

WORK PLAN
Waste Management Unit Investigations
Riverview-Trenton Railroad Company
Former McLouth Steel Site
18251 West Jefferson Avenue
Riverview, Michigan

June 28, 2019

Prepared For:
Riverview-Trenton Railroad Company
12225 Stephens Road
Warren, Michigan 48089

Prepared By:
ASTI Environmental
10448 Citation Drive, Suite 100
Brighton, Michigan 48116
1-800-395-ASTI

ASTI Project No. 10860



WORK PLAN
Waste Management Unit Investigations
 Riverview-Trenton Railroad Company
 Former McLouth Steel Site
 18251 West Jefferson Avenue
 Riverview, Michigan
 ASTI Project No. 10860

Table of Contents

1.0	Introduction.....	1
2.0	Background.....	1
3.0	Site Description.....	2
3.0	Geology and Hydrogeology.....	2
4.0	Proposed Work Plan Activities.....	3
4.1	WMU26 – North Debris Pile.....	3
4.1.1	WMU26 – Proposed Activities.....	3
4.2	WMU27 – Former Equipment Storage Yard.....	4
4.2.1	WMU27 – Proposed Activities.....	4
4.3	WMU29 – TSCA Storage Building.....	5
4.3.1	WMU29 – Proposed Work Activities.....	6
4.4	WMU30 – Former Electric Arc Furnace Admission Control/Dust Storage Pile.....	7
4.4.1	Proposed Work Plan Activities.....	8
4.5	WMU31 – Electric Arc Furnace Emission Control Sludge/Dust Storage Tanks.....	9
4.5.1	WMU31 – Proposed Work Plan Activities.....	10
5.0	Decontamination Procedures.....	11
6.0	Site Health and Safety Plan.....	11
7.0	Project Staff.....	11
8.0	Schedule.....	12
9.0	Cost Estimate.....	12

Appendices

- Attachment A - Figure 1 - Site Location Map
 Figure 2 - RTRR Property Site Plan
 Figure 3 - Waste Management Unit Locations
 Figure 4 – WMU27 and WMU29 Site Plan
 Figure 5 – WMU31 Site Plan

- Attachment B - Site Health and Safety Plan

WORK PLAN
Waste Management Unit Investigations
Riverview-Trenton Railroad Company
Former McLouth Steel Site
18251 West Jefferson Avenue
Riverview, Michigan
ASTI Project No. 10860

1.0 Introduction

ASTI Environmental (“ASTI”) prepared this Work Plan (Work Plan) for Investigation of five Waste Management Units (“WMUs”) located at the Riverview-Trenton Railroad Company (“RTRR”) property at 18251 W. Jefferson Avenue in the City of Trenton and City of Riverview, Wayne County, Michigan (“Subject Property”). This Work Plan was completed on behalf of RTRR as required by the Corrective Action Consent Order (“CACO”) between RTRR and the Michigan Department of Environment, Great Lakes, and Energy (“EGLE”), Waste Management and Radiological Protection Division, dated November 1, 2018. This Work Plan was completed to implement the Statement of Work (“SOW”) included as Attachment A of the CACO for the Subject Property. Figure 1 provides a Site Location Map and a Site Plan is provided as Figure 2.

This Work Plan is provided for the completion of additional investigation activities at five WMUs located on the Subject Property (referred to in the CACO as Site Identification Number: MIK420024889). Those WMUs are presented in the table below:

WMU Number	WMU Name
WMU26	North Debris Pile
WMU27	Equipment Storage Yard
WMU29	TSCA Storage Building
WMU30	Former Electric Arc Furnace Emission Control/Dust Storage Pile
WMU31	Electric Arc Furnace Emission Control Sludge/Dust Storage Tanks

Figure 3 shows the locations of the WMUs on the Site Plan.

2.0 Background

The Subject Property originally consisted of wetlands and open water, with some uplands in the northwestern portion of the property, until sometime after 1936. During that time, the Monguagon Creek bisected the property, emptying into the Trenton Channel of the Detroit River at about Sibley Road. Between about 1946 and 1952 much of the property had been filled to the current Detroit River bank, but open water remained in the original Monguagon Creek channel. By 1954 the mouth of the Monguagon Creek had been enlarged for docking, including an area of open water to the south and at least five above ground storage tanks located north of the mouth. By 1967, the original Monguagon Creek channel had been filled, the creek was redirected along the northern property line, and no open water remained on the property.

The Subject Property was acquired around 1947 by the McLouth Steel Company (“McLouth”), and used for storage of raw materials, waste, and product to support the integrated production of steel and iron on the remainder of the property (known as “the County Property”) from approximately 1952 to 1975. Facilities on the Subject Property included a storage area for electric arc furnace air pollution control dust (WMU30 and WMU31) and storage areas for PCB equipment (WMU27 and WMU29). After about 1975, production decreased on the County Property, until McLouth ceased operations in April of 1996 after filing for Chapter 11 bankruptcy protection on September 29, 1995. Hamlin Holdings, Inc. acquired the Subject Property in July of 1996. Detroit Steel Company (“DSC”) obtained title for the Subject Property in August of 1996. Crown Enterprises purchased the Subject Property on June 2, 2000, and conveyed the property to RTRR in November of 2000.

3.0 Site Description

The Subject Property consists of approximately 76.2 acres of land on a portion of the former McLouth Steel site in Trenton and Riverview, Michigan. The Subject Property is contained in three parcels; 51009030001000, 54001010082300, and 54001990006704. The property is bounded by Trenton Channel of the Detroit River to the east; a portion of the County Property portion of the McLouth Steel site, a railroad line, and West Jefferson Avenue to the west; the Grosse Ile Toll Bridge and Monguagon Creek to the north; and the County Property to the south. Further east of the property, beyond the Trenton Channel, is Grosse Ile, further west, beyond West Jefferson Avenue, is a quarry, residential, commercial and industrial property and further north, beyond Monguagon Creek, is commercial and industrial property. Figure 1 provides a Site Location Map for the Subject Property and Figure 2 provides a Site Plan.

3.0 Geology and Hydrogeology

Based on the previous environmental investigations conducted at the Subject Property, the general site stratigraphy consists of fill soils of unknown origin varying in composition from sand to clayey-silt and containing urban debris (brick, metal, concrete, etc.) overlying a native clay stratum. The fill thickness ranges from 4 feet to 25 feet below ground surface (“bgs”) and generally increases in thickness from west to east towards the Detroit River. This fill most likely consists of slag placed between 1952 and 1996, underlain by materials of unknown origin placed in open water and wetlands prior to 1952.

Because much of the property was wetlands and open water prior to filling placement, the fill material is inferred to be underlain by sediments from the Detroit River over the eastern half of the Subject Property. This sediment is assumed to have originated upstream of the Subject Property and therefore may contain contaminants associated with upstream industrial operations.

Beneath the fill material and inferred sediments are low permeability clays and silts which mostly overly limestone bedrock. The underlying clay layer varies in thickness from 10 to 20 feet, thinning to the east. It has not been determined if the underlying clay layer is continuous over the entire Subject Property, but if so, it would separate the lower bedrock aquifer from surface impacts.

Based on previous studies reviewed, perched groundwater is encountered at 0 to 15 feet bgs, primarily in the fill material. The perched groundwater is approximately 5 feet to 15 feet

above typical surface water elevations in the Trenton Channel. The perched zone generally flows east toward the Detroit River and, on the northern portion of the Subject Property, flows northeast toward the Monguagon Creek. The perched zone appears to be hydraulically connected to surface water.

4.0 Proposed Work Plan Activities

The SOW provides a summary of activities required to complete or confirm investigation activities performed at the WMUs in the past through a review of existing documentation and collection of additional samples. All sampling and analytical activities will be conducted according to the Quality Assurance Project Plan (“QAPP”). The following sections provide a summary of the required tasks and serve as individual work plans for completion of the SOW.

4.1 WMU26 – North Debris Pile

WMU26 is an approximately 20-acre area on the northern portion of the RTRR property (Figure 3) that McLouth Steel used to accumulate debris generated at the plant for reclamation prior to disposal. Numerous solid waste streams, including refractory material, slag, air pollution control solids (bag houses), BOF scrubber sludge, and scale pit sludge are assumed to have been collected in various piles. The piles were magnetically processed and screened to reclaim steel-containing material. Processed residuals were then stockpiled in the area pending transportation to McLouth’s Gibraltar Landfill. Piles of ore and slag were also stored in this area.

Though limited documentation is available, approximately 400,000 cubic yards (approximately 90,000 tons) of debris was removed from the North Area of the Subject Property and disposed off-site. An additional 300,000 tons of material was removed from this area of the property at a later time. A slag pile containing approximately 39,000 cubic yards known as “Levy Mountain” was apparently graded across the area (based on discussions with EGLE). The area is now roughly graded and generally flat.

The objectives of the tasks for WMU26 are:

- 1) Inspect the area of the former North Debris Piles to document that the piles have been removed and that the surface materials are visually similar to other surface materials on the RTRR Property,
- 2) Review the updated topographic survey, and
- 3) Prepare a report for submittal to EGLE to document the results of the investigation.

4.1.1 WMU26 – Proposed Activities

ASTI will inspect the area of the Former North Debris Piles to determine if the piles still exist on the RTRR Property. The inspection will consist of visual observation of the topography and surface cover in the WMU26 area. Field documentation will consist of a visual description of the surface soil (i.e. color, general grain size classification, noting non-soil material present, if applicable) additionally; a similar inspection will take place at two locations outside of WMU26 which represent areas “similar to other materials on the RTRR

Property”. No subsurface investigation or analysis will be conducted during this inspection. ASTI field personnel will take photographs of the areas of the Former North Debris Piles and the areas used to represent the areas outside of WMU26. All site work will be preformed under the Project QAPP and Site Health and Safety Plan (“SHSP”).

If debris piles still exist on the Subject Property, ASTI will provide the footprint and location(s) on a topographic survey. Though no subsurface investigation will take place, ASTI will estimate the thickness of the piles based on the topographic survey and adjacent elevations.

ASTI will provide EGLE with a report detailing the investigation activities. The report will include a narrative summary of the investigation activities, a topographic map, and photo documentation of the areas investigated. If debris piles are present, their general locations will be depicted on map provided in the report.

4.2 WMU27 – Former Equipment Storage Yard

WMU27 comprises an area of approximately 1.2 acres of undeveloped land that is situated on the western-central portion of the Subject Property. This area was formerly utilized as an equipment storage yard. Based on historical aerial photos and maps, the location of WMU27 is shown on Figure 3 and Figure 4 provides a Site Plan for the WMU27 area.

The objectives of this section of the Work Plan are:

- 1) Conduct a soil investigation around the former Equipment Storage Yard to determine the horizontal and vertical extent of PCBs in soil that exceed 25 parts per million (“ppm”), and
- 2) Prepare an investigation report to provide the results of sampling and laboratory analysis and to identify any additional measures (if required) to be taken to prevent unacceptable human exposure to PCBs.

4.2.1 WMU27 – Proposed Activities

As described in the SOW, an investigation around the former Equipment Storage Yard will be conducted to determine the horizontal and vertical extents of PCBs in soil in exceedance of 25 ppm. A random sampling approach will be use to install 20 soil borings for collection of soil samples for laboratory analysis. Soil borings will be installed using the approach detailed in EGLE Guidance Document titled Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria (S3TM [EGLE, 2002]).

In January 2001, an investigation was conducted to determine if PCBs were present in surface soil within MWU27. Twelve surface soil samples (approximately 0 to 6 inches bgs) were analyzed for PCBs. One sample contained a concentration of PCBs in exceedance of 25 ppm. Based on that exceedance, an additional soil sample from the depth of 6 inches to 12 inches bgs was analyzed for PCBs. The total PCB concentration from that interval was below 25 ppm. A WMU27 Site Plan is included as Figure 4.

Based on this previous investigation, an ASTI field scientist will oversee the installation of 20 soil borings to be completed by a licensed drilling subcontractor. The ASTI field scientist will

collect two to three soil samples from each boring to assess the vertical extent of PCB impacts (if present). A Geoprobe® rig, or equivalent, will utilize direct push technology to advance the soil borings to the groundwater surface or to the first confining (clay) layer; whichever is encountered first. Soil samples to be collected from each boring will include one surface soil sample (one inch to three inches bgs) and one sample from immediately above the groundwater or upper confining layer. An additional sample may be collected from an interval which displays potential impacts based on visual observations (i.e. staining, odor, etc.). Prior to field investigation activities, ASTI will locate the extents of WMU27 from a review of historical aerial photographs and will use that information to determine the locations of the extents of WMU27. That information will be used in the field to locate the extents. For future reference the four corners of WMU27 will be staked and geo-located.

Additional samples will be collected for the purpose of assuring quality assurance/quality control (“QA/QC”). Those samples will include duplicate samples and matrix spike/matrix spike duplicates (“MS/MSD”). One duplicate sample will be collected for every 20 soil samples collected. Two to three duplicate samples are expected for this investigation. Three MS/MSD samples will be collected.

Soil sample collection, handling, and laboratory analysis will be conducted according to United States Environmental Protection Agency (“U.S. EPA”) and EGLE methodology as required by the Project QAPP. All samples will be analyzed for PCBs. Soil samples will be submitted under chain-of-custody to a National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory for analysis using U.S. EPA Method 8082A.

Soil analytical results will be compared to the cleanup level provided by the Toxic Substances Control Act (“TSCA”) for low occupancy areas of 25 ppm. At the conclusion of the WMU27 PCB investigation, ASTI will submit a report to EGLE to provide the results of the investigation and additional measures recommended to be taken (if necessary). The investigation report will include a narrative summary of the investigation and results, tabularized laboratory analytical data, figures, soil boring logs, and copies of the laboratory analytical results.

4.3 WMU29 – TSCA Storage Building

The location of the former TSCA Storage Building is shown on Figure 3 and Figure 4 provides a Site Plan of the WMU29 area. This scope of work to be conducted in WMU29 will include cleaning and sampling the concrete pad in the location of the former TSCA Storage Building and a determination of the horizontal and vertical extent of PCBs beneath the concrete pad and in surrounding soils. Analytical results for PCBs will be compared to the TSCA cleanup level for low occupancy areas of 25 ppm.

A previous investigation of the Former TSCA Storage Building floor indicated that concentrations of PCBs were present at levels in exceedance of the low occupancy criteria. Additionally, two soil samples collected from beneath the concrete slab contained concentrations of PCBs in exceedance of 25 ppm.

Based on the previous investigation, this soil investigation is required to determine the horizontal and vertical extents of PCB impacts.

The objectives of this section of the Work Plan are:

- 1) Clean, or remove, the concrete slab of the Former TSCA Storage Building via pressure washing.
- 2) Collect concrete samples to determine if PCBs are present at concentrations exceeding 25 ppm in the concrete.
- 3) Conduct a soil investigation to determine the horizontal and vertical extents of PCBs in soils exceeding 25 ppm.
- 4) Prepare a report documenting the findings of the concrete decontamination and confirmation sampling and PCB soil investigation.

During the investigation, ASTI will geo-locate the extents of WMU29 and provide the updated location and extents on a site figure to be included in the investigation report. All work conducted for this task will be conducted according to this Work Plan.

4.3.1 WMU29 – Proposed Work Activities

This section of the Work Plan documents the procedures required to clean the concrete slab, collect concrete samples, and conduct a soil investigation at WMU29 within the Subject Property.

Concrete Slab Cleaning

The entire surface of the concrete slab will be cleaned with the use of a pressure washer or via scarifying the surface of the concrete, or the pad will be removed for off-site disposal. If cleaning takes place via pressure washer, wash water will be contained for proper characterization. Wash water will be disposed of off-site, as allowed under 40 C.F.R. 761.49(g) and 761.79(b)(1), or discharged to the Publicly Owned Treatment Works (“POTW”) under permit. If the concrete pad is removed for off-site disposal, cleaning will not take place and sampling will be conducted as necessary for disposal.

Concrete Sampling

After concrete cleaning is complete, ASTI will collect samples of the concrete matrix for laboratory analysis of PCBs. Based on the area of WMU29 (approximately 672 square feet [ft²]), the site is considered a small site (small sites are those up to 10,890 ft²) as described in EGLE Sampling Strategies and Statistics Training Materials (“S3TM”) for Part 201 Cleanup Criteria dated 2002. Using the formula from S3TM for determination of a sampling grid based on the area to be sampled, a grid interval of approximately 7.3 feet was calculated. ASTI will collect samples from 20 grid locations for characterization of the WMU29 area.

ASTI will collect one concrete sample from each pre-determined grid location in accordance with U.S. EPA and EGLE methodology. Samples will generally be collected from the center of the grid; however, priority will be given to areas of staining, if present. ASTI will collect the samples in a manner consistent with the Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls.

Concrete core samples will be submitted to a NELAP-certified laboratory using chain of custody procedures and analyzed for PCBs using U.S. EPA Method 8082A. If laboratory analytical results for the concrete samples indicate that PCBs are present at concentrations

greater than 25 ppm, additional concrete cleaning or scarifying may take place, followed by additional concrete sampling, or the concrete may be removed and legally disposed off-site.

Soil Investigation

ASTI proposes advancing up to 16 soil borings in and around WMU29 to determine the horizontal and vertical extents of PCBs in soil in exceedance of 25 ppm. Soil boring locations around the concrete pad will be selected randomly using the approach detailed in the EGLE Guidance Document titled S3TM. Two soil borings will be authoritatively selected within the footprint of the concrete slab and 14 soil borings will be randomly selected in soils adjacent to the slab with at least two borings adjacent to each side of the rectangular slab. The soil samples below the concrete slab will be collected from approximately the same locations as previous samples with elevated PCB concentrations.

The borings will be installed with the use of a Geoprobe[®] rig, or equivalent, using direct push to retrieve soil samples. Two to three samples will be installed in each boring; one surface soil sample (one inch to three inches bgs), one sample from the interval immediately above groundwater or a confining layer, and the third sample may be collected from an interval determined by the ASTI field scientist which may have a higher probability of containing PCB impacts (i.e. staining).

An ASTI field scientist will oversee the soil boring installation and collect the required soil samples. Soil sample collection will take place in accordance with U.S. EPA and EGLE guidelines. ASTI will collect up to 48 soil samples for submittal to a NELAP-certified laboratory for analysis of PCBs by U.S. EPA Method 8082A. For the purpose of QA/QC, one duplicate soil sample and one matrix spike/matrix spike duplicate (“MS/MSD”) sample will be collected for every 20 soil samples collected (2 to 3 QA/QC samples).

After logging lithology, the ASTI field scientist will collect the soil samples into laboratory-provided jars and place on ice and kept cool until delivery to the laboratory. The samples will be handled using chain of custody procedures and delivered to the laboratory by ASTI or via courier. All sampling will be conducted in accordance with the Project QAPP.

Upon confirmation of the laboratory data, ASTI will prepare a report to detail the WMU29 soil investigation and provide a summary the laboratory data. PCB concentrations will be compared to the TSCA Cleanup Criteria of 25 ppm. ASTI will identify further measures, if any, to be taken to prevent unacceptable human exposure to PCBs.

4.4 WMU30 – Former Electric Arc Furnace Admission Control/Dust Storage Pile

McLouth Steel historically utilized an Electric Arc Furnace (“EAF”) at the County Property as part of their steel production operations. Based on the Final Closure Report and Certification dated March 31, 1998 (Techna Corporation), a Resource Conservation and Recovery Act (“RCRA”) permit was filed on November 17, 1980 for storage of EAF dust on the Subject Property prior to treatment or disposal. Dust produced from these operations was stored on the west-central portion of the Subject Property (WMU30). McLouth ceased accumulating dust in 1988 after an additional RCRA permit application was rejected. Closure activities at WMU30 were conducted between 1991 and 1996 including removal of residual waste materials from WMU30. The location of WMU30 is depicted on Figure 3.

Subsurface Investigations at and in the nearby vicinity of WMU30 were conducted by Clayton Environmental Consultants involving shallow soil sampling between November 1996 and 1997. Shallow soil samples were collected between the surface and 2 feet bgs at 41 locations; 20 locations in WMU30 and 21 outside of the area to evaluate background concentrations. The samples were analyzed for barium, cadmium, total chromium, lead, pH, and select samples for hexavalent chromium. Results indicated that portions of WMU30 are impacted with lead above the Generic Non-Residential Cleanup Criteria (“GNRCC”) for direct contact. No fine/coarse lead fractions were analyzed on samples with lead concentrations above 75 ppm as currently required by EGLE.

Techna Corporation (“Techna”) used those previous investigation results and collected 10 additional background soil samples on July 28, 1997 to prepare a closure report. Results of the investigation were presented in a Final Closure Report and Certification dated March 31, 1998 on behalf of DSC Ltd. Techna's conclusions in the Closure Report indicated that comparisons of soil closure assessment results to typical fill chemistries demonstrated that management of EAF dust wastes at the storage pile did not contribute to the levels of target metals measured in area fill during the closure assessment. It was reported that the final waste removal activities successfully remediated the former dust pile sufficient to achieve closure to site-specific background. In addition, they indicated that results of comparisons of down-gradient groundwater assessment results with up-gradient groundwater results demonstrated that contaminants from the EAF dust storage pile were not released to groundwater.

The objectives of the tasks for WMU30 are:

- 1) Review existing data from previous investigations to determine the horizontal extent of lead in surface soils that exceed GNRCC;
- 2) If the previous data is not sufficient to define the horizontal extents of lead in surface soil, conduct a surface soil investigation to confirm that previously identified lead impacts in surface soils (between 0 and 12 inches from the surface) were previously remediated. This investigation will use any available pre-existing data to assist in defining the horizontal extent and new data will be added, as needed to supplement existing data; and
- 3) Prepare a report to document the findings of the Surface Soil Investigation.

All work conducted for this project will be conducted according to this Work Plan.

4.4.1 Proposed Work Plan Activities

This section documents a soil investigation to determine the extent of surface soil impacts as described above for WMU30.

The surface soil investigation will be completed at WMU30 to determine the horizontal extent of lead in surface soils that exceed nonresidential generic direct contact criteria.

Soil Investigation

WMU30 is considered a medium site (between 0.25 and 3 acres) based on the EGLE Sampling Strategies and Statistics Training Materials (S3TM) for Part 201 Cleanup Criteria dated 2002. Using the formula from S3TM for determining a sampling grid based on the

area to be sampled, a grid interval of 22 feet was determined.

ASTI will review existing data to determine if additional soil samples are required to delineate the horizontal extent of lead in surface soils that exceed the Nonresidential Generic Direct Contact Criteria. The number of boring required, if any, for additional characterization will be determined based on the number and placement of existing sample locations, but will not exceed 20.

If additional characterization is required, soil borings will be advanced using a stainless steel hand auger, or equivalent. One soil sample will be collected from each boring at a depth between the surface and one foot bgs. One duplicate soil sample and one MS/MSD sample will be collected for every 20 samples collected, if additional soil samples are required.

Prior to the investigation, ASTI will approximate the extents of the former EAF Admission Control/Dust Storage Pile based on historical aerial photographs. Approximate locations will be determined and those locations will be used to determine the extents of WMU30 in the field.

Sample Analysis (if required)

Samples collected from each of the borings will be visually inspected and lithology will be logged by an ASTI field scientist. Soil samples (if required) will be submitted under chain-of-custody to a NELAP-certified laboratory for analysis of total lead. Based on results of laboratory analysis, soil samples with total lead concentrations equal to or greater than 75 milligrams per kilogram (mg/kg) will be separated by the laboratory into fine grain (smaller than 250 microns) and coarse grain (larger than 250 microns) fractions. The fine and coarse grain fractions will then be analyzed for total lead. The fractionated soil analytical results will be compared to EGLE Generic Cleanup Criteria for Non-Residential Direct Contact. Soil sampling and analysis will be conducted according to U.S. EPA and EGLE guidelines, and as required by the QAPP.

Surface Soil Investigation Report

Upon completion of the surface soil investigation, ASTI will review the laboratory analytical data and provide a report to summarize the findings. The Surface Soil Sampling Investigation Report will include a narrative summary of the site background, current conditions, field activities, a tabularized summary of laboratory analytical data, site figures, laboratory analytical reports, and other information relevant to the investigation.

4.5 WMU31 – Electric Arc Furnace Emission Control Sludge/Dust Storage Tanks

This task will be conducted in WMU31 to determine if the EAF Emission Control Sludge/Dust Storage Tanks were cleaned and closed appropriately. The location of WMU31 is shown on Figure 3. If it's determined that the tanks were not closed appropriately, or if the proper closure documentation cannot be obtained, ASTI will collect concrete samples from the remaining enclosure.

