MACTEC

engineering and constructing a better tomorrow

March 9, 2016

Mr. Ian Beilby
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Subject: **Scope of Work: Focused Remedial Investigation Activities for OU-3 and OU-1**
AL Tech Specialty Steel (NYSDEC Site 401003)
MACTEC Engineering and Consulting, P.C., Project No. 3617157374

MACTEC Engineering and Consulting, P.C., (MACTEC), is providing this Scope of Work (SOW) for focused remedial investigation (FRI) activities planned at the Main Plant Area (MPA) portion of the AL Tech Specialty Steel site (Site) (Site No. 401003) in Colonie, New York. This investigation will include evaluation of:

- hazardous building materials including asbestos and polychlorinated biphenyls (PCBs),
- pre-demolition conditions of onsite buildings,
- storm system infrastructure and discharge locations, and
- American Petroleum Institute (API) oil water separator (OWS) contents and disposal requirements.

MACTEC will perform this work under Work Assignment No. D007619-37 and the April 2011 Superfund Standby Contract D007619 between MACTEC and the New York State (NYS) Department of Environmental Conservation (NYSDEC).

BACKGROUND AND OBJECTIVES

Previous investigations at the Site identified hazardous building materials, including roofing and wall panels constructed with "Galbestos," a corrugated metal sheeting with asbestos felt on both sides, coated with either bitumen or polyester resin (MACTEC, 2015). Future remedial activities at

the Site are likely to include remediation of onsite buildings, which are collectively referred to as Operable Unit 3 (OU-3), and potential remediation or decommissioning of storm drain and oil/water separator infrastructure (OU-1).

MACTEC will conduct FRI activities to support further evaluation of remediation alternatives and costs for anticipated remediation and demolition activities.

For OU-3, the objective will be to further evaluate the extent of hazardous materials (particularly asbestos and PCBs) that are present in Site buildings and to identify other factors that may affect demolition, removal, and disposal.

For OU-1, one objective will be to determine the volume of water and soil within the on-Site API OWS and evaluate the requirements for treatment or disposal to support removal via a planned interim remedial measure (IRM). A second objective will be to derive information about the Site's storm water drainage infrastructure, especially its relationship to onsite buildings where it may be a factor in remedial action decisions.

FIELD OPERATIONS

The proposed field tasks, methods, and analytical program are summarized in Table 1. This SOW identifies the following work elements:

- Hazardous Building Materials Survey
- Pre-Demolition Survey of Onsite Buildings
- Storm Water Collection System Evaluation
- API Oil Water Separator Evaluation

Companion documents to this SOW that will govern the execution of the field exploration activities include MACTEC's Program Health and Safety Plan (HASP) (MACTEC, 2011b) and Quality Assurance Program Plan (MACTEC, 2011a). In addition to these program documents, the Site-specific HASP (Attachment 1) provides details related to health and safety for on-site activities. Field data records (FDR) will be completed for sampling activities. FDRs are included in Attachment 2.

Hazardous Building Materials Survey

MACTEC will conduct an updated Hazardous Building Materials Survey to meet the Asbestos Hazard Emergency Response Act (AHERA) sampling requirements identified in 40 Code of Federal Regulations 763.86 and to assess if areas of buildings not previously surveyed contain building materials with asbestos and PCBs. These activities will be conducted to identify materials that must be remediated in accordance with NYS regulations, and to identify building materials that may contain PCBs at levels that are regulated by the Toxic Substances Control Act. Figure 1 identifies the structures that will be assessed at OU-3 (see insert table) and the location of the API OWS.

The Hazardous Building Materials Survey Update will supplement previous building materials sampling activities conducted in June 2014 and July 2015, and will be conducted by a NYS Licensed Asbestos Inspector in accordance AHERA.

Hazardous Building Materials Survey field activities will include sampling for asbestos and PCBs as shown in Table 1 and as described below:

- For building materials suspected to contain asbestos:
    - Re-sampling materials where asbestos is suspected but where prior results did not achieve the lower requirements of AHERA.
    - Collecting samples from areas that were not sampled previously, including areas requiring a man lift to access.
- For building materials suspected to contain PCBs:
    - Collecting samples from caulking and other building materials that may contain PCBs for analysis.
- For building materials that do not appear to be "Galbestos," and therefore are not expected to contain PCBs or asbestos:
    - Collecting samples of coating on steel siding/roofing materials for PCB and asbestos analysis.
    - Based on analytical results, evaluating the potential to recycle the materials.

PCB samples will be shipped to TestAmerica, a laboratory accredited under the National Voluntary Laboratory Accreditation Program, for analysis by United States Environmental Protection Agency (USEPA) Method 8082. Asbestos samples will be shipped to AMA Analytical Services of Lantham Maryland, an accredited laboratory for analysis of the presence and quantity of asbestos

in the suspected asbestos-containing materials using laboratory methods PLM (Polarized Light Microscopy) and TEM (Transmission Electron Microscopy), and following NYS Department of Health regulations.

MACTEC will present findings of the Hazardous Building Materials Survey sampling activities in a Hazardous Building Materials Survey Update Report that will be appended to the OU-3 FRI Report.

Pre-Demolition Survey of Onsite Buildings

In conjunction with the hazardous building materials survey, MACTEC will conduct a pre-demolition survey of the onsite buildings (Figure 1). Each building will be evaluated separately during pre-demolition field activities. These field activities will include obtaining data to support:

- Identifying whether the building is considered clean (no hazardous building materials) or is a source of contamination (Galbestos)
- Identifying areas of staining that potentially require remediation prior to or after demolition
- Estimating quantities of scrap metal for salvage
- Estimating quantities of bulk demolition waste
- Estimating the volume of water in pits requiring treatment or disposal
- Estimating the volume of space available for filling with bulk demolition wastes, once pits are emptied
- Estimating quantities of concrete ground slabs (as separate units)
- Identifying the labor effort and equipment necessary to conduct abatement and/or demolition at each building
- Identify tanks and associated piping and review existing information related to the product which may have been contained within (Figure 2) to evaluate disposal options if necessary

Based on the findings of the pre-demolition survey and the hazardous building materials survey, MACTEC will prepare a Pre-Demolition Survey Report as an appendix to the OU-3 FRI Report. The report will contain a cost estimate (+/- 50%) for demolition of each building, including the cost for hazardous building materials abatement.

Storm Water Collection System Evaluation

As part of the OU-3 FRI, MACTEC will evaluate the storm water collection system (SWCS) at the Site. It is suspected that the SWCS is connected to and flows under onsite buildings; however, a better understanding of the storm water drainage may affect demolition activities and will help inform remediation alternative formulation for the upcoming OU-3 Feasibility Study.

SWCS evaluation activities will provide information on the following:

- System infrastructure, including identification of manholes, catch basins, and other structures that may be part of the SWCS
- Discharge locations
- Presence of potentially contaminated accumulated sediments
- Potential for ongoing migration of contaminants

MACTEC will perform a dye test to evaluate the water flow direction through the Site drain line system. This information will be used to map the SWCS piping system and identify locations where the SWCS crosses OU-3 and may be affected during demolition. MACTEC's subcontractor, Precision Environmental Services, Inc., will provide a water truck for the dye test. The test will be performed over four days, using different colors of dye, to map various parts of the SWCS system. Nontoxic dye will be utilized in accordance with the manufacturer's recommendations.

Dye testing will be conducted by pouring water soluble nontoxic dye into manholes and flushing with enough water to flow through the piping, to trace the flow of water and to identify discharge location(s). Water and dye will be released into the manhole(s) or catch basin(s) determined to be at upgradient locations of the drain network. MACTEC field personnel will remove covers from downgradient manholes and catch basins, and perform visual inspections in these locations to determine the direction of water flow through each pipe section and observe the presence/absence of the dye. MACTEC will also visually observe locations in the Kromma Kill (e.g. outfall locations 009 and 010) and the unnamed stream south of the Scrap Metal Storage Area for dye.

Observations of the presence and timing of dye in downgradient manholes, catch basins, and outfalls will be documented on field data forms and supported with photographs. Areas of accumulated soil observed from manholes or catch basins will also be documented and

photographed. If not already surveyed, manhole and catch basin locations will be surveyed using a TrimbleGeoXT Global Positioning System unit. If necessary to clarify flow pathways in some areas of the storm system, a video inspection may be conducted during a future field event.

The dye testing may suggest areas in the Kromma Kill where site contaminants could accumulate in stream sediment. These areas will be noted and scheduled for future sampling and laboratory analysis during the OU-1/4 (MPA and Kromma Kill) FRI field activities.

API Oil Water Separator Evaluation

An IRM is scoped to remove PCB contaminated soil and water contained within the API OWS for off-site disposal. The objective of the OWS evaluation during this field event is to evaluate the approximate volume and chemical composition of water and accumulated soils in preparation for the IRM.

MACTEC will estimate the volume of water and soil within the OWS by measuring the depth of each with a tank gauge, at several points within each bay of the OWS. A railed catwalk provides access to one side of the OWS. The other side of the OWS will be accessed using a ladder provided by the subcontractor, Precision. The location of the API OWS is shown on Figure 1.

MACTEC will collect samples of soil and water within the OWS as follows:

- Water
    - 4 grab samples of water (one per bay) will be collected and samples will be sent to TestAmerica for analysis of
        - Volatile organic compounds (VOCs) by USEPA Method 8260;
        - PCBs by USEPA Method 8082;
        - Semi-volatile organic compounds (SVOCs) by USEPA Method 8270; and
        - Target analyte list metals plus molybdenum by USEPA Methods 6010 and 7470.
    - The purpose of water sample analysis is to determine whether water can be disposed through the sanitary sewer, and what treatment at the site, if any, would be required for such disposal.

- Soil
    - 4 grab samples of soil (one per bay) will be collected using a hand auger or ponar dredge and samples will be sent to TestAmerica for analysis of
        - VOCs by USEPA Method 8260;
        - PCBs by USEPA Method 8082;
        - SVOCs by USEPA Method 8270;
        - Toxicity Characteristic Leaching Procedure metals by USEPA Method 1311;
        - Pesticides by USEPA Method 8081; and
        - Reactivity by USEPA Method 9010.
    - The purpose of soil sample analysis is to characterize the accumulated solids for disposal.

REPORTING

MACTEC will present the findings of the activities in FRI Reports that will be specific to OU-3 and OU-1/4. The FRI Reports will include a discussion of the work performed, supporting field documents, figures, investigation findings, and recommendations for future activities. Hazardous Building Materials Survey Report and a Buildings Demolition Cost Estimate Report will be prepared and appended to the OU-3 FRI Report.

FIELD SCHEDULE

Upon approval of this SOW, subcontractors will be procured and field personnel will mobilize to accomplish the field work. MACTEC anticipates that field work will commence within 10 days of approval (currently scheduled between March 14 and April 8, 2016).

BUDGET

The activities described herein will be completed using the WAD007619-37 budget approved in February 2016.

If you have any questions or concerns, please feel free to call us at 207-775-5401.

Sincerely,

MACTEC Engineering and Consulting, P.C.

Jean Firth, C.G.
Project Manager

Eric Sandin, C.G.
Technical Review

Enclosures (2)

Attachment 1: Health and Safety Plan

Attachment 2: Field Data Records

cc: File

REFERENCES

MACTEC Engineering and Consulting, P.C. (MACTEC), 2015. Galbestos Investigation Report, Al Tech Specialty Steel WMA, Site 401003. Prepared for the New York State Department of Conservation, Albany, NY. July 2015.

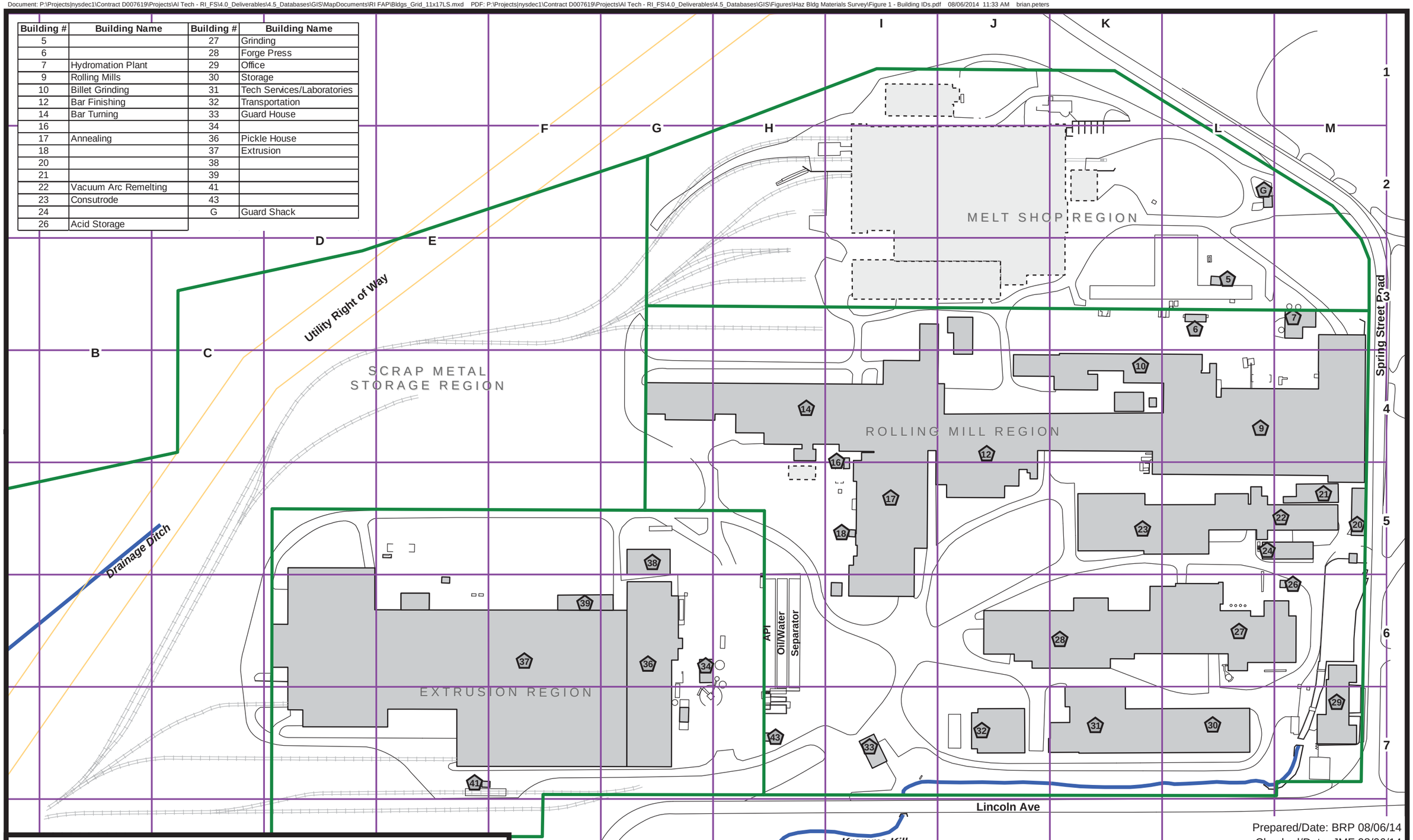
MACTEC Engineering and Consulting, P.C. (MACTEC), 2011a. Field Activities Plan & Quality Assurance Program Plan. Prepared for the New York State Department of Environmental Conservation, Albany, New York. June 2011.

MACTEC Engineering and Consulting, P.C. (MACTEC), 2011b. Program Health and Safety Plan. Prepared for the New York State Department of Environmental Conservation, Albany, New York. June 2011.

LIST OF ACRONYMS

AHERA	Asbestos Hazard Emergency Response Act
API	American Petroleum Institute
FDR	field data records
FRI	Focused Remedial Investigation
HASP	Health and Safety Plan
IRM	interim remedial measure
MACTEC	MACTEC Engineering & Consulting, P.C.
MPA	Main Plant Area
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
OU-3	Operable Unit 3
OWS	Oil water separator
PCB	polychlorinated biphenyl
RI	Remedial Investigation
Site	Al Tech Specialty Steel site
SOW	Scope of Work
SVOC	semi-volatile organic compound
SWCS	Storm water collection system
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

Building #	Building Name	Building #	Building Name
5		27	Grinding
6		28	Forge Press
7	Hydromation Plant	29	Office
9	Rolling Mills	30	Storage
10	Billet Grinding	31	Tech Services/Laboratories
12	Bar Finishing	32	Transportation
14	Bar Turning	33	Guard House
16		34	
17	Annealing	36	Pickle House
18		37	Extrusion
20		38	
21		39	
22	Vacuum Arc Remelting	41	
23	Consutrode	43	
24		G	Guard Shack
26	Acid Storage		



Prepared/Date: BRP 08/06/14
Checked/Date: JMF 08/06/14

Legend

- Current Building
- Former Building
- 200 Foot Grid
- Road
- Former Railroad Tracks

N 0 80 160 Feet

NYSDEC Site # 401003
Al Tech Specialty Steel
Colonie, New York

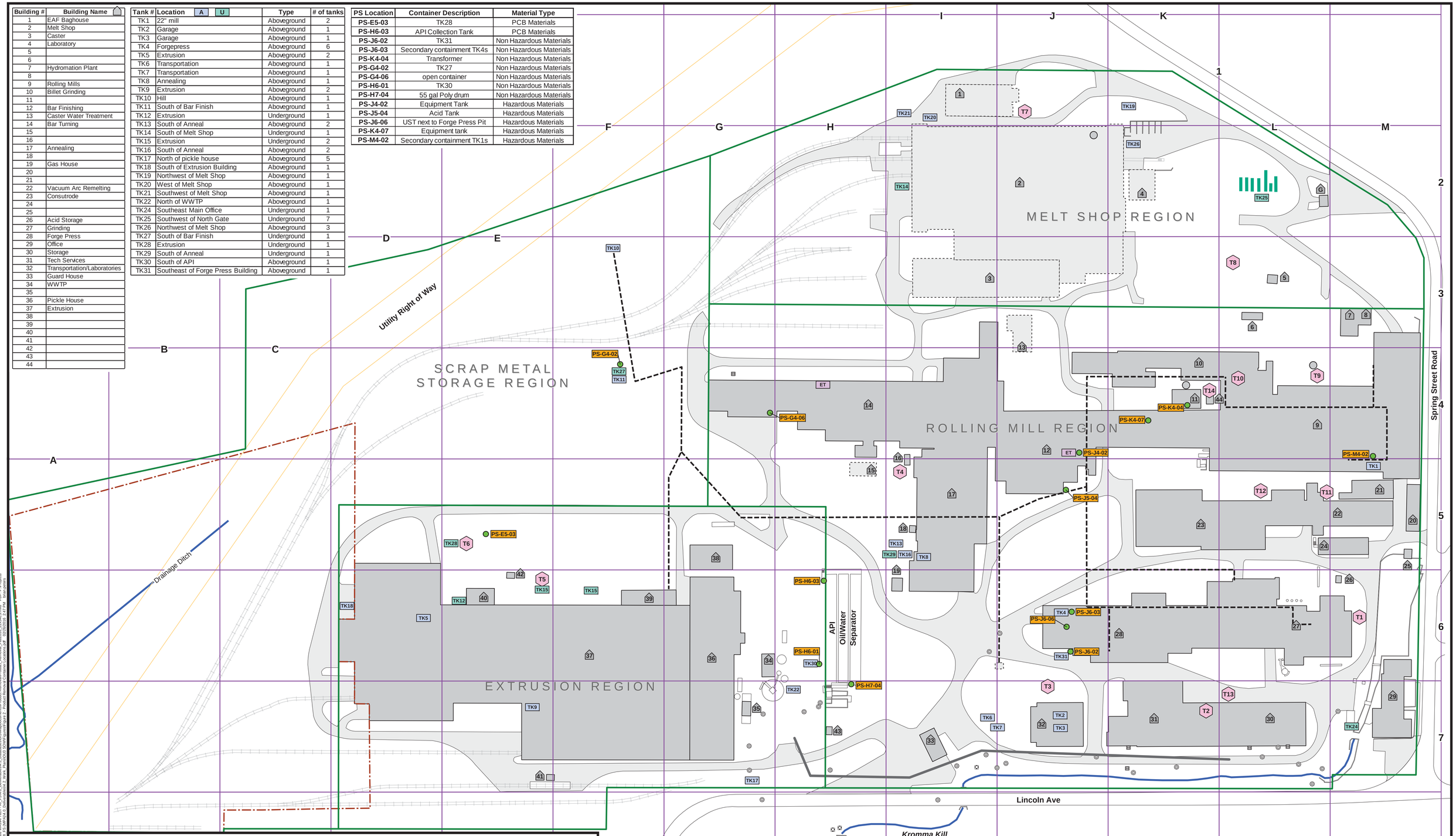
MACTEC

Building IDs
Hazardous Building Materials Survey
Project 3617157374
Figure 1

Building #	Building Name
1	EAF Baghouse
2	Melt Shop
3	Caster
4	Laboratory
5	
6	
7	Hydromation Plant
8	
9	Rolling Mills
10	Billet Grinding
11	
12	Bar Finishing
13	Caster Water Treatment
14	Bar Turning
15	
16	
17	Annealing
18	
19	Gas House
20	
21	
22	Vacuum Arc Remelting
23	Consutrode
24	
25	
26	Acid Storage
27	Grinding
28	Forge Press
29	Office
30	Storage
31	Tech Services
32	Transportation/Laboratories
33	Guard House
34	WWTP
35	
36	Pickle House
37	Extrusion
38	
39	
40	
41	
42	
43	
44	

Tank #	Location A U	Type	# of tanks
TK1	22" mill	Aboveground	2
TK2	Garage	Aboveground	1
TK3	Garage	Aboveground	1
TK4	Forgepress	Aboveground	6
TK5	Extrusion	Aboveground	2
TK6	Transportation	Aboveground	1
TK7	Transportation	Aboveground	1
TK8	Annealing	Aboveground	1
TK9	Extrusion	Aboveground	2
TK10	Hill	Aboveground	1
TK11	South of Bar Finish	Aboveground	1
TK12	Extrusion	Underground	1
TK13	South of Anneal	Aboveground	2
TK14	South of Melt Shop	Underground	1
TK15	Extrusion	Underground	2
TK16	South of Anneal	Aboveground	2
TK17	North of pickle house	Aboveground	5
TK18	South of Extrusion Building	Aboveground	1
TK19	Northwest of Melt Shop	Aboveground	1
TK20	West of Melt Shop	Aboveground	1
TK21	Southwest of Melt Shop	Aboveground	1
TK22	North of WWTP	Aboveground	1
TK24	Southeast Main Office	Underground	1
TK25	Southwest of North Gate	Underground	7
TK26	Northwest of Melt Shop	Aboveground	3
TK27	South of Bar Finish	Underground	1
TK28	Extrusion	Underground	1
TK29	South of Anneal	Underground	1
TK30	South of API	Aboveground	1
TK31	Southeast of Forge Press Building	Aboveground	1

PS Location	Container Description	Material Type
PS-E5-03	TK28	PCB Materials
PS-H6-03	API Collection Tank	PCB Materials
PS-J6-02	TK31	Non Hazardous Materials
PS-J6-03	Secondary containment TK4s	Non Hazardous Materials
PS-K4-04	Transformer	Non Hazardous Materials
PS-G4-02	TK27	Non Hazardous Materials
PS-G4-06	open container	Non Hazardous Materials
PS-H6-01	TK30	Non Hazardous Materials
PS-H7-04	55 gal Poly drum	Non Hazardous Materials
PS-J4-02	Equipment Tank	Hazardous Materials
PS-J5-04	Acid Tank	Hazardous Materials
PS-J6-06	UST next to Forge Press Pit	Hazardous Materials
PS-K4-07	Equipment tank	Hazardous Materials
PS-M4-02	Secondary containment TK1s	Hazardous Materials



Note:
Region Boundaries from Environmental Strategies Corporation (ESC). "Draft Phase I RCRA Facility Investigation Report, AL Tech Specialty Steel Corporation, Watervliet, New York." August 11, 1995.

0 40 80 Feet

Legend

- PS-E5-03 Product Removal Container Location
- Transformer/Capacitor # (AOC 1)
- 200 Foot Grid
- Equipment Tank
- Drums
- Railroad Tracks
- Former Railroad Tracks
- Region Boundary
- Utility Right of Way
- Former Fuel Oil Distribution System
- Fuel Oil ICM Interceptor Trench
- Surface Waterbody
- Scrap Metal Storage Area (SMSA)
- Paved Area
- Current Building
- Former Building
- Approximate Utility:
- Catch Basin
- Manhole
- Outfall

Prepared/Date: BRP 02/26/16
Checked/Date: DF 02/26/16

NYSDEC Site # 401003
Al Tech Specialty Steel
Colonie, New York

MACTEC

Product Removal Container Locations

Project 3617157374 Figure 2

Document: P:\Projects
Path: J:\Projects\3617157374\Work - Completed\WAA\Tech - Rb (FS\4.0 Deliverables\4.5 Database\GIS\MapDocuments\Product Removal\Product Removal_Feb2016_2x3ALS.mxd PW: P:\Projects
Date/Time: Tue, Feb 23, 2016 - 3:47 PM User: jsteele
Project Contact: DOO1919\Hanks\3 Tech - Rb FS\NPA\4.0 Deliverables\2. Work Plans\Out SOW\Figures\Figure 2 - Product Removal Container Locations.pdf 02/26/2016 2:47 PM Mark Jeffers

Table 1: Proposed Sample Methodology, Rationale, Identification, and Analytical Schedule

							Analysis	Asbestos	Asbestos	PCB	PCB	SVOCs	TCLP Metals	Pesticide	Reactivity	VOC	pH	VOC	PCB	SVOC	TAL Metals + molybdenum
							Media	Solid	Solid	Solid	Solid	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Water	Water	Water
							Method	PLM 198.1	TEM 198.4	8082	8082	8270	1311	8081	9010	8260	9040	8260	8082	8270	6010/7470
							Container	bag	bag	bag	4 oz	4 oz	4 oz	4 oz	4 oz	2x40 mL	4 oz	2 x 40 mL	500 mL	1 L	500 mL
							Preservation	none	none	none	4° C	none	none	4° C	4° C	4° C	4° C	4° C	4° C	4° C	nitric
							Reporting Limit	1%	1%	1 mg/kg	1 mg/kg	various	various	1 ppb	NA	1 ppb	NA	0.5 ug/L	0.009 ug/L	various	various
							Objective	AHERA	AHERA	TSCA	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal
Area Of Concern	**Evaluation Objectives**	**Methodology**	**Sample Rationale**	**Loc I.D.**	**Media**	**Sample I.D.**	**Depth Interval**	**# of Samples**													
OU-3	**HAZARDOUS BUILDING MATERIALS SURVEY** To evaluate: 1) if building materials contain asbestos 2) if building materials contain PCBs	**Collect of building materials suspected of containing asbestos** - Samples will be collected in compliance with the Asbestos Hazard Emergency Response Act (AHERA) sampling requirements identified in 40 Code of Federal Regulations (CFR) 763.86.	To identify materials which must be remediated in accordance with NYS regulations.	TBD	Solid	TBD	NA	110	120												
		Collect of building materials suspected of containing PCBs - Samples will be collected from caulking and other building materials that may contain PCBs. Samples may also be collected to show siding/roofing materials do not contain PCBs.	To identify building materials that may contain PCBs at levels that are regulated by TSCA.	TBD	Solid	TBD	NA			40											
OU-1	**STORM SYSTEM INVESTIGATION** To evaluate: 1) storm drain infrastructure and where it is discharging 2) if accumulated soils are present in the storm sewers that contain contaminants exceeding SCOs 3) if there is a potential for continuing migration of contaminants through the storm system	**Dye Test and Video Inspection** Dye testing will be conducted by pouring water soluble dye into manholes and flushing with enough water to flow through the piping to trace the flow of water and to identify discharge location(s). Areas of accumulated soil will be noted during the investigation and evaluated for the need to collect samples.	NA	NA	NA	NA	NA														
OU-1	**API OIL WATER SEPARATOR (OWS) EVALUATION** To evaluate: 1) waste disposal requirements for soil inside the OWS 2) the volume of water and soil contained within the separator that will be removed for offsite disposal	**Soil sampling** Samples of soil contained within the API OWS will be sampled and analyzed for waste disposal parameters	To prepare a waste profile for disposal of the material.	APISS-01	Soil	401003APISS01	NA				1	1	1	1	1	1	1				
				APISS-02	Soil	401003APISS02	NA				1	1	1	1	1	1	1				
				APISS-03	Soil	401003APISS03	NA				1	1	1	1	1	1	1				
				APISS-04	Soil	401003APISS04	NA				1	1	1	1	1	1	1				
		Water sampling Grab samples of water in each bay of the OWS will be sampled.	To determine disposal options (onsite, at a POTW or if it needs to be disposed as	APIWW-01	Water	401003APIWW01	NA											1	1	1	1
				APIWW-02	Water	401003APIWW02	NA											1	1	1	1
				APIWW-03	Water	401003APIWW03	NA											1	1	1	1
				APIWW-04	Water	401003APIWW04	NA											1	1	1	1
		Soil and water volume estimates Volume estimates of the soil and water contained in the API OWS will be measured at serval points within each bay.	NA	NA	NA	NA	NA														

NOTES:

PCB- polychlorinated biphenyl
PLM - polarizing light microscopy
TCLP - toxicity characteristic leaching procedure
TEM- transmission electron microscope
VOCs - volatile organic compounds
SVOCs- semivolatile organic compounds

NA- Not pplicable
TBD- To be determined
TSCA - Toxic Substance Control Act
AHERA-Asbestos Hazard Emergency Response Act

Created by: RB 2/22/2016
Checked by: JMF 2/26/2015

ATTACHMENT 1

HEALTH AND SAFETY PLAN

MACTEC Short Form HASP

MACTEC, Inc.

