

Work Plan



**Remedial Action Work Plan for
Phase 2 Wet Dredge**

Ashland/NSP Lakefront Site
Project I.D.: 17X001

NSPW
Eau Claire, Wisconsin

April 2017





Joint Venture

101 International Drive, P.O. Box 16655
Missoula, MT 59808

April 13, 2017

Mr. Eric Ealy
Project Coordinator
Xcel Energy, Inc., on behalf of NSPW
414 Nicollet Mall-2
Minneapolis MN 55401

Dear Mr. Ealy:

RE: *Remedial Action Work Plan for Phase 2 Wet Dredge*
Ashland/NSP Lakefront Site

On behalf of Foth Infrastructure & Environment/Envirocon Joint Venture (FE JV), the *Remedial Action Work Plan (RAWP) for Phase 2 Wet Dredge* for the Ashland/NSP Lakefront Site is enclosed. The RAWP has also been posted to the FE JV SharePoint site for Agency review.

If you have any questions concerning this *Report*, please contact either of the undersigned at (920) 497-2500.

Sincerely,

Foth Infrastructure & Environment/Envirocon Joint Venture

A handwritten signature in black ink that reads "Steve Laszewski".

Steve J. Laszewski, Ph.D.
Management Committee Member

A handwritten signature in black ink that reads "Denis Roznowski".

Denis Roznowski, P.E.
Project Manager

Remedial Action Work Plan for Phase 2 Wet Dredge

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Remedial Action Work Plan for Phase 2 Wet Dredge

Project ID: 17X001

Prepared for

NSPW

Eau Claire, Wisconsin

Prepared by

**Foth Infrastructure & Environment/
Envirocon Joint Venture**

April 2017

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Remedial Action Work Plan for Phase 2 Wet Dredge

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List of Abbreviations, Acronyms, and Symbols

Agencies	U.S. Environmental Protection Agency and Wisconsin Department of Natural Resources
ARAR	applicable or relevant and appropriate requirements
barrier system	water quality barriers
Bay	Chequamegon Bay
<i>CD</i>	<i>Consent Decree</i>
CERCLA	Comprehensive Environmental Response and Compensation Liability Act
City	City of Ashland
COC	contaminants of concern
<i>CQAP</i>	<i>Construction Quality Assurance Plan</i>
cy	cubic yards
DMU	Dredge Management Unit
DWTS	Dredge Water Treatment System
EOC	elevations of contamination
EPA	Environmental Protection Agency
<i>ESD</i>	<i>Explanation of Significant Differences</i>
FE JV	Foth Infrastructure & Environment/Envirocon Joint Venture
<i>Final Design</i>	<i>Final (100%) Design for Phase 2 Wet Dredge</i>
<i>FS Study</i>	<i>Feasibility Study</i>
GAC	granular activated carbon
<i>HASP</i>	<i>Health and Safety Plan for Phase 2 Wet Dredge</i>
LTWTS	Long-Term Water Treatment System
<i>Monitoring Plan</i>	<i>Monitoring Plan for Phase 2 Wet Dredge</i>
MTTD	medium temperature thermal desorption
NAPL	non-aqueous phase liquid
NSP	Northern States Power Company
NSPW	Northern States Power Company, a Wisconsin Corporation
PAH	polynuclear aromatic hydrocarbon
<i>Phase 1 Final Design</i>	<i>Final Design for Phase 1 Remedial Action</i>
Pilot Study	Wet Dredge Pilot Study
<i>Pilot Study Final Design</i>	<i>Final Design for Phase 2 Wet Dredge Pilot Study</i>
POTW	publicly-owned treatment works
ppm	parts per million
PRG	preliminary remediation goal
QA	quality assurance
RA	Remedial Action
RAO	Remedial Action Objectives
<i>RAWP</i>	<i>Remedial Action Work Plan for Phase 2 Wet Dredge</i>
RD	Remedial Design

List of Abbreviations, Acronyms, and Symbols (*continued*)

RI	Remedial Investigation
<i>ROD</i>	<i>Record of Decision</i>
sediment processing tent	temporary fabric structure covering the sediment stabilization area
Site	Ashland/NSP Lakefront Site
STWTS	Short-Term Water Treatment System
SVOC	semi-volatile organic compounds
SWAC	surface-weighted average concentration
TBC	to-be-considered
TVOCs	total volatile organic compounds
Temporary WTS	Temporary Water Treatment System
tPAH	total polynuclear aromatic hydrocarbon
TSS	total suspended solids
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compounds
Vonco	Vonco V Waste Management Campus
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System

1 Introduction

This *Remedial Action Work Plan for Phase 2 Wet Dredge (RAWP)* summarizes the remedial action (RA) objectives, provides a description of the selected RA, summarizes the permitting equivalency requirements and presents the schedule to complete RA within the Phase 2 Dredge Area at the Ashland/NSP Lakefront Site (Site). This *RAWP* describes the process and support activities related to implementing the Phase 2 Wet Dredge project at the Site. It has been prepared on behalf of Northern States Power Company, a Wisconsin Corporation (NSP/NSPW). This *RAWP* builds upon the *Final (100%) Design for Phase 2 Wet Dredge (Final Design)* (FE JV, 2017a) and takes into account both observations from the Wet Dredge Pilot Study (Pilot Study) work in 2016 and lessons learned from mechanical dredging and sediment management performed during 2015 as part of the Ashland Breakwater construction project (FE JV, 2015), all having been prepared/performed by Foth Infrastructure & Environment/Envirocon Joint Venture (FE JV).

The Phase 2 Wet Dredge project is being performed to achieve cleanup goals and performance standards for sediments at the Site, as described in the *Record of Decision (ROD)* (U.S. Environmental Protection Agency [USEPA], 2010) and the *Explanation of Significant Differences (ESD)* (USEPA, 2016), and will be implemented consistent with the *Consent Decree (CD)* (USEPA, 2017), which was entered on March 1, 2017, and the *Final Design*. Total polynuclear aromatic hydrocarbon (tPAH)-impacted sediments will be dredged (all sediments to be wet dredged, including the nearshore sediments) and transported to shore, offloaded and managed on site (including amendment to reduce moisture content), then transported for off-site disposal.

1.1 Site Description

The Site is located in the city of Ashland (City), Wisconsin, along the southeast shoreline of Chequamegon Bay (Bay), which is part of southwestern Lake Superior (Figure 1-1). The Site was historically industrialized and encompasses several upland properties, including the sites of a former manufactured gas plant, former lumber operations, a former wastewater treatment plant, and several acres of impacted sediment offshore. The Site has known contamination of upland soils, groundwater, and Bay sediments, and has been divided into two remedial areas: the Phase 1 upland area, where soil removal is completed and groundwater treatment is currently ongoing; and the Phase 2 sediment area, which is further divided into nearshore and offshore areas in the *ROD*. When referring to the “Phase 2 Project Area,” it includes the Phase 2 Wet Dredge Area, and also includes the upland areas south of the sheet pile bulk head wall that are necessary for sediment management, staging areas and water treatment associated with the Phase 2 work.

The *ROD* identified a select set of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including polynuclear aromatic hydrocarbons (PAHs), non-aqueous phase liquid (NAPL), and metals as contaminants of concern (COCs) for human and ecological receptors. Recreational receptor exposures to COCs in sediments were below USEPA's target risk levels, with the exception of iron (USEPA, 2010). EPA established a remedial goal for tPAHs for ecological receptors, as discussed in the *ROD*. As referenced in Worksheet 15A of

the *Quality Assurance Project Plan Addendum 2 (QAPP Addendum 2)* (FE JV, 2016a), tPAH was calculated as the sum of 18 individual listed PAHs: 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene, benzo(a)anthracene, benzo(a)pyrene, benzo(e)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, and pyrene. Drawing No. 11 of the *Final Design* shows the current estimate of the extent of tPAH-impacted sediment in the Phase 2 Wet Dredge Area.

The local offshore subsurface environment consists of impacted fill materials consisting primarily of wood waste and impacted offshore soft sediments which directly underlie the free water of the Bay. The most abundant COCs include benzene (VOC) and naphthalene (PAH) and also free phase hydrocarbons (free product) present as NAPL. NAPL has also been found in subsurface sediments in the Phase 2 near shore area. Much of the impacted sediment is covered with a layer of wood waste.

Wood waste is thickest near the shoreline and the East and West Peninsulas. The wood debris varies in thickness and is further detailed in Section 5 of the *Final Design*. Wood debris overlays approximately 95% of the impacted sediments. The underlying sand unit is typically impacted with PAHs increasing with depth below the sediment/surface water interface, until encountering the deeper silt/clay unit which is generally un-impacted and forms an interface between contaminated sediment and clean lakebed material. The *Feasibility Study (FS Study)* (URS, 2008) estimated that the entire area of impacted sediments encompasses approximately 16 acres based upon a preliminary remediation goal (PRG) for sediment, expressed as a surface-weighted average concentration (SWAC), of 9.5 parts per million (ppm) tPAH. Updated estimates of the impacted sediment footprint and sediment and debris volumes from the *Final Design* are summarized in Table 1-1. (See Drawing Nos. 11 and 12 of the *Final Design* for more details.)

The identification of high subgrade areas (as discussed in the Section 5.6.3 of the *Final Design*), where clean (meets performance standards) sediments or lakebed material is present above target dredge elevations (elevation of contamination [EOC] minus 12 inches), may result in reduced final dredge volumes. Dredging clean fine-grained material creates unnecessary and unwelcomed total suspended solids (TSS) loadings that are proven to be problematic to the water treatment components found in the Dredge Water Treatment System (DWTS).

Post-mechanical interim sampling, after achieving the EOC in these areas, will be implemented and results evaluated prior to determining if the EOC minus one foot should be targeted prior to final confirmation sampling.

Table 1-1

Removal Volume Summary for Phase 2 Wet Dredge Area

	DMU-1			DMU-1 Null Areas				DMU-2			DMU-2 Null Areas			Total of All Areas
	Target Volume ^(2,3)	Overdredge Allowance (6")	Total	Target Volume ⁽¹⁾	Overdredge Allowance (6")	Total		Target Volume ⁽²⁾	Overdredge Allowance (6")	Total	Target Volume ⁽¹⁾	Overdredge Allowance (6")	Total	
Wood/Debris (cy)	25,721	–	25,721	2,778	1,389	4,167		22,091	–	22,091	4,638	2,319	6,957	58,936
Sediment (cy)	23,538 ²	3,667	27,205	–	–	–		32,947	5,117	38,064	–	–	–	65,269
Total (cy)	49,259	3,667	52,926	2,778	1,389	4,167		55,038 ³	5,117	60,155	4,638	2,319	6,957	124,205

Table Source: Table 5-1 in the *Final Design for Phase 2 Wet Dredge* (FE JV, 2017a).

1. Target volume calculated using 12-inch removal.
2. Target volume calculated to design EOC minus 12 inches.
3. Volume excludes material removed above water line on West Peninsula

Prepared by: KDA1
Checked by: BMS1

1.2 Previous Remedial Actions

1.2.1 Phase 1 Remedial Action

The *Final Design for Phase 1 Remedial Action (Phase 1 Final Design)* (FE JV, 2015) was prepared by the FE JV, and described the basis of design, requirements, and considerations for RAs to be conducted as described in the *ROD* for the Kreher Park and Upper Bluff/Filled Ravine portions (Phase 1 Project Area) of the Site. The Phase 1 work included:

- ◆ installation of a soil-bentonite cutoff wall and shoreline bulkhead wall;
- ◆ excavation of certain pre-defined areas of impacted soil that exceeded the performance standards;
- ◆ pre-treatment handling and sorting of the excavated material;
- ◆ medium temperature thermal desorption (MTTD) treatment of the impacted soil;
- ◆ placement of the treated soil and other suitable material to backfill the excavations;
- ◆ temporary water treatment and discharge to the City's Publicly Owned Treatment Works (POTW);
- ◆ construction of a long-term groundwater collection and treatment system; and
- ◆ site restoration to support future use of the property.

The Phase 1 soil removal work at the Site is complete, and active groundwater treatment is underway. Utilizing the newly constructed bulkhead wall at the shoreline and a slurry wall surrounding the impacted upland area, the groundwater treatment system includes an extensive water extraction and monitoring well system, with an on-site Long-Term Water Treatment System (LTWTS).

1.2.2 Breakwater Construction

The Site breakwater rubble-mound structure (Breakwater) was completed in fall 2015. The Breakwater serves as a wave attenuator for the Phase 2 area and encloses the Bay where the Phase 2 Wet Dredge will take place. There are two gaps, one on the east and west ends of the Breakwater. These gaps facilitate long-term water circulation and the west gap will facilitate long-term access by watercraft. The Breakwater serves to reduce energy imposed by incoming wind-generated waves, preventing impacts to remedial operations at the Site.

The Breakwater is approximately 840 feet long (measured at the crest), with a roughly shore-parallel orientation, and is located 400 to 500 feet from the shoreline at the Site. This configuration creates a semi-sheltered basin that encompasses the location where the Phase 2 Wet Dredge will occur. The Breakwater foundation is comprised of various quarried stone materials (bedding, core, and filter), with the exterior armor layer comprised of stone ranging from 2 to 6 tons. The breakwater served as a valuable wave attenuation and containment

structure during the Pilot Study and Extended Pilot Study, and will continue to provide the same protective measures during the full-scale Phase 2 Wet Dredge project work. At the completion of the Phase 2 Wet Dredge RA, the Breakwater will be dedicated to the City as a site improvement, and the City will thereafter operate and maintain the structure.

1.2.3 Phase 2 Pilot Study and Extended Pilot Study

The *ROD* allows for a wet-dredge remedy (including nearshore sediments) to be implemented at the Site for the impacted sediments upon successful completion of a Pilot Study and EPA approval. The *Final Design for the Phase 2 Wet Dredge Pilot Study (Pilot Study Final Design)* (FE JV, 2016b) was approved by the USEPA on May 16, 2016.

The Wet Dredge Pilot Study was performed to evaluate whether wet dredging could effectively remove targeted impacted sediments at the Site while simultaneously achieving *ROD* cleanup goals and performance standards. Various sediment removal and water handling, processing, and treatment methods were assessed as part of the Pilot Study, as well as determining the effectiveness of the barrier containment system in controlling the movement of re-suspended sediment and COCs that had a potential for release during the dredging operation. Extensive water quality sampling, air monitoring and sediment confirmation sampling during the Pilot Study demonstrated wet dredging methods met the *ROD* cleanup goals and performance standards for tPAH. Results from the containment intra-system water quality monitoring demonstrated the barrier curtain system provided significant reduction in COCs and turbidity concentrations, as measured within and between the various barriers and outside of the tertiary curtain. Measurements showed consistent reductions of greater than 95% in tPAH concentrations and 85% in turbidity concentrations.

Based on the results from the Pilot Study, USEPA in consultation with the Wisconsin Department of Natural Resources (WDNR), approved NSPW's request to move into the Extended Pilot Area (USEPA, 2016). Dredging performance standards in the Extended Pilot Study were similar to those in the Pilot Study Dredge Area. The Pilot Study demonstrated wet dredging of nearshore sediments can achieve cleanup goals and performance standards in a manner that is protective of human health and the environment. Based upon these findings, the USEPA issued an *ESD* in December 2016 that allows the use of wet dredging for all the tPAH-impacted sediment at the Site.

2 Remedial Action Objectives

The *ROD* has established sediment Remedial Action Objectives (RAOs) to reduce or remove impacted sediments which pose an unacceptable risk to human health. Similarly, for ecological receptors, the RAOs were developed to prevent direct contact with or ingestion of impacted sediments at levels of COCs that would pose an unacceptable risk to populations of ecological receptors or individuals of protected species. RA objectives for sediment include:

- ◆ Protect human health by eliminating exposure (direct contact, ingestion, inhalation, fish ingestion) to sediment with COCs in excess of regulatory or risk-based standards;
- ◆ Conduct NAPL (source) removal whenever it is necessary to halt or contain the discharge of a hazardous substance or to minimize the harmful effects of the discharge to the air, land, or water; and
- ◆ Protect populations of ecological receptors or individuals of protected species by eliminating exposure (direct contact with sediment or ingestion of sediment or prey) to sediment with COCs that would pose an unacceptable risk.

2.1 Performance Standards

Several performance standards must be met for the Phase 2 Wet Dredge project as listed in Section 12.3 of the *ROD*. Table 2-1, in the *Final Design*, summarizes the performance standards to achieve RAOs for the Phase 2 Wet Dredge and how the project will address each of them.

Phase 2 Wet Dredge design and implementation will also be compliant with the following:

- ◆ Applicable or relevant and appropriate requirements (ARARs), as described in the *ROD*.
- ◆ Quality assurance (QA) protocols, measures, and contingency actions applicable to the implementation process, as described in the *Construction Quality Assurance Plan (CQAP)* (FE JV, 2017b), which is provided in Appendix E of the *Final Design*.
- ◆ Health and safety requirements to be strictly adhered to by the project team throughout implementation as outlined in the *Health and Safety Plan for Phase 2 Wet Dredge (HASP)*, which is provided in Appendix A of this report.
- ◆ Any real estate, permitting, easement, and access requirements necessary for completing the Phase 2 Wet Dredge:

3 Proposed Remedy

3.1 Sediment Removal

Approximately 125,000 cubic yards (cy) of woody debris and sediments, containing a select set of VOCs, SVOCs, including PAHs, NAPL, and metals will be removed from the Phase 2 Wet Dredge area, followed by the placement of a restorative layer. The removal of debris and sediment from the Phase 2 Wet Dredge Area is a complex operation that will take into account many factors. Debris removal activities will include the clearing of objects and obstructions from the Phase 2 Wet Dredge Area prior to sediment dredging activities, including one foot of debris removal from the null areas.

Based on an in-depth review of the dredge units' characteristics, including the nature of subsurface conditions and the characteristics of the material to be dredged required sequencing and the success achieved during the Pilot work, mechanical dredging has been selected as the preferred technique for inventory dredging for the full-scale Phase 2 Wet Dredge project. The mechanical excavator will use an environmental bucket to achieve a level cut and minimize turbidity. A variety of additional attachments, such as a rake, grapple or thumb, will be used to retrieve wood debris from the site.

Excavated dredged material will be placed in barges for transport to the barge offloading area. The barge offloading area is located adjacent to the existing shoreline bulkhead wall, which is also adjacent to the former Pilot Study areas. The offloading pad is where debris and sediment will be offloaded from material barges for either gross sorting or screening via a vibratory grizzly prior to further mechanized processing within the adjacent sediment processing structure. Decant water from barges will be pumped to geotextile tubes located within the sediment processing tent in order to better control odors. Decant water will flow overland to the existing sump for conveyance to Modutanks.

Hydraulic dredging equipment using a plain suction dredge head will be used to remove the thin organic low solids layer (generated residuals) that could be present on the mechanically dredged dredge management units (DMUs) and null area surfaces. Due to the undulating nature of the design elevation, and typical hard lakebed material, an articulated swinging ladder dredge will be used to perform the removal of these generated residuals. Hydraulically removed material will be transported to a geotextile tube dewatering area via pipeline, where dewatering will occur with the use of geotextile tubes.

3.1.1 Water Quality Barriers

A series of water quality barriers will be deployed landward of the Breakwater from offshore to nearshore to contain TSS and COCs, while not causing interference with Phase 2 Wet Dredge operations and allow for sufficient space (between curtains) for barrier system maintenance and monitoring, and implementation of contingency measures, if required.

The barrier system will consist of three main components including: a Breakwater and gap areas dual barrier curtain system; a rock protection barrier along with multiple oil control and oil absorbent booms along the East and West Peninsulas, and temporary closure of the Breakwater

gaps with geotextile tubes (filled with restorative layer material). While not intended to be water-tight, the gap barriers will also serve as physical barriers to contain or limit TSS and COCs transported outside the Phase 2 Wet Dredge Area.

3.2 Debris and Sediment Management and Disposal

The dredged material management program, which includes transport, screening, dewatering, stabilization, and off-site transport and disposal will effectively process dredged material from point of origin to final disposition in a safe manner, while maintaining established production rates and construction schedule.

The infrastructure to support the staging and processing of mechanically dredged material is mostly in place, including a sediment processing tent over the westernmost asphalt working pad, which will be the site of the Phase 2 sediment stabilization efforts. Final construction activities for the processing tent will be completed before dredging commences.

Sediments from the hydraulic dredging effort will be pumped to geotextile tubes on the geotextile tube dewatering pad (easternmost asphalt working pad).

The sump arrangements and drainage patterns adjacent to the sediment processing tent and adjacent to the geotextile tube dewatering pad allow decontamination to be performed in multiple areas should it be needed. The layout provides for designating and maintaining “dirty areas” and “clean areas” and segregates the site drainage into contact and non-contact areas relative to sediment processing activities and precipitation.

Aged sediment will be removed from full geotextile tubes and hauled with heavy tandem trucks with sealed gates to the sediment processing tent for stabilization, as needed. Stabilized sediment from mechanical and hydraulic dredging operations will be loaded into highway transport trucks with sealed gates at the east and southeast areas of the sediment processing tent in designated areas. The dewatered material will be transported to an approved subtitle D landfill (Vonco V Waste Management Campus [Vonco] and/or Shamrock Landfill).

3.3 Restorative Layer Placement

After the completion of final sediment confirmation sampling and any potential re-dredging, NSPW, in consultation with the USEPA and WDNR (collectively the “Agencies”), will determine when to place the restorative layer. This restorative layer installation process is expected to occur in 2018, following ice-out and establishment of safe on-water operating conditions. The restorative layer will provide habitat for benthic organisms.. After the restorative layer is placed, thickness verification sampling, in accordance with the standard operating procedures described in the *Monitoring Plan for Phase 2 Wet Dredge (Monitoring Plan)* (FE JV, 2017c), will be conducted to ensure that the 6-inch minimum thickness has been met.

3.4 Water Management

Water that is generated by Phase 2 Wet Dredge activities will be collected and treated by a process similar to the former on-site Temporary Water Treatment System (Temporary WTS), successfully installed and operated for the Phase 1 project, and the Short Term Water Treatment System (STWTS), successfully installed and operated for the Pilot Study work. The STWTS design has been modified for the full-scale Phase 2 Wet Dredge project to handle expected increased flow capacity, now referred to as the DWTS. Contact water will be collected and treated in accordance with WPDES Permit Equivalency requirements for discharge to Lake Superior/Chequamegon Bay via a new outfall, expected to be no more stringent than the requirements for the Pilot Study. The new outfall discharge is intended to be located within the active dredge area enclosed by the Breakwater and gap closures. The DWTS design basis is to reliably meet WPDES Permit Equivalency requirements.

3.5 Air Monitoring

The perimeter air monitoring program will provide ongoing data regarding air quality during Phase 2 Wet Dredge activities. Data collected as part of the program will be evaluated to assess and provide for necessary contingency and corrective action, as required. Perimeter air monitoring procedures and details are provided in the *Monitoring Plan*. Air quality will also be monitored within the sediment processing tent for protection of the Site workers in accordance with the *HASP* (Appendix A) using PID, reactive tubes, and dosimeter badges.