WMU31 included two reinforced concrete tanks that were used for EAF APC sludge and dust (K061). The in-ground tanks were used for less than 90-day accumulation of EAF dust prior to off-site disposal. The tanks were surrounded by a concrete secondary containment with interstitial space between the tanks and the secondary containment and leaks could be

monitored by collection of liquid samples. The unit was constructed in late 1988 to early 1989 and was used until steel-making operations ceased in 1995 or 1996. No releases to the interstitial space or surrounding ground were reported. All wastes were removed and the unit was cleaned by McLouth in 1996 after termination of EAF operations.

Based on limited documentation, approximately 14.7 tons of EAF dust waste (K061) was removed from the site. The concrete tanks were decontaminated and the above-ground portion of the tanks was demolished. The tanks were cleaned and closed in 1996 and pressure washed in 2001. Concrete samples were collected and results for metals indicated that concentrations met Part 201 criteria.

The objectives of this section of the Work Plan are:

- 1) Review existing documents to determine if the reported closure was adequately documented.
- 2) If the appropriate documentation cannot be located, collect up to 20 concrete surface samples.
- 3) If sample analytical results exceed the Part 201 Groundwater to Surface Water Interface criteria for any of the Chemicals of Interest, re-clean or scarify, and re-sample the concrete or remove the concrete from the site for legal disposal off-site.
- 4) Resample locations of exceedances following cleaning.
- 5) Prepare a report documenting the tank closure reporting or concrete remediation.

During the investigation (or while on-site for other activities if additional investigation is not required), ASTI will geo-locate the extents and location of WMU31 and provide the updated information on a site figure to be included with the tank closure documentation report or the concrete remediation report (whichever report is necessary). All work conducted for this task will be conducted according to this Work Plan.

4.5.1 WMU31 – Proposed Work Plan Activities

This section of the Work Plan documents the WMU31 investigation to determine if the EAF Emission Control Sludge/Dust Storage Tanks were properly closed or the concrete investigation activities.

Document Review

ASTI will attempt to locate tank closure documentation from the cleaning and closing activities which took place in 1996. If proper closure documentation can be located, it will be provided to EGLE for official tank closure. If proper documentation cannot be located additional concrete investigation activities will take place as described below. As an alternative to concrete investigation, RTRR may elect to remove the concrete pad for off-site disposal.

Concrete Investigation

Based on review of the aerial map, the approximate surface area of the exposed concrete is 9,600 ft². Based on the random sampling approach for a small site (up to 10,890 ft²) as defined in EGLE S3TM, a grid interval of approximately 28 feet is required. For verification of remediation, samples can be collected from 25 percent of the calculated grids. ASTI will collect up to 20 samples to complete the concrete evaluation. The EMW31 Site Plan is

provided as Figure 5. Prior to sampling, field measurements will be conducted to verify the surface area measurements and required number of samples.

If proper tank closure cannot be demonstrated, ASTI will collect concrete surface samples (including QA/QC samples) for laboratory analysis of the 10 Michigan Metals (arsenic, barium, cadmium chromium, copper, lead, mercury, selenium, silver, and zinc). ASTI will collect concrete samples in accordance with the procedures outlined in the QAPP and according to EPA and EGLE guidelines. That procedure includes collection of concrete core samples using decontaminated equipment to remove a core then placing the core into laboratory-provided jars. The samples will be labeled with a unique identification number and kept cool until delivery to a NELAP-certified Laboratory using proper chain of custody procedures.

Laboratory analytical results for the concrete samples will be compared to EGLE Part 201 Generic Cleanup Criteria ("GCC") Groundwater Surface Water Interface Criteria. ASTI will prepare a report to provide the results of the investigation to EGLE. If the results do not exceed the GCC, WMU31 closure document will be provided. If analytical results exceed the GCC, a determination will be made to re-clean or scarify all or a portion of the concrete pad, or to demolish the pad and properly dispose off-site. If re-cleaning or scarifying is conducted, additional samples will be collected in the areas where concentrations exceeded the criteria.

Cleaning will consist of pressure washing the concrete and containing the rinse water for storage until proper disposal can be arranged. If the determination is made that the pad requires demolition and off-site disposal, the concrete will be sampled for disposal parameters then removed and legally disposed off-site.

5.0 Decontamination Procedures

All non-disposable sampling equipment used for completion of this Work Plan will be decontaminated between samples. Decontamination will be completed using an Alconox®/water mix followed by a clean water rinse. Liquid generated during the decontamination process will be managed on-site until proper disposal can be arranged.

6.0 Site Health and Safety Plan

The SHSP was developed to address known conditions and risks at the Subject Property. All field activities performed at the Subject Property will be conducted in accordance with the SHSP. The SHSP lists the Site Health and Safety Coordinator, emergency telephone numbers, directions to the nearest emergency care facility, and emergency procedures. Field personnel, including subcontractors, will be required to review and sign the SHSP prior to beginning any activities on the Subject Property. A copy of the SHSP is included as Attachment B.

7.0 Project Staff

The following is a list of staff that will be involved with this project. This list can also be found in the SHSP (See Attachment B).

Project Manager: Mr. Greg Oslosky

Site Safety Officer: Mr. Brian Earl

Project Staff: Mr. John Schuitema, Mr. Brian Earl, Mr. Mitchel Dykla, Ms. Kera Sharpe, and Mr. Jeremy Efros.

8.0 Schedule

ASTI will begin the WMU investigation activities immediately following approval of this Work Plan and will notify EGLE in writing at least 14 calendar days prior (or earlier) to beginning field work associated with any of the WMUs.

Field activities for the WMU26 investigation are anticipated to take approximately three work days to complete. ASTI will provide a report to EGLE detailing the investigation activities within five weeks of the investigation.

Field activities for the WMU27 investigation are anticipated to take four to five work days to complete. Within five weeks of completion of the investigation, ASTI will provide a summary report to EGLE.

Field activities for the investigation at WMU29 are anticipated to take five work days to complete. Within five weeks of completion of the investigation, ASTI will provide a summary report to EGLE.

Field activities for the investigation at WMU30 are anticipated to take five work days to complete. Within five weeks of completion of the investigation, ASTI will provide a summary report to EGLE.

Field activities for the investigation at WMU31 are anticipated to take four work days to complete. Within five weeks of completion of the investigation, ASTI will provide a summary report to EGLE.

9.0 Cost Estimate

The following are the estimated costs to implement the tasks included in this Work Plan.

Investigations of WMUs

WMU 26

Documentation of Existing Conditions	\$2,300
Report	\$1,300

WMU 27

Documentation of Existing Conditions	\$500
Soils Investigation	\$5,000
Direct Costs	\$10,000
Analytical Costs (60 samples and 9 QA/QC samples)	\$5,900
Report	\$3,300

WMU 29

Documentation of Existing Conditions	\$500
Post Cleaning Sampling	\$5,000
Direct Costs	\$2,100
Analytical Costs (48 samples)	\$4,200
Soils Investigation	\$5,000
Direct Costs	\$9,000
Analytical Costs (57 samples and 5 QA/QC samples)	\$5,200
Report	\$4,300

WMU 30

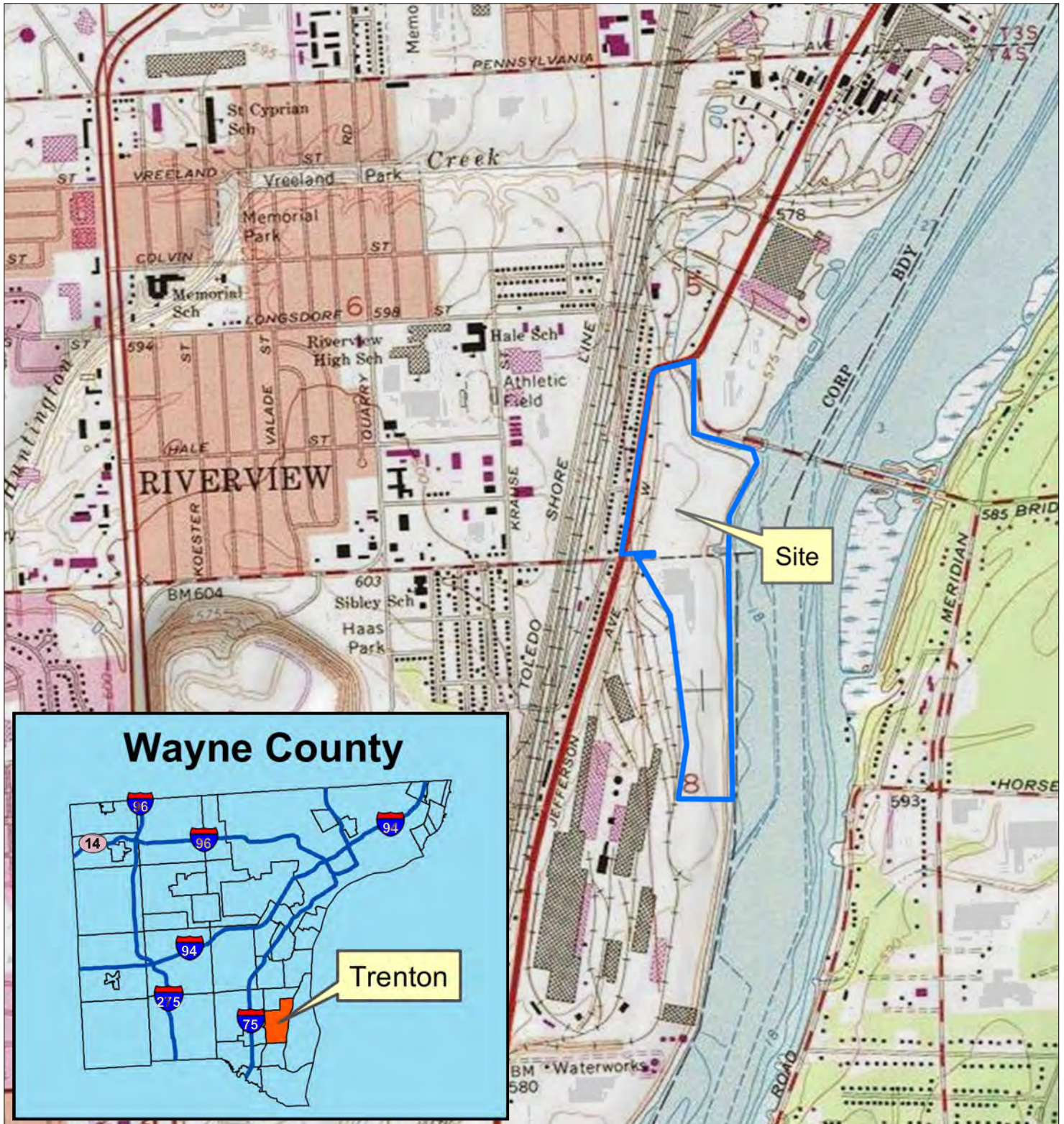
Documentation of Existing Conditions	\$500
Soils Investigation	\$5,000
Direct Costs	\$9,000
Analytical Costs (40 samples and 6 QA/QC samples)	\$3,900
Report	\$3,100

WMU 31

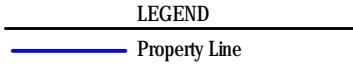
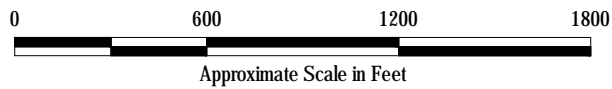
Documentation of Existing Conditions	\$1,000
Concrete Sampling	\$5,900
Direct Costs	\$2,500
Analytical Costs (36 samples)	\$5,700
Report	<u>\$3,200</u>
Total Above	\$103,400

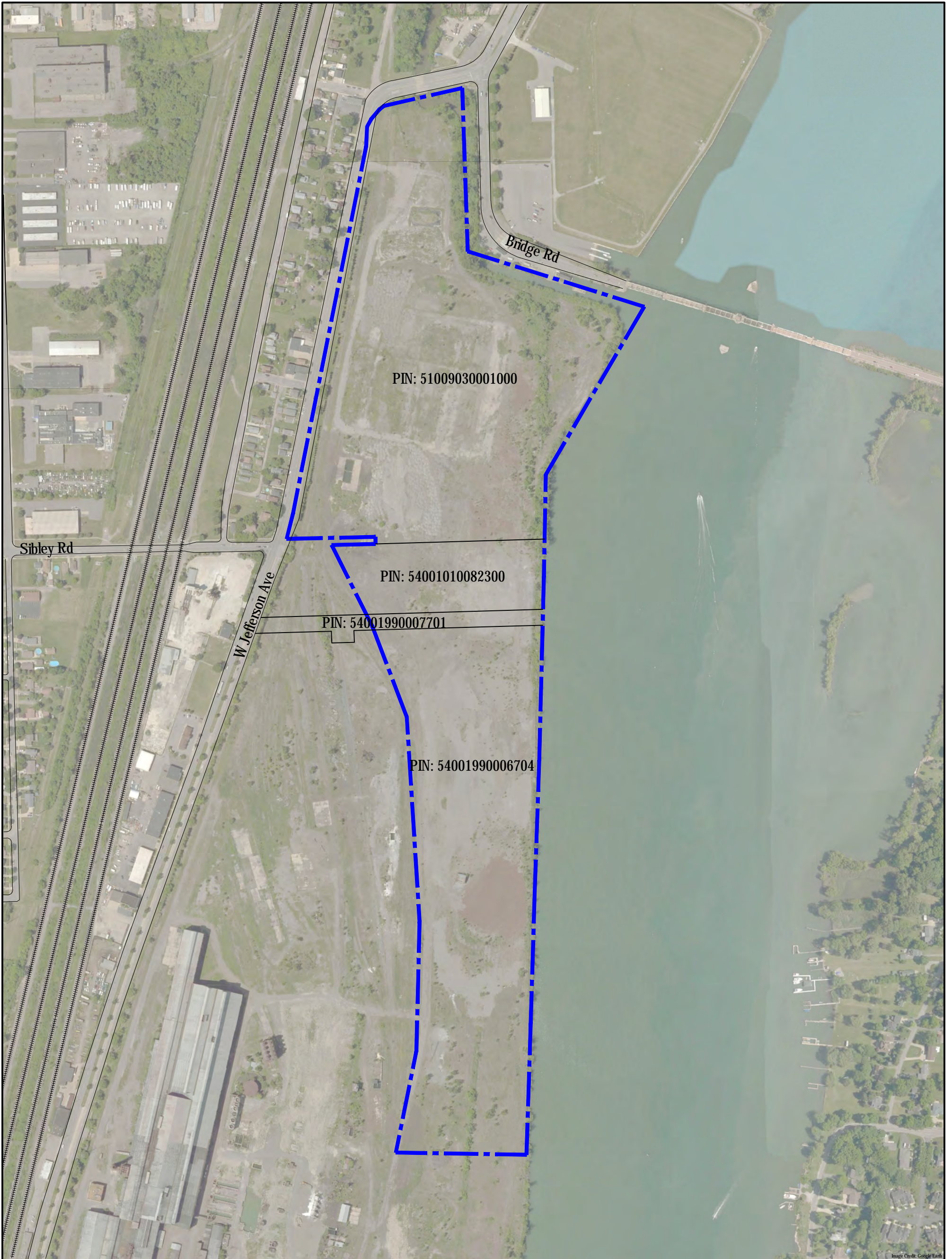
**Attachment A
Figures**

**Work Plan
Waste Management Unit Investigations**



Y:\Project Files\Current and Closed\10860-10899\10860-10899\10860 Property\CAD\10860.dwg 4/11/2019 11:45 AM





LEGEND

- ▬ Subject Property
- Approx. Parcel Boundary

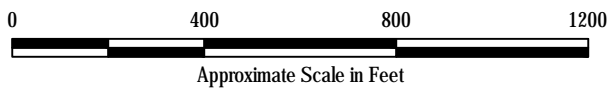


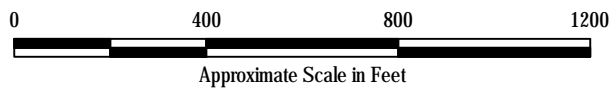




Image Credit: Google Earth

LEGEND
 Subject Property
 WMU



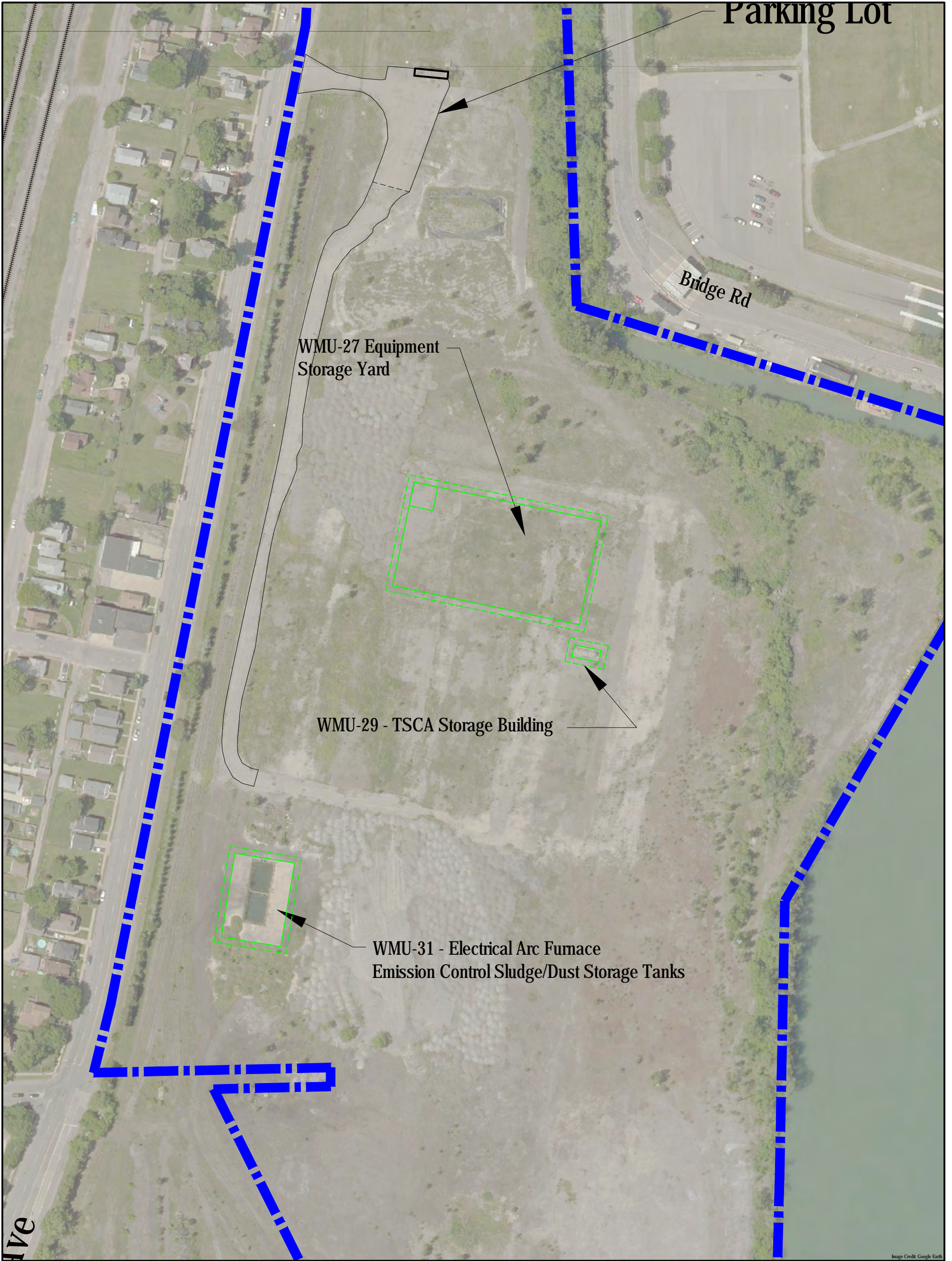


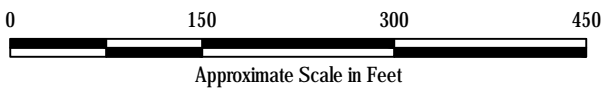


Image Credit: Google Earth

LEGEND

-  Subject Property
-  WMU



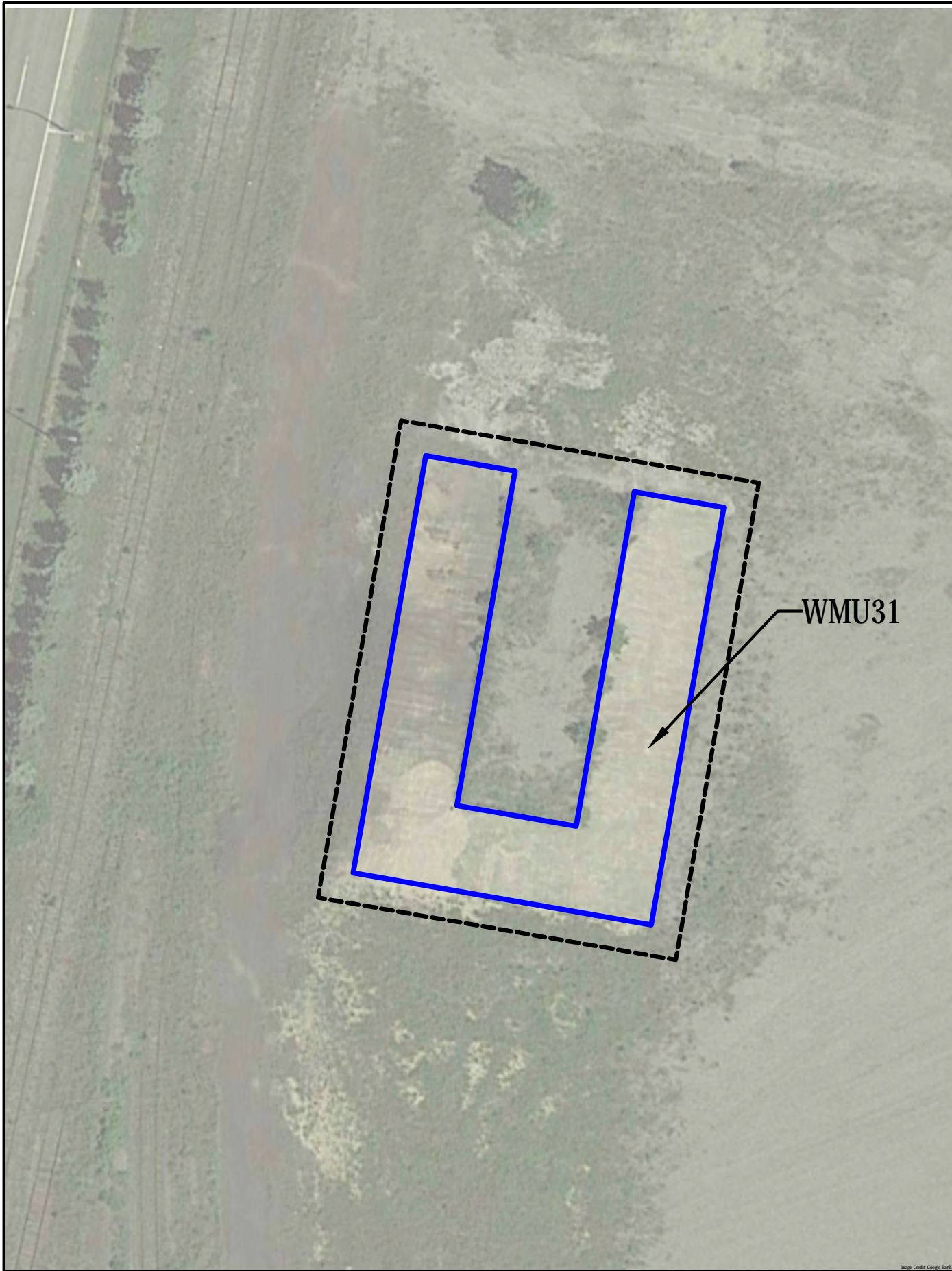
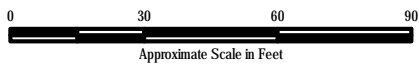