Site: Al Tech Specialty Steel – MPA –OU3 FRI Pre-demo survey Job/Task Number: 3617157374.02
treet Address: Intersection of Lincoln Ave and 1st Street Watervliet/Colonie, NY 12189
Proposed Date(s) of Investigation: March -April, 2016 Project Manager: Jean Firth
Prepared by: Brad Wolfe Date: 7/9/2015

*Approved by: Kendra Bavor, CSP Date: 2/19/2016
Site Description: **(attach map)** Former steel mill, some vacant building, limited access, property fenced, uneven ground.
Comments: Activities will include hazardous building mateirals survey, pre-demolition survey, stormwater collection and API oil water separator evaluation.

*Approval also serves as certification of a Hazard Assessment as required by 29 CFR 1910.132

Tasks:

MACTEC	Subcontractor	Task Description
☒	☐	Hazardous building material sampling (Asbestos and PCBs)
☐	☒	Aerial Lift Operation
☒	☐	Pre-demolition Survey
☒	☐	Stormwater dye testing
☒	☐	Oil water separator evaluation – soil and water sampling
☐	☐	

Dates of Required Training and Medical Surveillance (add additional training topics, as required)**:**

Name	Dylan Farrell	Andrew Shust	Brian Havens	Justin Rogers	Seth Gilbert*	Jeremy Wegleitner*
Job duties	**Field Team Lead**	**Field Team**	**Field Team HSO**	**Field Team**	**Field Team**	**Field Team**
	Dates	**Dates**	**Dates**	**Dates**	**Dates**	**Dates**
Medical Surveillance	4/22/2015	6/1/2016	8/13/2015	12/21/2015		5-7-14
-Exam Type (A[4], B, C)	B	C	B	B		B
40-Hour Initial	5/5/2014	7/18/1998	09/16/2014	5/21/2009	NA	2-23-12
8-Hour Supervisor [3]	1/28/2016	5/3/2015	2/16/2016			
8-Hour Refresher	7/24/2015	1/23/2016	2/03/2016	12/5/2015		12-5-2015
First Aid	8/23/2014	3/11/2017				
CPR	8/23/2014	3/11/2017				
Hazard Communication	3/26/2014	4/4/2012	11/30/2016			
Lead	7/28/2014		8/13/2015	2/24/2016		
Chromium		4/5/2011		2/24/2016		

[2] At least one worker must be trained in First Aid/CPR and should received Bloodborne Pathogen Training
[3] Required for Field Lead and Site Health and Safety Officer
[4] **Medical Surveillance Exam A has no respiratory clearance so can only be used for Level D PPE.** . Exam A (basic HAZWOPER), Exam B (respirator & HAZWOPER under 40 years old), Exam C (respirator & HAZWOPER over 40 years old), Exam E (DOT), Exam F (asbestos monitoring), Exam G (lead monitoring) etc.
* Employees are not required to be in HAZWOPER training. They will be onsite less than 40 hours. They will be escorted while onsite. Site Specfic orientation and HAZCOM will be provided the first day of work onsite.

Known or Suspected Contaminants (include PELs/TLVs):

Contaminants of Concern (COC) (Attach Fact Sheets*)	Maximum Concentrations			PEL/TLV
	Galbestos siding	Soil (mg/kg)	Water/Groundwater (µg/l)	
PCBs-Aroclor 1242(Method 8082)	-	110	-	0.5 mg/m^3
Aroclor 1254(Method 8082)	-	13.0	0.23J	0.5 mg/m^3
Aroclor 1260(Method 8082)	-	2.5	0.396	0.5 mg/m^3
PCBs (Total as 1254, on site)	-	345	-	0.5 mg/m^3
Asbestos	7.4%	-	-	.1 f/cc
PAH		69		0.2 mg/m3
Copper		88.7		1 mg/m3
Zinc				2 mg/m3
Chromium		1470		0.005mg/m3
Lead		79.3		0.05 mg/m3
Nickel		1550		1 mg/m3

*Workers must be made aware of the signs, symptoms, and first aid for each COC. Information is located on the COC fact sheets.

Air Monitoring Action Levels:

PID/FID Reading[1]	Detector Tube[1]	Dust Meter[1]	LEL[2]/O_2[1]	Action
				Contaminants expected in wetted sediments. Not anticipated dust or air exposures. Also remote sampling of OWS.
			>10% LEL	Stop work. Evacuate area. Consider return with ventilation system and spark proof/intrinsically safe equipment.
			<19.5% O_2	Stop work and evacuate area.

[1] Sustained readings measured in the breathing zone
[2] Readings at measured at the source (borehole, well, etc.)

JHAs: Check and attach all that apply (add applicable JHAs not already listed):

Activity Specific JHAs:

☒	Mobilization/Demobilization and Site Preparation
☒	Field Work – General
☒	Field Work – Oversight
☒	Sediment and water Sampling (grab from OWS)
☒	Poisonous Plants
☒	Insect Stings and Bites
☒	Aerial Lift Use
☒	Asbestos Inspection and Air Sampling
☒	Stormwater system dye tracing

Hazard Specific JHAs:

☐	
☐	
☐	
☐	
☐	
☐	
☐	
☐	

HAZARD IDENTIFICATION SUMMARY

Complete the checklist for summarizing the hazards identified in the JHAs

Standard Hazards			
☒ Falling Objects	☒ Slips and trips	☒ Pinch points	☐ Rotating equipment
☒ Falls	☒ Power equipment/tools	☐ Elevated work surfaces	☐ _____

Eye Hazards			
☒ Particulates	☒ Liquid splashes	☐ Welding Arc	☐ _____

Hearing Hazards			
☒ None	☐ Impact noise	☐ High frequency noise	☐ High ambient noise

Respiratory Hazards						
☐ None	☒ Dust/aerosols/particulates	☐ Organic Vapors	☐ Acid Gases	☐ O_2 deficient	☒ Metals	☒ Asbestos

Chemical Hazards			
☐ None	☐ Organic solvents	☐ Reactive metals	☒ PCBs
☐ Acids / bases	☐ Oxidizers	☐ Volatiles/Semi-volatiles	☐ _____

Environmental Hazards				
☐ None	☒ Cold Stress	☒ Heat Stress	☒ Wet location	☒ Bio hazards (snakes, insects, spiders, poisonous plants, etc.)
☐ Explosive vapors	☐ Confined space	☐ Engulfment Hazard	☒ Work over water - OWS	

Electrical Hazards				
☐ None	☐ Energized equipment or circuits	☒ Overhead utilities	☐ Underground utilities	☐ Wet location

Fire Hazards			
☒ None	☐ Cutting, welding, or grinding generated sparks or heat sources	☐ Flammable materials present	☐ Oxygen enriched location

Ergonomic Hazards					
☒ Lifting	☒ Bending	☐ Twisting	☒ Pulling/tugging	☐ Repetitive motion	☒ Carrying
Computer Use in the: ☒ Office ☐ Field			☐ _____	☐ _____	

Radiological Hazards						
☒ None	☐ Alpha	☐ Beta	☐ Gamma/X-rays	☐ Neutron	☐ Radon	☐ Non-Ionizing

Other Hazards
☐

PPE and Monitoring Instruments

Initial Level of PPE *			
☐ Level D	☒ Modified Level D	☐ Level C	* Cannot use Short Form HASP for Level B or A work

Standard PPE					
☒ Hard Hat	☒ Safety boots	☒ Safety glasses	☐ Chem. Resistant Boots	☒ High visibility vest	☐ Other:_____

Eye and Face Protection			
☐ Face shield	☐ Vented goggles	☐ Unvented goggles	☐ Indirect vented goggles

Hearing Protection			
☐ Ear plugs	☐ Ear Muffs	☐ Ear plugs and muffs	☐ Other _____

Respiratory Protection					
☒ None	☐ Dust mask	☐ Full Face APR	☐☐ Half Face APR	Cartridge Type: _____	Change Cartridges: _____

Protective Clothing			
☒ Work uniform	☐ White uncoated Tyvek®	☐ Poly-coated Tyvek®	☐ Saranex®
☐ Boot covers	☒ Reflective vest	☐ Chaps or Snake Legs	☐ Other _____

Hand Protection					
☐ None	☐ Cotton gloves	☐ Leather gloves	☐ Glove liners	☐ Cut-resistant gloves	☐ Other _____
☒ Outer Gloves: List Type nitrile or vinyl			☐ Inner Gloves: List Type_____		

Monitoring Instruments Required*

Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

- When work begins on a different portion of the site.
- When contaminants other than those previously identified are being handled.
- When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling.)
- When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon.)

☐ LEL/O2 Meter	☐ PID: ☐ 10.0-10.6 eV Lamp ☐ 11.7 eV Lamp	☐ FID	☐ Hydrogen Sulfide/Carbon Monoxide
☐ Dräger Pump (or equivalent) List Tubes__	☐ Dust Meter: ☐ Respirable dust ☐ Total dust		☐ Other: Micro Rem Radiation Meter

*Monitoring instruments will be calibrated daily in accordance with manufacturer's instructions. Results will be recorded in the field logbook.

Chemicals Brought to the Site:

List all chemicals brought to the site (e.g., preservatives, decon solutions, calibration gases, gasoline, etc.).

Chemicals (Note: Name listed must match name on label and MSDS)	**MSDS Attached?**
BRIGHT DYE FLUORESCENT YELLOW/GREEN LIQUID DYE	☒
BRIGHT DYE FLUORESCENT RED LIQUID DYE	☒
BRIGHT DYE FLUORESCENT BLUE LIQUID DYE	☒
HYDORCHLORIC ACID (HCL)	☒
NITRIC ACID (HNO3)	☒
LIQUINOX	☒
	☐

Chemicals will be kept in their original containers. If transferred to another container, aside from days use by one individual, the new container will be labeled with the name of the chemical and the hazard warnings.

Work Zones:

The work zones will be defined relative to the location of the work activity. The Exclusion Zone is considered the area within a 10-foot diameter of the sampling location. The Contamination Reduction Zone is considered to be the area with in a 20-foot diameter of the sampling location. The decontamination zone is to be located upwind of the work area. Work zones will be maintained through the use of:

☒ Warning Tape
☐ Cones and Barriers
☒ Visual Observations

Decontamination Procedures and Equipment:
Note: See Decontamination JHA for further information

Level D Decontamination Procedures

Decontamination Solution:	Detergent and Water
Station 1: Equipment Drop	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, etc. on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.
Station 2: Outer Boots, and Gloves Wash and Rinse (if worn)	Scrub outer boots, and outer gloves decon solution or detergent water. Rinse off using copious amounts of water.
Station 3: Outer Boot and Glove Removal (if worn)	Remove outer boots and gloves. Deposit in plastic bag.
Station 4: Inner glove removal	Remove inner gloves and place in plastic bag.
Station 5: Field Wash	Hands and face are thoroughly washed. Shower as soon as possible.

Modified Level D and Level C PPE Decontamination Procedures

Decontamination Solution:	Detergent and Water
Station 1: Equipment Drop	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, etc. on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.
Station 2: Outer Garment, Boots, and Gloves Wash and Rinse	Scrub outer boots, outer gloves, and splash suit with decon solution or detergent water. Rinse off using copious amounts of water.
Station 3: Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4: Canister or Mask (Level C only) Change	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 are donned, joints are taped, and worker returns to duty.
Station 5: Boot, Gloves and Outer Garment Removal	Boots, chemical resistant splash suit, and inner gloves are removed and deposited in separate containers lined with plastic.
Station 6: Face Piece Removal (Level C only)	Facepiece is removed. Avoid touching face with fingers. Facepiece is deposited on plastic sheet.
Station 7: Field Wash	Hands and face are thoroughly washed. Shower as soon as possible.

Site Communication:

- ☒ Verbal
- ☐ Two-way radio
- ☒ Cellular telephone
- ☐ Hand signals
  - Hand gripping throat ---------- Out of air, can't breathe

- Grip partner's wrist or both hands around waist _____ Leave area immediately
- Hands on top of head _____ Need assistance
- Thumbs up _____ OK, I am all right, I understand
- Thumbs down _____ No, negative

☐ Horn
☐ Siren
☐ Other:

EMERGENCY CONTACTS

NAME	TELEPHONE NUMBERS		DATE OF PRE-EMERGENCY NOTIFICATION (if applicable)
Fire Department:	911		
Hospital:Albany Medical Center	518-262-3125		
Police Department:	911		
Site Health And Safety Officer: Brian Havens	Office:	Cell: 703-309-6241	
Client Contact: Ian Bielby	Office:518-402-9676	Cell:NA	
Project Manager: Jean Firth	Office:207-828-3610	Cell:207-441-7530	
Health & Saftey Coordinator (Kendra Bavor)	Office: 207-828-3699	Cell: 207-650-8671	
EPA/DEP (if applicable):	NA	NA	
OTHER: Ambulance	911		

Emergency Equipment:
The following emergency response equipment is required for this project and shall be readily available:

- ☒ Field First Aid Kit (including bloodborne pathogen kit/supplies)
- ☐ Fire Extinguisher (ABC type)
- ☐ Eyewash (Note: 15 minutes of free-flowing fresh water)
- ☐ Other: _____

EMERGENCY PROCEDURES

- The HSO (or alternate) should be immediately notified via the on-site communication system. The HSO assumes control of the emergency response.
- The HSO notifies the Project Manager and client contact of the emergency.
- If the emergency involves an injury to an AMEC employee, the HSE Coordinator or Field Lead are to implement the AMEC Early Injury Case Management program. See procedures and Flow Diagram below:
- If applicable, the HSO shall notify off-site emergency responders (e.g. fire department, hospital, police department, etc.) and shall inform the response team as to the nature and location of the emergency on-site.
- If applicable, the HSO evacuates the site. Site workers should move to the predetermined evacuation point (See Site Map).
- For small fires, flames should be extinguished using the fire extinguisher. Large fires should be handled by the local fire department.
- In an unknown situation or if responding to toxic gas emergencies, appropriate PPE, including SCBAs (if available), should be donned. If appropriate PPE is unavailable, site workers should evacuate and call in emergency personnel.
- For chemical spills, follow the job specific JHA for spill containment

- If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and wash affected area. Site worker should shower as soon as possible after incident.
- If the emergency involves toxic gases, workers will back off and reassess. Prior to re-entering the work zone, the area must be determined to be safe. Entry will be using Level B PPE and utilize appropriate monitoring equipment to verify that the site is safe.
- An injured worker shall be decontaminated appropriately.
- Within 24 hours after any emergency response, the Incident Analysis Report (and Vehicle Incident Report if vehicle incident) shall be completed and returned to the Regional HSE Manager. Injuries requiring medical treatment beyond first aid (as well as work-related vehicle incidents) will require the employee to submit a post incident drug test.

AMEC Early Injury Case Management Program

NON-EMERGENCY INCIDENT	EMERGENCY INCIDENT
Steps 1 & 2 must be completed before seeking medical attention other than local first aid. 1. Provide first-aid as necessary. Report the situation to your immediate supervisor AND HSE coordinator (all incidents with the apparent starting event should be reported within 1 hour of occurrence). 2. Injured employee:	1. Provide emergency first aid. Supervisor on duty must immediately call 911 or local emergency number; no employee may respond to outside queries without prior authorization. Any outside media calls concerning this incident must be referred immediately to Cindy Sundquist. 2. Once medical attention is sought and provided, the supervisor must:
Call WorkCare 24/7 Hotline* **(888) II-XPRTS or (888) 449-7787**	
WorkCare will assess the situation and determine whether the incident requires further medical attention. During this process, WorkCare will perform the following: • Explain the process to the caller. • Determine the nature of the concern. • Provide appropriate medical advice to the caller. • Determine appropriate path forward with the caller. • Maintain appropriate medical confidentiality. • Help caller to execute path forward, including referral to the appropriate local medical facility. • Send an email notification to the Corporate HSE Department.	WorkCare will be responsible for performing the following: • Contact the treating physician. • Request copies of all medical records from clinic. • Send an email update to the Corporate HSE Department.
3. IMMEDIATELY after contacting WorkCare send a brief email notification AND inform verbally (direct contact is required) ONE of HSE corporate representatives See Figure 11.3. 4. Make all other local notifications and client notifications. 5. Local Supervisor, HSE Coordinator, SSHO and any applicable safety committees to complete preliminary investigation, along with the initial Incident Report within 24 hours. 6. Corporate Loss Prevention Manager to complete Worker's Compensation Insurance notifications as needed.	

7. Corporate HSE to conduct further incident notifications, investigation, include in statistics, classify, and develop lessons learned materials.

* - **NOTE: Step 2 is only applicable to the North-American operations and to incidents involving AMEC personnel. High potential near misses, subcontractors' incidents, regulatory inspections, spills and property damages above $1,000 should be reported immediately, following directions from Step 3.**

Site Specific Procedures are as follows:

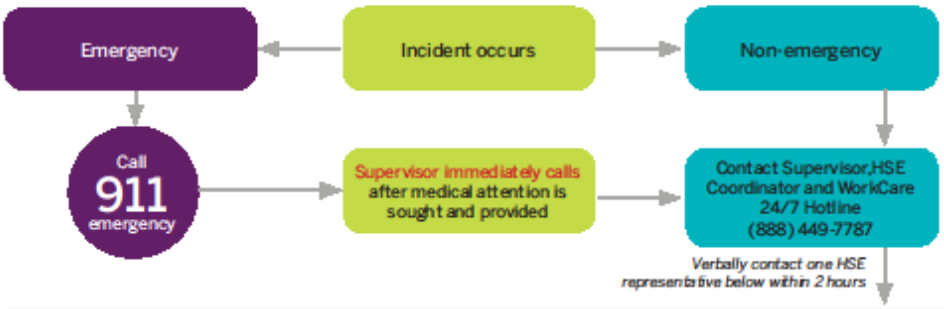
No one shall enter the Oil Water separator. Samples are to be grabbed remotely. No one shall enter the stormwater system. Use caution and guard around open manholes.

INCIDENT FLOW CHART

Incident flow chart

Call immediately

amec foster wheeler



E&I Corporate HSE department contact list

Name/email	Office location	Contact information
Bruce Voss bruce.voss@amecfw.com	Cathedral City, CA	760.202.3737 (office) 951.897.6381 (cell)
Chad Barnes chad.barnes@amecfw.com	Phoenix, AZ	602.733.6000 (office) 480.495.9846 (cell)
Cindy Sundquist cynthia.sundquist@amecfw.com	Portland, ME	207.828.3309 (office) 207.650.7593 (cell) 207.892.4402 (home)
Gabe Sandholm gabe.sandholm@amec.com	Minneapolis, MN	612.252.3785 (office) 206.683.9190 (cell)
John Mazur john.mazur@amec.com	Wilmington, NC	910.444.2978 (office) 910.431.2330 (cell) 910.681.0538 (home)
Lori Dowling lori.dowling@amec.com	Prince George, BC	250.564.3243 (office)
Philip Neville philip.neville@amec.com	Thorold, ON	905.687.6616 (office) 905.380.4465 (cell)
Tim Kihn tim.kihn@amec.com	Edmonton, AB	780.944.6363 (office) 780.717.5058 (cell)
Vladimir Ivensky (can call 24/7) vladimir.ivensky@amec.com	Plymouth Meeting, PA	610.877.6144 (office) 484.919.5175 (cell) 215.947.0393 (home)
Kirby Lastinger kirby.lastinger@amec.com	Lakeland, FL	836-667-2345 x207 (office) 863-272-4775 (cell)

*High potential near misses, subcontractor incidents, regulatory inspections, spills, and property damage should be reported within 60 minutes to one of the above HSE Representatives.
WITHIN 24 HOURS - Local Supervisor, HSE Coordinator, Project HSE Officer, and any applicable safety committees must complete preliminary investigation, along with the initial Incident Analysis Report Form and forward it to the Corporate HSE Department

Rev. Feb15-Hb

FIELD TEAM REVIEW: I acknowledge that I understand the requirements of this HASP, and agree to abide by the procedures and limitations specified herein. I also acknowledge that I have been given an opportunity to have my questions regarding the HASP and its requirements answered prior to performing field activities. Health and safety training and medical surveillance requirements applicable to my field activities at this site are current and will not expire during on-site activities.

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Routes to Emergency Medical Facilities

HOSPITAL(for immediate emergency treatment):

Facility Name: Emergency Room at Albany Medical Center

Address: 43 New Scotland Avenue, Albany, NY 12208

Telephone Number: (518) 262-3131

DIRECTIONS TO PRIMARY HOSPITAL (attach map):

CLINIC (for non-emergency medical treatment)
(Contact Sylvia Basak at Wells Fargo – 404-923-3700 for the name and address of the clinic to be used if job is of two weeks duration or more):

Facility Name: St. Peter's Hospital

Address: 515 Loudon Rd, Loudonville, NY 12211

Telephone Number: (518) 783-2554

DIRECTIONS TO CLINIC (attach map):

Directions to Emergency Room at Albany Medical Center:

Start:
280 Spring Street Rd
Watervliet, NY 12189, US
US

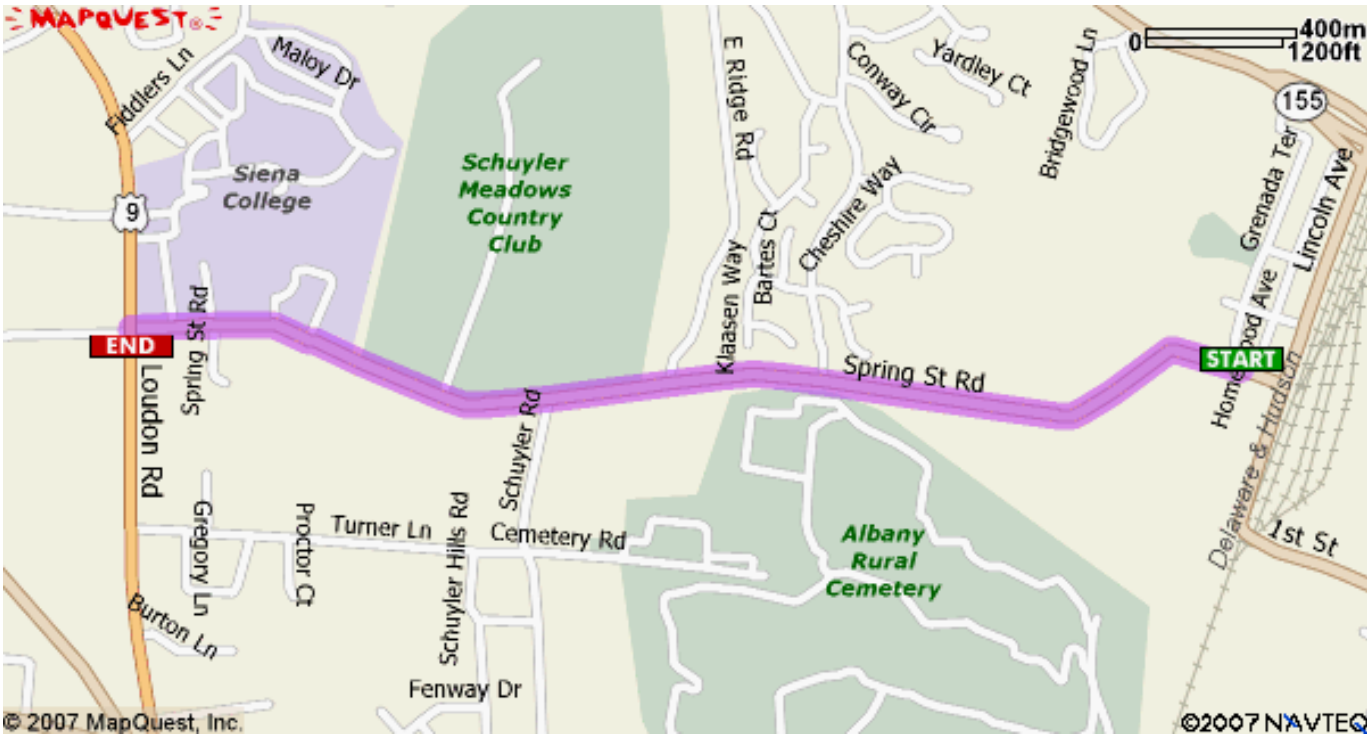
End:
Albany Medical Ctr: 518-262-3125
43 New Scotland Ave, Albany, NY 12208,

Routes to Emergency Medical Facilities

PRIMARY HOSPITAL:

Facility Name: Albany Medical Center
Address: 43 New Scotland Ave, Albany, NY 12208, US
Telephone Number (518) 262-3125

			Distance
		Total Est. Time: **15 minutes** Total Est. Distance: **7.29 miles**	
START	1:	**Start out going WEST on SPRING ST RD toward E HILLS BLVD.**	**1.8 miles**
SOUTH 9	2:	**Turn LEFT onto LOUDON RD / US-9. Continue to follow US-9 S.**	**4.1 miles**
	3:	**Turn LEFT onto CLINTON AVE / US-9.**	**0.1 miles**
	4:	**Turn RIGHT onto LARK ST / US-9W.**	**0.6 miles**
	5:	**Turn RIGHT onto MADISON AVE / US-20.**	**0.2 miles**
	6:	**Turn LEFT onto NEW SCOTLAND AVE.**	**0.1 miles**
END	7:	**End at** Albany Medical Ctr: **43 New Scotland Ave, Albany, NY 12208, US**	
		Total Est. Time: **15 minutes**Total Est. Distance: **7.29 miles**	



Start:
280 Spring Street Rd
Watervliet, NY 12189, US
US

End:
St Peter's Hospital: 518-783-2554
515 Loudon Rd, Loudonville, NY 12211,

Routes to Emergency Medical Facilities

ALTERNATE HOSPITAL

Facility Name: St Peter's Hospital
Address: 515 Loudon Rd, Loudonville, NY 12211, US
Telephone Number (518) 783-2554

Directions			Distance
		Total Est. Time: **4 minutes** Total Est. Distance: **1.87 miles**	
START	1:	**Start out going WEST on SPRING ST RD toward E HILLS BLVD.**	**1.8 miles**
	2:	**Turn LEFT onto LOUDON RD / US-9.**	**<0.1 miles**
END	3:	**End at** St Peter's Hospital: **515 Loudon Rd, Loudonville, NY 12211, US**	
		Total Est. Time: **4 minutes**Total Est. Distance: **1.87 miles**	

TAILGATE SAFETY MEETING REPORT

Check One:

☐ Initial Kickoff Safety Meeting ☐ Regular/Daily Tailgate Safety Meeting ☐ Unscheduled Tailgate Safety Meeting

Date: _____ Site: _____

Site Manager: _____ Site Health and Safety Officer: _____
Print *Print*

Order of Business

Topics Discussed (Check all that apply)

☐ Scope of Work
☐ Site History/Site Layout
☐ Personnel Responsibilities
☐ Training Requirements
☐ Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazard effects)
☐ Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
☐ Safe Work Practices
☐ Engineering Controls
☐ Chemical Hazards and Controls
☐ Signs and symptoms of over exposure to site chemicals
☐ Medical Surveillance Requirements
☐ Action Levels
☐ Monitoring Instruments and Personal Monitoring
☐ Perimeter Monitoring, Type and Frequency
☐ PPE Required/PPE Used
☐ Define PPE Levels, Donning, Doffing Procedures
☐ Decontamination Procedures for Personnel and Equipment
☐ Physical Hazards and Controls (e.g., overhead utility lines)
☐ Anticipated Weather (snow, high winds, rain)
☐ Temperature Extremes (heat or cold stress symptoms and controls)
☐ Biological Hazards and Controls (e.g., poison ivy, spiders)
☐ Site Control (visitor access, buddy system, work zones, security, communications)
☐ Sanitation and Illumination
☐ Logs, Reports, Recordkeeping
☐ Incident Reporting Procedures
☐ Near Misses/Hazard ID including worker suggestions to correct and work practices to avoid similar occurrences
☐ General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
☐ General Emergency Response Procedures (e.g., earthquake response, typhoon response, etc.)
☐ Medical Emergency Procedures (e.g., exposure control precautions, location of first aid kits, etc.)
☐ Route to Hospital and Medical Care Provider Visit Guidelines
☐ Site/Regional Emergency Response Procedures (e.g., exposure control precautions, location of first aid kits, etc.)
☐ Hazardous Materials Spill Procedures

Safety Suggestions by Site Workers: _____

_____

_____

Action Taken on Previous Suggestions: _____

_____

_____

Injuries/Incidents/Personnel Changes since last meeting: _____

_____

_____

Observations of unsafe work practices/conditions that have developed since previous meeting: _____

_____

_____

Location of (or changes in the locations of) evacuation routes/safe refuge areas: _____

_____

_____

Additional Comments: _____

_____

_____

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting

Name (Print)	Company	Signature

Meeting Conducted by: _____ Title: _____
Print

Signature: _____ Time: _____
Print

PPE Selection Guidelines

When selecting the appropriate PPE for the job, consider the following:

- **Safety glasses** – general eye protection – source of hazard, typically coming from straight on, required at most sites
- **Tinted Safety Glasses** – same as above, but when working in direct sunlight. May need two both tinted and untinted if working in both sunlight and shade/overcast skys.
- **Safety goggles** – needed for splash hazard, more severe eye exposures coming from all directions. Non-vented or indirect venting for chemical splash, non-vented for hazardous gases or very fine dust, vented for larger particulates coming from all directions.
- **Face shield** – needed to protect face from cuts, burns, chemicals (corrosives or chemicals with skin notation), etc.
- **Safety boots** – needed if danger of items being dropped on foot that could injure foot
- **Hard hat** – danger from items falling on head – any overhead work, tools, equipment, etc that is above the head and could fall on head of item fails, or falls off work platform. Typically required at most sites as a general PPE
- **Thin, chemical protective inner gloves** (e.g., thin Nitrile, PVC – do not use latex – many people are allergic to latex) –needed to protect hands from incidental contact with low risk contamination at very low concentrations (ppb or low ppm concentrations in groundwater or soil) or used in combination with outer gloves as a last defense against contamination. Need to specify type
- **Outer gloves** – thicker gloves (e.g., Nitrile, Butyl, Viton, etc.) – used when potential for high concentrations of contaminants (e.g., floating product, percent ranges of contaminant, opening drums, handling pure undiluted chemicals, etc.). Need to specify type.
- **Leather gloves, leather palm, cotton** – good in protecting hands against cuts – no protection from chemicals. May be used in combination with chemical protective gloves.
- **Boot Covers –** when there is contamination in surface soils or waking surface in general. When safety boots need protection from contact with contaminants.
- **White (uncoated) Tyveks** – protect clothing from getting dirty, good for protection against solid, non-volatile chemicals (e.g., asbestos, metals) – no chemical protection.
- **Polycoated Tyveks** – least protective of chemical protective clothing. Used when some risk of contamination getting on skin or clothing. Usually, lower ppm ranges of contaminants.
- **Saranex** – Greater protection against contamination than Polycoated Tyveks. Used to protect against PCBs or higher concentrations of contaminants in the soil or groundwater.
- **Other Chemical protective clothing** – if significant risk of dermal exposure, contact H&S to determine best kind.
- **Long sleeved shirts, long pants** – if working in areas with poison ivy/oak/sumac, poisonous insects, etc. and no chemicals exposure. May want to use uncoated Tyveks for work in areas where poisonous plants are know to be to protect clothing.
- **Cartridge Respirator (Level C PPE)** – Need to calculate change schedule (contact Division EH&S Manager for this) to determine length of use. To be able to use cartridge respirators, need to know contaminants, estimate levels to be encountered in the breathing zone, need to ensure that cartridge will be effective against COCs, and need to be able to monitor for COCs using PID, FID, Dräger tubes, etc.. If can't do any of these, then Level B PPE is probably going to be needed.
- **High Visibility Vest** – needed for any road work (with in 15 feet of a road) or when working on a site with vehicular traffic or working around heavy equipment. Needed if work tasks would take employee concentration away from movement of vehicles and workers would have to rely on the other driver's ability to see the employee in order not to hit them. This includes heavy equipment as well as cars and trucks, on public roads or the jobsite. Not needed if wearing Polycoated Tyveks – as they are already high visibility.
- **Reflective Vest** – see above, but for use at night.
- **Hearing Protection** – needed if working at noise levels above 85 dBA on a time weighted average. If noise measurements are not available, use around noisy equipment, or in general, if you have to raise your voice to be heard when talking to someone standing two feet away.
- **Protective Chaps –** required when using a machete or chain saw or any other cut hazard to legs.