Although the analysis in *Final Design* Appendix D demonstrates that the emissions from all potential sources will be in compliance with NR 455 thresholds, without the use of controls, an odor/emission control system, incorporating five granular activated carbon (GAC) treatment units has been added to the sediment processing tent in order to control potential odors emanating from the structure. Although the primary function of the GAC is to remove odors, the units have an added benefit of removing up to 95% of the vapor phase organic emissions as part of the operation. This reduction has not been taken into account when calculating estimated emissions from the processing tent. It is important to reiterate that when not taking the reductions into account, the untreated air will easily meet any COC ARAR thresholds for the Site as shown in Table 1 of *Final Design* Appendix D. Wis. Admin. Code NR 445 provides useful guidance for ensuring proper management of odor/emission controls. The calculations in Appendix D demonstrate air emissions from all potential sources are well below any relevant NR 445 thresholds without use of an odor/emission control system. In particular, calculated potential to emit emissions are well below the emission thresholds in Table A of NR 445.07. Ongoing monitoring of the odor/emission control system will be performed for operations and maintenance decision making and ensure performance as intended throughout the project.

COC and particulates compliance monitoring for adherence with health related ARARs for the adjacent community will be performed at the perimeter of the Site with the robust network of real-time air monitoring stations.

4 Permit Equivalency Requirements

RAs at the Site are being undertaken under the authority of the Comprehensive Environmental Response and Compensation Liability Act (CERCLA) and are implemented in accordance with ARAR and to-be-considered (TBC) criteria as identified in the *ROD*.

The ARARs and TBCs for remediation activities are located in Appendix C of the *ROD*. Phase 2 Wet Dredge construction will occur within the Site, and the CERCLA statute and USEPA guidance (USEPA, 1992) state that permits are not required for CERCLA on-site response actions; however, a permit “equivalency” process is to be followed, meaning that the substantive requirements but not procedural requirements must be met. The lead agency ensures that those substantive requirements are met.

Permit equivalency for state requirements (through WDNR) and permit equivalency for federal requirements (through USEPA) have been incorporated into the *Final Design* via the Agency comments process. In these processes, the federal and state review comments are communicated to USEPA and incorporated into the *Final Design* requirements, thus providing information necessary for the Agencies to prepare the appropriate permit equivalency documents as summarized below.

4.1 Chapter 30 Permit

A Chapter 30 Permit Equivalency for the Phase 2 Wet Dredge project, which is anticipated to be substantially similar to the same document issued for the Pilot Study project, will be issued by WDNR with conditions of the equivalency stated. The permit will cover sheetpile extensions, peninsula trim back and rock backfill, dredging, restorative layer placement, habitat enhancement placement, temporary west peninsula extension, gap barrier construction, barrier curtain installation, and spreading of gap barrier materials onto the lakebed when barriers are decommissioned.

4.2 Wisconsin Pollution Discharge Elimination System

The new outfall discharge is intended to be located within the active dredge area enclosed by the Breakwater and east and west gap closures. The DWTS design basis will be to reliably meet WPDES discharge standards. The expected WPDES Permit Equivalency requirements are summarized in Table 4-2. It is anticipated that the new outfall will be permitted as an amendment to the existing WPDES Permit Equivalency and monitored separately from the existing outfall for the LTWTS.

**Table 4-1
Water Quality-Based Effluent Limitations for Great Lakes Discharge**

Laboratory Parameter	Analyte	Daily Max. (ug/L)	Weekly Avg. (ug/L)	Monthly Avg. (ug/L)
pH	pH, Field	6.0 - 9.0 su	-	-
TSS	Suspended Solids, Total	40,000	-	-
VOCs	Benzene	-	-	55
	Ethylbenzene	-	-	-
	Toluene	-	-	-
	Xylenes, Total	-	-	-
	BETX, Total ^a	-	-	750
SVOCs	Acenaphthene	-	-	220
	Anthracene	0.71	0.21	-
	Benzo(a)pyrene	-	0.24	0.054
	Fluorene	-	36	-
	Naphthalene	-	-	70
	PAHs ^b	-	-	0.1
	Phenol	-	-	3,300
Cyanide	Cyanide, Total	45	-	-

Notes:

- a. BETX, Total comprised of total concentration of Benzene, Ethylbenzene, Toluene and Xylenes, Total
- b. PAHs comprised of total concentration of Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene.

Prepared by: bbell
Checked by: bds1

4.3 Wisconsin Administrative Code NR 445

Since calculated emissions from the sediment processing tent are below applicable Wisconsin Administrative Code Chapter NR 445 thresholds using emissions calculations based on potential to emit, NR 445 has been an ARAR considered for the sediment removal and processing activities, consistent with Appendix C of the ROD. However, due to the low potential to emit values, a permit equivalency is not required at this time. If during the operation and monitoring of the sediment processing emissions, it is determined that the emissions calculations underestimated the potential to emit and NR 445 standards are exceeded, an NR 445 Permit Equivalency will be issued for the stack emissions of the sediment processing tent.

5 Points of Compliance

5.1 Surface Water Quality

Four Compliance locations are established for surface water: one each approximately 50 feet lakeside of the gap closures, and; two locations 50 feet lakeside of the breakwater at approximate 1/3 (300 feet) and 2/3 (600 feet) points determined by the overall length of the breakwater (900 feet); and compared to the Background location, approximately 200 feet lakeside of the mid-point of the breakwater.

Monitoring of surface water will commence at the start of on-the-water operations and continue as long as there is a risk for a release from the site (e.g., the active work area water quality is above turbidity and COCs levels indicated in the *Monitoring Plan*). This may extend beyond active sediment removal activities.

5.2 Sediment and Restorative Layer

As part of the monitoring to meet sediment performance standards, samples will be collected at the completion of dredging and restorative layer placement. Specifically, sediment and restorative layer samples will be collected for the following purposes:

- ◆ Final SWAC confirmation sediment sampling
- ◆ Restorative layer thickness and SWAC verification sampling

Final confirmation sediment core samples will be collected to evaluate the performance of sediment removal from the Phase 2 Wet Dredge Area. Final confirmation core sampling and processing for comparison to the sediment performance standards will occur with the oversight of EPA, WDNR, and NSPW on-site representatives. Field staff will provide a three-day (72 hours) notice to the Agencies prior to the anticipated sampling event.

Final confirmation core samples will be collected from independent (i.e., different from post-mechanical dredge and post-hydraulic dredge interim core sample locations) randomly selected locations within each DMU and based on an established grid as described and shown in the *Monitoring Plan*. Null areas will not receive final confirmation sampling as pre-dredge data results demonstrated these areas meet the performance standards.

A random number generator will be used to select numbers (locations) that correspond to the geographic coordinates for the core sampling point within each grid. (Note: This process will also be used for the post-mechanical and post-hydraulic interim samples.) This process will result in approximately 21 unique locations per acre being sampled for either visual or chemical verification to achieve performance standards. The random core sample locations will be selected after dredging has been completed and presented to the on-site Agency representative, along with bathymetry. Core sample locations may be constrained by site conditions, and alternative random core sample points may be selected if poor recovery, or refusal do not allow for collection of a complete or representative core.

5.3 Wastewater

Wastewater monitoring will be conducted for the DWTS to assure compliance with the treated effluent permit equivalency limits. The DWTS effluent will be directed to a new Outfall under an amended WPDES Permit Equivalency.

The present WPDES Permit Equivalency for Outfall 001 is provided in Appendix C of the *Monitoring Plan*. The WPDES Permit Equivalency includes a summary of analytical parameters, limit type, limits and units, sample frequencies, and sample types. The WPDES Permit Equivalency limits are typically on a daily, weekly or monthly average basis. The Outfall 001 WPDES Permit Equivalency parameters are also summarized in the *Quality Assurance Project Plan for Phase 2 Wet Dredge (QAPP)* (FE JV, 2017d), which is Appendix E of the *Final Design*.

The monitoring locations for DWTS WPDES Permit Equivalency include the following:

- ◆ The influent to the DWTS will be sampled and characterized in the line leading from the 400,000 gallon Modutanks to the initial “Weir Tank”;
- ◆ The effluent sample will be taken from the piping leading to the DWTS effluent tank, and;
- ◆ A sample will be taken to characterize the flow after the primary (lead) GAC vessel and before the secondary (lag) GAC vessel.

5.4 Air Quality

Air quality during on-the-water operations and processing of sediment will be evaluated at five locations (AMP-01, AMP-02, AMP-03, AMP-04, AMP-05) surrounding the Site, as shown on Drawing No. 5 of the *Final Design*. Selection of stations was based on proximity to sensitive off-site receptors, such as residences, church, school, hotel, and other businesses near the Site. AMP-01 final location will be determined during a spring 2017 site walkthrough and located based on access agreement, terrain condition, proper power, security, and influence from non-site related air emission sources. AMP-01 may be relocated from its present location to a location further south.

Real-time air monitoring will be conducted at each of the five fixed monitoring stations that effectively surround the Project Area. Each station will be equipped with continuous monitors to measure total volatile organic compounds (TVOCs) as well as the respirable fraction of particulate matter as PM₁₀. The placement of air monitoring stations has taken into account the location of residences in the nearby community as well as proximity of the school and its associated playground area.

In addition to real-time monitoring, time-weighted composite air sampling will be conducted at two of the five fixed air monitoring stations over a 24-hour period twice per week. The purpose of this monitoring will be to collect supplemental data to validate information being obtained

from the real-time monitoring network and confirm that concentrations of indicator chemicals at the stations are within recommended guidelines. Time-weighted average sampling will also provide information on naphthalene and styrene, which are not included in the suite of VOC chemicals analyzed during real-time monitoring by the GC. The time-weighted composite sampling will also provide an additional evaluation of the effectiveness of emission controls.

While the range of monitoring locations could include all five real-time locations, it is believed that placement of time-weighted monitoring equipment at two of these locations will provide sufficient supplemental information for the project. Based on these data and sensitive receptors, it is anticipated the two time-weighted average monitoring locations will be at AMP -02 and AMP-03.

6 Coordination with City of Ashland

Wastewater generated by Phase 2 Wet Dredge operations will be treated by the DWTS. Discharge to the City of Ashland POTW would be pursued as a contingency only, in the event that upsets to the DWTS preclude meeting permit equivalency limits. Prior to treating contact water in the DWTS, the water will undergo settlement processes to reduce total suspended load. Prior to any discharge to the City POTW, water will meet the following requirements:

- ◆ Any wastewater that is to be discharged to a publicly-owned treatment system shall meet all requirements set forth in that facility's permit, including pretreatment standards. Specific water quality standards are identified in the City approval to discharge letter to NSPW, dated January 28, 2016.
- ◆ Concentrations to meet City POTW discharge limits including, but not limited to, metals, VOCs and tPAH.
- ◆ Acceptance of the treated water to the City POTW is dependent upon its capacity to handle this flow during storm events.

Noise monitoring will be conducted to confirm compliance with City ordinances. NSPW to gain agreement with modifying the ordinance before 24-hour dredging operations become necessary.

Existing Access Agreement with the City will be complied with by the City, NSPW and its contractors, including, but not limited to, maintaining public access to the marina, boat launch and related parking areas.

7 Construction Schedule

This section provides an overview and sequence of activities for the implementation of the Phase 2 Wet Dredge. The schedule is subject to weather conditions (e.g., ice out date in spring and ice cover and extreme cold in fall), timely regulatory approvals by USEPA and WDNR, and other possible factors.

The Phase 2 Wet Dredge will be implemented utilizing existing infrastructure established during the Wet Dredge Pilot Study project and subsequent infrastructure improvements made in the winter of 2016/2017 including, but not limited to moving utilities/ storm sewer, grading, paving and building erection.

The current Phase 2 Wet Dredge implementation schedule is presented on Figure 7-1. The schedule is based on an estimated ice out date of April 17, 2017. The first on-the-water activities of gap closure and barrier system installation are dependent on ice out. The schedule also reflects dredging activities completed in 2017 and placing restorative layer in 2018. However, adverse weather, field or other delays could result in dredging activities continuing in 2018. Generally, field work will be conducted during a single 12-hour shift, however, to address hydraulic dredging needs, it is anticipated that two 12-hour shifts will be required for hydraulic dredging of DMU-2. As the construction season progresses, it is possible that other field work activities could be necessary for a short term, on an extended day basis (beyond 12-hours/day) to complete dredging in 2017, to the extent practicable. On-the-water resources (certain barrier system components, in-situ measurement stations, signage, and navigational marker buoys) that would be affected by ice will be removed at the end of the 2017 construction season. Any structures remaining in place at the end of the construction season will be signed and identified for public safety. The restorative layer placement is anticipated to commence as early as April 2018 and potentially be completed as early as August 2018, depending on when dredging activities at the Site are completed. The goal is to complete all Phase 2 Wet Dredge and marine restoration activities by December 2018.

8 Health and Safety

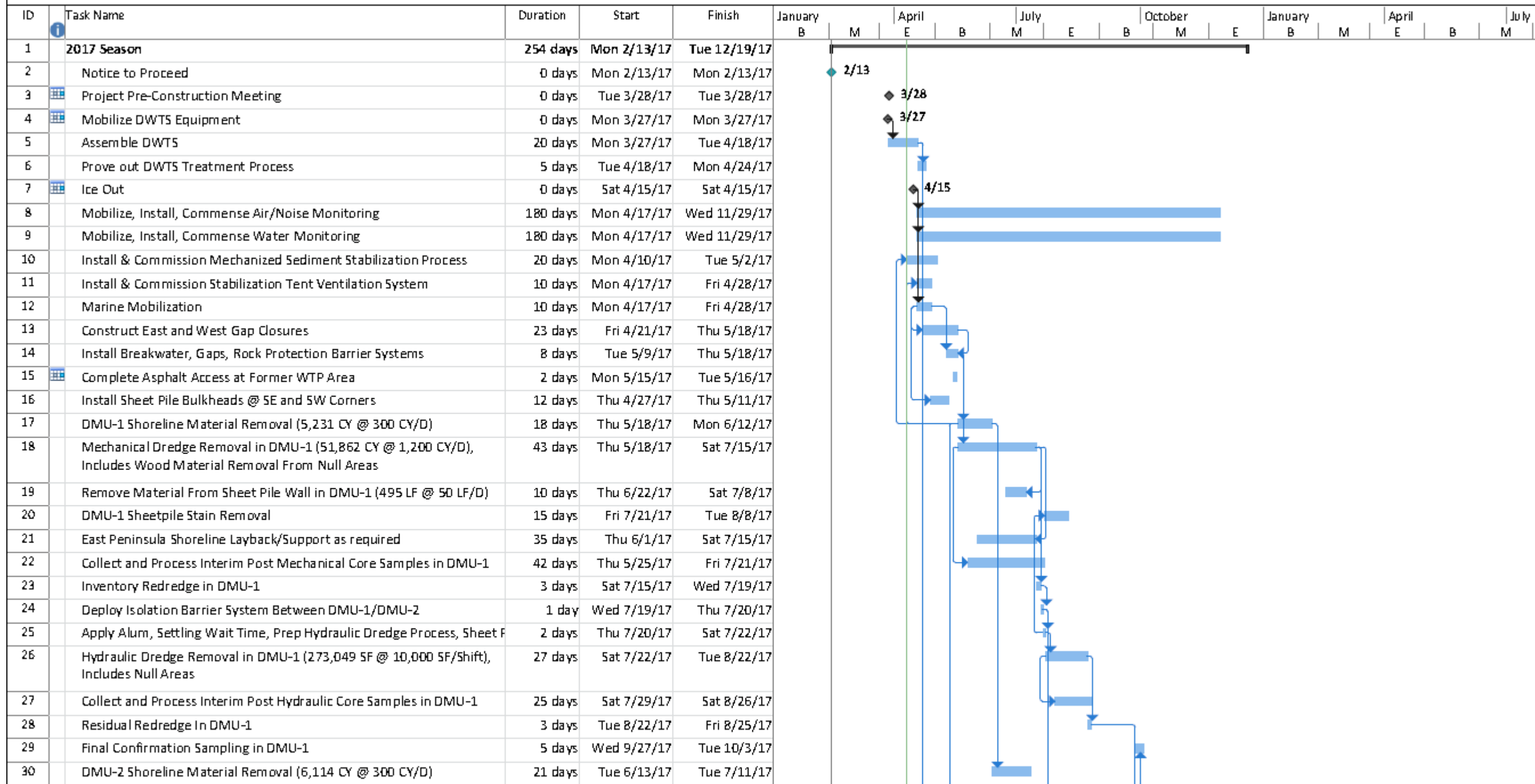
Appendix A contains the *HASP* providing health and safety procedures for the Phase 2 Wet Dredge activities.

9 References

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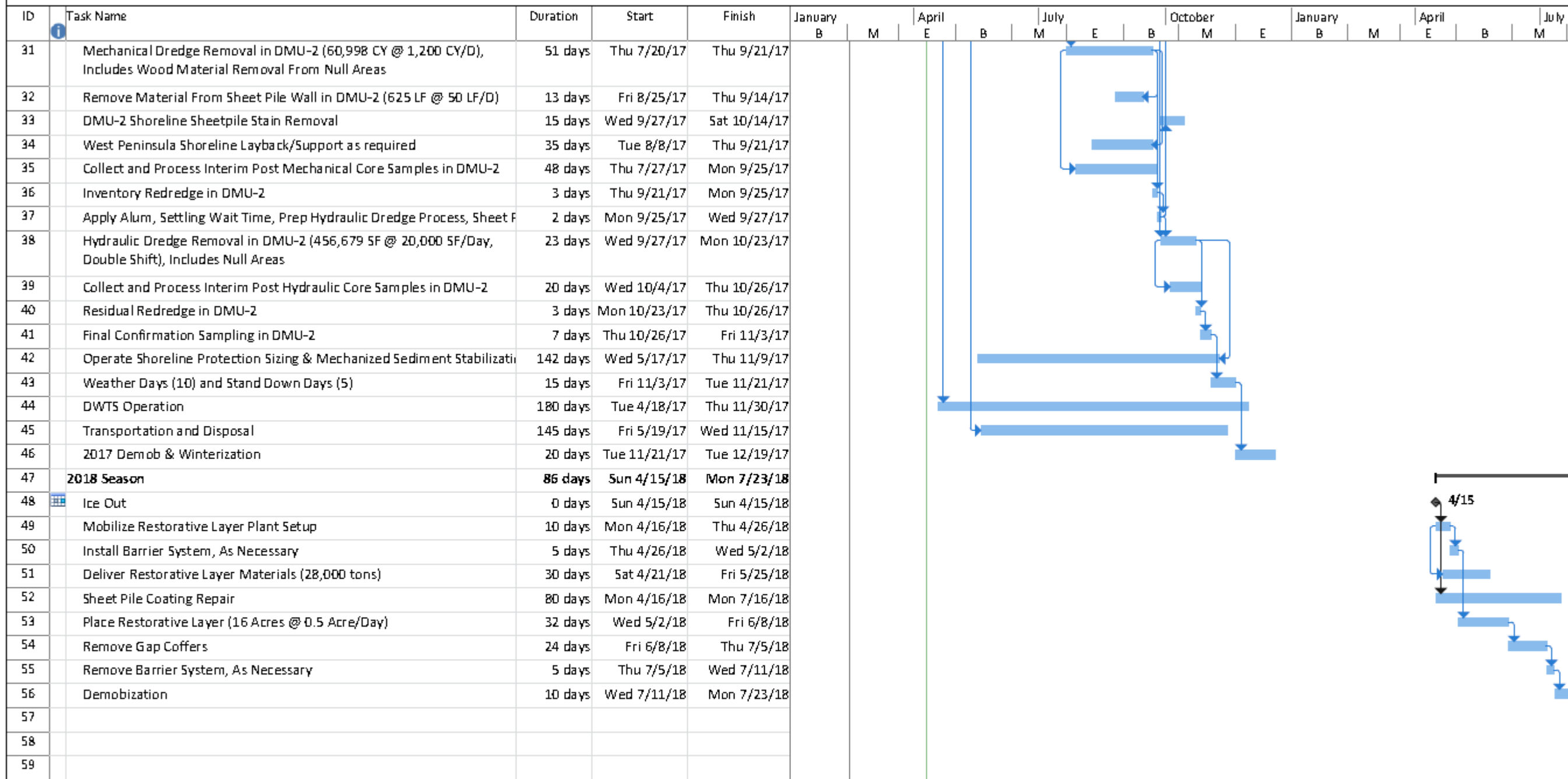
Figures

FIGURE 7-1 WET DREDGE CONSTRUCTION SCHEDULE



Project: Wet Dredge Construction Date: Mon 4/10/17	Task		Project Summary		In active Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		In active Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only		Manual Progress	
	Summary		Inactive Task		Duration-only		Finish-only			

FIGURE 7-1 WET DREDGE CONSTRUCTION SCHEDULE



Project: Wet Dredge Construction Date: Mon 4/10/17	Task		Project Summary		In active Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		In active Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only		Manual Progress	
	Summary		Inactive Task		Duration-only		Finish-only			

Appendix A

Health and Safety Plan for Phase 2 Wet Dredge

Plan



Health and Safety Plan for Phase 2 Wet Dredge

Ashland/NSP Lakefront Site
Project I.D.: 16X002

NSPW
Eau Claire, Wisconsin

March 2017





Joint Venture

101 International Drive, P.O. Box 16655
Missoula, MT 59808

March 7, 2017

Mr. Eric Ealy
Project Coordinator
Xcel Energy, Inc., on behalf of NSPW
414 Nicollet Mall-2
Minneapolis, MN 55401

Dear Mr. Ealy:

RE: *Health and Safety Plan for Phase 2 Wet Dredge*
Ashland/NSP Lakefront Site

On behalf of Foth Infrastructure & Environment/Envirocon Joint Venture (FE JV), this *Health and Safety Plan for Phase 2 Wet Dredge (HASP)* for the Ashland/NSP Lakefront Site is enclosed.

This *HASP* provides safety-related information and requirements specific to the task and work location(s) for the Wet Dredge Project Area.

If you have any questions concerning this report, please contact either of the undersigned at (920) 497-2500.

Sincerely,

Foth Infrastructure & Environment/Envirocon Joint Venture

A handwritten signature in black ink that reads "Steve Laszewski".

Steve J. Laszewski, Ph.D.
Management Committee Member

A handwritten signature in black ink that reads "Denis Roznowski".

