PCB Work Plan

Former McLouth Steel Site
County Property
1491 West Jefferson Avenue
Trenton, Michigan

December 17, 2018

Prepared For:
MSC Land Company, LLC

Prepared By:
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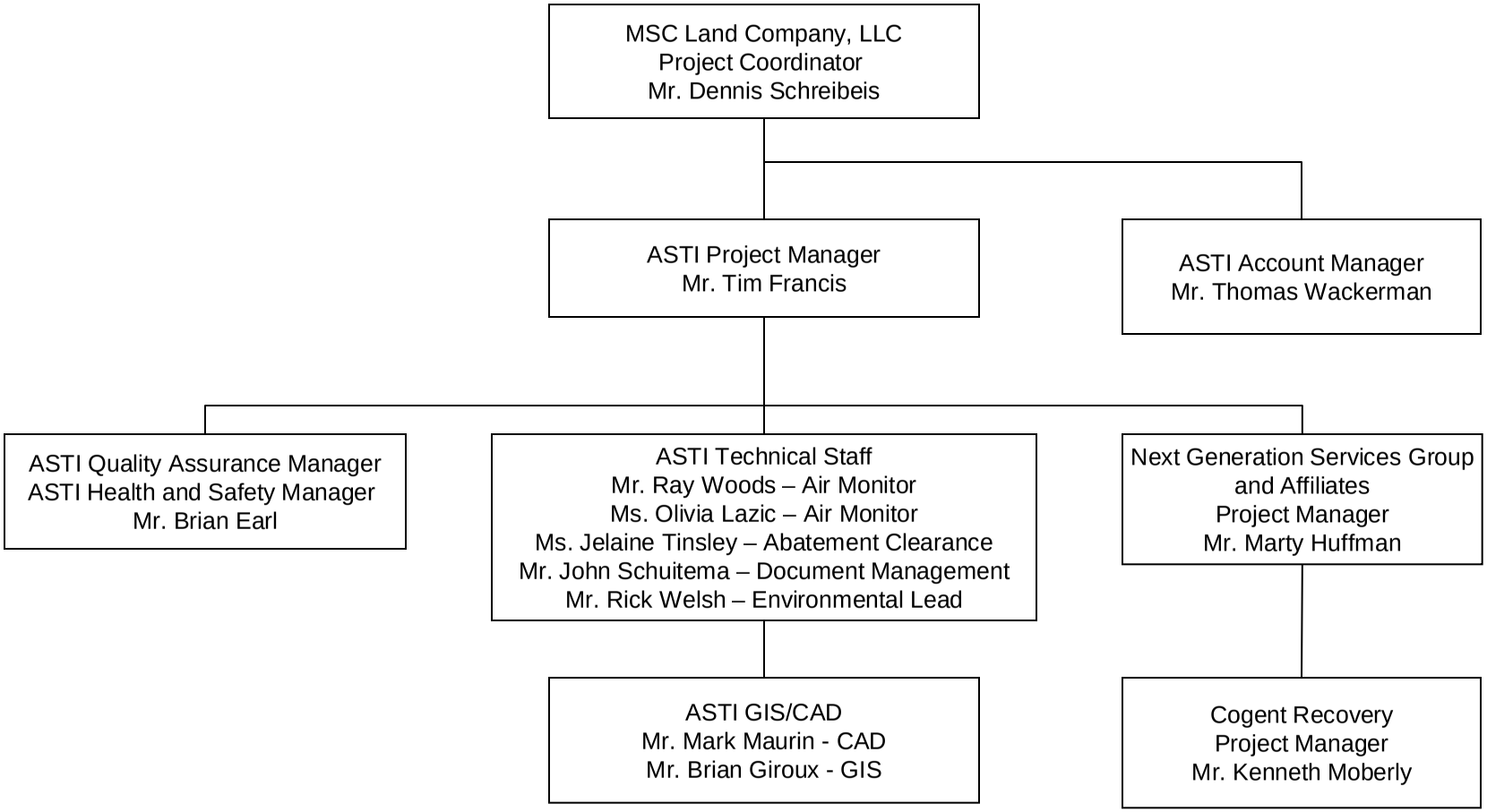
Brighton, Michigan 48116
1-800-395-ASTI

ASTI Project No. 10391

Project Organization Chart

Former McLouth Steel – County Property



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PCB WORK PLAN

FORMER MCLOUTH STEEL SITE

DECEMBER 17, 2018

1.0 Introduction

ASTI Environmental Corporation (ASTI) has prepared this self-implemented polychlorinated biphenyl (PCB) Work Plan (the "PCB Work Plan") for the approximately 180-acre portion of the Former McLouth Steel site commonly known as the County Property (Parcel No: 54001990006705 and Parcel No: 54001990006706) located at 1491 W. Jefferson Avenue in the City of Trenton, Wayne County, Michigan (the "Property"). A Site Location Map is provided as **Figure 1**, and the Property is indicated on **Figure 2**.

This PCB Work Plan was developed to implement the Statement of Work (SOW) contained in Appendix D of the Administrative Settlement Agreement and Covenant Not to Sue (the "Agreement") for the Property. Unless otherwise provided herein, all terms used in this Work Plan are defined as provided in the Agreement. The purpose of this PCB Work Plan is to assess the following five Areas for Investigation (AFIs) as part of the Demolition Requirement and SOW activities at the Property (the "Site Activities") and implement the appropriate self implementing low occupancy closure for each Area.

- AFI 1. South Motor Room (located in the main production building inside No. 1 finishing building)].
- AFI 2. Continuous Caster Substation (continuous casting building has been demolished).
- AFI 3. Electric Room of the Recirculation Water System (recirculation water system building has been demolished).
- AFI 4. Existing and former transformer locations at AOC 48 (located northeast of machine shop).
- AFI 5. Existing and former transformer locations at AOC 66 (location not known, but assumed to be south of rolling mill).

General descriptions of the AFI's are provided in **Attachment A** and the general location of each AFI is depicted in **Figure 3** – County Property with AFIs Map. For each AFI, samples will be collected as described below to characterize the horizontal extent of PCBs that exceed 25 parts-per-million (ppm). Prior to the PCB assessments, each AFI will be cleared of equipment and significant debris and all debris will be segregate for off-site disposal. A random sample

methodology will be used to collect samples from the segregated debris to determine disposal options. Pits or sumps within the AFI will be emptied and cleaned of visible residues prior to implementing this PCB Work Plan as described in the Liquid and Sludge Removal Work Plan. In addition, the work described in this PCB Work Plan will be conducted prior to demolition of the structures in which an AFI is contained, if applicable.

2.0 PCB Sampling Methods

ASTI Standard Operating Procedures (SOPs) for surface soil sampling are presented in **Attachment B**. EPA's Standard Operating Procedures (SOP) for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), paragraphs for Hard Porous Surfaces are presented in **Attachment C**.

For AFIs 1 and 5, located within the existing mill building, concrete sampling will be conducted in and around the potential PCB impacted area. The PCB sampling will be conducted at the pre-determined locations based on the grid intervals described below. The samples will be collected in accordance with the EPA's SOP for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs) for Hard Porous Surfaces. The samples will be placed in pre-cleaned 4 or 8-ounce glass jars and delivered to the analytical laboratory under standard chain-of-custody procedures.

For AFIs 2 and 3, located in formerly demolished buildings, concrete and surface soil sampling will be conducted in and around the potential PCB impacted area. The PCB sampling will be conducted at the pre-determined locations based on the grid intervals described below. The concrete samples will be collected in accordance with the EPA's SOP for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs) for Hard Porous Surfaces. . If sampling locations are outside the former building slab, soil samples will be collected from the surface to 6 inches below ground surface (bgs) using a pre-cleaned plastic scoop or a stainless steel trowel. All samples will be placed in pre-cleaned 4 or 8-ounce glass jars and delivered to the analytical laboratory under standard chain-of-custody procedures. Unaffected or clean surface material will remain as a cap. If PCBs are known to exist underneath the clean surface material, the thickness of the material will be confirmed to ensure compliance with the low-occupancy closure requirement of 6 inches.