Incident Report Forms

1. Incident Analysis Report (IAR)
2. Vehicle Incident Report (VIR)
3. Ground Disturbance Incident Report(GDR)
4. Utility Clearance Form

Check one
Initial Report: ☐
Update: ☐
Final Report: ☐ ____

INCIDENT ANALYSIS REPORT

AMEC Environment & Infrastructure
Confidential - Privileged

Incident Potential
Letter: Select One
Number: Select One
Investigation Level: Select One

Group: Select One HSE Manager: ____ Incident Review Panel Team (if applicable): ____

Incident Date: _____ Report Date: _____

Section 1 – General Information

Employee Name: ____ Sex: ☐ M ☐ F Date of Birth: ____ Age Range: Select One Time of incident: ____ ☐ am | ☐ pm

Job Position: Select One Hire Date: ____ Time employee began work: _____

Business Line: Select One Department Number: ____ Project Manager: ____

Project Name: ____ Project Number: ____ Client: ____

Office where employee works from: ____ Immediate Supervisor: ____ Hours employee worked during last 7 days: ____ hrs

Location: Select One Is this a Company controlled work site: ☐ Yes ☐ Incident Assigned to: Select One

Location description: ____

Section 2 – Incident Type - Process (**mark at least ONE BOLD TYPE** and all that apply)

☐ **Fatality** ☐ **Environmental** ☐ **Injury/Illness Incident** If Injury/illness: Select One

☐ **Security** ☐ **Near Miss / Hazard ID** ☐ **Property Damage** If Damage: Select One ☐ 3rd Party?

☐ Hospitalization ☐ Regulatory Inspection ☐ Notice of Violation or Citation ☐ Agency Reportable?

☐ Motor Vehicle Incident Involving Injury ☐ Other (describe): ___

Outcome/Result: Select One Source of Hazard: Select One If "other", specify: ___ Immediate Cause: Select One

A. If **injury/illness**: Indicate the part of the body: Select One If "other", specify: ___
Indicate body part location: Select One If "other", specify: ___
Injury Type: Select One If "other", specify: ___ Illness Type: Select One If "other", specify: ___

B. If **property damage**: describe what happened and estimate ($) of damage to all objects involved? ___

C. If **environmental**: Type of Environmental incident?: Select One Name, CAS#, physical state and quantity? ___
Receiving Environment?: Select One Mechanism of Incident?: Select One If "other", specify: ___
Nature of Breach?: Select One Duration of Breach?: Select One

D. If **security**: Security Incident Type: Select One If Physical: Select One If Criminal: Select One If Intellectual: Select One

E. If an **inspection by a regulatory agency**, what agency, who were the inspectors, inspector contact information? ___

Section 3 – Incident Description

Attach and number additional pages, as needed, to ensure all details related to the incident are captured.

A. List the names of all persons involved in the incident, and employer information: ____

B. List the names of any witnesses, their employer, and a local/company telephone number or address: ____

C. Name of Employee's supervisor: ____ Contact phone number for supervisor: ____

D. What specific job/task or action was the employee(s) doing just prior to the incident: ____

E. Was a tool or equipment involved? ☐ Yes ☐ No What was it: ____ Last Inspection Date: ____Defects: ____

F. Explain in **detail** what happened: ____

G. Explain in **detail** what object or substance directly harmed the employee: ___

H. What were the weather conditions at time of incident?: ___

I. What was the lighting like at time of incident? Bright ☐ Shadows ☐ Dark ☐ Other: ___

J. List any damaged equipment or property (other than motor vehicles). Provide model and serial number **and** estimated costs to repair/replace damaged equipment or property, if applicable: ___

Section 4 - Incident Analysis

A. Was a Health and Safety Plan (HASP) or Activity Hazard Analysis (AHA) completed for the work being performed? ☐ Yes ☐ No
If "yes", Who prepared the document?: ___

B. Who and when was the last manager (Project, Unit, etc.) at the site of the incident?: ___

C. When and what safety training **directly related** to the incident has the person(s) involved had?: ___

D. List attached documentation (HASP acknowledgement forms, kickoff/daily/weekly meetings, inspections, photographs): ___

Section 5 - Incident Investigation Results and Corrective Actions

This section to be completed by the Group HSE Manager/IRP with support from location where incident occurred.

Causal Factors (Acts or Omissions / Conditions)

(Attach and number any additional pages as needed to completely address this section)

	IMMEDIATE CAUSE	IMMEDIATE CAUSE SUB-TYPE	DESCRIPTION
1	Select One	_____	_____
2	Select One	_____	_____
3	Select One	_____	_____
4	Select One	_____	_____

Root Cause(s) Analysis - The below items represents major root cause categories which have been determined to be Less Than Adequate (LTA). A more detailed determination of the root cause will be facilitated, if needed, by the applicable Group HSE Manager / IRP.

	ROOT CAUSE TYPE	ROOT CAUSE SUB-TYPE	DESCRIPTION
1	Select One	_____	_____
2	Select One	_____	_____
3	Select One	_____	_____
4	Select One	_____	_____

Corrective Actions

Root Cause #	**Corrective Actions Taken** (Attach additional pages as needed to completely address this section)	**Responsible Person**	**Proposed Completion Date**	**Closed on Date**	**Verified by and Date Verified**
_____	____	____	____	____	____
_____	____	____	____	____	____
_____	____	____	____	____	____
_____	____	____	____	____	____
_____	____	____	____	____	____

Section 6 - Notifications, Certification & Approvals

Check the appropriate boxes indicating the applicable reports have been made to the following applicable organizations:

Auto Insurance Carrier was called ☐ **Group HSE Manager Notified** ☐

WorkCare was called ☐ **Post-incident Drug/Alcohol Testing Performed** ☐

Incident Report prepared by: ___

Employee (s): ___	Date: ___	Employee's Supervisor: ___	Date: ___
HSE Coordinator/Project/Unit Manager: ___	Date: ___	Group HSE Manager:___	Date: ___

ATTACHMENT 2

VEHICLE INCIDENT REPORT

Confidential - Privileged

Section 1 - General Information

Date of Incident: _____

Time incident occurred: _____ ☐ am | ☐ pm | Illumination: ☐ Dark ☐ Dusk ☐ Light | Road Condition: ☐ Dry ☐ Wet ☐ Icy/snow

Were police summoned to scene? ☐ Yes ☐ No Police Department and Location: _____

Report #; _____ Officer's Name: _____ Officer's Badge Number: _____

Section 2 - Company Driver and Vehicle

Driver's name: _____ D/L #: _____ State: _____

Driver's home office address: _____ Driver's Phone #: _____

Company Vehicle #: _____ Year: _____ Model: _____ License #: _____ State: _____

Company car?: ☐ Yes ☐ No Personal Vehicle?: ☐ Yes ☐ No Rental Vehicle?: ☐ Yes ☐ No

If rental, rented from: _____

Passenger/Witness Name(s): _____ Address: _____ Telephone: _____

Passenger/Witness Name(s): _____ Address: _____ Telephone: _____

Damage to vehicle: _____

Was an employee injured?: ☐ Yes ☐ No If yes, please describe: _____

Injuries to others?: ☐ Yes ☐ No If yes, please describe: _____

Vehicle was being used for: Company business ☐ Yes ☐ No Personal business ☐ Yes ☐ No

Towed?: ☐ Yes ☐ No If yes, by whom?: _____ To Where?: _____

Section 3 - Other Driver and Vehicle Information

Driver's Name: _____ D/L # : _____ State: _____

Current address: _____ City: _____ State: _____

Telephone: _____ Work: _____ Cell: _____

Registered Owner's Name: _____ Address: _____ City: _____ State: _____

(verify registration document)

The Other Vehicle: Make: _____ Model: _____ Year: _____ License #: _____ State: _____

Insurance company name: _____ Address: _____ Phone #: _____

Policy No.: _____ Contact Person: _____ Phone #: _____

Passenger/Witness Name(s): _____ Address: _____ Telephone: _____

Passenger/Witness Name(s): _____ Address: _____ Telephone: _____

Damage: (*Make note of pre-existing damage and take pictures if possible – you may attach additional pages if necessary):* _____

Injuries to other driver/passengers: _____

Section 4 – Approvals (signatures required)

Form completed by (please print): _____ Date: _____

Signature: _____

Office/Project Manager (please print): _____ Date: _____

Signature: _____

Things to Do First In The Event Of a Motor Vehicle Incident

GENERAL INFORMATION

1. Do not decide on your own whether a particular incident is "covered" by insurance. Should there be any doubt, it is always preferable to report an occurrence, as this allows underwriters, the Risk Management Department and insurance adjusters to determine if a covered loss has taken place.

2. Policy Conditions do require that all losses and occurrences, which may result in a claim be promptly reported.

3. Do not admit liability or offer your opinion of liability to anyone.

4. Complete this IAR/VIR form promptly and forward with all applicable supporting documentation. It is essential both division and location information be provided.

5. For automobile collisions within the **United States**, please indicate on the IAR form that you have contacted Zurich at:

Zurich Insurance Company
1-800-987-3373 or
1-877-928-4531
24 hours a day, 7 days a week

6. For automobile collisions within **Canada**, please indicate on the IAR form that you have contacted Zurich at:

Crawford Adjusters Canada
Claims Alert
1-888-218-2346
24 hours a day, 7 days a week

The more details you have the better but, don't delay reporting if you don't have all of the information - that may be obtained later. A Zurich trained operator will answer your call and ask for all relevant information regarding the incident. The initial information required includes:

- Your division,
- Office location and division contact name – advise that you are an AMEC Company
- Name, drivers license and phone number of the driver involved in the loss
- Description of the vehicle which he/she was driving (i.e., year, make, model, license plate number, serial number)
- Date, time and location of incident
- Passenger information (if applicable)
- Third party information (i.e., name, phone number, address, vehicle information, insurance information)
- If any injuries occurred (if applicable)
- Police information
- Witness information (if applicable)

Call 911 if there are serious injuries!

If you are injured or think you were injured, **contact your supervisor and call WorkCare at 888-449-7787**. Your supervisor will notify your HSE Coordinator and your Group HSE Manager. For additional instructions on what to do, go to AMEC's HSE website at:

http://ee.amecnet.com/she/sheweb/incident_reporting.htm

1. Call for an officer if the incident occurred on public property (streets, highways or roads). Disputes often arise between the parties involved as to who was at fault; therefore, a police report is important. If an officer is unable to attend the scene of the collision, a counter police report may be filed at most stations. Insurance companies rely on police reports to determine liability.
2. Complete the Incident Investigation Report and the Vehicle Incident Report forms. It is important that both these forms are completed in detail. Include a diagram of the incident on the provided sheet. Incomplete information may lead to delays in processing associated claims and in helping to prevent this type of incident from occurring again.
3. Give only information that is required by the authorities or as directed by AMEC contractual requirements.
4. Sign only those statements required by the authorities or as directed by AMEC contractual requirements. Do not sign away your or the company's rights.

Vehicle Incident Diagram

This or a similar diagram <u>must be completed</u> with all VIRs

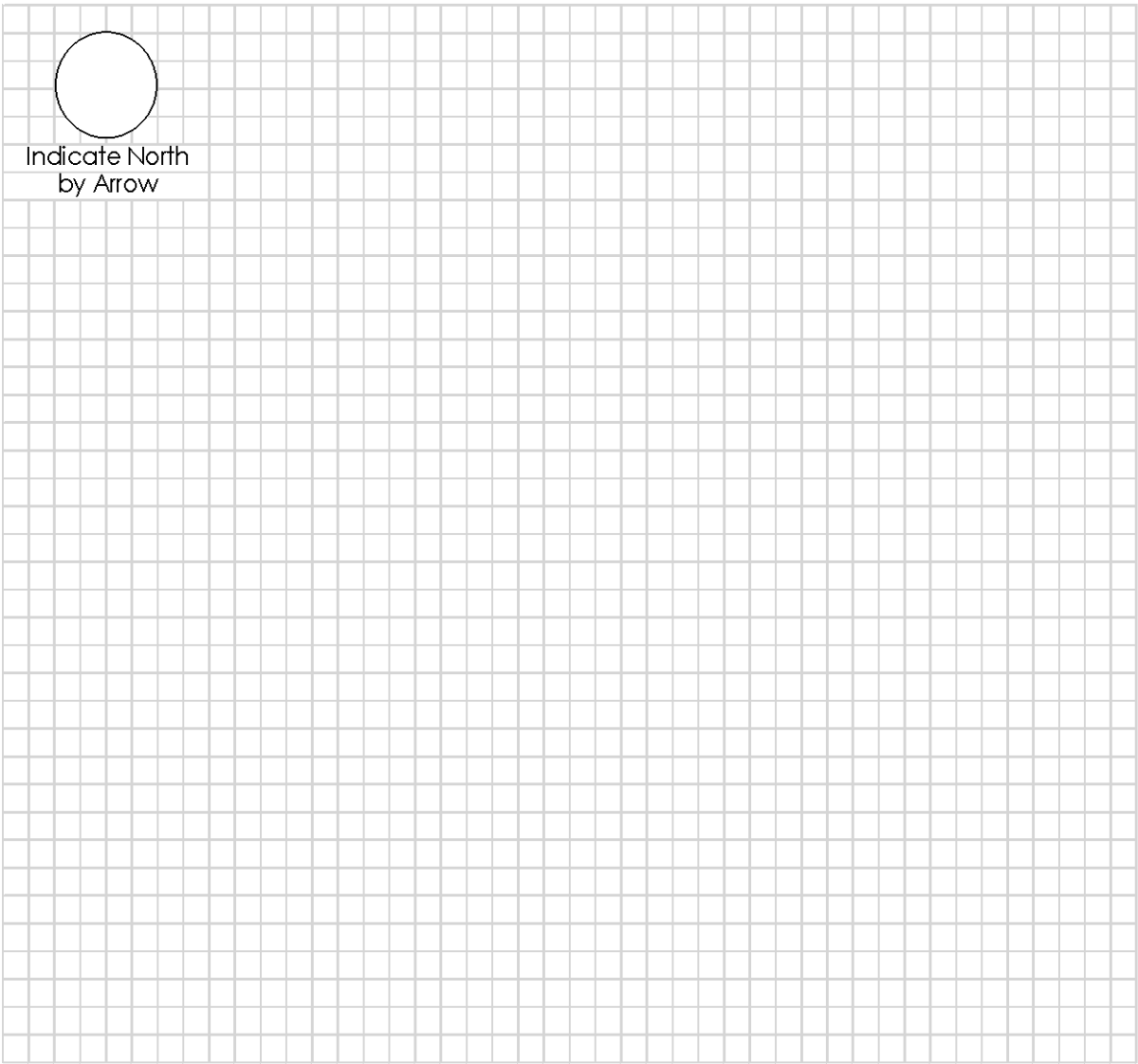
MACTEC, Inc.

Vehicle Crash Diagram

Instructions:

1. Number each vehicle and show directions → 1 ⟵ 2
2. Use a solid line to show path before incident and use a dotted line to show path after incient

   → 1 (before) - - - - → 1 (after)
3. Show pedestrian/non-motorist by: ——→○
4. Show railroad by: ┼┼┼┼┼┼┼┼┼┼
5. Indicate north by arrow as: ↗
6. Show street or highway names or numbers
7. Show signs, signals, warning and traffic controls.



Prepared by: _____ Date: _____

GROUND DISTURBANCE INCIDENT REPORT

AMEC Environment & Infrastructure

Section 1 – General Information

Employee Name: _____ Time of incident: _____ ☐ am | ☐ pm Time Reported:_____ ☐ am | ☐ pm Report Date: _____

Project Name: _____ Project Number: _____ Client: _____

List of All Parties Present

Name	Company	Telephone No.	Role
____	____	____	____
____	____	____	____
____	____	____	____
____	____	____	____
____	____	____	____

Describe the chronological description of Incident and response:____

Section 2 – Date and Location of Event

A. *Date of Event: (MM/DD/YYYY)

B. ***Country** ***State** ***County** **City**

C. **Street address** **Nearest Intersection**

D. *Right of Way where event occurred

E. Public: ☐ City Street ☐ State Highway ☐ County Road ☐ Interstate Highway ☐ Public-Other

F. Private: ☐ Private Business ☐ Private Land Owner ☐ Private Easement

G. ☐ Pipeline ☐ Power /Transmission Line ☐ Dedicated Public Utility Easement

☐ Federal Land ☐ Railroad ☐ Data not collected ☐ Unknown/Other

List attached documentation (Public Utility Locates, Private Utility Locates, Copy of notifications submitted to Owner or other utility Owners, photographs): _____

Section 3 – Affected Facility Information

***What type of facility operation was affected?**

☐ Cable Television ☐ Electric ☐ Natural Gas ☐ Liquid Pipeline ☐ Sewer (Sanitary Sewer)

☐ Steam ☐ Telecommunications ☐ Water ☐ Unknown/Other

***What type of facility was affected?**

☐ Distribution ☐ Gathering ☐ Service/Drop ☐ Transmission ☐ Unknown/Other

Was the facility part of a joint trench?

☐ Unknown ☐ Yes ☐ No

Was the facility owner a member of One-Call Center?

☐ Unknown ☐ Yes ☐ No

Section 4 – Excavation Information

***Type of Excavator**

☐ Contractor ☐ County ☐ Developer ☐ Farmer ☐ Municipality ☐ Occupant
☐ Railroad ☐ State ☐ Utility ☐ Data not collected ☐ Unknown/Other

***Type of Excavation Equipment**

☐ Auger ☐ Backhoe/Trackhoe ☐ Boring ☐ Drilling ☐ Directional Drilling
☐ Explosives ☐ Farm Equipment ☐ Grader/Scraper ☐ Hand Tools ☐ Milling Equipment
☐ Probing Device ☐ Trencher ☐ Vacuum Equipment ☐ Data Not Collected ☐ Unknown/Other

***Type of Work Performed**

☐ Agriculture ☐ Cable Television ☐ Curb/Sidewalk ☐ Bldg. Construction ☐ Bldg. Demolition
☐ Drainage ☐ Driveway ☐ Electric ☐ Engineering/Survey ☐ Fencing
☐ Grading ☐ Irrigation ☐ Landscaping ☐ Liquid Pipeline ☐ Milling
☐ Natural Gas ☐ Pole ☐ Public Transit Auth. ☐ Railroad Maint. ☐ Road Work
☐ Sewer (San/Storm) ☐ Site Development ☐ Steam ☐ Storm Drain/Culvert ☐ Street Light
☐ Telecommunication ☐ Traffic Signal ☐ Traffic Sign ☐ Water ☐ Waterway Improvement
☐ Data Not Collected ☐ Unknown/Other

Section 5 – Pre-Excavation Notification

***Was the One-Call Center notified?**

☐ Yes ☐ No If Yes, which One-Call Center? Ticket number:

Was Private Contract Locator used?

☐ Yes ☐ No

Section 6 – Locating and Marking

***Type of Locator**

☐ Utility Owner ☐ Contract Locator ☐ Data Not Collected

***Were facility marks visible in the area of excavation?**

☐ Yes ☐ No ☐ Data Not Collected

***Were facilities marked correctly?**

☐ Yes ☐ No ☐ Data Not Collected

What technology was used to locate utilities?

☐ Maps ☐ Active(transmitter+receiver) ☐ Passive (receiver only) ☐ GPR
☐ Acoustic ☐ Magnetic ☐ Infrared ☐ Unknown/Other

What Factors affected the ability to locate services?

☐ Soil Type:_____ ☐ Non-Grounded ☐ Common Bonded ☐ Depth
☐ Electromagnetic interference ☐ Parallel facilities ☐ Congested facilities ☐ Unknown/Other

Section 7 – Excavator Downtime

Did Excavator incur down time?

☐ Yes ☐ No

If yes, how much time?

☐ Unknown ☐ Less than 1 hour ☐ 1 hour ☐ 2 hours ☐ 3 or more hours Exact Value _____If

Estimated cost of down time?

☐ Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value _____

Section 8 – Description of Damage

***Was there damage to a facility?**
☐ Yes ☐ No (i.e. near miss)
***Did the damage cause an interruption in service?**
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other
If yes, duration of interruption
☐ Unknown ☐ Less than 1 hour ☐ 1 to 2 hrs ☐ 2 to 4 hrs ☐ 4 to 8 hrs ☐ 8 to 12 hrs ☐12 to 24 hrs
☐ 1 to 2 days ☐ 2 to 3 days ☐ 3 or more days ☐ Data Not Collected Exact Value _____
Approximately how many customers were affected?
☐Unknown ☐ 0 ☐ 1 ☐ 2 to 10 ☐ 11 to 50 ☐51 or more Exact Value _____
Estimated cost of damage / repair/restoration
☐Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value _____
Number of people injured
☐ Unknown ☐0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____
Number of fatalities
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____

Was there a Product Release?
Product Release: ☐ No ☐ Yes ☐ N/A Type: ____ **If Yes, Incident Type is Environmental Report.**
Volume: ____ Spill Controls: ____
Repair Process: ____

Section 9 – Description of the Root Cause

Please choose one

One-Call Notification Practices Not Sufficient
☐ No notification made to the One-Call Center
☐ Notification to one-call center made, but not sufficient
☐ Wrong information provided to One Call Center
_____

Locating Practices Not Sufficient
☐ Facility could not be found or located
☐ Facility marking or location not sufficient
☐ Facility was not located or marked
☐ Incorrect facility records/maps

Excavation Practices Not Sufficient
☐ Failure to maintain marks
☐ Failure to support exposed facilities
☐ Failure to use hand tools where required
☐ Failure to test-hole (pot-hole)
☐ Improper backfilling practices
☐ Failure to maintain clearance
☐ Other insufficient excavation practices

Miscellaneous Root Causes
☐ One-Call Center error
☐ Abandoned facility
☐ Deteriorated facility
☐ Previous damage
☐ Data Not Collected
☐ Other

Section 10 - Notifications, Certification & Approvals

Check the appropriate boxes indicating the applicable reports have been made to the following applicable organizations:

One Call was called ☐ **Spills Reporting Agency Notified** ☐

Emergency Responders (Fire) was called ☐ **Post-incident Drug/Alcohol Testing Performed**

List of All Agencies Contacted

Name/Agency	**Phone #**	**Date**	**Time**

Incident Report prepared by: ____

Employee (s): ____ Date: ____

Employee's Supervisor: ____ Date: ____

HSE Coordinator/Project/Unit Manager: ____ Date: ____

Group HSE Manager:____ Date: ____

Utility Clearance Form

Site Name: Al Tech Specialty Steel – MPA Investigation

Site Address: Intersection of Lincoln Ave and 1st Street Watervliet/Colonie, NY 12189

Project No./Task No.: 3612122256

One Call Ticket No.: _____

Ticket Good until: _____

Project Manager Name: Jayme Connelly

PM Phone No.: _____

Locations cleared by facility? _____

Date Cleared: _____

Utility Clearance:

Potential Utilities		Identified		Colors	Utility Company Name(s)	Utilities
Member of One Call	*Non Members	Utility Marked	Utility Responded not Present			
						WHITE - Proposed Excavation
						****PINK** - Temporary Survey Markings
						RED - Electric Power Lines, Cables, Conduit and Lighting Cables
						YELLOW - Gas, Oil, Steam, Petroleum or Gaseous Materials
						ORANGE - Communication, Alarm or Signal Lines, Cables or Conduit
						BLUE - Potable Water
						PURPLE - Reclaimed Water, Irrigation and Slurry Lines
						GREEN - Sewers and Drain Lines

*Contact local municipality

** Survey markings need to be protected. If disturbed or destroyed, replace markings.

Private Utility Locator/Geophysical Survey

Method to be used:
___ Pipe and Cable Location
___ Ground Penetrating Radar
___ Magnetics and Electromagnetics

Non-Destructive Excavation Method to be used

___ *Hand Dig
___ Soil Vacuum
___ Air Knife
___ Water Knife

* Use electrically insulated gloves if potential for power lines

Field Clues Observed/Evaluated:

___ Overhead power lines
___ Cell phone/radio antennas
___ Trench patches
___ Trench settlement
___ Trench drains
___ Utility manholes
___ Manholes just outside building
___ Valve risers
___ Floor cleanout covers
___ Floor drains
___ Patches in concrete floors
___ Drainage ditches in area
___ Utility vaults
___ Transformer pads
___ Conduits from power panels into slab
___ Above ground propane tanks
___ Fire protection rooms
___ Fire protection lines
___ Fire hydrant locations – valves in ground
___ Footings under structural columns
___ Guard shack – service utilities
___ Bathroom and kitchen facilities
___ Radiant heat systems in slabs (ask)
___ Cooling units outside building
___ Process water to equipment in factory
___ Sprinkler system landscaping
___ Grounding systems near perimeter
___ Water tower on site.
___ Foundation drains - building perimeter

Additional Notes/Remarks: _____

Confidence Level that All Utilities have been identified:

___ High ___ Medium High ___ *Moderate ___ *Medium Low ___ *Low

*Contact PM. Get PM and OM permission prior to proceeding

*Cleared by PM? _____ *Cleared by OM? _____

Job Hazard Analysis (JHA)

1 – SFJHA – Mobilization Demobilization and Site Preparation

2 – SFJHA – Field Work – General R1

3 – SFJHA – Field Work – Oversight

4 – SFJHA – Sediment and water sampling from OWS

5 – SFJHA – Poisonois Plants with Giant Hogweed

6 – SFJHA – Insect Stings and Bites

7 – SFAHA - Aerial Lift Use

8 – SFAHA – Asbestos Inspection and Air Sampling

9 – SFAHA – Stormwater system dye tracing

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Job Hazard Analysis – HASP Format

Job Title: Mobilization/Demobilization and Site Preparation **Date of Analysis:** 8/15/06

Minimum Recommended PPE*: High visibility vest, hard hat, steel-toed boots, safety glasses, hearing protection
*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Prepare for Site Visit	1A) N/A	1A) Prior to leaving for site ▪ Obtain and review HASP prior to site visit, if possible ▪ Determine PPE needs – bring required PPE to the site, if not otherwise being provided at the site (e.g., steel toed boots) ▪ Determine training and medical monitoring needs and ensure all required Health and Safety training and medical monitoring has been received and is current ▪ Ensure all workers are fit for duty (alert, well rested, and mentally and physically fit to perform work assignment) ▪ If respiratory protection is required/potentially required, ensure that training and fit-testing has occurred within the past year. ▪ Familiarize yourself with route to the site
	1B) Vehicle defects	1B) Inspect company owned/leased vehicle for defects such as: ▪ Flat tires ▪ Windshield wipers worn or torn ▪ Oil puddles under vehicle ▪ Headlights, brake lights, turn signals not working
	1C) Insufficient emergency equipment, unsecured loads	1C) Insufficient emergency equipment, unsecured loads ▪ Ensure vehicle has first aid kit and that all medications are current (if first aid kits are not provided at the site) ▪ Ensure vehicle is equpped with warning flashers and/or flares and that the warning flashers work ▪ Cell phones are recommended to call for help in the event of an emergency ▪ Vehicles carrying tools must have a safety cage in place. All tools must be properly secured ▪ Vehicles must be equipped with chocks if the vehicle is to be left running, unattended. ▪ Ensure sufficient gasoline is in the tank
2. Operating vehicles – general	2A) Collisions, unsafe driving conditions	2A) Drive Defensively! ▪ Seat belts must be used at all times when operating any vehicle on company business. ▪ Drive at safe speed for road conditions ▪ Maintain adequate following distance ▪ Pull over and stop if you have to look at a map ▪ Try to park so that you don't have to back up to leave. ▪ If backing in required, walk around vehicle to identify any hazards (especially low level hazards that may be difficult to see when in the vehicle) that might be present. Use a spotter if necessary
3. Driving to the jobsite	3A) Dusty, winding, narrow roads	3A) Dusty, winding, narrow roads ▪ Drive confidently and defensively at all times. ▪ Go slow around corners, occasionally clearing the windshield.
	3B) Rocky or one-lane roads	3B) Rocky or one-lane roads ▪ Stay clear of gullies and trenches, drive slowly over rocks. ▪ Yield right-of-way to oncoming vehicles---find a safe place to pull over.
	3C) Stormy weather, near confused tourists	3C) Stormy weather, near confused tourists ▪ Inquire about conditions before leaving the office. ▪ Be aware of oncoming storms. ▪ Drive to avoid accident situations created by the mistakes of others.