Denis M. Roznowski, P.E.
Project Manager

Health and Safety Plan for Phase 2 Wet Dredge

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Health and Safety Plan for Phase 2 Wet Dredge

Project ID: 16X002

Prepared for

NSPW

Eau Claire, Wisconsin

Prepared by

**Foth Infrastructure & Environment/
Envirocon Joint Venture**

March 2017

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List of Abbreviations, Acronyms, and Symbols

°	degree
ACGIH	American Conference of Governmental Industrial Hygienists
AGA	American Gas Association
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
AOC	Administrative Order by Consent {or Area of Concern}
APR	Air-Purifying Respirator
ARAR	Applicable or Relevant and Appropriate Requirements
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing Materials
ATW	Authorization to Work
BBS	Behavior Based Safety
BMP	Best Management Practices
bpm	beats per minute
CAS	Chemical Abstracts Service (Number)
CAMU	Corrective Action Management Unit
CBI	BBS Critical Behavior Inventory
CDL	Commercial Driver's License
CERCLA	Comprehensive Environment Response, Compensation and Liability Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CKD	Cement Kiln Dust
COC	Contaminants of Concern
CWA	Clean Water Act
dB	decibels
dB(A)	Decibels A-Scale
DNAPL	Dense Non-Aqueous Phase Liquids
DOL	Department of Labor
DOT	Department of Transportation
EMT	Emergency Medical Technician
Envirocon	Envirocon, Inc.
EPA	Environmental Protection Agency
FE JV	Foth Infrastructure & Environment/Envirocon Joint Venture
FID	Flame Ionization Detector
Foth	Foth Infrastructure & Environment, LLC
FR	Federal Register
GC	gas chromatography
GFCI	Ground Fault Circuit Interrupter
GFI	see GFCI (Ground Fault Circuit Interrupter)
gpm	gallons per minute
HAZ COMM	Hazardous Communication Standard
HEPA	High-Efficiency Particulate Air (filtration)
Hg	Mercury

List of Abbreviations, Acronyms, and Symbols (continued)

HPAH	High density Poly Aromatic Hydrocarbons
HSO	Health and Safety Officer
HSS	Health and Safety Supervisor
HSM	Health and Safety Manager
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life and Health
JSA	Job Safety Analysis
LEL	Lower Explosive Limit
LNAPL	Light Non-Aqueous Phase Liquid
LPAH	Low density Poly Aromatic Hydrocarbons
lpm	liters per minute
LUST	Leaking Underground Storage Tank
mg/m ³	milligrams per meter cubed
MGP	manufactured gas plant
mil	one mil equals 1/1000 of a unit
MOC	Management of Change
mppcf	million particles per cubic foot
MTTD	Medium Temperature Thermal Desorption
MUTCD	Manual for Uniform Traffic Control Devices
NEMA	National Electrical Manufacturer's Association
NEPA	National Environmental Policy Act
NFC	National Fire Code
NFRAP	EPA designated "No Further Remedial Action Planned" site
NFPA	National Fire Protection Association
NHTSA	National Highway Traffic Safety Administration
NIOSH	National Institute of Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
NRR	Noise Reduction Rating
NSP	Northern States Power Company
NSPW	Northern States Power Company, a Wisconsin Corporation
NTP	National Toxicology Program OR Normal Temperature and Pressure
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OV	Organic Vapor (e.g., respirator cartridges)
OVA	Organic Vapor Analyzer
PAH	Poly Aromatic Hydrocarbons (see also PNA, HPAH and LPAH)
PAPR	Powered Air-Purifying Respirator
PCB	polychlorinated biphenyls
PEL	Permissible Exposure Limit (OSHA exposure standard)
PFD	personal flotation device
PID	Photo Ionization Detector
PLHCP	physician or other licensed health care professional
PM	Project Manager
PNA	Poly Nuclear Aromatic (see also PAH, HPAH, LPAH)

List of Abbreviations, Acronyms, and Symbols (continued)

POTW	publically owned treatment works
ppb	parts per billion, 1 x 10 ⁻⁹
PPE	Personal Protective Equipment
ppm	parts per million, 1 x 10 ⁻⁶
psi	pounds per square inch
psig	pounds per square inch gauge
PVA	Polyvinyl Alcohol
PVC	Polyvinyl Chloride
QLFT	Qualitative Fit Testing
QNFT	Quantitative Fit Testing
RA	Remedial Action
<i>HASP</i>	<i>Health and Safety Plan for Phase 2 Wet Dredge</i>
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH equivalent of the OSHA PEL)
RQ	Reportable quantity
<i>ROD</i>	<i>Record of Decision</i>
<i>SAP</i>	<i>Sampling and Analytical Plan</i>
SARA	Superfund Amendment and Reauthorization Act
S-B	Soil-Bentonite
SCBA	Self-Contained Breathing Apparatus
SCP	Safety Competent Person
SDS	Safety Data Sheet
SOW	Statement of Work
SPCC	Spill Prevention, Control and Countermeasures
SSE	Short Service Employee (refer to SSE Addendum to EI Procedure 1403.004)
STEL	Short-Term Exposure Limit (typically 15 minutes)
SVOC	Semi Volatile Organic Compounds
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leachate Procedure
TLV	Threshold Limit Value (ACGIH equivalent of the OSHA PEL)
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average (typically 8 hours)
UEL	Upper Explosive Limit
UFC	Uniform Fire Code
UL	Underwriters Laboratory
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compounds
WDNR	Wisconsin Department of Natural Resources
WWTP	Wastewater Treatment Plant

A. Site Introduction

This *Health and Safety Plan for Phase 2 Wet Dredge (HASP)* provides safety-related information and requirements specific to the task and work location(s) for the full-scale dredge operations. General requirements contained in the Envirocon, Inc. (Envirocon) *Health and Safety Program Manual* (Envirocon, 2013), along with this site-specific *HASP*, will be implemented except where noted. A hard copy of the Envirocon Health and Safety Program Manual will be available at the site for reference.

A.1. Scope

This *HASP* applies to the Ashland/Northern States Power Company, a Wisconsin Corporation (NSP/NSPW), Lakefront Site Remedial Action (RA); will be implemented by Foth Infrastructure & Environment/Envirocon Joint Venture (FE JV); and applies to the FE JV team members, subcontractors, and visitors to the Site. FE JV is responsible for control of the Site along with NSPW. The Site Superintendent is a direct employee of Envirocon, a FE JV team member, and is responsible for implementing the safety program. They are responsible for enforcing its compliance with the program with personnel performing duties on the Site and visitors.

While the Envirocon *Health and Safety Program Manual* serves as the reference program guidance, FE JV team members may implement additional requirements covering their personnel or activities under their direct control provided that the additional requirements are at least as protective of site personnel, the environment, and the community as described in the Envirocon *Health and Safety Program Manual*. Appendix A includes JF Brennan Co.'s Health and Safety Plan.

A.2. Site Description

The Site is located in Ashland, Wisconsin along the southern shore of Chequamegon Bay (Bay), which is part of southwestern Lake Superior. Approximately 40 acres of the National Priority List (NPL) Site includes 24 acres upland (onshore) and 16 acres offshore. This RA is strictly limited to the near shore and offshore sediments and debris of the Site and is bounded to the north by the recently constructed Breakwater, to the south by the shoreline/sheet pile wall, to the east by the East Peninsula boat launch and west by the West Peninsula located near the Ashland Marina.

A former manufactured gas plant (MGP) operated from 1885 until 1947 in the area of the Former NSPW Service Center above the lakefront on the Upper Bluff, where other contemporaneous industrial facilities operate; including a series of lakefront saw mills and wood treatment operations, as well as an active railroad corridor. The Schroeder Lumber Company operated in the location currently occupied by Kreher Park, and the city of Ashland and the county of Ashland each owned (and the City still owns) portions of Kreher Park. The Soo Line Rail owned and operated rail lines in Kreher Park for 116 years from 1871 to 1987, and that property is now owned by Canadian National Rail Line.

Kreher Park was formed from man-made land containing 4 to 5 feet of soil overlying wood debris deposited in the late 1800s by various sawmill operations.

A.3. History of Previous Investigations, Record of Decision and Remedies

The Site was added to the NPL in 2002. The U.S. Environmental Protection Agency (USEPA) and NSPW completed a *Remedial Investigation Report (RI Report)* (URS, 2007) /*Feasibility Study (FS)* (URS, 2008) under an Administrative Order of Consent (AOC) for the entire Site. The USEPA issued the *Record of Decision (ROD)* (USEPA, 2010) in September 2010 and a Notice of Completion of the *RI Report/FS* AOC in December 2010.

NSPW installed a recovery system on the Former NSPW Service Center property in 2000 to collect non-aqueous phase liquids (NAPL) discovered in the Copper Falls Aquifer. In 2002, NSPW excavated the contaminated soil in a seep area in Kreher Park, installed a low permeability cap over the area, and installed a groundwater extraction well at the base of the Filled Ravine. NSPW excavated contaminated soil beneath St. Claire Street in 2003 where access and repair of utilities was required.

A.4. Project Scope of Work

The *ROD*, as amended by the EPA's issuance of the "*Explanation of Significant Differences*" (*ESD*) (USEPA, 2016) describes the selected remedy for several areas associated with Phase 2 RA activities.

Task 1 – Mobilization of Equipment and Personnel, Site Preparation and General Construction Activities

Description of Activity

The FE JV will mobilize all personnel, materials, tools, and equipment necessary to complete containment system installation, sediment and debris removal from wet dredge activities in the Bay and along the shoreline, stabilization and loading of material for offsite transport, and restorative layer placement. The FE JV will require an area for lay down, parking and staging materials and equipment for the duration of the project.

Task 2 – Woody Debris Removal

Description of Activity

Woody debris will be removed from the lake bottom using excavators staged both on the shore and on a floating barge. Larger pieces of debris to be removed will require the excavators equipped with a grapple, debris rake, or conventional bucket with a thumb. Finer material such as wood chips or sawdust will be removed with a standard dredge bucket or environmental bucket. For the offshore removal operations, the removed debris will be transported to shore via a material barge. Once on shore, the woody debris will be transported (following sizing, if required to the sediment processing tent).

Task 3 – Security and Erosion Controls

Description of Activity

Site security will involve the daily monitoring of all perimeter fences at the site. Additionally when fences need to be removed, temporary construction fences will be placed. Temporary construction fences will be removed during daily remediation operations and replaced every night.

Throughout the project soil erosion control measures will be installed to control erosion of soils that are being excavated from the site. Approved control measures will be used such as the use of silt fence and covering of soils with polyethylene sheeting (Visqueen) to stop the flow of rain of water on the soil allowing soil to erode and wash off site. Determination for the installation of silt fence or the use of Visqueen will be made at the time of project activities.

The silt fence will be installed and maintained throughout the project. The determination for the use of these control measures will be based on the project activities performed in a day which may leave the site in a position that covering of soils may not be needed. Covering of storm drains will also be done to prevent any possibility of materials getting into them.

Task 4 – Barrier System Installation

Description of Activity

A barrier system will be placed in the Bay around the entire perimeter of the Wet Dredge area to control turbidity and sheens from drifting out of the project area. Posts will hold the curtain in place and will be clearly marked.

Task 5 – Sediment Dredging

Description of Activity

The FE JV will utilize a barge mounted excavator to mechanically remove sediment and debris from the Wet Dredge area. Dredged sediment will be loaded into material barges for transport to the offloading area.

Task 6 – Restorative Layer Placement

Description of Activity

Following dredging operations, restorative, granular backfill will be placed throughout the entire Phase 2 Wet Dredge Area. This procedure will be completed using the land excavator, barge mounted excavator used for dredging operations, and spreading equipment.

Task 7 – Sediment Processing

Description of Activity

An excavator will be utilized to offload sediment and load restorative layer material. The excavator may utilize various attachments based on the different type of material and job task. New processing equipment will be added for the Full Scale project. This includes, but is not limited to the following: vibrating grizzly/finer deck grid, two pocket conveyors with one belt scale, blade mill, pebble lime silo with PLC controlled auger feed, two jump conveyors, and radial stacking conveyor. The safe operation of this equipment will be addressed in specific task JSAs established and reviewed by site personnel prior to operation.

Task 8 – Crane Operations

Description of Activity

Crane operations will be utilized for launching segmental barges, hydraulic dredge, marine excavators, and other ancillary equipment used for the project. The tasks will include but are not limited to the lifting of equipment described above from shore to the water where they will be transported to the project site.

Task 9 – Site Restoration

Description of Activity

Once all necessary RA activities are completed, FE JV will restore the project site to the specifications shown on the project drawings. Following completion of restorative layer installation, FE JV will complete general housekeeping activities to bring the site to a neat and orderly appearance. An FE JV representative will tour the site with the client representative to ensure all tasks are completed to the site specifications and established punch list items have been addressed.

A.5. Tasks

The scope of work associated with this project includes supervision, labor, equipment and expertise to perform the following:

- ◆ Site mobilization tasks;
- ◆ Erosion controls;
- ◆ Water quality in-situ measurement and chemicals-of-concern (COC) sampling;
- ◆ Perimeter air quality and noise monitoring;
- ◆ Grubbing, site clearing;
- ◆ Site security fencing modifications for access;
- ◆ Installation of temporary building structures for material handling;
- ◆ Construct and/or maintain haul roads;
- ◆ Barrier system installation, integrity evaluation and maintenance;
- ◆ Mechanical and hydraulic sediment dredging;

- ◆ Visual post-mechanical and hydraulic interim and final confirmation COC sampling to confirm dredge completion
- ◆ Loader/excavator material handling;
- ◆ Crane operations;
- ◆ Surveying;
- ◆ Equipment fueling/spill containment;
- ◆ Sheet pile wall installation and protection measures (as applicable);
- ◆ Dewatering and impacted water management/treatment;
- ◆ Restorative layer placement;
- ◆ Processing of sediment (removal of oversize and debris);
- ◆ Sediment stabilization;
- ◆ Loading and hauling materials;
- ◆ Transport of stabilized material to a Subtitle D landfill facility;
- ◆ Site restoration;
- ◆ Maintaining and operating ancillary features; and
- ◆ Site demobilization tasks.

B. Basis

This section will discuss the basis in regulations, standards, and policies for the project. It includes Occupational Safety and Health Administration (OSHA) regulations, the NSPW Contractor Safety System, and Envirocon's *Health and Safety Program Manual*.

B.1. Preparation and Approval

This plan is based upon existing available information regarding the site and upon past experience at other sites. This document is also based on OSHA regulations, contractual specifications applicable to the scope of work, the client's health and safety plans and procedures. FE JV team members and lower tier subcontractors are required to adhere to all of these documents during the course of this project.

B.1.a. Prepared For

This plan was prepared for:
Northern States Power Company (NSPW)
414 Nicollet Mall-2
Minneapolis, MN 55401

B.1.b. Prepared By

This plan was prepared by and under the direction of:
David Hardy, CHST
Project Health and Safety Manager
Envirocon, Inc.
7878 Wadsworth Blvd, Suite 340
Arvada, CO 80003

B.1.c. Approvals and Modifications

This plan and future changes must be approved as follows:

- 1) The designated Project Manager, Denis Roznowski, is responsible for the final approval of this *HASP*.
- 2) After preparation and approval by the Project Manager and FE JV, this *HASP* will be submitted to the client in accordance with the applicable contract and specifications.
- 3) David Hardy, the Envirocon Health and Safety Manager, is responsible for implementation of this *HASP* and for any future modifications after preparation.

Note: Certified Safety and Health Professionals (CIH, CSP or CHST) working directly on the execution of this RA are hereby approved to make changes to this plan on an as needed basis during the execution of the work adapting to Site and work conditions.

B.2. Incident-Free Performance of Work

Incident-free performance means error-free project execution: no injuries, illnesses, property damage, community or environmental impacts, or incidents that could have resulted in these occurrences under different conditions. Incident-free performance does not happen by chance. It is achievable through the integration of safety into all management systems, the project process, and individual efforts. The FE JV believes that all incidents are preventable. In order to respond to employee emergencies, employees are asked to complete a Voluntary Employee's Emergency Information Data Sheet. This form is located in Appendix B.

B.3. Policies and Regulatory Basis

Key applicable regulations and standards are listed in Table B.3.

Table B.3. Some Important Applicable Regulations and Standards

Latest Revision	Contract Specifications Applicable to the Scope of Work
29 CFR 1910.20	Access to employee exposure and medical records
29 CFR 1910.38	Employee emergency plans
29 CFR 1910.95	Occupational noise exposure
29 CFR 1910.134	Respiratory protection
29 CFR 1910.120	Hazardous waste operations
29 CFR 1910.151	Medical services and first aid kit
29 CFR 1910.157	Portable fire extinguisher
29 CFR 1910.1000	Air contaminants
29 CFR 1910.1200	Hazard communication
29 CFR 1926	Construction Industry Standards

CFR = Code of Federal Regulations

B.4. Changing Conditions and Management of Change

B.4.a. Management of Change

The plan presents a realistic approach to the anticipated hazards at the site. It is expected that site conditions may vary throughout the duration of the project.

B.4.b. Changing Conditions

Changes in conditions and identification of previously unrecognized hazards are identified by the following processes:

- ◆ Site inspections by supervisory and site safety personnel;
- ◆ Observations and suggestions by all personnel;
- ◆ Proper planning for each new phase of operations;
- ◆ Authorization to Work (ATW) process and its required walk down;

- ◆ Job Safety Analysis Job Safety Analysis (JSA) for each new phase of operations;
- ◆ Communicating plans and controls to all affected employees;
- ◆ Accident investigations and lessons learned from this and other projects; and
- ◆ Contract modifications.

B.4.c. Response to Changes in Conditions

- 1) A risk assessment will be conducted in response to changing conditions.
- 2) An ATW form (Appendix C) will be completed by the work crew.
- 3) This plan, JSAs, and/or other plans shall be changed, as necessary, to reflect the risk assessment.
- 4) Changes in plans will be authorized by responsible individuals.

B.4.d. HASP and JSA Familiarization

The information presented in this plan will be reviewed with the employees during site-specific training to be completed before working on site. These site entry briefings will focus on the specific tasks of those being briefed. A copy of this plan will be available at all times on the site for anyone to review thoroughly and the crews for those tasks will be briefed on the appropriate JSA(s) to review (Appendix D). JSAs will highlight applicable controls from this plan. All assigned personnel, visitors, and regulatory personnel are therefore expected to be familiar with and comply with all aspects of this plan. If the safety requirements are unclear, each individual is responsible for getting clarification from their supervisor. The qualifications required for various tasks on this project are summarized in the training and qualifications section below.

B.5. Compliance

Failure to follow the rules and procedures prescribed in this document potentially jeopardizes the working environment of other employees. For this reason, the FE JV is prepared to enforce the progressive disciplinary procedures described in Section D.5.d, Discipline, for those who fail to follow the established policies and procedures for this project.

C. Site Organization and Key Personnel

29 CFR 1910.120 requires an effective site organization to be responsible for supervision of all work at hazardous waste sites. The purpose of this section is to describe this site's organization as it applies to this project.

C.1. Quality Assurance Project Manager: Peter Joy

The Quality Assurance (QA) Project Manager is responsible for oversight and management of all aspects of the project including health and safety, QA, construction, RD, equipment, and personnel.

- ◆ The Project Manager is responsible for project health and safety performance in accordance with incident-free performance goals;
- ◆ Conducting periodic site inspections;
- ◆ Participating in incident investigations; and
- ◆ Provides safety leadership through example and by holding all personnel assigned to this project accountable for their safety responsibilities.

C.2. Construction Manager: Brad Hay

The Construction Manager serves as the site's general supervisor in accordance with the requirements of 29 CFR 1910.120(b)(2)(i)(A). The Construction Manager is responsible for coordinating activities with the Project Manager and the Site Safety Officer (SSO). This includes:

- ◆ Enforcing the provisions of this *HASP*;
- ◆ Preparing for new tasks in advance of field operations in accordance with the Envirocon Field Operations Manual;
- ◆ Ensuring that a JSA has been completed before any new work commences;
- ◆ Ensuring an ATW has been completed by the crew;
- ◆ Briefing crew members before assigning them to the new task;
- ◆ Ensuring that employee safety suggestions are fairly and respectfully evaluated and that employees are informed of the outcome of the evaluations;
- ◆ Monitoring the conduct of operations in the field to ensure safe delivery of a quality product for the client;
- ◆ Supervising subcontractors in accordance with this plan; and
- ◆ Ensuring that injured personnel (with or without life threatening injuries) are escorted to medical treatment by the SSO or other supervisory personnel.

C.3. FE JV Director of Health and Safety: Frank Sullivan, CIH, CSP, PMP

The FE JV Director of Health and Safety is responsible for the development and implementation of the FE JV Health and Safety Program. The program contains accident prevention plans and procedures and other related plans, policies and procedures required by OSHA standards. The FE JV Director is responsible for:

- ◆ Ensuring that all health and safety issues on site are resolved;
- ◆ Ensuring that employee complaints are addressed in accordance with FE JV safety policies and procedures; and applicable laws;
- ◆ Ensuring that all employee complaints received by the director are kept confidential;
- ◆ Ensuring appropriate investigation of all incident reports;
- ◆ Ensuring that audit findings are corrected in accordance with FE JV safety policies and procedures; and applicable laws; and
- ◆ Providing professional support for the Project Manager's Health and Safety Program.

C.4. Project Health & Safety Coordinator: Chris Seider

The Project Health & Safety Coordinator provides overall coordination between the different elements of the overall project, specifically between the professional service-related activities such as pre-design investigations work, post mechanical/hydraulic interim sampling, final confirmation sampling, air/water quality monitoring and sampling, and vibration monitoring; and construction activities.

The Project Health & Safety Coordinator is responsible for the following:

- ◆ Coordinating health and safety program implementation between the Program and Project Manager; and
- ◆ Verifying that any health and safety issues that are identified by the Project Health & Safety Manager or other personnel during periodic inspections and audits of the project site are addressed.

C.5. Project Health & Safety Manager: David Hardy, CHST

The Project Health & Safety Manager is the senior health and safety professional assigned to the construction elements of the project and provides technical assistance to the Project Manager and on-site health and safety personnel. The Project Health & Safety Manager reports to the Corporate Director of Health and Safety with regard to project health and safety issues.

The Project Health & Safety Manager is responsible for the following:

- ◆ Developing and implementing the Project Manager’s site-specific health and safety program and procedures;
- ◆ Providing professional technical support for the Project Manager with regard to all matters of health and safety associated with the project;
- ◆ Technical supervision of the Health and Safety Officers (HSO) and technicians assigned to the project;
- ◆ Assisting HSOs in developing and reviewing project health and safety procedures, hazard analysis and other supporting documents;
- ◆ Implementing and administers this *HASP*;
- ◆ Designating Site Competent Person;
- ◆ Conducting periodic inspections and audits of the project site for the Corporate Director of Health and Safety;
- ◆ Coordinating the activities of other health and safety department personnel supporting the project with the senior health and safety official on site and the Project Manager;
- ◆ Coordinating all health and safety activities with the Project Manager; and
- ◆ In the event that personnel fail to adhere to established safety guidelines, recommending disciplinary and/or corrective actions to the Project Manager.

C.6. Project Health & Safety Supervisor: Dan Allen

The Project Health & Safety Supervisor is the senior designated HSO assigned to the project and is responsible for the following:

- ◆ Developing and implementing the Project Manager’s site-specific health and safety program and procedures;
- ◆ Providing professional technical support for the Project Manager with regard to all matters of health and safety associated with the project;
- ◆ Technical supervision of the HSOs and technicians assigned to the project;
- ◆ Assisting HSOs in developing and reviewing project health and safety procedures, hazard analysis and other supporting documents;
- ◆ Implementing and administers this *HASP*;
- ◆ Conducting periodic inspections and audits of the project site for the Corporate Director of Health and Safety;
- ◆ Coordinating all health and safety activities with the Project Manager; and

- ◆ In the event that personnel fail to adhere to established safety guidelines, recommending disciplinary and/or corrective actions to the Project Manager.

C.7. Site Health & Safety Officer(s): Dan Allen

The HSO(s) are the employees designated as the health and safety competent persons for this project.