For AFI 4, located adjacent to an existing building, asphalt and surface soil sampling will be conducted in and around the potential PCB impacted area. The PCB sampling will be conducted at the pre-determined locations based on the grid intervals described below. The asphalt samples will be collected in accordance with the EPA's SOP for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs) for Hard Porous Surfaces. . If sampling locations are outside the existing surfacing materials, soil samples will be collected from the surface to 6 inches bgs using a pre-cleaned plastic scoop or a stainless steel trowel. All samples will be placed in pre-cleaned 4 or 8-ounce glass jars and delivered to the analytical laboratory under standard chain-of-custody procedures.

For the above sampling activities, 10% of the sampling locations will have replicate samples collected directly adjacent to the parent sample.

All sampling and analysis for this PCB Work Plan will be conducted consistent with United States Environmental Protection Agency (US EPA) approved methods, the attached SOPs, and the project-specific Quality Assurance Project Plan (QAPP). All samples will be analyzed for Polychlorinated Biphenyls (PCBs) by Method 8082.

The laboratory selected for this project will either participate in the Environmental Response Laboratory Network ("ERLN"), be accredited under the National Environmental Laboratory Accreditation Program ("NELAP"), meet International Standardization Organization (ISO 17025) standards, or meet other nationally recognized programs as meeting the quality system requirements.

3.0 Sampling Locations

Systematic samples will be collected along the floor based on the size of each area and will be implemented using the Michigan Department of Environmental Quality (DEQ) guidance document titled "Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria" dated 2002 and actual site conditions. For each location, the minimum number of floor samples will be determined as follows.

Number of Floor Samples	
Area of Floor (square feet)	Number of Samples

<500	2
500 < 1,000	3
1,000 < 1,500	4
1,500 < 2,500	5
2,500 < 4,000	6
4,000 < 6,000	7
6,000 < 8,500	8
8,500 < 10,890	9

Floor samples will be systematical located to represent the AFI area based on the number of samples to be collected. Additional biased samples may be collected in each AFI area based on visual observations in the field indicating potential releases. Visual identification features include dry, dark staining; discernible oil staining (potentially with the presence of oil); areas where transformers were formerly situated based on obvious structural features; signage indicating PCBs, PCB containing equipment or storage areas; or stressed vegetation.

The anticipated initial numbers of samples for each AFI are summarized in the table below. It should be noted that the sizes of each AFI are approximate based on the current available information and that each AFI will be field verified.

Areas for Investigation	**Size (ft^2)**	**Number of Grid Samples**	**Number of Biased Samples**
1 South Motor Room (1st Floor)	Floor- 4,045	7	6
(basement)	Floor- 4,045	7	6
2 Continuous Caster Substation	Floor - 600	3	2
3 Electric Room of the Recirculation Water System	Floor - 1,225	4	2
4 Existing and former transformer locations at AOC 48	Floor - 600	3	2
5 Existing and former transformer locations at AOC 66	Floor - 600	3	2

Based on the results of the sampling, additional step-out samples will be collected where PCB analytical results exceed 25 ppm until the lateral extent of PCB contamination above 25 ppm

has been determined. These additional step-out samples will be collected from the four cardinal directions twenty feet from the impacted sample.

Quality Assurance/Quality Control (QA/QC) duplicate samples in AFIs 2 and 3, or replicate samples in AFIs 1, 4, and 5, will additionally be collected at a rate of one per every ten samples.

4.0 Response Activities for Media Impacted with PCBs

Engineered controls will be installed for all AFIs where impacts exceed 25 ppm as indicated below.

In areas were surfacing materials will remain in-place, the response activities will be as follows:

- For areas where sampling results indicate the presence of remaining PCBs over 25 ppm, the areas will initially be circumscribed with fluorescent green spray paint and isolated from further Site Activities until further actions can be implemented.
- Further actions may include removing surfacing materials for off-site disposal or cleaning surfacing materials in accordance with 40 CFR 761.79 until further sampling results indicate the PCBs are below 25 ppm.

For all areas, the response activities will be as follows:

- If the sampling results indicate the presence of remaining PCBs greater than 25 ppm but equal to or less than 50 ppm, an engineered control will be placed (or, if already existing, maintained), or a four-foot high chain link fence will be installed, around those impacts in the AFI, with signage that warns of potential risks from entering the area; or
- If the sampling results indicate the presence of remaining PCBs greater than 50 ppm, existing engineered control will be maintained or adequate cover will be installed to limit the potential for significant contact with the underlying contaminated material and appropriate signage will be installed. In addition, for new engineered controls, a colored plastic membrane will be installed between the existing porous or non-porous material and the cover; and if fill materials are used, the cover will be stabilize by planting grass or placing sod and then maintain the grass or sod cover, watering as necessary.

Existing or new cover will be maintained. All fenced areas will include a lockable gate for maintenance.

5.0 Schedule

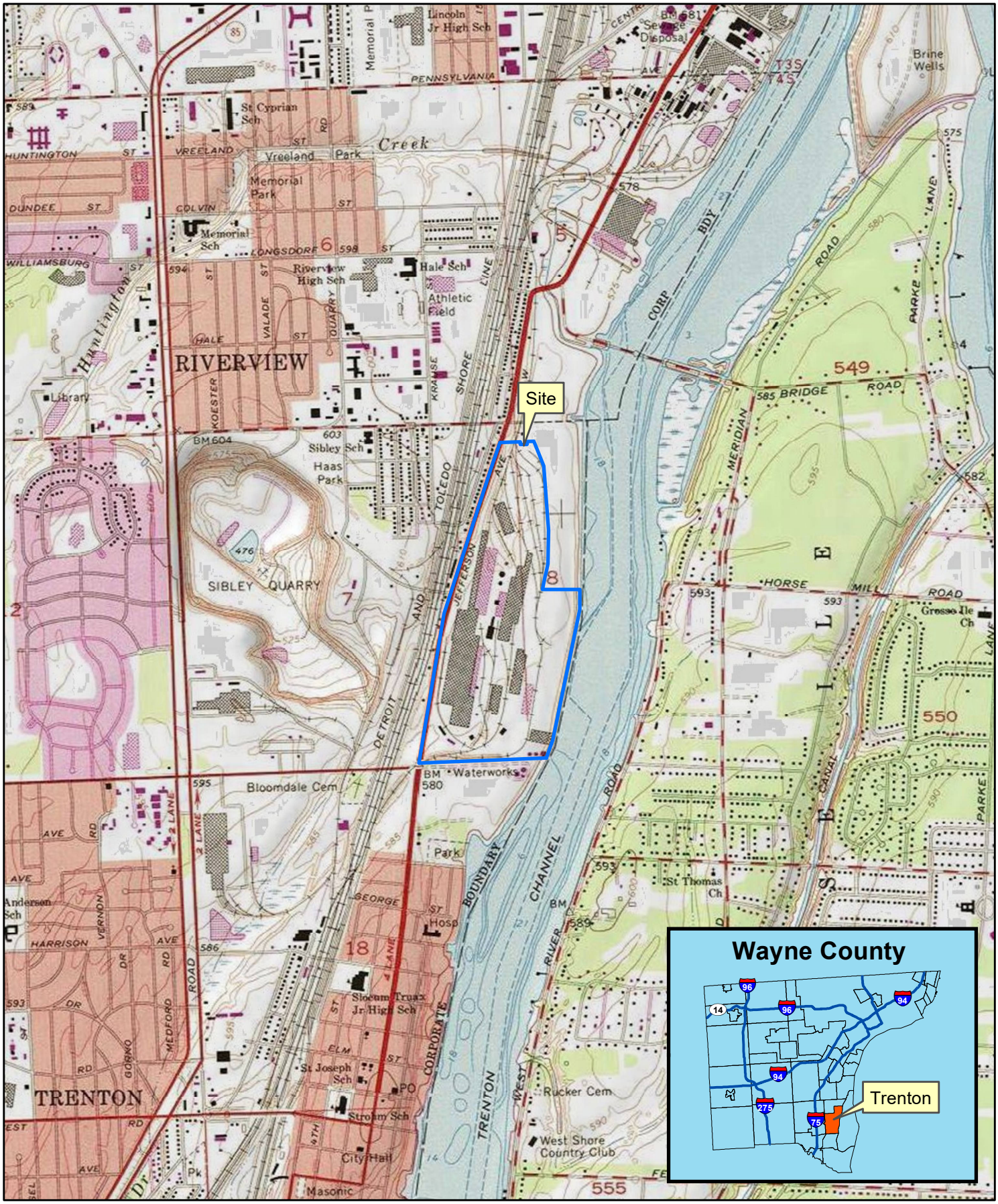
Sampling will be scheduled following approval of this PCB Work Plan and is expected to be completed by October 30, 2019. For each area where cleaning and demolition is scheduled, sampling will be conducted following area preparation and before cleaning operations. Engineered controls will either be maintained or installed within 90 days of receiving analytical results confirming the extent of PCB impacts over 25 ppm, weather permitting.