Image Credit: Google Earth



LEGEND
— Concrete Pad
- - - Boundary Condition

Attachment B
Site Health and Safety Plan

Work Plan
Waste Management Unit Investigations

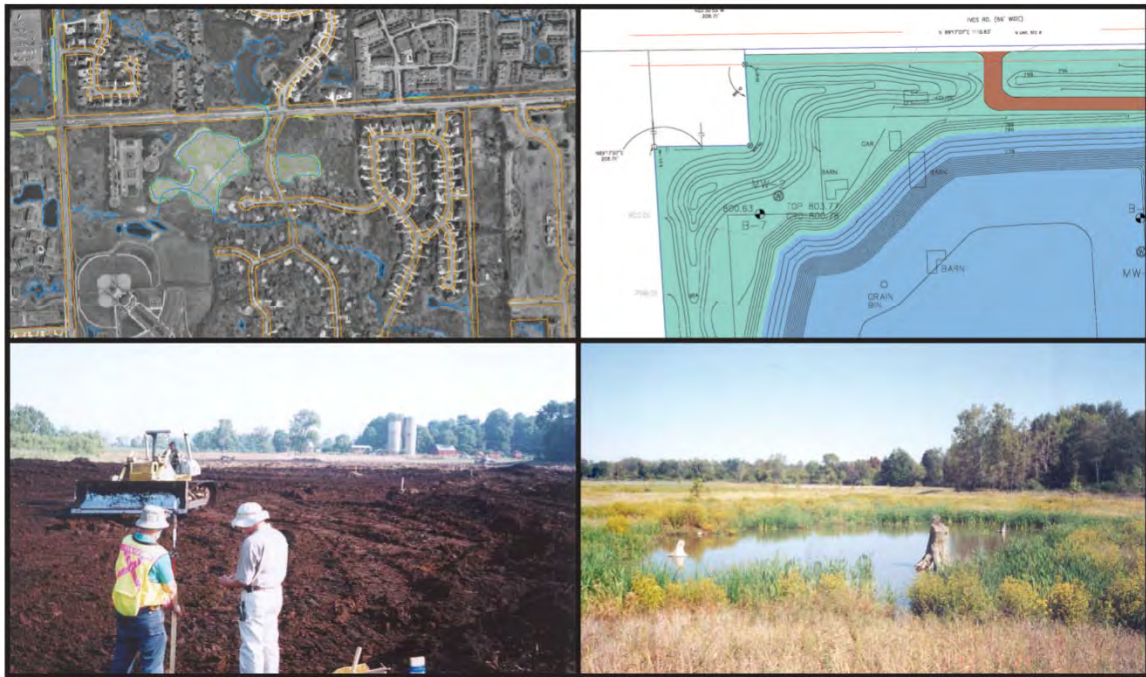
Health and Safety Plan

Riverview-Trenton Railroad Property
18251 West Jefferson Avenue
Riverview, Michigan 48193

Riverview-Trenton Railroad Company

April 1, 2019

ASTI ENVIRONMENTAL



Health and Safety Plan

Riverview-Trenton Railroad Company
1491 West Jefferson Avenue
Riverview, Michigan 48193

April 1, 2019

Prepared For:

Riverview-Trenton Railroad Company
12225 Stephens Rd.
Warren, MI 48089

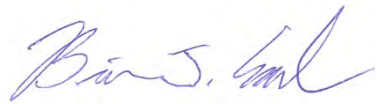
Report Prepared By:

ASTI Environmental
10448 Citation Drive, Suite 100
Brighton, Michigan 48116
1-800-395ASTI

ASTI Project No. 10860

Report Prepared by:

Report Reviewed by:



Brian Earl, CP
Environmental Professional



Greg S. Oslosky
Director



TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 Introduction	1
2.0 Site Location and Background	2
2.1 Location	2
2.2 Background	2
2.3 Current Purpose and Scope of Work	3
3.0 Responsibilities and Line of Authorities	4
3.1 Project Team Responsibilities	4
3.1.1 Project Manager (PM):	4
3.1.2 Contractor Health and Safety Manager (CHSM):	5
3.2 Subcontractor Responsibilities	7
4.0 Behavior Based Safety (BBS)	9
5.0 General Hazard Assessment	12
5.1 Chemical Exposure Hazards	12
5.2 Physical Hazards	12
5.3 Biological Hazards	13
5.4 Task By Task Risk Analysis	13
5.5 Job Safety Analysis	13
5.6 Disciplinary Action	13
6.0 Training Requirements	14
6.1 Basic Training Required	14
6.2 Site-Specific Training	14
6.3 Tailgate Safety Briefings	15
6.4 Site Specific Overview	15
7.0 Personnel Protection	16
7.1 Definitions	16
7.2 Personnel Protection Requirements	16
7.3 Respirator Fit Test	17
7.4 Site Communications Plan	17
7.5 Work Zones	17
7.6 The Buddy System	18
7.7 Nearest Medical Assistance	19
8.0 Confined Space Entry	20

9.0	Emergency Response	21
9.1	General	21
9.2	Responsibilities	21
9.3	Evacuation	21
9.4	Emergency Contacts/Notification System	22
9.5	Emergency Medical Treatment	22
9.5.1	Hospital Directions	22
9.6	Occupational Health Clinic Directions	23
9.7	Fire or Explosion	23
9.8	Spills/Leaks	23
9.9	Adverse Weather Conditions	24
9.10	Underground Utilities	25
9.11	Site Safety Inspection	25
9.12	Documentation	25
9.13	Operation Shutdown	26
10.0	Permit to Work System	27
11.0	Personnel Decontamination Procedures	28
12.0	Additional Safe Work Practices	29
13.0	Disposal Procedures	31
14.0	Approvals	32
15.0	Project Team Review	33

TABLE OF CONTENTS
(continued)

TABLES

Table 1	List of Potential Chemicals
Table 2	Emergency Notification List*

FIGURES

Figure 1	Site Location Map
Figure 2	County Property Map
Figure 3	Route to Hospital (map with directions)*
Figure 4	Route to Urgent Care Clinic (map with directions)*

APPENDICES

Appendix A	Daily Tailgate Meeting & Job Clearance Form
Appendix B	Job Site Safety Inspection Checklist
Appendix C	Employee Exposure/Injury Incident and Near Miss Reports
Appendix D	Decontamination Procedures
Appendix E	Safety Data Sheets (SDS)*
Appendix F	Job Safety Analysis Forms (JSA)*
Appendix G	Heat & Cold Stress
Appendix H	Biohazards
Appendix I	System of Work Permits

* Items to be posted prominently on site, or made readily available to personnel.

1.0 INTRODUCTION

Riverview-Trenton Railroad Company (RTRR), APPLIED SCIENCE & TECHNOLOGY, INC. dba ASTI Environmental (ASTI), and all subcontractors who are to perform on-site work (the Project Team) are committed to providing a safe and healthful work environment. The goal of the Project Team is zero incidents and zero near misses, meaning that we strive to complete every project without injury, illness, property damage, or environmental damage. Safety must always take precedence over expediency.

This Health and Safety Plan (HASP) has been developed by ASTI to comply with Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response regulations (Code of Federal Regulations (CFR) Standard 29 CFR 1910.120(b)(4)) and 29 CFR 1926.65. This HASP addresses all of the reasonably foreseeable activities to be conducted at the Former McLouth Steel Property – RTRR Property (Subject Property) located at 18251 West Jefferson Avenue, Riverview, Michigan 48193 (Parcel Nos: 51009030001000, 54001010082300, and 54001990006704). This HASP will be implemented by each of the Project Team’s respective Health and Safety Managers (“HSM”) during all site activities. Compliance with this HASP is required of all personnel. All site work will be conducted in accordance with OSHA 29 CFR, Parts 1904, 1910, and 1926 as well as the occupational health rules of the State of Michigan, MIOSHA STD 1101 Part 1, MIOSHA STD 1301 Part 1, and MIOSHA STD 1501 Part 11.

The management of the day-to-day site activities and implementation of this HASP in the field is the responsibility of each Contractor’s HSM. Assistance in the implementation of this HASP will also be provided by the Project Manager. The content of this HASP may change or undergo revision based upon additional information made available to health and safety personnel, monitoring results, or changes in the scope of work.

2.0 SITE LOCATION AND BACKGROUND

2.1 Location

The RTRR Property is located at 18251 West Jefferson Avenue in the City of Riverview, Wayne County, Michigan. A Site Location Map is provided as **Figure 1**.

2.2 Background

The RTRR Property consists of approximately 76.2 acres. **Figure 2** provides a Site Plan of the RTRR Property. The property is bounded by Trenton Channel of the Detroit River to the east; a portion of the McLouth Steel property referred to as the “County Property”, a railroad line, and West Jefferson Avenue to the west; the Grosse Ile Toll Bridge and Monguagon Creek to the north; and a portion of the former McLouth Steel site known as the County Property to the south. Further east of the property, beyond the Trenton Channel, is Grosse Ile, further west, beyond West Jefferson Avenue, is a quarry, residential, commercial and industrial property and further north, beyond Monguagon Creek, is commercial and industrial property.

The Subject Property originally consisted of wetlands and open water, with some uplands in the northwestern portion of the property, until sometime after 1936. During that time, the Monguagon Creek bisected the property, emptying into the Trenton Channel of the Detroit River at about Sibley Road. Between about 1946 and 1952 much of the property had been filled to the current Detroit River bank, but open water remained in the original Monguagon Creek channel. By 1954 the mouth of the Monguagon Creek had been enlarged for docking, including at least five above ground storage tanks located north of the mouth. By 1967, the original Monguagon Creek channel had been filled, the creek was redirected along the northern property line, and no open water remained on the property.

The Subject Property was acquired around 1947 by the McLouth Steel Company (“McLouth”), and used for storage of raw materials, waste, and product to support the integrated production of steel and iron on the adjoining County Property from approximately 1952 to 1975. Facilities on the Subject Property included a storage area for electric arc furnace air pollution control dust. After about 1975, production decreased on the County Property, until McLouth ceased operations in April of 1996 after filing for Chapter 11 bankruptcy protection on September 29, 1995. Hamlin Holdings, Inc. acquired the Subject Property in July of 1996. Detroit Steel Company obtained title for the Subject Property in August of 1996. On June 2, 2000, Crown Enterprises purchased the Subject Property, and conveyed the property to RTRR in November of 2000.

2.3 Current Purpose and Scope of Work

This HASP has been prepared to address activities associated with the groundwater investigation, investigation of five Waste Management Units (WMUs), and general field activities. These activities include groundwater monitoring well installation and completion of soil borings and soil sampling.

3.0 RESPONSIBILITIES AND LINE OF AUTHORITIES

The following briefly describes health and safety designations and general responsibilities which are to be employed during the Scope of Work. The personnel titles have been established to accommodate the site needs and requirements in order to ensure safe conduct during the Scope of Work. The number and type of health and safety (H&S) personnel for a given work location are to be based upon the particular H&S requirements relative to the proposed activities or operations.

3.1 Project Team Responsibilities

The following briefly describes the H&S designations and general responsibilities that will be employed for this site, until otherwise amended.

3.1.1 ASTI Project Manager (PM):

The ASTI Project Manager (PM) is Greg Oslosky (616-485-5743).

His responsibilities include:

- Ensuring that this HASP is developed and approved prior to on site activities.
- Updating the Health and Safety Program as dictated by changing conditions, jobsite inspection results, etc. and approving changes to this HASP.
- Conducting Jobsite Safety Inspections, Conducting Tailgate Safety Meetings (**Appendix A**), and assisting with communication of results and correction of shortcomings found.
- Maintaining records on personnel (training and certifications, accident investigation results, etc.).
- Conducting a pre-deployment operational readiness meeting to discuss the scope of work, staffing, equipment, etc.
- Ensuring that all the tasks in the project are performed in a manner consistent with this HASP.
- Participating in the development and implementation of this HASP.
- The management of the day to day site activities and implementation of this HASP in the field.
- Ensuring that all site personnel and visitors complete an initial H&S orientation, and know, understand and implement the applicable portions of this HASP.
- Resolving conflicts that may arise concerning safety requirements and working conditions.

- Knowing (and ensuring that all site personnel also know) emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.
- Establishing that all onsite Project Team personnel have completed a minimum of 40 hours of health and safety training, have appropriate medical clearance as required by 29 CFR 1910.120, and have been fit tested for the appropriate respirators (if applicable). Verifying that contractors and subcontractors (of any tier) meet minimum health and safety criteria.
- Conduct “twilight toolbox meeting” with field team members to discuss that day’s activities & progress, any areas of improvement, behavior based safety observations (BBSOs), changes, and expectations for the following day.

3.1.2 Contractor Health and Safety Manager (CHSM):

ASTI shall have an on-site Contractor Health and Safety Manager (CHSM).

The CHSM’s responsibilities include:

- Suggesting updates to the Health and Safety Program as dictated by changing conditions, jobsite inspection results, etc.
- Assisting the PM with implementation of the HASP.
- Performing Jobsite Safety Inspections (using Checklist (**Appendix B**)), and correcting any shortcomings in a timely manner.
- Seeing that their personnel (including subcontractors) are aware of the potential hazards associated with site operations.
- Ensuring that proper PPE is available, worn by their employees (including subcontractors) and properly stored and maintained.
- Controlling entry into and exit from the site contaminated areas or restricted zones.
- Monitoring their employees (including subcontractors) for signs of stress, such as heat stress, fatigue, and cold exposure.
- Monitoring site hazards and conditions.
- Knowing (and ensuring that their site personnel (including subcontractors) also know emergency procedures, evacuation routes, and how to access the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.
- Correcting any work practices or conditions that may result in injury or unacceptable exposure to hazardous substances.

- Reporting all incidents, injuries and near misses to the Project Manager immediately. The Employee Near Miss/Injury Incident Report is provided in **Appendix C**.
- Establishing that their personnel (including subcontractors) are aware of the provisions of this plan, are instructed in the work practices necessary to ensure safety, and are familiar with planned procedures for dealing with emergencies.
- Establishing that all their onsite personnel (including subcontractors) have completed a minimum of 40 hours of health and safety training, have appropriate medical clearance as required by 29 CFR 1910.120, and have been fit tested for the appropriate respirators (if applicable).
- Verifying that their subcontractors (of any tier) meet minimum health and safety criteria.

Specific health and safety information for all Project Team members are listed in the table below, with reference to ASTI’s Corporate health and safety plan. Each Project Team company shall adhere to this HASP as well as their company’s HASP while working on-site.

Topic	Appendix	Title	Section/Page
Personal Protective Equipment	D	ASTI Environmental Health and Safety Plan	SECTION 5 PAGE 14
Confined Space Entry	D	ASTI Environmental Health and Safety Plan	SECTION 6 PAGE 20
Respiratory Protection Program	D	ASTI Environmental Health and Safety Plan	SECTION 7 PAGE 21
Extreme Working Conditions	D	ASTI Environmental Health and Safety Plan	SECTION 8 PAGE 23
Emergencies	D	ASTI Environmental Health and Safety Plan	SECTION 9 PAGE 28
Other Safety Procedures	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 30
Traveling	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 30
Drilling Activities	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 30
Sample Handling Procedures	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 30
Suspected Hazardous Sites	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 31
Known Hazardous Sites	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 31

Topic	Appendix	Title	Section/Page
Decontamination	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 31
Emergency Response	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 32
Water Safety	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 32
Building Safety	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 32
Working Alone	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 33
General Precautions When Working Alone in the Field	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 33
Specific Precautions When Working Alone in the Field	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 33
When Not to Work Alone	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 33
Working in Traffic Areas	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 34
Communication	D	ASTI Environmental Health and Safety Plan	SECTION 10 PAGE 35

3.2 Subcontractor Responsibilities

Each subcontractor utilized for this project shall develop and implement their own HASP, which identifies a lead individual as the Subcontractor's Safety Representative (SSR) who is responsible for H&S compliance for each of their employees, lower-tier subcontractors, and consultants. A copy of the subcontractor's HASP will be provided to the ASTI PM prior to conducting any site activities, and that HASP will be at least as stringent as this HASP. All subcontractor staff must be familiar with and abide by the requirements outlined in their own HASP. A subcontractor may elect to adopt this HASP as its own, provided that it has given written notification to the PM, but where this HASP excludes provisions pertinent to the subcontractor's work (e.g., confined space entry and relevant Job Safety Analysis (JSA)) the subcontractor must provide written addendums to this HASP. Additionally, the subcontractor must:

- Ensure their employees are trained in the use of all appropriate PPE for the tasks involved; and

- Notify the PM of any hazardous material brought onto the job site or site related area, the hazards associated with the material, and must provide a Safety Data Sheet (SDS) for the material which will be incorporated in to **Appendix E**; and
- Have knowledge of, understand, and abide by all current federal, state, and local health and safety regulations pertinent to the work; and
- Ensure their employees have received current HASP-required training, and training in the appropriate levels of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER); and
- Ensure their employees have been medically cleared to work in Hazardous Waste Sites and to wear a respirator, if necessary; and
- If respirators are necessary, ensure their employees have been fit-tested within the year on the type of respirator they will wear;

During the subcontractor's activities onsite, the subcontractor's SSR will perform continuing work area inspections, participate in the development of Job Safety Analyses (JSAs) included in **Appendix F**, and conduct safety meetings and safety orientations for all new employees. The SSR will attend daily safety meetings with the CHSM. The SSR will also investigate accidents and overexposures involving subcontractor personnel, and report these to their respective CHSM and the PM.

The PM will provide a copy of this Health and Safety Plan to each site subcontractor in order to fulfill its obligation under 29 CFR 1910.120 to inform subcontractors of site hazards. Each subcontractor is to provide health and safety procedures that complies with 29 CFR 1910.120 and addresses the activities of its employees relative to this project.

4.0 BEHAVIOR BASED SAFETY (BBS)

Unsafe behaviors are often habitual in most people (i.e., we have done something the wrong way for so long that we are not conscious of the behavior). The objective of BBS is to replace all the unconscious unsafe behaviors with unconscious, or automatic, safe behaviors - or safe habits. To help create a BBS culture, the PM will create a **Safety Leadership Team** made of field team members. It will generally be a rotating core team of 3-5 staff, working together. This team will be responsible for planning, designing and executing the activities that will promote a culture of safety. The Safety Leadership Team will use regular positive reinforcement for safe behaviors to replace unsafe habits with safe habits.

At a minimum the PM will track the positive observations, positive interventions, “pauses”, JSAs, proactive behaviors, etc. each day. Note that a “pause” is a last minute risk assessment to identify immediate changes in the field due to internal or external factors. Examples can include visitors in work area, change of tools, changing weather conditions, etc.

The goals of BBS are to:

- Create a culture where safety is the responsibility of everyone equally
- Motivate everyone to take responsibility for the safety of coworkers in addition to themselves
- Create a mindset where safety is a discussion that takes place every day
- Develop a feedback-rich culture where safe and unsafe behaviors are recognized
- Eliminate unsafe conditions or acts and near misses
 - An unsafe act involves performance of a task or other activity in a manner that may threaten the health and/or safety of workers
 - Examples include:
 - Operating equipment without qualification or authorization
 - Lack of/improper use of PPE
 - Operation of equipment at unsafe speeds
 - Failure to warn
 - Bypass or removal of safety devices
 - Using defective equipment
 - A near miss is an unplanned event that did not result in injury, illness, or damage - but had the potential to do so. Only a fortunate break in the chain of events prevented an injury, fatality or damage. An incident is the sequence of events or actions that produces that accident. All accidents are incidents. However the

definition of an incident is wider in that it also includes dangerous occurrences and near misses.

The responsibilities of each Project Team member include:

- Participate in daily tailgate meetings, audits, and trainings
- Review and sign-off on project HASP
- Complete and modify (if necessary) task-specific JSAs, Permits to Work
- Initiate field pauses, as necessary, positive observations, and positive interventions
- Ensure permits are issued for the tasks prior to commencing work
- Provide subcontractors oversight
- Ensure subcontractors are adhering to our safety principles
- Notify management of any changes proposed, or technical and safety issues requiring additional equipment or PPE

Each SSR's responsibilities include:

- Conduct and document Site-specific training for their employees new to the Site, subcontractors, and visitors.
- Complete and issue necessary work permits (i.e. hot work, working from heights, excavation/ subsurface intrusion, etc.), and JSAs
- Ensure field staff are completing daily equipment inspection documentation
- Ensure field team members have read and signed off on the project HASP
- Conduct & document daily tailgate meetings with field team members, where the task-specific JSAs, permits, and daily work plan are discussed
- An unsafe condition is a condition in the work place that is likely to cause property damage or injury. Examples include:
 - Defective tools, equipment or supplies
 - Inadequate supports or guards
 - Congestion in the workplace
 - Inadequate warning systems
 - Fire and explosion hazards
 - Poor housekeeping
 - Hazardous atmospheric conditions

At the end of each day, the team will report out positive observations and interventions:

Positive Observations

- Any observation of people or activities in which one party observes safe working practices
- This is tracked to identify what we are doing correctly, and to encourage those safe work practices
- Any “proactive items” addressed to correct conditions prior to them becoming an unsafe act or condition would also be considered a positive observation
 - e.g., applying salt to an icy walkway, or pre-marking “no parking zones” in anticipation of on-site truck traffic
- Using “pauses” throughout each day, as applicable

Positive Intervention

- Is a conversation between at least two people
- Should relate to a safe or an unsafe act
- Is a learning opportunity
- Includes open questions and active listening
- Focuses on what could go wrong and for whom
- Results in an immediate action
- Focuses on the behaviors, not the individual

5.0 GENERAL HAZARD ASSESSMENT

This section provides an assessment of the general hazards that may be encountered during field work activities at the site through a task by task risk analysis. Potential hazards, generally categorized as chemical exposure and physical hazards, are addressed below.

5.1 Chemical Exposure Hazards

Known and suspected chemical contaminant hazards that could be encountered during site activities are summarized in **Table 1**. An inventory of safety data sheets (SDS) for chemical products used on site can be found in **Appendix E**. The main route of exposure for chemicals on the Subject Property is (i) inhalation of vapors/dust, (ii) skin/eye contact, or (iii) absorption. Incidental ingestion is also a possible, but unlikely, route of exposure.

Previous investigations have identified the potential constituents of concern (COCs) as primarily polychlorinated biphenyls (PCBs), lead, and other metals in the soils. In the groundwater COCs include Ammonia, Arsenic, Barium, Chloride, Chromium, Copper, Cyanide (Free), Lead, Manganese, Mercury, Nickel, Selenium, Silver, Vanadium, Zinc, VOCs, SVOCs, PCBs, pH, and Total Dissolved Solids.

Potential exposures will be reduced or eliminated by following the work practices and using the PPE designated in this HASP. Control measures include avoiding the generation of dust during site activities as described in the Dust Control Plan, and including, but not limited to: changing work procedures when significant visible dust is present, mitigating dust generation by misting with water, wearing a dust mask (when applicable) to prevent inhalation of dust, wearing gloves during site activities to avoid dermal contact with soil, and avoiding consumption of food, drink, or tobacco in the vicinity of site activities.

5.2 Physical Hazards

Physical hazards, which may be encountered during site operations for this project, are detailed in **Table 1**. Caution should always be used around site activities and machinery.

Heat stress and cold exposures poses a hazard to personnel working under extreme temperatures. Guidelines to prevent ill effects of exposure are presented in **Appendix G**.

Slip, trip, or fall hazards may be present throughout the site, with increased risks when working around pits, sumps or lagoons, or on uneven terrain. Use caution when walking on the site. Secure footing to prevent falls into pits, sumps or lagoons.

5.3 Biological Hazards

Biological hazards that are common to overgrown vacant lands occur at the site. Deer ticks, which are known to be carriers of the Lyme disease virus, are reported to be found in the vicinity of the site, and deer are present onsite.

Common “allergy causing” plants, such as poison oak, poison ivy, giant hogweed, and animals, such as black widow spiders, brown recluse spiders, bees, wasps, and eastern massasauga rattlesnake may be present at the site. Stay alert for wildlife habitats. Animals may become aggressive if a threat is perceived. Maintain safe working distance.

Guidelines for potential biohazards are presented in **Appendix H**.

5.4 Task By Task Risk Analysis

Through information gathering, inspection, and monitoring, hazards that are potentially present have been determined for each specific task described in **Table 1**. This table provides a summary of chemical exposure and physical hazards that could potentially be encountered by personnel during each task effort.

5.5 Job Safety Analysis

A Job Safety Analysis (JSA) is a process to identify existing and potential hazards associated with each job or task so these hazards can be eliminated, controlled or minimized. A JSA will be performed at the beginning of each work day, and will be updated during the shift if new or different tasks or unanticipated hazards are encountered, or if the control measures are inadequate. All JSAs must be developed or reviewed by all parties involved. A blank JSA form and documentation of completed JSAs are in **Appendix F**. The completed forms are to be maintained on site until the completion of the project, at which time they are to be placed in the project files.

5.6 Disciplinary Action

Any behaviors or actions on the part of project personnel or subcontractors that jeopardize the safety of others or are deemed harmful to human health or the environment will result in the immediate removal of those individuals from the project.