The HSO(s):

- ◆ Serves as the OSHA “Site Safety and Health Supervisor” as defined in the HAZWOPER Standard 29 CFR 1910.120/1926.65(b) (Note: This includes authorization to administer the requirements of this plan, the Envirocon Health and Safety Program, and applicable OSHA regulations on site);
- ◆ Implements the provisions of this *HASP*;
- ◆ Serves as a safety and health competent person (SCP);
- ◆ Conducts and documents daily site safety inspections;
- ◆ Maintains the site health and safety logs;
- ◆ Maintains health and safety records on site;
- ◆ Reports and documents incidents and issues related to site safety;
- ◆ Assists the Project Manager with incident investigations related to health and safety;
- ◆ Supervises decontamination of personnel and equipment;
- ◆ Conducts monitoring tasks on site;
- ◆ Monitors the use of personal protective equipment (PPE) to ensure proper usage;
- ◆ Inventories and inspects PPE;
- ◆ Selects PPE within the guidelines of this plan;
- ◆ Ensures all personnel are qualified and “Fit for Duty;”
- ◆ Inspects first aid kits/fire extinguishers and emergency response equipment;
- ◆ Accompanies employees, as needed, to clinics or other health care providers to ensure proper care and evaluation of injured or ill employees; and
- ◆ Reports and coordinates return-to-work issues with the Corporate Director of Health and Safety.

C.8. Site Competent Persons

OSHA's general safety and health provisions from the construction industry standards (29 CFR 1926.20(b) and 29 CFR 1910.120(b)(2)(i)(B)) include accident prevention responsibilities. Such programs shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employers. OSHA's regulations regarding scaffolding, excavation and hazardous waste operations have similar requirements. The construction safety competent person is defined in 29 CFR 1926.32 to mean "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them."

Competent persons are designated on the form that follows this section. Each competent person is given responsibility and authority for certain aspects of safety on site. It is important for each competent person to recognize the limits of their own knowledge, training, experience and capability. It is the responsibility of each competent person to act within the limits of their own knowledge, training, experience, and capabilities.

C.8.a. Site Safety Competent Persons

The HSO(s) serve as the general site competent person (SCP) responsible for accident prevention in accordance with 29 CFR 1926.20 and 29 CFR 1910.120(b)(2)(i)(B). The competent person is responsible for, and authorized to act to ensure that personnel are not working under conditions which are unsanitary, hazardous, or dangerous to their health or safety.

- 1) The competent person's accident prevention responsibilities includes:
 - a. Frequent and regular inspections of the job site;
 - b. Inspections of materials on site; and
 - c. Inspection of equipment on site.
- 2) The Project Manager may designate additional competent persons.
- 3) Designated persons, in accordance with 29 CFR 1926.32, must be capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees.
- 4) Once designated, these competent persons share the Site Safety Officer's authority to take prompt corrective measures to eliminate these hazards.

C.8.b. Excavation Competent Person

This individual will have direct supervisory control over all excavation activities involving entry into excavations or trenches. All competent persons shall be authorized and acknowledge authorization in the Competent Person Designation form located in Section C.10.

- 1) Compliance standards

The excavation competent person ensures compliance with 29 CFR 1926, Subpart P (1926.650 thru 652). The scope of these regulations includes all excavations (e.g., hand digging, equipment excavation, with or without personnel entry). Additional competent persons may be designated by the Project Manager in consultation with the Corporate Director of Health and Safety. Designation will be based on experience and knowledge of these standards.

2) Specific duties include:

- a. Assists Project Safety Supervisor with planning excavations;
- b. Ensures that utilities are located and marked (underground or overhead hazards) prior to excavating. Hand dig to locate when excavating within six feet of utilities;
- c. Where personnel entries are involved, classifies soils in accordance with OSHA soil classification in 29 CFR 1926 Subpart P;
- d. Ensures the use of protective systems in accordance with Subpart P where personnel entries are required;
- e. Monitors all excavation activities for associated hazards;
- f. The competent person is authorized by the Project Safety Coordinator to take corrective action to eliminate hazardous or dangerous situations. This includes halting excavation operations and/or removing personnel from excavations; and
- g. Performs inspections of excavations prior to the start of work, as needed throughout the shift and after every rainstorm.

C.8.c. Scaffold Competent Person

This individual(s) will have direct supervisory control over all scaffold activities. All competent persons shall be authorized and acknowledge authorization in the Competent Person Designation form located in Section C.10.

1) Compliance standards

The scaffold competent person ensures compliance with 29 CFR 1926, Subpart L (1926.451 thru 453). Additional competent persons may be designated by the Project Manager in consultation with the Corporate Director of Health and Safety. Designation will be based on experience and knowledge of these standards.

2) Specific duties include:

- a. Supervises scaffold erections:
- b. Inspects scaffold repairs:
- c. Inspects scaffolds daily: and

- d. The competent person is authorized by the Project Safety Coordinator to take corrective action to eliminate hazardous or dangerous situations. This includes halting operations and/or removing personnel from scaffolds.

C.9. Lower Tier Subcontractors

Lower tier subcontractors are responsible for supervising their work and personnel in accordance with this plan and applicable site policies and procedures. Regardless of other requirements, lower tier subcontractors shall adhere to all federal, state, and local laws and regulations. In particular this includes the requirements of 29 CFR 1910.120/1926.65 HAZWOPER Standards. Lower tier subcontractors' personnel will be supervised in accordance with the same requirements and standards as FE JV and subcontractor personnel. Where their programs, policies, and procedures exceed the requirements of this document and the applicable site policies and procedures, the lower tier subcontractor may use their own policies and procedures to implement these requirements. Regardless, they must at a minimum meet the requirement established in this *HASP*.

C.9.a. Site Access Control

FE JV is in part responsible for controlling access to this site along with our client. FE JV reserves the right to deny access to personnel who in their opinion pose a hazard to operations through serious, willful, or repeated violation of safety requirements; and those personnel who are not otherwise qualified to work on site.

This *HASP* does not necessarily address all of the hazards specific to lower tier subcontractors' work. Lower tier subcontractors shall submit either a Site-Specific *HASP* (Appendix A) for their particular operation(s) or prepare and submit appropriate JSA(s) to append to this plan.

C.10. Competent Person Designation Form

COMPETENT PERSON DESIGNATION		
<p>The following individual(s) has been designated as the "Competent Person," meaning one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who is hereby authorized by Envirocon to take prompt corrective measures to eliminate them.</p> <p>The person(s) named below has knowledge of the systems, equipment, conditions and procedures in relationship to the proper use, inspection, manufacturers' recommendations and instructions, and maintenance as designated below. This person(s) has been delegated the responsibility to coordinate all activities and operations as defined by the designation(s). In carrying out these responsibilities, it shall be the duty of the competent to act within the limits of their knowledge and training.</p>		
Competent persons added to the list must be approved by the Project Manager and HSO.		
NAME/DESIGNATION(S)	COMPANY	COMPETENT PERSON
Dan Allen	Envirocon	<input checked="" type="checkbox"/> Excavation, <input checked="" type="checkbox"/> Site Safety, <input checked="" type="checkbox"/> Scaffolds
Project Manager's approval: _____; HSM/HSO Approval: _____ Acknowledged: _____ Date _____ _____ Competent Person's Signature		
Dave Gehring	Envirocon	<input checked="" type="checkbox"/> Excavation, <input checked="" type="checkbox"/> Site Safety, <input checked="" type="checkbox"/> Scaffolds
Project Manager's approval: _____; HSM/HSO Approval: _____ Acknowledged: _____ Date _____ _____ Competent Person's Signature		
Brad Hay	Envirocon	<input type="checkbox"/> Excavation, <input checked="" type="checkbox"/> Site Safety, <input type="checkbox"/> Scaffolds
Project Manager's approval: _____; HSM/HSO Approval: _____ Acknowledged: _____ Date _____ _____ Competent Person's Signature		
	Envirocon	<input type="checkbox"/> Excavation, <input type="checkbox"/> Site Safety, <input type="checkbox"/> Scaffolds
Project Manager's approval: _____; HSM/HSO Approval: _____ Acknowledged: _____ Date _____ _____ Competent Person's Signature		

C.11. Authorization to Work

C.11.a. Discussion

- 1) The RA activities for the Site will require several contractors and subcontractors to be working in close proximity and using paths for access to tasks that pass through, or are co-located in the work zones of an unaffiliated work group. It is essential that a procedure be established that mandates a disciplined and regular communication method to protect personnel from an unexpected hazard not inherent in their own task as they move and work around the Site.

C.11.b. Basis

- 1) OSHA Directives CPL 02-00-124 and CPL 2-0.124–Multi-Employer Citation Policy (Dec. 10, 1999) describe the requirement for multi-employer worksites to perform hazard analysis identify how each employer may be in one or several categories: Controlling, Exposing, Creating and/or correcting a recognized hazard.

C.11.c. Planning Requirements

- 1) Every employer on the Site will be required to have each employee or subcontractor under their supervision perform the following:
 - a. Review specifically the task;
 - b. Review the hazards associated with performing the task;
 - c. Walk down the work area at some point in the planning process;
 - d. Review that controls for each hazard that will protect:
 - i. workers,
 - ii. other personnel entering their work zone,
 - iii. the environment, and
 - iv. the public;
 - e. Ensure the tools, personal protective equipment, monitoring, and work zone controls are available and ready for implementation;
 - f. Identify any paths of travel through another contractor's work zone; and
 - g. Determine whether another contractor is likely to also work in the proximity of their task.
- 2) The Construction Manager shall be responsible for ensuring that adequate planning is performed. Employees are expected to participate in all above elements of the planning process.

- 3) Planning shall occur if a task or work location changes, but at a minimum shall be pre-shift before the commencement of any activity. The required crew walk down of the work area may occur at the end of a shift in anticipation of the following calendar day's activities if weather or other changes have not occurred during the interim.

C.11.d. Documentation

- 1) The document that establishes that the above elements have been performed is the ATW. Appendix C provides examples of these. Standardization of a common-use form is not the objective. The forms may be customized, and a short form for a short task is acceptable.
- 2) All personnel who participate in the task must sign the ATW. The Construction Manager, or HSO, must also sign the ATW.
- 3) A copy of the ATW must be immediately available to the work crew, and in the trailer used by the Construction Manager or HSO.
- 4) The ATW is not a substitute for a JSA. It is a way to make sure a JSA has been prepared and is correct in identifying hazards and setting controls.

C.11.e. Multi-Employer Sites

- 1) If a work area is such that a crew may be exposing another work group to hazards, at a minimum, they must do the following:
 - a. Review and sign each other's ATWs: and
 - b. Document on each ATW how hazard communication will be conducted.Examples are:
 - i. Channel 2 of radio to let crew know when water truck will pass.
 - ii. Flagger at gate entrance to monitor haul truck and cross-traffic.
- 2) The employer who is responsible for creating or controlling a hazard has final say over the means by which they will control the hazard including setting controls and conditions in their ATW that other work crews entering their work zone must follow.
- 3) Contractors or their employees responsible for preventing the exposure to site hazard, but willfully deficient in doing so, or deficient in correcting a recognized hazard will be subject to disciplinary or contractual processes. Examples of deficiencies would include;
 - a. No barricades, warnings, monitors, preventing exposure to an open vertical wall trench in a common use area
 - b. Personnel using a route through a materials handling area where loaders/excavators running without identifying the route on an ATW, and checking with that work area supervisor on ATW controls.

C.11.f. Safety Time-Out

- 1) Any employee may call a safety time-out if an individual who has not signed an ATW enters a work area with an identified hazard.
- 2) Safety time out may also be called as described in Section G.3.e.

C.11.g. Best Management Practices

The following are suggestions demonstrating implementation Best Management Practices (BMP).

- 1) Safety meetings or Plan-of-the-Day sessions that include subcontractors and as many other FE JV team member's subcontractors as possible. Safety meetings may actually benefit from being held at the end of shift for the next day's activity.
- 2) Large sign at every site entrance instructing every entrant to sign in and get site briefing from SSO/Superintendent. The visitor/vendor/new hire can then be guided through the ATW process.
- 3) Site map or bulletin board that posts all active shift ATWs to facilitate a quick check on activities and hazards.
- 4) Regular spot checks by Superintendents and SSOs in the field for work groups to ensure they have participated in the ATW process.
- 5) The required crew walk down of the work area may occur at the end of a shift in anticipation of the following calendar day's activities, if weather or other changes have not occurred during the interim.

D. Site Security

D.1. Site Security and Controls

This section deals with site access and general project rules, physical security of the project work areas, and the controls related to waste management and access to impacted areas to ensure qualifications of personnel.

The work areas associated with this project are within the confines of the Site. Site security will be maintained to prevent access and vandalism to the Site.

D.2. NSPW Screening of Personnel Needing Reoccurring Site Access

NSPW requires direct compliance with their in-house security process prior to being granted site access. Access to the site may be denied if it is determined that a threshold of unacceptable security risk is in evidence. This process is comprised of two parts:

- 1) Personal questionnaire (residences, criminal history, etc.) and
- 2) Security screening that will look at:
 - a. Criminal records
 - b. Driving records
 - c. Social security number trace

D.3. FE JV Security Responsibilities

D.3.a. Security Officer

The FE JV Project Manager is responsible for the overall security of the project site.

- 1) The Project Manager will be assisted in these duties by the Project Health & Safety Supervisor who will serve as security officer.
- 2) The security officer's responsibilities include:
 - a. Ensuring that all personnel entering the site are in compliance with NSPW's security procedures.
 - b. Ensuring that authorized personnel conduct themselves in accordance with the established security and safety requirements.
 - c. Ensuring that personnel sign in and sign out at the beginning and end of each shift, and visitors are directed to the main office.
 - d. Establishing and maintaining appropriate exclusion zone boundaries around contaminated areas.
 - e. Work areas and zones shall be adequately marked and posted along access routes to give warning of restrictions to visitors.

- f. Ensuring that adequate barriers and warnings are used to prevent site access by the general public or unqualified personnel.
- g. Providing adequate surveillance and lock-up for:
 - i. Trailers and storage facilities;
 - ii. Fuel and hazardous materials storage;
 - iii. Materials of potential homeland security concern;
 - iv. Heavy equipment, vehicles, and related equipment; and
 - v. Small equipment and pilferable items.
- h. Ensuring that heavy equipment is adequately secured after working hours to prevent theft or mischief.

D.4. Public Safety

The Site perimeter must be secured to prevent access to ensure safety for neighborhood children, associated with a nearby school, or other vulnerable people that may be attracted to the work area.

The work area shall be suitably delineated (i.e., as appropriate for a construction site with recognized chemical contamination) in order to prevent unauthorized entry. Typical signage language may read as follows:

“Warning.” Materials on-site may pose a risk to public health through direct contact. Entry is restricted. Authorized personnel must sign in at Main Office or call (insert phone number) for further information.”

Visitors shall be directed to the Project Manager’s designated representative to seek authorization when appropriate. Visitors shall be logged onto the site. Visitors that are not qualified for work in the Exclusion Zone shall be escorted or otherwise prevented from accidentally entering the Exclusion Zone.

All unattended equipment will be secured physically and mechanically during periods of nonuse. Keys shall be removed from equipment and stored in a secure location.

D.5. Project Rules

The project rules have been developed by FE JV and NSPW to create a problem-free and rewarding work environment; one in which the employee understands what is expected of them on the project site. An employee who fails to maintain at all times the proper standards of conduct or who violates any of the following rules and regulations may be subject to disciplinary action, including but not limited to, termination of employment or denial of access.

D.5.a. Unacceptable Conduct

Unacceptable employee conduct and/or violation of a project rule or requirement may be reason for disciplinary action up to and including suspension without pay, termination of employment, or denial of access to the work area or client facilities. Examples of unacceptable employee (including contractor and subcontractor) conduct and/or rule violation are as follows:

- ◆ Being mentally or physically unfit for duty at any time while on the job, such as reporting to work under the influence of drugs or alcohol, or when ill, fatigued, or under mental stress to a degree that could affect job performance or safety.
- ◆ Possessing, when not authorized, project's or other person's property or services or theft of the same;
- ◆ Altering, damaging, or mutilating project's or other person's property;
- ◆ Violating the security rules;
- ◆ Reporting or badging for other employees or other identification misrepresentation;
- ◆ Making or stating false claims or falsifying reports or records;
- ◆ Refusing to submit to a search;
- ◆ Refusing to submit to drug and alcohol screening or testing or other similar inspections;
- ◆ Possessing or using alcoholic beverages, controlled substances, or weapons on the project;
- ◆ Using or possessing keys or other devices used for lock opening without specific permission;
- ◆ Sleeping on the project;
- ◆ Improperly using, or failure to use, toilet facilities;
- ◆ Failure or refusal to perform assigned work as directed;
- ◆ Fighting;
- ◆ Negligence resulting in an infraction of health and safety or project rules or requirements;
- ◆ Taking unauthorized work breaks;
- ◆ Engaging in horseplay of any kind;
- ◆ Engaging in gambling or the sponsoring of raffles;
- ◆ Not using trash receptacles or otherwise creating unsanitary conditions;

- ◆ Smoking, using tobacco, or eating in prohibited areas;
- ◆ Unauthorized cooking on the project;
- ◆ Selling food, beverages, or other items on the project;
- ◆ Failure to display identification badge or area access credentials in the proper manner and in a conspicuous place;
- ◆ Violating health and safety or project rules or requirements;
- ◆ Sexual harassment;
- ◆ Abusing equipment, vehicles, or other FE JV member's property or rentals;
- ◆ Operating equipment or vehicles without authorization and proper qualification;
- ◆ Failure to operate equipment or vehicles in the manner specified by the manufacturer (including proper maintenance and repairs);
- ◆ Not reporting use of prescription drugs;
- ◆ Not reporting equipment or material damage;
- ◆ Not reporting an accident or incident; and
- ◆ Displaying pornographic, sexually explicit or otherwise offensive photographs, calendars, or other materials that may be objectionable to other individuals or groups.

The above is not an all-inclusive list. If you are unsure what may constitute unacceptable behavior, ask your Construction Supervisor.

D.5.b. Prohibited Articles, Materials, Substances

The use, possession, concealment, transportation, promotion, or sale of the following items or substances is prohibited on site premises. Employees who violate this policy will be subject to disciplinary action up to and including removal from site and/or termination. Project management reserves the right to conduct drug and/or alcohol search and screening consistent with NSPW's facility policy.

- ◆ Illegal, look-alike, designer drugs and drug paraphernalia;
- ◆ Controlled substances, such as medications, when usage is abused;
- ◆ Valid medications, when not kept in marked prescription bottles;
- ◆ Alcoholic beverages;
- ◆ Firearms, weapons, and ammunition;
- ◆ Unauthorized explosives;
- ◆ Stolen property or contraband;
- ◆ Unauthorized cameras or photographic equipment; and
- ◆ Unauthorized recording devices

D.5.c. Substance Abuse

It is the policy of FE JV and NSPW (Policy 9.3 Alcohol and Drug-free Workplace) to run a drug-free workplace.

- 1) Substance abuse policy and program description are contained in Procedure 1403.006. The detailed procedures for performing substance abuse tests are contained in the medical surveillance procedures (Procedure 1403.005M.f).
- 2) On-site personnel are subject to the following substance abuse testing in accordance with procedures described above:
 - a. Pre-employment and pre-project
 - b. Post-accident
 - c. Random
 - d. Reasonable suspicion
- 3) It is not anticipated that for the purpose of the FE JV random substance abuse testing that a common pool be established, but it is the requirement of this *HASP* that the FE JV shall separately and faithfully comply independently with their own random selection method from their designated pool.

D.5.d. Discipline

FE JV reserves the right to take disciplinary action, at its discretion, up to and including suspension or termination of employment or denial of access to the site work areas, depending on the severity of the violation.

- 1) At the discretion of management, suspension with/without pay may be given in lieu of discharge.
- 2) FE JV members should refer to their primary employer's Employee Information Manual for policies and procedures related to employee conduct and disciplinary action.
- 3) Verbal warnings and written reprimands are forms of discipline used to document and intended to correct, undesirable actions.
- 4) Unacceptable conduct or failure to adhere to established policies and procedures willfully or repeatedly may be subject to removal from this project and/or termination.

D.5.e. Subcontractors

Subcontractors shall also adhere to established policies and procedures applicable to this project site.

- 1) Subcontractors are responsible for disciplinary actions regarding their own employees and their lower tier subcontractors.
- 2) Failure of subcontractor employees to adhere to policies and procedures as described in this document will result in verbal or written warnings to the responsible subcontractor.

- 3) FE JV reserves the right to permanently or temporarily remove and bar subcontractor employees from the project site. Unacceptable conduct or failure to adhere to established policies and procedures willfully or repeatedly may result in such removal from the project site.

D.6. Communications

Personnel in the Exclusion Zone will remain in constant communication or within sight of the Project Manager, or his/her representative. Two-way radio is the primary method of communication.

- 1) If radio communication and hand signals are not feasible:
 - a. The Project Manager will identify the site activities that can continue without communication, if any; and
 - b. If necessary, one long air horn signal will be used to evacuate the site until communications have been restored.
- 2) Emergencies
 - a. One long or continuous horn blast.
 - b. Unless otherwise directed, all personnel will leave the Exclusion Zone.
 - c. The audible signals in Table D.6, using an air horn, will be used as appropriate:

Table D.6. Emergency Signals

One long or continuous blast	Emergency, including fire/explosion Evacuate unless otherwise directed
One short blast	Attention-getter; stop work and assemble at Contamination Reduction Zone
Two short blasts	All is clear

D.7. Site Access

Access to the site shall be limited to those personnel that are qualified and have an acceptable (in the judgment of the client facility’s designated representatives and the Security Manager) reason for being on site. Continuing access is further conditioned on adherence to the established site policies and procedures.

D.7.a. Motor Vehicles

Privately owned vehicles are subject to site rules and regulations when operated on site. Seat belts are required for all vehicle drivers and passengers when the vehicle is in motion.

D.7.b. Parking

Parking areas are provided for employee vehicles as designated by the client's project manager. Privately owned vehicles are prohibited from entering the work areas. Employees who illegally park in fire lanes, areas posted with no parking signs, handicapped parking spaces, or visitor parking spaces are subject to disciplinary action and removal of the vehicle at the workers expense.

D.7.c. Inspection

All employees are subject to search upon entering or leaving the job site.

D.7.d. Cameras/VCRs

No photos or recordings are permitted without prior authorization from site management.

D.8. Contamination Control Boundaries

The HSO is responsible for establishing and maintaining contamination control boundaries and supervising decontamination.

D.8.a. Postings

All work areas and zones shall be posted and demarcated adequately in order to communicate the following:

- 1) The nature of the boundary.
- 2) The hazards associated with the area.
- 3) Applicable controls, work rules or restrictions associated with the area.

D.8.b. Work Areas

The work area, for purposes of this project, is that area defined by hazardous waste and supporting operations. The work area is that area that is regulated by 29 CFR 1910.120 and/or 1926.65.

D.8.c. Exclusion Zone

The Exclusion Zone is that part of the work area where, at a given time, workers may potentially come in contact with contaminated materials. This contact is generally defined as inhalation of airborne levels exceeding site-specific action limits or 50% of established exposure limits (OSHA or American Conference of Industrial Hygienists [ACGIH]). Contact also includes any ingestion, skin contact, injection, or other contact route of exposure to materials exceeding USEPA or other established levels of contamination for the site.

