided the material in question does not exhibit a characteristic of hazardous waste, RCRA requirements do not apply"*. A footnote is included which states *"Listing determinations are often particularly difficult in the remedial context because the listings are generally identified by the sources of the hazardous wastes rather than the concentrations of various hazardous constituents; therefore, analytical testing alone, without information on a waste's source, will not generally produce information that will conclusively indicate whether a given waste is a listed hazardous waste"*.

Attempts have been made to determine if the source of TCE present in the environmental media meets F, U or P listing criteria. It has been concluded that the efforts have not yielded the necessary information to definitively assert that the source of contamination would have been a listed hazardous waste. Therefore, our due diligence in addition to the EPA guidance document mentioned above supports the determination that the environmental media will not be regulated as a listed hazardous waste. It will be classified as characteristically hazardous waste if the Toxic Characteristic Leaching Procedure (TCLP) concentration of the regulated compounds exceed the RCRA regulatory threshold for those compounds.

In summary, the environmental media currently generated and the additional material potentially generated by an excavation in PAOC 18 are not listed hazardous wastes.

If you have any questions, please let me know.

Thanks

Beth

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APPENDIX D

STRATIGRAPHIC LOGS FOR DEEP WELLS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 3

PROJECT NAME: RACER - CVO
PROJECT NUMBER: 017303
CLIENT: RACER TRUST
LOCATION: YPSILANTI, MICHIGAN

HOLE DESIGNATION: DMW-1
DATE COMPLETED: March 28, 2012
DRILLING METHOD: ROTASONIC
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	NORTHING: 268202.27 EASTING: 13344258.09	GROUND SURFACE 716.59 TOP OF RISER 716.57 TOP OF CASING 716.20						
	ASPHALT	716.39	CONCRETE SEAL					1.1
2	SP/GP-SAND AND GRAVEL (FILL), loose, fine to coarse sand and gravel, poorly graded, brown and gray, moist	715.89	BENTONITE GROUT					0.1
4	SC-CLAYEY SAND (FILL), trace silt and fine gravel, compact, fine to coarse grained, poorly graded, orange brown, moist	715.39	2" PVC WELL CASING	1RS	90			0.0
6	SP-SAND (FILL), trace silt, compact, fine grained, trace medium to coarse grained, poorly graded, orange brown, moist							0.0
8	- with silt, fine grained at 5.0ft BGS	708.69	8" BOREHOLE					0.0
10	- with fine gravel, trace silt, fine to coarse grained at 7.0ft BGS							0.5
12	- fine grained, trace silt and fine gravel at 7.3ft BGS							1.1
14	SP-SAND, trace silt, with fine gravel, compact, fine to coarse grained, poorly graded, light brown, moist	703.09						26.0
16	- trace coarse gravel, with fine gravel, brown, wet at 10.0ft BGS	702.69						11.7
18	CL-SILTY CLAY, firm, low plasticity, gray, moist	700.89						5.2
20	SM-SILTY SAND, compact, fine grained, poorly graded, gray, wet		6" BOREHOLE					0.0
22	CL-SILTY CLAY, firm, low plasticity, gray, moist							0.0
24	- 0.05' silty sand seam, fine grained, gray, wet at 17.3ft BGS							0.0
26	- 0.3' silty sand seam, fine grained, gray, wet at 17.8ft BGS							0.0
28	- trace coarse sand to fine gravel at 18.3ft BGS							0.0
30				2RS	100			0.0
32								0.0
34				4RS	100			0.0
36								0.0
38				3RS	100			0.0
	- stiff at 27.0ft BGS							0.0

OVERBURDEN LOG 17303.GPJ CRA CORP.GDT 8/13/12

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 3

PROJECT NAME: RACER - CVO
PROJECT NUMBER: 017303
CLIENT: RACER TRUST
LOCATION: YPSILANTI, MICHIGAN

HOLE DESIGNATION: DMW-1
DATE COMPLETED: March 28, 2012
DRILLING METHOD: ROTOSONIC
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
42				5RS		100		0.0
44								0.0
46								0.0
48								0.0
50	- medium plasticity, firm at 49.0ft BGS							0.0
52				6RS		100		0.0
54								0.0
56								0.0
58	- no coarse sand to fine gravel, stiff, medium to high plasticity at 57.0ft BGS							0.0
60	- firm, low plasticity at 59.0ft BGS							0.0
62				7RS		100		0.0
64								0.0
66								0.0
68	ML-SILT, with clay, trace fine sand, very soft, non plastic, gray, moist to wet	650.09 649.59						0.0
70	CL-SILTY CLAY, firm, low to medium plasticity, gray, moist	648.59 647.79						0.0
72	ML-SILT, with clay, trace fine sand, very soft, non plastic, gray, moist to wet	646.59						0.0
74	CL-SILTY CLAY, firm, low to medium plasticity, gray, moist							0.0
76	CL-CLAY, with silt and fine sand, trace coarse sand to fine gravel, soft to firm, low plasticity, gray, moist			8RS		100		0.0
78	COBBLE	640.89 640.59						0.0
	SM-SILTY SAND, dense, fine grained, gray, wet							0.0
	- 0.3' silty clay seam, stiff, low plasticity, gray at 78.4ft BGS	637.59						0.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 3 of 3

PROJECT NAME: RACER - CVO
PROJECT NUMBER: 017303
CLIENT: RACER TRUST
LOCATION: YPSILANTI, MICHIGAN

HOLE DESIGNATION: DMW-1
DATE COMPLETED: March 28, 2012
DRILLING METHOD: ROTOSONIC
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
		636.59						
	SM/ML-SAND AND SILT, dense, fine sand, gray, wet	635.69						0.0
82	SP-GRAVELLY SAND, compact, fine to coarse grained, fine gravel, poorly graded, gray, wet			9RS		100		0.0
84	CL-CLAY (till), with silt and fine sand, trace fine gravel, hard, low plasticity, gray, dry							0.0
86	- 0.1' gravelly sand seam, fine to coarse grained, fine gravel, gray, wet at 81.5ft BGS							0.0
88								0.0
90								0.0
92								0.0
94								0.0
96				10RS		100		0.0
98	END OF BOREHOLE @ 97.0ft BGS	619.59						0.0
100								
102								
104								
106								
108								
110								
112								
114								
116								
118								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17303.GPJ CRA CORP.GDT 8/13/12

SAND PACK

BENTONITE CHIPS

WELL DETAILS
Screened interval:
640.59 to 635.59ft BGS
76.00 to 81.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: 0.010
Material: PVC
Seal:
647.39 to 642.59ft BGS
69.20 to 74.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:
642.59 to 633.09ft BGS
74.00 to 83.50ft BGS
Material: SAND



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 3

PROJECT NAME: RACER - CVO
PROJECT NUMBER: 017303
CLIENT: RACER TRUST
LOCATION: YPSILANTI, MICHIGAN

HOLE DESIGNATION: DMW-2
DATE COMPLETED: March 29, 2012
DRILLING METHOD: ROTASONIC
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	NORTHING: 268231.93 EASTING: 13344731.84 TOP OF RISER GROUND SURFACE TOP OF CASING	714.65 714.64 714.23						
	ASPHALT	714.44	CONCRETE SEAL					0.0
	CRUSHED LIMESTONE (FILL), sand and gravel size, loose, gray, moist	714.04	BENTONITE GROUT					0.0
2	SP-SAND (FILL), trace silt and fine gravel, compact, fine to coarse grained, poorly graded, dark brown, moist	713.64	2" PVC WELL CASING	1RS	85			0.0
4								0.0
6	SP-SAND (FILL), with silt, compact, fine grained, poorly graded, orange brown, moist							0.0
8	- 0.3' gravelly sand seam, fine to coarse sand, fine gravel, light brown, moist at 6.2ft BGS	707.64	8" BOREHOLE					0.0
10	SP-SAND, with fine gravel, compact, fine to coarse grained, poorly graded, light brown, moist							0.0
12	- brown, wet at 8.8ft BGS							0.0
14	- 0.3' silty clay seam, firm, low plasticity, gray, moist at 9.0ft BGS							1.3
16	- fine grained, brown gray, wet at 9.3ft BGS							6.4
18	CL-SILTY CLAY, firm, low plasticity, gray, moist	697.24	6" BOREHOLE					1.2
20								1.3
22	- trace coarse sand to coarse gravel at 20.5ft BGS							0.0
24								0.0
26								0.0
28				2RS	100			0.0
30	- stiff at 29.0ft BGS							0.0
32								0.0
34	- firm, medium plasticity at 33.0ft BGS			4RS	100			0.0
36								0.0
38	- stiff, low plasticity at 37.0ft BGS			3RS	100			0.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17303.GPJ CRA CORP.GDT 8/13/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 3

PROJECT NAME: RACER - CVO
PROJECT NUMBER: 017303
CLIENT: RACER TRUST
LOCATION: YPSILANTI, MICHIGAN

HOLE DESIGNATION: DMW-2
DATE COMPLETED: March 29, 2012
DRILLING METHOD: ROTOSONIC
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
42				5RS		100		0.0
44								0.0
46								0.0
48	- no sand and gravel, stiff at 48.0ft BGS							0.0
50	- firm at 50.0ft BGS							0.0
52				6RS		100		0.0
54								0.0
56								0.0
58	- soft to firm at 59.0ft BGS							0.0
60								0.0
62				7RS		100		0.0
64								0.0
66								0.0
68	ML-SILT, with clay and fine sand, soft, non plastic, gray, moist to wet - 0.3' clay seam at 67.0ft BGS	647.94 646.44 645.64						0.0
70	CL-SILTY CLAY, firm, low plasticity, gray, moist							0.0
72	ML-SILT, with clay and fine sand, soft, non plastic, gray, moist to wet - 0.3' clay seam at 67.0ft BGS	643.64						0.0
74	CL-CLAY, with silt and fine sand, trace coarse sand to coarse gravel, firm to stiff, low plasticity, gray, moist			8RS		100		0.0
76								0.0
78	SM-SILTY SAND, dense, fine grained, poorly graded, gray, wet	637.64						0.0
	SP-SAND, trace silt and fine gravel, very	635.64						0.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17303.GPJ CRA CORP GDT 8/13/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 3 of 3

PROJECT NAME: RACER - CVO
PROJECT NUMBER: 017303
CLIENT: RACER TRUST
LOCATION: YPSILANTI, MICHIGAN

HOLE DESIGNATION: DMW-2
DATE COMPLETED: March 29, 2012
DRILLING METHOD: ROTOSONIC
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
82	dense, fine to coarse grained, poorly graded, gray, wet	632.64		9RS		100		0.0
84	CL-CLAY (till), with silt and fine sand, trace coarse sand to coarse gravel, hard, low plasticity, gray, dry							0.0
86								0.0
88								0.0
90		615.64		10RS		100		0.0
92	- no sand and gravel at 91.5ft BGS							0.0
94	- sandy clay, with silt, trace coarse sand to coarse gravel at 94.0ft BGS							0.0
96	- 0.1' fine to medium grained sand seam, gray, wet at 95.5ft BGS							0.0
98								0.0
100	END OF BOREHOLE @ 99.0ft BGS							

OVERBURDEN LOG 17303.GPJ CRA CORP.GDT 8/13/12

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

APPENDIX E

BASIS FOR REMEDIATION REQUIREMENTS

APPENDIX E1 GSIPC CALCULATIONS BASIS FOR REMEDIATION REQUIREMENTS

CRA calculated Mixing Zone-Based GSI criteria for several constituents at the Site using the river flow rate of 0.1 ft³/s obtained from the MDEQ website for Willow Run Creek. Using the calculated Mixing Zone-Based GSI criteria, the equation for the soil-water partitioning value (SWPV) and guidance in the March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document - Attachment 9 was used to calculate the GSI protection criteria (GSIPC) (i.e., target soil concentrations). The Mixing Zone-Based GSIPC were calculated for trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC).

The following tables provide a summary of the calculations completed:

- Table 1 provides the calculations and results of the Mixing Zone-Based GSIPC using the generic fraction of organic carbon (Foc) value provided in the March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document - Attachment 9.
- Table 2 provides the calculations and results of the Mixing Zone-Based GSIPC using Site specific Foc values. This table provides a summary of Site specific Foc values for sand, silty sands and clays as well as the calculated minimum, maximum and average values for each of the compounds.
- Table 3 provides a summary of the Mixing Zone-Based GSIPC values calculated in Tables 1 and 2. For comparison purposes, 20 times the calculated Mixing Zone-Based GSI criterion is presented on this table. This value was calculated as suggested in the March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document - Attachment 9, which identifies that following calculation of the SWPV, that value is compared to 20X the Mixing Zone-Based GSI criterion and the greater of the two becomes the GSIPC value. Also presented on this table is the proposed PAOC 18 Target Soil Concentrations.

Following a phone call with the MDEQ Water Division on October 9, 2012 the Mixing Zone-Based GSI criteria were evaluated based on a range of flow rates from a minimum of 0.003 ft³/s (equivalent to the groundwater discharge rate to the stream) to a maximum of 10:1 dilution rate for a pond/lake. The MDEQ Water Resource Division staff identified the 10:1 dilution ratio on phone call identified above. These revised Mixing Zone-Based GSI criteria were then used to calculate the Mixing Zone-Based GSIPC as described above. Tables 4A, 4B and 4C present the ranges of the calculated Mixing Zone-Based GSI criteria and Mixing Zone-Based GSIPC. These tables also present graphs comparing total constituent concentrations vs. Synthetic Precipitation Leaching Procedure (SPLP) results for soil samples of varying total concentrations. These samples were collected and analyzed as a second line of evidence for selecting the Target Soil Concentrations for the PAOC 18 remedy.

TABLE 1
GENERIC Foc VALUES
MIXING ZONE-BASED GSI PROTECTION CRITERIA CALCULATION
COMPANY VEHICLE OPERATIONS SITE
YPSILANTI, MICHIGAN

$$SWPV = C_w \left[K_d + \left(\frac{\theta_w + (H' \times TAF \times \theta_a)}{\rho_b} \right) \right]$$

SWPV = Soil Water Partitioning Value (ug/kg)¹ (GSI Protection Criteria)
Cw = Target Soil Leachate Concentration (ug/L) (Target Water Criteria x 16)
Kd = Soil-Water Distribution Coefficient (L/kg)
Koc = Soil Organic Carbon-Water Partition Coefficient (L/kg)
Foc = 0.002 (Fraction of Organic Carbon in Soil) generic value
H' = Dimensionless Henry's Constant

HLC = Henry's Law Constant at 25°C
θw = 0.16 Lwater/Lair (Soil Water-Filled Porosity)
θa = 0.09 Lair/Lsoil (Soil Water-Filled Porosity)
TAF = 0.50 (Temperature Adjustment Factor)
ρb = 1.5 kg/L (Dry Soil Bulk Density)

Trichloroethene Mixing Zone Based GSIPC Calculation

Mixing Zone-Based GSI Criteria = 1,867 See Table 2
Cw = 29,867 =MZ GSI*16
Kd = 0.34 =Koc x Foc
Koc = 168 Chemical Specific²
H' = 0.42 =41*HLC
HLC = 0.0103 Chemical Specific²

SWPV =	13,599 ug/kg
--------	---------------------

Cis-1,2-Dichloroethene Mixing Zone Based GSIPC Calculation

Mixing Zone-Based GSI Criteria = 5,787 See Table 2
Cw = 92,587 =MZ GSI*16
Kd = 0.07 =Koc x Foc
Koc = 35.6 Chemical Specific²
H' = 0.17 =41*HLC
HLC = 0.00408 Chemical Specific²

SWPV =	16,933 ug/kg
--------	---------------------

Vinyl Chloride Mixing Zone Based GSIPC Calculation

Mixing Zone-Based GSI Criteria = 121 See Table 2
Cw = 1,941 =MZ GSI*16
Kd = 0.04 =Koc x Foc
Koc = 18.5 Chemical Specific²
H' = 1.11 =41*HLC
HLC = 0.0270 Chemical Specific²

SWPV =	343 ug/kg
--------	------------------

Notes:

GSIPC - Groundwater Surface Water Interface Protection Criteria

1 - SWPV equation obtained from March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1
- Technical Support Document - Attachment 9

2 - Chemical specific values obtained from March 2011 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1
- Table 4. Toxicological and Chemical-Physical Data

TABLE 2
SITE SPECIFIC Foc VALUES
MIXING ZONE-BASED GSI PROTECTION CRITERIA CALCULATION
COMPANY VEHICLE OPERATIONS SITE
YPSILANTI, MICHIGAN

$$SWPV = C_w \left[Kd + \left(\frac{\theta_w + (H \times TAF \times \theta_a)}{\rho_b} \right) \right]$$