6.0 TRAINING REQUIREMENTS

The general training requirements for site personnel are discussed in the following sections.

The site access personnel categories and required training levels are:

- A. Site Employees with Access to Active Work Areas – will require the Basic Training (below) and Site-Specific Training (below)
- B. Site Management and Staff without Access to Active Work Areas – Site-Specific Overview (below)
- C. Vendors/Delivery Personnel, Waste and Salvage haulers – Site-Specific Training (below)
- D. Subject Property Owner, their representatives and special guests, visitors, regulatory personnel – Site Specific Overview (below)

6.1 Basic Training Required

Completion of an initial 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training program as detailed in 29 CFR 1910.120(e), is required for all employees who will perform work in areas where the potential for a toxic exposure exists. Annual eight-hour refresher training is also required to maintain competencies to ensure a safe work environment. Training records will be maintained by PM.

6.2 Site-Specific Training

Prior to field implementation, all site personnel will undergo project orientation, which includes implementation and execution of policies, including, but not limited to, Risk Assessment and JSA's, Change Management, and elements of this HASP. All site personnel will participate in documented daily health and safety tailgate meetings to discuss site conditions, hazards, hazard controls, applicable HASP requirements and JSAs. Training will be provided to specifically address the activities, procedures, monitoring, and equipment for site operations at the beginning of each field mobilization and the beginning of each discrete phase of work. The training will include the site and facility layout, hazards, and emergency services at the site, and will detail all the provisions contained within this HASP.

Required Training - All site personnel must have the following training:

- HASP Orientation;
- Permit to Work(refer to Section 10);

- Operators/ laborers also need task specific training such as operator’s certification for operation of heavy equipment, lifting/hoisting, ground disturbance, aerial lift training, etc., as applicable for the site activities.

Compliance with all HASP rules is mandatory for everyone while on the Subject Property, and failure to comply will result in disciplinary action, which may include leaving the Site and banishment from additional work.

6.3 Tailgate Safety Briefings

Before starting work each day and as needed thereafter, the PM or a SSR designated by the PM will conduct a brief tailgate safety briefing meeting to assist site personnel in conducting their activities safely. Tailgate meetings will be documented in the form included in **Appendix A**.

Briefings will include the following:

- Scope of work for the day,
- Review of safety information relevant to planned tasks and environmental conditions,
- New activities/task being conducted,
- Results of Jobsite Safety Inspection Checklist,
- Changes in work practices,
- Safe work practices, and
- Discussion and remedies for noted or observed deficiencies or near misses.

The Tailgate Safety Briefing will include a focused discussion using a “pause” as well as a discussion of a past lessons learned relevant to the work being performed. Further, a twilight toolbox meeting will be held at the conclusion of field activities for the day, to review any safety or progress related items, and discuss the following days proposed activities.

6.4 Site Specific Overview

The Site Specific Overview will provide information and awareness of site conditions, activities, hazards and evacuation procedures. This overview will cover individuals that will be on-site temporarily and are not performing work activities. Individuals in this category are Subject Property Owner and their representatives, visitors, regulatory personnel, elected officials, etc. All personnel in these categories will be escorted at all times while in the work zone of the Subject Property. The work zone is all areas of the property other than Office Trailer and Laydown Area located in the southwest corner of the property.

7.0 PERSONNEL PROTECTION

7.1 Definitions

The following levels of personnel protective equipment (PPE) are defined for the site activities performed on the Subject Property by site personnel:

- Level C operations are not anticipated but will use all of the items listed under Modified Level D plus the addition of a full or half face piece and a respirator equipped with appropriate cartridges or canisters.

- Modified Level D is not anticipated but may be required for specific tasks. Modified Level D includes:
 - Hardhat
 - Safety glasses with side shields (or impact resistant goggles)
 - Approved safety shoes
 - Ear protection in vicinity of noisy equipment
 - Work gloves and/or chemical-resistant gloves
 - Reflective safety vest ANSI Class 2 for work near roads or heavy equipment (Class E apparel is required for work at night or during periods of poor visibility)
 - Tyvek outer clothing for work with liquids
 - Nitrile outer gloves and latex inner gloves for work with liquids
 - Rubber boot covers for work with liquids

- Level D, the minimum PPE for site personnel includes:
 - Hardhat
 - Safety glasses with side shields (or impact resistant goggles)
 - Approved safety shoes
 - Ear protection in vicinity of noisy equipment
 - Work gloves and/or chemical-resistant gloves
 - Traffic safety vest in the vicinity of heavy equipment

7.2 Personnel Protection Requirements

Each contractor/subcontractor will provide PPE to their staff to protect them from the specific hazards they are likely to encounter on site. Selection of the appropriate PPE must take into consideration: (1) the work being conducted; (2) identification of the hazards or suspected hazards; (3) potential exposure routes; and, (4) the performance of the PPE construction (materials and seams) in providing a barrier to these hazards.

Based on anticipated site conditions and the proposed work activities to be performed at the site, Level D Protection will be used. The upgrading/downgrading of the level of protection will be based on the type of work performed. The decision to modify standard PPE will be made by the CHSMs after conferring with the PM.

7.3 Respirator Fit Test

Use of respirators is not anticipated for the current scope of work; however, if that requirement changes, all project employees who may be required to wear Level C PPE must be in possession of a full or half face piece, air purifying respirator and have been successfully fit tested within the past year. Fit test records must be provided by the respective contractors and will be maintained by the PM.

7.4 Site Communication Plan

Verbal communication will be the primary method of communication used at the site during the site activities. Handheld radios (i.e. walkie-talkies) may be used when practical. In the instances where verbal communication cannot be used, such as when working in respiratory protective equipment (if required), hand signals will be used. Hand signals will be covered during site specific training. Hand signals and their messages are defined in the subsequent table:

Hand Signal	Meaning
Hand gripping throat	Out of air; cannot breathe
Grip partners wrists or place both hands around waist	Leave immediately without debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm alright; I understand
Thumbs down	No; negative
Simulated "stick" break with fists	Take a break; stop work

Use of cell phones on site will be limited to the cell phone areas designated by the PM.

7.5 Work Zones

Work zones will be established as described below:

- Exclusion Zone – An approximately 25-100 foot (as practical) circle around the work area will be defined before work starts. The encircled area will constitute the “Exclusion Zone.” This zone is where potentially hazardous contaminants and physical hazards to the workers will be contained. Plastic sheeting (visqueen) and/or tarps may be used as

necessary to control contaminated materials that are either airborne or spilled to the ground during site operations, but in all cases each Exclusion Zone will be clearly demarcated. The size of the Exclusion Zone may be altered to accommodate site conditions and to ensure contaminant containment. No personnel or site visitors will be permitted into the Exclusion Zone unless they are in full compliance with the PPE requirements of this Plan.

- Contamination Reduction Zone (CRZ) – A corridor leading from the Exclusion Zone to the Support Zone will be defined and demarcated. All decontamination activities will occur in the CRZ. A waste container will be placed at the end of the corridor so contaminated disposable equipment can be placed inside and covered. Surface/soil contamination in this area will be controlled using plastic sheeting. No personnel or site visitors will be permitted into the Contamination Reduction Zone unless they are in full compliance with the PPE requirements of this Plan.
- Support Zone – A Support Zone, the outermost part of the any work area, will be defined for each field activity. Support equipment will be located in this area. Level D is appropriate in the Support Zone. The location of this zone depends on factors such as accessibility, wind direction (upwind of work area), and resources (i.e., roads, shelter, utilities, etc.).

7.6 The Buddy System

When working in teams of two or more, workers will use the "buddy system" for all work activities to ensure that rapid assistance can be provided in the event of an emergency. This requires work groups to be organized such that workers can remain close together and maintain visual contact with one another. Workers using the "buddy system" have the following responsibilities:

- Provide his/her partner with assistance,
- Observe his/her partner for signs of chemical or heat/cold exposure,
- Periodically check the integrity of his/her partner's PPE, and
- Notify the CHSM/PM or other site personnel if emergency service is needed.

7.7 Nearest Medical Assistance

The address and telephone number of the nearest hospital and Urgent Care facility:

Trenton Total Healthcare (Urgent Care) 1.2 miles

1675 Kingsway Ct #1

Trenton, MI 48183

Telephone: (734) 676-8530

Approximately 0.2 miles west of Fort St., then left onto Kingsway Court.

Beaumont Hospital, Trenton 4.2 miles

5450 Fort St.

Trenton, MI 48183

Telephone: (734) 671-3883

Approximately 0.75 miles south of Van Horn Road, the hospital is located on the right.

A map with directions to the hospital/urgent care are shown on **Figure 3 and Figure 4, respectively**. This information will be posted prominently at the site and will be available to all personnel all of the time. The location and directions to the hospital and urgent care facility will be reviewed in a daily safety meeting.

8.0 CONFINED SPACE ENTRY

Confined space is not anticipated as part of this project. If confined space entry becomes necessary, this HASP will need to be revised prior to beginning any confined space work. Confined space work should only be conducted by those with the proper training and qualifications and after all pre-work documentation has been completed by a competent person.

9.0 EMERGENCY RESPONSE

9.1 General

Because of the hazards that may be present at the site and the conditions under which operations are conducted, it is possible that an emergency situation may develop. Emergency situations can be characterized as injury or acute chemical exposure to personnel, fire or explosion, environmental release, or hazardous weather conditions.

9.2 Responsibilities

Site Emergency Coordinator

The PM, or their alternate, will serve as the Site Emergency Coordinator and shall implement emergency procedures whenever conditions warrant such action. The PM will be responsible for assuring the evacuation, emergency treatment, emergency transport of site personnel, and notification of emergency units and the appropriate management staff. Emergency response instructions will be provided by the PM as part of every employee's training prior to the start of work.

Employees

All employees at the site will be familiar with emergency response procedures for this work location.

9.3 Evacuation

In the event of an emergency situation, an air horn or vehicle horn will be sounded three times indicating the initiation of evacuation procedures. Loud voice command, if appropriate, can also be used. All personnel will evacuate and assemble at the site entrance. No one, except the emergency responders, will be allowed to proceed into the area once the emergency signal has been given. The site H&S officer will ensure that access for emergency equipment is provided and that all sources of combustion (e.g., operating machinery, etc.) have been shut down once the alarm has been sounded. Wind direction will be taken into consideration for evacuation plans. Evacuation plans will be discussed at the initial Site Specific Training and as needed at the regular safety briefings.

In all situations, when an onsite emergency results in an evacuation, personnel shall not re-enter until:

- The conditions resulting in the emergency have been corrected, and

- The hazards have been reassessed, and
- This HASP has been reviewed for changes, and
- Site personnel have been briefed on any changes to this HASP, and
- The PM has indicated that work can continue.

9.4 Emergency Contacts/Notification System

The fire department and other emergency response groups will be notified by telephone of the emergency as soon as possible. An emergency telephone numbers list is presented as **Table 2** in this HASP. This list will be posted prominently at the Site Office Trailer.

9.5 Emergency Medical Treatment

Personnel Injury

In case of injury to personnel, a First Aid Trained person will immediately administer emergency first aid. The ambulance/rescue squad will also be contacted as necessary. Some situations may require transport of the injured parties by automobile. Therefore, maps/directions to the nearest hospital are provided as **Figure 3**.

Personnel Exposure

Emergency first aid procedures to be followed are:

- Skin Contact: Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Rinse eyes with water for at least 15 minutes.
- Inhalation: Move to fresh air and/ or, if necessary decontaminate and transport to emergency medical facility or request the assistance of emergency medical professionals.
- Ingestion: Decontaminate and transport to emergency medical facility or request the assistance of emergency medical professionals.

Puncture/ Laceration: Decontaminate, if possible, and transport to emergency medical facility or request the assistance of emergency medical professionals.

9.5.1 Hospital Directions

From Main Entrance at the McLouth Steel Property to Beaumont Hospital, Trenton at 4540 Fort Street., Trenton, Michigan 48183; phone (734) 671-3883:

- Exit onto West Jefferson Ave. southbound (left)
- Turn west (right) onto King Rd. to Fort St.
- Turn south(left) onto Fort St. and proceed to 5450 Fort St. on the right (4.2 miles).

A map with directions is provided on **Figure 3**.

9.6 Occupational Health Clinic Directions

To reach the occupational health clinic from the main entrance at the McLouth Steel Property to Trenton Total Healthcare at 1675 Kingsway Court #1, Trenton, Michigan 48183; Phone (734) 676-8530:

- Exit onto West Jefferson Ave. southbound (left)
- Turn west (right) onto King Rd. to Kingsway Court
- Turn south (left) onto Kingsway Court and proceed to 1675 Kingsway Court # 1(1.2 miles).

A map with directions is provided on **Figure 4**.

9.7 Fire or Explosion

Appropriate fire extinguishers will be made available at the site for trained personnel to use on insipient stage fires without endangering the safety and health of those nearby. If the use of fire extinguishers will not extinguish the fire, immediately notify the fire department, sound the evacuation signal, and then evacuate the area, assembling at the site entrance to be accounted for and to receive further instruction.

9.8 Spills/Leaks

The best emergency spill plan is planning to avoid and prevent spills. In the event of accidental spillage, the following spill response protocol will be implemented as follows:

1. First Aid shall be administered to the extent practical by qualified personnel to injured/contaminated persons. Any employee who observes a spill shall act immediately, to the extent practical, to protect injured/contaminated persons from any life-threatening situation. First Aid and/or decontamination procedures will be implemented as appropriate.

2. Warn unsuspecting persons of the hazard and isolate the spill area. Personnel shall act to prevent any unsuspecting persons from coming in contact with spilled materials by alerting other nearby persons and by obtaining assistance of other personnel who are familiar with spill control and cleanup techniques.
3. Stop the spill at the source, if possible, without taking unnecessary risks. Deploy spill response equipment.
4. Using available personal radio communications or other rapid communication procedures, the PM and the SSR will be notified of the spill, including information on material spilled, quantity, personnel injuries, and immediate life-threatening hazards.
5. Spill assessment and primary containment. The SSR/PM will make a rapid assessment of the spill and direct primary containment measures which may include, but are not limited to:
 - a. Construction of a temporary containment berm using on-site absorbent pads and booms or earth.
 - b. Digging a sump, installing a polyethylene liner and diverting the spilled material to the sump.
6. Spill clean-up. Personnel will clean-up spills following the spill clean-up plan developed by the SSR or PM. The SSR will be present during clean-up operations. Most equipment, materials, and supplies necessary to remediate a discharge should be readily available on site. Such items may include, but are not limited to: front end loader, shovels, rakes, absorbents, polyethylene, personal safety equipment (respirators, gloves, boots, protective coveralls, hard-hats, eye shields etc.), steel drums, pumps, and miscellaneous hand tools.
7. The PM will notify the Subject Property Owner.
8. The PM will notify the On-Site Coordinator for the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

9.9 Adverse Weather Conditions

In the event of severe weather (rain, heat, cold, etc.), conditions will be assessed on site to determine if the work can proceed safely. If it is determined that the weather poses a significant

hazard, site operations will be stopped and rescheduled. Some of the items to be considered prior to determining if work should continue include:

- Potential for heat stress and heat related injuries.
- Potential for cold stress and cold related injuries.
- Treacherous weather related working conditions.
- Limited visibility.
- High winds.
- Threat of wildfires

If lightning is spotted, all work must cease until 30 minutes have passed since the last sighting.

9.10 Underground Utilities

The following safe work practices must be followed by Project Team personnel before and during subsurface work:

- Obtain available utility drawings from the Subject Property Owner.
- Provide available utility drawings to the subcontractors.
- In the field, mark the proposed area of subsurface disturbance (when possible).
- Ensure that the MISSDIG (811) system has been notified within the proper response time.
- Ensure that the utility companies have responded to the utility locate notification prior to beginning subsurface work.
- Discuss subsurface work locations with the subcontractor.
- Obtain approval from the Subject Property Owner for proposed subsurface work locations.
- Use safe digging procedures when applicable.
- Stay at least 10 feet from all equipment performing subsurface work.

9.11 Site Safety Inspection

The PM or alternate will check the work area daily, at the beginning and end of each work shift or more frequently to ensure safe work conditions. The PM or alternate must complete the Jobsite Safety Inspection Checklist, found in **Appendix B**, at least weekly or before completion of work, whichever is shorter. Any deficiencies shall be discussed at the daily tailgate meeting.

9.12 Documentation

Immediately following an incident or near miss, unless emergency medical treatment is required, either the employee(s) or a coworker must contact the PM to report the incident or

near miss. For emergencies involving personnel injury and/ or exposure, the PM and affected employee(s) will complete an Employee Exposure/ Injury Incident Report (**Appendix C**).

“Near Miss” reports are to be submitted to the PM using the Near Miss Report included in **Appendix C**.

9.13 Operation Shutdown

If known or possible hazardous situations are present, there is a change in significant conditions, or if work tasks are unclear, any project staff may request that site operations be temporarily suspended while the underlying hazard is corrected or controlled. All project staff are encouraged to exercise “stop work” authority as part of applying principles of the behavior based safety culture. Following the identification of a change in conditions resulting in a “stop work” request, the following steps must be completed prior to resuming work:

- **Stop Work**
- **Communicate** – Identify the hazard or change in condition that needs to be addressed. If the situation is related to emissions, during operation shutdown, all personnel will be required to stand upwind to prevent exposure to fugitive emissions.
- **Mitigation Action** – The CHSM and PM will determine the mitigation action appropriate to address the identified hazard.
- **Resume Work** – Implement any mitigation action determined necessary for the safe implementation of work.

The PM will have ultimate authority for operations shutdown and restart.

10.0 PERMIT TO WORK SYSTEM

The following list of activities will require a task-specific work permit. Multiple activities which require permits may take place at one time and each must be permitted as appropriate. The System of Work Permits is included in **Appendix I**.

- Excavation/Trenching – Excavation work is not currently anticipated for this project. In the event that excavations are conducted, an Excavation Permit will be used when performing any excavation activity. This will be completed daily during the project earthwork activities.
- Hot Work (not anticipated) - A Hot Work Permit will be completed prior to performing hot work activities such as grinding, or other heat generating activities. No product storage tanks are located at the site and no explosive or flammable materials are stored onsite.
- Welding, Burning and Cutting (not anticipated) – A Welding, Burning, and Cutting permit will be completed prior to performing any activity that includes welding, burning or cutting.

Permits may only be issued by authorized personnel who are not performing the work. Upon completion of the permitted activity or at the end of each work day, the permit must be closed out by the same person who issued it, and copies will be maintained by the site S&H officer.

11.0 PERSONNEL DECONTAMINATION PROCEDURES

INFORMATION IS AVAILABLE IN APPENDIX D

All personnel, equipment, and samples leaving a contaminated area of the site must be decontaminated. Decontamination for this operation is achieved through physical removal and chemical detoxification/disinfection/sterilization. In order to minimize decontamination activities the following standard operating procedures have been established which are meant to minimize contact with wastes:

- Work habits that minimize contact with wastes are stressed.
- Disposable equipment, where appropriate, will be used.

12.0 ADDITIONAL SAFE WORK PRACTICES

Workers will be expected to adhere to the established safety practices for their respective specialties. The need to exercise caution in the performance of specific work tasks is made more acute due to weather conditions, restricted mobility and reduced peripheral vision caused by the protective gear itself, the need to maintain the integrity of the protective gear, and the increased difficulty in communicating caused by respirators (if required). Work at the site will be conducted according to established protocol and guidelines for the safety and health of personnel involved. The following are among the most important of these principles:

- If unsafe conditions are observed, stop work.
- In any unknown situation, always assume the worst conditions and plan responses accordingly.
- Employ the buddy system. Establish and maintain communication.
- Minimize contact with contaminated materials. Plan work areas, decontamination areas and procedures to accomplish this. Do not place equipment on the ground. Do not sit on contaminated materials.
- Smoking, eating, or drinking within a contaminated area and before decontamination will not be allowed.
- Avoid heat/cold and other work stresses related to wearing the protective gear. Work breaks should be planned to prevent stress-related accidents or fatigue.
- Maintain air monitoring systems. Be especially aware of combustible gas levels and adequate oxygen levels in your work area.
- Conflicting situations which may arise concerning safety requirements and working conditions must be immediately addressed and resolved rapidly by the site CHSMs to relieve any motivations or pressures to circumvent established safety policy.
- Unauthorized breaches of specified safety protocol will not be allowed. Personnel unwilling or unable to comply with the established procedures will be replaced. Any changes in established procedure should be documented on the form provided. The change should have a very specific and valid basis and must be approved by the PM.
- Be observant of not only one's own immediate surroundings but also that of others. Everyone will be working under constraints to awareness, and it is a team effort to notice and warn of impending dangerous situations. Extra precautions are necessary when working near heavy equipment while using personal protective gear. Vision, hearing, and communication are restricted by the protective gear.

- Level C respiratory protection is not anticipated for this project. However, if the need arises to wear Level C respiratory protection, personnel in Level C protection will be required to remove facial hair (except moustaches) to allow a proper fit of the face piece.
- Rigorous contingency planning and dissemination of plans to personnel minimize the impact of rapidly changing safety requirements in response to changing site conditions.
- Withdrawal from a hazardous situation to reassess procedures is the preferred course of action.

13.0 DISPOSAL PROCEDURES

Discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on site. Potentially contaminated materials (e.g., clothing, gloves, etc.) will be bagged or drummed as necessary with other contaminated materials, and segregated for disposal. If used, drums will be closed and bolted before leaving the site. Contaminated waste materials shall be disposed of as required by the provisions included in state and federal regulatory requirements. Non-contaminated materials shall be collected and bagged for appropriate disposal as normal waste.

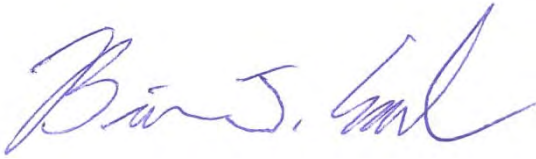
14.0 APPROVALS

By their signature the undersigned certify that this HASP is approved:



Greg Oslosky / ASTI Project Manager

4/1/2019
Date



Brian Earl / ASTI CHSM

4/1/2019
Date

15.0 PROJECT TEAM REVIEW

Each project team member shall sign this section after site-specific training is completed and before being permitted to work on site.

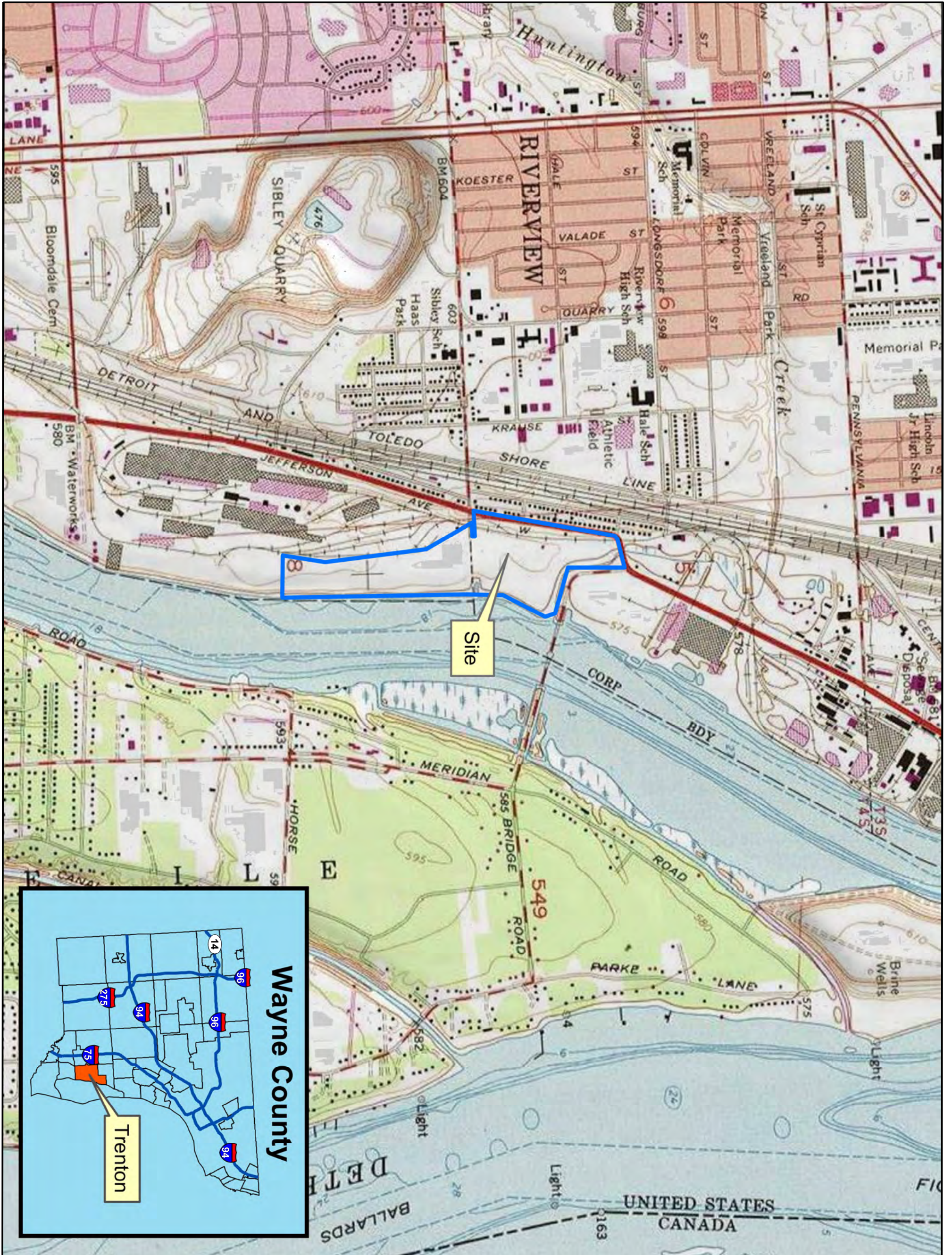
I have read and understand this Site-Specific Health and Safety Plan. I will comply with the provisions contained therein.