6.0 Applicable or Relevant & Appropriate Requirements

The following are the Applicable or Relevant and Appropriate Requirements (ARARs) for the work conducted as part of this Work Plan

- 40 CFR 110-140 – The Clean Water Act (Environmental Protection Agency (EPA))
- 40 CFR 700-766 – The Toxic Substance Control Act (EPA)
- 40 CFR 305 – The Comprehensive Environmental Response Compensation and Liability Act (EPA)
- Part 201 of Michigan P.A. 451 of 1994 – Environmental Response (MDEQ)

Figures



Former McLouth Steel Trenton Plant

1491 West Jefferson Avenue
Trenton, MI

0 500 1,000 2,000 Feet

N

ASTI Environmental

Client: MSC Land Company, LLC
Created by: BJG, July 26, 2018, ASTI Project 10391

Figure 1 - Site Location Map

LEGEND

Subject Property

0 550 1,100 1,650

Approximate Scale in Feet

Former McLouth Steel Trenton Plant

1491 West Jefferson Avenue, Trenton, MI

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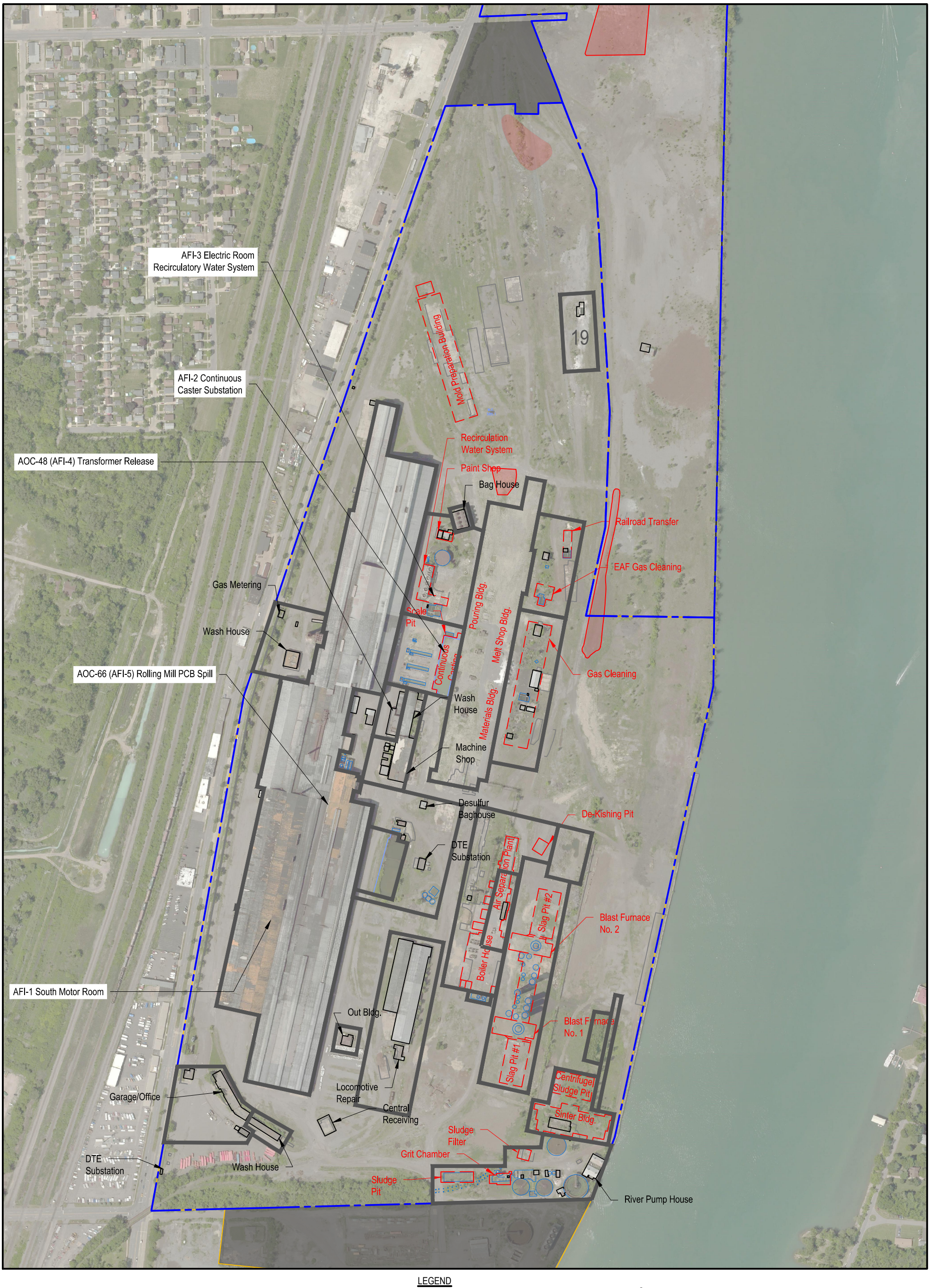
Created for: MSC Land Company, LLC

Figure 2 - County Property Map

ASTI Project 10391, SBW/BRB, July 16, 2018



0 400 800 1200

Approximate Scale in Feet

LEGEND

- County Property Property
- RTRR Property
- Parcel Lines
- Current Structure
- Former Structure
- Concrete
- Tanks and Silos
- Retention Pond

Former McLouth Steel Trenton Plant

1491 West Jefferson Avenue, Trenton, MI

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Created for: MSC Land Company, LLC

County Property with AFIs Map

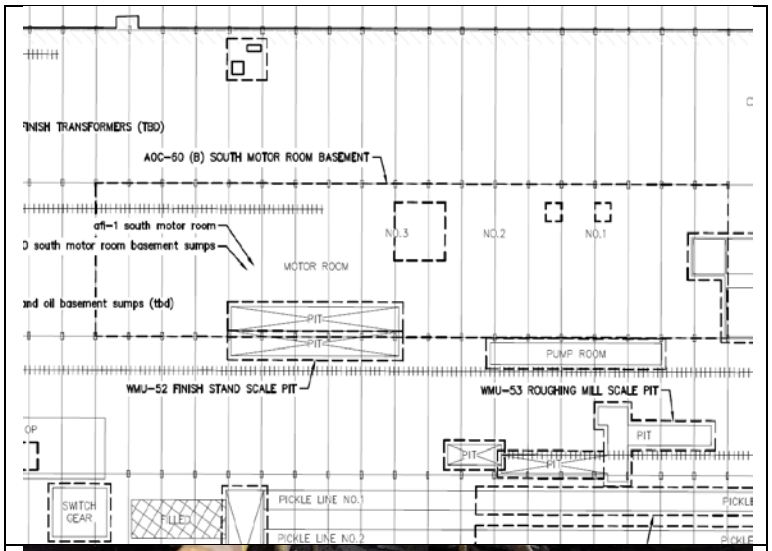
ASTI Project 10391, JMD/SBW, July 16, 2018

ATTACHMENT A

GENERAL DESCRIPTIONS OF THE AREAS FOR INVESTIGATION (AFIS)

Unit Description
Former McLouth Steel Facility County Property

AOC 60(b): South Motor Room Basement (also known as AFI6 and PT-2)