SWPV = Soil Water Partitioning Value (ug/kg)¹ (GSI Protection Criteria)
Cw = Target Soil Leachate Concentration (ug/L) (Target Water Criteria x 16)
Kd = Soil-Water Distribution Coefficient (L/kg)
Koc = Soil Organic Carbon-Water Partition Coefficient (L/kg)
Foc = Site Specific See Table below (Fraction of Organic Carbon in Soil)
H' = Dimensionless Henry's Constant

HLC = Henry's Law Constant at 25°C
θw = 0.16 Lwater/Lair (Soil Water-Filled Porosity)
θa = 0.09 Lair/Lsoil (Soil Water-Filled Porosity)
TAF = 0.50 (Temperature Adjustment Factor)
ρb = 1.5 kg/L (Dry Soil Bulk Density)

Location/ Depth	Soil Type	Foc	Trichloroethylene		cis-1,2-Dichloroethene		Vinyl Chloride	
			SWPV (µg/kg)	Avg SWPC by Soil Type (ug/kg)	SWPV (µg/kg)	Avg SWPC by Soil Type (ug/kg)	SWPV (µg/kg)	Avg SWPC by Soil Type (ug/kg)
SB18-288/11.0'-13.0'	Sand	0.013	66,786	Sand 122,147	51,871	Sand 88,238	724	Sand 1,120
SB18-292/11.5'-12.5'	Sand	0.003	19,119		20,558		383	
SB18-313/13.5'-15.0'	Sand	0.055	280,536		192,284		2,254	
SB18-296/10.0'-11.0'	Silty Sand	0.008	42,200	Silty Sand 81,504	35,720	Silty Sand 61,540	548	Silty Sand 829
SB18-314/8.5'-10.0'	Silty Sand	0.008	41,196		35,061		541	
SB18-308/12.0'-13.0'	Silty Sand	0.031	161,117		113,838		1,399	
SB18-288/17.0'-18.0'	Clay	0.025	128,502	Clay 102,160	92,413	Clay 75,109	1,166	Clay 977
SB18-128/14.0'-15.0'	Clay	0.013	67,789		52,530		731	
SB18-313/15.0'-16.0'	Clay	0.019	98,899		72,966		954	
SB18-308/15.0'-16.0'	Clay	0.022	113,450		82,525		1,058	
Average:		0.020	101,959		74,977		976	
Minimum		0.003	19,119		20,558		383	
Maximum		0.055	280,536		192,284		2,254	

Notes:

1 - SWPV equation obtained from March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document - Attachment 9

TABLE 3
SUMMARY
MIXING ZONE-BASED GSI PROTECTION CRITERIA CALCULATION
COMPANY VEHICLE OPERATIONS SITE
YPSILANTI, MICHIGAN

BASED ON STREAM FLOW OF 0.1 FT³/S PER MDEQ WEBSITE (AS USED IN RFP)

Basis for Calculation	Calculated SWPV (ug/kg)			
	Trichloroethene		Cis-1,2-Dichloroethene	Vinyl Chloride
Generic Foc	13,599		16,933	343
Site Specific Foc - min	19,119		20,558	383
Site Specific Foc - max	280,536		192,284	2,254
Site Specific Foc - avg	101,959		74,977	976
20 x MZ Based GSI ⁽¹⁾	37,333		115,733	2,420

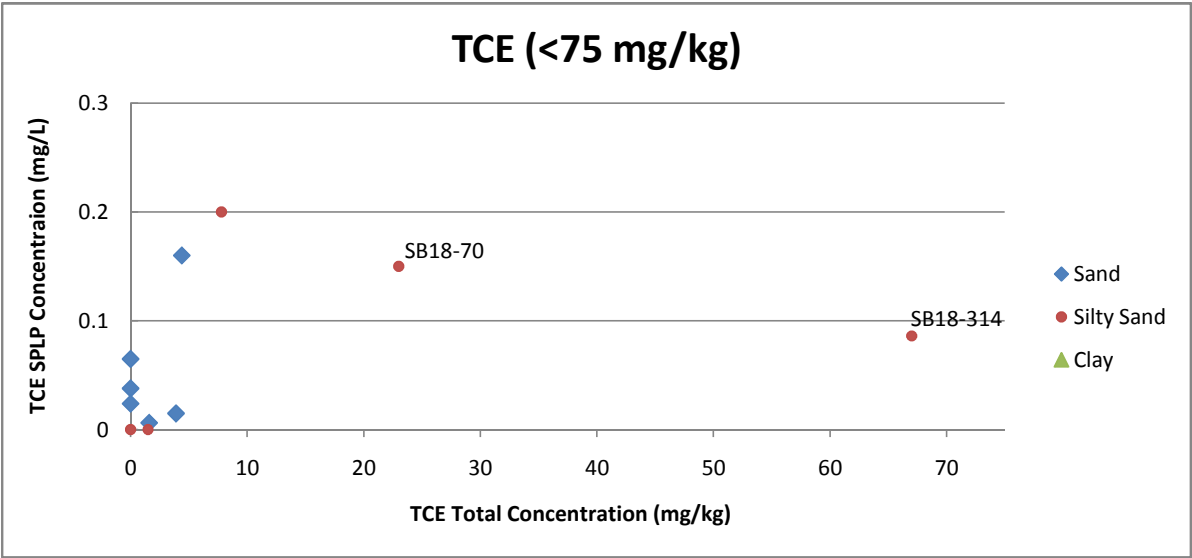
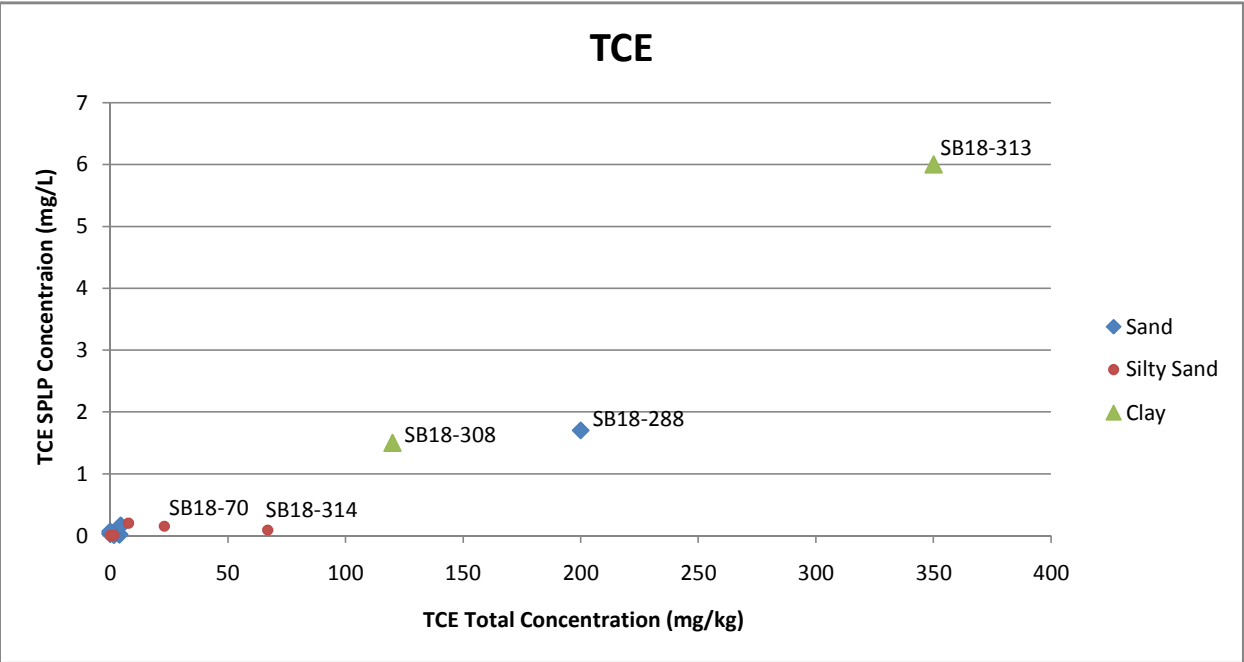
TABLE 4A
TCE SUMMARY
MIXING ZONE-BASED GSI PROTECTION CRITERIA CALCULATION
COMPANY VEHICLE OPERATIONS SITE
YPSILANTI, MICHIGAN

MIXING ZONE BASED SUMMARY					
		Stream Flow (ft³/s)			
Basis for MZ based Calculation	10-1 Dilution for Pond	0.1 (per MDEQ website)	0.05 (50% of MDEQ website value)	0.01 (10% of MDEQ website value)	0.003 (same as gw flow)
Calculated Water Values (ug/L)					
MZ based GSI	2,000	1,867	1,033	367	250
Calculated Soil Values (ug/kg)					
Generic Foc	14,571	13,599	7,528	2,671	1,821
Site Specific Foc - min	20,484	19,119	10,584	3,755	2,561
Site Specific Foc - max	300,574	280,536	155,297	55,105	37,572
Site Specific Foc - avg	109,242	101,959	56,442	20,028	13,655
20 x MZ Based GSI ⁽¹⁾	40,000	37,333	20,667	7,333	5,000

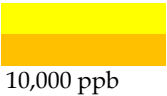
Notes
⁽¹⁾ Per March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document
Attachment 9 - Following calculation of the SWPV, that value is compared to 20X the mixing zone-based GSI criterion and the greater of the two becomes the GSIP criterion.

SPLP RESULTS SUMMARY							
Soil Type	Location	TCE (mg/kg)	SPLP TCE (mg/L)	Soil Type	Location	TCE (mg/kg)	SPLP TCE (mg/L)
clay	SB18-308	120	1.5	sand	SB18-128	0	0.038
clay	SB18-313	350	6	sand	SB18-292	0	0.024
silty sand	SB18-128	0	0	sand	SB18-313	0	0.065
silty sand	SB18-296	1.5	0	sand	SB18-288	1.6	0.0064
silty sand	SB18-303	7.8	0.2	sand	SB18-128	3.9	0.015
silty sand	SB18-70	23	0.15	sand	SB18-288	4.4	0.16
silty sand	SB18-314	67	0.086	sand	SB18-288	200	1.7

GRAPHICAL REPRESENTATION OF SPLP RESULTS



PROPOSED SOIL TARGET CONCENTRATION BASED ON DATA PRESENTED ABOVE



Value Included in RFP (rounded value)
Value calculated using most conservative stream flow
Value included in IMWP - reduced from values above to match the 20 x Toxicity Characteristic Regularoty Limit for waste disposal

TABLE 4B
CIS-1,2-DCE SUMMARY
MIXING ZONE-BASED GSI PROTECTION CRITERIA CALCULATION
COMPANY VEHICLE OPERATIONS SITE
YPSILANTI, MICHIGAN

MIXING ZONE BASED SUMMARY

		Stream Flow (ft³/s)			
Basis for MZ based Calculation	10-1 Dilution for Pond	0.1 (per MDEQ website)	0.05 (50% of MDEQ website value)	0.01 (10% of MDEQ website value)	0.003 (same as gw flow)
Calculated Water Values (ug/L)					
MZ based GSI	6,200	5,787	3,203	1,137	775
Calculated Soil Values (ug/kg)					
Generic Foc	169,327	16,933	9,373	3,326	2,268
Site Specific Foc - min	205,584	20,558	11,381	4,038	2,753
Site Specific Foc - max	1,922,845	192,284	106,443	37,770	25,752
Site Specific Foc - avg	749,768	74,977	41,505	14,728	10,042
20 x MZ Based GSI ⁽¹⁾	1,157,333	115,733	64,067	22,733	15,500

Notes

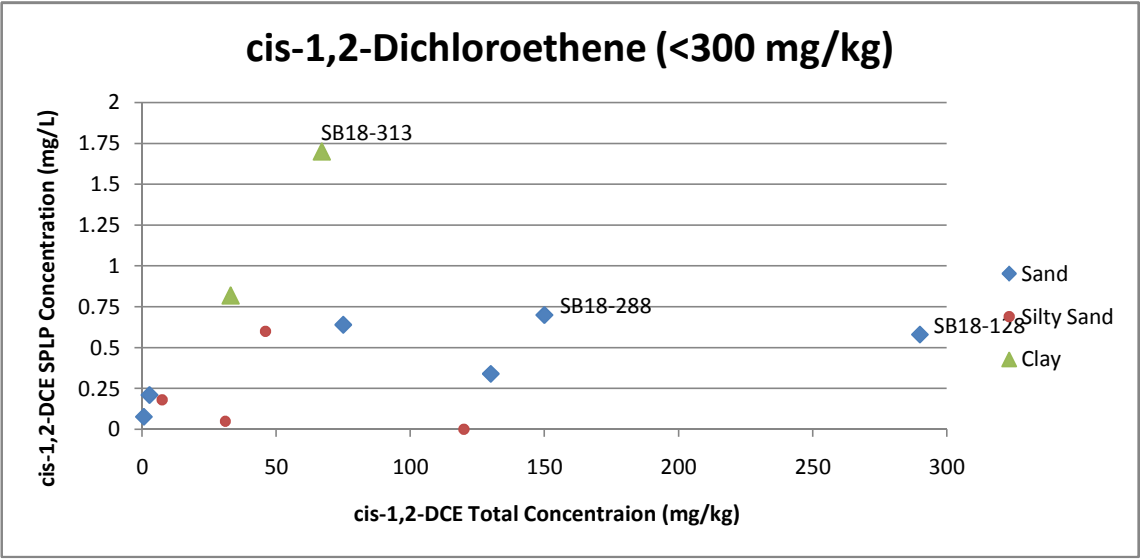
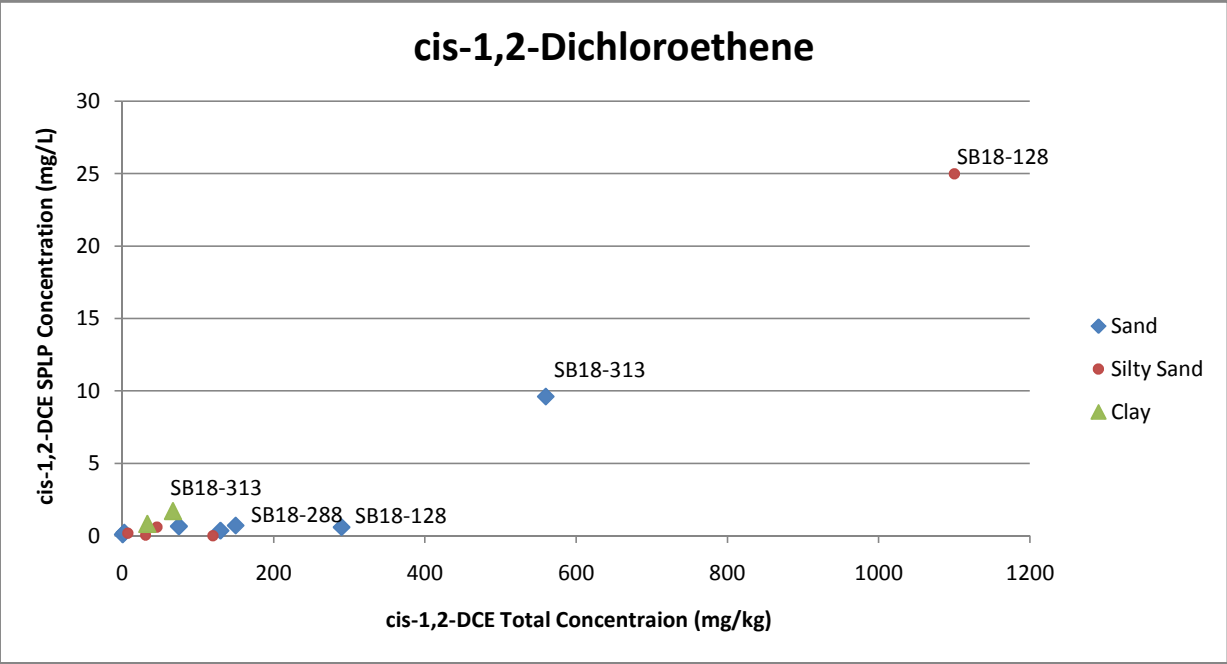
⁽¹⁾ Per March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document

Attachment 9 - Following calculation of the SWPV, that value is compared to 20X the mixing zone-based GSI criterion and the greater of the two becomes the GSIP criterion.