D.8.d. Regulated Areas

Regulated areas are those areas managed in compliance with certain vertical standards contained in the following OSHA Subparts:

- ◆ 29 CFR 1910, Subpart Z - Toxic and Hazardous Substances

- ♦ 29 CFR 1926, Subpart D - Occupational Health and Environmental Controls
- ♦ 29 CFR 1926, Subpart Z - Toxic and Hazardous Substances

Regulated areas will be established as a form of Exclusion Zone, as described in the applicable standard.

- 1) Typically, these areas will require special training and medical qualifications as described in the applicable standards.
- 2) In establishing these areas the HSO shall rely on the guidance of a qualified person, familiar with the applicable regulations.

D.8.e. Contamination Reduction Zone

The Contamination Reduction Zone is that part of the work area between the Exclusion Zone and support areas where contamination from the Exclusion Zone is controlled in such a way as to remove the potential for contaminating support areas.

D.8.f. Support Area

The support area is that part of the work area where supporting tasks are conducted, and where the potential for exposure to contaminants has been fully controlled (i.e., personnel are not exposed to potential contact with contaminants).

D.8.g. Boundaries

Boundaries are established by the HSO based on the definitions above as compared to actual site conditions as monitored. Boundaries are flexible and should reflect current site conditions.

- 1) Boundaries are to be marked with suitable barriers such as yellow banner guards, brightly colored ropes, barricades, or orange snow fence to clearly establish the specified areas and the applicable regulations for that area.
- 2) If rope is used, pennants should be tied to the rope to help increase the visibility to foot and vehicle traffic and to provide a suitable warning.

D.9. Decontamination

The HSO is responsible for establishing and supervising decontamination on site. The following procedures are intended to establish guidelines for this purpose. As work progresses, control zones may be altered. It is essential that the HSO adjust this process as necessary to ensure that:

- ♦ Personnel and equipment leave the site free of contamination; and
- ♦ Contamination is not spread to other areas on site.

D.9.a. Contamination Reduction Zone

Contamination Reduction Zone(s) are those areas established for the purpose of transition between an Exclusion Zone and adjoining areas. Contamination Reduction Zone(s) should be

established for personnel and/or equipment to decontaminate during exit from an Exclusion Zone into:

- 1) Clean support areas; and/or
- 2) An adjoining Exclusion Zone with different or lesser contamination.

D.9.b. Frequency

- 1) All equipment will be inspected and be adequately decontaminated to avoid cross-contamination when moving out of an Exclusion Zone.
- 2) All equipment will be decontaminated before leaving the site.
- 3) All personnel will be decontaminated before leaving a designated Exclusion Zone.
- 4) Decontamination of equipment shall be documented using the Equipment Decontamination Log Form located in Appendix E.

D.9.c. Personnel Decontamination Procedures

- 1) Entering contaminated area through Support Zone:
 - a. Pick up clean PPE and boots.
 - b. All donning of clothing and equipment, taping, etc. is done here.
 - c. Equipment contaminated from the preceding day is to be picked up in the contamination control area when exiting the decontamination area.
 - d. Proceed to contamination control area.
- 2) Entering Contamination Reduction Zone:
 - a. Prior to entering this area, be sure that all PPE is in good working condition.
 - b. Conduct final inspection of tape and PPE.
 - c. In Exclusion Zone.
- 3) Exiting Exclusion Zone:
 - a. Personnel and equipment leaving the Exclusion Zone shall be thoroughly decontaminated.
 - b. The following protocols shall be used for the decontamination stations according to the level of protection as follows. Where a step involves an article that is not prescribed, skip the step.

Table D.9.c. Decontamination Procedures

	Level C	Level D
1	equipment drop	equipment drop
2	outer boot rinse	outer boot rinse
3	outer boot removal	outer boot removal
4	outer glove removal	outer glove removal
5	remove hard-hat	remove hard-hat
6	remove respirator	NA
7	wash respirator	NA
8	rinse respirator	NA
9	Tyvek® removal	Tyvek® removal
10	remove inner gloves	NA
11	wash hands and face	wash hands and face
12	change to street clothing	change to street clothing

D.9.d. Contingency Plan – Emergency Decontamination – Evacuation to Support Areas for Mobile and Immobile Victims

This procedure applies to circumstances requiring exit decontamination. Emergency decontamination procedures are intended to be a guideline. Depending on the nature of the actual emergency, response personnel and evacuees will ultimately be responsible for weighing the risks of the emergency against the risk of incomplete decontamination.

- 1) Exclusion Zone evacuation to Support Zone areas.
 - a. The main objective in this case is to shed contaminated materials quickly (with the idea that discarded articles can be decontaminated later when the emergency is over).
- 2) Mobile victims will be expeditiously evacuated from the area for medical treatment in support areas.
 - a. Victims will be decontaminated (to the degree this can be safely and expeditiously accomplished).
 - b. Emergency Medical Technicians and medical facilities must be advised that the employee may still have some contamination.

D.9.e. Equipment Decontamination

- 1) Equipment decontamination for release from the site will be performed on the facility decontamination pad.

- 2) Decontamination of equipment will be documented using the Equipment Decontamination Log form located in Appendix E.
- 3) Prior to exiting an Exclusion Zone, the equipment operator will ensure that the equipment is inspected for visible gross contamination. Visible gross contamination will be removed using shovels and hand equipment as necessary to prevent cross-contamination of the site. If necessary, a low pressure water hose will be used to remove materials.
- 4) Before release from the site, all equipment will be thoroughly decontaminated at the decontamination pad using water hoses, low pressure mechanical washers as necessary to remove visible contamination.
 - a. Initially, equipment will be brushed free of contaminated materials with brooms. Equipment coming from exclusion zone tasks will be washed, if necessary, with high-pressure hoses. Special attention must be given to mud flaps, wheel wells, tracks, undercarriage and foot surfaces (cab floor, control pedals, or walking boards).
 - b. If water is used, the vehicles will be held in the area for a short time to allow for collection of drippings.
 - c. Excavators/loaders moved from one area to another will have wheels/tracks frisked and cleaned and buckets wrapped in plastic.
 - d. Following decontamination and prior to release the Project Manager or a designated alternate, shall be responsible for insuring that each piece of equipment (i.e., monitoring instruments, tools, generators, etc.) has been sufficiently decontaminated.
 - e. The final inspection for release will be logged and the log entry documented to the Project Manager.
- 5) If material is judged as un-cleanable, it will not be used outside the Contamination Zone and will be disposed of at the end of its usefulness.

D.9.f. Small Equipment Procedure

Surface debris and dirt will be removed from small equipment and tools with vigorous brushing.

D.9.g. Disposition of Decontamination Wastes

All equipment and solvents used for decontamination shall be decontaminated or disposed of with the established waste streams.

D.10. Waste Management and RCRA Compliance

The purpose of this procedure is to establish site-specific practices for compliance with environmental requirements of Resource Conservation and Recovery Act of 1976 (RCRA). The scope of this procedure includes all work conducted under the project heading.

D.10.a. Training

All personnel responsible for any aspect of waste handling on site shall receive a briefing on this procedure. Training will be documented and submitted as a safety meeting record. Personnel files regarding qualifications on site will be updated accordingly and maintained by the HSO.

D.10.b. Hazardous Waste Manager

- 1) The Hazardous Waste Manager for this site will be designated by the Project Manager.
- 2) The Hazardous Waste Manager is responsible for compliance with RCRA and associated environmental compliance standards.
- 3) Envirocon's Construction Manager or the Project Manager's designated representative shall serve as the QA/Quality Control (QC) Engineer responsible for hazardous waste coordination for Envirocon's activities regarding waste materials. The QA/QC Engineer shall ensure that:
 - a. The instructions of the client's Hazardous Waste Manager are strictly followed by Envirocon personnel; or
 - b. In the event of disputed procedures, the QA/QC Engineer shall immediately notify the Project Manager of the concern for resolution before proceeding.

D.10.c. Reporting Incidents

- 1) All incidents must be reported in accordance with the project *HASP*.
- 2) The Construction Supervisor is responsible for ensuring that the Hazardous Waste Manager is informed of any spills.
- 3) This includes, but is not limited to, the following:
 - a. Accidents (with or without damages);
 - b. Finding unusual material conditions (e.g., previously disturbed soils, materials with unusual odors, materials with unusual coloration, etc.);
 - c. Spills of remediation waste; or
 - d. Spills of lubricants, coolants, fuels, or any other hazardous materials.

D.10.d. Waste Stream Management

- 1) All waste must be segregated into the established waste streams. It is very important not to mix waste streams unless directed by the Hazardous Waste Manager.
- 2) The QA/QC Engineer will be responsible for field identification and sorting in accordance with the directions of the Hazardous Waste Manager.
- 3) If you are unclear which type of waste is which, ask your Supervisor.

- 4) Anticipated waste streams generated by the FE JV include:
 - a. Simple trash.
 - b. Recyclable oils (including lubricants, greases and related products that the recycler will accept).
 - c. Non-recyclable oils (e.g., oils contaminated with heavy metals).

D.10.e. Categorization

- 1) Waste streams will be categorized in accordance with the directions of the Hazardous Waste Manager.
- 2) Employees SHALL NOT determine if a waste stream is a “hazardous waste.” Only the Hazardous Waste Manager shall make this determination.
- 3) Waste streams will be placed in the appropriate containers designated by the Hazardous Waste Manager.
- 4) Waste streams will be labeled in accordance with the Hazardous Waste Manager’s instruction.
- 5) Waste streams SHALL NOT be labeled as “hazardous waste” unless expressly authorized by the Hazardous Waste Manager.

D.10.f. Tracking Records

- 1) All regulated waste streams (i.e., those identified in the *ROD* for the site) shall be identified and logged immediately after being contained for storage or disposal.
- 2) FE JV will track and document the movement and disposition of all regulated wastes in the waste handling log until the materials are removed from site or otherwise transferred to the responsibilities of other entities.
- 3) The disposition of waste streams and the tracking records shall be maintained in accordance with the site QA/QC Engineer’s instructions.
- 4) The transfer of regulated wastes shall be performed in accordance with the directions of the Hazardous Waste Manager for the site.

D.10.g. Air Quality Controls

- 1) TVOC
 - a. *HASP* monitoring requirements for protection of personnel. Recognized limits for this monitoring include the Department of Labor (OSHA) Permissible Exposure Limits (PEL) and/or the ACGIH Threshold Limit Values (TLV).

- b. Perimeter TVOC levels will be monitored as described in the *Monitoring Plan* (Appendix C of the *Final Design (100%) for Phase 2 Wet Dredge [Final Design]* [FE JV, 2017]) to avoid public nuisance.
 - c. Exceedance of a Breathing Zone Action Level in an Exclusion Zone (Section F) shall be controlled by a combination of the following:
 - i. Changing control zone boundaries;
 - ii. Upgrading respiratory protection controls;
 - iii. Slowing or suspending intrusive work;
 - iv. Application of material barriers;
 - v. Application of a foam barrier; and
 - d. Exceedance of a perimeter Action Level (Table 7-4 of the *Monitoring Plan* [(Appendix C of the *Final Design*)]) at a Site perimeter monitoring station shall be controlled by a combination of the following:
 - i. Take all possible steps to minimize vapors;
 - ii. Cover stockpiles with tarp or foam;
 - iii. Halt non-essential material management operations; and
 - iv. Halt operations if necessary to re-assess situation.
- 2) PM₁₀
- a. *HASP* monitoring requirements for protection of personnel. Recognized limits for this monitoring include the Department of Labor (OSHA) PEL, and/or the ACGIH TLV.
 - b. Perimeter PM₁₀ levels will be monitored as described in the *Monitoring Plan*, (Appendix C of the *Final Design*), to avoid public nuisance.
 - c. Exceedance of a Breathing Zone Action Level in an Exclusion Zone (Section F) shall be controlled by a combination of the following:
 - i. Changing control zone boundaries;
 - ii. Upgrading respiratory protection controls;
 - iii. Slowing or suspending intrusive work;
 - iv. Application of material barriers;
 - v. Application of a foam barrier; and/or

- d. Exceedance of a perimeter Action Level (Table 7-4 of the *Monitoring Plan* [(Appendix C of the *Final Design*])) at a Site perimeter monitoring station shall be controlled by a combination of the following:
 - i. Take all possible steps to minimize fugitive dust;
 - ii. Cover and/or spray stockpiles;
 - iii. Use water and/or dust suppressants (foam) on traffic routes; and
 - iv. Reduce trucking rate

D.10.h. Spill Response and Prevention

Spill prevention controls and response procedures are documented in the emergency response procedures of this *HASP*.

D.10.i. Waste Management

- 1) All hazardous waste streams will be managed in accordance with the established waste management procedures. Each waste stream is to be segregated in the field in accordance with these procedures.
- 2) Segregated materials will be temporarily stored and protected until they can be replaced or remediated.

D.10.j. Waste Minimization

- 1) Waste generated on site will be minimized by proper sampling and categorization of waste streams.
- 2) Waste generated on site will be minimized by protecting segregated wastes from wind, weather and runoff.
- 3) Waste generated on site will be minimized through the proper selection of PPE, use of launderable materials where prudent, and reuse of decontaminated materials.

D.11. Qualifications and Access Requirements

Personnel access to project site is conditioned upon approval of NSPW security, maintaining FE JV qualifications with regard to training, medical monitoring, drug and alcohol testing, adherence to required procedures, and related requirements. Failure to maintain these qualifications may result in removal from site and/or termination of employment.

D.11.a. Training Qualifications Summary

Table D.11.a summarizes the training qualifications for this project.

Table D.11.a. Training Summary

	HAZWOPER & OSHA Training ^a				Site Specific ^b		
	40 hr with respirator training	8 hr annual refresher	8 Hr Supervisor	Site <i>HASP</i> Briefing	Site orientation	Applicable JSAs	Daily safety briefings 20 min ^⓪
Supervisors	X	X	X	X	X	A	X
Level C (i.e., with potential use of respirators)	X	X		X	X	A	X
Modified D in Exclusion Zone	X	X		X	X	X	X
Level D work only surveyors, engineers, mechanics	X	X		X	X	A	X
Work outside of Exclusion Zone				X	X	A	X
Personnel doing truck driving, perimeter fencing, or asphalt paving ^⓪				X	X	A	X
Trailer staff				X	X		
Delivery personnel				E	A	A	
Site Visitors	X	X		X	X		

Notes: **X** = required. **A** = those that are applicable. **E** = escorted

^⓪ Personnel doing truck driving, perimeter fencing, or asphalt paving are not anticipated to have contact with contaminated soil. For example, truck must not leave the vehicle while on site within the Exclusion Zone or Contamination Reduction Zone and not perform any decontamination procedures.

^a Applies to areas identified as Exclusion Zones

^b Applies to area outside Exclusion Zones

- 1) All personnel performing work at the project site will receive a briefing on the *HASP*. This training must be acknowledged on the sign-up sheet at the front of this plan. Personnel will also undergo briefings on task specific JSA(s).
- 2) Personnel entering the Exclusion Zone shall have a minimum of 40 hours of HAZWOPER training in accordance with 29 CFR 1910.120 or 1926.65, also known as 40 Hour RCRA Remediation Training (Project Specifications, Schedule A, Scope Of Work & Technical Specifications, Section 01010).
- 3) Personnel required to wear respiratory protection will have a minimum of 40 hours of HAZWOPER training, to include respiratory protection training.
- 4) Supervisors will have an additional 8 hours of supervisory training for work in the Exclusion Zone.
- 5) Personnel required to have HAZWOPER training must be up to date on annual 8 hour refresher training.
- 6) Personnel performing support functions (i.e., work outside of the Exclusion Zone) are not required to have HAZWOPER training but shall be briefed on this *HASP* and applicable JSA(s).

- 7) Daily Safety Meetings. In order to maintain qualifications, it is necessary to have regular meetings in order to enhance planning efforts and to pass information from lessons learned or changes in procedures.
- a. A “toolbox” or “tailgate” safety meeting will be held at least daily before starting work. Safety meetings will also be held when site conditions change, before starting new activities, and after accidents.
 - b. These daily meeting shall be used to keep personnel up to date on changes in plans and procedures since their initial training and also to ensure coordinated work assignments by outlining the day’s activities and job assignments.
 - c. These meetings may also serve a coordinating function for multi-employer ATW reviews (refer to Section C.11).
 - d. Attendance is mandatory for all site personnel including lower tier subcontractors.
 - e. Meetings will also be used to discuss:
 - i. Topics of interest or concern of the crew;
 - ii. Suspected hazards for that day’s work and what precautions are necessary to deal with these hazards as documented on the ATW;
 - iii. Necessary training requirements and site work rules;
 - iv. Changes in work practices or environmental conditions;
 - v. Precautions or safe work practices related to the day’s site activities;
 - vi. New or modified site-wide procedures or requirements; and
 - vii. Incident alerts provided by the client.
 - f. Documentation of daily safety meetings shall be maintained on site.
 - g. Daily safety meetings shall be used as a time for personnel to make safety suggestions. Suggestions shall be noted in the minutes and evaluated by supervisory and safety personnel. Actions taken on suggestions should be noted on the daily safety meeting form.
 - h. The daily safety meeting shall function as the project’s Environmental Health and Safety Committee. At the option of the Project Manager, a separate committee may be established. Members shall be determined from nominations of the wage earning employees.

D.11.b. Medical Qualifications Summary

The following medical qualifications are required to perform work in certain areas.

Table D.11.b. Medical Qualifications Summary

TEST COMPONENT ⁽¹⁾	Level D Exclusion Zone ⁽¹⁾	Level C Exclusion Zone ⁽¹⁾	Support Zone Workers ⁽¹⁾	New Hires ⁽¹⁾ ⁽⁵⁾	Post-Accident/ Exposure ⁽¹⁾	End of Project ⁽¹⁾⁽²⁾
Occupational History/update	X	X	(5)	X		(6)
Audiometric Exam	X	X		X		
Manual lifting protocol	X	X		X		
Drug testing ⁽¹⁾				(5)	(4)X	
DOT Breathalyzer Alcohol Testing					(4)X	
Fitness to return to work (after work/non-work related injuries or illness).					X	
Fitness for Hazardous Waste Work (29 CFR 1910.120) including liver functions		X			(1)	(6)
Fitness to wear respirators (29 CFR 1910.134)		(3)		(3)		
Basic Fitness For Duty (Level D, Construction, or non-HAZWOPER)	X	X	(5)	(5)		X

NOTES:

(1) WorkCare provides medical monitoring for all Envirocon employees through local health care facilities. The appropriate protocol will be scheduled by an authorized FE JV representative and should never be scheduled by the employee (except in the case of a medical emergency). Lower tier subcontractors and guest are required to produce their own protocols equivalent to those indicated and/or in accordance with the referenced regulatory requirements. Employee may be required at any scheduled exam, examinations conducted after accidents, randomly, or as part of facility procedures to donate specimens for drug and alcohol testing. Failure to conform to medical monitoring requirements, drug & alcohol, or other related requirements may be grounds for removal from site and termination of employment.

(2) This column refers to certain site-specific protocols. It IS NOT A TERMINATION OF EMPLOYMENT EXAM requirement. All Envirocon employees should be notified of potential eligibility for termination exams when they are terminated from employment. If they request such an exam, the Director of Health and Safety will review the request and determine eligibility under the Envirocon Medical Monitoring Program in accordance with 29 CFR 1910.120.

(3) Must be completed prior to wearing respiratory protection

(4) As determined by Envirocon policy and the Director of Health and Safety accidents, incidents, injuries, or illnesses involving medical evaluations, potential OSHA recordability, potential property damages in excess of \$500, involving damages or injuries to parties not affiliated with Envirocon shall be evaluated.

(5) New employees are hired provisionally based on their ability to pass the fitness for duty examination. WorkCare makes the final determination regarding fitness for duty for Envirocon employees (this includes all aspects of fitness for duty and drug testing results). New hires may begin Level-D work (i.e., this evaluation does not authorize work where exposures may exceed the action levels for chemical exposures) with the basic fitness for duty evaluation provided by the attending or examining physician. The examining or attending physician's evaluation is considered temporary (not to exceed 30 days) until final evaluation by WorkCare's final evaluation.

(6) Employees that will be terminated at the end of the project and have not had a HAZWOPER physical within the last six months shall be offered a termination examination.

E. Hazards

An effective safety and health program includes a variety of processes for recognizing and evaluating hazards in order to plan controls. Hazard identification and evaluation must be a continuing process although the focal point is the planning phases of tasks.

E.1. Accident Prevention Program

Envirocon's Health and Safety Program Manual serves as the primary accident prevention program document in accordance with the requirements of 29 CFR 1926.20. This *HASP* further develops the site-specific procedures to prevent accidents at the site. Beyond these documents, the accident prevention program is an ongoing process which involves the participation of all personnel through hazard identification, hazard analysis and hazard control. Refer to Envirocon's Health and Safety Program Procedure 1403.014 "Correcting Unsafe Conditions and Work Practices."

E.1.a. Elements of the Accident Prevention Program

The accident prevention process at this site includes a number of ways to identify hazards and develop appropriate controls. They include the following programs and procedures.

- 1) Proper planning: There are a number of planning processes that take place prior to execution of a given task. Based on many other plans and programs, FE JV has developed a *HASP* for the site. The Envirocon Field Operations Manual Procedure 1401.030 documents the project procedures for developing individual task plans.
- 2) Job Safety Analysis: (refer to Appendix D).
 - a. The planning and hazard assessment process continues into the individual job task through the use of JSAs.
 - b. The HSO contributes to the task planning process required by Envirocon's Field Operations Manual 1401.030 by preparing JSAs with the assistance of the activity participants.

In order to better manage change, duplication should be avoided. Example: There should not be two JSAs for excavation activities or a JSA duplicating a *HASP* section on excavations.

- c. JSAs shall be developed for all significant work tasks associated with this project. New tasks, or previously unrecognized hazards, require a new JSA or redraft existing ones. As needed, this *HASP* may be modified in order to accommodate control requirements identified through the JSA process. JSAs are developed in accordance with Envirocon's Health and Safety Program Procedure 1403.013.

- 3) Authorization to Work: The planning and hazard analysis processes come together in their final details at the employee/daily level with the ATW.
 - a. ATW(s) should be newly prepared each shift because it is intended to be changed and redrafted as necessary to meet changes in the tasks or site conditions.
 - b. ATWs are prepared by each work crew and approved by their foreman/team leader. To encourage employee participation, groups must be kept as small as possible.
 - c. Every front line supervisor (foreman/team leader) with the assistance of the HSO must prepare their own ATW(s) with their crew.
 - d. Employee participation is critical to the ATW process. Everyone on the team must sign their ATW. If task assignments change during the day, personnel should review the new team's ATW and sign it.
- 4) Workplace Inspections: All supervisory personnel, safety officers, and competent persons shall conduct site inspections. Site inspections are intended to ensure that established plans and procedures are followed, changes in conditions are identified, effectiveness of controls are assessed, and new hazards identified.
- 5) Employee Involvement: The active involvement of every employee is encouraged through the ATW process, site incentives program, "time out for safety" authority, safety observer program, and daily safety briefings. Employee involvement is the cornerstone of the incident-free performance goal. This goal will not be met (and has no real meaning) without every employee's complete focus at all times on every task. Additionally, every employee is required to look out for their coworkers when their focus falters.
- 6) Incident Investigations: Employees are required to immediately report all incidents in order to ensure a timely investigation. Incident investigation is aggressive at site in order to capture lessons learned from minor incidents and correct controls before significant accidents occur.