<u>Description:</u> TBD

<u>Construction:</u> TBD

<u>Size:</u> TBD

<u>Contents:</u> TBD

<u>Estimated Depth of Contents:</u> TBD

<u>Est. Volume of Contents:</u> TBD

<u>Demolition Area:</u> Area 4

<u>Unit Subject to</u>: EPA Work Plan, AHERA, RCRA, CERCLA, TSCA

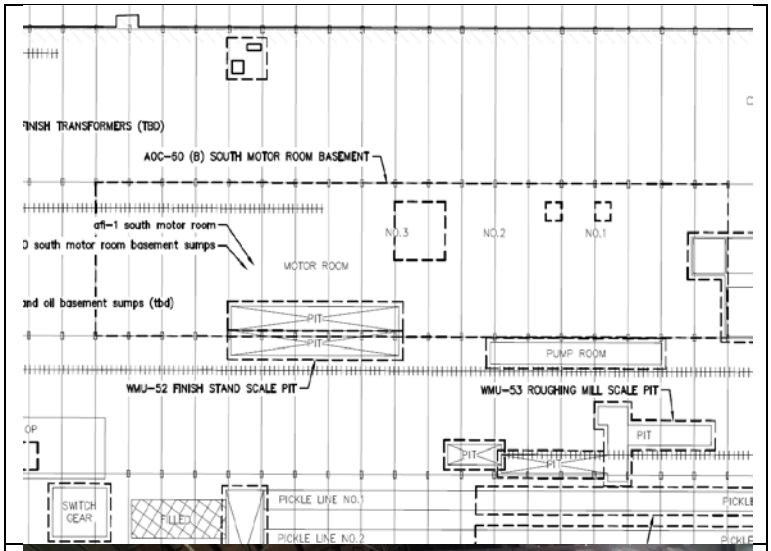
<u>Special Considerations</u>: removal of transformers, volume of water, communication with groundwater)

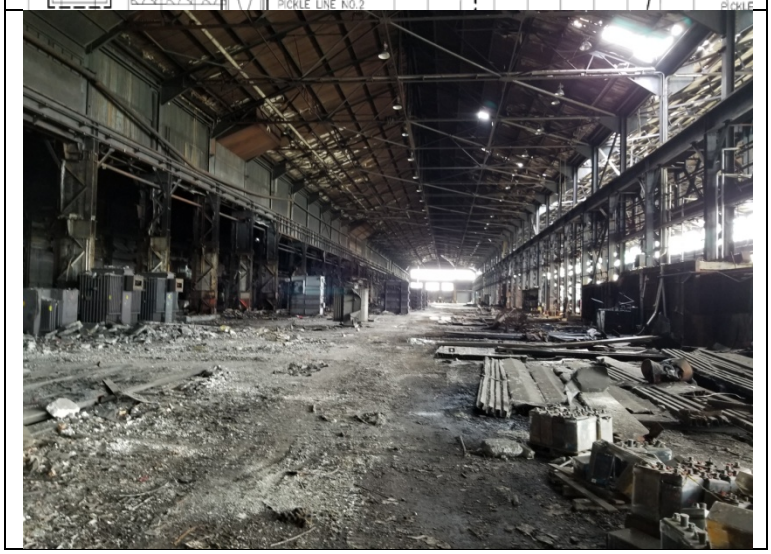
<u>Clearance Required:</u>

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	Yes

Unit Description
Former McLouth Steel Facility County Property

AOC 60(a) South Motor Room (also known as AFI1 and PT-1)





Description: TBD

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 4

Unit Subject to: EPA Work Plan, AHERA, RCRA, CERCLA, TSCA

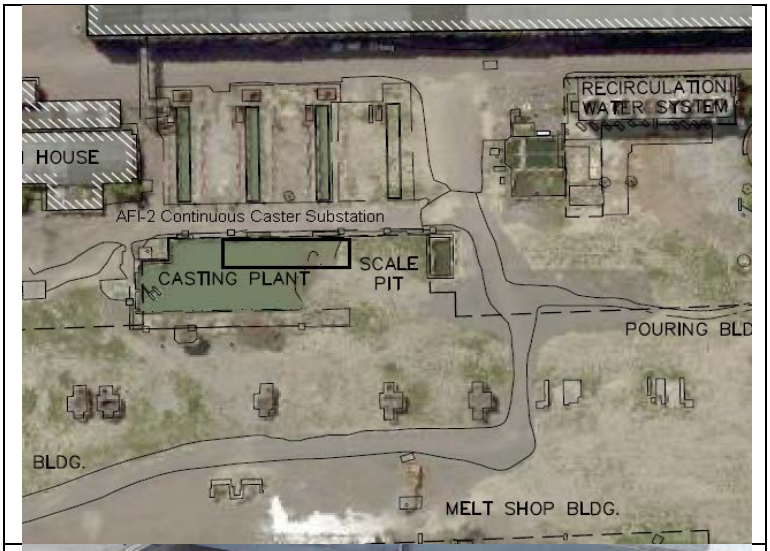
Special Considerations: None

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	Yes

Unit Description
Former McLouth Steel Facility County Property

AOC 60(c): Continuous Caster Substation (also known as AFI2)



Description: TBD

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 25

Unit Subject to: EPA Work Plan, TSCA, CERCLA

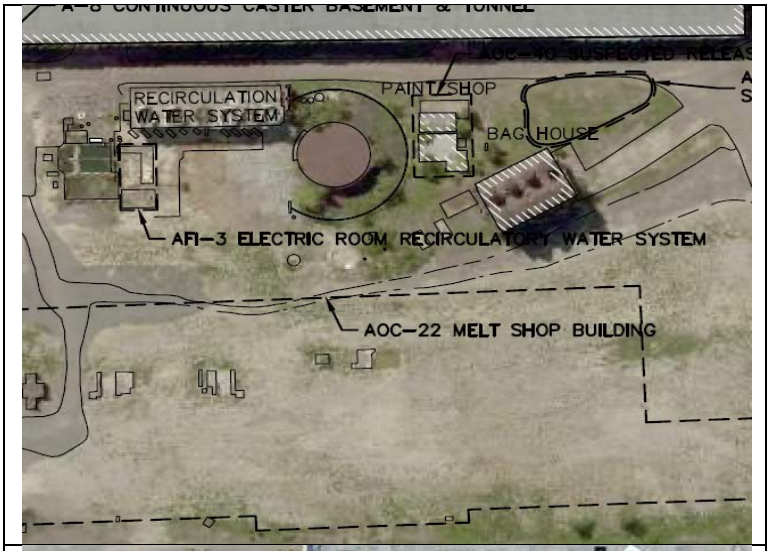
Special Considerations: location not accurately known

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

Unit Description
Former McLouth Steel Facility County Property

AOC 60(d): Electric Room of the Recirculation Water System (also known as AFI3)



Description: TBD

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 7

Unit Subject to: EPA Work Plan, TSCA, CERCLA

Special Considerations: None

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

Unit Description
Former McLouth Steel Facility County Property

AOC 48: Transformer Release (also known as AFI4)

Description: Reported release from an outside PCB transformer

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 6

Unit Subject to: EPA Work Plan, TSCA, CERCLA

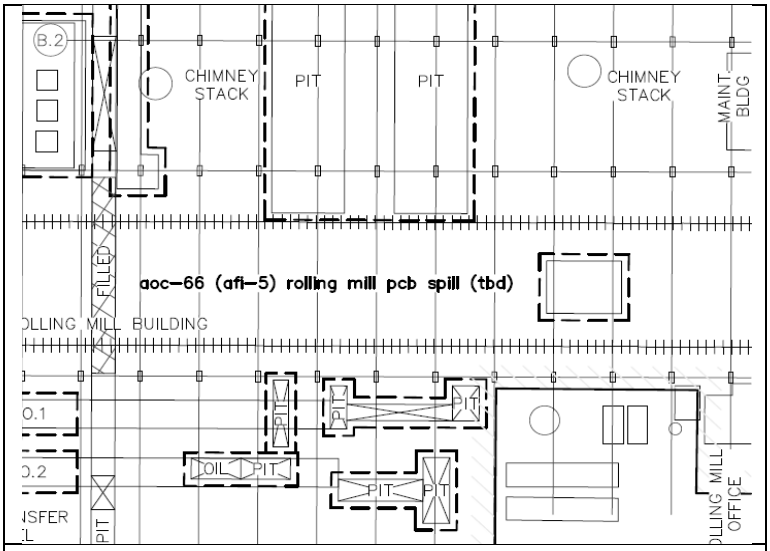
Special Considerations: release was reported to have been remediated in or around 1978