SPLP RESULTS SUMMARY

Soil Type Location		cis-DCE (mg/kg)	SPLP cis-DCE (mg/L)	Soil Type Location		cis-DCE (mg/kg)	SPLP cis-DCE (mg/L)
clay	SB18-308	33	0.82	sand	SB18-128	0.7	0.077
clay	SB18-313	67	1.7	sand	SB18-292	2.8	0.21
silty sand	SB18-70	7.4	0.18	sand	SB18-288	75	0.64
silty sand	SB18-314	31	0.049	sand	SB18-288	130	0.34
silty sand	SB18-303	46	0.6	sand	SB18-288	150	0.7
silty sand	SB18-296	120	0	sand	SB18-128	290	0.58
silty sand	SB18-128	1100	25	sand	SB18-313	560	9.6

GRAPHICAL REPRESENTATION OF SPLP RESULTS



PROPOSED SOIL TARGET CONCENTRATION BASED ON DATA PRESENTED ABOVE



16,900 ppb

Value Included in RFP (rounded value)

Value calculated using most conservative stream flow

Value included in IMWP - based on value included in RFP (rounded value)

TABLE 4C
VINYL CHLORIDE SUMMARY
MIXING ZONE-BASED GSI PROTECTION CRITERIA CALCULATION
COMPANY VEHICLE OPERATIONS SITE
YPSILANTI, MICHIGAN

MIXING ZONE BASED SUMMARY

		Stream Flow (ft³/s)			
Basis for MZ based Calculation	10-1 Dilution for Pond	0.1 (per MDEQ website)	0.05 (50% of MDEQ website value)	0.01 (10% of MDEQ website value)	0.003 (same as gw flow)
Calculated Water Values (ug/L)					
MZ based GSI	130	121	67	24	16
Calculated Soil Values (ug/kg)					
Generic Foc	368	343	190	67	46
Site Specific Foc - min	410	383	212	75	51
Site Specific Foc - max	2,415	2,254	1,248	443	302
Site Specific Foc - avg	1,046	976	540	192	135
20 x MZ Based GSI ⁽¹⁾	2,600	2,420	1,343	477	325

Notes

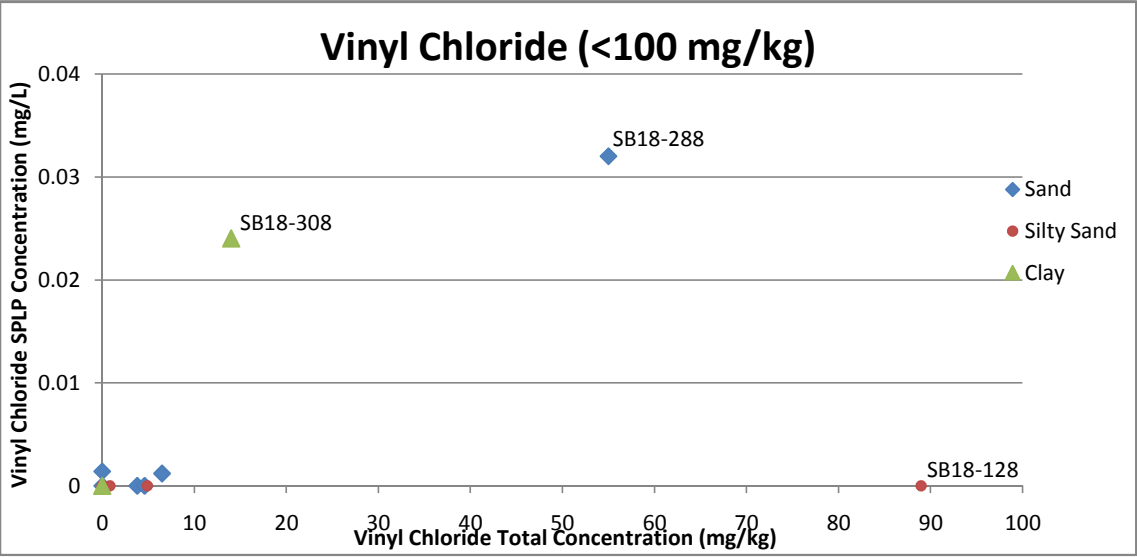
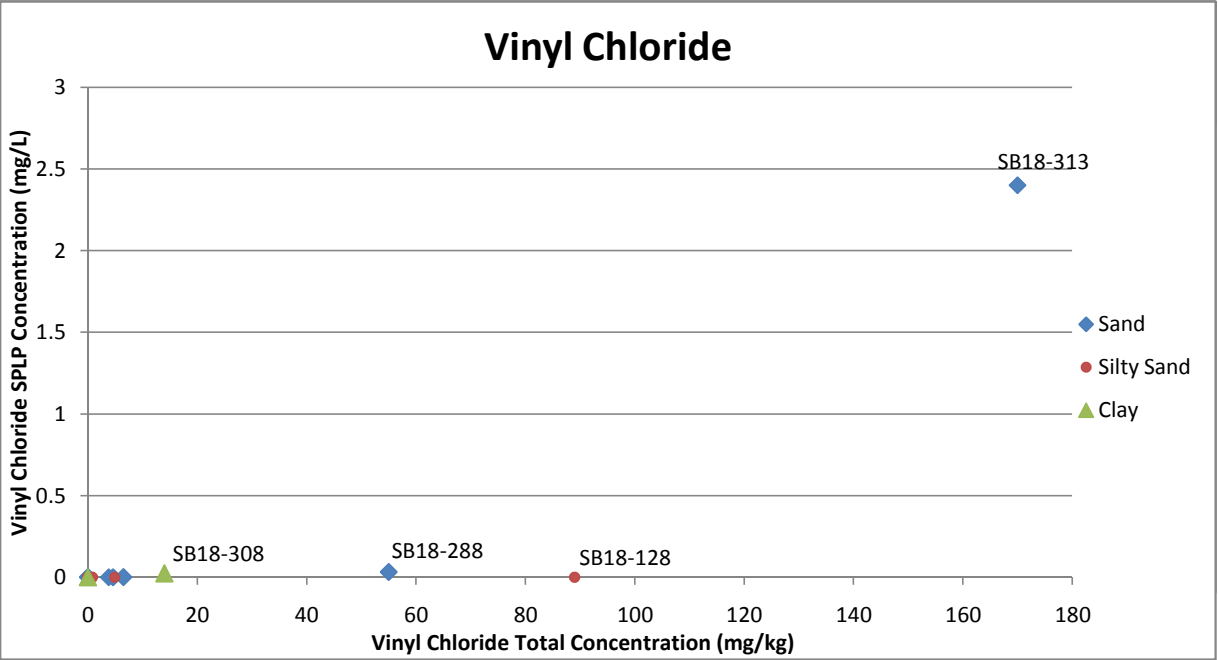
⁽¹⁾ Per March 2005 Michigan Department of Environmental Quality RRD Operational Memorandum No. 1 - Technical Support Document

Attachment 9 - Following calculation of the SWPV, that value is compared to 20X the mixing zone-based GSI criterion and the greater of the two becomes the GSIP criterion.

SPLP RESULTS SUMMARY

Soil Type Location		VC (mg/kg)	SPLP VC (mg/L)	Soil Type Location		VC (mg/kg)	SPLP VC (mg/L)
clay	SB18-313	0	0	sand	SB18-128	0	0.0014
clay	SB18-308	14	0.024	sand	SB18-288	0	0
silty sand	SB18-70	0	0	sand	SB18-128	3.8	0
silty sand	SB18-314	0	0	sand	SB18-288	4.6	0
silty sand	SB18-303	0.84	0	sand	SB18-292	6.5	0.0012
silty sand	SB18-296	4.9	0	sand	SB18-288	55	0.032
silty sand	SB18-128	89	0	sand	SB18-313	170	2.4

GRAPHICAL REPRESENTATION OF SPLP RESULTS



PROPOSED SOIL TARGET CONCENTRATION BASED ON DATA PRESENTED ABOVE



343 ppb

Value Included in RFP
Value calculated using most conservative stream flow
Value included in IMWP - based on value included in RFP

APPENDIX E2

BASIS FOR PCB REMEDIATION REQUIREMENTS

The Site is currently zoned as industrial and is fenced to restrict public access. Prior to or following completion of the RCRA Corrective Action at the Site, a restrictive covenant will be filed restricting the land use to non-residential use, to prohibit the direct use of groundwater and limit the relocation of soil and intrusive activities in several areas. A clean up level of 50 ppm is proposed based on the limited future use of PAOC 18 (industrial activities, no intrusive activities and no public access) and Site conditions following the implementation of the clean up (asphalt or top soil and seed, and limited access), which facilitate safe use of the Site and protection of human health and the environment.

As discussed in Section 2.3 of the IMWP, due to the removal of CVOCs as a driver for this interim measure, PCBs at concentrations less than 50 ppm will be removed and disposed of off-Site due to the commingled nature of the CVOC and PCB impacts. Based on the distribution of CVOCs at concentrations greater than Remediation Requirements that require removal, the majority of the PCB detections greater than 1 ppm will be removed from the Site and all of the PCB detections greater than 16 ppm (MDEQ Part 201 non-residential direct contact criteria) are expected to be removed.

To demonstrate that this level of removal will not present an unreasonable risk to human health and the environment, exposure pathways (listed in the MDEQ "Training Material for Part 201 Cleanup criteria and Part 213 Risk Based Screening Levels", dated June 2006) were evaluated, as follows:

Groundwater Pathways

A deed restriction, restricting the use of groundwater for any purpose will be recorded with the Washtenaw County Register of Deeds. A "Groundwater not in an Aquifer" designation was approved for the Site in September 1, 2004. As such, the drinking water pathways do not present an unreasonable risk to human health.

PCBs have not been detected in the groundwater recovered from French Drain that currently collects groundwater from within the sheet pile wall area. PCBs have been detected in groundwater at concentrations that exceed groundwater surface water interface criteria from three wells periodically (not consistently) within PAOC 18. All of these locations are within the planned excavation area. The interim measure is designed to remove debris and DNAPL from the AFR, therefore the source of the PCBs will be removed. As such, the adjacent surface water body will be protected from PCBs and with the removal of the free phase DNAPL, PCB concentrations will be below inhalation or groundwater contact criteria established under Michigan Act 451, Part 201.

Soil Pathways

Due to the deed restriction that will be placed on the Site as described above and the "Groundwater not in an Aquifer" designation, drinking water pathways relative to soil do not present an unreasonable risk to human health. With the removal of PCBs greater than 50 ppm and the additional removal of PCBs due to the commingled nature of the CVOCs, soil with PCB

concentrations above inhalation criteria established under Michigan Act 451, Part 201 will be removed. As such, inhalation pathways do not present an unreasonable risk to human health.

Furthermore, following the interim measure, PAOC 18 will be covered with either asphalt (parking lot area) or topsoil and seed (on the bank of the pond). As such, direct contact and soil run off to surface water pathways are not complete.

APPENDIX F

PCB REMEDIATION WASTE SUMMARY

APPENDIX F

PCB REMEDIATION SCOPE OF WORK

This Appendix summarizes the PCB remediation that will be completed as part of the PAOC 18 IMWP. The presence of PCBs, although not the regulatory driver to perform this interim measure, must be considered because they are commingled with VOCs and will be substantially removed from the Site as a result of this interim measure. This appendix does not present any information that was not included in the IMWP text. Rather, it serves to consolidate the components of the IMWP specific to addressing TSCA regulated PCBs.

HISTORY

Historically, waste material (including paint sludge and various drummed wastes) were dumped in various locations within the CVO Site during the 1940s and 1950s. This includes between the CVO fence line and Tyler Pond. Site investigations in the mid-2000s identified DNAPL (up to 1.5% PCBs), stained soils and additional buried debris present in this area.

TOXIC SUBSTANCES CONTROL ACT EVALUATION

The historical dumping which contaminated the CVO property took place in the 1940s and 1950s. Based on the Site history and review of aerial photographs, the PCBs were released into the environment prior to April 18, 1978 and according to 40 Code of Federal Regulations (CFR) 761.50(b)(3)(i)(A) are presumed not to present an unreasonable risk of injury to health or the environment unless the United States Environmental Protection Agency (U.S. EPA) Regional Administrator makes a finding that that such a risk exists. Data from PAOC 18 suggests that the PCBs are not mobile (i.e. PCBs have not been detected in the groundwater recovered from the sheet pile wall area French Drain); however, PCBs are present at significant levels in soils and DNAPL in PAOC 18. The driver for this interim measure is the mobility of CVOs in groundwater in this area, not the PCBs; although the presence of PCBs commingled with CVOs does present additional challenges to remedial efforts.

Based on review of the regulations including 40 CFR 761.50(b)(3)(i) and the age of the release, this interim measure (clean-up) may not need to comply with 40 CFR 761.61 (although the disposal of any waste material does) unless the U.S. EPA Regional Administrator makes a finding that an unreasonable risk exists. If the U.S. EPA Regional Administrator does make a finding that an unreasonable risk exists, the cleanup will be limited to the material with PCBs greater than 50 ppm. Soils remaining after the cleanup of PCBs greater than 50 ppm will not be subject to TSCA regulations or restrictions.

For waste disposal any soil material within the Area for Remediation (AFR) with pre-conditioning or pre-excavation PCB concentrations greater than 50 parts per million (ppm) will be disposed at a Toxic Substances Control Act (TSCA) facility. The required disposal facility for soils with PCB concentrations below 50 ppm will be determined by VOC concentrations present in the soil, but is not required to be a TSCA permitted facility.

This IMWP proposes several deviations from 40 CFR 761.61. The proposed modifications and the implementation of the proposed interim measure will address any risk posed by PCBs at the Site and will result in conditions that are protective of human health and the environment. These modifications include clean-up levels and a modified sampling program.

PCB REMEDIATION REQUIREMENTS

The PCB Remediation Requirement criteria (50 ppm) is based on the disposal of TSCA regulated PCBs. It should be noted that due to the widespread CVO impacts within the AFR, soils with PCB concentrations below 50 ppm will be removed where they are commingled with soil impacted by CVOs over the Remediation Requirements. With this removal, it is anticipated that the majority of material with PCBs

greater than 1 ppm will be removed from within the AFR and concentrations greater than 16 ppm (MDEQ non-residential direct contact criteria) are not expected to remain. PCB verification sampling will only be completed for areas identified with PCBs greater than 50 ppm. Appendix E provides additional details to demonstrate that this 50 ppm PCB clean up level will not present an unreasonable risk.

PCB DISTRIBUTION

In-situ concentrations of PCBs in soils within PAOC 18 range from non-detect (< 1 ppm) to 360 ppm. The maximum concentration of PCBs in soil was detected in a waste characterization sample after a drilling event, at a concentration of 648 ppm. Tables 2.1 through 2.5 provide tabulated total PCB data presented in five foot elevation lifts. Figures 2.22 through 2.26 show the 1, 25, 50 and 100 ppm PCB contours, using the soil analytical data collected to date. These figures represent a summary of the PCB concentrations in five foot elevation lifts within PAOC 18.

PCB IMPACTED SOIL (TSCA) REMOVAL SCOPE OF WORK

This section describes the means and methods to be used for CVOC impacted soils with PCBs greater than 50 ppm.

Following the removal of the reusable overburden and non-hazardous soils, the areas with known PCB concentrations greater than 50 ppm will be removed. Completing the removal of PCB impacted material at this stage will help prevent the potential for cross-contamination of areas with PCB concentrations less than 50 ppm during Task D and will also assist with locating free phase DNAPL. With the removal of this material, a low lying area (sump) will be created to allow for DNAPL accumulation, and removal, if present. By extracting accumulated liquids from the sump, which would be constructed into the existing clay, water control can be maintained throughout the excavation. This will assist with maintaining a dry excavation area and protects the pond from receiving impacted water that has passed through the excavation area.

VOLUME OF PCB IMPACTED SOIL (TSCA)

Figures 2.23 through 2.25 identify the areas where PCBs have been identified above 50 ppm. The volume of soil with PCB concentrations greater than 50 ppm needs to be further defined but at present is estimated between 550 – 1,000 CYD. This assumes that for the areas identified as greater than 50 ppm on Figures 2.23 through 2.25 the entire 5 foot interval is above 50 ppm. Additional proposed field characterization work scheduled to be performed in March 2013 will assist in better defining the outer limits of the area containing PCBs over 50 ppm. See below for additional details for the proposed additional sampling.

Figures 3.1, 3.2 and 3.3 show the expected extent of the TSCA (> 50 ppm) impacted soils, aerially and vertically. The aerial coverage is shown on Figures 3.1 and 3.2. The vertical coverage is shown on the bottom of Figure 3.2 with existing analytical data along the cross section lines. Figure 3.3 shows a cross section along A – A' from Figure 3.1, this shows the PCB distribution along with the approach for excavated soil surrounding the TSCA regulated soils (>50 ppm) (i.e. reuse or condition and dispose).

PCB SOIL EXCAVATION, MATERIAL HANDLING AND DISPOSAL

Although CVOCs are the primary regulatory driver to perform this interim measure the presence of PCBs must be considered in carrying out the interim measure. The impacts at the Site show the commingled nature of the CVOCs and PCBs due to the historic fill activities. Almost all of the soils with PCBs greater than 50 ppm exhibit CVOC concentrations that could make them RCRA characteristically hazardous wastes at the point of generation. Therefore, to minimize costs and the risks associated with long distance transportation of soils (i.e. to RCRA/TSCA incinerator in Texas) conditioning of the soils to remove hazardous waste characteristics within the AFR (AOC) prior to excavation and disposal is planned.