Site/Project: McLouth Steel Property – RTRR Property, Riverview, Michigan

<u>Name Printed</u>	<u>Signature</u>	<u>Date</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FIGURES

- 1 Site Location Map
- 2 Property Map
- 3 Hospital Location Map
- 4 Urgent Care Location Map





LEGEND
 - - - Property Line
 ——— Approx. Parcel Boundary

Take W Jefferson Ave to Fort St in Trenton

4 min (2.0 mi)

- ↑ 1. Head south on W Jefferson Ave toward High St
1.4 mi
- 2. Turn right onto King Rd
0.7 mi

Follow Fort St

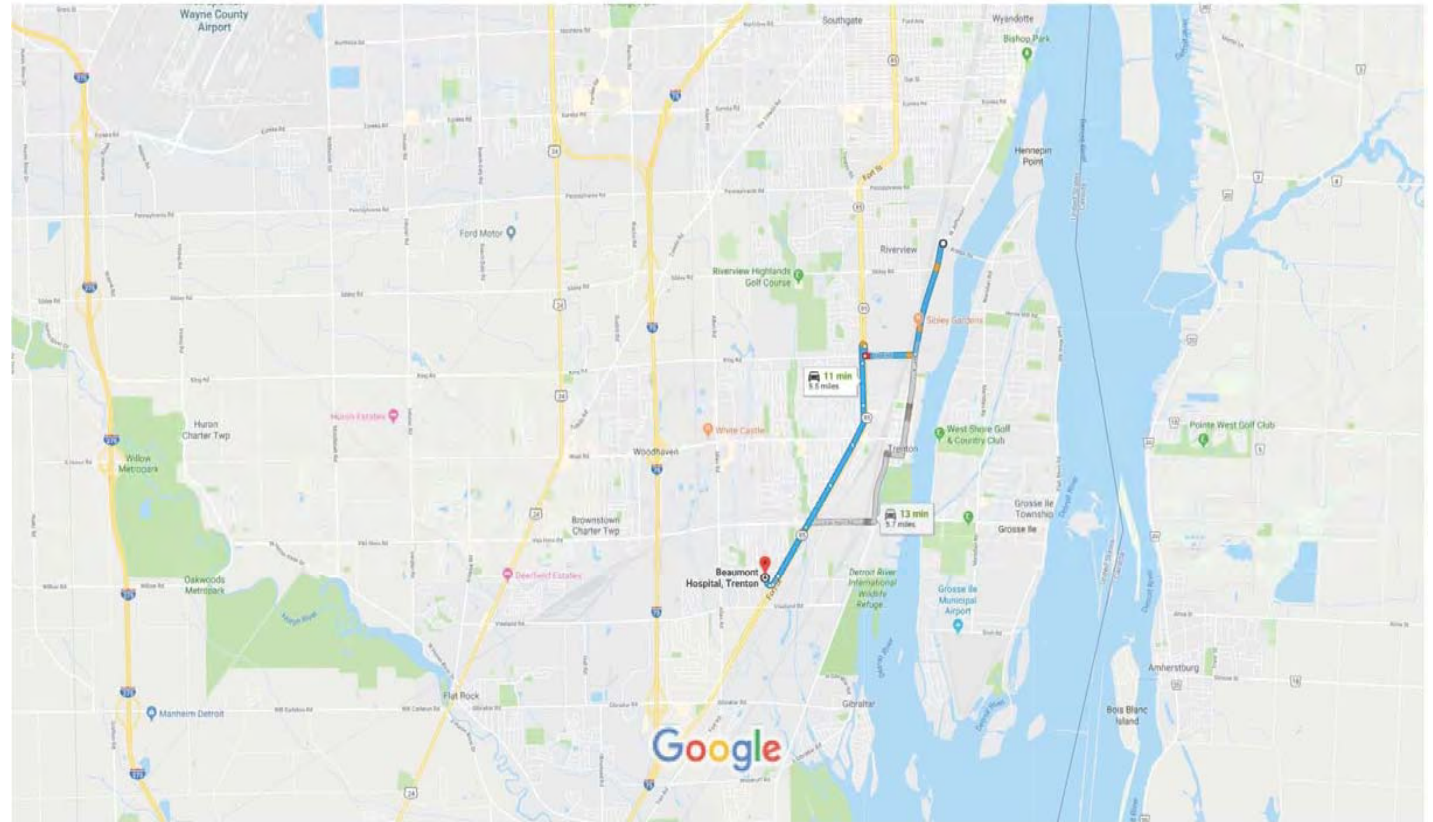
5 min (3.4 mi)

- 3. Turn right onto Fort St
0.1 mi
- ↶ 4. Sharp left to stay on Fort St
0.3 mi
- ↑ 5. Continue straight to stay on Fort St
0.5 mi
- ↑ 6. Continue straight to stay on Fort St
0.5 mi
- ↑ 7. Continue straight to stay on Fort St
0.6 mi
- ↑ 8. Continue straight to stay on Fort St
0.6 mi
Pass by Citizens Bank (on the right in 0.5 mi)
- ↑ 9. Continue straight to stay on Fort St
0.7 mi
- ↑ 10. Continue straight to stay on Fort St
0.1 mi

Drive to your destination

49 s (466 ft)

- 11. Turn right
207 ft
- 12. Turn right
Destination will be on the right
259 ft



Beaumont Hospital, Trenton

5450 Fort St, Trenton, MI 48183



- ↑ 1. Head south on W Jefferson Ave toward High St

- ↗ 2. Turn right onto King Rd

- ↖ 3. Turn left onto Kingsway Ct

- ↗ 4. Turn right

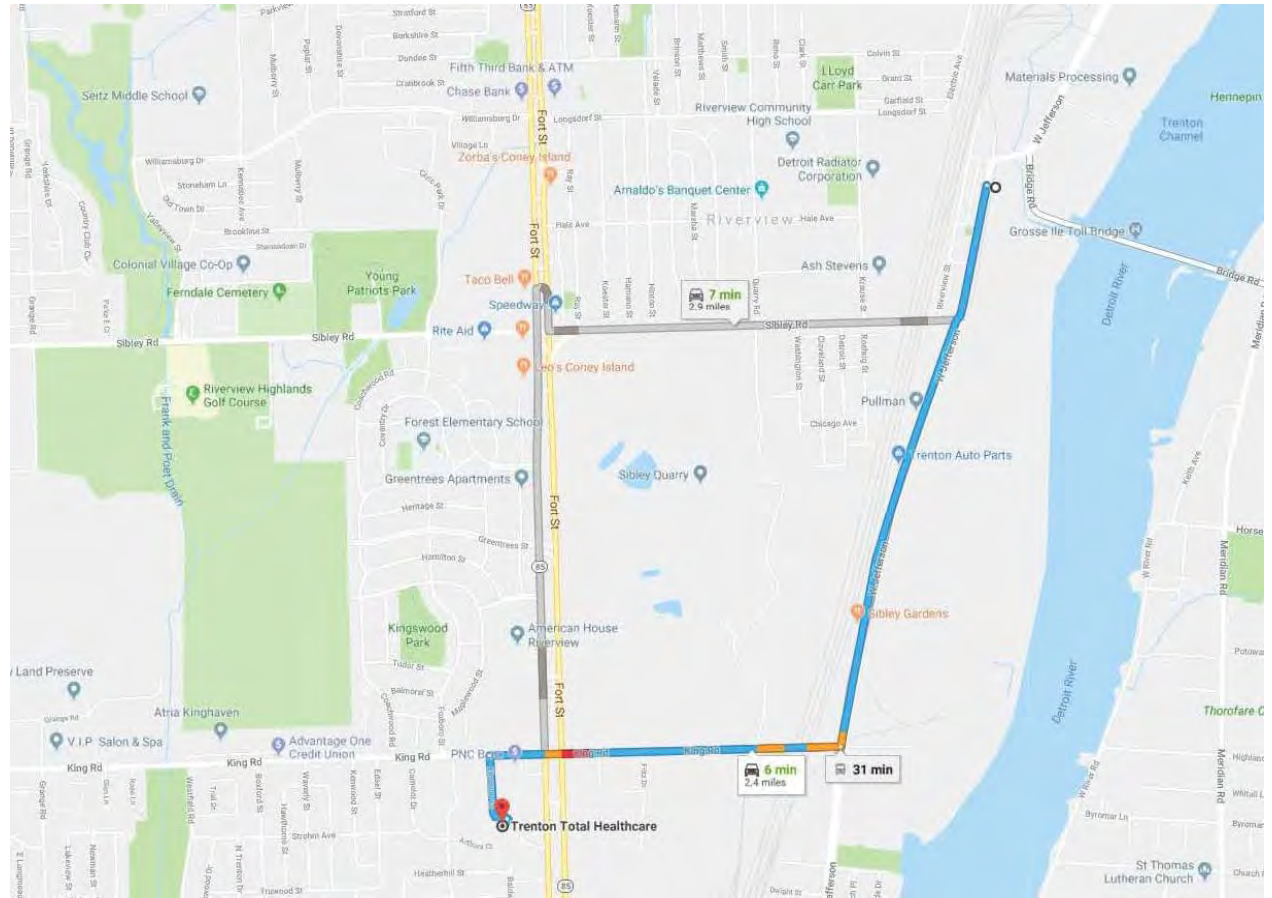
1.4 mi

0.8 mi

0.2 mi

108 ft

Trenton Total Healthcare
 1675 Kingsway Ct, Trenton, MI 48183



TABLES

- 1 List of Potential Chemicals
- 2 Emergency Notification List*

Table 1
List of Potential Chemicals

Former McLouth Steel Facility
RTRR Property

The following chemicals may be encountered while working on the RTRR Property:

Ammonia	Free Cyanide	Arsenic
Barium	Cadmium	Chromium
Cobalt	Copper	Ammonia
Lead	Manganese	Mercury
Nickel	Selenium	Silver
Xylenes	Vanadium	Zinc
1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	2,4-Dimethylphenol
2-Methylphenol	3-Methylphenol	4-Methylphenol
Benzene	Benzo(a)anthracene	Benzo(a)pyrene
Benzo(b)fluoranthene	Carbazole	Dibenzofuran
Ethylbenzene	Fluoranthene	Fluorene
Methylphenol	Naphthalene	N-nitroso-di-n-propylamine
PCBs	Perchloroethylene	Phenanthrene
Phenol	Vinyl Chloride	

Table 2
Emergency Contact List

Former McLouth Steel Facility
RTRR Property

Emergency Contact List

Emergency Contacts	Phone Number
Police/Fire Emergency	911
Beaumont Hospital	734-655-4800
MDEQ – Rich Conforti, MDEQ - Site Coordinator If unavailable, contact the Jacob Runge	(734) 740-9019 (517) 284-6580
Project Manager – Greg Oslosky	(616) 485-5743
MSC Land Company, LLC	(614) 774-9487 or (586) 405-1884
National Response Center (NRC)	(800) 424-8802
MI Pollution Emergency Alerting System	(800) 320-0519
DEQ Chemical Emergency	(800) 292-4706
Poison Control Center	(800) 222-1222

APPENDICES

Appendix A

WCC/ Permit #: Project Site: Date:	Daily Tailgate Meeting & Job Clearance Form
--	--

Job Location:	Date:
Site Supervisor:	Project Manager:

List activities to be performed today:	
Permitted Activities (specific permit to be completed):	<input type="checkbox"/> Not Applicable <input type="checkbox"/> Confined Space Entry <input type="checkbox"/> Excavation/Trenching <input type="checkbox"/> Hot Work <input type="checkbox"/> Hoisting/Rigging (<u>any</u> lifting with equipment, excluding drill rigs) <input type="checkbox"/> Natural Gas System Maintenance

Muster Point:	Spill Kit Location:
First Aid Kit Location:	Fire Extinguisher Location:
Emergency cut-off switches:	Designated cell phone use area(s):

Has the Site Manager/Owner been notified of our activities and/or participated in a pre-work site walk?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Is a fuel delivery scheduled for today?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Have all personnel reviewed and understand the site specific HASP?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Does each activity have a Job Safety Analysis (JSA)?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Does each subcontractor have JSAs for their activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have JSAs been reviewed by all affected personnel on-site?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Has a site walk been performed to identify additional hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Have any newly identified hazards been documented on the JSA?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have all members of the work team confirmed understanding of the work, hazards, and controls/ mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Has each person on the work team discussed all hazards and mitigation measures associated with any task which will require their feet to leave the ground?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have work areas been properly cordoned-off to protect workers, site staff, and the public?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have equipment checks been completed, documented, and reviewed?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have there been any equipment modifications made by subcontractor(s)? Is yes, discuss modifications.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Do all members of the work team have API Safety Keys?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Do all members of the work team have a Shell "Life Saving Rules" Training card?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Do all site workers understand injury/ intervention reporting requirements including immediately notifying the Site Supervisor of any injury near miss, unsafe condition or hazard observation?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
If permits are required, have they been reviewed and permit conditions understood by the Team?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
If drilling, did driller physically point out all pinch points to entire team?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
If drilling, has the driller & crew agreed the audible and visible signals for "all clear" prior to engaging controls?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A

* If No, then work cannot be performed until corrective action is completed and documented.

Title of JSAs reviewed today:	Title of Subcontractor's JSAs reviewed today:
-------------------------------	---

All personnel are wearing (regardless of activity):	<input type="checkbox"/> Hard Hat <input type="checkbox"/> Safety Glasses <input type="checkbox"/> Safety Vest <input type="checkbox"/> Steel-Toed Boots <input type="checkbox"/> Gloves (appropriate for task) <input type="checkbox"/> Long-Sleeved Shirt <input type="checkbox"/> Snake Bite Prevention Chaps *See JSA for additional task specific PPE requirements.
---	--

Other Safety and Task-Specific Items Discussed Today:	Stop Work Authority & Obligation
	* All employees will stop the job any time anyone is concerned or uncertain about safety. * All employees will stop the job if anyone identifies a hazard or additional mitigation not recorded on the JSA. * All employees will be alerted to any changes in personnel or conditions at the worksite. * All employees will stop the job and reassess a task, hazards, and mitigations, and then amend the JSA as needed.

WCC/ Permit #: Project Site: Date:	Daily Tailgate Meeting & Job Clearance Form	
---	--	--

SITE WORKERS (including Contractors and Subcontractors): By signing here, you are stating the following:

- * You have been involved in reviewing the JSAs and understand the hazards and control measures associated with each task you are about to perform.
- * You understand the permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * You understand the Life Saving Rules and are aware that tasks or work that is not risk-assessed shall not be performed.
- * You are aware of your authority and obligation to 'Stop Work'.

I arrived and departed fit for duty:

- * You are physically and mentally fit for duty,
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or fatigue issue you may have to the Site Supervisor.
- * You will sign-out uninjured unless you have otherwise informed the Site Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed)

SITE VISITORS (attach additional Site Visitor sign-in/out sheets if needed)

Print Name	Company Name	Arrival Time	Departure Time	Signature

SITE REPRESENTATIVE Sign In/Out (operating sites only, and signature must be requested. If the operator refuses to sign, note this on the Form)

Sign In: <i>I have discussed this Job Clearance Form with the contractor</i>		Sign Out: <i>I have discussed this Job Clearance Form with the contractor</i>	
Site Representative Name	Site Representative Signature	Site Representative Name	Site Representative Signature

WCC/ Permit #: Project Site: Date:	Daily Tailgate Meeting & Job Clearance Form	
--	--	--

TWILIGHT TOOL BOX TALK (Complete the following once field activities for the day have been concluded): <i>All BBOs shall also be logged on the BBO tracking form and HSE field tracking matrix</i>		
Were there any Incidents, Near Misses, Potential Incidents, or Positive Interventions today? <i>(These should also be recorded on the task-specific JSA)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide details:
Were there any 'Stop Work' interventions? <i>(These should also be recorded on the task-specific JSA)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide details:
Were there any areas for improvement noted? <i>(These should also be recorded on the task-specific JSA)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide details:
Is the Site Manager/Owner happy with the way you left the site (including the location of waste drums and/or equipment)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If no, provide details:

Project Performance and Milestone Tracking- Daily Accomplishment:	On-Site Equipment Requiring Daily Inspection/ SN/ Responsible Party
	1)
	2)
	3)
	4)
	5)
	6)
	7)
	8)
	9)
	10)
	11)
	12)
	13)
	14)
	15)

I certify that the above information is true and the job site is being left in a safe condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	Site Supervisor Signature:
--	--	-----------------------------------

Appendix B

<input type="checkbox"/> A <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input checked="" type="checkbox"/> X <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input type="checkbox"/> NA <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<p>A6 Housekeeping and Hygiene</p> <ol style="list-style-type: none"> 1. Work area free of debris. 2. Daily pickup and storage of tools. 3. Work areas and walkways free and clear of debris. 4. Adequate lighting. 5. Portable water available. 	<hr/> <hr/> <hr/> <hr/> <hr/>
<input type="checkbox"/> A <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input checked="" type="checkbox"/> X <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input type="checkbox"/> NA <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<p>A7 Safety Training and Education</p> <ol style="list-style-type: none"> 1. HASP reviewed and signed by employees/subcontractors. 2. MSDS maintained in HASP. 3. Required training documented in HASP. 4. Employees and subcontractors have appropriate training. 5. Controlled-substance testing documents up-to-date. 6. Tailgate safety meetings documented. 7. Job Safety Analysis (JSA) in HASP. 8. Current first aid and CPR trained personnel on-site. Documentation available. 	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<input type="checkbox"/> A <input type="checkbox"/> — <input type="checkbox"/> —	<input checked="" type="checkbox"/> X <input type="checkbox"/> — <input type="checkbox"/> —	<input type="checkbox"/> NA <input type="checkbox"/> — <input type="checkbox"/> —	<p>A8 Motor Vehicles and Equipment</p> <ol style="list-style-type: none"> 1. Proper speed limit obeyed. 2. Seat belts being used. 3. Company name displayed. 4. Fire extinguisher available. 	<hr/> <hr/> <hr/> <hr/>
<input type="checkbox"/> A <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input checked="" type="checkbox"/> X <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input type="checkbox"/> NA <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<p>A9 Hand & Power Tools</p> <ol style="list-style-type: none"> 1. Tools in good condition. 2. Tools inspected prior to use. 3. Tools stored safety when not in use. 4. Employees familiar with using tools. 5. Additional PPE needed / available. 6. Defective tools & equipment removed from site. 	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<input type="checkbox"/> A <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input checked="" type="checkbox"/> X <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input type="checkbox"/> NA <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<p>A10 Underground Utilities</p> <ol style="list-style-type: none"> 1. One call completed by responsible party. 2. Drawings reviewed for utility locations. 3. Client approved areas of intrusive work. 4. Underground utility markings visually observed. 5. Subsurface work at least 3 feet from marked utilities. 6. Soft digging / Hand probing for underground utilities required. 7. Overhead utilities observed. 8. Underground Utility Checklist completed 	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<input type="checkbox"/> A <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input checked="" type="checkbox"/> X <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<input type="checkbox"/> NA <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> — <input type="checkbox"/> —	<p>A11 Borings, Wells & Other Intrusive Earth Work</p> <ol style="list-style-type: none"> 1. Appropriate permit obtained and available. 2. Locations approved by client. 3. Locations at least 3 feet from underground utilities. 4. Hand probing for underground utilities. 5. Employee 10 feet from equipment performing work. 6. Equipment at least 10 feet from overhead power lines. 7. Safety cones/barricades used to identify open areas. 8. Overhead utilities observed. 	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

A	X	NA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	

A12 Test Pits & Soil Excavation

1. Appropriate permit obtained and available.
2. Excavations sloped or benched as required.
3. Safety cones/barricades used to identify open areas.
4. Hand probing for underground utilities.
5. Soil placed back 4 ft. from edge of excavation/test pit.
6. Employee 10 feet from equipment performing work.
7. Equipment at least 10 feet from overhead power lines.
8. Safety cones/barricades used to identify open areas.
9. Overhead utilities observed.
10. Test pit filled in after work completed.

A	X	NA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	

A13 Material Handling, Storage, Use, and Disposal

1. Proper lifting techniques being used.
2. Waste containers identified properly.
3. Materials properly anchored or secured.

A	X	NA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	
—	—	

A14 Electrical Work Procedures

1. Electrical equipment grounded including portable hand tools and extension cords.
2. Ground fault circuit interrupters provided for electrical wiring, cords, and equipment.
3. Cords protected from damage
4. Equipment at least 10 feet from power lines.
5. Electrical dangers at site noted.

A	X	NA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	

A15 Work Permits

1. Work Permits issuance procedure set up and understood..
2. Work Permits available.
3. Work to be covered under Work Permit procedure defined.
4. Permits issued for pressurized/energized systems.
5. Excavation permit required/obtained.
6. Work permit reviewed and initialed by Air Products' Representative.
7. Work permits reviewed by contractor/subcontractor.

A	X	NA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
—	—	

A16 Air Monitoring

1. Air monitoring instrument required / used – (note type).
2. Air monitoring instruments calibrated.
3. Air monitoring readings recorded.
4. Action levels provided /understood.

A17 Additional Comments

Unsafe Acts:

Notes:

Appendix C

Near Miss Report Health and Safety

A Near-Miss is an incident which did not result in property damage or employee injury, but potentially could have under different circumstances. Near-Miss Reporting is the process of identifying and preventing an unsafe act or condition before it causes property damage or employee injury. All near misses must be reported to the Health and Safety Department using this form.

Near Miss Information

Check all that apply:

<input type="checkbox"/> Unsafe Condition	<input type="checkbox"/> Unsafe Act/ Behavior
<input type="checkbox"/> Unsafe Equipment	<input type="checkbox"/> Unsafe Use of Equipment

Location/
Project #:

Date/Time: _____

Description of Near Miss (Who, What, Where, When & How): _____

Causes (Why it happened):

Corrective Action (How can this be prevented in the future?):

Submitted By: _____

Date: _____

Reviewed by (Health and Safety Department Use Only)

Name: _____

Date: _____

NMR #: _____

Incident / Injury Report Health & Safety

(Complete and return to Health & Safety Department)

Affected Employee Name: _____ Date: _____

Incident type: Injury Report Only/No Injury
 Near Miss Other: _____

EMPLOYEE INFORMATION (Person completing Form)

Employee Name: _____ Employee No: _____

Title: _____ Office Location: _____

Length of time employed or date of hire: _____

Mailing address: _____

Sex: M F Birth date: _____

Business phone & extension: _____ Residence/cell phone: _____

INCIDENT INFORMATION

Project: _____ Project #: _____

Date/time of incident: _____ Time work started & ended: _____

Site location: _____

Incident Type: Possible Exposure Exposure Physical Injury

Names of person(s) who witnessed the incident: _____

Exact location incident occurred: _____

Describe work being done: _____

Describe in detail how the incident occurred: _____

Nature of the incident (List the parts of the body affected): _____

Person(s) to whom incident was reported (Time and Date): _____

Incident / Injury Report

Health & Safety

Nature of the incident (List the parts of the body affected): _____

Person(s) to whom incident was reported (Time and Date): _____

List the names of other persons affected during this incident: _____

Possible causes of the incident (equipment, unsafe work practices, lack of PPE, etc): _____

Weather conditions during incident: _____

MEDICAL CARE INFORMATION

Did affected employee receive medical care? Yes No

If Yes, Provide name & address of facility (hospital, clinic, etc): _____

Length of stay at the facility? _____

Did the employee miss any work time? Yes No Undetermined

Date employee last worked: _____ Date employee returned to work: _____

Has the employee returned to work? Yes No

Does the employee have any work limitations or restrictions from the injury? : Yes No

If Yes, please describe: _____

HEALTH & SAFETY INFORMATION

Was the operation being conducted under an established site specific Health and Safety Plan?