E.1.b. Responsibilities

- 1) Responsibilities for planning, safety and quality shall be specifically assigned and acknowledged. The primary means for accomplishing this is as follows:
 - a. Project Plans (e.g., *Tech Memo* and *HASP*) are assigned to the Project Manager, Health & Safety Supervisor, QA/QC Engineer, etc. and shall be signed by the individuals' assigned responsibility for the document.
 - b. 1401.030 Task Plans and JSAs are assigned to and signed by the appropriate Superintendent (or other operations supervisor); HSO; QA/QC Engineer; and any other technical supervisors required for proper planning associated with the task. For example, tasks involving crane operations should have a lift supervisor assigned to the task plan.

- c. Daily ATWs are assigned to every front line supervisor and shall be signed by the responsible supervisor and every member of the work team.
- 2) Supervisors, assisted by safety and health personnel are responsible for implementing effective accident prevention processes. This includes:
 - a. Conducting required planning;
 - b. Conducting required inspections;
 - c. Aggressively investigating all incidents;
 - d. Encouraging employee participation; and
 - e. Taking a leadership role in achieving Incident-free performance.
- 3) Employees are responsible for:
 - a. Following established procedures;
 - b. Actively participating in training processes;
 - c. Reporting all incidents immediately to their supervisors;
 - d. Participating in behavior observation, and assisting in the preparation of JSAs and ATW;
 - e. Positively assisting in investigations of incidents; and
 - f. Looking out for their coworkers (i.e., “buddies”).

E.2. Risk Assessment

For purposes of this *HASP*, risk will be described by a ranking methodology. This purpose of this ranking is to focus attention on significant hazards for purposes of better utilizing limited resources. The purpose of this assessment is not to determine precise probabilistic measures (it is actually intended that high potentials will go unrealized by focused attention). Two cases define the issue of risk versus hazard in the accident prevention context. Severe hazards that are infrequently encountered, and low severity hazards that are frequently encountered both represent cases where controls may not receive the attention they merit. This ranking system will consider three factors that contribute to overall risk potential. They include severity of outcome, frequency of exposure, and potential for occurrence when exposed.

E.2.a. Severity

Severity describes the significance of consequences if the potential is realized.

- 1) High severity means the following:
 - a. There is a distinct possibility of fatal injury or illness.
 - b. A factor of 4 will be used to score risk potential.

- 2) Moderate severity means the following:
 - a. There is a distinct possibility of permanent disabling injury or illness.
 - b. There may be a residual possibility of fatal injury or illness.
 - c. A factor of 2 or 3 will be used to score risk potential.

- 3) Low severity means the following:
 - a. It is unlikely to result in fatality.
 - b. There may be a residual possibility of permanent disabling injury/illness.
 - c. There is a distinct possibility of medical treatment.
 - d. A factor of 1 will be used to score risk potential.

E.2.b. Frequency of Exposure

For this analysis, frequency represents the amount of exposure to the hazard, or how often risk is experienced.

- 1) Frequent exposure means the following:
 - a. Regular or daily exposure to the hazard.
 - b. A factor of 4 will be used to score risk potential.

- 2) Moderate frequency of exposure means the following:
 - a. Weekly or biweekly exposure to hazard, or
 - b. Seasonally, it becomes a frequent exposure to hazard.
 - c. A factor of 2 or 3 will be used to score risk potential.

- 3) Infrequent exposure means the following:
 - a. Exposures occur several times a year or less.
 - b. A factor of 1 will be used to score risk potential.

E.2.c. Probability of Occurrence

Probability reflects the likelihood of injury or illness when exposed to the hazard. For purposes of this analysis, probability includes consideration of efficiency of identifying hazards in order to implement controls and effectiveness of controls.

- 1) Probable means the following.
 - a. Difficult to recognize.
 - b. Controls tend to have limited effectiveness.
 - c. A factor of 4 will be used to score risk potential.

- 2) Somewhat probable means the following.
 - a. Either the hazard is difficult to recognize or controls tend to have limited effectiveness.
 - b. A factor of 2 or 3 will be used to score risk potential.

- 3) Generally improbable means the following.
 - a. The hazard is readily recognized and reliably controlled.

b. A factor of 1 will be used to score the risk potential.

E.2.d. Number of Employees and/or Third Party Personnel Exposed

This reflects the population of employees exposed to this particular risk. Heat stress for example generally affects ground laborers wearing PPE. Equipment operators or supervisory personnel in enclosed air-conditioned cabs are not exposed to the stress.

- 1) Score of 4 = more than 50.
- 2) Score of 3 = 10 to 50.
- 3) Score of 2 = 3 to 10.
- 4) Score of 1 = 1 to 3.

E.2.e. Risk Assessment

Table E.2.e. Hazard Descriptions

Type of Hazard	Severity Score	Frequency Score	Probability Score	Number of Employees	RISK Potential	Description of Potential Hazards
Safety	4	3	1	3	36	Heavy equipment
	1	4	2	3	24	Slips/trips/falls and walking and working surfaces
	4	2	2	2	32	Working on or near water.
	3	2	2	2	24	Falls from heights > 6 feet
	4	3	1	2	24	Vehicle traffic
	2	3	2	2	24	Manual lifting
	3	2	1	2	12	Excavations collapse
	2	2	1	2	8	Structural and equipment fires
	4	1	2	1	8	Utility strikes during intrusive activities
Toxic	4	1	1	1	4	Utility strikes of overhead line, guyline
	1	3	1	1	3	PAH sediment excavation and transport
Biological/ Mental	1	4	2	3	24	Noise from equipment
	2	1	1	4	8	Heat or cold stresses
	2	2	1	2	8	Poisonous plants and insects

PAH = Polyaromatic Hydrocarbons

E.3. Potential Chemical Waste Hazards

The waste contaminants of concerns (COC) are described along with their hazards and properties in Appendix F.

F. Industrial Hygiene Program Controls

OSHA mandates programmatic controls for many hazards. This section describes the programs in place to control safety and health hazards on site.

F.1. Site Monitoring

Table F.1. Air Monitoring Requirements⁽¹⁾

Chemical Hazard	PEL/TLV	Instrument	Method ⁽¹⁾	Action Level	Action ⁽³⁾
Oxygen (O ₂)	19.5% to 23.5%	O ₂ meter (w/ Combustible Gas)	Direct read area sample prior to confined space entry.	<19.5%, or >23.5%	Ventilate until readings can be brought to 21% +/- 1% or do not enter. Ventilate until readings can be brought to 21% +/- 1% or do not enter.
Combustible Gas/Vapors (CG)	NA	Combustible Gas/ O ₂ meter	Direct reading area sample prior to entering confined space	>10% LEL	Clean, secure source of vapors, ventilate until readings can be brought to +/- 1% LEL or do not enter.
			<ul style="list-style-type: none"> • Prior to hot work near flammables • Suspect gas leak 	Any detection above background drift or fluctuation.	Clean, secure source of vapors, ventilate until readings indicate source has been controlled.
Benzene Ethyl Benzene Toluene Xylene	1 ppm/5ppm STEL	PID in Breathing zone of worker.	Breathing Zone ⁽²⁾ for 5 minutes	1 ppm above background	Determine benzene concentration with Drager tube method or other direct reading instrument
	100ppm/100ppm			>50% < 10x PEL or TLV	Apply engineering controls (vapor suppression methods as necessary) Upgrade PPE to level C ⁽³⁾ .
	200ppm/50ppm			>50X PEL or TLV	Apply engineering controls(foaming, vapor suppression misting) Upgrade PPE to level B ⁽³⁾ .
	100ppm/100ppm			>1000 PPM or > IDLH	Stop work, determine source of hazard and apply an engineering control.

Chemical Hazard	PEL/TLV	Instrument	Method ⁽¹⁾	Action Level	Action ⁽³⁾
Benzene	1 ppm/5ppm STEL	Drager pump and benzene tube or equivalent	Breathing Zone ⁽²⁾	>50% < 10x PEL or TLV	Apply engineering controls (vapor suppression reagents) Sample with media by method below. Upgrade PPE to level C ⁽³⁾ .
				>50X PEL or TLV	Apply engineering controls(foaming, vapor suppression misting) Upgrade PPE to level B ⁽³⁾ .
				>1000 PPM or > IDLH	Stop work, determine source of hazard and apply an engineering control.
Benzene	1 ppm/5ppm STEL	Air Sampling Pump <0.2 L/min or personal air monitoring badge	Breathing Zone ⁽²⁾ NIOSH 1501	>50% < 10x PEL or TLV	Apply engineering controls(vapor suppression reagents) Upgrade PPE to level C ⁽³⁾ .
Ethyl Benzene	100ppm 100 ppm			>50X PEL or TLV	Apply engineering controls(foaming, vapor suppression misting) Upgrade PPE to level B ⁽³⁾ .
Toluene	200ppm/50 ppm			>1000 PPM or > IDLH	Stop work, determine source of hazard and apply an engineering control.
Xylene	100ppm/100ppm				
Naphthalene and PAHs	Naphthalene 10 PPM PAHs 0.2 mg/m3	(4)	Breathing Zone ⁽²⁾⁽⁴⁾	>50% < 10x PEL or TLV	Apply engineering controls Upgrade PPE to level C ⁽³⁾ .
				>50X PEL or TLV	Apply engineering controls(foaming, vapor suppression misting) Upgrade PPE to level B ⁽³⁾ .
				>1000 PPM or > IDLH	Stop work, determine source of hazard and apply an engineering control.
Respirable PNOC (Particulates Not Otherwise Classified)	5mg/m3	Personal sampling pumps, pre-weighted PVC filter cassette in breathing zone of worker	NIOSH 0600 when suspect or monthly	>50% < 10x PEL or TLV	Apply engineering controls Upgrade PPE to level C ⁽³⁾ .

Comments or special instructions:

- Methodology determines the analytical method used by the laboratory
- Breathing zone is the location of the sampling media. It would be attached to the workers shoulder at approximately the same height of the workers nose and mouth.
- For PPE upgrades refer to Table F.2.c for respiratory protection selection guidelines and Table F.2.a for other PPE items.
- Concentrations of PAHs will be characterized using a modified version of National Institute for Occupational Safety and Health (NIOSH) Method 5515 – “Polycyclic Aromatic Hydrocarbons in Air by Gas Chromatography.” Samples will be collected at a flow rate of 2 L/min using sorbent tubes containing XAD-2 resin. Collected samples will be returned to the laboratory where they will be extracted and analyzed for naphthalene and other PAHs as provided in the analytical method. The required detection limit for this method is approximately 0.001 mg/m3.

F.1.a. Monitoring

- 1) All monitoring will be conducted in accordance with the equipment manufacturer's operating instructions.
- 2) Readings will generally be taken where indications exceed normal background and drift of the equipment.
- 3) Readings other than peak readings will generally be taken as sustained readings lasting for several seconds.

F.1.b. TWA Sampling

TWA (time weighted average) sampling may include time weighted average sampling of personal exposures as well as specific areas (e.g., Exclusion Zone boundaries or worst case locations).

- 1) All TWA sampling will be conducted in accordance with NIOSH or OSHA standard methods for purposes of documenting exposure compliance. In some cases TWA sampling may be used for other purposes such as detecting exposure potential, but these samples shall not be documented as compliance samples.
- 2) Routine TWA sampling includes worst case breathing zone sampling. If three consecutive samples are below action levels, no further testing is required unless/until conditions changes.
- 3) Where worst case samples indicate exposures above action levels, conduct area TWA sampling of Exclusion Zone boundaries and discrete job tasks. Where three consecutive samples indicate exposures below the action levels, no further testing is required unless/until there is a change in conditions.

F.1.c. Characterization and Confirmation

- 1) Characterize means:
 - a. Collect three worst case TWA personal exposure samples.
 - i. These samples shall be taken at different times.
 - ii. Each sample shall reflect a full shift of activities and exposures.
 - iii. These samples shall be matched against applicable direct reading monitoring results.
 - iv. More samples may be taken to evaluate effectiveness of control modifications.
 - b. At such time as the three latest TWA samples indicate a consistent result the work process may be considered to be characterized if the HSO determines that there

are no other indications that these samples should not be considered representative. Consistent results include:

- i. Three (3) consecutive samples below the action level;
 - ii. Three (3) consecutive samples at or below Level C half mask requirements; and
 - iii. Three (3) consecutive samples at or below Level C full face requirements.
- c. Must be repeated or confirmed whenever a change in conditions is identified. Indications of a change in condition include the following:
- i. New materials are encountered that have been determined to contain significant changes in contaminant concentrations.
 - ii. Odors have changed significantly.
 - iii. Operational methods have changed in a way that could produce different exposures.
 - iv. Direct reading instrument results are no longer consistent with the results taken during characterization.
 - ◆ For example, the direct reading instrument results associated with a TWA characterization that was half of the action level are now getting close to doubling.
 - ◆ A confirmatory TWA sample should be taken to ensure that the current direct readings are still indicative of TWA exposures less than the action level.
 - ◆ A change in condition must be assumed and therefore controls must be upgraded (e.g., upgrade respiratory protection).

2) Confirmation means:

- a. A direct reading monitoring result or a TWA exposure sample that is consistent with the latest characterization is a confirmation sample or monitoring result.
- b. One (1) UP confirmation sample to upgrade/Three DOWN confirmation samples to downgrade.
 - i. At any time that a confirmatory TWA sample produces a new result which is inconsistent with the latest characterization, a change in condition must be assumed and therefore controls must be upgraded (e.g., upgrade respiratory protection).

- ii. While any single direct reading or TWA result inconsistent with a lower level of controls must indicate upgrading controls; a full set of three consecutive TWA results indicate a consistent characterization appropriate for downgrading controls.
 - iii. Similarly, three consecutive direct reading results must be produced to downgrade (provided the direct reading results have been previously confirmed against applicable TWA levels).
 - c. Routine confirmation by TWA sampling and direct reading monitoring should be performed.
 - i. Routine confirmation monitoring or sampling means to perform the evaluation even if there is no other indication of a change in conditions.
 - ii. Unless otherwise specified, routine confirmation sampling is conducted daily for direct reading instrument monitoring and monthly for TWA sampling.
 - d. Confirmation wipe samples mean to collect a sample from the same location and over the same amount of surface area as a previously characterized location.
- 3) Downgrading of respiratory protection shall be approved by Certified Industrial Hygienist.

F.1.d. Documentation

See the recordkeeping section below.

- 1) All calibration, sampling information and results will be documented using a log or Envirocon standard forms.
- 2) Results collected for specific individuals will be passed directly to the applicable employee. Result briefings will be documented.
- 3) Results will be generically passed (without mention of specific employee names) to all personnel during morning safety meetings.

F.2. Personal Protective Equipment

F.2.a. Summary of PPE Requirements

Table F.2.a. Summary of Standard PPE

Activity	Head/Face	Foot	Hands	Respirator	Clothing
General site labor, non-intrusive support zone tasks	<ul style="list-style-type: none"> • Hard hat⁽²⁾ • Safety glasses⁽²⁾ 	Steel toed boots	Leather gloves as needed.	None ⁽¹⁾	<ul style="list-style-type: none"> • Shirt w/sleeves • Long pants • High visibility vest⁽⁵⁾
Supervision of support zone work	<ul style="list-style-type: none"> • Hard hat⁽²⁾ • Safety glasses⁽²⁾ 	Steel toed boots		None ⁽¹⁾	<ul style="list-style-type: none"> • Shirt w/sleeves • Long pants • High visibility vest⁽⁵⁾
Dry equipment decontamination	<ul style="list-style-type: none"> • Hard hat⁽²⁾ • Safety glasses⁽²⁾ • Face shields or goggles 	Steel toed PVC/rubber outer boots	Leather or PVC coated outer gloves	None ⁽¹⁾	<ul style="list-style-type: none"> • Tyvek⁽³⁾ • High visibility vest⁽⁵⁾
General site labor tasks in dry contaminated areas	<ul style="list-style-type: none"> • Hard hat • Safety glasses⁽²⁾ 	PVC/rubber outer boots w/steel toes, or steel toed boots w/ boot covers ⁽⁴⁾	Leather or PVC coated cotton as needed	None ⁽¹⁾	<ul style="list-style-type: none"> • Tyvek⁽³⁾ • High visibility vest⁽⁵⁾
General site labor tasks in wet contaminated areas	<ul style="list-style-type: none"> • Hard hat • Safety glasses⁽²⁾ 	Steel toed boots with water resistant outer boot covers ^{(6) (8)}	Nitrile or Leather or PVC coated cotton as needed	None ⁽¹⁾	<ul style="list-style-type: none"> • Water resistant outer coveralls⁽³⁾⁽⁶⁾ • High visibility vest⁽⁵⁾
General site labor tasks working on/near water	<ul style="list-style-type: none"> • Hard hat • Safety Glasses 	Steel toed boots	Leather gloves as needed	None ⁽¹⁾	<ul style="list-style-type: none"> • Shirt w/sleeves • Long pants • High visibility vest⁽⁵⁾ • USCG type III PFD
Wet Decontamination	<ul style="list-style-type: none"> • Hard hat • Safety glasses⁽²⁾ • Face shield 	Steel toed boots with water resistant outer boot covers ^{(6) (8)}	Nitrile gloves in combination with Leather or PVC coated cotton gloves	None ⁽¹⁾	<ul style="list-style-type: none"> • Water resistant outer coveralls⁽³⁾⁽⁶⁾⁽⁷⁾ • High visibility vest⁽⁵⁾
Drivers	<ul style="list-style-type: none"> • (9) 	<ul style="list-style-type: none"> • (9) 	<ul style="list-style-type: none"> • (9) 	<ul style="list-style-type: none"> • None⁽¹⁾ 	<ul style="list-style-type: none"> • long pants • shirts with sleeves⁽⁹⁾

(1) Refer to Table F.2.b. for initial respiratory protection requirement options.

Voluntary use of respirators is authorized for nuisance dusts and exposures known to be below PEL levels. For nuisance dust use disposable N, R or P 95 or better (dispose of N or R types daily and P type weekly) For odors use half mask with OV or OV/P95 or better (change at start of week)

- (2) Hard hats and safety glasses are not required inside of enclosed cabs with windshields; or when working outside of the contaminated areas performing non-labor tasks such as walking to and from buildings/trailers, typing, or making notes.
- (3) Dust resistant outer coveralls such as Tyvek. These are not allowed for use when contact with hazardous materials is likely. The safety officer will evaluate this requirement for tasks that involve minimal risk of contact with contaminants on personal clothing or skin.
- (4) Boot covers are any suitable covering capable of resisting dust penetration which would contaminate steel toed boots, and with durability appropriate for the task.
- (5) High visibility vests are for use in work areas within 25 feet of vehicular or equipment traffic. For heat stress considerations, an orange/high-visibility T-Shirt, or an orange/high-visibility hard hat may be substituted for the vest.

- (6) When working with wet contaminated materials, PVC or other equivalent water resistant outer boot covering will be used to prevent contamination of steel toed boots.
- (7) For purposes of preventing heat or cold stress, decontamination personnel may use water proof outer coverings with holes in the backs or aprons to allow for perspiration to escape (provided inner garments do not get wet as a result).
- (8) Wet work and decontamination may use a PVC steel-toed boot in place of a leather boot with cover.
- (9) Drivers entering contaminated areas shall be prepared to put on the applicable personal protective clothing worn in that area in the event of an emergency exit.

F.2.b. Respiratory Protection Selection; Initial Assignment

Initial assignment of personnel to wear respiratory protection shall be based on the assumption that COCs have not been characterized with assurance and until they have been so characterized some tasks shall be undertaken in Level C. When a characterization and confirmation as described in Section F.1.d. has been completed, a downgrade in respiratory protection may be made.

Table F.2.b. shall be used as guidance for the decision for the PPE ensemble. Table F.2.b. shall be used for initial assignment of respiratory protection, but at the discretion of the HSO may be upgraded. Personnel may make a voluntary selection of the next highest level of respiratory protection up to Full-Face Negative Pressure.

Table F.2.b. Initial Assignment of Respiratory Protection

Task	Required Respiratory Protection
Site mobilization tasks	None
Grubbing, site clearing	Disposable filtering facepiece
Surveying	Determine at time of assignment – use work area prior characterizations.
Erosion controls	None
Installation, operation and maintenance of perimeter air monitoring stations	None
Protection of sheet pile wall	None
Dredging, dewatering and contaminated water management	Determine at time of assignment. PID measurements for characterization and decision.
Staging and processing of sediment (removal of oversize and debris).	Determine at time of assignment. PID measurements for characterization and decision.
Sediment processing	Determine at time of assignment. PID measurements for characterization and decision.
Loading and hauling materials	Determine at time of assignment. PID measurements at well-head employed for characterization and decision.
Restorative Layer Placement	None
Maintaining and operating ancillary features	None
Demobilization tasks	None

F.2.c. Respirator Selection Based on Monitoring/Sampling

Table F.2.c. Respirator Selection⁽¹⁾

It is anticipated that during the Wet Dredge portion of this project personnel might be exposed to contaminants at or above action levels or established PELs. Should the exposure become apparent, below summarizes the required respirator selection.