Using excavating equipment equipped with GPS instruments, soils with PCBs greater than 50 ppm as identified by existing data and the additional characterization data which will be collected as described in Section 3.4.3 will be conditioned and excavated for off-Site disposal at a TSCA permitted facility. The additional characterization sampling plan was designed such that the results of the investigation could be translated into physical limits (floor, ceiling, sidewall) that can be used by the excavator equipped with GPS instruments to accurately remove the soils impacted with PCBs greater than 50 ppm.

Appendix G provides details on how the soils will be conditioned. The conditioning of soils will reduce VOC concentrations; it is neither designed nor practical to significantly reduce PCB concentrations using this approach. The U.S. EPA has identified a concern with the potential for PCBs to be volatilized due to an increase in soil temperature during the conditioning. A detailed evaluation of the potential for volatilization of PCBs during conditioning and the planned monitoring method are presented in Appendix H.

The conditioning approach for areas with PCB concentrations greater than 50 ppm will not be handled any differently than the soils with PCBs less than 50 ppm, with the exception of the PCB verification sampling. Mixing of soils impacted with PCBs greater than 50 ppm associated with the conditioning will not impact the ultimate disposal facility for the soils based on their PCB concentrations; the soils will be disposed at a TSCA permitted disposal facility based on the premixing greater than 50 ppm concentration. The post-conditioned VOC concentrations will be used to determine whether the disposal facility must be a RCRA hazardous waste facility or not, in addition to TSCA permitted. Therefore the soils with PCB concentrations greater than 50 ppm, as determined by pre-mixing data, will be disposed at a TSCA permitted landfill or TSCA permitted incinerator based on the resulting post conditioning VOC concentrations. Additional details associated with the conditioning approach are provided in Appendix G.

The identified areas within the AFR with PCB concentrations greater than 50 ppm will be demarcated based on surveyed locations in the field. Based on the size of these areas, a grid system as described in Appendix G will be used to condition the soils. Based on the post conditioning concentration of the VOCs, the ultimate disposal facility for these soils will be as follows:

- Wayne Disposal, Inc. (WDI) for TSCA direct landfill if VOCs are less than 20 x Toxicity Characteristic RLs
- WDI for RCRA/TSCA direct landfill if VOCs are greater than 20 x Toxicity Characteristic RLs, and below Alternative Soil Treatment Standards and the concentration of PCBs are less than 100 ppm
- Veolia, Port Arthur, Texas – for high temperature incineration if either of the following conditions exist
 - o VOCs are greater than 20 x Toxicity Characteristic RLs and below Alternative Soil Treatment Standards and the concentration of PCBs are greater than 100 ppm
 - o VOCs are greater than 20 x Toxicity Characteristic RLs, and above Alternative Soil Treatment Standards and the concentration of PCBs are greater than 50 ppm

ADDITIONAL CHARACTERIZATION SOIL SAMPLING

Additional characterization data is required to better define the extent of soil requiring disposal at a TSCA permitted facility. Pre-excavation sampling allows for more efficient handling of the non-TSCA material above and adjacent to the TSCA regulated intervals.

Figure 3.1 and Table 3.1 provides a summary of the additional characterization sampling program. Samples will be collected at predetermined elevations as detailed in Table 3.1 to define the floor, side walls and ceiling of the areas where PCBs have been detected at or above 50 ppm. Figure 3.1 includes a cross section of the PCB areas that shows the vertical layout of the intervals impacted at concentrations greater than 50 ppm. This detail also identifies the vertical location of floor, side wall and ceiling sampling locations. Side wall samples will be collected along the midpoint of the 2.5 foot or 5 foot vertical interval.

The locations identified on Figure 3.1 and in Table 3.1 are approximately 10 – 15 feet apart along the estimated extent of 50 ppm contour. Floor and ceiling samples within the greater than 50 ppm contour line are approximately 15 feet apart. This spacing provides for sufficient delineation along with existing data to be protective of health and the environment, because all locations with over 50 ppm will be excavated including some areas of less than 50 ppm PCBs.

VERIFICATION SAMPLING

Results from the characterization sampling described above will be used as verification samples for the removal of material at concentrations greater than 50 ppm if all results are below the 50 ppm clean up criteria. If results from the characterization sampling show concentrations exceeding 50 ppm, additional sampling, (pre or post excavation), consistent with the approach used in the characterization sampling, will be completed where appropriate to verify the concentrations greater than 50 ppm have been removed.

If pre-excavation sampling is unable to verify below 50 ppm in a location, then additional soil (either vertically or laterally) will be removed during the excavation in that area prior to collecting additional verification samples.

TSCA NOTIFICATION AND CERTIFICATION

Appendix J provides a copy of the Notification of PCB Waste Activity Form (U.S. EPA Form 7710-53). Section 7.2.2 of the IMWP provides the TSCA certification consistent with 40 CFR 761.61 (a)(3)(i) (E).

APPENDIX G

SOIL CONDITIONING APPROACH

APPENDIX G

SOIL CONDITIONING APPROACH

Conditioning will involve in-place mixing of oxidants and activator within the excavation area. The conditioning (oxidants) reagents include Klozur persulfate manufactured by FMC Environmental Solutions (FMC), using lime as the activator, and potassium permanganate manufactured by Carus.

Persulfate will reduce concentrations of both CVOCs as well as hydrocarbons present due to the historic filling in this area. Therefore, this will be used first. If subsequent soil analysis shows that CVOCs are still above reuse or landfill disposal criteria, additional application of persulfate or potassium permanganate will be completed. The color change property of permanganates is useful in a field application to determine overall mixing efficiency, but permanganate is less effective when oxidizing hydrocarbons. Overall additions of either oxidant will be less than 2 percent by weight. Any individual or daily application will be less than 0.5 percent by weight.

The conditioning approach is described below:

- A three dimensional grid system, each cell measuring approximately 20' by 20' by 10' deep (or less if native clay encountered) will be used to mix and track VOC concentrations in soil. Each cell will represent approximately 150 cubic yards. This provides for manageable conditioning volumes and ability to track sample locations for conditioning confirmation and waste characterization.
- Conditioning will begin within each cell using lime (activator) and FMC's Klozur persulfate. The soils and reagents will be mixed throughout the each cell using the bucket of a hydraulic excavator by an operator experienced with on-Site conditioning activities. This process will include addition of water, which aids in the oxidation process and in preventing generation of dust.
- Progress samples will include composite and/or grab samples collected at random intervals in the cell to gauge the mixing effectiveness and to ascertain residual oxidant, VOC concentrations, and temperature. An on-Site lab with expedited turnaround time (TAT) will be utilized for the VOC analysis of these samples as stated below. Review of progress data will lead to a daily activity plan regarding the addition of more oxidant, moisture conditioning, and mixing. If concentrations of VOCs are above disposal criteria, then additional oxidant will only be added when soil temperatures are less than 125° F.
- When progress sample results suggest that VOC concentrations in soil meet waste disposal criteria, soil samples will be collected with the aid of an excavator bucket to verify VOC concentrations for waste disposal criteria.
- Since conditioning is not designed or expected to reduce or increase PCB concentrations in soil, PCB waste characterization samples may be collected earlier in the conditioning process once progress work suggests that the grid is thoroughly mixed. These waste characterization samples

will not render soils previously identified as TSCA to be non-TSCA regulated. The samples will be collected to verify PCB concentrations are below 50 ppm in areas outside the TSCA regulated zones for landfill acceptance of the wastes. This sampling also provides a concentration for the evaluation of LDRs if the conditioning is not able to reduce the VOC concentrations to RCRA characteristically non-hazardous levels. PCB laboratory analysis may be completed at an on-Site or off-Site laboratory.

- Progress and waste characterization samples will be submitted to an independent on-Site laboratory for analysis of VOCs. A key component of the approach requires using the on-Site laboratory to provide as close to real time analysis as possible. Results are typically available within 4 to 24 hours of sample collection. This facilitates decisions regarding additional conditioning and final disposition of soil without incurring costly delays for standby time and handling of reagents. It also provides data before the point of waste generation.
- Typically, there are a minimum of two mix events before soil is conditioned well enough to meet landfill disposal criteria. A map will be prepared daily that shows the location of cells that were mixed that day along with lab results. This process will track the success of on-Site conditioning on a daily basis and ensure that only soil that meets disposal criteria is removed from the AFR.
- Conditioned soil will remain in the excavation area, until on-Site laboratory analyses of soil samples from that cell verify that the soil meets one of the following conditions:
 - a) Contains total VOC concentrations less than 20 x Toxicity Characteristic RLs.
 - b) Cannot be reasonably conditioned to below non-hazardous disposal requirements.

If non-TSCA soils meet item a, above, they will be loaded into trucks for disposal or staged near the southern limit of the remedial excavation area, if needed for better logistical control of export to the landfill. Post-conditioning verification sample results will be submitted to disposal facilities for approval prior to scheduling shipment. Waste characterization profiles for each type of waste will be prepared and submitted to the landfills prior to beginning the excavation. The verification results will be required by the landfill to identify that soil meets the profile requirements. Republic's Carlton Farms Landfill is the planned subtitle D landfill for disposal of non-hazardous soils.

For non-TSCA soil cells that cannot be reduced to non-hazardous disposal criteria with reasonable effort (item b above), sample results will be compared to the Alternative Soil Treatment Standards and, if achieved, will be disposed at WDI, a subtitle C hazardous waste landfill. RCRA-impacted soils that exceed the Alternative Soil Treatment Standards will be evaluated and profiled for treatment at Michigan Disposal, Inc. (MDI), a Part B RCRA treatment facility for treatment prior to disposal. If WDI and MDI cannot accept the waste, soils will be sent to Veolia in Port Arthur, Texas following similar waste profile verification process. If needed for waste profiling, additional samples will be collected and submitted for off-Site laboratory analysis for TCLP or total VOCs, SVOCs, PCB or metals.

MATERIAL SAFETY DATA SHEET

Klozur®



MSDS Ref. No.: 7775-27-1-12

Date Approved: 05/13/2009

Revision No.: 5

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	Klozur®
SYNONYMS:	Sodium Persulfate, Sodium Peroxydisulfate; Disodium Peroxydisulfate
GENERAL USE:	In situ and ex situ chemical oxidation of contaminants and compounds of concern for environmental remediation applications.

MANUFACTURER

FMC CORPORATION
FMC Peroxygens
1735 Market Street
Philadelphia, PA 19103
(215) 299-6000 (General Information)
msdsinfo@fmc.com (Email - General Information)

EMERGENCY TELEPHONE NUMBERS

(303) 595-9048 (Medical - U.S. - Call Collect)

For leak, fire, spill, or accident emergencies, call:
(800) 424-9300 (CHEMTREC - U.S.A. & Canada)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- White, odorless, crystals
- Oxidizer.
- Decomposes in storage under conditions of moisture (water/water vapor) and/or excessive heat causing release of oxides of sulfur and oxygen that supports combustion. Decomposition could form a high temperature melt. See Section 10 ("Stability and Reactivity").

POTENTIAL HEALTH EFFECTS: Airborne persulfate dust may be irritating to eyes, nose, lungs, throat and skin upon contact. Exposure to high levels of persulfate dust may cause difficulty in breathing in sensitive persons.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt. %	EC No.	EC Class
Sodium Persulfate	7775-27-1	>99	231-892-1	Xn-O; R8-R22-R36/37/38-R42/43

4. FIRST AID MEASURES

EYES: Flush with plenty of water. Get medical attention if irritation occurs and persists.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, contact a medical doctor.

NOTES TO MEDICAL DOCTOR: This product has low oral toxicity and is not irritating to the eyes and skin. Flooding of exposed areas with water is suggested. For gastric lavage or emesis induction, consider the possible aggravation of esophageal injury, and the expected absence of system effects. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Deluge with water.

FIRE / EXPLOSION HAZARDS: Product is non-combustible. On decomposition releases oxygen which may intensify fire. Presence of water accelerates decomposition.

FIRE FIGHTING PROCEDURES: Do not use carbon dioxide or other gas filled fire extinguishers; they will have no effect on decomposing persulfates. Wear full protective clothing and self-contained breathing apparatus.

FLAMMABLE LIMITS: Non-combustible

SENSITIVITY TO IMPACT: No data available

SENSITIVITY TO STATIC DISCHARGE: Not available

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Spilled material should be collected and put in approved DOT container and isolated for disposal. Isolated material should be monitored for signs of decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water and dispose as a hazardous waste. All disposals should be carried out according to regulatory agencies procedures.

7. HANDLING AND STORAGE

HANDLING: Use adequate ventilation when transferring product from bags or drums. Wear respiratory protection if ventilation is inadequate or not available. Use eye and skin protection. Use clean plastic or stainless steel scoops only.

STORAGE: Store (unopened) in a cool, clean, dry place away from point sources of heat, e.g. radiant heaters or steam pipes. Use first in, first out storage system. Avoid contamination of opened product. In case of fire or decomposition (fuming/smoking) deluge with plenty of water to control decomposition. For storage, refer to NFPA Bulletin 430 on storage of liquid and solid oxidizing materials.

COMMENTS: VENTILATION: Provide mechanical general and/or local exhaust ventilation to prevent release of dust into work environment. Spills should be collected into suitable containers to prevent dispersion into the air.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Sodium Persulfate	0.1 mg/m ³ (TWA)		

ENGINEERING CONTROLS: Provide mechanical local general room ventilation to prevent release of dust into the work environment. Remove contaminated clothing immediately and wash before reuse.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Use cup type chemical goggles. Full face shield may be used.

RESPIRATORY: Use approved dust respirator when airborne dust is expected.

PROTECTIVE CLOTHING: Normal work clothes. Rubber or neoprene footwear.

GLOVES: Rubber or neoprene gloves. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	None
APPEARANCE:	White crystals
AUTOIGNITION TEMPERATURE:	Not applicable. No evidence of combustion up to 800°C. Decomposition will occur upon heating.
BOILING POINT:	Not applicable
COEFFICIENT OF OIL / WATER:	Not applicable
DENSITY / WEIGHT PER VOLUME:	Not available
EVAPORATION RATE:	Not applicable (Butyl Acetate = 1)
FLASH POINT:	Non-combustible
MELTING POINT:	Decomposes
ODOR THRESHOLD:	Not applicable
OXIDIZING PROPERTIES:	Oxidizer
PERCENT VOLATILE:	Not applicable
pH:	typically 5.0 - 7.0 @ 25 °C (1% solution)
SOLUBILITY IN WATER:	73 % @ 25 °C (by wt.)
SPECIFIC GRAVITY:	2.6 (H ₂ O=1)
VAPOR DENSITY:	Not applicable (Air = 1)
VAPOR PRESSURE:	Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Heat, moisture and contamination.
STABILITY:	Stable (becomes unstable in presence of heat, moisture and/or contamination).
POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Acids, alkalis, halides (fluorides, chlorides, bromides and iodides), combustible materials, most metals and heavy metals, oxidizable materials, other oxidizers, reducing agents, cleaners, and organic or carbon containing compounds. Contact

with incompatible materials can result in a material decomposition or other uncontrolled reactions.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxygen that supports combustion and oxides of sulfur.

COMMENTS: PRECAUTIONARY STATEMENT: Pumping and transport of Klozur persulfate requires appropriate precautions and design considerations for pressure and thermal relief.

Decomposing persulfates will evolve large volumes of gas and/or vapor, can accelerate exponentially with heat generation, and create significant and hazardous pressures if contained and not properly controlled or mitigated.

Use with alcohols in the presence of water has been demonstrated to generate conditions that require rigorous adherence to process safety methods and standards to prevent escalation to an uncontrolled reaction.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Non-irritating (rabbit) [FMC Ref. ICG/T-79.029]

SKIN EFFECTS: Non-irritating (rabbit) [FMC Ref. ICG/T-79.029]

DERMAL LD₅₀: > 10 g/kg [FMC Ref. ICG/T-79.029]

ORAL LD₅₀: 895 mg/kg (rat) [FMC Ref. ICG/T-79.029]

INHALATION LC₅₀: 5.1 mg/l (rat) [FMC Ref. I95-2017]

SENSITIZATION: May be sensitizing to allergic persons. [FMC Ref. ICG/T-79.029]

TARGET ORGANS: Eyes, skin, respiratory passages

ACUTE EFFECTS FROM OVEREXPOSURE: Dust may be harmful and irritating. May be harmful if swallowed.