Yes No Not Applicable:

Describe protective equipment and clothing used by the employee:

Did any limitations in safety equipment or protective clothing contribute to or affect exposure / injury? If so, explain:

Employee Signature

Date

Representative

Date

Appendix D

PERSONNEL DECONTAMINATION

LEVEL C DECONTAMINATION

Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	2. Scrub outer boots, outer gloves and chemical-resistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Canister or Mask Change	4. If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5:	Boot, Gloves and Outer Garment Removal	5. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6:	Facepiece Removal	6. Facepiece is removed (avoid touching face with fingers). Facepiece deposited on plastic sheets.
Station 7:	Field Wash	7. Hands and face are thoroughly washed. Shower as soon as possible.

LEVEL D DECONTAMINATION

Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment,	2. Scrub outer boots, outer gloves and chemical-resistant

	Boots, and Gloves Wash and Rinse	splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Boot, Gloves and Outer Garment Removal	4. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 5:	Field Wash	5. Hands and face are thoroughly washed. Shower as soon as possible.

EQUIPMENT DECONTAMINATION

GENERAL:

Equipment to be decontaminated during the project may include tools, monitoring equipment, respirators, sampling containers, laboratory equipment and drilling equipment.

All decontamination will be done by personnel in protective gear, appropriate for the level of decontamination, as determined by the site HSO. The decontamination work tasks will be split or rotated among support and work crews.

Within the “hot-spot” excavations, equipment bucket and treads (any parts that may have contacted the soil) will be dry scrubbed to remove any caked or course material, prior to leaving the immediate excavation area, to limit the potential for cross contamination between excavations. It is intended that machinery performing work in the “hot-spot” excavations/ exclusion zone will remain within that designated area. If equipment is to leave the “hot” area, it will be decontaminated first by dry scrub decon, followed by decontamination over a portable decontamination pad to contain wash water; or, wash water may be allowed to run off into a storm sewer system. Equipment needed may include a steam generator with high-pressure water, empty drums, screens, screen support structures, and shovels. Drums will be used to hold contaminated wash water pumped from the lined pit. These drums will be labeled as such. Decontamination pads, drums, or any other “wet” decon operations must be contained and remain no less than 100 feet from any potential receptors, as identified by the HSO/ Site Supervisor.

Miscellaneous tools and equipment will be dropped into a plastic pail, tub, or other container. They will be brushed off and rinsed with a detergent solution, and finally rinsed with clean water.

All equipment and dump trucks leaving the Site will proceed through the tire wash station located onsite. Water from the tire wash station will be collected via sump and disposed of per the HSO/ Site Supervisor. The tire wash station will not be located within 100 feet of any potential receptors.

Refer to the attached map (B-1) for locations, definitions, and placement of the exclusion zone, contaminant reduction zone, and clean zone.

MONITORING EQUIPMENT:

Monitoring equipment will be protected as much as possible from contamination by draping, masking, or otherwise covering as much of the instruments as possible with plastic without hindering the operation of the unit. The PID or OVA meter, for example, can be placed in a clear plastic bag, which allows reading of the scale and operation of knobs. The probes can be partially wrapped keeping the sensor tip and discharge port clear. The RAM Dust meters will be wiped down daily at a minimum, or as needed.

The contaminated equipment will be taken from the drop area and the protective coverings removed and disposed in the appropriate containers. Any dirt or obvious contamination will be brushed or wiped with a disposable paper wipe.

RESPIRATORS:

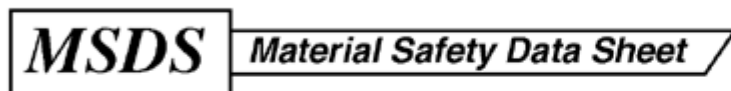
Respirators will be cleaned and disinfected after every use. Taken from the drop area, the masks (with the cartridges removed and disposed of with other used disposable gear) will be immersed in a cleaning solution and scrubbed gently with a soft brush, followed by a rinse in plain warm water, and then allowed to air dry. In the morning, new cartridges will be installed. Personnel will inspect their own masks for serviceability prior to donning them. And, once the mask is on, the wearer will check the respirator for leakage using the negative and positive pressure fit check techniques.

Appendix E

Safety Data Sheets (SDS)

All contractors who will be bringing any chemical for use on site are required to provide a method statement of intent of use for each chemical and review the Safety Data Sheet(SDS) with the Site Safety Manager and Project Manager(PM) prior to use.

SDSs will be kept on file with each contractor's site specific HASP. A copy of the SDS will be provide to the Site Safety Manager/PM and will be on file in the Office Trailer.

MSDS Number: **H3880**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

HYDROCHLORIC ACID, 33 - 40%

1. Product Identification

Synonyms: Muriatic acid; hydrogen chloride, aqueous

CAS No.: 7647-01-0

Molecular Weight: 36.46

Chemical Formula: HCl

Product Codes:

J.T. Baker: 5367, 5537, 5575, 5800, 5814, 5821, 5839, 5861, 5862, 5894, 5962, 5963, 5972, 5994, 6900, 7831, 9529, 9530, 9534, 9535, 9536, 9538, 9539, 9540, 9544, 9548

Mallinckrodt: 2062, 2515, 2612, 2624, 2626, 3861, 5583, 5587, H611, H613, H987, H992, H999, V078, V628

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Hydrogen Chloride	7647-01-0	33 - 40%	Yes
Water	7732-18-5	60 - 67%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 2 - Moderate

Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:

Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.

Ingestion:

Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea.

Swallowing may be fatal.

Skin Contact:

Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.

Eye Contact:

Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure:

Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never

give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Extreme heat or contact with metals can release flammable hydrogen gas.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

If involved in a fire, use water spray. Neutralize with soda ash or slaked lime.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving hydrochloric acid. Stay away from ends of tanks. Cool tanks with water spray until well after fire is out.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When

diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Hydrochloric acid:

- OSHA Permissible Exposure Limit (PEL):

5 ppm (Ceiling)

- ACGIH Threshold Limit Value (TLV):

2 ppm (Ceiling), A4 Not classifiable as a human carcinogen

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Colorless, fuming liquid.

Odor:

Pungent odor of hydrogen chloride.

Solubility:

Infinite in water with slight evolution of heat.

Density:

1.18

pH:

For HCL solutions: 0.1 (1.0 N), 1.1 (0.1 N), 2.02 (0.01 N)

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

53C (127F) Azeotrope (20.2%) boils at 109C (228F)

Melting Point:

-74C (-101F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

190 @ 25C (77F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Containers may burst when heated.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

A strong mineral acid, concentrated hydrochloric acid is incompatible with many substances and highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.

Conditions to Avoid:

Heat, direct sunlight.

11. Toxicological Information

Inhalation rat LC50: 3124 ppm/1H; oral rabbit LD50: 900 mg/kg (Hydrochloric acid concentrated); investigated as a tumorigen, mutagen, reproductive effector.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Hydrogen Chloride (7647-01-0)	No	No	3
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater.

Environmental Toxicity:

This material is expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: HYDROCHLORIC ACID

Hazard Class: 8

UN/NA: UN1789

Packing Group: II

Information reported for product/size: 475LB

International (Water, I.M.O.)

Proper Shipping Name: HYDROCHLORIC ACID

Hazard Class: 8

UN/NA: UN1789

Packing Group: II

Information reported for product/size: 475LB

15. Regulatory Information

Risk and Safety Phrases:

Symbol: C

Risk: 34-37

Safety: (1/2-)26-45

-----\Chemical Inventory Status - Part 1\-----
 Ingredient TSCA EC Japan Australia

Hydrogen Chloride (7647-01-0)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	--Canada--			
	Korea	DSL	NDSL	Phil.
Hydrogen Chloride (7647-01-0)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Hydrogen Chloride (7647-01-0)	5000	500*	Yes	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8(d)
Hydrogen Chloride (7647-01-0)	5000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2R

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **1**

Label Hazard Warning:

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
 Do not breathe vapor or mist.
 Use only with adequate ventilation.
 Wash thoroughly after handling.
 Store in a tightly closed container.
 Remove and wash contaminated clothing promptly.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 16.

Disclaimer:

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

Material Safety Data Sheet

Isobutylene



Section 1. Chemical product and company identification

Product Name : Isobutylene
Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253
Product use : Synthetic/Analytical chemistry.
MSDS# : 001031
Date of Preparation/Revision : **4/3/2007.**
In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Gas. (COLORLESS LIQUEFIED COMPRESSED GAS WITH A SWEET GASOLINE-LIKE ODOR)
Emergency overview : Warning!
FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
VAPOR MAY CAUSE FLASH FIRE.
Keep away from heat, sparks and flame. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation.
Contact with rapidly expanding gases can cause frostbite.
Routes of entry : Inhalation
Potential acute health effects
Eyes : No known significant effects or critical hazards.
Skin : No known significant effects or critical hazards.
Inhalation : Acts as a simple asphyxiant.
Ingestion : Ingestion is not a normal route of exposure for gases
Potential chronic health effects : **CARCINOGENIC EFFECTS** Not available.
MUTAGENIC EFFECTS Not available.
TERATOGENIC EFFECTS Not available.
Medical conditions aggravated by overexposure : Acute or chronic respiratory conditions may be aggravated by overexposure to this gas.
See toxicological Information (section 11)

Section 3. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
Isobutylene	115-11-7	100	Del Lietuvos Higienos Normos (Lithuania, 12/2001). TWA: 100 mg/m ³ 8 hour(s). Form: All forms

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Isobutylene

- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

Section 5. Fire fighting measures

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : 465°C (869°F)
- Flammable limits** : Lower: 1.8% Upper: 9.6%
- Products of combustion** : These products are carbon oxides (CO, CO₂).
- Fire hazards in presence of various substances** : Extremely flammable in presence of open flames, sparks and static discharge, of oxidizing materials.
- Fire fighting media and instructions** : In case of fire, use water spray (fog), foam, dry chemicals, or CO₂.

If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.

Extremely flammable. Gas may accumulate in confined areas, travel considerable distance to source of ignition and flash back causing fire or explosion.

- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 7. Handling and storage

- Handling** : Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire, minimize ignition sources. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not puncture or incinerate container. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor or dust concentrations below any explosive limits. Use explosion-proof ventilation equipment.

Personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Isobutylene

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Personal protection in case of a large spill** : A self-contained breathing apparatus should be used to avoid inhalation of the product.
- Consult local authorities for acceptable exposure limits.**

Section 9. Physical and chemical properties

- Molecular weight** : 56.12 g/mole
- Molecular formula** : C₄H₈
- Boiling/condensation point** : -6.89°C (19.6°F)
- Melting/freezing point** : -139.99°C (-220°F)
- Critical temperature** : 144.8°C (292.6°F)
- Vapor pressure** : 24.3 psig
- Vapor density** : 1.9 (Air = 1)
- Specific Volume (ft³/lb)** : 6.68449
- Gas Density (lb/ft³)** : 0.1496

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances** : Extremely reactive or incompatible with oxidizing agents.

Section 11. Toxicological information

- Other toxic effects on humans** : No specific information is available in our database regarding the other toxic effects of this material for humans.
- Specific effects**
- Carcinogenic effects** : No known significant effects or critical hazards.
 - Mutagenic effects** : No known significant effects or critical hazards.
 - Reproduction toxicity** : No known significant effects or critical hazards.




Section 12. Ecological information

- Products of degradation** : These products are carbon oxides (CO, CO₂) and water.
- Toxicity of the products of biodegradation** : The product itself and its products of degradation are not toxic.
- Environmental fate** : Not available.
- Environmental hazards** : No known significant effects or critical hazards.
- Toxicity to the environment** : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1055	ISOBUTYLENE SEE ALSO PETROLEUM GASES, LIQUEFIED	2.1	Not applicable (gas).		<p>Limited quantity Yes.</p> <p>Packaging instruction Passenger Aircraft Quantity limitation: Forbidden.</p> <p>Cargo Aircraft Quantity limitation: 150 kg</p> <p>Special provisions 19, T50</p>
TDG Classification	UN1055	ISOBUTYLENE	2.1	Not applicable (gas).		<p>Explosive Limit and Limited Quantity Index 0.125</p> <p>ERAP Index 3000</p> <p>Passenger Carrying Ship Index Forbidden</p> <p>Passenger Carrying Road or Rail Index Forbidden</p> <p>Special provisions 29</p>
Mexico Classification	UN1055	ISOBUTYLENE SEE ALSO PETROLEUM GASES, LIQUEFIED	2.1	Not applicable (gas).		-

Section 15. Regulatory information

United States

- U.S. Federal regulations** : TSCA 8(b) inventory: 2-Methylpropene(Isobutylene)
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: 2-Methylpropene(Isobutylene)
SARA 311/312 MSDS distribution - chemical inventory - hazard identification:
2-Methylpropene(Isobutylene): Fire hazard, Sudden Release of Pressure
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: 2-Methylpropene(Isobutylene)
Clean air act (CAA) 112 regulated flammable substances: 2-Methylpropene(Isobutylene)
Clean air act (CAA) 112 regulated toxic substances: No products were found.
- State regulations** : Pennsylvania RTK: 2-Methylpropene(Isobutylene): (generic environmental hazard)
Massachusetts RTK: 2-Methylpropene(Isobutylene)
New Jersey: 2-Methylpropene(Isobutylene)

Canada

- WHMIS (Canada)** : Class A: Compressed gas.
Class B-1: Flammable gas.
CEPA DSL: 2-Methylpropene(Isobutylene)

Section 16. Other information

United States

- Label Requirements** : FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
VAPOR MAY CAUSE FLASH FIRE.

Canada

- Label Requirements** : Class A: Compressed gas.
Class B-1: Flammable gas.

Hazardous Material Information System (U.S.A.)

Health	1
Fire hazard	4
Reactivity	0
Personal protection	C

National Fire Protection Association (U.S.A.)



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

LIQUINOX MSDS

Section 1 : MANUFACTURER INFORMATION

Supplier: Same as manufacturer.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255 -3924.
813-248 -0585 (outside of the United States).

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Supplier MSDS date: 2005/02/24

D.O.T. Classification: Not regulated.

Section 2 : HAZARDOUS INGREDIENTS
--

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE

Section 3 : PHYSICAL / CHEMICAL CHARACTERISTICS
--

Physical state: Liquid.

Appearance & odor: Odourless.
Pale yellow.

Odor threshold (ppm): Not available.

Vapour pressure @ 20°C (68°F) (mmHg): 17

Vapour density (air=1): >1

Volatiles (%)

By volume: Not available.

Evaporation rate (butyl acetate = 1): < 1.

Boiling point (°C): 100 (212F)
Freezing point (°C): Not available.
pH: 8.5
Specific gravity @ 20 °C: (water = 1).
1.083
Solubility in water (%): Complete.
Coefficient of water\oil dist.: Not available.
VOC: None

Section 4 : FIRE AND EXPLOSION HAZARD DATA

Flammability: Not flammable.
Conditions of flammability: Surrounding fire.
Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.
Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.
Use water spray to cool fire exposed containers.
Auto-ignition temperature: Not available.
Flash point (°C), method: None
Lower flammability limit (% vol): Not applicable.
Upper flammability limit (% vol): Not applicable.
Not available.
Sensitivity to mechanical impact: Not available.
Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.
Rate of burning: Not available.
Explosive power: Containers may rupture if exposed to heat or fire.

Section 5 : REACTIVITY DATA

Chemical stability: Product is stable under normal handling and storage conditions.
Conditions of instability: Extreme temperatures.
Hazardous polymerization: Will not occur.
Incompatible substances: Strong acids.
Strong oxidizing agents.
Hazardous decomposition products: See hazardous combustion products.

Section 6 : HEALTH HAZARD DATA

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of Acute Exposure

Eye contact: May cause irritation.

Skin contact: Prolonged and repeated contact may cause irritation.

Inhalation: May cause headache and nausea.

Ingestion: May cause vomiting and diarrhea.
May cause gastric distress.

Effects of chronic exposure: See effects of acute exposure.

LD50 of product, species & route: > 5000 mg/kg rat oral.

LC50 of product, species & route: Not available.

Exposure limit of material: Not available.

Sensitization to product: Not available.

Carcinogenic effects: Not listed as a carcinogen.

Reproductive effects: Not available.

Teratogenicity: Not available.

Mutagenicity: Not available.

Synergistic materials: Not available.

Medical conditions aggravated by exposure: Not available.

First Aid

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

Eye contact: Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: if irritation persists, consult a physician.

Inhalation: Remove victim to fresh air.
If irritation persists, seek medical attention.

Ingestion: Do not induce vomiting, seek medical attention.
Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.

Section 7 : PRECAUTIONS FOR SAFE HANDLING AND USE

Leak/Spill: Contain the spill.
Prevent entry into drains, sewers, and other waterways.
Wear appropriate protective equipment.
Small amounts may be flushed to sewer with water.
Soak up with an absorbent material.
Place in appropriate container for disposal.
Notify the appropriate authorities as required.

Waste disposal: In accordance with local and federal regulations.

Handling procedures and equipment: Protect against physical damage.
Avoid breathing vapors/mists.
Wear personal protective equipment appropriate to task.

Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Avoid extreme temperatures.
Launder contaminated clothing prior to reuse.

Storage requirements: Store away from incompatible materials.
Keep containers closed when not in use.

Section 8 : CONTROL MEASURES

Precautionary Measures

Gloves/Type:



Wear appropriate gloves.

Respiratory/Type: None required under normal use.



Eye/Type:

Safety glasses recommended.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

Appendix F

Job Safety Analysis (JSA)

Health and Safety

JSA Title: **Building Construction Oversight**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input checked="" type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input checked="" type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input type="checkbox"/> Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. Contusions from dropped equipment	1. Use proper lifting techniques / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
2. Drilling/anchor bolt installation	1. Hazards associated with drilling, flying objects, heavy equipment, ground level hazards and dust 2. Slips/ Trips/ Falls 3. Hazards associated with concrete work	1. Maintain a safe distance from drilling operation / Wear proper PPE (hard hat, safety glasses, safety shoes, safety vest) 2. Be aware of potential trip hazards / Follow good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches)

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		with safety cones or spray paint / Wear the proper PPE (safety shoes) 3. Maintain a safe distance from pouring operation
3. Steel building erection	1. Overhead hazards, falling objects 2. Pinching/crushing hazards	1. Wear proper PPE (hard had, safety glasses, safety vest) / Be aware of overhead hazards and maintain a safe distance of at least 10 ft. 2. All personnel should make others aware of moving objects or their inten to move objects / Avoid areas where pinching and crushing hazards are possible
4. All activities 4. All activities (cont'd)	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<i>Prepared by:</i>		
<i>Reviewed by:</i>		

Job Safety Analysis (JSA)

Health and Safety

JSA Title: **Electrical Connection Oversight**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input checked="" type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input type="checkbox"/> Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Transport equipment to work area	6. Back Strain 7. Slips/ Trips/ Falls 8. Traffic 9. Cuts/abrasions from equipment 10. Contusions from dropped equipment	6. Use proper lifting techniques / Use wheeled transport 7. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 8. Wear proper PPE (high visibility vest or clothing) 9. Wear proper PPE (leather gloves, long sleeves) 10. Wear proper PPE (safety shoes)
6. Overall Hazards	4. Shock or electrocution 5. Sparks/Fire	4. De-activate the energy so the machine/equipment is isolated from the power source / Ensure completed lockout tagout isolation before

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	6. Slips/ Trips/ Falls	beginning the job / Test electrical components using an approved, working electrical meter to ensure and prove the machine/equipment's electrical circuits are isolated from the power source 5. Ensure complete lockout tagout isolation before beginning the job 6. Be aware of potential trip hazards / Follow good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint / Wear proper PPE (safety shoes)
7. Pipe/Wire cutting	3. Power Tools 4. Sparks/Fire	3. Competent person must inspect power tools daily / Only authorized personnel should operate power tools / Wear proper PPE when using power tools (safety shoes, safety glasses, hearing protection, leather gloves) 4. Ensure work area is free of flammable substances/objects / Keep flammables in proper containers / Keep an appropriate, properly inspected fire extinguisher onsite at all times
8. Wiring connections	1. Pinch Hazard 2. Cuts/abrasions to knuckles/hands 3. Back Strain	1. Wear proper PPE (leather gloves) 2. Wear proper PPE (leather gloves) 3. Use proper lifting techniques / Use wheeled transport
9. All activities 5. All activities (cont'd)	11. Slips/ Trips/ Falls 12. Hand injuries, cuts or lacerations during manual handling of materials 13. Foot injuries 14. Back injuries 15. Traffic 16. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 17. High Noise levels 18. Overhead hazards 19. Heat Stress/ Cold Stress 20. Eye Injuries	11. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 12. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 13. Wear Langan approved safety shoes 14. Use proper lifting techniques / Consider load location, task repetition, and load weight when evaluating what is safe or unsafe to lift / Obtain assistance when possible 15. Wear high visibility clothing & vest / Use cones or signs to designate work area 16. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 17. Wear hearing protection 18. Wear hard hat / Avoid areas where overhead hazards exist. 19. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Take breaks as necessary to avoid heat/cold stress 20. Wear safety glasses
Additional items.		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<i>Prepared by:</i>		
<i>Reviewed by:</i>		

Job Safety Analysis (JSA)

Health and Safety

JSA Title: **Equipment Transportation and Set-Up**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input type="checkbox"/> Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
10. Transport equipment to work area	11. Back Strain 12. Slips/ Trips/ Falls 13. Traffic 14. Cuts/abrasions from equipment 15. Contusions from dropped equipment	11. Use proper lifting techniques / Use wheeled transport 12. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 13. Wear proper PPE (high visibility vest or clothing) 14. Wear proper PPE (leather gloves, long sleeves) 15. Wear proper PPE (safety shoes)
11. Moving equipment to its planned location	7. Pinch Hazard 8. Slips/ Trips/ Falls	7. Wear proper PPE (leather gloves) 8. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
12. Equipment Set-up	5. Pinch Hazard 6. Cuts/abrasions to knuckles/hands 7. Back Strain	5. Wear proper PPE (leather gloves) 6. Wear proper PPE (leather gloves) 7. Use proper lifting techniques / Use wheeled transport
13. All activities	21. Slips/ Trips/ Falls 22. Hand injuries, cuts or lacerations during manual handling of materials 23. Foot injuries 24. Back injuries 25. Traffic 26. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 27. High Noise levels 28. Overhead hazards 29. Heat Stress/ Cold Stress 30. Eye Injuries	21. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 22. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 23. Wear Langan approved safety shoes 24. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 25. Wear high visibility clothing & vest / Use cones or signs to designate work area 26. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 27. Wear hearing protection 28. Wear hard hat / Avoid areas where overhead hazards exist. 29. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Take breaks as necessary to avoid heat/cold stress 30. Wear safety glasses
8. All activities (cont'd)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<i>Prepared by:</i>		
<i>Reviewed by:</i>		

Job Safety Analysis (JSA)

Health and Safety

JSA Title: **General Construction Activities**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input checked="" type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input checked="" type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input type="checkbox"/> Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
14. Transport equipment to work area	16. Back Strain 17. Slips/ Trips/ Falls 18. Traffic 19. Cuts/abrasions from equipment 20. Contusions from dropped equipment	16. Use proper lifting techniques / Use wheeled transport 17. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 18. Wear proper PPE (high visibility vest or clothing) 19. Wear proper PPE (leather gloves, long sleeves) 20. Wear proper PPE (safety shoes)
15. Installation of piping from vapor wells to skid connections and from discharge piping to effluent stack	9. Pinch fingers when connecting pipes 10. Slips/ Trips/ Falls 11. Machinery Hazards	9. Wear proper PPE (leather gloves) 10. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint 11. Wear proper PPE (safety vest) / Maintain safe distance from operating machinery
16. Remediation equipment	8. Back strain when lifting heavy equipment	9. Use proper lifting techniques / Use wheeled transport / Minimize distance

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<i>Prepared by:</i>		
<i>Reviewed by:</i>		

Blank Template Identify the job task/activity being analyzed	Job Safety Analysis (JSA) Health and Safety
JSA Title:	
<p>A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventative/corrective actions.</p>	

Employees should modify the template JSA's as to reflect site specific conditions.