MACTEC

Job Hazard Analysis – HASP Format

Job Title: Mobilization/Demobilization and Site Preparation **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3D) When angry or irritated	3D) When angry or irritated ▪ Attitude adjustment; change the subject or work out the problem before driving the vehicle. Let someone else drive.
	3E) Turning around on narrow roads	3E) Turning around on narrow roads ▪ Safely turn out with as much room as possible. ▪ Know what is ahead and behind the vehicle. ▪ Use a backer if available.
	3F) Sick or medicated	3F) Sick or medicated ▪ Let others on the crew know you do not feel well. ▪ Let someone else drive.
	3G) On wet or slimy roads	3G) On wet or slimy roads ▪ Drive slow and safe, wear seatbelts.
	3H) Animals on road	3H) Animals on road ▪ Drive slowly, watch for other animals nearby. ▪ Be alert for animals darting out of wooded areas
4. Gain permission to enter site	4A) Hostile landowner, livestock, pets	4A) Hostile landowner, livestock, pets ▪ Talk to land owner, be courteous and diplomatic ▪ Ensure all animals have been secured away from work area
5. Mobilization/ Demobilization of Equipment and Supplies	5A) Struck by Heavy Equipment/Vehicles	5A) Struck by heavy equipment ▪ Be aware of heavy equipment operations. ▪ Keep out of the swing radius of heavy equipment. ▪ Ground personnel in the vicinity of heavy equipment operations will be within the view of the operator at all times ▪ Employees shall wear a high visibility vest or T-shirt (reflective vest required if working at night). ▪ Ground personnel will be aware of the counterweight swing and maintain an adequate buffer zone. ▪ Ground personnel will not stand directly behind heavy equipment when it is in operation.
	5B) Struck by Equipment/Supplies	5B) Struck by Equipment/Supplies ▪ Workers will maintain proper space around their work area, if someone enters it, stop work. ▪ When entering another worker's work space, give a verbal warning so they know you are there.
	5C) Overexertion Unloading/Loading Supplies	5C) Overexertion Unloading/Loading Supplies ▪ Train workers on proper body mechanics, do not bend or twist at the waist while exerting force or lifting. ▪ Tightly secure all loads to the truck bed to avoid load shifting while in transit.
	5D) Caught in/on/between	5D) Caught in/on/between ▪ Do not place yourself between two vehicles or between a vehicle and a fixed object.
	5E) Slip/Trip/Fall	5E) 1E). Slip/Trip/Fall ▪ Mark all holes and low spots in area with banner tape. Instruct personnel to avoid these areas. ▪ Drivers will maintain 3 point contact when mounting/dismounting vehicles/equipment. ▪ Drivers will check surface before stepping, not jumping down.

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Job Hazard Analysis – HASP Format

Job Title: Mobilization/Demobilization and Site Preparation **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	5F) Vehicle accident	5F) Vehicle accident ▪ Employees should follow MACTEC vehicle operation policy and be aware of all stationary and mobile vehicles.
6. Site Preparation	6A) Slip/Trip/Fall	6A) Slip/Trip/Fall ▪ Mark all holes and low spots in area with banner tape. Instruct personnel to avoid these areas
7. Installation of soil erosion and sediment controls	7A) Overexertion	7A) Overexertion ▪ Workers will be trained in the proper method of placing erosion controls. ▪ Do not bend and twist at the waist while lifting or exerting force.
	7B) Struck by Equipment/Supplies	7C) Struck by Equipment/Supplies ▪ Workers will maintain proper space around their work area, if someone enters it, stop work. ▪ When entering another worker's work space, give a verbal warning so they know you are there.
8. Driving back from the jobsite	8A) See hazards listed under item #3	8A) See safe work practices under item #3

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Job Hazard Analysis – HASP Format

Job Title: Field Work - General **Date of Analysis:** 8/15/06

Minimum Recommended PPE*: hard hat, steel-toed boots, safety glasses
*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Mobilization/ Demobilization and Site Preparation	1A) See Mobilization/Demobilization and Site Preparation JHA	1A) See Mobilization/Demobilization and Site Preparation JHA
2. Communication	2A) Safety, crew unity	2A) Talk to each other. ▪ Log all workers and visitor on and off the site. ▪ Let other crewmembers know when you see a hazard. ▪ Avoid working near known hazards. ▪ Always know the wherabouts of fellow crewmembers. ▪ Carry a radio and spare batteries or cell phone ▪ Review Emergency Evacuation Procedures (see below).
3. Walking and working in the field	3A) Falling down, twisted ankles and knees, poor footing	3A) Always watch your footing. ▪ Horseplay is strictly prohibited ▪ Slow down and use extra caution around logs, rocks, and animal holes. ▪ Extremely steep slopes (>50%) can be hazardous under wet or dry conditions; consider an alternate route. ▪ Wear laced boots with a minimum 8" high upper and non-skid Vibram-type soles for ankle support and traction.
	3B) Falling objects	3B) Protect head agains falling objects. ▪ Wear your hardhat for protection from falling limbs and pinecones, and from tools and equipment carried by other crewmembers. ▪ Stay out of the woods during extremely high winds.
	3C) Chemical/Toxicological Hazards	3C) Chemical/Toxicological Hazards ▪ See HASP for appropriate level of PPE ▪ Use monitoring equipment, as outlined in HASP, to monitor breathing zone ▪ Read MSDSs for all chemicals brought to the site ▪ Be familiar with hazards associated with site contaminants. ▪ Ensure that all containers are properly labelled ▪ Decon thoroughly prior to consumption of food, beverage or tobacco.
	3D) Damage to eyes	3D) Protect eyes: ▪ Watch where you walk, ecpecially around trees and brush with limbs sticking out. ▪ Exercise caution when clearing limbs from tree trunks. Advise wearing eye protection. ▪ Ultraviolet light from the sun can be damaging to the eyes; look for sunglasses that specify significant protection from UV-A and UV-B radiation. If safety glasses require, use one's with tinted lenses
	3E) Bee and wasp stings	3E) See JHA for Insect Stings and Bites
	3F) Ticks and infected mosquitos	3F) See JHA for Insect Stings and Bites
	3G) Wild Animals	3G) Wild Animals ▪ Avoid phyisical contact with wild animals ▪ Do not threaten and/or conrner animals ▪ Make noise to get the animal to retreat. ▪ Stay in or return to vehicle/equipment if in danger

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Job Hazard Analysis – HASP Format

Job Title: Field Work - General **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3H) Contact with poisonous plants or the oil from those plants:	3H) Contact with poisonous plants or the oil from those plants: ▪ Look for signs of poisonous plants and avoid. ▪ Ensure all field workers can identify the plants. Mark identified poisonous plants with spray paint if working at a fixed location. ▪ Do not allow plant to touch any part of your body/clothing. ▪ Wear PPE as described in the HASP and wear Tyveks, gloves and boot covers if contact with plant is likely ▪ Always wash gloves before removing them. ▪ Discard PPE in accordance with the HASP. ▪ Use commercially available products such as Ivy Block or Ivy Wash as appropriate.
		
	3I) Back Injuries	3I) Back Injuries ▪ Site personnel will be instructed on proper lifting techniques. ▪ Mechanical devices should be used to reduce manual handling of materials. ▪ Split heavy loads in to smaller loads ▪ Team lifting should be utilized if mechanical devices are not available. ▪ Make sure that path is clear prior to lift.
	3J) Shoveling	3J) Shoveling ▪ Select the proper shovel for the task. A long handled, flat bladed shovel is recommend for loose material ▪ Inspect the handle for splinters and/or cracks ▪ Ensure that the blade is securely attached to the handle ▪ Never be more than 15 inches from the material you are shoveling ▪ Stand with your feet about hip width for balance and keep the shovel close to your body. ▪ Bend from the knees (not the back) and tighten your stomach muscles as you lift. ▪ Avoid twisting movements. If you need to move the snow to one side reposition your feet to face the direction the snow will be going. ▪ Avoid lifting large shoveling too much at once. When lifting heavy material, pick up less to reduce the weight lifted. ▪ Pace yourself to avoid getting out of breath and becoming fatigued too soon. ▪ Be alert for signs of stress such as pain, numbness, burning and tingling. Stop immediately if you feel any of these symptoms.
	3K) Slips/Trips/Falls	3K) Slips/Trips/Falls ▪ Maintain work areas safe and orderly; unloading areas should be on even terrain; mark or repair possible tripping hazards. ▪ Site SHSO inspect the entire work area to identify and mark hazards. ▪ Maintain three points of contact when climbing ladders or onto/off of equipment

MACTEC

Job Hazard Analysis – HASP Format

Job Title: Field Work - General **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3L) Overhead Hazards	3L) Overhead Hazards ▪ Personnel will be required to wear hard hats that meet ANSI Standard Z89.1. ▪ All ground personnel will stay clear of suspended loads. ▪ All equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects. ▪ All overhead hazards will be identified prior to commencing work operations.
	3M) Dropped Objects	3M) Dropped Objects ▪ Steel toe boots meeting ANSI Standard Z41 will be worn.
	3N) Noise	3N) Noise ▪ Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); all equipment will be equipped with manufacturer's required mufflers. Hearing protection shall be worn by all personnel working in or near heavy equipment.
	3O) Eye Injuries	3O) Eye Injuries ▪ Safety glasses meeting ANSI Standard Z87 will be worn.
	3P) Heavy Equipment (overhead hazards, spills, struck by or against)	3P) Heavy Equipment ▪ All operators will be trained and qualified to operate equipment ▪ Equipment will have seat belts. ▪ Operators will wear seat belts when operating equipment. ▪ Do not operate equipment on grades that exceed manufacturer's recommendations. ▪ Equipment will have guards, canopies or grills to protect from flying objects. ▪ Ground personnel will stay clear of all suspended loads. ▪ Personel are prohibited from riding on the buckets, or elsewhere on the equipment except for designated seats with proper seat belts or lifts specifically designed to carry workers. ▪ Ground personnel will wear high visibility vests ▪ Spill and absorbent materials will be readily available. ▪ Drip pans, polyethylene sheeting or other means will be used for secondary containment. ▪ Ground personnel will stay out of the swing radius of excavators. ▪ Eye contact with operators will be made before approaching equipment. ▪ Operator will acknowledge eye contact by removing his hands from the controls. ▪ Equipment will not be approached on blind sides. ▪ All equipment will be equipped with backup alarms and use spotters when significant physical movement of equipment occurs on-site, (i.e., other than in place excavation or truck loading). ▪ Inspect rigging prior to each use.

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Job Hazard Analysis – HASP Format

Job Title: Field Work - General **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3Q) Struck by vehicle/equipment	3Q) Struck by vehicle/equipment ▪ Be aware of heavy equipment operations. ▪ Keep out of the swing radius of heavy equipment. ▪ Ground personnel in the vicinity of vehicles or heavy equipment operations will be within the view of the operator at all times. ▪ Ground personnel will be aware of the counterweight swing and maintain an adequate buffer zone. ▪ Ground personnel will not stand directly behind heavy equipment when it is in operation. ▪ Drivers will keep workers on foot in their vision at all times, if you lose sight of someone, Stop! ▪ Spotters will be used when backing up trucks and heavy equipment and when moving equipment. ▪ High visibility vests will be worn when workers are exposed to vehicular traffic at the site or on public roads.
	3R) Struck/cut by tools	3R) Struck/cut by tools ▪ Cut resistant work gloves will be worn when dealing with sharp objects. ▪ All hand and power tools will be maintained in safe condition. ▪ Do not drop or throw tools. Tools shall be placed on the ground or worksurface or handed to another employee in a safe manner. ▪ Guards will be kept in place while using hand and power tools**.**
	3S) Caught in/on/between	3S) Caught in/on/between ▪ Workers will not position themselves between equipment and a stationary object. ▪ Workers will not wear long hair down (place in pony-tail and tuck into shirt) or jewelry if working with tools/machinery.
	3T) Contact with Electricity/Lightning	3T) Contact with Electricity/Lighting ▪ All electrical tools and equipment will be equipped with GFCI. ▪ Electrical extension cords will be of the “Hard” or “Extra Hard” service type. ▪ All extension cords shall have a three-blade grounding plug. ▪ Personnel shall not use extension cords with damaged outer covers, exposed inner wires, or splices. ▪ Electrical cords shall not be laid across roads where vehicular traffic may damage the cord without appropriate guarding. ▪ All electrical work will be conducted by a licensed electrician. ▪ All equipment will be locked out and tagged out and rendered in a zero energy state prior to commencing any operation that may exposed workers to electrical, mechanical, hydraulic, etc. hazards. ▪ All utilities will be marked prior to excavation activities. ▪ All equipment will stay a minimum of 10 feet from overhead energized electrical lines (50 kV). This distance will increase by 4 inches for each 10 kV above 50 kV. Rule of Thumb: Stay 10 feet away from all overhead powerlines known to be 50 kV or less and 35 feet from all others.) ▪ The SHSO shall halt outdoor site operations whenever lightning is visible, outdoor work will not resume until 30 minutes after the last sighting of lightning.
	3U) Equipment failure	3U) Equipment failure ▪ All equipment will be inspected before use. If any safety problems are noted, the equipment should be tagged and removed from service until repaired or replaced.

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Job Hazard Analysis – HASP Format

Job Title: Field Work - General **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3V) Hand & power tool usage.	3V) Hand & power tool usage ▪ Daily inspections will be performed. ▪ Ensure guards are in place and are in good condition. ▪ Remove broken or damaged tools from service. ▪ Use the tool for its intended purpose. ▪ Use in accordance with manufacturers instructions. ▪ No tampering with electrical equipment is allowed (e.g., splicing cords, cutting the grounding prong off plug, etc.) ▪ See JHA for Power Tool Use - Electrical and Power Tool Use - Gasoline
	3W) Fire Protection	3W) Fire Protection ▪ Ensure that adequate number and type of fire extinguishers are present at the site ▪ Inspect fire extinguishers on a monthly basis – document ▪ All employees who are expected to use fire exinguishers will have received training on an annual basis. ▪ Obey no-smoking policy ▪ Open fires are prohibited ▪ Maintain good housekeeping. Keep rubbish and combustibles to a minimum. ▪ Keep flammable liquids in small containers with lids closed or a safety can. ▪ When dispensing flammable liquids, do in well vented area and bond and ground containers.
	3X) Confined Space Entry	3X) Confined Space Entry ▪ See JHA for Confined Space Entry

4. Environmental health considerations	4A) Heat Stress	4A) Take precautions to prevent heat stress
		▪ Remain constantly aware of the four basic factors that determine the degree of heat stress (air temperature, humidity, air movement, and heat radiation) relative to the surrounding work environmental heat load.
		▪ Know the signs and symptoms of heat exhaustion, heat cramps, and heat stroke. Heat stroke is a true medical emergency requiring immediate emergency response action.
		NOTE: The severity of the effects of a given environmental heat stress is decreased by reducing the work load, increasing the frequency and/or duration of rest periods, and by introducing measures which will protect employees from hot environments.
		▪ Maintain adequate water intake by drinking water periodically in small amounts throughout the day (flavoring water with citrus flavors or extracts enhances palatability).
		▪ Allow approximately 2 weeks with progressive degrees of heat exposure and physical exertion for substantial acclimatization.
		▪ Acclimatization is necessary regardless of an employee's physical condition (the better one's physical condition, the quicker the acclimatization). Tailor the work schedule to fit the climate, the physical condition of employees, and mission requirements.
		  ▪ A reduction of work load markedly decreases total heat stress.
		  ▪ Lessen work load and/or duration of physical exertion the first days of heat exposure to allow gradual acclimatization.
		▪ Alternate work and rest periods. More severe conditions may require longer rest periods and electrolyte fluid replacement.

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Job Hazard Analysis – HASP Format

Job Title: Field Work - General **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	4B) Wet Bulb Globe Temperature (WBGT) Index	4B) WBGT ▪ Curtail or suspend physical work when conditions are extremely severe (see attached Heat Stress Index). ▪ Compute a Wet Bulb Globe Temperature Index to determine the level of physical activity (take WBGT index measurements in a location that is similar or closely approximates the environment to which employees will be exposed). WBGT THRESHOLD VALUES FOR INSTITUTING PREVENTIVE MEASURES 80-90 degrees F — Fatigue possible with prolonged exposure and physical activity. 90-105 degrees F — Heat exhaustion and heat stroke possible with prolonged exposure and physical activity. 105-130 degrees F — Heat exhaustion and heat stroke are likely with prolonged heat exposure and physical activity.
	4C) Cold Extremes	4C) Take precautions to prevent cold stress injuries ▪ Cover all exposed skin and be aware of frostbite. While cold air will not freeze the tissues of the lungs, slow down and use a mask or scarf to minimize the effect of cold air on air passages. ▪ Dress in layers with wicking garments (those that carry moisture away from the body – e.g., cotton) and a weatherproof slicker. A wool outer garment is recommended. ▪ Take layers off as you heat up; put them on as you cool down. ▪ Wear head protection that provides adequate insulation and protects the ears. ▪ Maintain your energy level. Avoid exhaustion and over-exertion which causes sweating, dampens clothing, and accelerates loss of body heat and increases the potential for hypothermia. ▪ Acclimate to the cold climate to minimize discomfort. ▪ Maintain adequate water/fluid intake to avoid dehydration.
	4D) Wind	4D) Effects of the wind ▪ Wind chill greatly affects heat loss (see attached Wind Chill Index). ▪ Avoid marking in old, defective timber, especially hardwoods, during periods of high winds due to snag hazards.
	4E) Thunderstorms	4E) Thunderstorms ▪ Monitor weather channels to determine if electrical storms are forcased. ▪ Plan ahead and identify safe locations to be in the event of a storm. (e.g., sturdy building, vehicle, etc.) ▪ Suspend all field work at the first sound of thurnder. You should be in a safe place when the time between the lightning and thunder is less than 30 seconds. ▪ Only return to work 30 minutes after the after the last strike or sound of thunder

furnished by National Weather Service Gray, ME

Relative Humidity (%)

Air Temperature

°F	40	45	50	55	60	65	70	75	80	85	90	95	100
110	136												
108	130	137											
106	124	130	137										
104	119	124	131	137									
102	114	119	124	130	137								
100	109	114	118	124	129	136							
98	105	109	113	117	123	128	134						
96	101	104	108	112	116	121	126	132					
94	97	100	103	106	110	114	119	124	129	135			
92	94	96	99	101	105	108	112	116	121	126	131		
90	91	93	95	97	100	103	106	109	113	117	122	127	132
88	88	89	91	93	95	98	100	103	106	110	113	117	121
86	85	87	88	89	91	93	95	97	100	102	105	108	112
84	83	84	85	86	88	89	90	92	94	96	98	100	103
82	81	82	83	84	84	85	86	88	89	90	91	93	95
80	80	80	81	81	82	82	83	84	84	85	86	86	87

Heat Index (Apparent Temperature)

With Prolonged Exposure and/or Physical Activity

Extreme Danger
Heat stroke or sunstroke highly likely
Danger
Sunstroke, muscle cramps, and/or heat exhaustion likely
Extreme Caution
Sunstroke, muscle cramps, and/or heat exhaustion possible
Caution
Fatigue possible

Wind Chill Chart

Wind (mph) \ Temperature (°F)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

Job Hazard Analysis Form

Job Title: Field Work - Oversight **Date of Analysis:** 4/13/10
Minimum Recommended PPE*: High visibility vest, hard hat, steel-toed boots, safety glasses, hearing protection
*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Prepare for site visit	1A) N/A	▪ Obtain and review HASP prior to site visit, if possible ▪ Determine PPE needs – bring required PPE to the site, if not otherwise being provided at the site (e.g., steel toed boots) ▪ Determine training and medical monitoring needs and ensure all required Health and Safety training and medical monitoring has been received and is current ▪ Complete site specific/ client required training ▪ Ensure all workers are fit for duty (alert, well rested, and mentally and physically fit to perform work assignment) ▪ First aid kits shall be available at the work site and on each transport vehicle. ▪ Familiarize yourself with route to the site ▪ Check weather forecast. Pack appropriate clothing and other items (e.g., sunscreen) for anticipated weather conditions ▪ Verify that subsurface utilities have been identified.
2. Traveling to the site by vehicle	2A) See JHA for Mobilization, Demobilization and Site Preparation	▪ See JHA for Mobilization, Demobilization and Site Preparation
3. Initial Arrival - Assess Site Conditions	3A) Communication with subcontractor and other site personnel	▪ Develop communication methods (agree on hand signals, warning alarms) ▪ Log all workers and visitor on and off the site. ▪ Let other crewmembers know when you see a hazard. ▪ Avoid working near known hazards. ▪ Always know the whereabouts of fellow crewmembers. ▪ Carry a radio and spare batteries or cell phone ▪ Hold and document Safety tailgate meetings ▪ Establish work zones, evacuation routes and rally locations.
	3B) Insect Bites and Stings	▪ Discuss the types of insects expected at the Site and be able to identify them. ▪ Look for signs of insects. ▪ Inform crew members if allergic to insects and what to do if you need assistance. ▪ Avoid wearing heavy fragrances. ▪ Carry first-aid and sting relief kits. ▪ Carry identification of known allergies and necessary emergency medication. ▪ Spray clothing with insect repellant as a barrier. ▪ Wear light colored clothing that fits tightly at the wrists, ankles, and waist. ▪ Cover trouser legs with high socks or boots. ▪ Tuck in shirt tails.

	3C) Poisonous plants	▪ Wear long sleeves, long pants and boots ▪ Ensure all field workers can identify the plants. Mark identified poisonous plants with high visibility spray paint if working at a fixed location. ▪ Look for signs of poisonous plants and demark area to aid in avoiding plant. ▪ Do not touch any plant part to any part of your body/clothing. ▪ Use commercially available products such as Ivy Block or Ivy Wash as appropriate.
	3D) Vermin, leaches, animal borne disease	▪ Survey the area for dens, nests, etc. ▪ Identify areas where biological hazards may be present. ▪ Wear long sleeve shirt and full length pants ▪ Be aware of your surroundings. ▪ Wear appropriate footwear (snake boots, etc.) ▪ Avoid high grass areas if possible ▪ Do not put hand/arm into/under an area that you cannot see into/under clearly ▪ Perform routine inspections for ticks, leaches, etc. of yourself and co-workers.
	3E) Chemical Hazards	▪ Wear chemical resistant PPE as identified in the HASP ▪ Use monitoring equipment, as outlined in HASP, to monitor breathing zone ▪ Read MSDSs for all chemicals brought to the site ▪ Be familiar with hazards associated with site contaminants. ▪ Ensure that all containers are properly labeled
	3F) Overhead Power Lines	▪ Identify the location of all overhead power lines at the site. ▪ Maintain clearances depending on voltage - All equipment will stay a minimum of 10 feet from overhead energized electrical lines (50 kV or less). This distance will increase by 4 inches for each 10 kV above 50 kV. Rule of Thumb: Stay 10 feet away from all overhead power lines known to be 50 kV or less and 35 feet from all others.) ▪ Re-locate work so it is not close to power lines ▪ Avoid storing materials under overhead power lines
	3G) Underground Utilities	▪ All utilities will be marked prior to excavation activities ▪ For areas where utility locations cannot be verified, workers must hand dig for the first 3 feet ▪ Use lineman's gloves when locating underground power lines ▪ Work at adequate offsets from utility locations ▪ Immediately cease work if unknown utility markings are discovered.

	3H) Cold Stress	▪ Dress in layers with wicking garments (those that carry moisture away from the body – e.g., cotton) and a weatherproof slicker. A wool outer garment is recommended. ▪ Take layers off as you heat up; put them on as you cool down. ▪ Wear head protection that provides adequate insulation and protects the ears. ▪ Maintain your energy level. Avoid exhaustion and over-exertion which causes sweating, dampens clothing, and accelerates loss of body heat and increases the potential for hypothermia. ▪ Acclimate to the cold climate to minimize discomfort. ▪ Maintain adequate water/fluid intake to avoid dehydration. ▪ Be aware of signs of hypothermia, its prevention, detection and treatment. ▪ Have extra protection available, in case of an emergency such as blankets and heating devices. ▪ Don't work under extremely adverse weather conditions ▪ Stay in tune to current weather and extended forecasts.
	3I) Heat Stress	▪ Remain constantly aware of the four basic factors that determine the degree of heat stress (air temperature, humidity, air movement, and heat radiation) relative to the surrounding work environmental heat load. ▪ Know the signs and symptoms of heat exhaustion, heat cramps, and heat stroke. Heat stroke is a true medical emergency requiring immediate emergency response action. ▪ Maintain adequate water intake by drinking water periodically in small amounts throughout the day (flavoring water with citrus flavors or extracts enhances palatability). ▪ Lessen work load and/or duration of physical exertion the first days of heat exposure to allow gradual acclimatization. ▪ Alternate work and rest periods. More severe conditions may require longer rest periods and electrolyte fluid replacement.
	3J) Lightning and Thunder	▪ Monitor weather channels to determine if electrical storms are forecasted. ▪ Plan ahead and identify safe locations to be in the event of a storm. (e.g., sturdy building, vehicle, etc.) ▪ Suspend all field work at the first sound of thunder. You should be in a safe place when the time between the lightning and thunder is less than 30 seconds.
	3K) Severe Weather	▪ Watch for clouds and incoming weather. ▪ Monitor weather forecasts. ▪ Train workers about weather and appropriate precautions. ▪ Identify a shelter and a safe place in event of tornado etc
	3L) Sun	▪ Keep body protected ▪ Wear sunscreen, wide brimmed hat or hardhat. ▪ Schedule work for cool part of day. ▪ Take breaks in the shade.
	3M) High Crime Areas	▪ Do not enter areas where threats are present. ▪ Contract security where applicable. Use the buddy system. ▪ Maintain contact with support such as radio or cell phone ▪ Do not work after dark.

	3N) Operations conducted at an active facility	▪ Stay well clear of operations being conducted at the facility ▪ Keep alert for moving materials, equipment or vehicles ▪ Determine client specific PPE needs prior to arriving at the site ▪ Determine client specific emergency response procedures and follow as appropriate ▪ Participate in client required safety training ▪ Get copies of Clients MSDSs for any client chemicals that workers may be exposed to. ▪ Provide MSDSs to client for all chemicals brought to the site.
	3O) Remote Locations	▪ Carry a two-way radio and know how to use it. ▪ Work in teams. Account for all at the end of the work day. ▪ Make sure someone on crew is certified in first aid. ▪ Carry a first aid kit.
	3P) Set up Decon Station	▪ Refer to MSDS for specific hazards associated with decon solutions ▪ Monitor breathing zone for decon solutions (e.g., methanol, hexane, etc.), if appropriate (see HASP) ▪ Removal of PPE will be performed by the following tasks in the listed order: o Gross boot wash and rinse and removal o Outer glove removal o Suit removal o Respirator removal (if worn). o Inner glove removal ▪ Contaminated PPE is to be placed in the appropriate, provided receptacles. ▪ Employees will wash hands, face, and any other exposed areas with soap and water. ▪ Portable eyewash stations and showers will be available should employees come into direct contact with contaminated materials. ▪ Decon solutions will be disposed of according to the work plan.
4. Walk around the Site	4A) Poisonous plants	▪ See section 3C above
	4B) Vermin, leaches, animal borne disease	▪ See Section 3 D above ▪
	4C) Chemical Hazards	▪ See Section 3 E above
	4D) Slips/Trips/Falls	▪ Wear slip resistant footwear preferably laced boots with a minimum 8" high upper and non-skid soles for ankle support and traction. ▪ Pay attention to where you place your feet ▪ Slow down and use extra caution around logs, rocks, and animal holes. ▪ Extremely steep slopes (>50%) can be hazardous under wet or dry conditions; consider an alternate route. ▪ Site SHSO will inspect the entire work area to identify and mark hazards. ▪ Clear area of trip hazards; mark or barricade those that cannot be moved; ▪ Use caution when walking around excavated areas ▪ Stay back at least 5 feet from excavated areas ▪ Use caution when walking on or around loose soil. ▪ Be aware of surroundings. Avoid muddy areas if possible.