CHRONIC EFFECTS FROM OVEREXPOSURE: Sensitive persons may develop dermatitis and asthma [Respiration 38:144, 1979]. Groups of male and female rats were fed 0, 300 or 3000 ppm sodium persulfate in the diet for 13 weeks, followed by 5000 ppm for 5 weeks. Microscopic examination of tissues revealed some injury to the gastrointestinal tract at the high dose (3000 ppm) only. This effect is not unexpected for an oxidizer at high concentrations. [Ref. FMC I90-1151, Toxicologist 1:149, 1981].

CARCINOGENICITY:

NTP:	Not listed
IARC:	Not listed
OSHA:	Not listed
OTHER:	ACGIH: Not listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

Bluegill sunfish, 96-hour LC_{50} = 771 mg/L [FMC Study I92-1250]
Rainbow trout, 96-hour LC_{50} = 163 mg/L [FMC Study I92-1251]
Daphnia, 48-hour LC_{50} = 133 mg/L [FMC Study I92-1252]
Grass shrimp, 96-hour LC_{50} = 519 mg/L [FMC Study I92-1253]

CHEMICAL FATE INFORMATION: Biodegradability does not apply to inorganic substances.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose as a hazardous waste in accordance with local, state and federal regulatory agencies.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME:	Sodium Persulfate
PRIMARY HAZARD CLASS / DIVISION:	5.1 (Oxidizer)
UN/NA NUMBER:	UN 1505
PACKING GROUP:	III
LABEL(S):	5.1 (Oxidizer)
PLACARD(S):	5.1 (Oxidizer)
MARKING(S):	Sodium Persulfate, UN 1505
ADDITIONAL INFORMATION:	Hazardous Substance/RQ: Not applicable

49 STCC Number: 4918733

This material is shipped in 225 lb. fiber drums, 55 lb. poly bags and 1000 - 2200 lb. IBC's (supersacks).

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PROPER SHIPPING NAME:

Sodium Persulfate

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) / INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

PROPER SHIPPING NAME:

Sodium Persulfate

OTHER INFORMATION:

Protect from physical damage. Do not store near acids, moisture or heat.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):

Not applicable

SECTION 311 HAZARD CATEGORIES (40 CFR 370):

Fire Hazard, Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):

The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:

None

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):

There are no ingredients in this product, which are subject to Section 313 reporting requirements.

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):

Unlisted, RQ = 100 lbs., Ignitability

TSCA (TOXIC SUBSTANCE CONTROL ACT)**TSCA INVENTORY STATUS (40 CFR 710):**

All components are listed or exempt.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)**RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):**

Waste Number: D001

CANADA**WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Hazard Classification / Division: C
D2A
D2B

Domestic Substance List: All components are listed or exempt.

INTERNATIONAL LISTINGS

Australia (AICS): Listed
China: Listed
Japan (ENCS): (1)-1131
Korea: KE-12369
Philippines (PICCS): Listed

HAZARD AND RISK PHRASE DESCRIPTIONS:

EC Symbols:	Xn	(Harmful)
	O	(Oxidizer)
EC Risk Phrases:	R8	(Contact with combustible material may cause fire)
	R22	(Harmful if swallowed.)
	R36/37/38	(Irritating to eyes, respiratory system and skin.)
	R42/43	(May cause sensitization by inhalation or by skin contact.)

16. OTHER INFORMATION

HMIS

Health	1
Flammability	0
Physical Hazard	1
Personal Protection (PPE)	J

Protection = J (Safety goggles, gloves, apron & combination dust & vapor respirator)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:

4 = Severe

3 = Serious

2 = Moderate

1 = Slight

0 = Minimal

NFPA

Health	1
Flammability	0
Reactivity	1
Special	OX

SPECIAL = OX (Oxidizer)

NFPA (National Fire Protection Association)

Degree of Hazard Code:

4 = Extreme

3 = High

2 = Moderate

1 = Slight

0 = Insignificant

REVISION SUMMARY:

This MSDS replaces Revision #4, dated September 18, 2006.

Changes in information are as follows:

Section 1 (Product and Company Identification)

Section 3 (Composition / Information on Ingredients)

Section 15 (Regulatory Information)

Section 16 (Other Information)

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WesternLime

MSDS – Material Safety Data sheet
High Calcium Pebble Lime
(Calcium Oxide)

- 1 -

I. Product and Company Information

Created on 6/19/06

Manufacturer: Western Lime Corporation Information: 800-433-0036
206 N. 6th Avenue
West Bend, WI 53095

Chemical Name Calcium Oxide	Chemical Family Alkaline earth oxide	Chemical Formula Mostly CaO
Molecular weight CaO = 56.08	Trade Names/Synonyms Quicklime, (Pebble)Lime, Calcium Oxide	Material Use Flux, Caustic agent, pH adjustment, absorption

II. Composition and Information on Ingredients

Component	CAS#	Exposure Limits	% by weight
Calcium Oxide	1305-78-8	OSHA PEL: 5 mg/m ³ ACGH TLV: 2mg/m ³	> 90%
Magnesium Oxide	1309-48-4	OSHA PEL: 15 mg/m ³ ACGIH TLV: 10 mg/m ³	< 2.0%
Crystalline Silica	14808-60-7	OSHA PEL: <u>10 mg/m³</u> (% SiO ₂ resp +2) ACGIH TLV: 0.025 mg/m ³	N/A

III. Hazards Identification

Emergency Overview: Quicklime is an odorless white or greyish-white granular powder. Contact can cause irritation to eyes, skin, respiratory system, and gastrointestinal tract. Quicklime reacts violently with water, releasing sufficient heat to ignite combustible materials.

Eyes: Contact can cause severe irritation or burning of eyes, including permanent damage.

Skin: Contact can cause severe irritation or burning of skin, especially in the presence of moisture.

Ingestion: This product can cause severe irritation or burning of gastro-intestinal tract if swallowed

Inhalation: This product can cause severe irritation of the respiratory system. Long-term exposure may cause permanent damage. Quicklime is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain crystalline silica, which has been classified by IARC as (Group I) carcinogenic to humans when inhaled in the form of quartz or cristobalite. Inhalation of silica can cause a chronic lung disorder, silicosis.

Medical Conditions Aggravated by Exposure: Contact may aggravate disorders of eyes, skin, gastrointestinal tract, and respiratory system.

Potential Environmental Effects: This material is alkaline and if released into water or soil will cause and increase in its pH.

IV. First Aid Measures

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes. Pull back the eyelid to make sure all the lime dust has been washed out.

Skin: Flush exposed area with large amounts of water. Seek medical attention immediately.

Inhalation: Remove to fresh air. Seek medical attention if necessary. If breathing has stopped, give artificial respiration.

Ingestion: Give large quantities of water or fruit juice. Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing.

Note to Physicians: Provide general supportive measures and treat symptomatically.



MSDS – Material Safety Data sheet
High Calcium Pebble Lime
(Calcium Oxide)

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V. Fire Fighting Measures	
Fire Hazards:	Quicklime is not combustible or flammable. However, quicklime reacts violently with water, releasing sufficient heat to ignite combustible materials in certain instances. Quicklime is not an explosion hazard, although reaction with water or other incompatible materials causes the material to swell and may rupture containers.
Hazardous Combustion Products:	None Identified.
Extinguishing Media:	Use dry chemical fire extinguisher. Do not use water or halogenated compounds, except that water may be used to deluge small amounts of quicklime.
Fire Fighting Instructions:	Keep personnel removed from and upwind of fire. Wear full fire-fighting turn-out gear(full Bunker gear), and respiratory protection (SCBA)

VI. Accidental Release Measures	
Spill/Leak Procedures:	DO NOT use water on bulk material spills. Lime Reacts violently with water, producing heat. Use proper protective equipment.
Small Spills:	Use dry methods to collect spilled materials. Do not clean up with compressed air. Store spilled materials in dry, sealed plastic or metal containers. Surfaces contaminated with residual amounts may be water washed.
Large Spills:	Use dry methods to collect spilled materials. Evacuate area down wind of clean-up operations to avoid dust exposure. Store spilled materials in dry, sealed plastic or metal containers.
Containment:	For large spills, as much as possible avoid the generation of dusts. Do not release into sewers or waterways.
Cleanup:	Residual amounts can be flushed with large amounts of water. Equipment can be decontaminated by washing with either a mild vinegar and water solution, or detergent and water solution.

VII. Handling and Storage	
Handling:	Keep in tightly closed containers. Protect from physical damage. Avoid direct contact with material.
Storage:	Store in a cool, dry and well ventilated location. Do not store near incompatible materials. Keep away from moisture. Do not store or ship in aluminum containers.

VIII. Exposure controls/Personal Protection Equipment	
Personal Protective Equipment (PPE)	Wear clean, dry gloves, full length pants over boots, long sleeved shirt buttoned at the neck, head protection and approved eye protection selected for the working conditions.
Gloves	Gauntlets cuff style
Respiratory	NIOSH approved filtering anti-dust mask
Eyes	Tight fitting goggles/glasses with side shield
Footwear	Resistant to caustics
Clothing	Fully covering skin



WesternLime

MSDS – Material Safety Data sheet
High Calcium Pebble Lime
(Calcium Oxide)

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IX. Physical and chemical properties

Physical State: Solid	Appearance: White granular substance	Odor: No Odor	Specific Gravity: 3.2 – 3.4
Boiling Point: 5162 F, 2850 C	Vapor Pressure: N/A	pH (25° C): Sat Soln CaO: 12.45	Density (kg/m3): 720 - 1130
Melting Point: 4658 F, 2570 C	Vapor Density: N/A	Solubility in Water: 0.125/100 g Sat.soln	Freezing Point: 2580 C

X. Stability and Reactivity

Stability:	Chemically stable, but reacts rapidly with water to form calcium hydroxide, generating heat.
Incompatibility/Conditions to avoid:	Quicklime should not be mixed or stored with the following materials, due to the potential for violent reaction and release of heat. Water, Acids, Reactive Fluorinated Compounds, Reactive Brominated Compounds, Reactive Powdered Metals, Organic Acid Anhydrides, Nitro-Organic Compounds, Reactive Phosphorous Compounds.
Hazardous Decomposition Products:	None
Hazardous Polymerization:	None

XI. Toxicological Information

No LD50/LC50 have been identified for this products components. Quicklime is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain crystalline silica, which has been classified by IARC as (Group I) carcinogenic to humans when inhaled in the form of quartz or cristobalite.

XII. Ecological Information

Ecotoxicity:	Because of the high pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.
Environmental Fate:	This material shows no bioaccumulation or food chain toxicity potential.

XIII. Disposal Considerations:

Dispose of in accordance with all applicable federal, state, and local environmental regulations. If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation Act

XIV. Transportation Information

Quicklime is not classified as a hazardous material by DOT when transported
When being transported by air, quicklime is classified in the Department of Transportation (DOT) regulations as a hazardous material. (49 CFR 172, Table 172.101:Calcium Oxide by aircraft only. Class 8 Corrosives. PIN UN1910. Packing Group III. Maximum Net per package – passenger vehicles, 25 kg.)



WesternLime

MSDS – Material Safety Data sheet
High Calcium Pebble Lime
(Calcium Oxide)

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XV. Regulatory Information	
EPA Regulations	
RCRA Hazardous Waste Number (40 CFR 261.33)	Not Listed
RCRA Hazardous Waste Classification (40 CFR 261)	Not Listed
CERCLA Hazardous Substance (40 CFR 261)	Not Listed
CERLA Reportable Quantity (RQ)	Not Listed
SARA 311/312 codes	Not Listed
Sara Toxic Chemical (40 CFR 372.65)	Not Listed
SARA EHS (Extremely Hazardous Substance) (40 CFR 355)	Not Listed
Threshold Planning Quantity (TPQ)	Not Listed
All components are listed on the USEPA TSCA Inventory List	
OSHA/MSHA Regulations	
Air Contaminant (29 CFR 1910.1000, Table Z-1)	Not Listed
MSHA	Not Listed
OSHA Specifically Regulated Substance (29CFR 1910)	Not Listed
State Regulations: Consult state and local authorities for guidance	
Canadian Environmental Protection Act (CEPA)	
Domestic Substances List	Listed

XVI. Other Information		
HMIS	Health Risks	1
	Flammability	0
	Reactivity	1
	Personal Protection	E
NFPA	Health Hazard	3
	Fire Hazard	0
	Reactivity	1
WHIMS Classification	"E" Corrosive Materials	
WHIMS Classification	"D2A" Materials Causing Other toxic effects	



RemOx®S

ISCO Reagent

EC- SAFETY DATA SHEET according to Regulation (EC) № 1907/2006 of the European Parliament and of the Council, of 18 December 2006 concerning REACH

MATERIAL SAFETY DATA SHEET

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Section 1 Chemical Product and Company Identification

PRODUCT NAME: RemOx® S ISCO Reagent TRADE NAME: RemOx® S ISCO Reagent		Revised Date: April 2008
USES OF SUBSTANCE: RemOx® S ISCO Reagent is an oxidant recommended for applications that require a strong oxidant.		
COMPANY NAME (Europe): CARUS NALON S.L.	COMPANY ADDRESS: Carus Nalon S.L. Barrio Nalon, s/n 33100 Trubia-Oviedo Espana, Spain	
COMPANY NAME (US): CARUS CORPORATION	INFORMATION: (34) 985-785-513 (34) 985-785-513 www.caruseurope.com (Web) carus@carusnalon.com (Email)	
	EMERGENCY TELEPHONE: (34) 985-785-513	
	COMPANY ADDRESS: 315 Fifth Street Peru, IL 61354, USA	
	INFORMATION: (815)-223-1500 www.caruscorporation.com (Web) salesmkt@caruscorporation.com (Email)	
	EMERGENCY TELEPHONE: (800) 435 -6856 (USA) (800) 424-9300 (CHEMTREC, USA) (815-223-1500 (Other countries)	

Section 2 Hazards Identification

1. **EYE CONTACT**

RemOx® S ISCO Reagent is damaging to eye tissue on contact. It may cause severe burns that result in damage to the eye.

2. **SKIN CONTACT**

Contact of solutions at room temperature may be irritating to the skin, leaving brown stains.
Concentrated solutions at elevated temperature and crystals are damaging to the skin.

3. **INHALATION**

Acute inhalation toxicity data are not available. However, airborne concentrations of RemOx® S ISCO Reagent the form of dust or mist may cause damage to the respiratory tract.

4. **INGESTION**

RemOx® S ISCO Reagent , if swallowed, may cause severe burns to mucous membranes of the mouth, throat, esophagus, and stomach.



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Section 3 Hazardous Ingredients

<u>MATERIAL OR COMPONENT</u>	<u>CAS NO.</u>	<u>EINECS</u>	<u>HAZARD DATA</u>
Potassium Permanganate	7722-64-7	231-760-3	PEL/C 5 mg Mn per cubic meter of air TLV-TWA 0.2 mg Mn per cubic meter of air
<u>HAZARD SYMBOLS:</u>			
			
O	Xn	N	
<u>RISK PHRASES:</u>			
8	Contact with combustibles may cause fire.		
22	Harmful if swallowed.		
50/53	Very toxic to aquatic organisms, may cause long-term effects in the aquatic environment.		
<u>SAFETY PHRASES:</u>			
60	This material and its container must be disposed of as hazardous waste.		
61	Avoid releases to the environment. Refer to special instructions / Safety data sheet.		

Section 4 First Aid Measures

1. EYES

Immediately flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Do not attempt to neutralize chemically. Seek medical attention immediately. **Note to physician:** Soluble decomposition products are alkaline. Insoluble decomposition product is brown manganese dioxide.

2. SKIN

Immediately wash contaminated areas with water. Remove contaminated clothing and footwear. Wash clothing and decontaminate footwear before reuse. Seek medical attention immediately if irritation is severe or persistent.

3. INHALATION

Remove person from contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. Seek medical attention immediately.

4. INGESTION

Never give anything by mouth to an unconscious or convulsing person. If person is conscious, give large quantities of water. Seek medical attention immediately.



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Section 5 Fire Fighting Measures

NFPA* HAZARD SIGNS

Health Hazard	1	=	Materials which under fire conditions would give off irritating combustion products. (less than 1 hour exposure) Materials that on the skin could cause irritation.
Flammability Hazard	0	=	Materials that will not burn.
Reactivity Hazard	0	=	Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special Hazard	OX	=	Oxidizer

***National Fire Protection Association 704 (USA)**

FIRST RESPONDERS:

Wear protective gloves, boots, goggles, and respirator. In case of fire, wear positive pressure breathing apparatus. Approach incident with caution.

FLASHPOINT

None

FLAMMABLE OR EXPLOSIVE LIMITS EXTINGUISHING MEDIA

Lower: Nonflammable Upper: Nonflammable
Use large quantities of water. Water will turn pink to purple if in contact with RemOx® S ISCO Reagent. Dike to contain. Do not use dry chemicals, CO₂ Halon® or foams.