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

Unit Description
Former McLouth Steel Facility County Property

AOC 66: Rolling Mill PCB spill (also known as AFI5)



No Picture

Description: Reported PCB spill south of the rolling mill

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 4

Unit Subject to: EPA Work Plan, TSCA, CERCLA

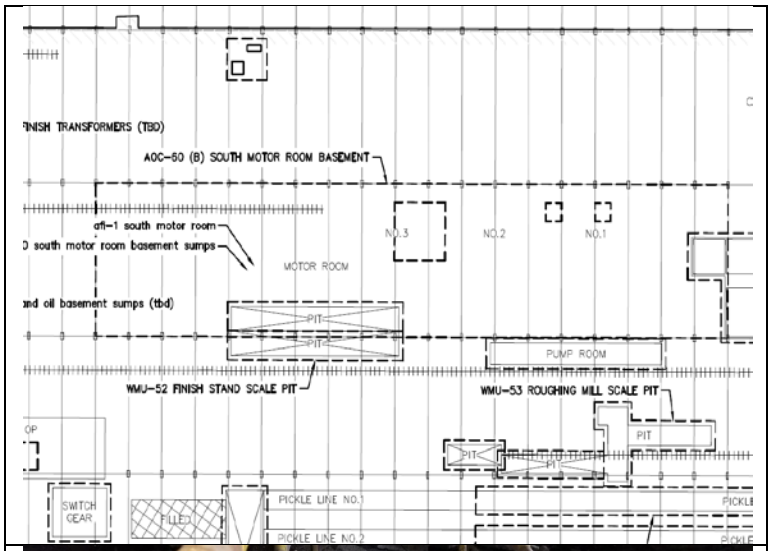
Special Considerations: Location needs to be determined

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

Unit Description
Former McLouth Steel Facility County Property

AOC 60(b): South Motor Room Basement (also known as AFI6 and PT-2)



<u>Description:</u> TBD

<u>Construction:</u> TBD

<u>Size:</u> TBD

<u>Contents:</u> TBD

<u>Estimated Depth of Contents:</u> TBD

<u>Est. Volume of Contents:</u> TBD

<u>Demolition Area:</u> Area 4

<u>Unit Subject to</u>: EPA Work Plan, AHERA, RCRA, CERCLA, TSCA

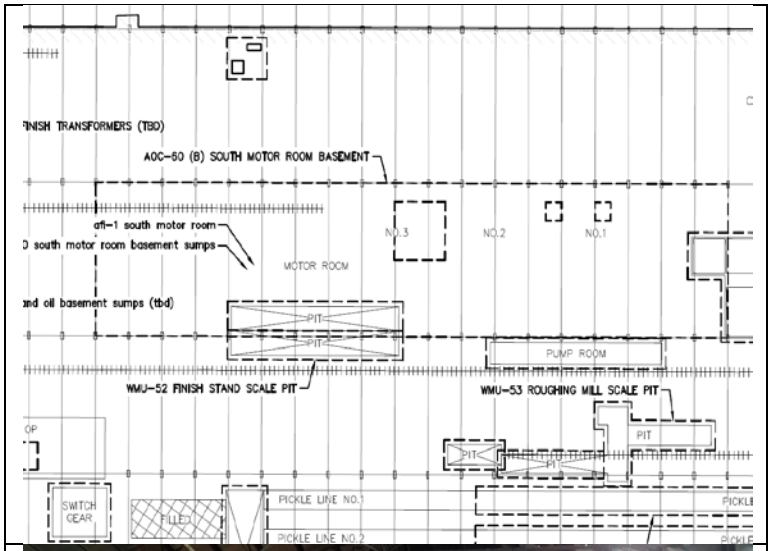
<u>Special Considerations</u>: removal of transformers, volume of water, communication with groundwater)

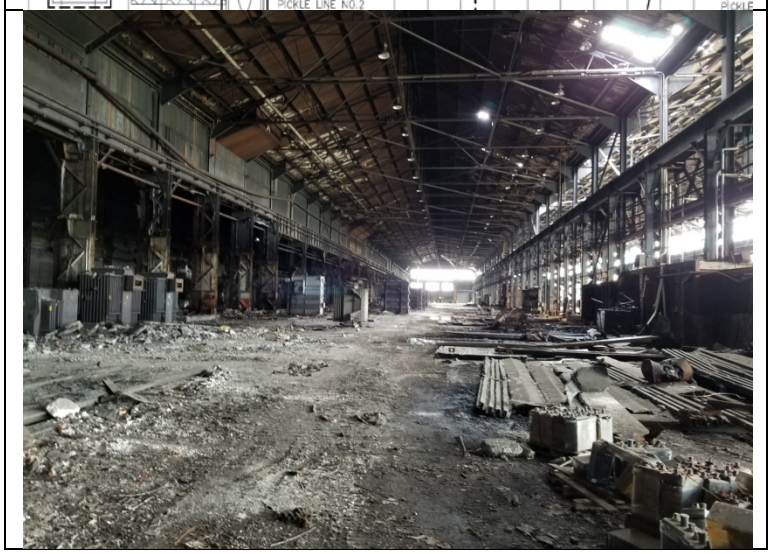
<u>Clearance Required:</u>

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	Yes

Unit Description
Former McLouth Steel Facility County Property

AOC 60(a) South Motor Room (also known as AFI1 and PT-1)





Description: TBD

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 4

Unit Subject to: EPA Work Plan, AHERA, RCRA, CERCLA, TSCA

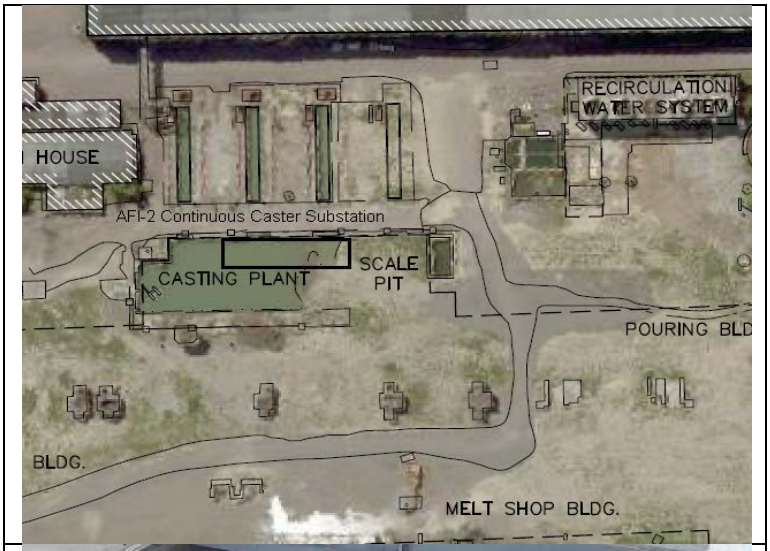
Special Considerations: None

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	Yes

Unit Description
Former McLouth Steel Facility County Property

AOC 60(c): Continuous Caster Substation (also known as AFI2)



Description: TBD

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 25

Unit Subject to: EPA Work Plan, TSCA, CERCLA

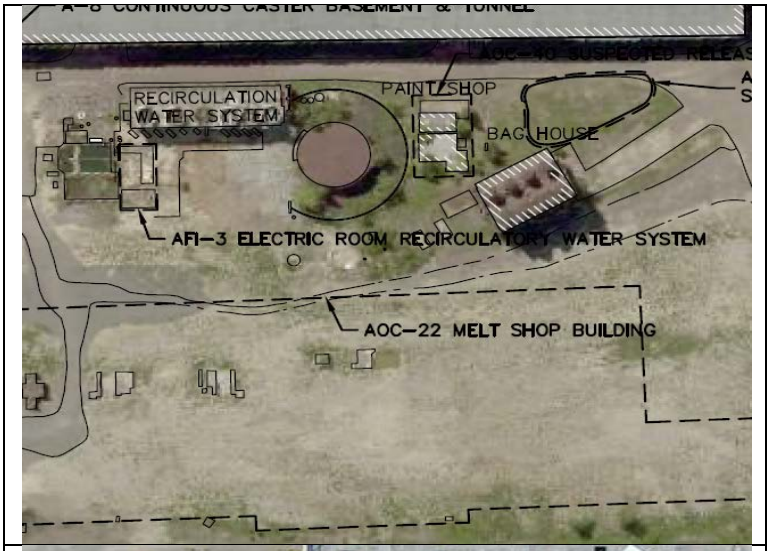
Special Considerations: location not accurately known