5. Oversight during drilling, or construction operations	5A) Heavy Equipment/ Vehicles	▪ Spotters will be used when backing up trucks and heavy equipment and when moving equipment. ▪ Ground personnel in the vicinity of vehicles or heavy equipment operations will be within the view of the operator at all times. ▪ Ground personnel will be aware of the swing radius and maintain an adequate buffer zone. ▪ Ground personnel will not stand directly behind heavy equipment when it is in operation. ▪ Personnel are prohibited from riding on the buckets, or elsewhere on the equipment except for designated seats with proper seat belts or lifts specifically designed to carry workers. Ground personnel will stay clear of all suspended loads. ▪ Ground personnel will wear high visibility vests ▪ Eye contact with operators will be made before approaching equipment.
	5B) Eye Injury	▪ Wear appropriate safety glasses (tinted for sun). ▪ Watch where you walk, especially around trees and brush with protruding limbs.
	5C) Foot Injury	▪ Wear steel toed boots ▪ Wear insulated steel toed boots during winter ▪ Ensure shoes/boots have good traction ▪ Pay attention to where you place your feet, especially when walking on uneven terrain
	5D) Head Injury	▪ Wear hardhat ▪ Do not walk or work under scaffolding or other elevated work unless there are guardrails and toeboards in place ▪ Flag or mark protruding objects at head level
	5E) Chemical Hazards	▪ See Section 3E above ▪ Wash hands and face prior to consumption of food, beverage or tobacco.
	5F) Dust - particulates (respiratory)	▪ Use dust suppression methods ▪ Stand upwind of point of dust generation
	5G) Overhead Power Lines	▪ See Section 3F above.
	5H) Underground Utilities	▪ See Section 3G above
	5I) Standing/Static Posture	▪ Change posture on a frequent basis ▪ Stretch prior to any physical activity
	5J) Slips/`Trips/Falls	▪ See Section 4D above

	5K) Noise	▪ Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs). ▪ All equipment will be equipped with manufacturer's required mufflers. ▪ Hearing protection shall be worn by all personnel working in or near heavy equipment. ▪ Hearing protection will be worn when workers need to shout when standing two feet away from each other. ▪ Segregate noisy equipment from the operators ▪ Use sound dampening around noisy equipment
	5L) Moving Equipment	▪ Clear area of obstructions and communicate with all workers involved that drilling is beginning ▪ Do not exceed manufacturer's recommended speed, force, torque, or other specifications. and penetrate the ground slowly with hands on the controls for at least the first foot of soil to minimize chance of auger kick-out ▪ Stay clear of rotating auger ▪ Use long-handled shovel to clear away cuttings when auger has stopped ▪ Do not wear loose clothing ▪ Wear appropriate PPE including leather gloves and steel-toed boots (See HASP)
6. Sampling Oversight	6A) Chemical Hazards	▪ See Section 3E above ▪ Wash hands and face prior to consumption of food, beverage or tobacco. ▪ Calibrate meters in a clean, well ventilated area ▪ Store calibration gases in well vented area. Ensure chemical labels and warnings are legible.
	6B) Personnel Decontamination	▪ Refer to MSDS for specific hazards associated with decon solutions ▪ Monitor breathing zone for decon solutions (e.g., methanol, hexane, etc.), if appropriate (see HASP) ▪ Removal of PPE will be performed by the following tasks in the listed order: o Gross boot wash and rinse and removal o Outer glove removal o Suit removal o Respirator removal (if worn). o Inner glove removal ▪ Contaminated PPE is to be placed in the appropriate, provided receptacles. ▪ Employees will wash hands, face, and any other exposed areas with soap and water. ▪ Portable eyewash stations and showers will be available should employees come into direct contact with contaminated materials. ▪ Decon solutions will be disposed of according to the work plan.
	6C) Lifting	▪ Good lifting techniques (lift with legs not back) ▪ Mechanical devices (e.g., hand truck, cart, forklift, etc.) should be used to reduce manual handling of materials and drums. ▪ Team lifting should be utilized if mechanical devices are not available. (mandatory for items over 50 lbs) ▪ Split heavy loads in to smaller loads ▪ Make sure that path is clear prior to lift. ▪ Redesign work area to avoid low lifts ▪ Stretch prior to lifting ▪ Maintain a healthy life style and level of physical fitness.

	6D) Hand Tools	▪ Cut resistant work gloves will be worn when dealing with sharp objects. ▪ All hand and power tools will be maintained in safe condition. ▪ Do not drop or throw tools. Tools shall be placed on the ground or work surface or handed to another employee in a safe manner. ▪ Guards will be kept in place while using hand and power tools. ▪ Daily inspections will be performed. ▪ Remove broken or damaged tools from service and tag out as defective ▪ No tampering with electrical equipment is allowed (e.g., splicing cords, cutting the grounding prong off plug, etc.) ▪ Do not use excessive force or impact ▪ Do not use tool improperly. Ensure all workers are trained
	6E) Slips/Trips/Falls	▪ See Section 4D above.
	6F) Struck by Vehicle	▪ Ground personnel in the vicinity of vehicles operations will be within the view of the operator at all times. ▪ Ground personnel will not stand directly behind vehicles when it is in operation ▪ Drivers will keep workers on foot in their vision at all times, if you lose sight of someone, Stop! ▪ High visibility vests will be worn when workers are exposed to vehicular traffic at the site or on public roads. ▪ Try to park so that you don't have to back up to leave. ▪ If backing in required, walk around vehicle to identify any hazards (especially low level hazards that may be difficult to see when in the vehicle) that might be present. Use a spotter if necessary ▪ Place cones in the font and rear of the vehicle ▪ Prior to driving off, walk around vehicle to collect cones and identify any hazards - especially low level hazards that may be difficult to see when in the vehicle. ▪ Set up "Workers in the Road" or similar warning signs and cones to alert traffic. ▪ Use emergency flashers and roof top flashing light (recommended) to alert oncoming vehicular traffic. ▪ Remain alert at all times as to the traffic outside the vehicle. Step to the side of the road when distracted by by-standers. Keep unofficial personnel out of the work area. ▪ Exit vehicle with caution. ▪ Wear High Visibility Vest when outside the vehicle. ▪ Utilize vehicle as a shield from oncoming traffic, as practical
7. IDW pickup oversight	7A) Foot Injury	▪ See Section 5C above.
	7B) Chemical Hazards	▪ See Section 3E above.
	7C) Lifting	▪ See Section 6C above.
	7D) Slips/Trips/Falls	▪ See Section 4D above
8. Return to office/home	8A) See Mobilization/ Demobilization and Site Preparation JHA	**See Mobilization/ Demobilization and Site Preparation JHA**

AHA – Sediment and Surface Water Sampling from Shore
Activity Description

Activity/Work Task:	Sediment and Surface Water Sampling from Shore		
Project Location:	**Kalamazoo River**		
Project Number:	**Varies**		
Date Prepared:	**6/25/2013**	**Date Accepted:**	
Prepared by (Name/Title):	Kenneth McRowe/Project Geologist		
Reviewed by (Name/Title):			

Overall Risk Assessment Code (RAC) (Use highest code) **L**

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

This AHA involves the following:

- Establishing site specific measures for sampling sediment and surface water from shore

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the site HASP for additional requirements. Contractor to follow general site safety controls for Slips Trips and Falls, Biological hazards, cuts lacerations and pinch points, and emergency procedures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE:Safety Boots/Shoes; Safety Glasses; Rubber boots; Waders; Personal Floatation Device	**Competent / Qualified Personnel:** Name – Position/Employer **Training requirements:** List specific certification (as applicable) Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting	Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. Inspect all PPE prior to use

AHA – Sediment and Surface Water Sampling from Shore
Activity Description

Job Steps	Hazards	Controls	RAC
1. Prepare for site visit	1A) Slips, trips, falls	1A) Familiarize self with site prior to visit. ▪ Complete appropriate training before going on site. ▪ Provide appropriate person in district office your itinerary. ▪ Prepare listing of emergency phone numbers, both on and offsite. ▪ Identify site/activity PPE needs. ▪ Ensure that First Aid training is current, and that tetanus booster are current.	L
2. Check and calibrate sampling equipment.	2A) Muscle Strain - lifting, twisting, tugging	2A) Muscle Strain - lifting, twisting, tugging ▪ Inspect all PPE and equipment and ensure that it is working properly. ▪ Get assistance from a coworker or use mechanical means to move equipment (dolly, cart, etc.)	L
	2B) Slips, trips, falls, strain	2B) Slips, trips, and falls ▪ Wear proper footwear. ▪ Pay attention to where walking.	L
3. Load/carry equipment to the site.	3A) Slips, trips, falls,	3A) Slips, trips, falls ▪ See AHA for Mobilization / Demobilization and Site Preparation ▪ Survey and clear the pathway. See AHA for Clearing Brush and Trees	L
	3B) Muscle Strain - lifting, twisting, tugging	3B) Muscle Strain - lifting, twisting, tugging ▪ Proper lifting, ergonomic practices and body mechanics. ▪ Share the load, move items in smaller shifts, or use cart.	L
	3C) Irate property owners, pets	3C) Irate property owners, pets ▪ Call property owners in advance. ▪ Check in to introduce yourself upon arrival. ▪ Be courteous and diplomatic	L
	3D) Crime	3D) Crime ▪ Do not enter areas where threats are present. ▪ Contract security where applicable. ▪ Use the buddy system. ▪ Maintain contact with support such as radio or cell phone.	L
	3E) Struck by traffic - sampling from a bridge or roadway.	3E) Struck by traffic - sampling from a bridge or roadway. ▪ Wear orange/yellow safety vest ▪ Use buddy system. ▪ Use traffic cones and a lookout. ▪ Attempt to sample away from the bridge if possible	L
4. Field parameters	4A) Falling into water	4A) Falling into water ▪ Limit access to water. ▪ Use equipment that facilitates reaching the location from a safe distance. ▪ Work using the buddy system. Wear PFD if working over water.	L

AHA – Sediment and Surface Water Sampling from Shore
Activity Description

Job Steps	Hazards	Controls	RAC
	4B) Slips trips and falls	4B) Slips trips and falls ▪ Wear appropriate footwear. ▪ Survey and clear walking area. ▪ Do not walk on slippery surfaces. ▪ Housekeeping.	**L**
	4C) Stuck in the mud or sand	4C) Stuck in the mud or sand ▪ Ensure secure footing. ▪ Provide walkways, platforms or secure walking surface. ▪ Use the buddy system and maintain communications with support staff. ▪ (See AHA for Working in Muddy Areas)	**L**
	4D) Vermin, leaches, Insect/animal born disease	4D) Vermin, leaches, Insect/animal born disease ▪ Survey the area for dens, nests, etc. ▪ Identify areas where biological hazards may be present. ▪ Be aware of your surroundings. ▪ Wear insect netting clothing or apply insect repellant on all exposed skin surfaces as appropriate – consider sample contamination ▪ Wear long sleeve shirt and full length pants ▪ Wear appropriate footwear (snake boots, etc.) ▪ Avoid high grass areas if possible ▪ Tuck pants leg into boot ▪ Do not put hand/arm into/under an area that you can not see into/under clearly ▪ Do not touch any suspected contaminant without appropriate hand PPE ▪ Wash hands as soon as possible upon completion of task. ▪ Perform routine inspections for ticks, leaches, etc. of yourself and co-workers. ▪ Contract vermin relocation, if applicable. ▪ Remain vigilant and respectful of wildlife. ▪ See AHA for Insects, Stings and Bites ▪ See AHA for Dog – Wildlife Safety.	**L**

AHA – Sediment and Surface Water Sampling from Shore
Activity Description

Job Steps	Hazards	Controls	RAC
	4E) Weather – temperature extremes	4E) Weather – temperature extremes ▪ Train workers about weather and appropriate precautions. ▪ Heat: o Familiarize self with signs of heat related illnesses: cramps, heat rash, dehydration, heat exhaustion, and heat stroke. ▪ Sun: o Keep body protected o Wear sunscreen, wide brimmed hat or hardhat. o Drink plenty of fluids to remain hydrated. o Schedule work for cool part of day. o Take breaks in the shade. ▪ Wind: o Wear layered clothing, gloves, hard hat with winter liner, etc. ▪ Cold: o During cold weather - layer clothing and wear wind impervious outerwear o During warm months – wear a long sleeve cotton/breathable fabric shirt and pant.	L
5. Sample collection	5A) Same as Item #4 above.	5A) Same as Item #4 above.	L
	5B) Bending, pulling, twisting	5B) Bending, pulling, twisting ▪ Use a vibrating or wiggling motion on the sample device to break the soil suction. ▪ Proper lifting technique.	L
	5C) Splash	5C) Splash ▪ Wear appropriate safety glasses (tinted for sun). ▪ Be aware if sampling water through a filter, if it becomes plugged with sediment it may unexpectedly “blow off” the hose and splash. ▪ Change filter prior to sedimentation back pressure.	L
	5D) Chemical exposure	5D) Chemical exposure ▪ Wear PPE including protective gloves, coveralls, safety glasses as appropriate. ▪ Work upwind of the sample location. ▪ Minimize exposure using a shovel/spoon or tool to collect the sample. ▪ Review and understand MSDS for all chemicals being handled. ▪ Be careful when handling acids and caustic substances. ▪ Wear adequate PPE and wash hands after completion of task.	L
	5E) Vegetation, sticks, reeds, - cuts and punctures	5E) Vegetation, sticks, reeds, - cuts and punctures ▪ Clear access to site. ▪ Be familiar with toxic plants such as poison ivy. Avoid such plants. ▪ Wash thoroughly after accidental contact with toxic materials and plants.	L

AHA – Sediment and Surface Water Sampling from Shore
Activity Description

Job Steps	Hazards	Controls	RAC
6. Sample preparation.	6A) Lifting heavy objects (covers, pumps, sampling equipment, coolers, etc.) Muscle strain	6A) Lifting heavy objects (covers, pumps, sampling equipment, coolers, etc.) Muscle strain ▪ Use proper ergonomics when lifting heavy objects ▪ Use appropriate mechanical assistance and tools when possible.	L
	6B) Chemical Exposure	6B) Chemical Exposure ▪ Wear PPE including protective gloves, coveralls, safety glasses as appropriate. ▪ Wash/wipe or decontaminate exterior of sample containers and equipment. ▪ Use care handling preservatives (acids/bases.) ▪ See Working with Preservatives AHA	L
	6C) Sharps and knives	6C) Sharps and knives ▪ Use care handling tape dispensers, knives and sharp objects.	L
	6D) Extreme cold (ice preservation)	6D) Extreme cold (ice preservation) ▪ Minimize exposure to ice. ▪ Use a shovel/spoon or tool to fill bags for preserving samples in coolers.	L
7. Site exit and drive home or next site.	7A) Vehicle contamination	7A) Vehicle contamination ▪ Wash hands promptly. ▪ Contaminated PPE (booties, Tyvek, nitrile gloves) should be disposed on-site. ▪ Remove boots and soiled clothing for secure storage in trunk; decontaminate as soon as possible. ▪ Update exposure log.	L
	7B) Traffic hazards.	7B) Traffic hazards. ▪ See AHA for Mobilization / Demobilization and Site Preparation.	L

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JOB HAZARD ANALYSIS - SHORT FORM HASP

Job Title: Poisonous Plants **Date of Analysis:** 1/19/2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1) Mobilization	1A) See JHA Mobilization/ Demobilization/Site Preparation	1A) See JHA Mobilization/Demobilization/Site Preparation
2) Preparation	2A) Training – Identifying Poisonous Plants	2A) Provide training on identifying the specific poisonous plants that could be present at the site
		
	2B) Poison Ivy 	2B) Poison Ivy: ▪ Grows everywhere in United States except Hawaii and Alaska. ▪ In the East, Midwest, and the South, it grows as a vine. ▪ In the Northern and Western United States, it grows as a shrub. ▪ Each leaf has three leaflets. ▪ Leaves are green in the summer and red in the fall. ▪ In the late summer and fall, white berries may grow from the stems.
	2C) Poison Oak 	2C) Poison Oak: ▪ Oak-like fuzzy leaves in clusters of three. ▪ It has two distinct kinds: ▪ Eastern poison oak (New Jersey to Texas) grows as a low shrub. ▪ Western poison oak (Pacific Coast) grows to six-foot-tall clumps or vines up to 30 feet long. ▪ It may have clusters of yellow berries.
	2D) Poison Sumac 	2D) Poison Sumac ▪ Grows in standing water in peat bogs in the Northeast and Midwest and in swampy areas in parts of the Southeast. ▪ Each leaf has clusters of seven to 13 smooth-edged leaflets. ▪ The plants can grow up to 15 feet tall. ▪ The leaves are orange in spring, green in summer and red, and orange or yellow in fall. ▪ There may be clumps of pale yellow or cream-colored berries.

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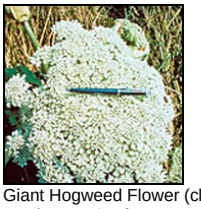
JOB HAZARD ANALYSIS - SHORT FORM HASP

Job Title: Poisonous Plants **Date of Analysis:** 1/19/2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	2E) Giant Hogweed  Giant Hogweed  Giant Hogweed Flower (clusters may reach up to 2.5 feet across)  Giant Hogweed Flower Leaves  Giant Hogweed Stem Thick stem with coarse hairs, Blistery dark purple splotches.	2E) Giant Hogweed ▪ Hogweed is a public health hazard. Its clear, watery sap has toxins that cause photo-dermatitis. Skin contact followed by exposure to sunlight produces painful, burning blisters that may develop into purplish or blackened scars. Contact with the eyes can cause temporary or permanent blindness. ▪ Since its introduction into North America, this plant has become established in rich moist soils along roadsides, stream banks and waste ground. In the eastern US, it is known to occur in Maine, New York, Pennsylvania, Connecticut, and now Massachusetts. ▪ A biennial or perennial herb growing 8 to 15 feet tall, giant hogweed usually has a taproot or occasionally fibrous root. The hollow stems are 2 to 4 inches in diameter with dark reddish-purple splotches and coarse white hairs. ▪ The deeply incised compound leaves grow up to 5 feet in width. Hairs on the underside of the leaf are stiff, dense and stubby. ▪ The large umbrella-shaped flower heads are up to 2 1/2 feet in diameter across a flat top with numerous small flowers produced in mid-May through July. ▪ Some plants die after flowering; others flower for several years. The plant produces flattened, 3/8 inch long, oval dry fruits that have a broadly rounded base and broad marginal ridges. Plants sprout in the early spring (or late winter in mild years) from the roots or from seed. ▪ Grows in standing water in peat bogs in the Northeast and Midwest and in swampy areas in parts of the Southeast. ▪ Each leaf has clusters of seven to 13 smooth-edged leaflets. ▪ The plants can grow up to 15 feet tall. ▪ The leaves are orange in spring, green in summer and red, and orange or yellow in fall. ▪ There may be clumps of pale yellow or cream-colored berries.

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JOB HAZARD ANALYSIS - SHORT FORM HASP

Job Title: Poisonous Plants **Date of Analysis:** 1/19/2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
3A) Contact with poisonous plants	3A) Hand Contact	3A) Hand Contact ▪ Apply IvyX (or similar product) to hands, forearms and other potentially exposed parts of the body, prior to starting work in the morning and again right after lunch. ▪ Leather Gloves must be worn at all times when digging, screening or carrying field equipment. ▪ Leather gloves should be of sufficient length to cover the entire wrist and cuff of the shirt. ▪ Carefully remove gloves, without touching the exterior surface, when taking notes and prior to lunch or restroom breaks. ▪ Gloves that become worn should be replaced immediately. ▪ Do not scratch or rub the face or other exposed skin while wearing gloves. ▪ Workers will apply Tecnu (or similar product) to the hands and forearms immediately after removing their gloves, prior to lunch and again at the end of the day. Tecnu will help cleanse the urushiol oil from the skin before it can be absorbed. Sensitive individuals can also apply prior to showering in the evening.
	3B) Arm Contact	3B) Arm Contact ▪ Apply IvyX (or similar product) to hands, forearms and other potentially exposed parts of the body, prior to starting work in the morning and again right after lunch. ▪ Wear light weight, long sleeved shirts as the sleeves will provide a physical barrier between the skin and any urushiol oil encountered. Disposable gauntlets may we worn over arms to keep oil from clothing as well. ▪ Have the sleeves pulled down to the base of the hand, covering the forearm and wrist (all exposed skin). ▪ Workers will apply Tecnu (or similar product) to the hands and forearms immediately after removing their gloves, prior to lunch and again at the end of the day. Tecnu will help cleanse the urushiol oil from the skin before it can be absorbed. Sensitive individuals can also apply prior to showering in the evening.
	3C) Leg Contact	3C) Leg Contact ▪ Wear long pants and boots. ▪ Assume boots are contaminated with the urushiol oil and only handle with gloved hands.
4) Handling Contaminated Equipment and Clothing	4A) Exposure from Handling Contaminated Equipment	4A) Exposure from Handling Contaminated Equipment ▪ Do not handle any field equipment that may have come in contact with poison ivy/oak/sumac without gloves. ▪ Decontaminate all equipment at the end of each workday with a solution of water and dish soap. ▪ Scrub all surfaces of the screens and shovels with a brush. ▪ Rinse with cool water using a portable garden sprayer.

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JOB HAZARD ANALYSIS - SHORT FORM HASP

Job Title: Poisonous Plants **Date of Analysis:** 1/19/2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	4B) Exposure from Handling Contaminated Clothing	4B) Exposure from Handling Contaminated Clothing ▪ Wash clothing potentially contaminated with urushiol oil prior to wearing again. ▪ Handle contaminated clothing with gloves as the oil can remain on environmental surfaces for up to 5 years.

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Job Hazard Analysis - HASP Format

Job Title: Insect Stings and Bites **Date of Analysis:** 4/20/06

Minimum Recommended PPE*: Long sleeved shirt and pants, light colored clothing
*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Traveling/working in areas with potential Tick Bites –Example outdoor wooded areas or fields.	1. Lyme Disease, Rocky Mountain Spotted Fever, etc.	▪ Spray clothing with insect repellant as a barrier. ▪ Wear light colored clothing that fits tightly at the wrists, ankles, and waist. ▪ Each outer garment should overlap the one above it. ▪ Cover trouser legs with high socks or boots. ▪ Tuck in shirt tails. ▪ Search the body on a regular basis, especially hair and clothing; ticks generally do not attach for the first couple of hours. ▪ If a tick becomes attached, pull it by grasping it as close as possible to the point of attachment and pull straight out with gentle pressure. Wash skin with soap and water then cleanse with rubbing alcohol. Place the tick in an empty container for later identification, if the victim should have a reaction. Record dates of exposure and removal. ▪ Do not try to remove the tick by burning with a match or covering it with chemical agents. ▪ If you can not remove the tick, or the head detaches, seek propmt medical help. ▪ Watch for warning signs of illness: a large red spot on the bite area; fever, chills, headache, joint and muscle ache, significant fatigue, and facial paralysis are reactions that may appear within two weeks of the attack. Symptoms specific to Lyme disease include: confusion, short-term memory loss, and disorientation.
2. Working/traveling in areas with potential bee and wasp stings-Example wooded areas and fields	2. Allergic reactions, painful stings	▪ Be alert to hives in brush or in hollow logs. Watch for insects travelling in and out of one location. ▪ If you or anyone you are working with is known to have allergic reactions to bee stings, tell the rest of the crew and your supervisor. Make sure you carry emergency medication with you at all times. ▪ Wear long sleeve shirts and trousers; tuck in shirt.. Bright colors and metal objects may attract bees. ▪ If you are stung, cold compresses may bring relief. ▪ If a stinger is left behind, scrape it off the skin. Do not use a tweezers as this squeezes the venom sack, worsening the injury. ▪ If the victim develops hives, asthmatic breathing, tissue swelling, or a drop in blood pressure, seek medical help immediately. Give victim antihistime, (Benadryl, chlo-amine tabs).
3. Traveling/working in areas of potential Mosquito Bites-Example- Woods, fields, near bodies of water and etc.	3. Skin irritation, encephalitis	▪ Wear long sleeves and trousers. ▪ Avoid heavy scents. ▪ Use insect repellants. If using DEET, do not apply directly to skin, apply to clothing only. ▪ Carry after-bite medication to reduce skin irritation.

AHA - Use of an Aerial Lift ("cherry picker")

Activity/Work Task:	Use of an Aerial Lift ("cherry picker")		
Project Location:			
Contract Number:			
Date Prepared:	**5-8-2013**	**Date Accepted:**	**5-8-2013**
Prepared by (Name/Title):	Kendra Bavor, CSP		
Reviewed by (Name/Title):	Cindy Sundquist, CSP, CIH		

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures
-

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the site HASP for additional requirements. Contractor to follow general site safety controls for Slips Trips and Falls, Biological hazards, cuts lacerations and pinch points, and emergency procedures.

Overall Risk Assessment Code (RAC) (Use highest code) **M**

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA - Use of an Aerial Lift ("cherry picker")

Job Steps	Hazards	Controls	RAC
1. Inspect/ Start Aerial Lift	1) Truck and Aerial Lift Device not in Safe, Operable Condition. Fire	1A) – Prior to the daily use of the aerial-lift device, a visual inspection and operational check shall be made in accordance with the manufacturer/owners manual. This visual inspection will include hydraulic hoses, fittings, pressure gauges and reservoir levels. 1B) – Lift controls shall be tested in accordance with the manufacture's recommendations prior to use to determine that such controls are operational and in safe working order. Both sets of lift controls (within the bucket and on the ground) will be tested. 1C) – Operator training (Documented) equipment specific. The operator must be able to recognize unsafe conditions. 1D) – ensure a spill kit is available and stocked incase or hydraulic or fuel release. 1E) – Shut down equipment during refueling. No smoking during refueling.	L
2. Stabilize the Lift Truck/Prepare for Operation	2) Poorly Secured lift could tip or be unstable, resulting in injury	2A) – Combined load in the boom shall not exceed manufacturers stated capacity or posted capacity. 2B) - The boom shall not be used as a crane. 2C) – Do not attempt to exceed the maximum tilt angle of the boom per the equipment specifications 2D) - The truck will be placed on the stable, hard surface. 2E) – The truck's braking system shall be set the truck's wheels will be chocked before operating lift. 2F) – The truck shall be parked on a slope of less than 5% with its long axis in line with the slope. 2G) – The truck's outriggers shall be extended and lock valves closed prior to operation of the aerial lift. 2H) – On soft ground, 4" thick plywood pads measuring 2'x 3' shall be centered under the outrigger pads. 2I) establish work area with cones, signs, barricades, caution tape. Limit access to the area. Communicate with property owner.	M
3. Secure Equipment	3) Unsecured Equipment or parts may fall and injure others on the ground.	3A) Prior to using the aerial-lift device, a visual inspection shall be made to insure all tools, equipment, and moving parts are properly secured within the lift bucket. 3B) lock equipment and remove key when unattended.	L

AHA - Use of an Aerial Lift ("cherry picker")

4. Operation of the manlift	4) Improper operation of the lift may result in injury or damage.	4A) Use of the aerial lift device requires that two (2) operators be present who are familiar with the proper operation of the equipment. ~~The primary operator will be in the bucket and will control the aerial lift operation.~~ The primary operator shall be able to operate the lift from the ground. NO PERSONNEL TO RIDE THE LIFT. The second operator will be on the ground and will be designated as a "spotter" to observe the work conditions and to communicate with the primary operator. 4B) Ground level controls shall not be operated unless permission has been obtained from the primary operator in the bucket, except in case of emergency. 4C) Only persons authorized by the team leader shall operate the aerial device.	L

5. Raise/Lower the Lift	5) Falling from the lift bucket or injury resulting from the lift striking a fixed object/structure. Electrocution Airplane collision Lightning and Storm conditions	5A) – Proposed task does not involve a person working in the bucdket at elevations. If that changes, workers will wear an approved, properly secured body harness and double, shock-absorbing lanyard at all times and shall be securely fastened to the bucket. The harness and lanyards shall be visually inspected by the users and other team member to ensure that they are in good working condition and properly secured prior to using the aerial lift. Only workers trained in fall protection will be allowed to work in the bucket at elevations greater than 6 feet above ground surface. 5B) – The lift operator and spotter on the ground shall observe overhead areas prior to raising and moving the aerial lift to ensure that there are no overhead power lines or other overhead hazards. DO NOT USE A MANLIFT WITHIN 30 FEET OF ANY OVERHEAD POWER LINES OR OTHER ELECTRICAL SOURCES. 5C) – While in the bucket, both feet shall remain in contact with the floor of the bucket at all times. 5D) – Leaning outside of the bucket will not be permitted. 5E) – Operators shall not step from the bucket to any elevated platform or object (building, tree, etc.) 5F) – Climbers (gaffs) shall not be worn while performing work from an aerial device. 5G) – An aerial truck shall not be moved when the boom is elevated. 5H) – Belting off to an adjacent pole, structure, or equipment while working from the aerial device shall not be permitted. 5I) – Employees shall not sit or climb on the edge of the basket or use planks, ladders or other devices to gain greater working height. 5J) - The operator shall look in the direction the boom is to be moved prior to activating the controls and while the bucket is moving. 5K) – Screen location prior to sighting the equipment clear of power lines. Spotter should watch for utility wires and overhead obstructions. 5L) - Aerial light on the top of the equipment. Notification to airport, other officials of the obstruction to be raised. 5M) - Monitoring weather continuously 5N) – Determine and discuss conditions to halt operations 5O) – Maintain communication with the team 5P) – Maintain Contact information to reach the rental agency if need to move equipment	**M**

6. Site conditions	6) Noxious Plants and insects	6A) - Know what poison ivy looks like and avoid it 6B) – Apply insect repellent 6C) – Conduct Tick check daily 6D) – wash after operations are completed daily.	**M**