Hazard	Levels		Respirator Type ⁽²⁾	Cartridge Type	Cartridge Change Schedule	Notes
	lower	upper				
PNOC (dust)		5 mg/m ³ total dust		P100 or P99 N100 or N99 R100 or R99	WEEK for P100 or P99 SHIFT for N100 or N99 R100 or R99	Optional: Provide for voluntary use.
	5 mg/m ³ total dust or 2.5 mg/m ³ respirable	25 mg/m ³ total dust or 12.5 mg/m ³ respirable	HM APR	P100 or P99 N100 or N99 R100 or R99	WEEK for P100 or P99 SHIFT for N100 or N99 R100 or R99	
	25 mg/m ³ total dust or 12.5 mg/m ³ respirable	250 mg/m ³ total dust or 125 mg/m ³ respirable	FF APR	P100 or P99 N100 or N99 R100 or R99	SHIFT	
	250 mg/m ³ total dust or 125 mg/m ³ respirable		FF PP SA	Airline or SCBA	n/a	
Respirable Combined	25 ug/m ³	50 mg/m ³	FF, HM, APR	P100	Week for P100	(4) (5)
benzene	0.5 ppm	10 ppm	HM APR	OV	each SHIFT	(4) (5)
	10 ppm	50 ppm	FF APR	OV	each SHIFT	(4) (5)
	50 ppm	500 ppm	FF PP SA	n/a	n/a	(4) (5)
	500 ppm		JSA ⁽³⁾			(4)(5)

Hazard	Levels		Respirator Type ⁽²⁾	Cartridge Type	Cartridge Change Schedule	Notes
	lower	upper				
TEX (toluene, xylene, ethylbenzene or mixed organic vapors other than benzene)	10 ppm	50 ppm	HM APR	OV	each WEEK	
	50 ppm	200 ppm	FF APR	OV	each SHIFT	
	200 ppm	500 ppm	FF PP SA	n/a	n/a	
	500 ppm		FF PP SA w/EE	n/a	n/a	
PAHs		0.2	Voluntary use dust mask.	P100 or P99 N100 or N99 R100 or R99	WEEK for P100 or P99 SHIFT for N100 or N99 R100 or R99	Optional: Provide for voluntary use.
		mg/m ³				
	0.2 mg/m ³	10 mg/m ³	HM APR	P100 or P99 N100 or N99 R100 or R99	WEEK for P100 or P99 SHIFT for N100 or N99 R100 or R99	
	10 mg/m ³	100 mg/m ³	FF APR	P100 or P99 N100 or N99 R100 or R99	SHIFT	
	100 mg/m ³		FF PP SA	Airline or SCBA	N/A	

Abbreviations:

acid = acid gas
 APR = Air Purifying Respirator
 combo = combination cartridges
 DFF = disposable filtering face piece
 EE = Emergency Egress SCBA (escape only)
 EEO = emergency escape only
 FF = full face
 (H) = hood

HM = half mask N100 R100 P100 = NIOSH approval types (for dust filtering cartridges)
 OV = organic vapor
 PP = positive pressure/pressure demand mode
 SA = supplied air (airlines or SCBA)
 SCBA = self-contained breathing apparatus
 SHIFT = start each shift with a new cartridge⁽⁵⁾
 WEEK = start each week with a new cartridge⁽⁵⁾

Notes:

- (1) This table sets the initial respiratory protection selection options. The Project Health and Safety Manager, the Corporate Director of Health and Safety, or an Envirocon CIH may approve additions or changes to this table based on a written hazard analysis. An Envirocon CIH must approve respiratory protection downgrades.
- (2) This represents the minimum respiratory protection allowed. Respirators with a higher protection factor assigned by NIOSH may also be used.
- (3) Job Safety Analysis (JSA) must be approved by the Project Health and Safety Manager, the Corporate Director of Health and Safety, or an Envirocon CIH.
- (4) Ensure compliance with OSHA 29 CFR 1910.1028 benzene regulated areas, medical surveillance and training, etc.
- (5) Regardless of the change schedule, chemical cartridges should always be changed if warning properties are detected.

F.2.d. PPE Rules

- 1) Downgrading respiratory protection must be approved by the FE JV CIH.
- 2) All personnel are required to use the PPE specified for their work. This may include, but is not limited to, cartridge respirator, protective suit, gloves, boots, hard hat, hearing protection, and safety glasses.
- 3) All respirator use to be done in accordance with FE JV Respiratory Protection Program and/or site-specific procedures. Refer to Section F.3 for the site-specific respiratory protection program and procedures.
- 4) Safety Boots/Shoes:
 - a. Safety steel-toed boots/shoes that meet the requirements and specifications of American National Standards Institute (ANSI) Z41.1 shall be worn while working in field locations.
 - b. Boots/shoes must be in good repair and laced or fastened. Sandals and tennis-style shoes of any type shall not be worn while working.
- 5) Safety/Hard Hats:
 - a. Approved safety hats that meet requirements and specifications established in ANSI Z89.1 shall be worn at all times in the field or construction zone/yard removal locations.
 - b. Safety hats are not required to be worn in vehicles (passenger cars or trucks) or offices. Safety hats are not required in construction equipment with enclosed cabs. Safety hats must be worn in all construction equipment (loaders, bobcats, excavators, dump trucks, backhoe, etc.) that do not have enclosed cabs.
- 6) Eye Protection:
 - a. As a minimum, ANSI-approved safety glasses with side shields will be worn at all times when working on this site.
 - b. ANSI-approved safety glasses must be worn by equipment operators while in cabs unless eye hazards are adequately controlled by other methods listed in the most recent eye hazards analysis for this project.
 - c. Proper eye protection (goggles, safety glasses, etc.) must be worn when performing work with a recognized hazard to the eyes such as wire brushing, hammering, buffing, chipping, grinding, welding, cutting wire rope, working on rust, dirty chains, cables, or handling chemicals. If the job might result in eye injury, then eye protection is required.
 - d. Special goggles must be worn while helping or working within close range of welders.

- e. Goggles or transparent full-face shields must always be worn when grinding.
 - f. FE JV will not provide prescription safety glasses; FE JV will provide safety glasses capable of fitting over prescription glasses.
- 7) Hearing Protection:
- a. Approved earplugs or earmuffs must be worn in areas of high noise levels.
 - b. High noise level is defined as areas where noise levels exceed, or may exceed, 90 decibels A-scale (dBA).
- 8) Safety Vests:
- a. Reflective high visibility safety vests are required anytime personnel are working around operating equipment.
 - b. This requirement applies to equipment operators whose duties involve them leaving the cab of their equipment and working in general area.
- 9) Clothing:
- a. Sleeved shirts must be worn on the job.
 - b. Tank tops will not be allowed.
 - c. Long pants shall be worn. Pants shall cover the work boot top.
 - d. Loose or ragged clothing shall not be worn.
- 10) All personnel are responsible to clean and maintain the protective equipment issued to them. Any noted defects in the equipment shall immediately be reported to the FE JV Project Manager or the site superintendent, as appropriate.

F.3. Site-Specific Respiratory Protection

F.3.a. Documents

Envirocon's written Respiratory Protection Program is contained in Procedure 1403.016. This health and safety plan procedure serves as the site-specific procedure for the use of respirators on this project.

F.3.b. Administration

- 1) The Respiratory Protection Program Administrator is Frank Sullivan.
- 2) The designated Site Safety Officer for this project will serve as Assistant Program Administrator.
- 3) Medical qualification procedures are evaluated and implemented by WorkCare.

F.3.c. Continuing Respirator Effectiveness

- 1) The Assistant Administrator (Site Health & Safety Officer) is responsible for conducting daily site inspections, including special inspections described in the inspections section of this procedure.
- 2) Daily site inspections shall include surveillance of work place conditions. In particular the following conditions shall be assessed.
 - a. Potential changes in contaminant concentration;
 - b. Changes in employee exposure or stress; and
 - c. Respirator effectiveness.

F.3.d. Training

- 1) Envirocon Respiratory Protection Training Procedure:
 - a. Employees may be trained using the Envirocon Respiratory Protection Program lesson plan.
- 2) 40 hr HAZWOPER Training. Employees may be trained in a recent 40 hour or Emergency Response training courses (within the last year), or a recent 8 hour refresher training course which covers the use of respiratory protection (within the last year).
- 3) Respirator wearers may also be trained by certified training using a lesson plan covering the 1998 revised respiratory protection program standard.

F.3.e. Voluntary Use of Respirators

- 1) The voluntary use of respirators by employees (e.g., for control of odors or dusts) must be qualified.
- 2) Voluntary use of respirators is only allowed in areas characterized as not requiring respiratory protection.
- 3) The specific type of respirator and conditions of use must be approved by the Director of Health and Safety.
- 4) Voluntary use of respirators must otherwise be in accordance with this procedure.
- 5) Employees voluntarily using respirators must be trained in the information provided in Appendix D to CFR Sec. 1910.134 "Information for Employees Using Respirators When Not Required under the Standard."
- 6) Voluntary use of disposable dust masks does not require medical evaluation. Voluntary use of these masks does not require a fit test.

F.3.f. Medical Qualifications

- 1) Envirocon (physician or other licensed health care professional [PLHCP]):
 - a. Respirator wearer's shall be medically evaluated by a company designated PLHCP.
 - b. Envirocon's PLHCP are the physicians of WorkCare.
 - c. The physicians of WorkCare will be assisted in these duties by a local PLHCP. Local PLHCPs will also be licensed physicians. Fitness to wear respiratory protection will be determined by the local PLHCP and reviewed by the physicians of WorkCare.

F.3.g. Fit Testing

- 1) General requirements:
 - a. Before an employee uses any respirator with a negative or positive pressure tight-fitting face piece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used.
 - b. Positive pressure (i.e., pressure-demand mode) supplied air respirators (SAR) or SCBA with tight-fitting face pieces are included in this requirement.
 - c. Unless noted otherwise, fit test shall be administered using an OSHA-accepted Quantitative Fit Testing (QNFT) protocol.
 - d. A Qualitative Fit Testing (QLFT) protocol may be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less (i.e., half mask air purifying respirators).
 - e. Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by QNFT or QLFT.
- 2) Tight-fitting atmosphere-supply and powered air-purifying respirators:
 - a. Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing QNFT or QLFT in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
 - b. QLFT of these respirators shall be accomplished by temporarily converting the respirator user's actual face piece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator face piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator face piece.
 - c. QNFT of these respirators shall be accomplished by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway

between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the face piece.

- d. Any modifications to the respirator face piece for fit testing shall be completely removed, and the face piece restored to NIOSH-approved configuration, before that face piece can be used in the workplace.
 - e. Voluntary use respirators:
 - i. Voluntary use of disposable paper masks for dusts does not require a fit test.
 - ii. Voluntary use of disposable paper masks for dusts does not require medical evaluation.
 - iii. Voluntary use of any other respiratory protection requires normal fit testing and medical evaluations.
- 3) Loose-fitting respirators:
- a. Loose-fitting respirators include respirators such as hood or helmet-type continuous flow (type C or CE) respirators.
 - b. Loose-fitting respirators do not require fit testing.
- 4) Envirocon fit testing will be done in accordance with the OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A, 29 CFR 1910.134.

F.3.h. Fit Testing Period

- 1) Fit test results are good for a period of one year.
- 2) If an employee using a tight-fitting face piece respirator will be assigned a different respirator face piece (size, style, model or make) the fit testing must be repeated.
- 3) Fit test results are voided whenever the employee, a supervisor, a safety officer, the PLHCP, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to:
 - a. Facial scarring;
 - b. Dental changes;
 - c. Cosmetic surgery; or
 - d. An obvious change in body weight.

F.3.i. Use of Respirators

- 1) Employees are not allowed to use respirators with tight-fitting face pieces with:
 - a. Facial hair that comes between the sealing surface of the face piece and the face or that interferes with valve function; or
 - b. Any condition that interferes with the face-to-face piece seal or valve function.
- 2) If an employee wears corrective glasses, Envirocon will obtain the appropriate spectacle kit and have it fitted with prescription lenses.
- 3) Employees are required to perform a fit check when donning all tight-fitting respirators.

F.3.j. General Inspection and Repairs

- 1) Inspection requirements:
 - a. All respirators used in routine situations shall be inspected before each use and during cleaning.
- 2) Repairs:
 - a. Respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with these procedures.
 - b. Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations.
 - c. Repairs shall be made using only the respirator manufacturer's NIOSH-approved parts designed for the respirator.
 - d. Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed.
 - e. Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.
- 3) Employees shall inspect their respirator carefully and paying particular attention to:
 - a. Exhalation valve(s);
 - b. Inhalation valve(s);
 - c. Tightness of components;
 - d. Elasticity of components;
 - e. Look for missing components;

- f. Look for cracked components;
 - g. Look for missing cartridge gaskets;
 - h. Look for damage to cartridges (in particular the seat that seals with the cartridge gasket); and
 - i. Ensure that all filters, cartridges and canisters used are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.
- 4) For supplied air systems also inspect for:
- a. Proper functioning of regulators;
 - b. Final regulator pressures not exceeding 125 psi;
 - c. Air lines (low pressure) not exceeding 300 feet in length; and
 - d. Grade D certification of breathing air.

F.3.k. Respirator Cartridges Changes

- 1) Respirator cartridges shall be changed:
- a. In accordance with manufacturer's recommendations; and
 - b. As prescribed by this *HASP* or *JSA*.
- 2) Cartridges shall also be changed:
- a. If the wearer detects vapor or gas breakthrough;
 - b. If the wearer detects changes in breathing resistance; or
 - c. If the wearer detects leakage of the face piece.

F.3.l. Cleaning and Disinfecting

- 1) Cleaning:
- a. Whenever respirators are doffed, employees shall wash their faces and respirator face pieces in order to prevent eye or skin irritation.
 - b. Cleaning shall be accomplished by using soap and water or equivalent cleaning solutions.
- 2) Disinfecting requirements:

- a. Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals.
 - b. Respirators maintained for emergency use shall be cleaned and disinfected after each use.
 - c. Respirators used in fit testing and training shall be cleaned and disinfected after each use.
 - d. Respirators used by a single individual shall be disinfected at least weekly.
- 3) Disinfecting procedures:
- a. Respirator components should be immersed for two minutes in one of the following:
 - i. Disinfecting agent recommended for respirator sanitizing; or
 - ii. Hypochlorite solution (50 parts per million [ppm] of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F); or
 - iii. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43°C (110°F).
 - b. Rinse components thoroughly in clean, warm (43°C [110°F] maximum), preferably running water.
 - c. Drain. (The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.)
 - d. Use a mild solution of baking soda to remove chlorine or disinfectant residues.
 - e. Components should be hand-dried with a clean lint-free cloth or air-dried.
 - f. Reassemble face piece, replacing filters, cartridges, and canisters where necessary.
 - g. Test and inspect the respirator to ensure that all components work properly.

F.3.m. Storage

- 1) All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals.

- 2) All respirators shall be packed or stored to prevent deformation of the facepiece and exhalation valve.
- 3) Emergency respirators shall be:
 - a. Kept accessible to the work area;
 - b. Stored in compartments or in covers that are clearly marked as containing emergency respirators; and
 - c. Stored in accordance with any applicable manufacturer instructions.

F.3.n. IDLH Atmospheres

- 1) Use of respirators in Immediately Dangerous to Life and Health (IDLH) atmospheres must be approved by the Respiratory Protection Program Administrator. The administrator will approve the entry by reviewing and signing off on the JSA for the entry.
- 2) A specific JSA shall be written for each IDLH entry. The JSA will include:
 - a. The type of respirators to be used;
 - b. Area monitoring requirements;
 - c. Escape provisions; and
 - d. Rescue provisions.
- 3) At least one employee will serve as an attendant.
 - a. Attendants will remain outside the IDLH atmosphere.
 - b. The attendant shall maintain visual, voice, or signal line communication with the employee(s) in the IDLH atmosphere.
 - c. Attendants and rescue personnel will be trained in the approved JSA/JHA for the entry.
 - d. Attendants shall not attempt a rescue until provisions have been made for someone else to assume responsibilities as attendant.

F.3.o. Site Inspections

- 1) The Assistant Administrator (Site Health & Safety Officer) is responsible for conducting certain site inspections on a routine basis.
- 2) Program inspections:
 - a. Site inspections will be conducted daily.

- b. The HSO is responsible for these inspections, including special inspections described in the inspections section of this procedure.
- c. Daily site inspections shall include surveillance of work place conditions. In particular the following conditions shall be assessed:
 - i. Potential changes in contaminant concentration;
 - ii. Changes in employee exposure or stress; and
 - iii. Respirator effectiveness.

F.4. Heat Stress

The site heat stress program shall be enforced prior during periods when the ambient temperature of 80°F. Training shall be accomplished prior to implementation.

F.4.a. Training

All site personnel shall be trained in the hazards and controls of heat stress prior to the onset of hot weather.

F.4.b. Acclimatization

Personnel become acclimatized in about 7 to 10 days (and loose acclimatization in about the same period of time). Extra attention should be given during transitional weather and to new employees that are not used to heat stressful conditions.

F.4.c. Fluids

Workers shall be encouraged to increase consumption of water. Cool or cold water shall be used to enhance palatability and consumption. Electrolyte-containing beverages may also be used to encourage consumption.

F.4.d. Shelter

Shelter from radiant heat (i.e., shade) shall be available for ground laborers exposed to direct sunlight (i.e., radiant heat loading) during conditions of heat stress. Shelter does not necessarily require air conditioning, and air conditioning may actually be uncomfortable for employees working in heat stressful conditions.

F.4.e. Clothing

Clean dry undergarments help prevent some heat stress related problems. Provisions should be made for changing PPE garments that may become sweaty and dirty. Showering also helps to rehab personnel that show signs of high stress. Every effort should be made to minimize PPE requirements which may increase the heat stress of personnel without a commensurate gain in personal protection.

F.4.f. Monitoring

- 1) One of the most important aspects of monitoring for heat stress is the buddy system. Employees, through their training must be sensitive to early warning signs. Self/buddy checks of pulse are a simple method of extending this principle.
- 2) The HSO will implement a program of personal stress monitoring as appropriate for personnel wearing PPE (e.g., level Mod D/C workers) and for most other situations.

F.4.g. Personal Monitoring Programs

A program of personal stress monitoring should be used for most situations where whole body chemical protective clothing PPE is in use. It may also be used for other situations as well. The HSO shall use pulse as the primary method for monitoring but may use any combination of the following which includes pulse.

F.4.h. Pulse

- 1) Pulse is the primary means of personal monitoring for heat stress. Pulse should be less than 110 beats per minute (bpm). (The radial or carotid pulse should be taken seated or standing if necessary.)
- 2) Finger or wrist cuffs are a simple and objective measuring device which can be used by employees to monitor their own crews. If employees are used as part of a monitoring program these devices should be available to ensure objective observations. Training in such case should include: signs and symptoms, this procedure, and thorough reading of the instructions provided for the monitoring device(s) that will be used.
- 3) Take reading before or at the beginning of a break whenever heat stress conditions exist. Workers should be rehabbed until the pulse returns below 100 bpm.
- 4) The HSO is responsible for establishing a schedule for monitoring and should include the following minimum requirements (additional monitoring may be required on certain days or for more sensitive individuals).

Table F.4.h. Pulse Monitoring Schedule

Conditions	8 a.m. to 11 a.m.	11 a.m. to 3 p.m.	3 p.m. to shift end
Personnel do not show any signs or symptoms and monitoring is negative.	• Monitor for signs and symptoms	• 2 hr. interval	• 1 hr. interval
Personnel show any signs or symptoms and monitoring is negative.	• Monitor for signs and symptoms	• 1 hr. interval	• 1 hr. interval
Monitoring shows employee stress.	• 2 hr. interval	• 1 hr. interval	• half hour interval

For ANY employee that has already removed for stress and is being returned.	<ul style="list-style-type: none"> Interval should be cut in half for any individual that has been removed from work for rehab earlier in the shift and is now returning to work. Additional monitoring should also be performed on the following days until employee becomes acclimatized and is no longer showing symptoms or positive monitoring results.
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F.4.i. Rehab

Rehabilitation should include at a minimum: seated rest in a shady location; removal of some/all outer garments; fluids; observation; reduction in the ratio of work/rest periods; and increased monitoring after return to work.

F.4.j. Action Level for Personal Monitoring

An action level for personal heat stress monitoring has been established at 85°F ambient temperature when site personnel are wearing chemical protective clothing during the performance of field activities.

At temperatures exceeding 100°F ambient temperature, all ground laborers, regardless of PPE, should be monitored.

F.4.k. Work/Rest Regimen

The following work/rest schedule may be used to help control heat stress when monitoring removals dictate the need. Ground labor and PPE labor should also be scheduled for early morning or evening if possible.

Table F.4.k. Work/Rest Regimen

Ambient Temperature (°F)	Work Period (minutes)	Rest Period (minutes)
72-80	120	15
80-85	90	15
85-90	60	15
90-95	30	15
95-100	15	15

F.4.l. Cold Stress

To minimize cold related illnesses, site supervisors are to be aware of the symptoms and environmental conditions that lead to cold-related illnesses. Appropriate steps shall be taken to take to prevent their occurrence of these illnesses. This procedure describes the causes, symptoms, treatment and/or prevention of cold-related illness.

F.4.m. Thermal Balance

When the temperature of the surrounding air or water is cooler than the worker, the body's physical processes must increase to maintain thermal balance.

Shivering is the body's attempt to generate increased heat.

F.4.n. Cold Stress Symptoms

- 1) Common (but unreliable) symptoms:
 - a. Shivering, pain, and numbness, although commonly associated with cold stress, are not trustworthy indicators to cold exposures.
 - b. The reason you should not trust these is because prolonged cold exposure numbs all body sensations.
 - c. If these symptoms are detected, cold stress should be suspected.
 - d. The lack of these symptoms DOES NOT rule out the possibility of cold stress.
- 2) Wind-chill temperature is a better means of evaluation as it takes into account the wind's ability to strip heat from the body through convection.
- 3) Water conducts heat away from the body much faster than air. Personnel are especially exposed to a cold stress hazard when performing spill cleanup in boats or around open water in cold weather situations. Falling into cold water can rob body heat very quickly.
- 4) Clothing that is wet with perspiration (as well as from water contact) will cause heat loss through conduction.

F.4.o. Cold Injury

- 1) Trench Foot:
 - a. Cause: Occurs as a result of extended exposure of the feet to cold and moisture.
 - b. Injury: Capillary walls of the feet are injured, resulting in tingling, itching and pain.
 - c. Recognition: Blisters may form followed by ulceration of the skin.
- 2) Frost-Nip:
 - a. Cause: Is a localized superficial freezing of extremities such as ears, nose, toes, and fingers.
 - b. Injury: Worker experiencing frost nip are susceptible to future injury and should avoid chilling.

- c. Recognition: Initially there is a dark bluish color due to bleeding under the skin which at times can become gangrenous.

3) Frostbite:

- a. Cause: Frostbite occurs when the moisture in the skin actually freezes, forming ice crystals, resulting in the damage of skin cells. The ears, nose, toes and fingers are most susceptible because of poorer circulation in these areas. The body may shut down flow to the extremities in order to maintain warmth in body core areas.
- b. Injury: Tissues are destroyed when bodily fluids turn to ice. Damaged area can become gangrenous resulting in the loss of tissue, finger tips and toes.
- c. Recognition:
 - i. A burning pain is noted initially, then pain decreases and numbness sets in.
 - ii. The injured area becomes red, then blue/red.
 - iii. The skin becomes waxy pale in appearance because of lack of oxygen.

4) Hypothermia:

- a. Cause: Occurs when heat production of the body is not sufficient to replace heat lost to the environment.
- b. Injury: The core body temperature is lowered and the pulse rate slows. Metabolic processes in the body are finely tuned to perform at normal body temperature. As the temperature is lowered, muscular weakness occurs, mental abilities dull and the worker becomes uncoordinated. Cardiac arrest follows if core temperature continues to fall.
- c. Recognition:
 - i. Signs of hypothermia are evident at 95°F body core temperature.
 - ii. Consciousness is lost between 89.6° - 86.0°F.
 - iii. At lower core temperatures, cardiac arrest is possible.
 - iv. Exposure to cold water decreases the body core temperature rapidly and consciousness is quickly lost.
 - v. Workers on or over water should be acutely aware of the danger of immersion during cold weather.
 - vi. Hypothermia results in dulling of senses and could result in poor decision making.

F.4.p. Prevention

1) Training and recognition:

- a. Prevention of cold stress is, in many ways, similar to preventing heat stress. Training and recognition of the hazard is especially important.
- b. All personnel will receive training on the cause, symptoms, and most importantly, methods of prevention of cold stress injuries.

2) Clothing:

- a. Prevention of hypothermia and other cold injuries is best accomplished by protecting workers from cold and moisture.
- b. Clothing is the most important factor in prevention of injury.
- c. Personnel working on land should layer clothing with outer layer being wind and water resistant.
- d. The layers should be capable of being vented at wrist, neck and waist to reduce wetting by perspiration.
- e. Protect extremities that have poor circulation.
- f. Keep head and face covered.
- g. Wear insulated footwear, keep socks dry (bring extra socks as needed).
- h. Gloves are extremely important.
- i. Never allow bare skin to contact metal surfaces at sub-zero temperatures.