SPECIAL FIREFIGHTING PROCEDURES

If material is involved in fire, flood with water. Cool all affected containers with large quantities of water. Apply water from as far a distance as possible. Wear self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION

Powerful oxidizing material. May decompose spontaneously if exposed to heat (150°C / 302°F). May be explosive in contact with certain other chemicals (Section 10). May react violently with finely divided and readily oxidizable substances. Increases burning rate of combustible material.

Section 6 Accidental Release Measures

PERSONAL PRECAUTIONS:

Ensure adequate ventilation. Avoid dust formation. Avoid inhalation and contact with eyes and skin. Personnel should wear protective clothing suitable for the task. Remove all ignition sources and incompatible materials before attempting clean up.

ENVIRONMENTAL PRECAUTIONS:

Do not flush into sanitary sewer system or surface water. If accidental release into the environment occurs, inform the responsible authorities. Keep the product away from drains, sewers, surface and ground water and soil.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Clean up spills immediately by sweeping or shoveling up the material. Do not return spilled material to the original container – transfer to a clean metal drum. To clean contaminated surfaces or floors, flush with abundant quantities of water into sewer, if permitted by federal, state, and local regulations - if not, collect water and treat chemically (Section 13).



RemOx®S

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Section 7 Handling and Storage

WORK/HYGIENIC PRACTICES

Wash hands thoroughly with soap and water after handling RemOx® S ISCO Reagent. Do not eat, drink or smoke when working with RemOx® S ISCO Reagent. Wear proper protective equipment. Remove clothing, if it becomes contaminated.

VENTILATION REQUIREMENTS

Provide sufficient mechanical and/or local exhaust to maintain exposure below the TLV/TWA.

CONDITIONS FOR SAFE STORAGE

Store in accordance with NFPA 430 requirements for Class II oxidizers. Protect containers from physical damage. Store in a cool, dry area in closed containers. Segregate from acids, peroxides, formaldehyde, and all combustible, organic, or easily oxidizable materials including antifreeze and hydraulic fluid.

Section 8 Exposure Controls and Personal Protection

RESPIRATORY PROTECTION

In cases where overexposure to dust may occur, the use of an approved NIOSH-MSHA dust respirator or an air supplied respirator is advised. Engineering or administrative controls should be implemented to control dust

EYE

Faceshield, goggles, or safety glasses with side shields should be worn. Provide eyewash in working area.

GLOVES

Rubber or plastic gloves should be worn.

OTHER PROTECTIVE EQUIPMENT

Normal work clothing covering arms and legs, and rubber, or plastic apron should be worn.

Section 9 Physical and Chemical Properties

APPEARANCE AND ODOR

Dark purple solid with metallic luster, odorless

BOILING POINT, 760 mm Hg

Not applicable

VAPOR PRESSURE (mm Hg)

Not applicable

SOLUBILITY IN WATER % BY SOLUTION

6% at 20°C (68°F) and 20% at 65°C (149°F)

PERCENT VOLATILE BY VOLUME

Not volatile

EVAPORATION RATE

Not applicable

MELTING POINT

Starts to decompose with evolution of oxygen (O₂) at temperatures above 150°C (302°F). Once initiated, the decomposition is exothermic and self-sustaining.

SPECIFIC GRAVITY

2.7 at 20°C (68°F)

BULK DENSITY

Approximately 1.45 - 1.6 kg / l

VAPOR DENSITY (AIR=1)

Not applicable

OXIDIZING PROPERTIES

Strong oxidizer



RemOx®S

ISCO Reagent

EC- SAFETY DATA SHEET according to Regulation (EC) № 1907/2006 of the European Parliament and of the Council, of 18 December 2006 concerning REACH

MATERIAL SAFETY DATA SHEET

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Section 10 Stability and Reactivity

STABILITY	Under normal conditions, the material is stable.
CONDITIONS TO AVOID	Contact with incompatible materials or heat (150°C / 302°F) could result in violent exothermic chemical reaction.
INCOMPATIBLE MATERIALS	Acids, peroxides, formaldehyde, anti-freeze, hydraulic fluids and all combustible organic or readily oxidizable inorganic materials including metal powders. With hydrochloric acid, chlorine gas is liberated.
HAZARDOUS DECOMPOSITION PRODUCTS	When involved in a fire, RemOx® S ISCO Reagent may liberate corrosive fumes.
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	Material is not known to polymerize.

Section 11 Toxicological Information

POTASSIUM PERMANGANATE:

1. ACUTE TOXICITY

INGESTION:

LD 50 oral rat: 780 mg/kg male (14 days); 525 mg/kg female (14 days).

Harmful if swallowed. ALD: 10g. Ingestion may cause nausea, vomiting, sore throat, stomach-ache and eventually lead to a perforation of the intestine. Liver and kidney injuries may occur.

SKIN CONTACT:

LD 50 dermal no data available.

The product may be absorbed into the body through the skin. Major effects of exposure: severe irritation, brown staining of skin.

INHALATION:

LC 50 inhalation: No data available.

The product may be absorbed into the body by inhalation. Major effects of exposure: respiratory disorder, cough.

2. CHRONIC TOXICITY

No known cases of chronic poisoning due to permanganates have been reported. Prolonged exposure, usually over many years, to heavy concentrations of manganese oxides in the form of dust and fumes may lead to chronic manganese poisoning, chiefly involving the central nervous system.

3. CARCINOGENICITY

Potassium permanganate has not been classified as a carcinogen by ACGIH, NIOSH, OSHA, NTP, or IARC.

4. MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Potassium permanganate solution will cause further irritation of tissue, open wounds, burns or mucous membranes.



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Section 12 Ecological Information

ENTRY TO THE ENVIRONMENT

Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble MnO_2 .

BIOCONCENTRATION POTENTIAL

In non-reducing and non-acidic environments, MnO_2 is insoluble and has a very low bioaccumulative potential.

AQUATIC TOXICITY

The toxicity data for Potassium permanganate is given below:

Rainbow trout, 96 hour LC_{50} :	1.8 mg/L
Bluegill sunfish, 96 hour LC_{50} :	2.3 mg/L
Milk fish (Chanos Chanos)/ 96 hour LC_{50} :	>1.4mg/l

Section 13 Disposal Considerations

Offer surplus and non-recyclable product or solutions to a licensed disposal company.

Reduce RemOx® S ISCO Reagent in aqueous solutions with sodium thiosulfate, a bisulfite or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Decant or filter and deposit sludge in approved landfill. Where permitted, the sludge may be drained into sewer with large quantities of water. Contact Carus Corporation for additional recommendations.

Packaging materials must be triple rinsed to remove all RemOx® S ISCO Reagent prior to re-cycling or disposal.

Section 14 Transport Information

USA (land, D.O.T.)	Proper Shipping Name: 49 CFR172.101....Potassium Permanganate Hazard Class: 49 CFR172.101....Oxidizer ID Number: 49 CFR172.101....UN 1490 Packing Group: 49 CFR172.101....II Division: 49 CFR172.101....5.1
European Labeling in accordance Road/Rail Transport (ADR/RID)	ID Number: UN 1490 ADR/RID Class 5.1 Description of Goods: Potassium Permanganate Hazard Identification No. 50
European Labeling in accordance with EC directive (Water, I.M.O.)	Proper Shipping Name: Potassium Permanganate Hazard Class: Oxidizer ID Number: UN 1490 Packing Group: II Division: 5.1 Marine Pollutant: No



RemOx®S

ISCO Reagent

EC- SAFETY DATA SHEET according to Regulation (EC) № 1907/2006 of the European Parliament and of the Council, of 18 December 2006 concerning REACH

MATERIAL SAFETY DATA SHEET

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Section 14 Transport Information (contd.)

European Labeling in accordance with EC directive (Air, I.C.A.O.)	Proper Shipping Name:	Potassium Permanganate
	Hazard Class:	Oxidizer
	ID Number:	UN 1490
	Packing Group:	II
	Division:	5.1

Section 15 Regulatory Information

EUROPEAN AND INTERNATIONAL REGULATIONS:

MARKINGS ACCORDING TO EU GUIDELINES:

The product has been classified and marked in accordance with EU directives/ordinances on hazardous materials.

CHEMICAL NAME

Potassium Permanganate

CAS NO.

7722-64-7

EINECS

231-760-3

UN NUMBER

UN 1490

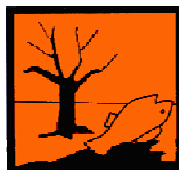
CODE LETTER AND HAZARD DESIGNATION OF THE PRODUCT:



O
Oxidizer



Xn
Harmful



N
Dangerous to the Environment

RISK PHRASES:

- 8 Contact with combustibles may cause fire.
22 Harmful if swallowed.
50/53 Very toxic to aquatic organisms, may cause long-term effects in the aquatic environment.

SAFETY PHRASES:

- 60 This material and its container must be disposed of as hazardous waste.
61 Avoid releases to the environment. Refer to special instructions / Safety data sheet.



RemOx[®]S

ISCO Reagent

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MATERIAL SAFETY DATA SHEET

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Section 15 Regulatory Information (contd.)

US FEDERAL REGULATIONS:

CHEMICAL INVENTORY STATUS – PART 1

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>TSCA</u>	<u>EC</u>	<u>Japan</u>	<u>Australia</u>
Potassium Permanganate	7722-64-7	Yes	Yes		

CHEMICAL INVENTORY STATUS – PART 2 --- CANADA---

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Korea</u>	<u>DSL</u>	<u>NDSL</u>	<u>PHIL</u>
Potassium Permanganate	7722-64-7	No	Yes		

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR, Canada) and the MSDS contains all of the information required by the CPR.

FEDERAL, STATE & INTERNATIONAL REGULATIONS – PART 1

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>SARA 302</u>		<u>SARA 313</u>	
		<u>RQ</u>	<u>TPQ</u>	<u>List</u>	<u>Chemical Catg.</u>
Potassium Permanganate	7722-64-7	N/A	N/A	Yes	Yes
(Manganese compounds)					

FEDERAL, STATE & INTERNATIONAL REGULATIONS – PART 2

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CERCLA</u>	<u>RCRA</u>	<u>TSCA 8(d)</u>
Potassium Permanganate	7722-64-7	Yes (RQ =100 lbs)	D001	No

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CWC</u>	<u>TSCA 12(b)</u>	<u>CDTA</u>	<u>SARA</u>
Potassium Permanganate	7722-64-7	No	No	<u>311/312</u>	4545 Kg

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Acute</u>	<u>Chronic</u>	<u>Fire</u>	<u>Pressure</u>	<u>Reactivity</u>	<u>Pure/Liquid</u>
Potassium Permanganate	7722-64-7	Yes	Yes	Yes	No	No	Pure

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Australian Hazchem Code</u>	<u>Poison Schedule</u>	<u>WHMIS</u>
Potassium Permanganate				C, D2B



RemOx®S ISCO Reagent

EC- SAFETY DATA SHEET according to Regulation (EC) № 1907/2006 of the European Parliament and of the Council, of 18 December 2006 concerning REACH

MATERIAL SAFETY DATA SHEET

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Section 16 Other Information

NIOSH	National Institute for Occupational Safety and Health
MSHA	Mine Safety and Health Administration
OSHA	Occupational Safety and Health Administration
NTP	National Toxicology Program
IARC	International Agency for Research on Cancer
PEL	Permissible Exposure Limit
C	Ceiling Exposure Limit
TLV-TWA	Threshold Limit Value-Time Weighted Average
CAS	Chemical Abstract Service
EINECS	Inventory of Existing Chemical Substances (European)

Chithambarathanu Pillai (S.O.F.)
April 2008

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APPENDIX H

POTENTIAL FOR VOLATILIZATION OF PCBs DURING SOIL CONDITIONING AND MONITORING METHODS

APPENDIX H

POTENTIAL FOR VOLATILIZATION OF PCBs DURING SOIL CONDITIONING & MONITORING METHODS

INTRODUCTION

Soil conditioning using in-situ chemical oxidation (ISCO) with base catalyzed sodium persulfate has been proposed for PAOC 18 at the RACER CVO Site in Ypsilanti, Michigan (Site). Chemicals of concern in the area of the Site to be treated include chlorinated volatile organic compounds (CVOCs) and polychlorinated biphenyls (PCBs). The United States Environmental Protection Agency has raised a concern that an increase in temperature as a result of the ISCO soil mixing may result in the volatilization of PCBs. PCBs present at the Site are primarily Aroclor 1260.

TEMPERATURE INCREASE DUE TO CATALYZED SODIUM PERSULFATE

The catalysis of sodium persulfate with high pH has been shown to be an effective treatment for many compounds including CVOCs and petroleum hydrocarbons; however, the catalyzed reaction is somewhat slow. CRA experience has shown that under base (lime as activator) catalyzed conditions, sodium persulfate can persist in the subsurface for up to 1 month. Due to the slow rate of reaction, significant increases in soil temperature are not observed. Additionally, groundwater and soil are heat sinks; therefore, any small increase in temperature that may occur due to the persulfate oxidation reaction would dissipate quickly and a sustained increase would not be observed. CRA has monitored subsurface temperature during several applications of base catalyzed sodium persulfate, and significant temperature increases were not observed. Arcadis experience with base catalyzed sodium persulfate has been similar. Their research showed that treatment of carbon disulfide with activated sodium persulfate was safe since a temperature increase that would have resulted in the potential for explosion or combustion of the carbon disulfide did not occur (Arcadis).

VOLATILIZATION OF PCBs

The most predominant type of PCB found in PAOC 18 is Aroclor 1260, which is a PCB congener with a boiling point of 780 degrees Fahrenheit (University of Tennessee, 2009). Types of PCBs such as Aroclor 1260 are more resistant to volatilization and degradation compared to other types of PCBs due to their high degree of chlorination and heavier molecular weight. For example, the results of one study comparing different flux rates for different types of PCBs, showed Aroclor 1242 to have a flux rate approximately 16 times higher than the flux rate of Aroclor 1260 (18.29 compared to 1.15 ng/cm²/hr, respectively) (Thibodeaux et al, 2002). Due to Aroclor 1260 being one of the heavier PCB congeners, it is more persistent and less likely to volatilize at expected temperatures resulting from the conditioning of soils.

Increases in temperature have been shown to cause very small increases in the volatilization of PCBs from sediment and aqueous media. The data of Miskewitz et al. (2008) suggested that a 3-degree Celsius increase in temperature doubled the flux rate of PCBs from approximately 60 ng/m²/h to 120 ng/m²/h in dredged sandy sediments. However, in most scenarios, PCBs are sorbed to organic carbon in soils and are not susceptible to volatilization.

The studies measuring PCB volatilization from the sorbed phase (Miskewitz et al., 2008; Qi et al., 2006) were performed using sediments from New York and New Jersey harbors, which were predominantly sand and contained significantly less organic matter than terrestrial soils. Therefore, PCBs would be expected to sorb to organic matter in terrestrial soils much more strongly than to the sandy sediments, and much less PCB would be available to volatilize.

The soil sorption coefficient (Koc) can be used to calculate the concentration of a compound that will remain sorbed to soil versus the concentration that will not be sorbed to soil and be available for volatilization according to the following equation:

$$Koc = \frac{[adsorbed] / [non - sorbed]}{Foc}$$

The Koc value for Aroclor 1260 is 7,700,000 (Little, 1981). Experimentally determined fraction organic carbon (Foc) values for the Site range from 0.75 percent to 5.5 percent.

If the Koc is 7,700,000, at a Foc of 0.75 percent, 57,750 times more PCBs will be present in the sorbed phase than in the non-sorbed phase, and therefore most PCBs will not be available for volatilization. At a Foc of 5.5 percent, this factor increases to 426,500. The maximum detected Aroclor 1260 concentration in Site soil is 648 mg/kg. Therefore, in areas with lower Foc values, the predicted concentration of Aroclor 1260 that would partition into soil pore water and therefore be available for volatilization is 11.2 micrograms per liter (µg/L) and in areas with higher Foc values, the predicted concentration of Aroclor 1260 available for volatilization would be 11.5 µg/L. These concentrations would not result in significant PCB levels in air, if they volatilize.

These calculations show that PCBs at the Site are much more likely to remain bound to the soil than pass into soil pore water and volatilize, even if the soil temperature increases.

MONITORING & HANDLING METHODS

Several monitoring and handling methods will be implemented to alleviate exposure concerns related to volatilization of PCBs.

Soil

The temperature of conditioned soils will be monitored and oxidant will not be added to soil when soil temperatures are greater than 125° F. In the event soil temperatures reach 120° F water will be added to the soil in sufficient amounts to counter any temperature rise to keep the temperature from exceeding 125° F. Additionally, groundwater and soil are heat sinks, therefore any small increase in temperature that may occur due to the conditioning reactions would dissipate quickly and a sustained increase would not be observed. Based on experience at other projects soil conditioning with oxidants is not expected to raise soil temperatures above 125° F.