AHA - Use of an Aerial Lift ("cherry picker")

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Hard Hat, safety glasses, gloves, steel toe work boots, high visibility safety vest)	Competent / Qualified Personnel: Name – Position/Employer Training requirements: List specific certification (as applicable) Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting Equipment specific training (Documented) Noxious plant and insect identification	Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. Inspect power cord sets prior to use. Inspect all PPE prior to use Tick check after operations (insect removal)

AHA - Asbestos Inspection and Air Monitoring
Activity Description

Activity/Work Task:	Asbestos Inspection and Associated Ambient Air Monitoring	Overall Risk Assessment Code (RAC) (Use highest code)	**M**
Project Location:			
Contract Number:			
Date Prepared:	8/31/2012	**Date Accepted:**	
Prepared by (Name/Title):	Kendra Bavor, CSP		
Reviewed by (Name/Title):			

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures
-

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the site HASP for additional requirements. Contractor to follow general site safety controls for Slips Trips and Falls, Biological hazards, cuts lacerations and pinch points, and emergency procedures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA - Asbestos Inspection and Air Monitoring
Activity Description

Job Steps	Hazards	Controls	RAC
1. Inspection planning: Prepare for site visit(s).	1A) Mobilization – Site Preparation	▪ Complete appropriate training and identify appropriate PPE needs before leaving for site. Verify condition/usefulness of PPE ▪ Provide itinerary to supervisor, or periodically check in w/office. ▪ Prepare listing of emergency phone numbers, both on and offsite. ▪ Keep vehicle maintenance up to date. ▪ Keep tools and spare tire in vehicle. ▪ Recommend carrying fire extinguisher, flashlight, battery jumper cables, first aid kit, and cellular phone in vehicle ▪ See **SFJHA Mobilization, Demobilization and Site Preparation**.	**L**
	1B) Slips, trips and falls	▪ Be aware of your surroundings. (including rough terrain, construction debris, unstable ground/surfaces, etc.). ▪ Avoid slippery floors and puddles ▪ Review facility file. ▪ Review reference documents on the facility being inspected (if available). ▪ Familiarize self w/site prior to visit; know contaminants of concern and properties, locations of suspected contaminant areas. ▪ Maintain clear path ways and work areas ▪ Wear skid-resistant soles and steel-toe shoes or boots. ▪ Do not climb homemade ladders or unstable structures.	**L**
	1C) Heavy Lifting/ Repetitive motions; frequent bending at waist	▪ Plan travel route prior to lifting materials ▪ Size up the load – divide load into manageable lots ▪ Get assistance – multi-person carry, use mechanical assistance (hand dolly or cart) ▪ Stage equipment at waist high when possible ▪ Use proper lifting techniques ▪ Stretch prior to and after lifting ▪ Stay physically fit for work	**L**
	1D) Abrasions, cuts, blunt impacts from handling equipment and/or tools	▪ Be aware of surroundings and limitations ▪ Use safety knife ▪ Do not use excessive force ▪ Wear cut resistant gloves ▪ Focus on the task at hand when handling sharps ▪ Keep body parts away from pinch points ▪ Wear long sleeves and long pants	**L**
2. Driving/parking vehicle	2A) Traffic accidents	▪ Always wear seat belts. ▪ Drive defensively/follow traffic regulations. ▪ Perform vehicle inspection for obvious items such as tire inflation, wind shield wipers, sufficient gas to get to destination. ▪ Observe state, federal and local guidelines for use of vehicle: make certain procedures regarding accidents, injuries, vehicular break downs or roadside emergencies are followed if necessary. ▪ Park in designated areas or well off travel ways when possible. ▪ Use warning signs and traffic cones when necessary	**L**

	2B) Hostile neighborhoods/ Irritated site owner	▪ Be aware of surroundings. ▪ Use buddy system, when possible. ▪ Keep doors locked. ▪ Recommend carrying cellular phone. ▪ Obtain a law enforcement escort if necessary. ▪ Be courteous and diplomatic. ▪ If escorting is required, do not enter site unless accompanied by site personnel. ▪ Identify areas where potential hazards may lurk, plan escape route in advance. ▪ Stick to schedule ▪ Wear or provide proper identification ▪ Assess site conditions	**L**
	2C) Heat Exhaustion, Sun Exposure and Weather conditions	▪ Heat- Avoid dehydration. ▪ Know signs of heat stroke have fluids available at site, take frequent rest breaks. ▪ Sun- Keep body protected wears sunscreen when not sampling, wide brimmed hat or hard hat and sunglasses. ▪ Inclement conditions- seek covered, secure shelter ▪ Extreme cold- layered clothing, gloves, hat, etc. ▪ Identify any addition hazards not in Health and Safety Plan; ▪ Be familiar with escape routes and emergency procedures.	**L**
3. Site inspection	3A) Slips trips and falls	▪ See 1B above	**L**
	3B) Confined Spaces/ Engulfment/ Drowning	▪ Avoid elevated tanks, or structures, lacking adequate safety features (such as handrails and good quality ladders.). ▪ Do not enter regulated asbestos areas without proper level of respirator, PPE, and appropriate training. Do not enter confined spaces. ▪ Active asbestos removal containment entry requires complete removal of street clothing in uncontaminated area and use of full Tyvek suit in contamination area, with appropriate safety equipment such as boots, gloves, hardhat, etc. within the containment area. ▪ Do not enter areas where floor is covered with water or other liquid; potential for engulfment/drowning.	**L**
	3C) Asphyxiation and/or inhalation of hazardous materials.	▪ Do not enter regulated asbestos areas without proper level of respirator, PPE, and appropriate training. ▪ If active removal area entry is necessary, the OSHA respiratory protection procedures for asbestos personnel shall be followed. ▪ Do not enter confined spaces without specific training, assessment of space, and person staying at entrance/exit. Confined spaces are places where toxic gases could be trapped, such as empty tanks, manholes, and chemical storage rooms (chlorine, etc.) with poor ventilation. ▪ Follow air monitoring as directed in the HASP ▪ Do not open containers.	**L**
	3D) Electrical hazards;	▪ Be alert and aware of surroundings. ▪ Do not touch electrical wires (or metal surfaces in contact with wires). ▪ Use GFCI outlets or “pigtails” ▪ Do not remove the grounding prong on plugs ▪ Keep cords and hoses out of the walk ways	**L**
	3E) Falling debris and low-hanging objects; Cuts/abrasion from sharp objects, debris, etc.	▪ Wear PPE including appropriate clothing, safety boots, hard hat, and cut resistant gloves. ▪ Recommend Tetanus immunization. ▪ Be aware of others working in the area and above ▪ Do not enter areas where falling debris is a likely	**L**

	3F) Dangerous animals and vegetation	▪ Be aware of your surroundings. ▪ Learn to identify and avoid toxic plants such as poison wood trees. ▪ Watch for dangerous animals, such as dogs, raccoons, snakes and insects. ▪ Wear appropriate clothing and boots and carry mosquito repellent.	**L**
	3G) Eye/skin contact with biological and chemical contaminants during inspection and sampling.	▪ Minimize exposure: avoid contact with contaminated surfaces. Wear adequate PPE, such as appropriate respiratory protection, clothing, gloves, and eye protection. ▪ Carry adequate supply of clean water for washing and flushing skin and eyes. ▪ Recommend periodical medical monitoring and Hepatitis immunization.	**L**
4. Entering abandoned buildings / Working near / around abandoned equipment / industrial processes / manufacturing equipment	4A) Structurally unsound building conditions	▪ Enter building/area with extreme caution and visually assess immediate areas for imminent hazards/dangers. ▪ Locate safest, fastest escape route out of building. ▪ Never enter an abandoned building without a partner. ▪ Maintain contact (voice or visual) with partner at all times. ▪ Be aware of potential infestation by rodents, birds, insects, or other animals. ▪ Document areas that are unsafe for access. ▪ Do not enter a building that is unsound, infested or unsafe.	**L**
	4B) Abandoned equipment still energized/not properly locked-out/tagged-out	▪ Turning on building lights may cause electrical shortages = fire hazards. ▪ Do not try to utilize or operate abandoned equipment. ▪ Stay on designated walk ways if possible ▪ Do not wear loose clothing or jewelry, tie back long hair.	**L**
	4C) Occupation by unauthorized people / criminal activities	▪ Be aware of potential unauthorized human vagrants. ▪ If conditions require, obtain law enforcement. ▪ Leave an unsafe area immediately and contact law enforcement and project management.	**L**
5. Unknown situation/ hazard encountered	5A) Unknown situation/ hazard encountered	▪ Stay away from unidentified pools of liquids, storage containers, steel drums, boxes, etc. where contents are unknown. ▪ Halt inspection and remove self to position of safety; contact supervisor/office for guidance. ▪ If appropriate guidance is unavailable, stop inspection and return to the office. ▪ If injury has occurred, proceed to nearest emergency medical facility for treatment. ▪ Contact supervisor as soon as possible. If you believe you have been exposed to harmful levels of chemicals or physical agents, inform supervisor as soon as possible to get medical monitoring. ▪ All injuries and suspected exposures are to be reported to supervisors.	**L**
6. Operate / install monitoring equipment	6A) Struck by, contact with, caught in or between various items or parts of the equipment	▪ make sure you understand the proper way to use each item ▪ After repairs, check to ensure everything back together properly before re-starting equipment after use put everything in safest mode. ▪ Be certain to disconnect monitors or calibrators or data acquisition units as necessary ▪ Use GFCI outlets or “pigtails” ▪ Do not remove the grounding prong on plugs ▪ Keep cords and hoses out of the walk ways	**L**
7. Asbestos Air Sample Collection	7A) Restricted access – work area	▪ Do not enter regulated asbestos areas without proper level of respirator, PPE, and appropriate training. ▪ Do not enter confined spaces. ▪ Active asbestos removal containment entry requires complete removal of street clothing in uncontaminated area and use of full Tyvek suit in contamination area, with appropriate safety equipment such as boots, gloves, hardhat, etc. within the containment area.	**M**

AHA - Asbestos Inspection and Air Monitoring
Activity Description

8. Site exit	8A) Improper decontamination	▪ Active asbestos removal containment entry requires (COMPLIANCE WITH OSHA ASBESTOS REMOVAL STANDARDS) such as air monitoring, work enclosures, asbestos wetting (to keep down airborne asbestos dust), complete removal of street clothing in uncontaminated area and use of full Tyvek suit in contamination area, with appropriate safety equipment such as boots, gloves, hardhat, respiratory protection, etc. within the containment area. ▪ Minimize exposure by avoiding contact with containment area. ▪ If entry occurs into active asbestos removal area, then all decontamination procedures must be followed. These procedures should include: proper decontamination and/or disposal of contaminated safety clothing; cleaning of PPE equipment; and shower before exiting the containment area. ▪ Update exposure log.	**L**
9. Drive to office or next site for inspection	9A) Traffic hazards	▪ See SFJHA Mobilization, Demobilization and Site Preparation	**L**
10. Record Inspection activities	10A) Slips, trips and falls	▪ See 1B above	**L**
	10B) Repetitive Motion	▪ Take stretch breaks ▪ Use ergonomic equipment ▪ Avoid reaching ▪ Elevate work to waist height if possible	**L**

AHA - Asbestos Inspection and Air Monitoring
Activity Description

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (1/2 face respirator with P-100 cartridge, Hard Hat, safety glasses, gloves, steel toe work boots, high visibility safety vest, hearing protection) Note: When initially entering the site the following PPE must be donned: • Work Uniform or Work Clothes • Hard Hat • Safety Glasses • Steel Toe Boots • Reflective Vests	**Competent / Qualified Personnel:** Name – Position/Employer (See HASP) **Training requirements:** List specific certification (as applicable) Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting Respiratory Protection Training Fit Test Physical Medical Clearance	Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. Inspect power cord sets prior to use. Inspect all PPE prior to use

AHA – Stormwater System Dye Testing
Activity Description

Activity/Work Task:	Stormwater System Dye Testing		
Project Location:			
Contract Number:			
Date Prepared:	2/19/2016	**Date Accepted:**	
Prepared by (Name/Title):	Kendra Bavor, CSP		
Reviewed by (Name/Title):			

Overall Risk Assessment Code (RAC) (Use highest code) **L**

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures
-

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the site HASP for additional requirements. Contractor to follow general site safety controls for Slips Trips and Falls, Biological hazards, cuts lacerations and pinch points, and emergency procedures.

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart
E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

AHA – Stormwater System Dye Testing
Activity Description

Job Steps	Hazards	Controls	RAC
1. Inspection planning: Prepare for site visit(s).	1A) Mobilization – Site Preparation	▪ Complete appropriate training and identify appropriate PPE needs before leaving for site. Verify condition/usefulness of PPE ▪ Provide itinerary to supervisor, or periodically check in w/office. ▪ Prepare listing of emergency phone numbers, both on and offsite. ▪ Keep vehicle maintenance up to date. ▪ Keep tools and spare tire in vehicle. ▪ Recommend carrying fire extinguisher, flashlight, battery jumper cables, first aid kit, and cellular phone in vehicle ▪ See **SFJHA Mobilization, Demobilization and Site Preparation**.	**L**
	1B) Slips, trips and falls	▪ Be aware of your surroundings. (including rough terrain, construction debris, unstable ground/surfaces, etc.). ▪ Avoid slippery floors and puddles ▪ Review facility file. ▪ Review reference documents on the facility being inspected (if available). ▪ Familiarize self w/site prior to visit; know contaminants of concern and properties, locations of suspected contaminant areas. ▪ Maintain clear path ways and work areas ▪ Wear skid-resistant soles and steel-toe shoes or boots. ▪ Do not climb homemade ladders or unstable structures.	**L**
	1C) Heavy Lifting/ Repetitive motions; frequent bending at waist	▪ Plan travel route prior to lifting materials ▪ Size up the load – divide load into manageable lots ▪ Get assistance – multi-person carry, use mechanical assistance (hand dolly or cart) ▪ Stage equipment at waist high when possible ▪ Use proper lifting techniques ▪ Stretch prior to and after lifting ▪ Stay physically fit for work	**L**
	1D) Abrasions, cuts, blunt impacts from handling equipment and/or tools	▪ Be aware of surroundings and limitations ▪ Use safety knife ▪ Do not use excessive force ▪ Wear cut resistant gloves ▪ Focus on the task at hand when handling sharps ▪ Keep body parts away from pinch points ▪ Wear long sleeves and long pants	**L**
2. Driving/parking vehicle	2A) Traffic accidents	▪ Always wear seat belts. ▪ Drive defensively/follow traffic regulations. ▪ Perform vehicle inspection for obvious items such as tire inflation, wind shield wipers, sufficient gas to get to destination. ▪ Observe state, federal and local guidelines for use of vehicle: make certain procedures regarding accidents, injuries, vehicular break downs or roadside emergencies are followed if necessary. ▪ Park in designated areas or well off travel ways when possible. ▪ Use warning signs and traffic cones when necessary	**L**

	2B) Hostile neighborhoods/ Irritated site owner	▪ Be aware of surroundings. ▪ Use buddy system, when possible. ▪ Keep doors locked. ▪ Recommend carrying cellular phone. ▪ Obtain a law enforcement escort if necessary. ▪ Be courteous and diplomatic. ▪ If escorting is required, do not enter site unless accompanied by site personnel. ▪ Identify areas where potential hazards may lurk, plan escape route in advance. ▪ Stick to schedule ▪ Wear or provide proper identification ▪ Assess site conditions	**L**
	2C) Heat Exhaustion, Sun Exposure and Weather conditions	▪ Heat- Avoid dehydration. ▪ Know signs of heat stroke have fluids available at site, take frequent rest breaks. ▪ Sun- Keep body protected wears sunscreen when not sampling, wide brimmed hat or hard hat and sunglasses. ▪ Inclement conditions- seek covered, secure shelter ▪ Extreme cold- layered clothing, gloves, hat, etc. ▪ Identify any addition hazards not in Health and Safety Plan; ▪ Be familiar with escape routes and emergency procedures.	**L**
3. Site inspection	3A) Slips trips and falls	▪ See 1B above	**L**
	3B) Confined Spaces/ Engulfment/ Drowning	▪ Avoid elevated tanks, or structures, lacking adequate safety features (such as handrails and good quality ladders.). ▪ Do not enter regulated asbestos areas without proper level of respirator, PPE, and appropriate training. Do not enter confined spaces. ▪ Active asbestos removal containment entry requires complete removal of street clothing in uncontaminated area and use of full Tyvek suit in contamination area, with appropriate safety equipment such as boots, gloves, hardhat, etc. within the containment area. ▪ Do not enter areas where floor is covered with water or other liquid; potential for engulfment/drowning.	**L**
	3C) Asphyxiation and/or inhalation of hazardous materials.	▪ Do not enter regulated asbestos areas without proper level of respirator, PPE, and appropriate training. ▪ If active removal area entry is necessary, the OSHA respiratory protection procedures for asbestos personnel shall be followed. ▪ Do not enter confined spaces without specific training, assessment of space, and person staying at entrance/exit. Confined spaces are places where toxic gases could be trapped, such as empty tanks, manholes, and chemical storage rooms (chlorine, etc.) with poor ventilation. ▪ Follow air monitoring as directed in the HASP ▪ Do not open containers.	**L**
	3D) Electrical hazards;	▪ Be alert and aware of surroundings. ▪ Do not touch electrical wires (or metal surfaces in contact with wires). ▪ Use GFCI outlets or “pigtails” ▪ Do not remove the grounding prong on plugs ▪ Keep cords and hoses out of the walk ways	**L**
	3E) Falling debris and low-hanging objects; Cuts/abrasion from sharp objects, debris, etc.	▪ Wear PPE including appropriate clothing, safety boots, hard hat, and cut resistant gloves. ▪ Recommend Tetanus immunization. ▪ Be aware of others working in the area and above ▪ Do not enter areas where falling debris is a likely	**L**

AHA – Stormwater System Dye Testing
Activity Description

	3F) Dangerous animals and vegetation	▪ Be aware of your surroundings. ▪ Learn to identify and avoid toxic plants such as poison wood trees. ▪ Watch for dangerous animals, such as dogs, raccoons, snakes and insects. ▪ Wear appropriate clothing and boots and carry mosquito repellent.	**L**
	3G) Eye/skin contact with biological and chemical contaminants during inspection and sampling.	▪ Minimize exposure: avoid contact with contaminated surfaces. Wear adequate PPE, such as appropriate respiratory protection, clothing, gloves, and eye protection. ▪ Carry adequate supply of clean water for washing and flushing skin and eyes. ▪ Recommend periodical medical monitoring and Hepatitis immunization.	**L**
4. Entering abandoned buildings / Working near / around abandoned equipment / industrial processes / manufacturing equipment	4A) Structurally unsound building conditions	▪ Enter building/area with extreme caution and visually assess immediate areas for imminent hazards/dangers. ▪ Locate safest, fastest escape route out of building. ▪ Never enter an abandoned building without a partner. ▪ Maintain contact (voice or visual) with partner at all times. ▪ Be aware of potential infestation by rodents, birds, insects, or other animals. ▪ Document areas that are unsafe for access. ▪ Do not enter a building that is unsound, infested or unsafe.	**L**
	4B) Abandoned equipment still energized/not properly locked-out/tagged-out	▪ Turning on building lights may cause electrical shortages = fire hazards. ▪ Do not try to utilize or operate abandoned equipment. ▪ Stay on designated walk ways if possible ▪ Do not wear loose clothing or jewelry, tie back long hair.	**L**
	4C) Occupation by unauthorized people / criminal activities	▪ Be aware of potential unauthorized human vagrants. ▪ If conditions require, obtain law enforcement. ▪ Leave an unsafe area immediately and contact law enforcement and project management.	**L**
5. Unknown situation/ hazard encountered	5A) Unknown situation/ hazard encountered	▪ Stay away from unidentified pools of liquids, storage containers, steel drums, boxes, etc. where contents are unknown. ▪ Halt inspection and remove self to position of safety; contact supervisor/office for guidance. ▪ If appropriate guidance is unavailable, stop inspection and return to the office. ▪ If injury has occurred, proceed to nearest emergency medical facility for treatment. ▪ Contact supervisor as soon as possible. If you believe you have been exposed to harmful levels of chemicals or physical agents, inform supervisor as soon as possible to get medical monitoring. ▪ All injuries and suspected exposures are to be reported to supervisors.	**L**
6. Creating dye solution. Mix dye concentrate with water	6A) Irritant to skin and eyes 6B) Staining of materials in contact. 6C) splash	▪ understand the product. review the SDS. ▪ follow manufacturer's instructions for mix ratio ▪ If ingested, drink water. (urine will be colored for a short period of time. ▪ Add concentrate and water slowly. Stir gently. Wear safety glasses under a face shield. ▪ Wear nitrile gloves and protective clothing to avoid staining from splashes. ▪ Ultraviolet light will deteriorate the color of the dye. Control spills.	**L**
7. Data Collection Tracing dye Open manhole covers, locate storm drain grates and outfalls	7A) Open manhole covers, locate storm drain grates and outfalls. Mud areas	▪ Do not enter confined spaces. ▪ Install barriers if opening manholes to prevent falling into the piping system and control traffic including vehicles and personnel in the work area. ▪ Wear chemical resistant boots near outfalls. ▪ View remotely when possible	**L**
8. Add dye solution to the system	7A) Fix number	▪ Add the solution to the system to minimize splash and spilling outside the system.	**L**

9. Site exit	8A) Improper decontamination	▪ Active asbestos removal containment entry requires (COMPLIANCE WITH OSHA ASBESTOS REMOVAL STANDARDS) such as air monitoring, work enclosures, asbestos wetting (to keep down airborne asbestos dust), complete removal of street clothing in uncontaminated area and use of full Tyvek suit in contamination area, with appropriate safety equipment such as boots, gloves, hardhat, respiratory protection, etc. within the containment area. ▪ Minimize exposure by avoiding contact with containment area. ▪ If entry occurs into active asbestos removal area, then all decontamination procedures must be followed. These procedures should include: proper decontamination and/or disposal of contaminated safety clothing; cleaning of PPE equipment; and shower before exiting the containment area. ▪ Update exposure log.	**L**
10. Drive to office or next site for inspection	9A) Traffic hazards	▪ See SFJHA Mobilization, Demobilization and Site Preparation	**L**
11. Record Inspection activities	10A) Slips, trips and falls	▪ See 1B above	**L**
	10B) Repetitive Motion	▪ Take stretch breaks ▪ Use ergonomic equipment ▪ Avoid reaching ▪ Elevate work to waist height if possible	**L**

AHA – Stormwater System Dye Testing
Activity Description

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (1/2 face respirator with P-100 cartridge, Hard Hat, safety glasses, gloves, steel toe work boots, high visibility safety vest, hearing protection) Note: When initially entering the site the following PPE must be donned: • Work Uniform or Work Clothes • Hard Hat • Safety Glasses • Steel Toe Boots • Reflective Vests • Barricade – open manholes • Chemical resistant boots • Face shield • Nitrile gloves	**Competent / Qualified Personnel:** Name – Position/Employer (See HASP) **Training requirements:** List specific certification (as applicable) Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting Physical Medical Clearance	Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. Inspect power cord sets prior to use. Inspect all PPE prior to use

Contaminant Fact Sheets

PCBs-Aroclor 1242(Method 8082)
Aroclor 1254(Method 8082)
Aroclor 1260(Method 8082)
PCBs (Total as 1254, on site)
Asbestos
PAH
Copper
Zinc
Chromium
Lead
Nickel

ATTACHMENT A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
PCBs (42% Chlorine)
CAS Number: 435469-21-9
Synonyms:
Chlorodiphenyl (42% Chlorine), Aroclor 1242, Polychlorinated biphenyl

HEALTH HAZARD DATA

Color: Colorless to light colored

Physical State: Solid ___ Liquid ___ Gas ___

Odor: Mild, Hydrocarbon

Odor Threshold: ___

Vapor Density: 11.5
Vapor Pressure 0.001 mmHg
Ionization Potential (IP): Unk

IDLH: Ca (5 mg/m^3)

Carcinogen: OSHA ___ IARC X NTP X ACGIH X NIOSH X

Skin absorbable Yes X No ___
Skin corrosive: Yes ___ No X

Signs/Symptoms of Acute Exposure:
Irritates the eyes; chloracne; liver damage; reproductive effects. Carcinogen.

Source	TWA (units) ppm	STEL (units) ppm	C (units) ppm
OSHA PELs	1 mg/m^3 Skin		
ACGIH TLVs	1 mg/m^3 Skin		
NIOSH RELs	0.001 mg/m^3		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level
Dust Meter	Any	Factory	N/A	**
**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits				

Checked by: Cindy Sundquist Date: 9/11/2009

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits: Saranex

Gloves: Viton or Neoprene

Boots: Butyl, Nitrile

Service Limit Concentration (ppm): **

MUC 1/2 Mask APR = TWA x 10 = **
MUC Full-Face APR = TWA x 10 = **

** Contact C. Sundquist

FIRE/REACTIVITY DATA

Flash Point: N/A

LEL/UEL: N/A

Fire Extinguishing Media:
Dry Chemical N/A Foam N/A
Water Spray N/A CO_2 N/A

Incompatibilities:
Strong Oxidizers

Note: The recommended protective clothing materials assumes that potential for direct contact (by splashing, dust inhalation, or other means) with the contaminants exists. Professional judgment and knowledge of on-site hazards should be used in selecting PPE appropriate to the concentration of the contaminant (trace vs percentage) to which the individual is likely to be exposed.

ATTACHMENT A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name
PCB-1254
CAS Number: 11097-69-1
Synonyms
Aroclor-1254, Chlorodipheny
Polychlorinated bipheny

HEALTH HAZARD DATA

Color: Colorless to pale yellov

Physical State: Solid X (below 50° F); Liquid (Viscous); Gas

Odor: Hydrocarbon

Odor Threshold: N/A

Vapor Density: N/A

Ionization Potential (IP): Unknown

IDLH: 5 mg/m³

Carcinogen: OSHA; IARC X; NTP X; ACGIH X; NIOSH X

Skin absorbable: yes X no ___

Skin corrosive: yes X no ___

Signs/Symptoms of Acute Exposure
Irritant to eyes, chloracne, liver damag

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	0.5 mg/m³		
ACGIH TLVs	0.5 mg/m³		
NIOSH RELs	0.001 mg/m³		

AIR MONITORING

Type	Brand/Mode No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level
Not Applicable				

Checked by: Emmet F. Curtis Date: 2/15/00

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials

Suits: Saranex

Gloves: Viton Butyl Rubber; Teflon, Neoprene

Boots

Service Limit Concentration (ppm)

MUC 1/2 Mask APR = TWA x 10 = 5 mg/m³
MUC Full-Face APR = TWA x 10 = 5 mg/m³

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA/NA

Fire Extinguishing Media

Dry Chemical	X	Foam	X
Water Spray	X	CO_2	X

Incompatibilities
Strong oxidizers

Note: The recommended protective clothing materials assumes that potential for direct contact (by splashing, dust inhalation, or other means) with the contaminants exists. Professional judgment and knowledge of on-site hazards should be used in selecting PPE appropriate to the concentration of the contaminant (trace vs percentage) to which the individual is likely to be exposed.

ATTACHMENT A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
Aroclors-General 1336-36-3,
CAS Number: 11097-69-1, 53469-21-9
Synonyms:
Chlorodiphenyls
Polychlorinated biphenyls (PCBs)

HEALTH HAZARD DATA

Color: Colorless to pale yellow

Physical State: Solid X (below 50^0 F)
Liquid (Viscous)
Gas

Odor: Hydrocarbon-like

Odor Threshold: NA

Vapor Density: NA

Ionization Potential (IP): Unknown

IDLH: 5 mg/m^3

Carcinogen: OSHA
IARC X
NTP X
ACGIH X
NIOSH X

Skin absorbable: yes X no ___
Skin corrosive: yes X no ___

Signs/Symptoms of Acute Exposure:
Irritant to eyes, chloracne, liver damage

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	0.5 mg/m^3 (1254)		
ACGIH TLVs	0.5 mg/m^3 (1254)		
NIOSH RELs	0.001 mg/m^3 (1254)		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level
Dust Meter	Any	Factory	N/A	**
**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits				

Checked by: C. Sundquist Date: 9/12/09

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits: Saranex, Butyl Rubber, Neoprene, Viton, Teflon, Barricade, Responder

Gloves: Viton, Butyl Rubber; Teflon, Neoprene

Boots: Butyl Rubber, Neoprene

Service Limit Concentration (ppm): **

MUC 1/2 Mask APR = TWA x 10 = **

MUC Full-Face APR = TWA x 10 = **

** Contact C. Sundquist

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA/NA

Fire Extinguishing Media:

Dry Chemical	X	Foam	X
Water Spray	X	CO_2	X

Incompatibilities:
Strong oxidizers

Note: The recommended protective clothing materials assumes that potential for direct contact (by splashing, dust inhalation, or other means) with the contaminants exists. Professional judgment and knowledge of on-site hazards should be used in selecting PPE appropriate to the concentration of the contaminant (trace vs percentage) to which the individual is likely to be exposed.