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

Unit Description
Former McLouth Steel Facility County Property

AOC 60(d): Electric Room of the Recirculation Water System (also known as AFI3)



Description: TBD

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 7

Unit Subject to: EPA Work Plan, TSCA, CERCLA

Special Considerations: None

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

Unit Description
Former McLouth Steel Facility County Property

AOC 48: Transformer Release (also known as AFI4)

Description: Reported release from an outside PCB transformer

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 6

Unit Subject to: EPA Work Plan, TSCA, CERCLA

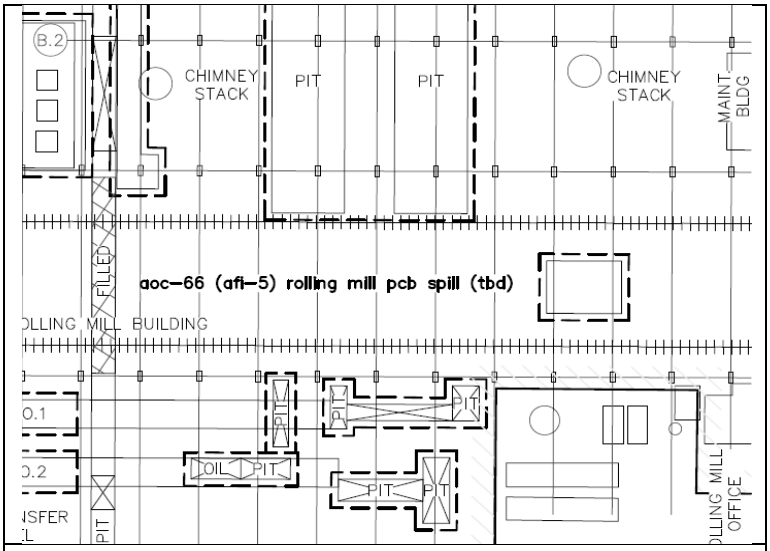
Special Considerations: release was reported to have been remediated in or around 1978

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

Unit Description
Former McLouth Steel Facility County Property

AOC 66: Rolling Mill PCB spill (also known as AFI5)



No Picture

Description: Reported PCB spill south of the rolling mill

Construction: TBD

Size: TBD

Contents: TBD

Estimated Depth of Contents: TBD

Est. Volume of Contents: TBD

Demolition Area: Area 4

Unit Subject to: EPA Work Plan, TSCA, CERCLA

Special Considerations: Location needs to be determined

Clearance Required:

Confined Space Entry	Yes
Pre-Disposal Approval	Yes
ACM Clearance	Yes
Cleaning Complete	Yes
Transformer Removal	No

ATTACHMENT B

ASTI SAMPLING STANDARD OPERATING PROCEDURES (SOPS)

ASTI ENVIRONMENTAL

STANDARD OPERATING PROCEDURE FOR

POROUS MEDIA CHIP SAMPLES

1.0 Scope and Applicability

This Standard Operating Procedure (SOP) applies to the collection of representative chip samples of porous surfaces. These procedures have been developed in general accordance with the United States Environmental Protection Agency (USEPA) Standard Operating Procedures (SOPs).

This SOP is an essential guide for all ASTI staff during collection of chip samples from porous media such as concrete and wood.

2.0 Summary of Method

The procedures in this SOP are used to ensure that samples representative of the true concentration of contaminants in a porous media are collected for characterization of the media. The following sections of this SOP are each divided into two parts. The procedures in this SOP are designed to act as a guide and may not be applicable to every sampling situation. Sampling procedures described in this SOP may need to be modified based on field conditions.

Samples are collected using a 1/2-inch wide cold chisel or other steel chisel and a hammer. Care must be taken to ensure that the chisel is cleaned properly prior to being used and between each sample. The chisel and hammer are used to break enough concrete off to fill a four ounce jar and collect a 10 gram sample in to a methanol kit.

3.0 Definitions

Chip – A fragment of the porous media to be sampled.

Porous Media – Material to be sampled that is permeable (i.e. cement or wood).

4.0 Health & Safety Warnings

Adequate health and safety measures must be taken into consideration during all site visits. ASTI employees are required to read and understand the Company's Corporate Health and Safety Plan prior to conducting any field work. Site Specific Health and Safety Plans must be developed for sites that will include porous media sampling and include detailed site information such as emergency phone numbers, emergency contact information, site hazards, site cautions, and MSDS sheets for chemicals used at these sites. *See ASTI SOP – Site Safety Plans.*

5.0 Cautions

1. Special care must be taken and precautions incorporated in this method must be followed to minimize cross-contamination of the sample.
2. The sampling team must take care to ensure that all sampling equipment materials are compatible with the contaminants of concern.
3. This method involves significant risk from flying debris. Eye protection MUST be worn while sampling porous media.

6.0 Interferences

The need to avoid contamination when collecting samples cannot be over-emphasized. Field collection personnel should be familiar with the potential sources of contamination, and implement those steps necessary for adequate control. Potential interferences that can cause contamination of samples that the sample collection team must be aware of include:

- Potential Sources of Contamination - These include improperly cleaned, and stored equipment, as well as atmospheric sources such as dirt and dust, automobile exhaust, laboratory workers, and cigarette smoke.
- Elevated Background Concentrations - Levels of contaminants can be a result of natural background or environmental contamination.
- Cross Contamination - The best way to control cross contamination is to minimize exposure of the sample and sampling equipment to possible sources of contamination. When possible, prior knowledge of sampling locations is used for planning collection activities to minimize chances of contamination from high sources, cross contamination resulting from sequentially sampling locations of high and low levels, and cross contamination during storage and transportation.
- Sampling Equipment Decontamination – Improper or incomplete decontamination of sampling equipment is a significant source of contamination. The decontamination of the sampling equipment used in vapor sampling is conducted primarily by the laboratory.

7.0 Personnel Qualifications/Responsibilities

All field staff must be trained by experienced field staff before performing Porous Media Sampling. Required field training is mandatory prior to leading a sampling team by new field staff. All field staff performing or assisting with sampling at sites that may be contaminated with hazardous substances are required to have 40-hour HAZWOPER training.

8.0 Equipment and Supplies

Equipment and supplies used during porous media sampling can change depending on the material to be sampled and site requirements, or other specific guidance; however, the following list presents the equipment generally required. These recommendations are consistent with equipment used at ASTI sites. Disposable materials such as gloves, storage bags, and plastic wrap, may be used new without additional cleaning.

1. **Chisel** - A 1/2 inch steel cold chisel designed to break through concrete.
2. **Hammer** - a three pound hand sledge.
3. **Plastic Tube** – Individual plastic tubes for crushing pieces of the porous media if required.
4. **Electronic Scale –**

9.0 Equipment Calibration and Set-up

Not Applicable.

10.0 General Instructions

These procedures are for a typical sampling application; actual field conditions and procedures may vary.

Before Arriving at the Sampling Location

1. Verify that required sample bottles are available.

2. Verify that required equipment is available.

3. Determine the sampling locations.

4. Review the Site-Specific Health & Safety Plan (HASP)

Sample Collection

1. Confirm the appropriate sample location has been selected.
2. Record sample location identifier in the field logbook (Refer to ASTI's Field Logbook SOP).
3. Don a clean pair of chemical resistant gloves.