Utilize the following chart to identify to employees the personal protective equipment (PPE) that is required/worn as needed while completing this identified task. The PPE indicated below should correlate with the PPE identified under "Preventive / Corrective Actions". Equipment that is not listed below must be added to the chart.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
<input type="checkbox"/> Safety Shoes	<input type="checkbox"/> Long Sleeves	<input type="checkbox"/> Safety Vest (Class 2)	<input type="checkbox"/> Hard Hat	<input type="checkbox"/> Hearing Protection
<input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input type="checkbox"/> Other: 				

The following Job Steps, Potential Hazards and Preventative/Corrective Actions must be completed or edited by the employee developing the JSA. To effectively complete the following steps the following should be considered: the purpose of the job, the activities it involves, and the hazards it presents.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
18. Describe the job, step by step, from beginning to end. Before examining each job step for potential hazards, define the job as a series of steps.	1. List the potential hazards associated with each job step. Examine each step carefully to find and identify hazards- the actions, conditions and possibilities that could lead to an accident.	1. List the actions to prevent or correct the potential hazards identified. Prevention and corrective action can include: engineering controls, providing safe guards, PPE, training, good housekeeping and proper ergonomics. Note: It is important to recognize the potential for creating additional hazards when modifying the initial process.
<p><u>For Example:</u></p> <p>19. Transport equipment to work site</p>	<p><u>Related Potential Hazards:</u></p> <p>1. Back Strain</p> <p>2. Slips/ Trips/ Falls</p> <p>3. Traffic (if applicable)</p>	<p><u>Preventative/ Corrective Actions to the identified potential hazards.</u></p> <p>1. Use proper lifting techniques / Use wheeled transport</p> <p>2. Minimize distance to work area/ Have unobstructed path to work area</p> <p>3. Wear high visibility vest</p>
20. All activities	<p>41. Slips/ Trips/ Falls</p> <p>42. Hand injuries, cuts or lacerations during manual handling of materials</p> <p>43. Foot injuries</p> <p>44. Back injuries</p> <p>45. Traffic</p> <p>46. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.)</p> <p>47. High Noise levels</p> <p>48. Overhead hazards</p> <p>49. Heat Stress/ Cold Stress</p> <p>50. Eye Injuries</p>	<p>41. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards</p> <p>42. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves</p> <p>43. Wear Langan approved safety shoes</p> <p>44. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible</p> <p>45. Wear high visibility clothing & vest / Use cones or signs to designate work area</p> <p>46. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed</p> <p>47. Wear hearing protection</p> <p>48. Wear hard hat / Avoid areas where overhead hazards exist.</p> <p>49. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress</p> <p>50. Wear safety glasses</p>

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
Additional items.		




Employees that prepare and/or review the JSA must sign and date below, indicating they have read and understand the information provided.



<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<i>Prepared by:</i>		
<i>Reviewed by:</i>		

Contractor:	Date:	JSA No:
Site Supervisor:	Permit to Work Required:	Permit No:
Location of Work Site:	Description of Work: Excavation Oversight	


	How / Where / When Could a hazard be present? What am I about to do? What could go wrong?	Emergency Management Plan Eliminate → Control → Protect Risk Control Measures List the control measures required to eliminate, control, or protect against the identified hazard.	Who is responsible?	Stop Trigger Discuss what needs to happen (or not happen) to stop the job during this task.
Motion	Heavy equipment operation	Maintain communication with operator. Stay within operator's line of sight. Communicate with operator prior to approaching equipment or excavation, establish equipment disabling protocol and commands; verbal or hand signal. Do not walk behind heavy machinery.		Lack of communication
	Vibration	Ensure all moveable objects are secure and unable to be moved via vibration.		Any improper movement
	Placement and movement of heavy equipment	Plan exclusion zone to be adequate to work within. Field technician should have a clear view of excavator, heavy equipment, and area being excavated. Dewatering equipment should be situated out of the primary working area. Equipment is properly staged at or around excavation/trenched area at conclusion of day's activities.		Visual confirmation, improper or unsafe barricading/setup of work area
	Equipment orientation	Stay clear of equipment, couplings, rotating devices; clean equipment only when it has stopped rotating and is in neutral, no loose clothing.		Any unsafe act
	Movement of equipment while excavating	Set leveling jack, chock wheels, set all brakes, gear box in neutral, levers/controls in proper position, test kill switches.		Any improper movement, failure to use stabilizers





	Flying and falling debris	Plan exclusion zone, effective communication, proper support of structures during demolition/excavation, protect property from undesired damage.		Compromised structural integrity
	Walking Surfaces	Remove trip hazards from work area, use caution when walking on pea gravel/loose gravel surface. Cordon off trenching and/or excavation areas.		Unsafe conditions
	Working at heights	Personnel should avoid walking on edges of excavation. Excavated materials and equipment must be effectively stored and retained at least 2 feet (0.6 meter) or more from the edge of a properly sloped/shored excavation  Protect yourself against a fall when working at height		Any unsafe act
	Overhead hazard	Scan directly overhead and overhead adjacent to excavation area for any potential overhead hazards that maybe caused by being directly or indirectly disturbed by heavy equipment.		Visual recognition of potential hazard
	Frayed cables or wire rope	Wire rope shall be removed from use when any of the following conditions exist: in hoisting ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay. Abrasion, scrubbing, flattening, or peening causing loss of >1/3 of the original diameter of the outside wires. Wear leather gloves if handling cables.		Frayed/fraying/damaged cable or wire rope
Chemical	Underground piping runs	Obtain as-builts and historic maps. Utilize utility locating services. Watch for backfill material. Air knife prior to ground disturbance to avoid unmarked underground utilities. Observe and trace surface patching. Utilize Utility Clearance Checklist		Any potential underground line




	Hazardous/flammable chemicals/vapors in exclusion zone	Verify no hazardous/flammable chemicals in exclusion zone, use air monitoring devices, fire watch in place.		Any air monitor reading over action level in HASP
	Chemicals, fluids leaking from tanks, lines, pumps	Locate shut offs prior to start work, know facility alarm system and procedure, Vehicle Inspection Checklist		Visual confirmation
	Dewatering (Contaminated Groundwater)	Spill control measures should be in place for all dewatering operations, water will be disposed of by proper handler.		Any unsafe/undesired condition
	Vapor release from disturbed soil	Use air monitoring equipment during all intrusive work.		Any air monitor reading over action level in HASP
	Excavation equipment fuel, hydraulic fluid and oil leaks	Check for leaks prior to day's activities, heavy equipment inspection form, and during excavation activities. Have absorbent pads and spill kit on site.		Visual confirmation
Environment	Weather			Thunder, lightning, any unsafe weather conditions
	Insects + hazardous wildlife	Insect repellent, check for ticks; scan area for bees and wasps, identify animal evidence (nests, feces) - call PM if nests could create hazardous condition in work area. Avoid overgrown areas.		Visible confirmation, insect bites
	Site workers, pedestrians, vagrants	<p>Mark out exclusion zone, follow sign-in procedure. Scan area frequently for pedestrians.</p>  No smoking onsite. Designate a smoking area offsite.  No alcohol or drugs while working or driving.  Verify isolation before work begins.		Any unsafe condition

	Am I fit for duty?			Not Fit
	Noise	Hearing protection is required in any location where powered or motorized equipment or any other noise source could reasonably be expected to exceed 85 dBA. At least two types of hearing protectors will be available, per SMS 026.		Lack of, failure to utilize proper hearing protection
	Slippery or unstable ground conditions	Verify excavator is situated in a stable area, remove pea gravel/loose stone from excavation, do not attempt to dig if ground conditions are not suitable for equipment stability.		Any unsafe condition
	Hazardous plants	Scan area for poison ivy/oak vines and mark/communicate areas to be avoided.		Hazardous plants identified in work area
Energized Systems	Vehicle	<p>Driver must turn off engine before exiting vehicle.</p>  Driver and passengers must wear seatbelt at ALL TIMES no matter what the speed or distance. <p> No cell phone use while driving.</p>		Unoccupied vehicle running. Driving without a seatbelt.
	Site systems	Review location of site systems, tanks, lines etc. in area at tailgate meeting, scan area for unsafe conditions		Leaks, drips, spills, sprays, noise, odor
	Motors, hydraulic pistons, rotary drive, electronic controls	Heavy Equipment Safety Inspection Checklist (SMS 19-1) Verify kill switches.		Any unsafe condition
	Equipment fueled systems	Have fire watch in place.		Leak, drip, spill, odor, smoke

Contractor:	Date:	JSA No:
Site Supervisor:	Permit to Work Required:	Permit No:
Location of Work Site:	Description of Work: Site visit	




	How / Where / When Could a hazard be present? What am I about to do? What could go wrong?	Emergency Management Plan Eliminate → Control → Protect Risk Control Measures List the control measures required to eliminate, control, or protect against the identified hazard.	Who is responsible?	Stop Trigger Discuss what needs to happen (or not happen) to stop the job during this task.
Motion	Vehicles entering/exiting site	Use traffic control, don PPE before leaving vehicle, avoid high traffic areas at peak times, if possible. Sign in/out with designated on-site manager		Unauthorized vehicles
	Slip, trip, and fall hazards – hoses, concrete/asphalt cracks, parking stops, ice, mud	Scan work area for hazards – remove or mark out trip hazards for visibility, apply sand/salt to ice		New hazard, unmarked hazard
	Wind – dust, debris	Wet down area if necessary, wear dust mask, safety glasses		Airborne dust
	Lifting	Take 5 prior to lifting at the end of day. Stretch tired muscles, use two people to carry loads > 50 lbs.		Any injury precursor
Chemical	Chemicals stored in vehicles – decon, sampling supplies, fire extinguishers	Make sure chemicals stores in vehicle or tool box are protected from extreme temps, set up fire extinguisher at firewatch – make sure it is secure		Spills, leaks, drips
	Hazardous/flammable chemicals/vapors in exclusion zone	Verify no hazardous/flammable chemicals in exclusion zone, use air monitoring devices, verify action levels in HASP.  Conduct gas tests where required and/or desired.		Visual confirmation, unsafe air monitor reading



	Chemicals, fluids leaking from tanks, lines, pumps, or vehicles	Locate shut-offs prior to start work, know facility alarm system and procedure, and pre-travel vehicle inspections		Visual confirmation
	Coolers leaking ice, liquids	Inspect coolers prior to use, close lids properly and make sure they seal, don't store beverages in sample coolers.		Visual confirmation
	Vehicles leaking fluid	Check vehicles regularly, have absorbent pads on site		Visual confirmation
Environment	Weather			Thunder, lightning, any unsafe weather condition
	Sun, heat	Wear sunscreen, stay hydrated, watch for signs of heat stress		Visual confirmation
	Insects	Insect repellent, check for ticks; scan area for bees and wasps- call PM if nests could create hazardous condition in work area. Avoid overgrown areas.		Visual confirmation/ insect bites
	Site employees, visitors, pedestrians	<p>Mark out exclusion zone. Follow sign in procedure. Scan area frequently for pedestrians.</p>  Verify isolation before work begins.  No smoking onsite. Designate a smoking area offsite.  No alcohol or drugs while working or driving.		Visual confirmation
	Thunder, lightning, hazardous weather conditions	Discuss inclement weather plan during tailgate meeting and determine rally point, review after 30 min stop period		Thunder, lightning, air horn, unsafe condition
	Cold stress	Know the signs of cold stress, take frequent breaks, stay hydrated		
	Confined work space	 Don't enter confined spaces without a permit!		No permit, and/or no vapor monitoring equipment

	Site worker's condition	Verify health conditions, allergies + medical history during tailgate meeting. Current meds – safe to operate machinery? Anyone intoxicated/hungover?		Any unsafe condition
Energized Systems	Vehicle	<p>Driver must turn off engine before exiting vehicle.</p>  Driver must wear seatbelt at ALL TIMES no matter what the speed or distance.  No cell phone use while driving.  Follow prescribed Journey Mgmt. Plan		Unoccupied vehicle running. Driving without a seatbelt. Violation of life-saving rule.
	Site systems	Review location of site systems, tanks, lines etc in area at tailgate meeting. Scan area for unsafe conditions		Leaks, drips, spills, sprays, noise, odor.
	Batteries in interface probe, PID, any necessary equipment	Battery check prior to work, discard PROPERLY any corroded batteries.		Corrosion or failed battery test.
	Pressure in drums	High vapor count in soil cuttings – vent drums if leaving onsite		PID readings of concern


Contractor:	Date:	JSA No:
Site Supervisor:	Permit to Work Required:	Permit No:
Location of Work Site:	Description of Work: Remote Area Site Walk (site walk, H&S paperwork, DTM, breakdown)	




	How / Where / When Could a hazard be present? What am I about to do? What could go wrong?	Emergency Management Plan Eliminate → Control → Protect Risk Control Measures List the control measures required to eliminate, control, or protect against the identified hazard.	Who is responsible?	Stop Trigger Discuss what needs to happen (or not happen) to stop the job during this task.
Motion	Vehicles entering/exiting site, black ice in parking lot	Use Level 3 traffic control, don PPE before leaving vehicle, determine & avoid high traffic areas at peak times, if possible, be aware of vehicle sliding/driftng		Unauthorized vehicles in work zone
	Slip, trip, and fall hazards – hoses, concrete/asphalt cracks, parking stops, ice, mud	Scan work area for hazards – remove or mark out trip hazards for visibility, apply sand/salt to ice		New hazard, unmarked hazard
	Wind – dust, debris, falling trees, branches, slope and/or canopy debris	Wet down area if necessary, wear dust mask, safety glasses, scan work area for hazards, determine safe travel routes		Airborne dust, hanging forest canopy debris and/or standing dead trees
	Bending, lifting, muscle strain + cramping, hiking long distance/steep slopes	Take 5 prior to lifting at the end of day. Stretch tired muscles, use two people to carry loads > 50 lbs. Avoid static posture and change body position frequently. Monitor surroundings and determine safe travel routes.		Any injury precursor
Chemical	Vehicles leaking fluid	Check vehicles regularly, have absorbent pads on site		Visual confirmation



Environment	Weather, Snow, Rain			Thunder, lightning, snow, rain, high winds, any unsafe weather condition
	Sun, cold	Wear sunscreen, stay hydrated, watch for signs of cold stress		Visual confirmation
	Insects, Ticks, Spiders	Insect repellent, check for ticks; scan area for bees and wasps- call PM if nests could create hazardous condition in work area. Avoid overgrown areas.		Visual confirmation/ insect bites
	Wildlife – deer and bears	Discuss potential wildlife encounters during tailgate meeting, determine rally point, do not approach or provoke any wildlife		Visual confirmation of potentially dangerous wildlife
	Site employees, visitors, pedestrians, hunters	<p>Mark out exclusion zone. Follow sign in procedure. Scan area frequently for pedestrians.</p> <p> Verify isolation before work begins.</p> <p> No smoking onsite. Designate a smoking area offsite.</p> <p> No alcohol or drugs while working or driving.</p> <p>If approached – politely talk to pedestrians and/or hunters and explain the situation</p>		Visual confirmation
	Thunder, lightning, hazardous weather conditions, ice/snow storm	Discuss inclement weather plan during tailgate meeting and determine rally point, review after 30 min stop period		Thunder, lightning, air horn, unsafe condition
	Black ice on paved surfaces, frost on vehicle windshields and/or windows	Discuss inclement weather plan during tailgate meeting, possible sliding/drift of vehicles, low visibility conditions. Allow sufficient time for windshield and windows to defrost prior to driving.		Ice too widespread for safe travel

	Mountain road stream flooding – perennial and ephemeral – during rainstorms	Discuss weather conditions during tailgate meeting , drive/walk slowly, watch surface conditions ahead, stay on flat areas with solid ground		Water flowing over roads/walkways, blocked roadways, unsafe driving conditions
	Site worker’s condition	Verify health conditions, allergies + medical history during tailgate meeting. Current meds – safe to operate machinery? Anyone intoxicated/hungover? Anyone exhausted from hiking?		Unfit for work
	Cold stress	Know the signs of cold stress, take frequent breaks, stay hydrated		First sign of cold stress/hypothermia
Energized Systems	Vehicle	<p>Driver must turn off engine before exiting vehicle.</p>  Driver and ALL passengers must wear seatbelt at ALL TIMES no matter what the speed or distance. <p> No cell phone use while driving.</p>		Unoccupied vehicle running. Driving or riding without a seatbelt.
	Site systems	Review location of site systems, tanks, lines, etc. in area at tailgate meeting. Scan area for unsafe conditions		Leaks, drips, spills, sprays, noise, odor.
	Batteries in interface probe, PID, any necessary equipment	Battery check prior to work, discard PROPERLY any corroded batteries.		Corrosion or failed battery test.
	Pressure in drums	High vapor count in soil cuttings – vent drums if leaving onsite		PID readings of concern

Contractor:	Date:	JSA No:
Site Supervisor:	Permit to Work Required:	Permit No:
Location of Work Site:	Description of Work: Surface Water Sampling	

	How / Where / When Could a hazard be present? What am I about to do? What could go wrong?	Emergency Management Plan Eliminate → Control → Protect Risk Control Measures List the control measures required to eliminate, control, or protect against the identified hazard.	Who is responsible?	Stop Trigger Discuss what needs to happen (or not happen) to stop the job during this task.
Motion	Bending, lifting, writing, muscle strain, and cramping	Avoid static posture and change body position frequently.		Potential for ache or cramp-before it starts!
	Slips, trips, falls on uneven surfaces	Inspect work area for safe footing prior to starting work. Take precaution when carrying loads across uneven ground; use two people to carry loads > 50 lbs.		Failure to check surroundings and/or communicate hazards
	Wind-blown dust/debris	Wear safety glasses and wet down area if necessary.		Unmanageable dust and debris.
	Moving water	Avoid static posture- change body position frequently, ensure footing is secure, appropriate stance, wear gloves, wear all appropriate PPE, including hip waders, safety harness and personal flotation device.  Permitting may be required to work near/over water!		Precursor to injury, any unsafe condition. Ex) Air + Water temp = less than 100 degrees, full body, thermal PFD required!
	Transfer sample to laboratory bottles	Wear appropriate PPE (gloves for material handling and safety glasses for splashes). Use proper lifting technique and don't twist when lifting. Avoid spray from wind.		Increased wind and any unsafe act or condition.
	Lifting and carrying sample coolers	Use proper lifting technique and don't twist when lifting. Seek help if lifting > 50 lbs. Plan the carrying route and mark out any potential trip hazards.		Any unsafe condition, injury precursor

Chemical	LPH, crude oil, or other chemicals in surface water	Hip waders, nitrile gloves, air monitoring, safety glasses, verify action levels in HASP		Visual confirmation, odor, air monitor reading
	Hazardous/flammable chemicals/vapors	Verify no hazardous/flammable by use air monitoring devices.		Visual confirmation, unsafe air monitor reading
	Chemicals, fluids leaking from tanks, lines, pumps	Locate shut offs prior to start work. Know facility alarm system and procedure. Pre-travel vehicle inspections and complete SMS 19-1.		Visual confirmation
	Preservatives in Glassware	Verify MSDS for all preservatives and take precautionary measures. Use caution when opening/closing bottleware and wear both nitrile and Kevlar gloves. Inspect bottleware prior to use and handling.		Cracked or broken bottleware
	Equipment fuel and oil leaks	Check for leaks regularly. Have absorbent pads in field vehicle/onsite.		Visual confirmation
Environment	Weather			Thunder, lightning, any unsafe weather condition
	Insects	Use insect repellant. Check for ticks. Avoid areas with active bee or wasp nests and verify bee sting allergies.		Visible confirmation, insect bites
	Site employees, visitors, pedestrians	<p>Mark out exclusion zone. Follow sign in procedure. Scan area frequently for pedestrians.</p> <p> No smoking onsite. Designate a smoking area offsite.</p> <p> No alcohol or drugs while working or driving.</p> <p> Verify isolation before work begins.</p>		Visual confirmation

	Am I fit for duty?			Not fit – any unsafe condition
	Slippery or unstable ground conditions	Remove trip hazards from work area, use caution when walking on pea gravel/loose gravel surface.		Any unsafe condition
Energized Systems	Vehicle	<p>Driver must turn off engine before exiting vehicle.</p>  Driver must wear seatbelt at ALL TIMES no matter what the speed or distance. <p> No cell phone use while driving.</p>		Unoccupied vehicle running. Driving without a seatbelt.
	Site systems	Review location of site systems, tanks, lines etc in area at tailgate meeting. Scan area for unsafe conditions		Leaks, drips, spills, sprays, noise, odor.
	Batteries in interface probe, PID	Battery check prior to work, discard PROPERLY any corroded batteries.		Corrosion or failed battery test.
	Tire pressure/ inflation method	Verify inflation method, make sure noted on SMS 19-1 or other inspection form,		Loose connection and/or air leak.

Appendix G

HEAT STRESS

Due to the increase in ambient air temperatures and the effects of protective outer wear decreasing body ventilation, there exists an increase in the potential for injury, specifically, heat casualties. Site personnel will be instructed in the identification of a heat stress victim, the First Aid treatment procedures for the victim and the prevention of heat stress casualties.

IDENTIFICATION AND TREATMENT

1. Heat Exhaustion

- a. Symptoms: Usually begins with muscular weakness, dizziness, nausea, and a staggering gait. Vomiting may be frequent. The bowels may move involuntarily. The victim is pale, his skin is clammy, and he may perspire profusely. The pulse is weak and fast, breathing is shallow. The victim may faint unless the victim lies down. This may pass, but sometimes it remains and death could occur.
- b. First Aid: Immediately remove the victim to the Personnel Decontamination Reduction Zone in a shady or cool area with good air circulations. Remove all protective outer wear. Call the local hospital for physician. Treat the victim for shock (Make victim lie down, raise feet 6-to 12-inches and keep warm but loosen all clothing.) If the victim is conscious, it may be helpful to sip an electrolytic solution. Transport victim to a medical facility as soon as possible.

2. Heat Stroke

- a. Symptoms: This is the most serious of heat casualties due to the fact that the body excessively overheats. Body temperatures often are between 107° to 110°F. First there is often pain in the head, dizziness, nausea, oppression, and the skin is dry, red and hot. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly.
- b. First Aid: Immediately evacuate the victim to a cool and shady area in the Contamination Reduction Zone. Remove all protective outer wear and all personal clothing and decontaminate the victim. Lay victim on their back on a clean sheet or blanket with the head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels, ice bags, etc. to the head and body. Sponge off the bare skin with cool water or rubbing alcohol, if available, or even place victim in a tub of cool water. The main objective is to cool the victim without chilling him. Give no stimulants. Transport the victim by ambulance to a medical facility as soon as possible.

PREVENTION OF HEAT STRESS

1. One of the major causes of heat casualties is the depletion of body fluids. On the site there will be plenty of fluids available. Personnel should replace water and salts loss from sweating. Salts can be replaced by drinking a commercial mix of electrolytes and nutrients such as Gatorade. If drinking Gatorade for extended periods of time, the Gatorade should be mixed at 50 percent of normal strength.
2. A work schedule should be established so that the majority of the work day will be during the morning hours of the day before ambient air temperature levels reach their highs.
3. A work/rest guideline will be implemented for personnel required to wear Level B or Level C protection. These guidelines are as follows:

<u>Ambient Temperatures</u>	<u>Maximum Wearing Time</u>
Above 90°F	1 hour
80° to 90°F	1-1/2 hours
70° to 80°F	2 hours
60° to 70°F	3 hours
less than 60°F	4 hours

A sufficient period will be allowed for personnel to “cool down.” This may require shifts of workers during operations.

HEAT STRESS MONITORING

For monitoring the body’s recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism. Monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70°F or above. Frequency of monitoring should increase as the ambient temperature increases or if slow recovery rates are indicated. When temperatures exceed 80°F workers should be monitored for heat stress after every work period.

- Heart Rate (HR): should be measured by the radial pulse for 30 seconds. The HR, 5 minutes after the beginning of the rest period, should not exceed 120 percent of the normal “at rest” HR. If the HR is higher, the next work period should be shortened by 10 minutes (or 33 percent), while the length of the rest period stays the same. This process should be repeated until an acceptable HR is achieved.
- Body Temperature: should be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature (OT), taken 5 minutes after beginning of the rest period, should not exceed 1/2 degree above normal “at rest” OT. If it does, the next work period should be shortened by 10 minutes (or 33 percent),

while the length of the rest period stays the same. If the OT taken 5 minutes after the beginning of the next resting period exceeds 1/2 degree above normal "at rest" OT, the following work cycle should be further shortened by 33 percent.