ATTACHMENT A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
Asbestos
CAS Number: 1332-21-4
Synonyms:
Actinolite, Amosite, Anthophyllite, Crysotile
Crocidolite, Tremolite

HEALTH HAZARD DATA

Color: hite, greenish, blue, or gray-gre
Fibrous
Physical State: Solid x
Liquid
Gas

Odor: Odorless

Odor Threshold: N/A

Vapor Density: N/A
Vapor Pressure N/A
Ionization Potential (IP) N/A

IDLH: Ca - NE
Route of Entry: Inh, Ing, Con

Carcinogen: OSHA X
IARC X
NTP X
ACGIH X
NIOSH X

Skin absorbabl Yes No X
Skin corrosive: Yes No X

Signs/Symptoms of Acute Exposure:
Asbestosis (chronic exposure), dyspenea, intersitia
fibrosis, restricted pulmonary function, finger clubb
irritates eyes, carcinogen

Source	TWA (units) ppm	STEL (units) ppm	C (units) ppm
OSHA PELs	0.1 f/cc	1 f/cc (15 min)	
ACGIH TLVs	0.1 f/cc		
NIOSH RELs	0.1 f/cc fiber/cubic centimeter		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level
Personal Sampling		Calibrate pump to flow rate of 2 LPM	N/A	N/A

Checked by: Cindy Sundquist Date: 10/26/2011

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:
Suits Uncoated Tyveks

Gloves

Boots

Service Limit Concentration (ppm):

MUC 1/2 Mask APR = TWA x 10 =
MUC Full-Face APR = TWA x 10 =

FIRE/REACTIVITY/FIRST AID DATA

Flash Point: N/A

LEL/UEL: N/A

Fire Extinguishing Media:
Dry Chemical Foam
Water Spray CO_2

Incompatibilities: None reported

First Aid: Irrigate eyes immediately. If inhale breath fresh air ASAP

Note: The recommended protective clothing materials assumes that potential for direct contact (by splashing, dust inhalation, or other means) with the contaminants exists. Professional judgment and knowledge of on-site hazards should be used in selecting PPE appropriate to the concentration of the contaminant (trace vs percentage) to which the individual is likely to be exposed.

NE = None Established Abs = Skin Absorption Inh = Inhalation
NA = Not Applicable/Not Available Ing = Ingestion Con = Skin and/or Eye contact

APPENDIX A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
Polycyclic Aromatic Hydrocarbons
CAS Number: 12-90-00
Synonyms:
Coal Tar Pitch Volatiles
(CAS 65996-93-2)

HEALTH HAZARD DATA

Color: Colorless

Physical State: Solid Residue ____
Liquid ____
Gas ____

Odor: NA

Odor Threshold NA

Vapor Density: >1.0 g/L

Ionization Potential (IP): NA

IDLH: 80 mg/m3

Carcinogen: OSHA ____
IARC X
NTP X
ACGIH X
NIOSH X

Skin absorbable: YES

Skin corrosive: YES

Signs/Symptoms of Acute Exposure:
Dermatitis, bronchitis.

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	0.2 mg/m3		
ACGIH TLVs	0.2 mg/m3		
NIOSH RELs	0.1 mg/m3		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Resonse or Conversion Factor	Meter Specific Action Level
Dust meter **Action limit will be based on soil concentrations. Contact C. Sundquist for action limits	Any		N/A	**

Checked by: Date:

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits Tyvek

Gloves Nitrile or neoprene

Boots Neoprene

Service Limit Concentration (ppm): NA

MUC 1/2 Mask APR = TWA x 10 = **2 mg/m3

MUC Full-Face APR = TWA x *50 = **10 mg/m3

*If quantitative fit testing is conducted, otherwise, use protection factor of 10

**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA

Fire Extinguishing Media:

Dry Chemical X Foam X

Water Spray ____ CO_2 X

Incompatibilities:
Strong Oxidizers

APPENDIX A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
Copper

CAS Number: 7440-50-8

Synonyms:
Cu, copper metal dusts

HEALTH HAZARD DATA

Color: Reddish gold metallic

Physical State: Solid X
Liquid
Gas

Odor: NA

Odor Threshold NA

Vapor Density: NA

Ionization Potential (IP): NA

IDLH: 100 mg/m^3

Carcinogen: OSHA
IARC
NTP
ACGIH
NIOSH

Skin absorbable: Yes

Skin corrosive: No

Signs/Symptoms of Acute Exposure:

Fumes/dust may cause eye/upper respiratory irritation; may induce allergic contact dermatitits in susceptible individuals. Ingestion causes nausea, vomiting, abdominal pain, metallic taste, and diarrhea. Ingestion of large doses may cause stomach and intestine ulceration, jaundice, and kidney and liver damage.

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	1 mg/m^3		
ACGIH TLVs	1 mg/m^3		
NIOSH RELs	1 mg/m^3		

AIR MONITORING

Type	Brand/Model No.	Calibration Method/ Media	Relative Response or Conversion Factor	Meter Specific Action Level
Collection on a Mixed Cellulose Ester Filter (MCEF) 0.8 microns at a flow rate of 2 liters/minute until a maximum collection volume of 960 liters is reached. Analysis via AAS or ICP	NA	NA	NA	NA
Dust meter **Action limit will be based on soil concentrations. Contact C. Sundquist for action limits	Any		N/A	**

Checked by: Date:

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits Tyvek, Polycoated Tyvkes

Gloves Any chemical –resistant Gloves

Boots Any chemical –resistant boots

Service Limit Concentration (ppm):

MUC 1/2 Mask APR = TWA x 10 = **10 mg/m^3

-MUC Full-Face APR = TWA x *50 = **50 mg/m^3

*If quantitative fit testing is conducted, otherwise, use protection factor of 10

**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA

Fire Extinguishing Media:

Dry Chemical X Foam X

Water Spray CO_2 X

Note: Do not allow molten copper to contact water

Incompatibilities:

Reacts violently with ammonium nitrate, bromates, chlorates, iodates, chloride, ethylene oxide, hydrazine mononitrate, hydrazoic acid, sodium azide, potassium oxide, acetylene gas and magnesium metal

APPENDIX A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name: Zinc

CAS Number: 7440-66-6

Synonyms: Zn, zinc metal dusts

HEALTH HAZARD DATA

Color: Silver/bluish white metallic

Physical State: Solid X

Liquid

Gas

Odor: NA

Odor Threshold NA

Vapor Density: NA

Ionization Potential (IP): NA

IDLH: NA

Carcinogen: OSHA

IARC

NTP

ACGIH

NIOSH

Skin absorbable: Yes

Skin corrosive: No

Signs/Symptoms of Acute Exposure:

Fumes/dust may cause eye/upper respiratory irritation; may cause acute lung damage/edema.

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	5 mg/m3		
ACGIH TLVs	2 mg/m3		
NIOSH RELs	5 mg/m3		

AIR MONITORING

Type	Brand/ Model No.	Calibration Method/ Media	Relative Response or Conversion Factor	Meter Specific Action Level
Collection on a Mixed Cellulose Ester Filter (MCEF) 0.8 microns at a flow rate of 2 liters/minute until a maximum collection volume of 960 liters is reached. Analysis via AAS or ICP	NA	NA	NA	NA
Dust meter **Action limit will be based on soil concentrations. Contact C. Sundquist for action limits	Any		N/A	**

Checked by: Date:

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits Uncoated Tyveks

Polycoated Tyveks

Gloves Any Chemical resistant Gloves

Boots Any Chemical resistant Boots

Service Limit Concentration (ppm):

MUC 1/2 Mask APR = TWA x 10 = NA

MUC Full-Face APR = TWA x 50 = NA

*If quantitative fit testing is conducted, otherwise, use protection factor of 10

**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA

Fire Extinguishing Media:

Dry Chemical X Foam

Water Spray CO_2

Note: Powder is very flammable; reacts chemically with halon and CO_2 gas extinguishers

Incompatibilities:

Incompatible with NH_4NO_3, barium oxide, $Ba(NO_3)_2$, Cadmium, CS_2, chlorates, Cl_2, CrO_3, (ethyl acetoacetate + tribromoneopentyl alcohol), F_2, hydrazine mononitrate, hydroxylamine, $Pb(N_3)_2$, (Mg + $Ba(NO_3)_2$ + BaO_2), $MnCl_2$, HNO_3, performic acid, $KClO_3$, KNO_3, K_2O_2, Selenium, $NaClO_3$, Na_2O_2, Sulfur, Te, water, $(NH_4)2_S$, As_2O_3, CS_2, $CaCl_2$, NaOH, chlorinated rubber, catalytic metals, halocarbons, o-nitroanisole, nitrobenzene, nonmetals, oxidants, paint primer base, pentacarbonyliron, transition metal halides, seleninyl bromide

APPENDIX A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name: Chromium

CAS Number: 7440-47-3

Synonyms: Chrome, Chromium metal

HEALTH HAZARD DATA

Color: Blue-white to steel-gray

Physical State: Solid X
Liquid
Gas

Odor: Odorless

Odor Threshold N/A

Vapor Density: N/A

Ionization Potential (IP): N/A

IDLH: 250 mg/m^3

Carcinogen: OSHA
IARC X
NTP X
ACGIH X
NIOSH X

Skin absorbable: No

Skin corrosive: No

Signs/Symptoms of Acute Exposure:

Irritates eyes and lungs

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	0.1 ppm (Cr); 0.005 (CrO3); 0.5 (CrII/III);	CrVI = 0.005 mg/m^3	
ACGIH TLVs	0.5 mg/m^3		
NIOSH RELs	0.5 ppm (Cr); 0.001 ppm(CrVI)		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Resonse or Conversion Factor	Meter Specific Action Level
Dust meter **Action limit will be based on soil concentrations. Contact C. Sundquist for action limits	Any		N/A	**

Checked by: Joanne Bacchus Date: 06/04/08

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits Tyvek, Polycoated Tyvkes

Gloves Any chemical –resistant Gloves

Boots Any chemical –resistant boots

Service Limit Concentration (ppm): NA

MUC 1/2 Mask APR = TWA x 10 = **0.05 mg/m^3

MUC Full-Face APR = TWA x *50 = * *0.25 mg/m^3

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA / NA

Fire Extinguishing Media:

Dry Chemical X Foam X

Water Spray X CO_2 X

Incompatibilities:

Strong oxidizers, alkalis

*If quantitative fit testing is conducted, otherwise, use protection factor of 10

**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits

APPENDIX A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
Lead
CAS Number: 7439-92-1
Synonyms:
Lead Metal, Plumbum

HEALTH HAZARD DATA

Color: Gray

Physical State: Solid X
Liquid
Gas

Odor: NA

Odor Threshold NA

Vapor Density: NA

Ionization Potential (IP): NA

IDLH: 100 mg/m3

Carcinogen: OSHA
IARC X
NTP
ACGIH X
NIOSH

Skin absorbable: NO

Skin corrosive: NO

Signs/Symptoms of Acute Exposure:

Weak, insomnia, facial pallor, anorexia, low weight, constipation, abdominal pain, anemia, paralysis, (wrist and ankle), kidney disease, eye irritant, hypotension

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	0.05 mg/m3		
ACGIH TLVs	0.05 mg/m3		
NIOSH RELs	0.05 mg/m3		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Resonse or Conversion Factor	Meter Specific Action Level
Dust Meter **Action Limit based on soil concentration. Contact C. Sundquist for action limits	Any		N/A	**

Checked by: Date:

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits Uncoated Tyveks
Polycoated Tyveks

Gloves Any Chemical resistant Gloves

Boots Any Chemical resistant Boots

Service Limit Concentration (ppm): NA

MUC 1/2 Mask APR = TWA x 10 = **0.25 mg/m3

MUC Full-Face APR = TWA x *50 = **0.25 mg/m3

*If quantitative fit testing is conducted, otherwise, use protection factor of 10

**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA

Fire Extinguishing Media:

Dry Chemical Foam

Water Spray CO_2

Incompatibilities:

Strong Oxidizers, hydrogen peroxide, acid

APPENDIX A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name: Nickel

CAS Number: 7440-02-0

Synonyms: Ni, nickel metal dusts

HEALTH HAZARD DATA

Color: Silver metallic

Physical State: Solid X

Liquid

Gas

Odor: NA

Odor Threshold NA

Vapor Density: NA

Ionization Potential (IP): NA

IDLH: 10 mg/m^3

Carcinogen: OSHA

IARC X

NTP X

ACGIH

NIOSH X

Skin absorbable: Yes

Skin corrosive: No

Signs/Symptoms of Acute Exposure:

Fumes/dust may cause eye/upper respiratory irritation; may induce allergic contact dermatitis in susceptible individuals.

Source	TWA (units)	STEL (units)	C (units)
OSHA PELs	1 mg/m^3		
ACGIH TLVs	1.5 mg/m^3		
NIOSH RELs	0.015 mg/m^3		

AIR MONITORING

Type	Brand/ Model No.	Calibration Method/ Media	Relative Response or Conversion Factor	Meter Specific Action Level
Collection on a Mixed Cellulose Ester Filter (MCEF) 0.8 microns at a flow rate of 2 liters/minute until a maximum collection volume of 960 liters is reached. Analysis via AAS or ICP	NA	NA	NA	NA
Dust Meter **Action Limit based on soil concentration. Contact C. Sundquist for action limits	Any		N/A	**

Checked by: Date:

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits Uncoated Tyveks

Polycoated Tyveks

Gloves Any Chemical resistant Gloves

Boots Any Chemical resistant Boots

Service Limit Concentration (ppm):

MUC 1/2 Mask APR = TWA x 10 = **10 mg/m^3

MUC Full-Face APR = TWA x *50 = **50 mg/m^3

*If quantitative fit testing is conducted, otherwise, use protection factor of 10

**Action limit will be based on soil concentrations. Contact C. Sundquist for action limits

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA

Fire Extinguishing Media:

Dry Chemical X Foam

Water Spray X CO_2

Note: Flammable as dust or fume and may release toxic vapors; dusts may combust spontaneously

Incompatibilities:

Strong acids, sulfur, selenium, wood & other combustibles, nickel nitrate

Safety Data Sheets (SDS)

BRIGHT DYES – FLUORESCENT YELLOW/GREEN
BRIGHT DYES – FLUORESCENT RED DYE
BRIGHT DYES – FLUORESCENT BLUE DYE
HYDORCHLORIC ACID (HCL)
NITRIC ACID (HNO3)
LIQUINOX

Kingscote CHEMICALS

Safety Data Sheet

Issue Date: 04-Oct-2013 **Revision Date:** 19-Nov-2014 **Version Number:** 1

1. Identification

Product Identifiers
Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use
Water tracing & leak detection dye

Manufacturer/Supplier
Kingscote Chemicals, Inc.
3334 South Tech Blvd.
Miamisburg, OH 45342
U.S.A.

Emergency Telephone Number
Company Telephone Number: (937) 886-9100
Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)
+1-352-323-3500 (International)

2. Hazards Identification

Classification
This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek medical attention immediately.

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Get medical attention if large quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation. Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media
Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media
Not determined

Specific Hazards Arising from the Chemical
Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters
Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices. Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing should not be allowed out of the workplace.

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions	Keep container tightly closed and store in a cool, dry, and well-ventilated area. Keep from freezing.
Incompatible Materials	Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines
This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls
Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection	Goggles.
Skin & Body Protection	Rubber gloves. Suitable protective clothing.
Respiratory Protection	No protection is ordinarily required under normal conditions of use.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical State	Liquid	**Odor**	None apparent
Appearance	Yellow/green liquid	**Odor Threshold**	Not determined
Color	Yellow/green		

Property	**Values**
pH	>8.0
Melting/Freezing Point	~32° F
Boiling Point/Range	~212° F
Flash Point	Not applicable
Evaporation Rate	1.8
Flammability (solid, gas)	Liquid – not applicable
Upper Flammability Limits	Not applicable
Lower Flammability Limits	Not applicable
Vapor Pressure	Not applicable
Vapor Density	0.6
Relative Density	Not applicable
Specific Gravity	1.04
Solubility	Highly soluble in water
Partition Coefficient	Not determined
Auto-ignition Temperature	Not determined
Decomposition Temperature	Not determined
Viscosity	Not determined

10. Stability and Reactivity

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to Avoid
Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials
Acids.

Hazardous Decomposition Products
Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation	Avoid breathing vapors or mists.
Ingestion	Do not ingest.
Skin Contact	May cause an allergic skin reaction.
Eye Contact	Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure
May cause an allergic skin reaction.

Numerical Measures of Toxicity
Not determined

Symptoms Associated with Exposure
See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP	None
IARC	None
OSHA	None

12. Ecological Information

Ecotoxicity
This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information
Not available

Persistence/Degradability
Not determined

Bioaccumulation
Not determined

Mobility
Not determined

Other Adverse Effects
Not determined

13. Disposal Considerations

Waste Disposal Methods
Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging
Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note
See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT	Not regulated
IATA	Not regulated
OMDG	Not regulated

15: Regulatory Information

International Inventories

TSCA	Listed

U.S. Federal Regulations

CERCLA	This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable state right-to-know regulations.

16: Other Information

HMIS

Health Hazards	Flammability	Instability	Special Hazards
1	0	0	Not determined

NFPA

Health Hazards	Flammability	Physical Hazards	Personal Protection
1	0	0	B

Issue Date 04-Oct-2013

Revision Date 19-Nov-2014

Revision Note New format

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 09-Jan-2014 **Revision Date:** 27-Jan-2015 **Version 2**

1. IDENTIFICATION

Product Identifier

Product Name Bright Dyes® Industrial Red Liquid

Other means of identification

SDS # 106000

Recommended use of the chemical and restrictions on use

Recommended Use Aqueous Dye.

Details of the supplier of the safety data sheet

Manufacturer Address

Kingscote Chemicals, Inc.
3334 South Tech Blvd.
Miamisburg, OH 45342

Emergency Telephone Number

Company Phone Number (937) 886-9100

Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Dark red liquid **Physical State** Liquid **Odor** Odorless

Classification

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2

Signal Word

Warning

Hazard Statements

Causes skin irritation
Causes serious eye irritation
May Cause cancer

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash it before reuse
If skin irritation occurs: Get medical advice/attention

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Acetic acid	64-19-7	7-13
Basic Violet 10	81-88-9	5-15%

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash skin with soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/ attention.

Inhalation Under normal conditions, no adverse effects are expected.

Ingestion Drink plenty of water. Do not induce vomiting without medical advice. Get medical attention if large quantities were ingested or if nausea occurs. Never give anything by mouth to a person who is unconscious or convulsing.

Most important symptoms and effects

Symptoms Can cause skin irritation and will temporarily color the skin. Causes redness and irritation of the eyes. Ingestion may cause severe gastrointestinal irritation and burns to the mouth. Urine may have a red color until dye is washed through the system.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Product is not flammable.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protection recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Flush spill area with water.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Wash face, hands, and any exposed skin thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store at room temperature but above the freezing point of water.

Incompatible Materials None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Acetic acid 64-19-7	STEL: 15 ppm TWA: 10 ppm	TWA: 10 ppm TWA: 25 mg/m^3 (vacated) TWA: 10 ppm (vacated) TWA: 25 mg/m^3	IDLH: 50 ppm TWA: 10 ppm TWA: 25 mg/m^3 STEL: 15 ppm STEL: 37 mg/m^3

Appropriate engineering controls

Engineering Controls Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Wear eye/face protection.

Skin and Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use and with adequate ventilation.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Dark red liquid	**Odor**	Odorless
Color	Dark red	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	1.8 - 2.2	
Melting Point/Freezing Point	0 °C / 32 °F	
Boiling Point/Boiling Range	100 °C / 212 °F	
Flash Point	Non-flammable	
Evaporation Rate	1.80	(butyl acetate = 1)
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	23.75 mm Hg	@ 25°C (77°F)
Vapor Density	0.60	(Air=1)
Specific Gravity	Approximately 1.0	
Water Solubility	Infinite	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep from freezing. Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes serious eye irritation.

Skin Contact Causes skin irritation.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Acetic acid 64-19-7	= 3310 mg/kg (Rat)	= 1060 mg/kg (Rabbit)	= 11.4 mg/L (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity ".

Chemical Name	ACGIH	IARC	NTP	OSHA
Basic Violet 10		Group 3		

Legend

IARC (International Agency for Research on Cancer)

Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity

Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea

Acetic acid 64-19-7		79: 96 h Pimephales promelas mg/L LC50 static 75: 96 h Lepomis macrochirus mg/L LC50 static	EC50 = 8.8 mg/L 15 min EC50 = 8.8 mg/L 25 min EC50 = 8.8 mg/L 5 min	47: 24 h Daphnia magna mg/L EC50 65: 48 h Daphnia magna mg/L EC50 Static

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Acetic acid 64-19-7	-0.31

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Acetic acid 64-19-7	Toxic Corrosive Ignitable

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

Chemical Name	TSCA	DSL	NDSL	EINECS	ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Acetic acid	Present	X		Present		Present	X	Present	X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*
IECSC *- China Inventory of Existing Chemical Substances*
KECL *- Korean Existing and Evaluated Chemical Substances*
PICCS *- Philippines Inventory of Chemicals and Chemical Substances*
AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Acetic acid 64-19-7	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

SARA 313

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Basic Violet 10 -	81-88-9	7.5-15%	1.0

SARA 311/312 Hazard Categories

Acute Health - Yes
Chronic Health Hazard - Yes
Fire Hazard - No
Sudden Release of Pressure Hazard - No
Reactive Hazard - No

CWA (Clean Water Act)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Acetic acid	5000 lb			X

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Basic Violet 10 -	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Acetic acid 64-19-7	X	X	X
Basic Violet 10	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	B

WHIMS Classification

D2A – Very Toxic material causing other toxic effects

Issue Date: 09-Jan-2014
Revision Date: 27-Jan-2015
Revision Note: New Hazard Identification

Disclaimer

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End of Safety Data Sheet

Kingscote CHEMICALS

Safety Data Sheet

Issue Date: 09-Jan-2014 **Revision Date:** 20-Nov-2014 **Version Number:** 1

1. Identification

Product Identifiers
Product Name: Bright Dyes® FLT Blue Liquid

Product Number: 106005

Recommended Use & Restrictions on Use
Water tracing & leak detection dye

Manufacturer/Supplier
Kingscote Chemicals, Inc.
3334 South Tech Blvd.
Miamisburg, OH 45342
U.S.A.

Emergency Telephone Number
Company Telephone Number: (937) 886-9100
Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)
+1-352-323-3500 (International)

2. Hazards Identification

Classification
This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek medical attention immediately.

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Get medical attention if large quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation. Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a blue color until the dye has been washed through the system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media
Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media
Not determined

Specific Hazards Arising from the Chemical
Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters
Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices. Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing should not be allowed out of the workplace.

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions	Keep container tightly closed and store in a cool, dry, and well-ventilated area. Keep from freezing.
Incompatible Materials	Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines
This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls
Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection	Goggles.
Skin & Body Protection	Rubber gloves. Suitable protective clothing.
Respiratory Protection	No protection is ordinarily required under normal conditions of use.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical State	Liquid	**Odor**	None apparent
Appearance	Dark blue liquid	**Odor Threshold**	Not determined
Color	Dark blue		

Property	**Values**
pH	5.1 – 5.3
Melting/Freezing Point	~32° F
Boiling Point/Range	~212° F
Flash Point	Not applicable
Evaporation Rate	Not applicable
Flammability (solid, gas)	Liquid – not applicable
Upper Flammability Limits	Not applicable
Lower Flammability Limits	Not applicable
Vapor Pressure	Not applicable
Vapor Density	Not applicable
Relative Density	Not applicable
Specific Gravity	1.02
Solubility	Highly soluble in water
Partition Coefficient	Not determined
Auto-ignition Temperature	Not determined
Decomposition Temperature	Not determined
Viscosity	Not determined

10. Stability and Reactivity

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to Avoid
Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials
Acids.

Hazardous Decomposition Products
Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation	Avoid breathing vapors or mists.
Ingestion	Do not ingest.
Skin Contact	May cause an allergic skin reaction.
Eye Contact	Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure
May cause an allergic skin reaction.

Numerical Measures of Toxicity
Not determined

Symptoms Associated with Exposure
See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP	None
IARC	None
OSHA	None

12. Ecological Information

Ecotoxicity
This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information
Not available

Persistence/Degradability
Not determined

Bioaccumulation
Not determined

Mobility
Not determined

Other Adverse Effects
Not determined

13. Disposal Considerations

Waste Disposal Methods
Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging
Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note
See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT	Not regulated
IATA	Not regulated
OMDG	Not regulated

15: Regulatory Information

International Inventories

TSCA	Listed

U.S. Federal Regulations

CERCLA	This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable state right-to-know regulations.

16: Other Information

HMIS

Health Hazards	Flammability	Instability	Special Hazards
1	0	0	Not determined

NFPA

Health Hazards	Flammability	Physical Hazards	Personal Protection
1	0	0	B

Issue Date 09-Jan-2014

Revision Date 20-Nov-2014

Revision Note New format

Disclaimer

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End of Safety Data Sheet

SAFETY DATA SHEET

1. Identification

Product identifier: HYDROCHLORIC ACID

Other means of identification

Synonyms: Muriatic Acid, Hydrogen Chloride, Aqueous

Product No.: 9385, 9538, 9165, V226, V187, V078, V001, 6900, 2624, 2515, H999, H987, H616, 5861, 2062, 5814, 2626, 2612, 5800, 9625, 5587, 9551, 9544, 9539, 9535, 9530, 9529, 5367, H613, 37825, 25496, 20620, H613

Recommended use and restriction on use

Recommended use: Not available.
Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor Information

Manufacturer

Company Name:	Avantor Performance Materials, Inc.
Address:	3477 Corporate Parkway, Suite 200 Center Valley, PA 18034
Telephone:	Customer Service: 855-282-6867
Fax:	
Contact Person:	Environmental Health & Safety
e-mail:	info@avantormaterials.com

Emergency telephone number:

24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Corrosive to metals	Category 1

Health Hazards

Acute toxicity (Oral)	Category 4
Skin Corrosion/Irritation	Category 1
Serious Eye Damage/Eye Irritation	Category 1
Specific Target Organ Toxicity - Single Exposure (Inhalation - vapor)	Category 3

Label Elements

Hazard Symbol:

Signal Word: Danger

Hazard Statement: May be corrosive to metals.
Harmful if swallowed.
Causes severe skin burns and eye damage.
May cause respiratory irritation.

Precautionary Statement

Prevention: Keep only in original container. Wash thoroughly after handling. Do not breathe dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this product.

Response: Absorb spillage to prevent material damage. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

Storage: Store locked up. Store in a well-ventilated place. Keep container tightly closed. Store in corrosive resistant container with a resistant inner liner.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
HYDROCHLORIC ACID		7647-01-0	20 - 40%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Call a physician or poison control center immediately. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Inhalation: Move to fresh air. Call a physician or poison control center immediately. Apply artificial respiration if victim is not breathing If breathing is difficult, give oxygen.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

Symptoms: Causes severe skin and eye burns. Harmful if swallowed.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

General Fire Hazards: No data available.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: The product is non-combustible. Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: Fire or excessive heat may produce hazardous decomposition products.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Ventilate closed spaces before entering them. Keep unauthorized personnel away. Evacuate area. Keep upwind. See Section 8 of the SDS for Personal Protective Equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Methods and material for containment and cleaning up: Neutralize with lime or soda ash. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures: Inform authorities if large amounts are involved.

Environmental Precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so.

7. Handling and storage

Precautions for safe handling: Do not eat, drink or smoke when using the product. Do not get in eyes, on skin, on clothing. Wash hands thoroughly after handling. Do not breathe dust/fume/gas/mist/vapors/spray. Use caution when adding this material to water.

Conditions for safe storage, including any incompatibilities: Keep container tightly closed. Store in a well-ventilated place. Unsuitable containers: metals.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	Type	Exposure Limit Values		Source
HYDROCHLORIC ACID	Ceiling	2 ppm		US. ACGIH Threshold Limit Values (2011)
	Ceil_Time	5 ppm	7 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	Ceiling	5 ppm	7 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceiling	5 ppm	7 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)

Appropriate Engineering Controls No data available.

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin Protection

Hand Protection: Chemical resistant gloves

Other: Wear suitable protective clothing and gloves.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

Hygiene measures: Provide eyewash station and safety shower. Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Do not get in eyes. Wash contaminated clothing before reuse. Do not get this material in contact with skin.

9. Physical and chemical properties

Appearance

Physical state: Liquid
Form: Liquid
Color: Colorless
Odor: Pungent
Odor threshold: No data available.
pH: 0.1 (1 N aqueous solution)
Melting point/freezing point: -35 °C

Initial boiling point and boiling range:	48 °C
Flash Point:	Not applicable
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	14.1 kPa
Vapor density:	No data available.
Relative density:	1.18 (20 °C)
Solubility(ies)	
Solubility in water:	Soluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. Stability and reactivity

Reactivity:	Reacts violently with strong alkaline substances.
Chemical Stability:	Material is stable under normal conditions.
Possibility of Hazardous Reactions:	Hazardous polymerization does not occur.
Conditions to Avoid:	Avoid contact with strong reducing agents. Strong oxidizing agents. Contact with alkalis.
Incompatible Materials:	Acids. Amines. Alkalies. Metals. Reducing agents. Oxidizing agents.
Hazardous Decomposition Products:	Chlorine. hydrogen chloride By heating and fire, corrosive vapors/gases may be formed.

11. Toxicological information

Information on likely routes of exposure

Ingestion:	Harmful if swallowed.
Inhalation:	Causes severe burns.
Skin Contact:	Causes severe skin burns.
Eye contact:	Causes serious eye damage.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product:	ATEmix (Rat): 581 mg/kg

Dermal

Product:	No data available.

Specified substance(s):

HYDROCHLORIC ACID	LD 50 (Mouse): 1,449 mg/kg

Inhalation

Product: No data available.

Specified substance(s):

HYDROCHLORIC ACID	LC 50 (Mouse, 1 h): 1108 ppm LC 50 (Rat, 1 h): 3124 ppm

Repeated Dose Toxicity

Product: No data available.

Skin Corrosion/Irritation

Product: Causes severe skin burns.

Serious Eye Damage/Eye Irritation

Product: Causes serious eye damage.