4. Don safety glasses.
5. Remove the pre-decontaminated chisel from the storage bag.
6. Beginning with the horizontal edges of the area to be sampled, begin chipping the horizontal edges approximately 1.5-inches apart and approximately 0.5-inch deep.
7. Chip the vertical lines approximately 1.5-inches apart and approximately 0.5–inch deep. Care should be taken not to fully dislodge the chip at this point.
8. Using the chisel and hammer carefully remove the chip such that it does not come into contact with any other surface other than the samplers gloves or the sample collection bottle.
9. Complete a second chip adjacent to the first to allow for the collection of sufficient volume for sampling.
10. Place the two chips into the disposable tubes provided by the laboratory for sample crushing.
11. Using the hammer break the chips up small enough to fit easily into the laboratory provided sample jars. If the chips are being pulverized in the field, continue to break the chips until they are composed primarily of particles of fine gravel size or smaller (approximately 2 or 3 millimeters in diameter).
12. Place the crushed or uncrushed (if laboratory will crush the sample) sample into the laboratory provided containers.
13. Place the sample(s) on ice and chill to approximately 6° C.
14. Fill out chain-of-custody and relinquish samples properly (it is important to note the canister serial numbers on the chain-of-custody).
15. Ship per standard chain of custody protocols to meet method holding times.
16. Decontaminate the chisel per the site HASP.

11.0 Data and Records Management

During sampling, field data collected should be carefully recorded in the field logbook. Logged sample data should be recorded for each sample including date and time sample collected, sample location, sample identification number, project number site name and weather conditions.

Any additional notes or observations should be recorded in field notebooks or on field data forms.

12.0 Quality Control and Quality Assurance / Quality Control

The collection of QA/QC samples must be an integral part of any sampling activities. The QA/QC procedures must be included in sampling activities to ensure the samples are representative of the subsurface conditions. A full QA/QC program should be implemented that includes the collection of at least one field duplicate per sampling event or one per 10 samples, whichever is greater. Duplicate samples shall be collected in separate sample containers, using the same procedures, at the location adjoining the original sample. Preferably, duplicate samples should be collected simultaneous to collection of the primary sample using a sampling tee.

13.0 Update and Review Procedures

Review and update this SOP when new equipment and/or new technology is used or when relevant federal/state agencies issue new guidance. Update this SOP by incorporation of relevant portions of new guidance.

14.0 References

- Chip, Wipe, and Sweep Sampling, SOP #2011, USEPA, November 16, 1994
- Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), USEPA, May 2011
- ASTI Corporate Field Notebook Standard Operating Procedures.

15.0 Attachments

Not Applicable.

ASTI ENVIRONMENTAL

STANDARD OPERATING PROCEDURE FOR

SOIL SAMPLING

1.0 Scope and Applicability

The purpose of this standard operating procedure (SOP) is to describe the procedures to be used by ASTI employees during the collection of representative soil samples. Analysis of soil samples may determine whether concentrations of specific pollutants exceed established action levels, or if the concentrations of pollutants present a risk to public health, welfare, or the environment.

2.0 Summary of Method

Soil samples may be collected using a variety of methods and equipment depending on the depth of the desired sample, the type of sample required (disturbed vs. undisturbed), and the soil type. Near-surface soils may be easily sampled using a spade, trowel and scoop. Sampling at greater depths may be performed using a hand auger or mechanical methods such as a direct push drill rig or hollow stem auger rig. Which method or methods of sample collection are to be used should be based on site conditions and the data quality objectives (DQOs) for the project. Whatever method is used to collect the soil sample, care must be taken to ensure that representative samples are collected and cross-contamination is eliminated.

The procedure used to collect soil samples will vary based on the analytes proposed for analysis, the method used to bring the soil to the surface for sampling, and site DQOs. Soil samples are collected using conventional procedures, including auger and split spoon techniques.

For samples to be analyzed by United States Environmental Protection Agency (USEPA) Method 5035 for volatile organic compounds (VOCs), sub-sample aliquots to be tested for VOCs are collected first, as soon as possible after the soil has been extracted from the ground, from as undisturbed a portion of the soil as possible. VOC samples are taken using a dedicated syringe-type coring device and immediately transferred into pre-weighed VOC vials containing reagent grade methanol sufficient to obtain a ratio of 1 milliliter of methanol to1 gram of soil. The samples are then transferred to the laboratory using proper chain-of-custody protocols.

> Method 5035A uses a 2:1 ratio of methanol volume to soil weight. This ratio is acceptable contingent that the requirements in the Michigan Department of Environmental Quality (DEQ) Operational Memorandum No. 2, Attachment 1, Target Detection Limits and Available Methods, are met.

For samples being collected for the analysis of other compounds, sub-samples are taken and transferred to laboratory provided pre-clean sample bottles as appropriate to the analysis to be performed. When collecting soil samples for analysis care must be

taken to ensure that the soil collected is representative of the soils at the sampled depth and that samples are as homogenous as possible. To achieve this, samples for non-volatile analysis should be composited and well-mixed prior to filling the laboratory container.

3.0 Definitions

ASTM D 1586-98 – Standard Test Method for Penetration Test and Split-Spoon (Barrel) Sampling of Soils
DEQ – Michigan Department of Environmental Quality OSHA – Occupational Safety and Health Administration USEPA – United States Environmental Protection Agency
VOC – volatile organic compound

4.0 Health & Safety Warnings

When working with potentially hazardous materials, follow USEPA, OSHA, DEQ, Corporate and/or Site Specific Health & Safety Plan.

5.0 Cautions

There are two primary potential problems associated with soil sampling – cross-contamination of samples and improper sample collection. Cross-contamination problems can be eliminated or minimized through the decontamination of sampling equipment (Refer to ASTI SOP – Decon). Improper sample collection can involve using contaminated equipment, disturbance of the matrix resulting in compaction of the sample, or inadequate homogenization of the samples where required, resulting in variable, non- representative results.

6.0 Interferences

Not Applicable

7.0 Personnel Qualifications/Responsibilities

The collection of soil samples will be conducted by personnel familiar with the sampling protocols outlined in this SOP. Field sampling and monitoring may be performed by a single individual or by two or more persons depending upon the nature of the project and site and weather conditions. Projects that require sampling at night should be conducted using two-person teams but may be reviewed on a case-by-case basis depending upon sampling location and suspected site hazards.

8.0 Equipment and Supplies

- ☐ Sample location maps/plot plan
- ☐ Work Plan
- ☐ Safety equipment/PPE, as specified in the site-specific Health and Safety Plan
- ☐ Tape measure
- ☐ Survey stakes or flags

- ☐ Camera and film
- ☐ Field potable scale or balance
- ☐ Stainless steel, plastic, or other appropriate homogenization bucket, bowl or pan
- ☐ Appropriate size sample containers
- ☐ Ziplock plastic bags
- ☐ Field book
- ☐ Chain of Custody records
- ☐ Field data sheets and sample labels
- ☐ Cooler
- ☐ Ice
- ☐ Decontamination supplies/equipment

9.0 Equipment Calibration and Set-up

Prior to each day of soil sampling for VOCs the field scale or balance should be calibrated to ensure accuracy throughout the day.

- If the syringe is being weighed alone (e.g., without a glass jar or other items that would cause the sample weight to be appreciably exceeded), the field calibration check can be conducted using either a traceable calibration weight or a United States Nickel coin. The coin should weigh approximately 5 grams plus/minus 5% (4.75 grams to 5.25 grams).
- If the syringe is being weighed together with a glass jar, preservative, or other items, then the calibration check weight that is used must be similar to the items weighed.

10.0 Procedure

10.1 Preparation

- ☐ Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies required.
- ☐ Obtain necessary sampling and monitoring equipment.
- ☐ Decontaminate or pre-clean equipment, and ensure that it is in working order.
- ☐ Prepare schedules and coordinate with client and regulatory agencies, if appropriate.
- ☐ Use stakes, flagging, or buoys to identify and mark all sampling locations.

Specific site factors, including extent and nature of contaminant, should be considered when selecting sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations should be utility-cleared (MISS DIG) prior to soil sampling; and utility clearance should always be confirmed before beginning work.

10.2 Sample Collection

10.2.1 Collecting Samples for VOC analysis

Collection of samples for analysis of VOCs should be by USEPA Method 5035. Sub-samples are taken using a dedicated syringe-type coring device as soon as possible after the soil has been extracted from the ground. Samples shall be collected from as undisturbed portion of the soil as possible, and immediately transferred into pre-weighed VOC vials containing reagent grade methanol sufficient to obtain a ratio of 1 milliliter of methanol to1 gram of soil.