Dust

As discussed above PCBs are more likely to remain bound to soil particles than volatilize, therefore dust monitoring and suppression are more effective and protective methods of preventing exposure to PCBs. Total Dust (TD) will be monitored using real time data logging equipment at the Site. The Ambient Air Quality Monitoring Plan (AAQMP), provided in Appendix I provides more details regarding the monitoring, including identifying action levels for the Site, which are also listed below:

<u>Constituent</u>	<u>Real Time Action Level</u>
TD	0.55 mg/m ³ *
PCBs	0.5 mg/m ³ **

*The TD Action limit is based on lead concentrations in soil at the Site.

**The PCB action limit is based on the OSHA PEL for Aroclor 1254, the more conservative PEL available for PCBs, as Aroclor 1260 does not have a published PEL.

The maximum PCB dust concentration at the TD action level can be calculated using the formula below:

$$[PCB]_{Dust} = [PCB]_{Soil} \times [TD]$$

Using the maximum detected soil PCB concentration of 648 mg/kg the maximum PCB dust concentration using the above equation is 0.0036 mg/m³. This is two orders of magnitude lower than the PCB action level at the Site.

The TD concentration at the PCB action level can be calculated using the formula below:

$$[TD] = \frac{[PCB]_{Dust}}{[PCB]_{Soil}}$$

Using the maximum detected soil PCB concentration of 648 mg/kg, the TD concentration at the PCB action limit using the above equation is 771.60 mg/m³. The action level for TD is 0.55 mg/m³, therefore, engineering controls will be implemented long before the necessary dust level could be reached to exceed the action level for PCBs.

DNAPL

The DNAPL at the Site is predominantly trichloroethylene (40%) with high levels of PCBs. The collection and storage of DNAPL will be completed in such a way to minimize the potential for the volatilization of VOCs, which have a higher affinity for volatilization than PCBs. Free phase DNAPL observed in the excavation will be pumped or absorbed using absorbents. Pumped DNAPL and DNAPL saturated absorbents will be stored in closed containers (drums or totes) for proper disposal. Ensuring the containers are closed when material is not being added to them will minimize the loss of VOCs and therefore PCBs due to volatilization. Air monitoring for VOCs will be completed at the Site.

CONCLUSION

The addition of base catalyzed sodium persulfate is not expected to lead to an increase in soil temperature at the Site. Although volatilization of PCBs does occur and is temperature sensitive, it occurs from PCBs that are not sorbed to soil. The organic content of Site soils will tend to sorb the PCBs and will, therefore, not favor volatilization of PCBs even if a small increase in soil temperature is observed.

As a general matter, PCBs are more likely to sorb to soil particles than volatilize as discussed in Appendix G, and therefore dust monitoring and suppression are more effective and protective methods of preventing exposure to PCBs. Additionally, water is added as part of the conditioning process which will help minimize dust and also minimize any temperature increase.

Soil temperatures and total dust concentrations will be monitored at the Site. Action levels for both soil temperature and total dust have been developed and are protective for PCBs.

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APPENDIX I

AMBIENT AIR QUALITY MONITORING PLAN



AMBIENT AIR QUALITY MONITORING PLAN (AAQMP)

**COMPANY VEHICLE OPERATIONS
YPSILANTI, MICHIGAN
U.S. EPA ID MIK468293311**

**Prepared For:
Revitalizing Auto Communities Environmental Response Trust
(RACER)**

**Prepared by:
Conestoga-Rovers
& Associates**

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**FEBRUARY 2013
REF. NO. 017303 (26)**

AMBIENT AIR QUALITY MONITORING PLAN (AAQMP)

**COMPANY VEHICLE OPERATIONS
YPSILANTI, MICHIGAN
U.S. EPA ID MIK468293311**

Prepared For:

**Revitalizing Auto Communities Environmental Response Trust
(RACER)**

FEBRUARY 2013

REF. NO. 017303 (26)

This report is printed on recycled paper.

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LIST OF FIGURES
(Following Text)

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LIST OF ACRONYMS

AAQMP:	Ambient Air Quality Monitoring Plan
ADM:	Area Dust Monitor
CRA:	Conestoga-Rovers and Associates
CVO:	Company Vehicle Operations
CVOC:	Chlorinated Volatile Organic Compounds
CYD:	Cubic Yard
DNAPL:	Dense Non-Aqueous Phase Liquid
GM:	General Motors
GSI:	Groundwater Surface water Interface
HASP:	Health and Safety Plan
IMWP:	Interim Measures Work Plan
PCBs:	Polychlorinated Biphenyls
ppm:	Parts per million
QA/QC	Quality Assurance/ Quality Control
RACER:	Revitalizing Auto Communities Environmental Response Trust
TCE:	Trichloroethylene
TD:	Total Dust
VOCs:	Volatile Organic Compounds
WRAP:	Willow Run Assembly Plant

1.0 INTRODUCTION

This Ambient Air Quality Monitoring Plan (AAQMP) was prepared by Conestoga-Rovers & Associates, Inc. (CRA) on behalf of Revitalizing Auto Communities Environmental Response Trust (RACER) for the Willow Run Company Vehicle Operations (CVO) site located in Ypsilanti, Michigan (Site). The purpose of the AAQMP is to present the scope of work for ambient air monitoring activities which will be conducted at the Site as part of the planned PAOC 18 Interim Measures Work Plan (IMWP). The IMWP activities are being implemented to remove (excavate) and/ or condition (chemically oxidize) soils impacted with volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and dense non-aqueous phase liquids (DNAPL). The objective of this air monitoring program is to quantify the airborne concentrations of contaminants, if any, at the Site that may be associated with the IMWP soil excavation and/ or treatment activities.

Specifically, this AAQMP describes the protocols and procedures for assessing potential airborne concentrations of VOCs, PCBs, Total Dust (TD), and lead using the following methods:

- Total VOC concentrations in air utilizing real time organic vapor analyzers
- TD in air utilizing a real time dust monitor; (PCB and lead concentrations will be calculated based on TD data and Site-specific soil concentrations of PCBs and lead)
- VOCs, and TD/lead air sample analysis by an off-Site laboratory utilizing National Institute for Occupational Safety and Health (NIOSH) analytical methods (if real time monitoring exceedances occur)

This AAQMP has been developed in conjunction with the IMWP and is based on project and Site-specific conditions. The monitoring activities will be implemented in support of the IMWP remediation activities.

The procedures and protocols identified in this AAQMP are applicable to air monitoring activities conducted around the Site during the IMWP excavation activities involving PCBs, VOCs, and DNAPL impacted soils. Daily supervision and implementation of this AAQMP will be completed by CRA for the purpose of ensuring protection of the surrounding community and the environment. This air monitoring program is separate from the health and safety air monitoring program to be implemented by the Contractor and CRA for worker safety during soil excavation and handling activities within the work and support zones. The Contractor and CRA will each be responsible for

implementing their air monitoring program in accordance with their Site-Specific Health and Safety Plan (HASP).

1.1 GENERAL STRATEGY

During the soil excavation and material handling activities at the Site, the potential exists for the emission of VOCs, PCBs, TD, and lead. In order to determine the extent of these potential emissions, air monitoring will be conducted around the Site perimeter, which includes the following areas:

- i) Active work areas
- ii) Site support areas

The Site perimeter air monitoring activities will be conducted to verify that on-Site IMWP activities do not adversely affect the health of off-Site members of the general public or the environment. The following two levels of air monitoring will be implemented at the Site perimeter:

- i) Real time monitoring instruments with the ability to data log results for total VOCs and TD (i.e.; short-term monitoring consisting of field measurements with immediate results)
- ii) Air monitoring for VOCs, and TD/Lead (i.e., long-term monitoring consisting of collection of air samples over a 24-hour period and subsequent analyses in a certified/approved laboratory, if real time monitoring exceedances occur)

The air monitoring activities associated with the active work areas and support areas will be conducted by the Contractor and CRA in accordance with their Site Health and Safety Plan.

1.2 HISTORY AND SUMMARY OF PLANNED SITE ACTIVITIES

The CVO Site consists of the eastern 22 acres of the former Willow Run Assembly Plant (WRAP). The Site has had many owners. The Kaiser-Frazer Company (Kaiser-Frazer) leased the area from the War Asset Administration in November 1945 and purchased the facility in December 1948. Kaiser-Frazer is thought to have constructed an administration building to house design and engineering facilities on the WRAP site. Kaiser-Frazer owned the property until its sale to General Motors (GM) in December 1954. The original building at the WRAP was used by GM as a parts storage warehouse

until 1955. In 1956, light truck assembly began at the plant. From 1956 to July 1993, operations were typical of an automotive assembly plant including sheet metal assembly by welding solder applications, metal finishing, electro-deposition painting operations, and interior assembly. These operations were not conducted on the CVO portion of the former WRAP. Following assembly operations, vehicles were distributed to dealers by both truck and railway systems. Production operations ceased in July of 1993 and deactivation and decommissioning operations proceeded to prepare the facility for an eventual sale in 1997. GM retained ownership of the CVO property, which was used to store and maintain GM owned company vehicles until 2010.

The Site is currently owned by RACER. RACER was created in March 2011 by the United States Bankruptcy Court to clean up and position for redevelopment properties and other facilities owned by the former General Motors Corporation before its 2009 bankruptcy.

PAOC 18 is located at the northern boundary of the Site along the bank of Tyler Pond as shown on Figure 1.1. Tyler Pond is a manmade impoundment of Willow Run Creek. In the 1990s it was determined that historic filling practices have impacted Site soils and groundwater. VOCs, specifically chlorinated volatile organic compounds (CVOCs) and PCBs, are the primary constituents of concern in PAOC 18. In 2004, stained soils and DNAPL were observed in PAOC 18 along the southern bank of Tyler Pond. The main constituents detected in the DNAPL are trichloroethylene (TCE) (approximately 40%) and PCBs (up to 1.5%). A sheet pile wall was installed in October 2004 to prevent DNAPL from migrating into Tyler Pond. The groundwater in this area has been significantly impacted such that concentrations of CVOCs in groundwater have been detected above the groundwater surface water interface (GSI) criteria based on acute toxicity in groundwater.

Work to be completed on Site includes the excavation of clean cover/reusable overburden, non-hazardous soils, PCB impacted soils, and VOC impacted soils. Approximately 600 cubic yards (CYD) of asphalt and underlying gravel base will be pulverized and stockpiled for later reuse. Soils that do not meet the Remediation Requirements but are below 20 x Toxicity Characteristic Regulatory Levels will be excavated, transported, and disposed at a non-hazardous landfill. PCB impacted soils with concentrations greater than 50 parts per million (ppm) will be conditioned, removed and disposed of at an appropriate disposal facility. VOC impacted soils will be conditioned, removed, and disposed of at an appropriate disposal facility. Conditioning will involve in place mixing of oxidants and an activator within the excavation to reduce VOC concentrations. For additional details and descriptions of the work to be complete on Site, refer to Section 3.0 of the IMWP.

1.3 AAQMP ORGINIZATION

This AAQMP consists of the following sections:

- Section 2.0 – describes the real time air monitoring procedures for the Site
- Section 3.0 – describes the long term (24-hour) air monitoring procedures for the Site
- Section 4.0 – describes the corrective actions required should the short-term (real time) or long term (24-hour) concentrations exceed the ambient air criteria

2.0 REAL TIME AIR MONITORING (SHORT TERM)

Real time air monitoring will be conducted at the Site perimeter to determine total VOCs and TD during the remedial activities. Short-term lead and PCB concentrations will be screened using the short-term TD data. Lead and PCB concentrations will be determined by multiplying the highest soil concentration fraction for PCBs and the second highest soil concentration fraction for lead by the TD concentration. A summary of real-time air monitoring activities is presented in Table 2.1.

2.1 REAL TIME SAMPLING LOCATIONS

The proposed perimeter sampling locations are presented on Figure 2.1. The locations are subject to change as determined by field conditions and predominant wind direction. Readings for total VOCs and TD will be obtained from four sampling locations around the Site perimeter. These four locations will be selected based on the area of active work and predominant wind conditions. The locations will be positioned at approximately 90 degree intervals around the Site. One of the four locations will represent the upwind (i.e. background) sample, while another location will represent the downwind sample. The results of the background monitoring will be compared to the downwind monitoring results to determine the extent of any potential emissions migrating off-Site due to on-Site activities.

2.2 REAL TIME SAMPLING METHODS

Real-time air monitoring will be performed utilizing the following instrumentation:

- VOC Instrumentation (AreaRAE PID with 11.7 eV Lamp, Draeger Tubes)
- TD Instrumentation (Thermo Scientific Area Dust Monitors (ADR)-1500)

All instrumentation will be utilized and calibrated in accordance with the manufacturers' specifications.

Short term lead and PCB concentrations will be determined by multiplying the highest (PCBs) and second highest (lead) soil fractions by the TD concentration. Also, odors will be monitored qualitatively by CRA at the four sampling locations to determine potential

odor impacts from Site activities. Odors are subjective with varying thresholds therefore odors observed cannot be assessed against regulated criteria.

2.3 REAL TIME SAMPLING FREQUENCIES

AreaRae PIDs and Thermo Scientific ADMs will be placed at the perimeter of the Site and configured to continuously monitor VOC and TD concentrations. Hourly data checks for exceedances will be conducted according to the type of activity occurring on-Site (details provided below). At the conclusion of each work shift, the recorded data from the monitoring instruments will be downloaded and stored electronically.

The Site perimeter real-time air monitoring frequencies are summarized in Table 2.1. Site activities have been divided into four different phases. During the clean cover and reusable overburden phase, TD will be monitored for the duration of the task with hourly data checks for the first three days. If stop work action levels are not exceeded during the first three days, data checks will be lowered to twice per day. During the removal of non-hazardous soils phase, VOCs and TD will be monitored for the duration of the task with hourly data checks for the first two days. If stop work action levels are not exceeded during the first two days, data checks will be reduced to twice per day. For the treatment and removal of PCB and VOC impacted soils phase, VOCs and TD will be monitored for the duration of the task with hourly data checks for the first week. If stop work action levels are not exceeded during the first week, data checks will be reduced to twice per day. The final phase of backfill will include monitoring of TD for the duration of the phase with hourly data checks for the first three days. If stop work action levels are not exceeded in the first three days, data checks will be reduced to twice per day. During real time monitoring, PCB and lead concentrations will be calculated based on the hourly readings for TD during each phase of work.

If "stop work" action levels for total VOCs, TD, lead, and PCBs are exceeded, the responses outlined in Table 2.2 will be followed. If exceeded concentrations cannot be lowered by implementing appropriate engineering controls, long term air monitoring will be implemented to verify results.

2.4 ACTION LEVELS, NOTIFICATION AND REPORTING

The real-time TD, lead, PCBs, and VOC air monitoring action levels for the Site perimeter are presented in Table 2.2. The action levels are based on standards established by the Michigan Occupational Safety and Health Administration (MIOSHA).

Detailed descriptions of each action level can also be found in Table 3.2. Corrective actions (should real-time readings exceed these criteria) are outlined in Section 4.0 of this AAQMP.

There are no quantitative criteria for odors; however, CRA will monitor odors and record their qualitative assessment. If odors become problematic (i.e. in judgment of CRA personnel or due to odor complaints by nearby property owners), corrective actions will be initiated (see Section 4.0).

RACER will be given immediate verbal notification of any operational problems or detected concentrations of airborne contaminants in excess of the action levels. Weekly results of the monitoring activities will be transmitted to RACER.

3.0 LONG TERM AMBIENT AIR MONITORING

Air sampling for selected VOCs, as well as TD/lead, will be performed at the Site perimeter during the excavation activities only if stop work action levels are exceeded (real time monitoring) and cannot be reduced by engineering controls.

The VOC and TD/lead Site perimeter air monitoring will be based on 24-hour air samples. The air monitoring program will yield average concentrations for the selected compounds over each 24-hour period. Concentrations for selected VOCs and TD/lead will be determined by:

- Measure the amount of contaminant collected onto absorbent media filters or into canisters over a 24-hour period
- Measure the volume of air collected over a 24-hour period, corrected for flow rates, temperature, humidity, and pressure

Meteorological readings will be recorded daily from nearby weather stations or a Site-specific station in order to correct the measured data to standard ambient conditions and to determine the quality of the measured data.

A summary of the long term air monitoring to be conducted at the Site perimeter is presented in Table 3.1.