- Body Water Loss (BWL): due to sweating, body water loss should be measured by weighing the worker in the morning and in the evening. The clothing worn should be similar at both weighings; preferably the worker should be nude. The scale should be accurate to plus or minus 1/4 pound. BWL should not exceed 15 percent of the total body weight. If it does, workers should be instructed to increase their daily intake of fluids by the weight lost.

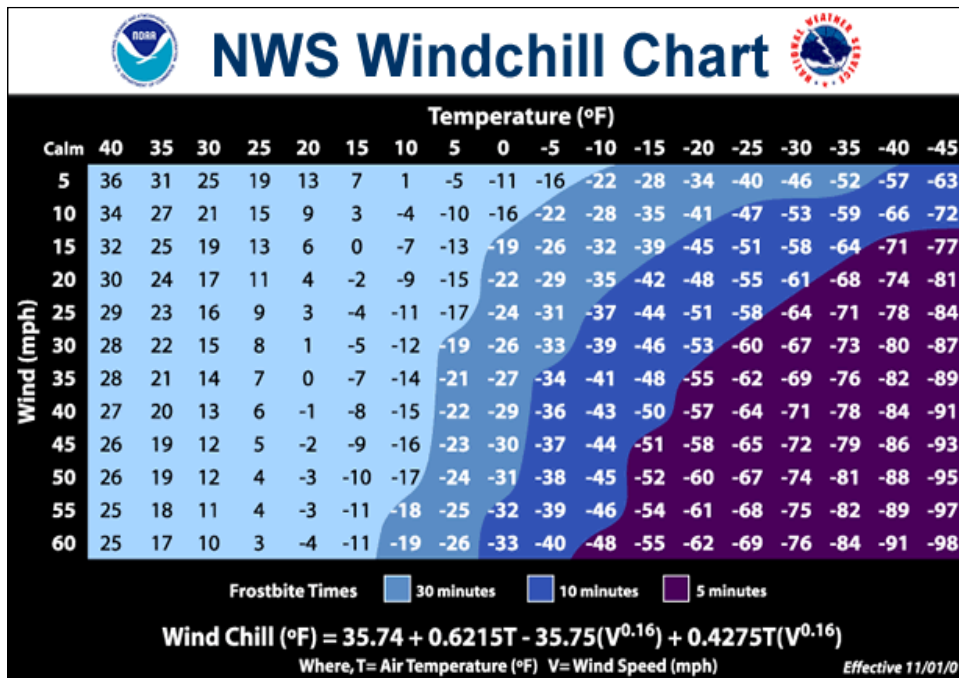
Ideally, body fluids should be maintained at a constant level during the work day.

Good hygienic standards must be maintained by frequent change of clothing and daily showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

COLD INJURY/STRESS

Cold injury (frostbite, hypothermia) and impaired ability to work are dangers at low temperatures and when the wind-chill factor is low. Areas of the body which have a high surface-area-to-volume ratio are the most susceptible to frostbite. Cold puts extra strain on the heart. Avoid exertion, any person with high blood pressure or heart disease needs to be extra careful not to over exert themselves. Never eat a large meal before working outdoors in the winter, this will limit the bodies ability to produce heat.

Two factors influence the development of a cold injury: ambient temperature and wind speed. The Project Manager and HSC will monitor conditions and provide insulating garments and a warm shelter as necessary. Work stoppages due to cold weather will be at the discretion of the HSC.



COLD INJURY MONITORING

Persons working on-site should watch for warning signs of cold injury (i.e., the stages of frostbite), including numbing of the extremities, a sudden whitening of the skin, or gradual stiffening of the outer layers of the skin. Affected persons will be moved to the site office for gradual warming of the exposed extremity with warm fluids, placing affected area next to warm skin, or sterile cloth materials. Do not apply direct heat to the area like heating vents or pads, this can lead to burns. Never rub or massage an area that has frostbite. If blisters form do not pop them. If there is a chance of refreezing do not heat the area. If at all possible, do not walk on frostbitten feet. The injured area will be kept elevated and covered with sterile, dry material after warming. If the person is showing signs of hypothermia, heat the center of the body first (head, chest, neck, and groin). Individuals will be transported to the emergency medical clinic or hospital, as appropriate.

The warning signs of hypothermia include shivering, listlessness or sleepiness, slow pulse, glassy stare and freezing of the extremities. Any of these conditions require immediate attention, and the HSC must be notified if they occur. Affected individuals will be moved to an appropriate location (e.g., the site office), where they will be wrapped in blankets and given warm fluids until the condition improves. Individuals will be transported to the emergency medical clinic or hospital, as appropriate.

PREVENTION OF COLD INJURY

The following table details work procedures for work activities under low temperature conditions in the work area. Work stoppages due to low temperature or wind chill will be at the discretion of the HSC.

Temperature	Work	Rest	Additional Actions
20 to 10 F	2 hrs	5 min	Review cold stress in a safety meeting.
10 to 0 F	2 hrs	15 min.	Rest area must be out of the wind. Monitor for cold stress.
0 to -10F	90 min	15 min	Rest area should be heated and must be out of the wind.
-10 to -20 F	30 min	15 min	Non-emergency work should be rescheduled if possible. Rest area must be heated and out of the wind.
<-20 F	15 min	15 min	All non-emergency work MUST be rescheduled.

Appendix H



Photo From:
http://commons.wikimedia.org/wiki/File:PoisonOak_w_b_biggerLeaves.jpg

Poison Oak (*Toxicodendron diversilobum*)

Family: Anacardiaceae

Description: Contains poisonous oil called urushiol. The oil is found on the surface of leaves and stems. Dermal contact with this oil causes an allergic reaction. The extent/degree of the allergic reaction is person dependent. Appearance and growth habit vary.

Growth: Leaves can be 1-4 inches long and have scalloped, toothed or lobed edges. From February to March leaves are developing and are bronze in color. In the spring leaves are bright green with blooming white flowers.

Injury Prevention: Pants, long-sleeves and durable footwear are effective in protecting

the skin from contact with Poison Oak. In case of skin contact, immediately wash affected areas with soap and cold water before urushiol oil bonds with skin. Urushiol oil on clothing is transferable. Being as such, remove contaminated clothing with care and wash with cold water and detergent. Visit a physician if a rash develops.



Water Hemlock (*cicuta maculata*)

Family: Apiaceae

Description: Considered the most poisonous plant in temperate North America. Poison is concentrated in the roots, although all parts of the plant are poisonous. The active toxin, cicutoxin, acts directly on the central nervous system and is a violent

convulsant. If ingested, the symptoms appear promptly and include abdominal pain, violent convulsions, fever, paralysis, respiratory failure and in some cases death as soon as 15 minutes after consumption. Touching the plant may result in serious skin irritation. The extent/ degree of irritation is personal dependent.

Growth: Water Hemlock grows in wet marshy areas along rivers and ponds. Maximum height of growth is between 3 and 5 feet. The long leaves are made up of several lance-shaped, pointed and serrated leaflets. Each leaflet is 1 to 4 inches long and the entire leaf may be up to 16 inches long. Small umbrella-like clusters of white flowers and dry tan fruit a few millimeters long blossom from this plant.

Injury Prevention: Never ingest. To avoid skin contact, wear long sleeves, pants, and durable footwear. If skin contact, immediately wash affected areas with cold water and soap. If skin irritation occurs, visit a physician. If ingestion occurs, immediately call 911.



Poison Ivy (*Toxicodendron radicans*)

Family: Anacardiaceae

Description: This is the most common source of allergic disease in the United States. Contact with the plant can cause urushiol-induced contact dermatitis, an itchy, irritating and sometimes painful rash. The rash is caused by a clear sap called urushiol.

Growth: Grows in forests, thickets and open lands in both wet and dry conditions. Vigorous vine climbing by aerial roots and

sprawling shrubs on the ground. May grow horizontal branches 3 to 6 feet long that spread from tree trunks. It can be identified by its thornless vine and three almond-shaped shiny leaflets that grow to 1-5 inches long.

Injury Prevention: If contact occurs, immediately wash with soap and cold water or rubbing alcohol. Calamine lotion may help mitigate symptoms if they occur. Wear long sleeves, pants and durable footwear to avoid contact.



Photo From:
<https://michiganflora.net/species.aspx?id=124>

Giant Hogweed (*Heracleum mantegazzianum*)

Family: Apiaceae

Description: With contact the stiff, postulate-based stem bristles can irritate the skin. Even more dangerous is the sap, which can cause serious blisters, burning and permanent scarring and brown staining of the skin. The toxic sap is contained in every part of the plant. The sap is phototoxic which prevents contacted skin from protecting itself from sunlight and leads to serious skin inflammation. Reaction can begin as soon as 15 minutes after contact.

Growth: Giant Hogweed can grow up to 12 to 15 feet tall with umbrella-shaped clusters of white flowers. The large leaves are incised, deeply lobed and can grow up to 4 feet wide. The stem is bright green with extensive dark reddish-purple splotches.

Injury Prevention: Avoid giant hogweed if encountered. Protective clothing such as long sleeves, pants and durable footwear can prevent contact. If handling the plant is necessary, wear gloves and eye protection. If contact with

the skin occurs, immediately wash the affected area with soap and cold water and avoid exposure to sunlight for a minimum of 48 hours after contact occurs.



Photo From:
<https://www.fws.gov/midwest/endangered/reptiles/eama/eama-fct-sht.html>

Eastern Massasauga Rattlesnake (*Sistrurus Crotalus*)

Family: Viperidae

Description: The eastern massasauga rattlesnake has been listed as a threatened species under the Endangered Species Act. These are small snakes with thick bodies and heart-shaped heads. They typically grow up to two feet long. They are grey or light brown with large brown blotches on their back and smaller blotches on the sides. They live in wet areas along rivers

and lakes. They have a cytotoxic venom that destroys tissue, disrupts blood flow and prevents blood clotting.

Hazard Prevention: This snake avoids humans when it can. Most bites have occurred after people deliberately handled or accidentally stepped on one. If seen, avoid the snake and stay aware of surroundings. Avoid hiking through areas of low visibility. Wear shoes and long pants.

If Bitten:

1. Remain calm and retreat from the snake at least 15 feet. Arrange to have the victim transported to a medical facility as soon as possible.
2. Remove restrictive clothing items (rings, bracelets, watches, buttoned shirts, etc.) from the victim.
3. Splint or otherwise immobilize any bitten limbs and keep them below heart level.
4. Keep victims calm; put them at rest; keep them warm and give them comfort and reassurance (which will lower their heart rate, slowing the spread of the venom). Keeping a victim's heart rate down, however, should never interfere with getting him or her to a medical facility.
5. If the snake is still present or nearby, try to get an accurate description by using a camera or remembering certain physical traits such as color, pattern, or length. This can help ensure the proper antivenin is administered. However, one should never put oneself at risk of being bitten to obtain this description.



Photo From: <https://en.wikipedia.org/wiki/Latrodectus>

Black Widow (*Latrodectus*)

Family: Theridiidae

Description: These are small spiders most easily recognized by their dark coloring and reddish hourglass-shaped markings on their abdomen. Their venom is unusually potent and contains a neurotoxin called latrotoxin. This toxin can cause pain, muscle rigidity, vomiting, sweating and very rarely can be fatal. Only the bites of the females are dangerous to humans. Their bodies range from 0.1 to 0.4 inches in size, and some females can reach up to 0.5 inches in length.

Hazard Prevention: Black widow spiders prefer to nest near the ground in dark undisturbed areas such as holes created by other animals or wood

piles so take caution when working around these conditions. They have poor eyesight and depend on vibrations reaching them through their webs, so be aware of surroundings during demolition or other disruptive construction processes.

If Bitten:

1. Remain calm. Very often the black widow will not inject any venom into the bite and serious symptoms will not develop.
2. Wash the wound well with soap and water to help prevent infection.
3. If muscle cramps develop, take the victim to the nearest hospital to receive black widow antivenin.



Photo From: https://en.wikipedia.org/wiki/Brown_recluse_spider

Brown Recluse (*Loxosceles Reclusa*)

Family: Sicariidae

Description: Brown recluse spiders typically range between 0.25 and 0.8 inches, but can grow larger. They are most commonly found having a light to medium brown color, but can be whitish to dark brown/blackish gray. They usually have black line markings on the back side of their head. For definitive identification, examine the eyes. Unlike other spiders, brown recluse only have six eyes that are arranged in pairs. They have potentially deadly hemotoxic venom that can cause necrosis. The bites do not always hurt right away and tend to only be discovered by the appearance of other symptoms

including reddened skin, blistering, pain, itching, open sores, fever and chills, neausea, vomiting and a rash all over the body with many tiny, flat purple and red splotches.

Hazard Prevention: They frequently build their webs in woodpiles, sheds, garages, cellars and any other dry undisturbed locations so take caution when working in these areas. Avoid undisturbed cardboard as they tend to favor this for habitat. Human-recluse contact most often occurs when these isolated spaces are disturbed and the spider feels threatened so remain aware of surroundings. Bites are most common when the spider has become tangled in clothing, towels or inside work gloves.

If Bitten:

1. Remain calm. Too much movement will increase the flow of venom into the blood.
2. Apply a cool, wet cloth to the bite or cover the bite with a cloth and apply an ice bag.
3. Do not apply a tourniquet.
4. Try to positively identify the spider.
5. Immediately call for medical care if severe symptoms or an open sore/necrosis occurs.



Photo From: https://en.wikipedia.org/wiki/Ixodes_scapularis

Deer Tick (*Ixodes scapularis*)

Family: Ixodida

Description: The deer tick, or black-legged tick, is found in the northern Midwestern United States and southeastern Canada. These ticks can carry many human and animal diseases, including Lyme disease and babesiosis. They are very small; the adult tick is approximately the size of a sesame seed. It is a parasite commonly found on white-tailed deer. An unfed tick is naturally black in color, but after it has consumed blood its abdomen will be a light grayish-blue color. Once latched on to a host, deer ticks will drink its blood for four to five days. Ticks are very hard and can survive severe weather conditions. Deer ticks live in shady, moist areas at ground level and will cling to tall grasses and shrubs. They also

live at the edges of wooded areas and around stone walls.

Hazard Prevention: Wear long sleeves, pants and closed-toed shoes with no holes. Tall socks with pant legs tucked help to prevent ticks from crawling up the pant leg. Tucking long sleeves into work gloves can also help ticks from coming into contact with skin. Thoroughly check yourself and your clothing after every work day, with special attention paid to your feet, ankles and legs, to ensure you have not been bitten. If a tick is found on the skins surface immediately follow the steps below to avoid having the tick burrow further into the skin.

If Bitten:

1. Remove the tick promptly and carefully. Use fine-tipped tweezers to grasp the tick as close to the skins surface as possible.
2. Pull upward with steady, even pressure. Do not twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin.
3. After the tick is removed, thoroughly clean the bite area and you hands with rubbing alcohol or soapy water.
4. Dispose of the tick by putting it in alcohol, placing it in a sealed bag, wrapping it tightly in tape or flushing it down the toilet. Never crush a tick with your fingers.
5. If a rash or fever develops within a few weeks of the tick bite, immediately see a doctor.

Sources:

<https://michiganflora.net/home.aspx>

<https://en.wikipedia.org/>

<https://www.fws.gov/midwest/endangered/reptiles/eama/eama-fct-sht.html>

<https://www.desertusa.com/insects/black-widow-spider-bite.html>

<https://www.mercy.net/newsroom/2018-07-11/a-brown-recluse-spider-bit-me---now-what/>

Appendix I

Safe Work System
EXCAVATION / TRENCHING PERMIT

Permit # _____

OSHA 1926.650(b) Scope and application. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches. "Excavation" means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

D Site Address _____ Cost Center _____ D

Contractor Company _____ Work Order/PO # _____ D

Name of the authorized Permit Holder _____ Phone _____

D Name of Permit Issuer _____ Phone _____

D The soils have been identified and a suitable excavation plan was designed by a competent person and communicated YES ___ NO ___

D The stability of adjoining structures that may potentially be endangered by excavation have been evaluated by a competent person and the plan communicated YES ___ NO ___

D Is the operator and equipment certified for the work to be performed YES ___ NO ___

D The on site means to contact emergency services are operable YES ___ NO ___

D The location of utilities (such as sewer, telephone, natural gas, fuel, electric, water) or any other underground installations have been determined prior to opening the excavation YES ___ NO ___

D The primary means of access/egress are located per OSHA standards YES ___ NO ___

D List the means to be used as a warning system for mobile equipment operating near the edge of excavations (Such as barricades, hand or mechanical signals, or stop logs) _____

D List the other hazards of the Excavation Work being performed _____

(Such as falling loads/tools/equipment, electrical, exhaust, combustibles, contaminated soil, mechanical defects, design defects, nearby vent stacks, hydrocarbon liquid or vapor, fuel delivery, omission of protective features, extreme temperature, extreme noise, high pressures, structures, weather, other)

D List the measures used to eliminate, or control other hazards before work _____

(Such as barricades, rigging performed by a competent person, stable surface, outriggers set as needed, lockout/tagout/verification of energy sources, correct extinguishers nearby, housekeeping, flag men, work stoppage during fuel delivery, other)

D Equipment/Materials are staged at least 2 feet from the edge of excavations YES ___ NO ___

D The excavation has been inspected daily, and as needed by a competent person for evidence of standing water, possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions YES ___ NO ___

D A hot work permit is required and issued (such as for use of equipment using combustible engines) YES ___ NO ___

D Guardrails are provided for walkways 6 feet or more above lower levels YES ___ NO ___

D Identify the system in place to protect employees from cave-ins for excavations greater than 5 feet or where the soil has potential for cave in _____

D List the safety equipment to be provided by contractor (such as extinguishers, PPE, protective equipment/clothing, face and eye protection, communications equipment, alarm systems, Other):

D All components of the excavation equipment and tools have been inspected and tested by a competent person and are adequate for use YES ___ NO ___

(Such as wire rope or straps, evidence of any heat or damage, guards cover moving parts and exhaust, air / hydraulic deterioration or leakage, other)

D Any other information necessary, in order to ensure employee safety _____

D Atmospheric conditions are safe for excavation: (if a well designed hazard assessment has been conducted to identify any underground piping or electrical, then a periodic gas check will be ok) YES ___ NO ___

Initial Readings:

Oxygen
19.5% - 23.5%

Combustible Gas
<10% LEL

Toxic Gas - Type and Levels
(CO-35PPM/H2S-10PPM/Other)

Authorized Tester Name _____ Date _____ Time _____

Contractor is solely responsible for the understanding, training and execution of OSHA regulations relative to this activity. Permit forms must be retained for a minimum of two years.

Safe Work System
HOT WORK PERMIT

Permit # _____

OSHA 1926.352(a,b,c) When practical, objects to be welded, cut, or heated shall be moved to a designated safe location or, if the objects to be welded, cut, or heated cannot be readily moved, all movable fire hazards in the vicinity shall be taken to a safe place, or otherwise protected. If the object to be welded, cut, or heated cannot be moved and if all the fire hazards cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them. No welding, cutting, or heating shall be done where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.

Prior to the start of any hot work the following procedures will be followed:

- Properly charged fire extinguishers will be placed in the work area with a minimum rating of 2A : 10B:C.
- Combustibles will be cleared within 35 feet from the work area.
- When working in a building with multiple levels all floor penetrations will be covered
- Including pipe sleeves.
- No hot work will be performed within 50 feet of fuel gas cylinders or explosive storage locations.
- Oxygen and Gas cylinders will be properly secured on a cart or cylinder rack.
- All hot work from an elevated location will require the area be demarcated with a ground man posted to monitor the area.
- Fire watch will be posted during breaks and lunches.
- Hot work permits will be turned in at the end of each shift.
- Hot Work Permits will be filled out for each work area at the beginning of each shift.

Site Address _____ Cost Center _____

Contractor Company _____ Work Order/PO # _____

Name of the authorized Permit Holder _____ Phone _____ D

Name of Permit Issuer _____ Phone _____ D

Name of fire watch, if applicable _____

The purpose and exact location of the Hot Work _____

List the type of Hot Work being performed _____
(Such as welding, cutting, drilling, grinding, sandblasting, concrete sawing, other)

List the hazards of the Hot Work being performed _____

(Such as electrical, atmospheric, combustible, chemical, mechanical, radiation, design defects, nearby vent stacks, hydrocarbon liquid or vapor, fuel delivery, omission of protective features, extreme temperature, extreme noise, high pressures, structures, other)

List the measures used to isolate the space and to eliminate, or control hazards before work

(Such as barricades, purging, blocking, inerting, ventilating, spark containment, correct extinguishers nearby, intrinsically safe tools, ventilation, bonding, grounding, fire watch, work stoppage during fuel delivery, other)

Sources of energy in the area of Hot Work are locked and tagged out YES ___ NO ___

The means to contact emergency services are operable YES ___ NO ___

List the safety equipment to be provided by contractor (such as PPE, protective equipment/clothing, face and eye protection, spark and direct ray protective screens, testing equipment, communications equipment, alarm systems, and rescue equipment):

All components of the tools have been inspected and are adequate for use YES ___ NO ___

Any other information necessary, in order to ensure employee safety _____

The acceptable Hot Work conditions:

Test conditions in the permit space to determine if acceptable conditions exist before work is authorized to begin. Conditions shall be continuously monitored in the areas where authorized work is performed. Record at least every 30 minutes:

Initial Readings:

Oxygen
19.5% - 23.5%

Combustible Gas
0% LEL

Toxic Gas - Type and Levels
CO-35PPM/H₂S-10PPM/Other)

Contractor is solely responsible for the understanding, training and execution of OSHA regulations relative to this activity. Permit forms must be retained for a minimum of two years.

Authorized Tester Name				Date	Time			
Continuous (alarmed) atmosphere Monitoring: (Record at least every 30 minutes)	Test	PEL	Initials	Time:	Time:	Time:	Time:	Time:
	Oxygen	19.5%-23.5%		Value:	Value:	Value:	Value:	Value:
	LEL	0%		Value:	Value:	Value:	Value:	Value:
	Other			Value:	Value:	Value:	Value:	Value:
Gas Tester Make/Model:					Instrument Serial Number:		Calibration Date:	
PERMIT VALIDATION								
This Permit is valid from am/pm TO am/pm on / / (Note: Permit must not exceed 1 day)								

Contractor is solely responsible for the understanding, training and execution of OSHA regulations relative to this activity. Permit forms must be retained for a minimum of two years.

I ensure this permit has been filled out completely and in accordance with all applicable OSHA requirements to provide a safe workplace. I will take action to control hazardous conditions associated with this work.

PermitAcceptance (print name): _
Permit Holder Signature:

PermitAuthorization (Print Name): _
Permit Issuer Signature:

Date: _____ Time: _____

Date: _____ Time: _____

PERMIT CLOSE OUT

AllworkhasbeencompletedinaccordancewiththisPermitandthesitehasbeenleftinasafeandsatisfactorycondition.

PermitHolderSignature:

PermitIssuerSignature:

Date: _____ Time: _____

Date: _____ Time: _____

WELDING, BURNING, AND CUTTING PERMIT

Date: _____ Shift: _____ Job #: _____ Permit #: _____

Contractor: _____ Foreman: _____

Type of Work: _____

Work Location: _____

PRE-WORK SAFETY CHECKLIST

1. Is a properly charged portable fire extinguisher, with a minimum rating of 2A:10B:C, available at the work location? Yes No Provide Rating: _____
2. Is the surrounding area clear of combustibles, in all directions, as noted below: All directions means above, below and behind adjacent walls. This includes pipe sleeves and openings into these adjacent areas:
Within 35 feet of the work area? Yes No
If no, combustibles must be covered with an approved fire-resistant material.
State type of covering: _____
3. Is the work location a minimum of 50 feet from all fuel, gas cylinders, or explosives storage locations? Yes No. If no, storage locations and combustibles stored in these locations must be covered with an approved fire-resistant material.
State type of covering: _____
4. Are oxygen and fuel gas cylinders used for the work properly stored in a cart or cylinder rack? Yes No
5. Are conveyor systems, or exhaust ventilation systems within 35 feet of the work location shut down or protected? Yes No
6. Is the work at an elevated location? Yes No
If yes, the area below must be completely barricaded for 35 feet in all directions.
7. Fire watch must be present at all times during breaks or lunch. One individual shall take a lunch before or after the crew to ensure fire does not occur at these times.

Please return this permit to the 21st Century Salvage, Inc. foreman at the end of each shift. Foreman must return completed and signed permits to the safety director.

SUBCONTRACTOR FOREMAN SIGNATURE:

DATE: _____

FOREMAN SIGNATURE:

DATE: _____