Respiratory or Skin Sensitization

Product: Not a skin sensitizer.

Carcinogenicity

Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):
No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: No mutagenic components identified

In vivo

Product: No mutagenic components identified

Reproductive Toxicity

Product: No components toxic to reproduction

Specific Target Organ Toxicity - Single Exposure

Product: Respiratory tract irritation.

Specific Target Organ Toxicity - Repeated Exposure

Product: None known.

Aspiration Hazard

Product: Not classified

Other Effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: No data available.

Specified substance(s):

HYDROCHLORIC ACID — LC 50 (Western mosquitofish (Gambusia affinis), 96 h): 282 mg/l Mortality

Aquatic Invertebrates

Product: No data available.

Specified substance(s):

HYDROCHLORIC ACID — LC 50 (Green or European shore crab (Carcinus maenas), 48 h): 240 mg/l Mortality
LC 50 (Common shrimp, sand shrimp (Crangon crangon), 48 h): 260 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic Invertebrates

Product: No data available.

Toxicity to Aquatic Plants

Product: No data available.

Persistence and Degradability

Biodegradation

Product: Expected to be readily biodegradable.

BOD/COD Ratio

Product: No data available.

Bioaccumulative Potential

Bioconcentration Factor (BCF)

Product: No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)

Product: No data available.

Mobility in Soil: The product is water soluble and may spread in water systems.

Other Adverse Effects: Large amounts of the product may affect the acidity (pH-factor) in water with possible risk of harmful effects to aquatic organisms.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

Contaminated Packaging: No data available.

14. Transport information

DOT

UN Number:	UN 1789
UN Proper Shipping Name:	Hydrochloric acid
Transport Hazard Class(es)	
Class(es):	8
Label(s):	8
Packing Group:	II
Marine Pollutant:	No

IMDG

UN Number:	UN 1789
UN Proper Shipping Name:	HYDROCHLORIC ACID
Transport Hazard Class(es)	
Class(es):	8
Label(s):	8
EmS No.:	F-A, S-B
Packing Group:	II
Marine Pollutant:	No

IATA

UN Number:	UN 1789
Proper Shipping Name:	Hydrochloric acid
Transport Hazard Class(es):	
Class(es):	8
Label(s):	8
Marine Pollutant:	No
Packing Group:	II

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

HYDROCHLORIC ACID Reportable quantity: 5000 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

[X] Acute (Immediate) [ ] Chronic (Delayed) [ ] Fire [ ] Reactive [ ] Pressure Generating

SARA 302 Extremely Hazardous Substance

Chemical Identity	RQ	Threshold Planning Quantity
HYDROCHLORIC ACID	5000 lbs.	500 lbs.

SARA 304 Emergency Release Notification

Chemical Identity	RQ
HYDROCHLORIC ACID	5000 lbs.

SARA 311/312 Hazardous Chemical

Chemical Identity	Threshold Planning Quantity
HYDROCHLORIC ACID	500lbs

SARA 313 (TRI Reporting)

Chemical Identity	Reporting threshold for other users	Reporting threshold for manufacturing and processing
HYDROCHLORIC ACID	10000 lbs	25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

HYDROCHLORIC ACID Reportable quantity: 5000 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

HYDROCHLORIC ACID Threshold quantity: 15000 lbs

HYDROCHLORIC ACID Threshold quantity: 5000 lbs

US State Regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act

HYDROCHLORIC ACID Listed

US. Massachusetts RTK - Substance List

HYDROCHLORIC ACID Listed

US. Pennsylvania RTK - Hazardous Substances

HYDROCHLORIC ACID Listed

US. Rhode Island RTK

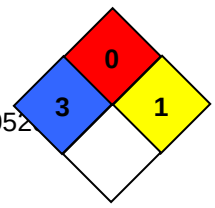
HYDROCHLORIC ACID Listed

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EU EINECS List:	On or in compliance with the inventory
EU ELINCS List:	Not in compliance with the inventory.
Japan (ENCS) List:	On or in compliance with the inventory
EU No Longer Polymers List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Switzerland Consolidated Inventory:	Not in compliance with the inventory.
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

16.Other information, including date of preparation or last revision

NFPA Hazard ID



Flammability

Health
Reactivity
Special hazard.

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue Date:	02-02-2015
Revision Date:	No data available.
Version #:	4.0
Further Information:	No data available.
Disclaimer:	THE INFORMATION PRESENTED IN THIS MATERIAL SAFETY DATA SHEET (MSDS/SDS) WAS PREPARED BY TECHNICAL PERSONNEL BASED ON DATA THAT THEY BELIEVE IN THEIR GOOD FAITH JUDGMENT IS ACCURATE. HOWEVER, THE INFORMATION PROVIDED HEREIN IS PROVIDED “AS IS,” AND AVANTOR PERFORMANCE MATERIALS MAKES AND GIVES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, AND EXPRESSLY DISCLAIMS ALL WARRANTIES REGARDING SUCH INFORMATION AND THE PRODUCT TO WHICH IT RELATES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION<(>,<)> WARRANTIES OF ACCURACY, COMPLETENESS, MERCHANTABILITY, NON-INFRINGEMENT, PERFORMANCE, SAFETY, SUITABILITY, STABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE. THIS MSDS/SDS IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PROPERLY TRAINED PERSON USING THIS PRODUCT, AND IS NOT INTENDED TO BE COMPREHENSIVE AS TO THE MANNER AND CONDITIONS OF USE, HANDLING, STORAGE, OR DISPOSAL OF THE PRODUCT. INDIVIDUALS RECEIVING THIS MSDS/SDS MUST ALWAYS EXERCISE THEIR OWN INDEPENDENT JUDGMENT IN DETERMINING THE APPROPRIATENESS OF SUCH ISSUES. ACCORDINGLY, AVANTOR PERFORMANCE MATERIALS ASSUMES NO LIABILITY WHATSOEVER FOR THE USE OF OR RELIANCE UPON THIS INFORMATION. NO SUGGESTIONS FOR USE ARE INTENDED AS, AND NOTHING HEREIN SHALL BE CONSTRUED AS, A RECOMMENDATION TO INFRINGE ANY EXISTING PATENTS OR TO VIOLATE ANY FEDERAL, STATE, LOCAL, OR FOREIGN LAWS. AVANTOR PERFORMANCE MATERIALS REMINDS YOU THAT IT IS YOUR LEGAL DUTY TO MAKE ALL INFORMATION IN THIS MSDS/SDS AVAILABLE TO YOUR EMPLOYEES.

SAFETY DATA SHEET

1. Identification

Product identifier: NITRIC ACID

Other means of identification

Synonyms: Aqua Fortis, Azotic Acid

Product No.: 9604, V471, V231, V230, V077, 6623, 2712, 2707, 2706, 2704, H988, 5876, 5856, 5801, 5796, 1409, 9761, 9670, 9618, 9617, 9616, 9615, 9612, 9607, 9606, 9601, 9598, 9597, 5371, 20758, 20754, 20752, 20750

Recommended use and restriction on use

Recommended use: Not available.
Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company Name:	Avantor Performance Materials, Inc.
Address:	3477 Corporate Parkway, Suite 200 Center Valley, PA 18034
Telephone:	Customer Service: 855-282-6867
Fax:	
Contact Person:	Environmental Health & Safety
e-mail:	info@avantormaterials.com

Emergency telephone number:

24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

2. Hazard(s) identification

Hazard classification

Physical hazards

Oxidizing liquids	Category 3
Corrosive to metals	Category 1

Health hazards

Skin corrosion/irritation	Category 1A

Unknown toxicity

Acute toxicity, oral	65 %
Acute toxicity, dermal	65 %
Acute toxicity, inhalation, vapor	100 %
Acute toxicity, inhalation, dust or mist	100 %

Unknown toxicity

Acute hazards to the aquatic environment	65 %
Chronic hazards to the aquatic environment	65 %

Label elements

Hazard symbol:

Signal word: Danger

Hazard statement: May intensify fire; oxidizer.
May be corrosive to metals.
Causes severe skin burns and eye damage.

Precautionary statement

Prevention: Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling. Keep only in original container. Keep away from heat. Keep/Store away from clothing/combustible materials. Take any precaution to avoid mixing with combustibles. Use only outdoors or in a well-ventilated area.

Response: In case of fire: Use water spray, foam, dry powder or carbon dioxide for extinction. Immediately call a POISON CENTER/doctor. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Absorb spillage to prevent material damage.

Storage: Store locked up. Store in corrosive resistant container with a resistant inner liner. Store in a well-ventilated place. Keep container tightly closed.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

Chemical identity	Common name and synonyms	CAS number	Content in percent (%)*
NITRIC ACID		7697-37-2	65 - 70%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Call a physician or poison control center immediately. Do NOT induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Inhalation: Move to fresh air. Call a physician or poison control center immediately. If breathing stops, provide artificial respiration. If breathing is difficult, give oxygen.

Skin contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

Symptoms: Corrosive to skin and eyes. Causes digestive tract burns. Spray mists may cause respiratory tract irritation.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

General fire hazards: Strong oxidizer - contact with other material may cause fire.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Water spray, fog, CO2, dry chemical, or regular foam.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: Oxidizing Contact with combustible material may cause fire. Fire may produce irritating, corrosive and/or toxic gases.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Keep unauthorized personnel away. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Use personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Methods and material for containment and cleaning up: Keep combustibles (wood, paper, oil, etc.) away from spilled material. Stop leak if possible without any risk. Do not absorb in sawdust or other combustible materials. Absorb spill with vermiculite or other inert material. Collect in a non-combustible container for prompt disposal. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures: Dike for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk. Inform authorities if large amounts are involved.

Environmental precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling: Keep away from combustible material. Do not get in eyes, on skin, on clothing. Wash hands thoroughly after handling. Do not eat, drink or smoke when using the product. Do not taste or swallow. Never add water to acid! Never pour water into acid/base. Dilute by slowly pouring the product into water while stirring.

Conditions for safe storage, including any incompatibilities: Do not store in metal containers. Store away from heat and light. Keep away from combustible material. Keep containers closed when not in use. Store in a cool, dry place. Keep container in a well-ventilated place.

8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Chemical identity	Type	Exposure Limit values		Source
NITRIC ACID	TWA	2 ppm		US. ACGIH Threshold Limit Values (2011)
	STEL	4 ppm		US. ACGIH Threshold Limit Values (2011)
	STEL	4 ppm	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	REL	2 ppm	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	2 ppm	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	2 ppm	5 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	STEL	4 ppm	10 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)

Appropriate engineering controls No data available.

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection: Chemical resistant gloves

Other: Wear suitable protective clothing.

Respiratory protection: In case of inadequate ventilation use suitable respirator. Chemical respirator with acid gas cartridge.

Hygiene measures: Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.

9. Physical and chemical properties

Appearance

Physical state:	Liquid
Form:	Liquid
Color:	Colorless to slightly yellow
Odor:	Pungent
Odor threshold:	No data available.
pH:	1 (0.1 molar aqueous solution)
Melting point/freezing point:	-42 °C
Initial boiling point and boiling range:	122 °C
Flash Point:	Not applicable
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	6.4 kPa
Vapor density:	2.5
Relative density:	1.41 (20 °C)
Solubility(ies)	
Solubility in water:	Soluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. Stability and reactivity

Reactivity: Reacts violently with strong alkaline substances.

Chemical stability: Material is stable under normal conditions.

Possibility of hazardous reactions: Hazardous polymerization does not occur. Decomposes on heating.

Conditions to avoid: Reacts violently with strong alkaline substances. Avoid contact with strong reducing agents. Excessive heat. Contact with incompatible materials.

Incompatible materials: Alcohols. Reducing agents. Metals. Alkalies.

Hazardous decomposition products: Nitrogen Oxides By heating and fire, corrosive vapors/gases may be formed.

11. Toxicological information

Information on likely routes of exposure

Ingestion: May cause burns of the gastrointestinal tract if swallowed.

Inhalation: May cause damage to mucous membranes in nose, throat, lungs and bronchial system.

Skin contact: Causes severe skin burns.

Eye contact: Causes serious eye damage.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: No data available.

Dermal
Product:
No data available.

Inhalation
Product: No data available.

Specified substance(s):
NITRIC ACID LC 50 (Rat, 4 h): 65 mg/l

Repeated dose toxicity
Product: No data available.

Skin corrosion/irritation
Product: Causes severe skin burns.

Serious eye damage/eye irritation
Product: Causes serious eye damage.

Respiratory or skin sensitization
Product: Not a skin nor a respiratory sensitizer.

Carcinogenicity
Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):
No carcinogenic components identified

Germ cell mutagenicity

In vitro
Product: No mutagenic components identified

In vivo
Product: No mutagenic components identified

Reproductive toxicity
Product: No components toxic to reproduction

Specific target organ toxicity - single exposure
Product: None known.

Specific target organ toxicity - repeated exposure
Product: None known.

Aspiration hazard
Product: Not classified

Other effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Specified substance(s):
NITRIC ACID LC 50 (Fish, 48 h): 100 - 330 mg/l Mortality

Aquatic invertebrates
Product: No data available.

Specified substance(s):
NITRIC ACID LC 50 (Cockle (Cerastoderma edule), 48 h): 330 - 1,000 mg/l Mortality
LC 50 (Green or European shore crab (Carcinus maenas), 48 h): 180 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and degradability

Biodegradation
Product: Expected to be readily biodegradable.

BOD/COD ratio
Product: No data available.

Bioaccumulative potential
Bioconcentration factor (BCF)
Product: No data available on bioaccumulation.

Partition coefficient n-octanol / water (log Kow)
Product: No data available.

Mobility in soil: The product is water soluble and may spread in water systems.

Other adverse effects: The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number:	UN 2031
UN proper shipping name:	Nitric acid
Transport hazard class(es)	
Class(es):	8, 5.1
Label(s):	8, 5.1
Packing group:	II
Marine Pollutant:	No

IMDG

UN number:	UN 2031
UN proper shipping name:	NITRIC ACID
Transport hazard class(es)	
Class(es):	8, 5.1
Label(s):	8, 5.1
EmS No.:	F-A, S-Q
Packing group:	II
Marine Pollutant:	No

IATA

UN number:	UN 2031
Proper Shipping Name:	Nitric acid
Transport hazard class(es):	
Class(es):	8, 5.1
Label(s):	8, 5.1
Marine Pollutant:	No
Packing group:	II

15. Regulatory information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
NITRIC ACID Reportable quantity: 1000 lbs.

Superfund amendments and reauthorization act of 1986 (SARA)

Hazard categories

[X] Acute (Immediate) [X] Chronic (Delayed) [X] Fire [ ] Reactive [ ] Pressure Generating

SARA 302 Extremely hazardous substance

Chemical identity	RQ	Threshold Planning Quantity
NITRIC ACID	1000 lbs.	1000 lbs.

SARA 304 Emergency release notification

Chemical identity	RQ
NITRIC ACID	1000 lbs.

SARA 311/312 Hazardous chemical

Chemical identity	Threshold Planning Quantity
NITRIC ACID	500lbs

SARA 313 (TRI reporting)

Chemical identity	Reporting threshold for other users	Reporting threshold for manufacturing and processing
NITRIC ACID	10000 lbs	25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

NITRIC ACID Reportable quantity: 1000 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

NITRIC ACID Threshold quantity: 15000 lbs

US state regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act

NITRIC ACID Listed

US. Massachusetts RTK - Substance List

NITRIC ACID Listed

US. Pennsylvania RTK - Hazardous Substances

NITRIC ACID Listed

US. Rhode Island RTK

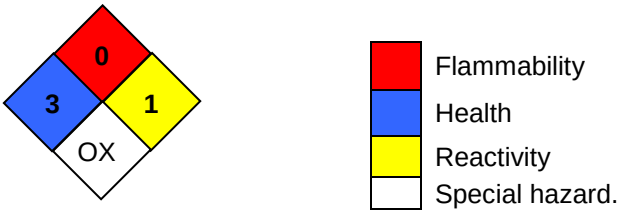
NITRIC ACID Listed

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EINECS, ELINCS or NLP:	On or in compliance with the inventory
Japan (ENCS) List:	On or in compliance with the inventory
China Inv. Existing Chemical Substances:	Not in compliance with the inventory.
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

16.Other information, including date of preparation or last revision

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
OXY: Oxidizer

Issue date:	06-04-2014
Revision date:	No data available.
Version #:	2.0
Further information:	No data available.

Disclaimer:

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Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Effective date: 05/12/2015 **Revision:** 05/12/2015

LIQUINOX

1 Identification of the Substance/mixture and of the Company/Undertaking

1.1 Product identifier

Trade name: LIQUINOX

Application of the substance / the preparation: Hand detergent.

1.2 Relevant identified uses of the substance or mixture and uses advised against:

No additional information available.

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer/Supplier:

Alconox, Inc.
30 Glenn St., Suite 309
White Plains, NY 10603
Phone: 914-948-4040

Further information obtainable from: Product Safety Department.

1.4 Emergency telephone number:

ChemTel Inc.: (800)255-3924, +1 (813)248-0585

2 Hazards Identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008:

Classification according to Directive 67/548/EEC or Directive 1999/45/EC:

GHS07

Skin Irrit. 2, H315: Causes skin irritation.

Information concerning particular hazards for human and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to the latest editions of the EU-lists, and extended by company and literature data

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008:

The product is classified and labelled according to the CLP regulation.

Hazard pictograms:

GHS07

Signal word: Warning

Hazard-determining components of labelling:

Alkyl benzene sulfonic acid, sodium salt.

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Effective date: 05/12/2015 **Revision:** 05/12/2015

LIQUINOX

Hazard statements:
H315: Causes skin irritation.

Precautionary statements:

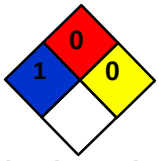
P332+P313: If skin irritation occurs: Get medical advice/attention.

P302+P352: IF ON SKIN: Wash with plenty of soap and water.

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

Other Hazard description:
WHMIS-classification and symbols:
D2B - Toxic material causing other toxic effects

NFPA ratings (scale 0 - 4)



Health = 1
Fire = 0
Reactivity = 0

HMIS-ratings (scale 0 - 4)

HEALTH	1	
FIRE	0	
REACTIVITY	0	

Health = 1
Fire = 0
Reactivity = 0

2.3 Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/Information on Ingredients

3.2 Chemical characterization: Mixture
Description: Hazardous ingredients of mixture listed below.

Identifying Nos.	Description	Wt. %
CAS: 68081-81-2	Alkyl benzene sulfonic acid, sodium salt	10 - 25%
CAS: 1300-72-7 EINECS: 215-090-9	Sodium xylene sulphonate	2.5 - 10%
CAS: 84133-50-6	Alcohol Ethoxylate	2.5 - 10%
CAS: 68603-42-9 EINECS: 271-657-0	Coconut diethanolamide	2.5 - 10%
CAS: 17572-97-3 EINECS: 241-543-5	Ethylenediaminetetraacetic acid, tripotassium salt	2.5 - 10%

Additional information: For the wording of the listed risk phrases refer to section 16.

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS

Effective date: 05/12/2015 **Revision:** 05/12/2015

LIQUINOX

4 First Aid Measures

4.1 Description of first aid measures

General information:

Take affected persons out into the fresh air.

After inhalation:

Supply fresh air; consult doctor in case of complaints.

After skin contact:

Immediately wash with water and soap and rinse thoroughly for 30 minutes. If skin irritation continues, consult a doctor.

After eye contact:

Remove contact lenses if worn.

Rinse opened eye for at least 30 minutes under running water, lifting upper and lower lids occasionally. Immediately consult a doctor.

After swallowing:

Do not induce vomiting; call for medical help immediately. Rinse out mouth and then drink plenty of water.

A person vomiting while laying on their back should be turned onto their side.

4.2 Most important symptoms and effects, both acute and delayed:

Irritating, all routes of exposure.

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information available.

5 Firefighting Measures

5.1 Extinguishing media:

Suitable extinguishing agents:

CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

5.2 Special hazards arising from the substance or mixture:

No additional information available.

5.3 Advice for firefighters:

Protective equipment:

Wear self-contained respiratory protective device.

Wear fully protective suit.

6 Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation.

Particular danger of slipping on leaked/spilled product.

6.2 Environmental precautions:

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

6.3 Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Clean the affected area carefully; suitable cleaners are: Warm water

Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

6.4 Reference to other sections:

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information

7 Handling and Storage

7.1 Precautions for safe handling:

No special precautions are necessary if used correctly.

Information about fire - and explosion protection:

No special measures required.

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7.2 Conditions for safe storage, including any incompatibilities:
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: No special requirements.
Further information about storage conditions: None

7.3 Specific end use(s): No additional information available.

8 Exposure Controls/Personal Protection

8.1 Control parameters
Ingredients with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls:
Personal protective equipment:
General protective and hygienic measures:
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Respiratory protection:
Not required under normal conditions of use.
Protection of hands:


Protective gloves

The glove material has to be impermeable and resistant to the product. Selection of the glove material should be based on the penetration time, rates of diffusion and the degradation of the glove material.

Material of gloves:
The selection of a suitable gloves does not only depend on the material, but also on the quality, and varies from manufacturer to manufacturer.
Penetration time of glove material:
The exact break through time has to be determined by the manufacturer of the protective gloves. DO NOT exceed the breakthrough time set by the Manufacturer.
For long term contact, gloves made of the following materials are considered suitable:
Butyl rubber, BR
Nitrile rubber, NBR
Natural rubber (NR)
Neoprene gloves
Eye protection:


Safety glasses
Goggles recommended during refilling.

Body protection: Protective work clothing

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9 Physical and Chemical Properties

9.1 Information on basic physical and chemical properties:

General Information:	
Appearance:	
Form:	Liquid
Color:	Light Yellow
Odor:	Odorless
Odor threshold:	Not determined.
pH-value:	8.5
Change in condition:	
Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	100°C
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Ignition temperature:	Not applicable.
Decomposition temperature:	Not determined.
Self-igniting:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
Vapor pressure at 20°C:	23 hPa
Density:	1.08 g/cm³
Relative density:	Not determined.
Vapor density:	Not determined.
Evaporation rate:	Not determined.
Solubility in / Miscibility with water:	Fully miscible.
Segregation coefficient (n-octanol/water):	Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Organic solvents:	Not determined.
Solids content:	Not determined.
9.2 Other information:	No additional information available.

10 Stability and Reactivity

10.1 Reactivity:

10.2 Chemical stability:

Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

10.3 Possibility of hazardous reactions:

Reacts with strong oxidizing agents. Reacts with strong acids.

10.4 Conditions to avoid:

No additional information available.

10.5 Incompatible materials:

No additional information available.

10.6 Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Sulphur oxides (SOx)
Nitrogen oxides

11 Toxicological Information

11.1 Information on toxicological effects:
Toxicity data: Toxicity data is available for mixture:
Primary irritant effect:
On the skin: Irritating to skin and mucous membranes.
On the eye: Strong irritant with the danger of severe eye injury.
Sensitization: No sensitizing effects known.
Additional toxicological information:
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version: Irritant

12 Ecological Information

12.1 Toxicity:
Aquatic toxicity: No additional information available.
12.2 Persistence and degradability: Biodegradable.
12.3 Bioaccumulative potential: Does not accumulate in organisms.
12.4 Mobility in soil: No additional information available.
Additional ecological information:
General notes:
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Must not reach sewage water or drainage ditch undiluted or un-neutralized.
12.5 Results of PBT and vPvB assessment:
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects: No additional information available.

13 Disposal Considerations

13.1 Waste treatment methods:
Recommendation:
Smaller quantities can be disposed of with household waste.
Small amounts may be diluted with plenty of water and washed away. Dispose of bigger amounts in accordance with Local Authority requirements.
The surfactant used in this product complies with the biodegradability criteria as laid down in Regulation (EC) No. 648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.
Uncleaned packaging:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agents: Water, together with cleansing agents, if necessary.

14 Transport Information

14.1 UN-Number:
DOT, ADR, ADN, IMDG, IATA: Not Regulated

14.2 UN proper shipping name:
DOT, ADR, IMDG, IATA: Not Regulated

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14.3 Transport hazard class(es):
DOT, ADR, IMDG, IATA:
Class: Not Regulated
Label: -

14.4 Packing group:
DOT, ADR, IMDG, IATA: Not Regulated

14.5 Environmental hazards:
Marine pollutant: No

14.6 Special precautions for user: Not applicable.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

UN "Model Regulation": Not Regulated

15 Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:
United States (USA):
SARA:
Section 355 (extremely hazardous substances): None of the ingredient is listed.
Section 313 (Specific toxic chemical listings): None of the ingredient is listed.
TSCA (Toxic Substances Control Act): All ingredients are listed.

Proposition 65 (California):
Chemicals known to cause cancer: None of the ingredient is listed.
Chemicals known to cause reproductive toxicity for females: None of the ingredient is listed.
Chemicals known to cause reproductive toxicity for males: None of the ingredient is listed.
Chemicals known to cause developmental toxicity: None of the ingredient is listed.

Carcinogenic Categories:
EPA (Environmental Protection Agency): None of the ingredient is listed.
TLV (Threshold Limit Value established by ACGIH): None of the ingredient is listed.
NIOSH-Ca (National Institute for Occupational Safety and Health): None of the ingredient is listed.
OSHA-Ca (Occupational Safety & Health Administration): None of the ingredient is listed.
Canadá:
Canadian Domestic Substances List (DSL): All ingredients are listed.
Canadian Ingredient Disclosure list (limit 0.1%): None of the ingredient is listed.
Canadian Ingredient Disclosure list (limit 1%): None of the ingredient is listed.

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases:
H315: Causes skin irritation.

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Abbreviations and Acronyms:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
IMDG: International Maritime Code for Dangerous Goods.
DOT: US Department of Transportation.
IATA: International Air Transport Association.
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.
ACGIH: American Conference of Governmental Industrial Hygienists.
NFPA: National Fire Protection Association (USA).
HMIS: Hazardous Materials Identification System (USA).
WHMIS: Workplace Hazardous Materials Information System (Canada).
VOC: Volatile Organic Compounds (USA, EU).
LC50: Lethal concentration, 50 percent.
LD50: Lethal dose, 50 percent.

SDS Created by:
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ATTACHMENT 2

FIELD DATA RECORDS

API OIL/WATER SEPARATOR

MACTEC

511 Congress Street, Portland Maine 04101

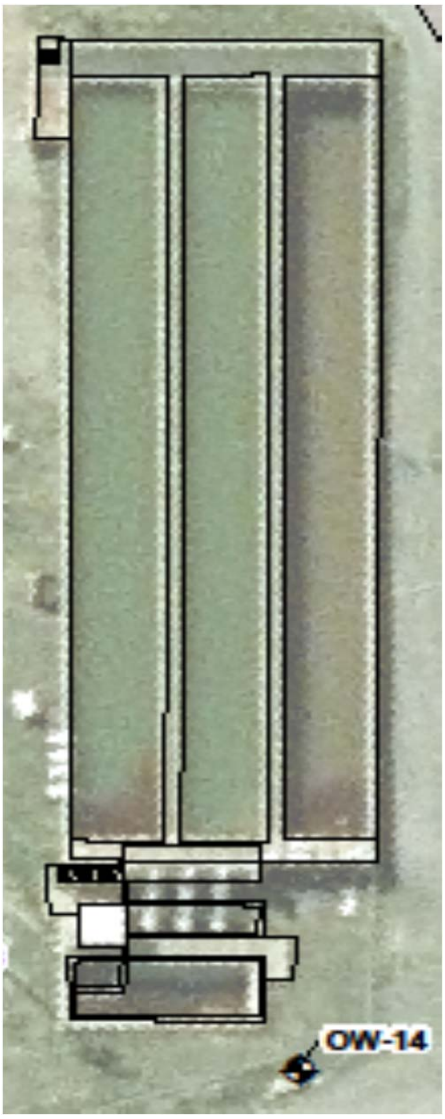
Project Name: Al Tech Specialty Steel Site # 401003		**Location ID/Description**:
Project Location: 1 Lincoln Ave, Watervliet, New York		
Project No.: 3617157374	**Client**: NYSDEC	
Photographs (Y/N):	**Protection Level:** D	
Date Started:	**Date Completed:**	
Logged By:	**Checked By:**	

Soil

#	Sample ID	Time	Analyses	Approximate Depth and Description

Water

#	Sample ID	Time	Analyses	Approximate Depth and Description



STORM SEWER INVESTIGATION

MACTEC

511 Congress Street, Portland Maine 04101

Project Name: Al Tech Specialty Steel Site # 401003

Location ID/Description:

Project Location: 1 Lincoln Ave, Watervliet, New York

Project No.: 3617157374 **Client**: NYSDEC

Photographs (Y/N): **Protection Level:** D

Date Started: **Date Completed:**

Logged By: **Checked By:**

Location Surface Observations (Open/Closed):

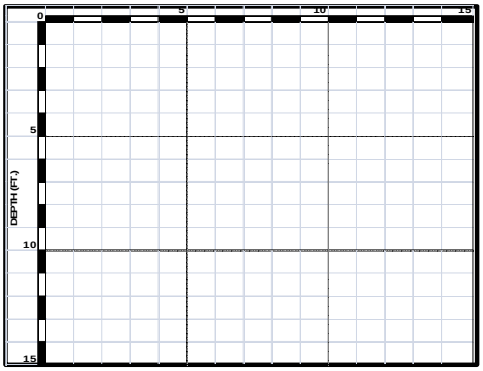
Number and Diameter of Distribution Lines:

Soil, Sediment or Rock Present:

Dye Color and Approximate Quanitity Added:

Time Added:

Flow Direction:



CROSS-SECTIONAL VIEW

PLANAR VIEW

Observed Connectivity Notes:

(Observed Locations and Time of Observations)