1. Make arrangements with the laboratory to obtain appropriate Methanol Preservation
   Sampling Kits.
2. Record the tracking or lot number(s) for the methanol in the field notebook. If more than one lot is used, each lot must be associated with the samples for which it was used.
3. Prior to collection, check the calibration of the balance per Section 9.0 above.
4. Prior to collection prepare a temperature blank sample using tap water.
5. Prior to collection, ensure a sufficient quantity of methanol field blanks, i.e., at least one per cooler and one per methanol lot, is available. The methanol field blank should be prepared by the lab/supplier.
6. Calibrate the syringe to estimate the amount of soil needed to meet the target weight (typically 10 g +/- 1 g for a 10 mL methanol preserved VOA vial with a 40 mL capacity), and use that syringe as a comparison for how much sample is needed. Calibration is performed using steps 10 - 17 below, using the syringe only, and part of the soil that is to be collected. The soil used for calibration cannot be used as the sample. It must be extruded from the sampler and discarded at the site before collecting the sample. The sampler does not have to be cleaned between calibration using this step, and collection of the sample.
7. Place the vessel, used to prevent balance contamination, on the balance.
   - If the vessel used is a wide mouth glass jar, the calibration weight used to check the scale on a daily basis prior to use should be in the same range of what will be measured/weighed.
   - In the absence of a suitable calibration-check weight for a large glass jar, the 5 g calibration method may be used and a kim-wipe or similar disposable tissue and the empty disposable syringe may be tared prior to weighing the sample.
8. Record the location, date, and time of sampling in the field log book. Do not place any labels, stickers, tape, etc. on the pre-weighed sample vials.
9. For methanol field blanks, the methanol blank should NOT be opened in the field, but should be handled and shipped like a water VOA trip blank, un-opened throughout the sampling process, then placed in the shipping cooler with the VOC samples.

10. Place the syringe to be used for the sample on the balance with any other items whose weight was included in the calibration-check (e.g., a pre-weighed VOC vial, a wide mouth jar).

11. Record the weight in the field log book. If the balance features re-zeroing, zero the balance.

12. Remove the syringe. If a cap is provided, remove the cap and reserve it for future use.

13. Insert the open end of the syringe into a fresh face of undisturbed soil, and fill it as appropriate according to the calibration of the syringe (Step 6).

14. If necessary, use your gloved finger (decontaminate before next sample), or other appropriate instrument, and push the soil deeper into the syringe sampler.

15. If a cap was provided, immediately cap the end of the syringe. Wipe the syringe clean.

16. Place the syringe in the jar on the balance. Read the weight, and if necessary, subtract the weight of the syringe, vial, and jar, as appropriate, to determine the weight of the soil.

17. If the weight of the sample is determined to be more than the maximum amount allowed, extrude enough soil to obtain the target amount within the specified tolerance, and re-weigh. See the table in this document, “Specifications for the Collection of Samples Using Methanol Preservation” for the applicable target sample size and tolerance.

18. If the weight of the sample is less than the minimum amount allowed, re-sample and repeat steps starting with Step 7.

19. Record the soil weight in the field notebook. DO NOT RECORD the weight on the sample vial label.

20. Remove the cap from the sample vial, and place it in the vessel on the balance, with the septum upwards.

21. If the required amount of methanol is not included with the pre-weighed vial, immediately remove a methanol tube from the wide mouth glass storage jar, holding the tube upright use scissors to cut (plastic) off one end, and pour the methanol into the sample vial, taking care to avoid spillage.

22. Insert the open end of the syringe sampler into the mouth of the vial, and carefully extrude the soil, taking care to avoid spillage. Loss of several drops will not make a significant difference in the results. If a significant amount is spilled, a new sample must be collected, or the sample must be appropriately flagged to indicate estimated results.

23. Using a clean brush, paper towel, or other suitable material, thoroughly wipe excess soil particles from the threads and vial body. Particles left on the threads will prevent a good seal.

24. Place the VOC cap on the sample vial. The cap must be tight; however, over- tightening should be avoided.

25. Gently swirl the sample and methanol for about 10 seconds to break up the soil. DO NOT SHAKE.

26. Place the sample in a plastic bag on ice in a cooler.
27. Using the syringe sampler, take another sample from the soil.
28. Cap and label the syringe with the sample identification.
29. Place the syringe with the sample in the plastic bag. This sample is for dry weight determination.
30. Decontaminate the jar/balance using decontamination procedures appropriate for the type and level of contamination.

For further details regarding the procedures for collecting of soil sample via USEPA Method 5035 refer to the DEQ Operational Memorandum No. 2, Attachment 6, Sampling Methods for Volatile Organic Compounds.

10.2.2 Collecting Samples for non-VOC analysis

Collection of samples for analysis other than VOCs should be done directly into laboratory provided pre-cleaned jars.

1. Make arrangements with the laboratory to obtain appropriate type and number of soil jars for the analysis to be requested.
2. Record the tracking or lot number(s) for the jars and any preservatives used in the field notebook. If more than one lot is used, each lot must be associated with the samples
   for which it was used.
3. Prior to collection prepare a temperature blank sample using tap water.
4. Record the location, date, and time of sampling in the field log book.
5. Place a sufficient amount of soil to fill all jars into a pre-cleaned stainless steel bowl or other appropriate apparatus such as a large zip-lock bag.
6. Using a decontaminated stainless steel spoon or similar sampling device, composite the sample. The soil should be mixed well prior to filling the rest of sample containers. If using a zip-lock bag, soil may be mixed by kneading the soil within the bag.
7. Using the spoon place sufficiently large sub-samples into each of the soil jars required for the requested analysis.
8. If necessary, use your gloved finger (decontaminate before next sample), or other appropriate instrument, and push the soil deeper into the jar.
9. Using a clean brush, paper towel, or other suitable material, thoroughly wipe excess soil particles from the threads and jar body. Particles left on the threads will prevent a good seal.
10. Place the cap on the sample jar. The cap must be tight; however, over-tightening should be avoided.
11. Place a label on the jar identifying location, date, and time of sampling, and the requested sample analysis.

12. Place the sample in a plastic bag on ice in a cooler.

11.0 Data and Records Management

Not Applicable.

12.0 Quality Control and Quality Assurance

There are no specific quality assurance (QA) activities which apply to the implementation
of these procedures. However, the following QA procedures apply:

1. All data must be documented within the field notebooks.
2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

13.0 Update and Review Procedures

Not Applicable

14.0 References

Michigan Department of Environmental Quality Operational Memorandum 2 Attachment
6, Sampling Methods for Volatile Organic Compounds, October 22, 2004

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15.0 Attachments

Not Applicable.

ATTACHMENT C

EPA's Standard Operating Procedure(SOP) for Sampling Porous Surfaces for Polychlorinated Biphenyls(PCBs)

9.0 Sample Collection

9.1 Hard Porous Surfaces

9 .1.1 Lock a l-inch or another size diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. For easy identification, sample locations may be pre-marked using a marker or paint. (Note: the actual drilling point must not be marked.) Remove any debris with a clean brush or cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook.

9.1.2 Use a Cubitainer with the top cut off or aluminum foil to contain the powdered sample. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground powder that can be easily collected.

9.1.3 Samples should be collected at l-inch depth intervals. Thus, the initial surface sample should be collected from 0-0.5 inches. A ~-inch deep hole generates about I 0 grams (20 mL) of powder. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes for a PCB determination. It is strongly recommended that the analytical laboratory be consulted on the minimum sample size needed for PCB extraction and analysis.

9.1.4 Wall and Ceiling Sampling: A team of two samplers will be required for wall and ceiling sampling. The second person will hold a clean catch surface (e.g. an aluminum pan) below the drill to collect the falling powder. Alternatively, use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. For ceilings, the drill may be held at an angle to collect the powder. Thus the driller can be drilling at an angle while the assistant steadies the pun to catch the falling powder. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the drill's cooling vents. Caution must *be* taken to prevent obstruction of the drill's cooling vents.