3.1 LONG TERM SAMPLING LOCATIONS

Potential sampling locations at the Site are presented on Figure 3.1. Samples for VOCs and TD/lead will be obtained from two sampling locations around the perimeter of the Site (i.e. upwind and downwind). The results of the upwind (background) sample will be compared to the downwind sample results to determine the concentration of emissions that may be migrating off Site due to on Site activities. It is expected that the same locations will be used for both the long term (24-hour) air monitoring as well as the real time air monitoring.

3.2 LONG TERM SAMPLING AND ANALYSIS METHODS

The long term air monitoring action levels are provided in Table 3.2. Methods for VOC and TD/lead sampling are described below.

3.2.1 VOCS

VOC air samples will be collected using a 1.7 Liter SUMMA canister or equivalent. These stainless-steel canisters are pre-cleaned and pre-evacuated in the laboratory. Utilizing a flow regulator, a 24-hour sample will be collected. The samples will be collected and analyzed in accordance with Method TO-14A as published by the United States Environmental Protection Agency (U.S. EPA) in the document entitled "Compendium of Methods TO-14A, Determination of Volatile Organic Compounds (VOCs) in Ambient Air using Specially Prepared Canisters with Subsequent Analysis by Gas Chromatography" (U.S. EPA, January 1999). During analysis, VOCs are separated in the air stream by gas chromatography and measured by mass selective detector or multi-detector techniques.

3.2.2 TD AND LEAD

Ambient air will be sampled and analyzed for TD using a battery operated air sampling pump according to NIOSH Method 0500. This method specifies the use of a 37 millimeter (mm), pre-weighed polyvinyl chloride (PVC) filter/filter cassette and a flow rate of 1 - 2 liters per minute. The sample is returned to the laboratory under chain-of-custody and the filter is desiccated and weighed again. The difference in weight is the total amount of TD collected during the sampling period. This mass of dust is divided by the total volume of air pulled through the filter to determine the mass concentration of dust in mg/m³. After determining the amount of dust collected, further analysis for lead can be performed on the same filter according to NIOSH Method 7300.

3.3 LONG TERM AMBIENT AIR SAMPLING FREQUENCY

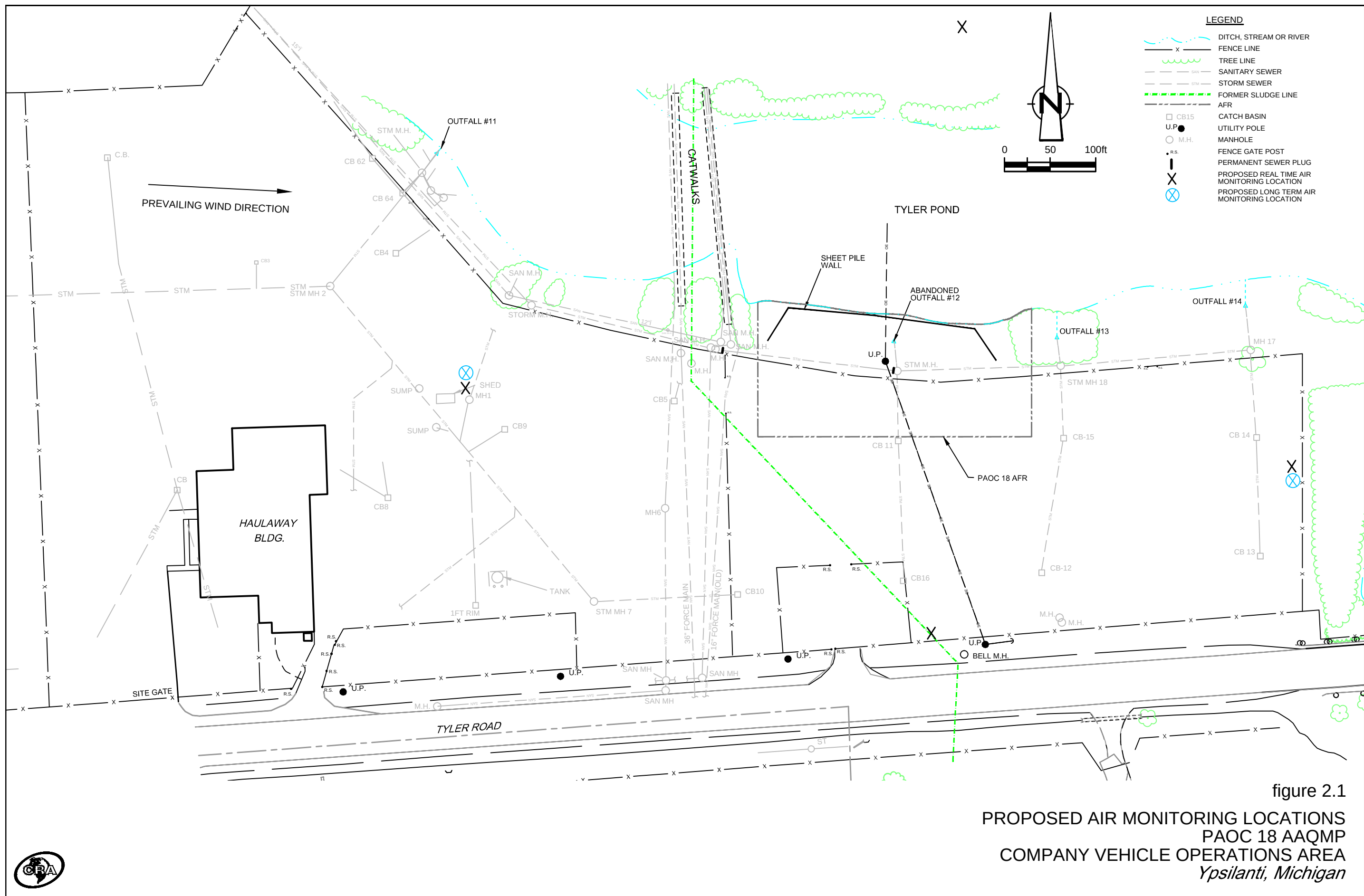
Long term air monitoring for VOCs and TD/lead will only occur when exceedances occur in the real time air monitoring. If there are no real time exceedances of the action levels, no 24 hour samples will be collected.

4.0 CORRECTIVE ACTION

Corrective measures for within the work area will not be necessary if elevated levels are detected. Workers within the active work areas will be protected in accordance with the Site-specific Health and Safety Plan. Provisions in the health and safety plan require that workers use personal protective equipment if specific monitoring results indicate that this is necessary.

Should elevated real time perimeter air monitoring results indicate potential exceedances of the Site action levels, and it is determined that these exceedances are a result of the activities at the Site, activities will be immediately evaluated. If real time results continue to exceed the action levels, long term monitoring will be implemented. If long term sample results indicate exceedances, Site activities will halt. A decision will then be made to recommence activities only after winds have subsided or to implement the use of emission suppressant materials. Emissions suppressant materials may include water, foam, sawdust or other material to minimize the migration of dust, odors, or organic compounds.

FIGURES



TABLES

TABLE 2.1

AIR MONITORING SUMMARY-REAL TIME (SHORT TERM)
PERIMETER AIR MONITORING PROGRAM: UTILIZING REAL TIME DATA LOG INSTRUMENTATION
COMPANY VEHICLE OPERATIONS: PAOC 18
YPSILANTI, MICHIGAN

<i>Remediation Phase</i>	<i>Expected Phase Duration</i>	<i>Parameters</i>	<i>Duration of Monitoring</i>	<i>Air Monitoring Locations</i>	<i>Air Monitoring Frequency</i>
Task A: Clean Cover and Reusable Overburden	7 days	Total VOCs	N/A	N/A	N/A
		TD/PCBs & lead ²	Duration of Task	Four locations around Site Perimeter	Hourly Data Check for first 3 days, Twice per day (if stop work action level is not exceeded in first 3 days ¹)
Task B: Non-Hazardous Soil	5 days	Total VOCs	Duration of Task	Four locations around Site Perimeter	Hourly data check for first 2 days, Twice per day (if stop work action level is not exceeded in first 2 days ¹)
		TD/PCBs & lead ²	Duration of Task	Four locations around Site Perimeter	Hourly data check for first 2 days, Twice per day (if stop work action level is not exceeded in first 2 days ¹)
Tasks C & D - PCB & VOC Impacted Soil	35 days	Total VOCs	Duration of Task	Four locations around Site Perimeter	Hourly data check for first week, Twice per day (if stop work action level is not exceeded in first week ¹)
		TD/PCBs & lead ²	Duration of Task	Four locations around Site Perimeter	Hourly data check for first week, Twice per day (if stop work action level is not exceeded in first week ¹)
Backfill Overburden/Fill	12 days	Total VOCs	N/A	N/A	N/A
		TD/PCBs & lead ²	Duration of Task	Four locations around Site Perimeter	Hourly data check for 3 days, Twice per day (if stop work action level is not exceeded in first 3 days ¹)

Footnotes:

1: If a stop work action level is exceeded, the frequency of real time air monitoring will be increased to hourly for one week after which the frequency may be decreased if stop work action levels are not exceeded

2: PCB and lead concentrations will be determined by multiplying the highest (PCBs) and second highest (lead) soil concentrations by the TD concentration
 Max PCB Concentration: 648 mg/kg
 Second highest lead Concentration: 26,000 mg/kg (Max detection was in waste material not soil)

TABLE 2.2

**REAL TIME AIR MONITORING ACTION LEVELS
PERIMETER AIR MONITORING PROGRAM
COMPANY VEHICLE OPERATIONS: PAOC 18
YPSILANTI, MICHIGAN**

<i>Action Levels</i>	<i>Response</i>
VOCs: 0.8 ppm Benzene: 0.25 ppm, Vinyl Chloride: 0.25 ppm	Confirm with second real-time instrument and or Draeger Tube if feasible. If confirmed, determine source of emissions, and take corrective actions, as necessary.
TD: 0.58 mg/m ³	Confirm with second real-time instrument if feasible. If confirmed, determine source of emissions, and take corrective actions, as necessary.
Lead: 0.015 mg/m ³	Double check calculations. If confirmed, determine source of emissions, and take corrective actions, as necessary.
PCBs: 0.5mg/m ³	Double check calculations. If confirmed, determine source of emissions, and take corrective actions, as necessary.
Odors, determined by CRA or based on public complaints	Attempt to determine source odors, and take corrective actions, as necessary. If odors are determined to be objectionable (present an unacceptable nuisance) for a continuous 10-minute period, "stop work" will be implemented until effective controls are implemented and objectionable odors at the Site boundary are eliminated.

Notes:

Lead and PCB concentrations are calculated based on the TD concentration

TABLE 3.1

AIR MONITORING SUMMARY - 24 HOUR SAMPLING (LONG TERM)
PERIMETER AIR MONITORING PROGRAM
COMPANY VEHICLE OPERATIONS: PAOC 18
YPSILANTI, MICHIGAN

<i>Remediation Phase</i>	<i>Parameters</i>	<i>Duration of Monitoring</i>	<i>Air Monitoring Locations</i>	<i>Air Monitoring Frequency</i>
Task A: Clean Cover and Reusable Overburden	Total VOCs	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls
	TD/PCBs ¹ & Lead	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls
Task B: Non-Hazardous Soil	Total VOCs	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls
	TD/PCBs ¹ & Lead	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls
Task C & D: PCB Impacted Soil (TSCA), VOC Impacted Soil	Total VOCs	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls
	TD/PCBs ¹ & Lead	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls
Backfill Overburden/Fill	Total VOCs	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls
	TD/PCBs ¹ & Lead	Dependent on Real Time Monitoring Results	Two locations around Site Perimeter (upwind & downwind)	Only if real time monitoring exceedances can not be lowered with appropriate engineering controls

Footnotes:

1: PCB concentrations will be determined by multiplying the highest PCB soil concentration (648 ppm) by the TD concentration

TABLE 3.2

**AIR MONITORING ACTION LEVELS
PERIMETER AIR MONITORING PROGRAM
COMPANY VEHICLE OPERATIONS: PAOC 18
YPSILANTI, MICHIGAN**

<i>Contstituents</i>	<i>Real Time Action Levels</i>	<i>Long Term Action Levels²</i>	<i>Comments/Rationale</i>
VOCs	0.8 ppm	0.4 ppm	The correction factor (multiplier) for a PID for vinyl chloride is approximately 0.6 (with 11.7 eV lamp). For VOCs, vinyl chloride is the driver on the site. A reading of 0.8 ppm is ½ of the OSHA PEL for vinyl chloride. Because there are no community receptors close to the site and any VOCs leaving the site would be diluted significantly through atmospheric dispersion, this is a reasonable level to warrant further investigation.
Benzene	0.25 ppm	0.12 ppm	A reading of 0.8 ppm VOCs will prompt on-site personnel to investigate and determine the specific VOC(s) responsible for the reading. A benzene specific reading of 0.25 ppm is ½ the OSHA Action Level for benzene. This level, if sustained for an extended duration presents a potential exposure concern to members of the community. Because there are no community receptors close to the site and any VOCs leaving the site would be diluted significantly through atmospheric dispersion, this is a reasonable level to indicate the need for modification of site activities / implementation of engineering controls.
Vinyl Chloride	0.25 ppm	0.12 ppm	A reading of 0.8 ppm VOCs will prompt on-site personnel to investigate and determine the specific VOC(s) responsible for the reading. A vinyl chloride specific reading of 0.25 ppm is ½ the OSHA Action Level for vinyl chloride. This level, if sustained for an extended duration could possibly present an exposure concern to members of the community. Because there are no community receptors close to the site and any VOCs leaving the site would be diluted significantly through atmospheric dispersion, this is a reasonable level to indicate the need for modification of site activities / implementation of engineering controls.
Total Dust	0.58 mg/m ³	0.29 mg/m ³	A total dust concentration of 0.58 mg/m ³ is approximately equivalent to a lead concentration of ½ the OSHA Action Level for lead based on the second highest reported soil concentration of lead (26,000 mg/kg). The duration of the project is such that this concentration of dust/lead in the air is not likely to present a community/public health hazard. This Action Level would be in effect for all areas of the site except the area where the highest soil lead concentration (61,300 mg/kg) was detected. In this area, the Action Levels would be reduced proportionally to account for the higher soil lead levels.
PCBs (Aroclor 1254) ¹	0.015 mg/m ³	0.25 mg/m ³	0.5 mg/m ³ is the OSHA PEL for Aroclor 1254 (54% chlorine PCB). Currently, OSHA does not have an exposure limit for Aroclor 1260. Therefore, the lowest OSHA exposure limit established for a PCB (Aroclor 1254) was applied to the highest reported PCB soil concentration of 648 mg/kg of Aroclor 1260. The maximum soil concentration of Aroclor 1254 is 648 mg/kg; the total dust concentration necessary to reach the action level for Aroclor 1260 would be 771 mg/m ³ . Therefore, the action level for particle-bound PCBs will not likely be reached.
Lead	0.5mg/m ³	0.008 mg/m ³	A lead dust concentration of 0.015 mg/m ³ is ½ the OSHA Action Level for lead. The duration of the project is such that this concentration of dust/lead in the air is not likely to present a community/public health hazard.

FootNotes:

1: OSHA does not have a PEL for Aroclor 1260 which is the most common PCB congener found on Site. Aroclor 1254 is the next closest congener and is the most conservative that OSHA has a PEL value for. Due to this fact, the PEL for Aroclor 1254 will be used for this Site.

2: Long term action levels are half the real time action levels

APPENDIX J

NOTIFICATION OF PCB WASTE ACTIVITY FORM

USEPAUnited States
Environmental Protection Agency
Washington, DC 20460Form Approved
OMB No. 2070-0112**Notification of PCB Activity****For Official Use Only****Return To:**Document Control Officer (5305P)
Office of Solid Waste
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20460-0001**1. Name of Facility**

RACER - CVO

Name of Owner Facility

RACER Properties, LLC

2. EPA Identification Number (if already assigned under RCRA)

MIK468293311

3. Facility Mailing Address (Street or PO Box, City, State, & Zip Code)2930 Ecorse Road
Ypsilanti, Michigan
48198**4. Location of Facility (No. Street, City, State, & Zip Code)**2901 Tyler Road
Ypsilanti, Michigan
48198**5. Installation Contact (Name and Title)**

Grant Trigger, Michigan Clean up Manager

Telephone Number (Area Code and Number)

(313) 486-2908

6. Type of PCB Activity (Mark 'X' in appropriate box. See Instructions.)

- | | |
|--|---|
| ☒ A. Generator w/onsite storage facility | ☐ B. Storer (Commercial) |
| ☐ C. Transporter | ☐ D. R&D/Treatability |
| ☐ E. Approved Disposer | ☐ F. Scrap Metal Recovery Oven/Smelter,
High Efficiency Boilers |

7. Certification

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate, and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as a company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

Signature**Name and Official Title (Type of Print)**Grant R Trigger
Michigan Cleanup Manager**Date Signed**

2-27-13

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