3) Acclimatization:

- a. Do not count on acclimatization.
- b. A limited degree of acclimatization can occur from exposure and working in cold environments.
- c. Some physiological changes do occur but people also learn how to more effectively protect themselves from temperature extremes.

4) Fluid Replacement:

- a. As with heat stress, blood circulation and heat transfer is critical to dealing with cold temperature extremes.
- b. Cold weather causes significant water loss as a result of the dryness of the air.

- c. Fluid intake should be increased to prevent dehydration which directly affects blood volumes and flow to the extremities.
 - d. Warm, sweet, caffeine-free, nonalcoholic drinks and soup offer the best fluid replacement and provide caloric energy.
- 5) Work-Rest Regimens:
- a. When temperatures are less than 20° F (actual or wind-chill) heated warming shelters should be made available.
 - b. Workers should use these on regular basis. See Table F.4.k. for guidelines for scheduling breaks.
- 6) Diet:
- a. As with any work in extreme temperatures, personnel will be instructed to eat a well-balanced diet to replace calories burned and provide necessary vitamins and nutrients.
- 7) Environmental Monitoring:
- a. Regular monitoring of the environment by recording wind speed and actual thermometer readings for comparison to the wind-chill chart should occur at regular intervals depending on conditions.
- 8) Prohibited Activities:
- a. Alcohol should not be consumed since it increases blood circulation to the skin and interferes with internal thermostatic control. Alcohol also interferes with mental acuity which can lead to risk taking.
 - b. Cigarette smoking should be prohibited since the nicotine restricts flow of blood to the extremities.
- 9) ACGIH TLV Guidelines:
- a. The current edition of the American Council of Governmental Industrial Hygienists' Threshold Limit Values (TLV) provides a reference on cold stress prevention. Some of the TLV information is summarized in Appendix G.

F.4.q. Treatment of Injuries

- 1) Trench Foot, Frosting and Frost Bite:
- a. These injuries require immediate response, including removal of the individual from a cold environment, the gradual warming of the affected areas, having the victim not use the affected limbs, (drive victim or carry, do not allow the victim to walk).

- b. Obtain immediate medical attention as these types of injuries become more severe as exposure progresses.
 - c. AVOID RAPID WARMING OF EXTREMITIES.
- 2) Hypothermia:
- a. Hypothermia is a life threatening condition that requires immediate response. Remove victim to a warm area. The individual may be disorientated and unable to talk clearly or understand you.
 - b. Help the individual to a warm place and wrap them in warm blankets or bathe them (if possible) in warm (not hot) water.
 - c. If they are conscious give hot (non-caffeine) liquids to drink.
 - d. Summon immediate medical attention. UNTREATED HYPOTHERMIA CAN LEAD TO VENTRICULAR FIBRILLATION (HEART ATTACK) AND DEATH.

F.5. Hazard Communication Program

The Envirocon Program, in its entirety, is located in a separate labeled notebook in the Envirocon project trailer and in the Envirocon online data base. The notebook is available for review by employees at any time during normal work shift. Envirocon will be responsible for maintaining a copy of their Hazardous Communication Program and Safety Data Sheets (SDS) on site. The online data base is available MSDS Online:

<https://msdsmanagement.msdonline.com/61fa7928-2936-4d21-806b-300a7e5d1da2/ebinder/?nas=True>.

Posters are also located at the site with online web address and hard copies (e.g. books) will be kept in crew trailers and LTWTS building.

F.5.a. Subcontractors

Subcontractors will be responsible for keeping an individual copy of their respective programs.

F.5.b. Safety Data Sheets

SDSs will be located in a separate labeled notebook in the Envirocon project trailer and in the Envirocon online data base. SDSs will be available to all employees for review during the work shift. Copies of all SDSs for materials on site will be provided to Bureau of Reclamation prior to material delivery on the site.

F.5.c. Container Labeling

All containers received on site will be inspected to ensure the following:

- 1) All containers clearly labeled;

- 2) Appropriate hazard warning; and
- 3) Name and address of the manufacturer.

F.5.d. Employee Training and Information

Prior to starting work, each employee will attend a health and safety orientation and will receive information and training on the following: An overview of the requirements contained in the Hazardous Communication Program. This training shall include at a minimum the following:

- 1) Hazardous chemicals brought to the site for the project;
- 2) The location and availability of the written Hazardous Communication Program;
- 3) Physical and health effects of the hazardous chemicals;
- 4) Methods of preventing or eliminating exposure;
- 5) Emergency procedures to follow if exposed;
- 6) How to read labels and review SDSs to obtain information; and
- 7) Location of SDS file and location of hazardous chemical list.

G. Site Safety Procedures

This section addresses safe work practices and site-specific safety procedures that will be used to control hazards on site.

G.1. Code of Safe Work Practices

Every employee has a responsibility to ensure that the program proceeds efficiently and safely. The following procedures constitute the basic safe work practices expected of every employee.

G.1.a. Conducting Yourself in a Responsible Manner

Safety programs are not only for your safety, but the safety of everyone on site. Your conduct potentially impacts your coworkers.

- 1) Perform all tasks in a safe and approved manner.
- 2) Do not direct an air hose at another person. Do not use compressed air to remove debris from clothes, hair, or any part of the body.
- 3) Honor the barricades erected by other contractors on the job site.
- 4) Do not stand in front of a door that opens toward you.
- 5) Do not work while your ability or alertness is so impaired by fatigue, illness, or other causes that they might unnecessarily expose yourself or others to injury.
- 6) Do not bring, keep, or use alcoholic beverages, controlled substances, or weapons on site.
- 7) Anyone known to be under the influence of drugs or intoxicating substance, which impair the employees ability to safely perform the assigned duties, shall not be allowed on the job while in that condition.
- 8) Workers shall not handle or tamper with any electric equipment in a manner not within the scope of their duties, unless they have received instructions from a qualified, licensed electrician.
- 9) Do not use any form of solvent, gasoline or kerosene for cleaning hands or clothing. Use soap and water or other cleansers intended for the purpose.
- 10) Keep hands and other part of your body out of pinch points, for example:
 - ♦ DO NOT use your hands to dislodge rocks or jams in tailgates (instead raise and lower the bed to use the gate's weight to clear materials and jams);
 - ♦ DO NOT get between counterweights on excavators or cranes and tracks, walls, excavation cuts etc.; and
 - ♦ DO NOT reach into belts with running machinery.

- 11) Use handrails when climbing or descending stairs and walkways.
- 12) Do not run, except as necessary in an emergency.
- 13) Horseplay, scuffling, and other acts which tend to have an adverse influence on the safety or the well-being of other employees is prohibited.
- 14) Do not jump from one level to another or one place to another. For example:
 - ◆ Get on and off equipment using three points of contact;
 - ◆ Walk down stairs without jumping or skipping steps;
 - ◆ Use ladders or ramps provided to descend into trenches;
 - ◆ Do not jump out of pickup beds; and
 - ◆ Do not jump across trenches.
- 15) Always stand on an approved ladder to remove articles that may out of reach from floor level. Do not stand on chairs, boxes, or other makeshift devices.
- 16) Loose or frayed clothing, hanging long hair, dangling ties, finger rings, etc., shall not be worn around moving machinery or other areas where they may become entangled.
- 17) Get help lifting heavy objects from heavy equipment, lifting devices, or help from another employee, and do not lift objects greater than 50 lbs. unaided.
- 18) Do not improperly use, mishandle, or tamper with health and safety equipment and sampling devices.
- 19) Personnel shall not drop or throw any articles or materials of any kind unless a specific procedure has been developed to do so safely.
- 20) Do not harass, feed, or photograph wildlife. If you find an injured or dead animal, contact the nearest gate attendant or the U.S. Fish and Wildlife Service.

G.1.b. Participate in Your Safety Programs

There are a number of ways for you to influence the safety on site. Don't just complain about problems; participate in your own safety.

- 1) Attend each day's work briefing as scheduled.
- 2) Attend all required safety meetings, training, or briefings.
- 3) Participate in ATW discussions.

- 4) Complete safety observer reports when you want to make a suggestion, observe a commendable act of safety or quality, take a “time out for safety” to correct an unsafe act or condition.
- 5) Approach every task with incident-free performance in mind.
- 6) Ask questions when you are uncertain about a procedure or equipment use.
- 7) Participate in the evaluation or investigation of any accident or incident when you are requested to do so.
- 8) If you fear reprisal, use the Envirocon safety Hotline **800-224-7389**.

G.1.c. Practice Good Housekeeping

Housekeeping is the hallmark of:

- 1) Keep your work area clean and orderly.
- 2) Good housekeeping practices shall be maintained continually.
- 3) Keep work, storage, and access areas clean of tools, equipment, and debris.
- 4) All means of egress shall be kept unblocked, kept clear of debris and slip or trip hazards, kept well lighted, and kept unlocked at times.
- 5) Immediately remove spilled liquids from the floor.
- 6) Clean up or otherwise remove slip/trip/fall hazards immediately.
- 7) Do not leave boards with protruding nails or other loose material on the floor where they may be stepped on.
- 8) Keep aisles and walkways clear of electrical and telephone cords.
- 9) Do not overload electrical outlets.
- 10) Electric cords shall not be exposed to potential damage from vehicles.
- 11) Mark or barricade slip/trip/fall hazards that cannot be removed.
- 12) Any time work is performed overhead, barricades shall be erected.
- 13) Barricades shall consist of caution (yellow) or danger (red) barricade colors and appropriately worded tape or signs.
- 14) All barricades shall be removed when not in use.

G.1.d. Follow Standard Procedures

Hazardous waste operations involve a number of standard procedures which are particularly important. Make these procedures a habit.

- 1) Use the Buddy System when performing operations in hazardous areas; when working with hazardous contaminants; when physical capabilities may become stressed (heat stress); or working in proximity of operating machinery or equipment.
- 2) Practice contamination-avoidance techniques.
- 3) Enter and exit the Exclusion Zone and the Contamination Reduction Zone through designated areas.
- 4) Complete sign-in/out logs when required.
- 5) Do not eat, drink, chew tobacco or gum, smoke, or engage in any other activity that may increase the possibility of hand-to mouth contact in the Exclusion Zone or the Contamination Reduction Zone. (Exceptions may be permitted by the Project Health and Safety Manager for other reasons, such as to allow fluid intake during heat stress conditions.)
- 6) Do not use lighters or matches in the Exclusion Zone and Contamination Reduction Zone.
- 7) Employees under a physician's care and/or taking prescribed narcotics must notify the designated site safety supervisor.
- 8) Lift material in a safe manner and avoid strains. Bend your knees, keep your back straight, and push upwards with your legs when lifting. The lifting of heavy and bulky objects will normally be done by or more shop personnel. Lifting heavy/bulky objects improperly can result in needless injury.
- 9) Get help (mechanical help or more people) when lifting heavy or awkward materials.
- 10) Wear the PPE specified in the *HASP*, including hard hats, steel toed boots, and safety glasses that must be worn at all times in active work areas.
- 11) If you are required to wear a respirator, remove facial hair (beards, long sideburns, or mustaches) that may interfere with the satisfactory fit of the respirator mask.
- 12) Use safety devices provided for your protection (e.g., handrails, guards, pressure relief valves, and seat belts). Do not remove these devices while the equipment is being operated.
- 13) Never approach within 25 feet of the operating area of a piece of equipment without first making eye contact with the operator, signaling your intention, and receiving an acknowledgement from the operator. If you wish to approach the equipment (e.g., to

Speak with the operator, the operator must first lower all buckets, blades, etc. and idle the engine before you approach).

- 14) When ground personnel support heavy equipment, pay particular attention to pinch points (e.g., the counterweight swing radius and the tracks of an excavator). Keep out from under suspended loads.

G.1.e. Follow Safety Procedures

In addition to standard procedures, there will be many site specific procedures to learn and follow. You need to learn these from your site-specific training and follow the procedures. If you feel the procedures are incorrect or inadequate it is improper to take it upon yourself to modify procedures. Ask your supervisor, make suggestions, or raise questions during planning and training.

- 1) Attend, pay attention, and ask questions during procedure training and briefings.
- 2) Implement, adhere to, and follow established rules, guidelines, procedures, plans, etc., as specified.
- 3) Follow proper decontamination procedures.
- 4) Make sure fall prevention, fall protection or fall arrest systems are in place when working at elevations greater than 4 feet above the surrounding work area.
- 5) Follow the work-rest regimens and other practices required by the heat stress program.
- 6) Where appropriate, lockout procedures shall be used.
- 7) Employees shall not work under vehicles supported by jacks or chain hoists without protective blocking that will prevent injury if jacks or hoists should fail.
- 8) Obey all authorized safety signs and demarcations. Do not place or remove these items except as authorized by the Site Health and Safety Supervisor (HSS).
- 9) Become familiar with the on-site hazards, work zones, PPE requirements, and decontamination methods.

G.1.f. Permit Required Procedures

Many of the most important procedures dealing with the most dangerous hazards involve permit requirements to ensure that necessary precautions are taken before work begins. Pay particular attention to these procedures.

- 1) Do not enter a permit-required Confined Space without a permit, and follow all requirements of permits as issued.
- 2) Don't rely on postings to warn you of confined space hazards. When in doubt ask for a permit and testing. Manholes, underground vaults, chambers, certain confining excavations, tanks, silos or other similar spaces may have a confined space hazard.

- 3) Check with your Supervisor prior to starting any hot work operation (welding or cutting operations) and, if you are working in an area that requires a hot work permit, follow the permit as issued.
- 4) Depending on the fire hazards at your facility, hot work permits may be required for use of cigarette lighters, electrical equipment that is not intrinsically safe, flash photography, motors, engines, or spark producing metal tools.
- 5) The combination of hot work and confined spaces is particularly dangerous even if you don't plan to enter the space. No burning, welding, or other source of ignition shall be applied to, or near any enclosed tank or vessel, even if there are some openings, until it has first been determined that no possibility of explosion exists and authority for the work is obtained from the foreman or superintendent. This includes small voids too. A sealed can, double space, storage compartments or similar small spaces can contain flammable debris or explosive vapors.
- 6) Do not dig or drive objects into the ground without first:
 - a. Ensuring that necessary permits have been obtained;
 - b. A competent person has been assigned;
 - c. A competent person has inspected the site;
 - d. Utilities have been located prior to beginning excavation activities;
 - e. Checking that excavations slopes are checked daily for stability and air quality;
and
 - f. Do not enter an excavation greater than 5 feet deep unless authorized by the HSS and then only after the excavation has been sloped or shored properly. Maintain safe means access and egress from all excavations.
- 7) Follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources. Install and remove locks and tags only in accordance with procedure and only when authorized.

G.1.g. Use Tools Properly

Tools, especially hand tools, are used frequently with minimal supervision. It can be all too easy to use tools improperly and create serious safety hazards.

- 1) Use all tools in the manner intended and/or prescribed. The operating instructions for all tools and equipment ARE MANDATORY.
- 2) Modification of use or design must be in accordance with the written instructions or permission of the manufacturer.
- 3) Do not suspend tools or any other items using electrical cords.

- 4) In locations where the use of a portable power tool is difficult, the tool shall be supported by means of a rope or similar support of adequate strength.
- 5) Air hoses shall not be disconnected at compressors until the hose line has been bled.
- 6) Inspect safety devices before every use, including but not limited to:
 - a. Respirators;
 - b. Personal protective equipment;
 - c. Body harnesses;
 - d. Lanyards;
 - e. Monitors;
 - f. Fire extinguishers;
 - g. Confined space retrieval systems (not the same as fall protection harnesses); and
 - h. Man baskets.
- 7) Inspect other tools and equipment before use.
 - a. A competent person must inspect scaffolds and man lifts before each day's use.
 - b. Ladders must be in good service, placed at the proper angle, secured, and extends to the proper length (for access to heights the ladder must be 3 feet above the landing).
 - c. Inspect power tools, looking especially for damaged insulation or missing ground plugs on electrical cords.
 - d. Inspect cutting devices looking especially for properly sharpened and guarded edges.
 - e. Inspect hand tools look especially for chisels, hammers and punches with mushroomed heads; files without handles, and hammers with broken handles.
- 8) Do not use defective equipment.
 - a. Don't leave defective equipment in service for others to use. Remove it from service and report the problem to your supervisor.
 - b. At a minimum, defective equipment must be tagged out of service.
 - i. Use a red tag placed near starting switches or levers.
 - ii. Describe the reason the equipment is tagged out.

- iii. Write your name and the date on the tag.
 - c. Alternatively, defective equipment can be taken out of service by destruction and disposal.
- 9) Use ground fault circuit interrupters (GFCI) for cord and plug equipment used outdoors, in damp locations, or when equipment is not plugged directly into permanent wiring.
 - 10) Use only extension cords rated for hard service or junior hard service (e.g., SO, JSO, SOW, JSOW). An Underwriters Laboratory (UL) label on a local hardware store flat cord is probably NOT rated for this service.
 - 11) Keep electrical cords out of walkways and accumulations of water unless protected and rated for such service.

G.1.h. Operate Equipment Safely

- 1) All equipment is to be operated in accordance with manufacturer's written instructions and/or manuals.
- 2) Equipment shall not be modified or operated out of specified limits without written permission from the manufacturer and the HSM for the project.
- 3) Only trained and authorized persons shall operate machinery or equipment.
- 4) Do not operate equipment unless you are properly trained and authorized to do so in a manner consistent with the owner/operators manual.
- 5) DO NOT use a piece of equipment, which has been tagged out of service. Do not remove red tags without authorization from the person placing the tag or the person responsible for the repairs.
- 6) Inspect equipment before using it.
 - a. Heavy equipment inspections shall be documented. Note all discrepancies and tag out equipment that may be dangerous to operate.
 - b. Red tags must have a description of the reason for the tag, the name of the person placing the tag, and the date the tag was applied.
- 7) Machinery shall not be serviced, repaired, or adjusted while in operation, nor shall oiling of moving parts be attempted, except on equipment that is designed or fitted with safeguards to protect the person performing the work.
- 8) Use vehicle or equipment seat belts any time the vehicle or equipment is in motion.
- 9) Excavating equipment shall not be operated near tops of 'cuts, banks, or cliffs if employees are working below.

- 10) Do not maneuver equipment into the working area of other equipment without first making eye contact with the operator working in the area and signaling your intentions to maneuver into that area.
- 11) Always acknowledge that you understand that other equipment or ground personnel may enter your working area.
- 12) Do not allow people on foot to approach without lowering hydraulically lifted or suspended components (e.g., buckets, blades, bellies) and reducing engine speed to idle.
- 13) Tractors, bulldozers, scrapers, and carryalls shall not operate where there is a possibility of overturning in dangerous areas such as the edges of deep fills, cut banks, and steep slopes.
- 14) Do not allow supporting ground personnel to work within pinch points of the equipment (e.g., the swing radius of a counterweight and the tracks on an excavator) or under suspended loads.

G.1.i. Prepare Yourself for Incidents

- 1) Become familiar with the emergency response plan so that you can respond properly in an emergency.
- 2) Become familiar with the locations and types of emergency equipment, such as fire extinguishers, emergency showers, or air horns.
- 3) Report all incidents to your supervisor immediately.
- 4) Participate fully and truthfully in incident investigations.

G.1.j. Supervisors Play a Leadership Role in Safety

As with all aspects of conducting operations, the supervisor is ultimately responsible for carrying out work in accordance with company policies and procedures, and in accordance with the specifications and applicable regulations.

- 1) Take a leadership role in establishing safety a safety culture on site.
- 2) Give employees frequent accident prevention instruction and encouragement.
- 3) First through encouragement and incentives, ensure that employees observe and obey all applicable company, state or federal regulation and order as is necessary to the safe conduct of the work. When necessary, compliance must be compelled using progressive disciplinary measures described in this document.
- 4) Ensure that employees are qualified for the work they are assigned.
- 5) No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness, or other causes that they might unnecessarily expose the employee or others to injury.

- 6) Do not allow anyone to remain on site when under the influence of drugs or intoxicating substance, which impair their ability to safely perform assigned duties.
- 7) Daily “tailgate” safety meetings shall be held to discuss safety concerns, instruct on new procedures, and discuss lessons learned from investigations and other related safety topics.
- 8) Encourage and listen to the suggestions of all employees.
- 9) All work shall be thoroughly planned and supervised to prevent injuries in the handling of materials and in working together with equipment.
- 10) Inspect the site daily.
- 11) Investigate all incidents.
- 12) Ensure thorough documentation of all aspects of the safety program.

G.2. Site Contingency Plan Summary

The contingency plan for the Site is embedded by reference in various sections. For clarity, they are summarized as follows:

G.2.a. Emergency Contacts

Reference Section I.8, Emergency Contacts.

G.2.b. Planning Dates for Community/Emergency Response Providers

To be determined.

G.2.c. First Aid Medical Information

Reference Section I, Incident and Emergency Procedures.

G.2.d. Air Monitoring Plan

Reference *Monitoring Plan*, Appendix C of the *Final (100%) Design for Phase 2 Wet Dredge (Final Design)* (FE JV, 2017).

G.2.e. Spill Prevention, Control and Countermeasures Plan

Reference Section I, Incident and Emergency Procedures.

G.3. Employee Participation

This project has established a variety of procedures to encourage the participation of employee in their own safety. Employee participation includes all FE JV, and lower tier subcontract personnel.

G.3.a. Training

Training is required for each employee before starting any new task or working in a new area. Training is considered an employee participation process. Employees are encouraged to ask questions and utilize training sessions to familiarize themselves with procedures.

G.3.b. Daily Safety Briefing

Each day's work begins with a safety briefing. These briefings shall be conducted in a manner to encourage employee participation.

- 1) Supervisors shall report the plan of the day for all employees. This should include other work that may occur near the project site or impact on project work. Special tasks expected for the day. Waste loads expected that will require special procedures.
- 2) Discuss lessons learned from incidents on this site or others.
- 3) Report and discuss safety observations made by employees.
- 4) Report and discuss times out for safety.
- 5) Participate in ATW discussions.
- 6) Discuss employee suggestions.
- 7) Recognize safety performance (good and unsatisfactory).

G.3.c. Safety Observer

This site has an established, behavior-based safety observer program. A minimum of two safety observer reports will be discussed each week. Employees will be instructed in the concept of unsafe conditions and behaviors. The primary interest is to draw attention to correcting unsafe conditions and adopting safe behaviors. Safety observations shall be documented and provided to the HSS.

- 1) To encourage everyone to participate in this program, employees will take turns making the mandatory weekly reports.
- 2) Voluntary observations are encouraged at any time and shall be handled as a safety suggestion.
- 3) Positive reports are encouraged to point out laudable behaviors for recognition.
- 4) All lower tier subcontractors shall be included in the safety observer program.

G.3.d. "Buddy System" Plus

Envirocon's incident-free performance objective is very demanding. This objective can only be met if every employee performs all work without incident. Since none of us is perfect, it is further necessary for each person to take responsibility not only for themselves, but the others

working with you. This concept is what Envirocon refers to as an expanded buddy system concept.

- 1) The HAZWOPER standard requires that employees remain in contact with at least one other “buddy” in the event of an emergency or accident.
- 2) The “buddy system” plus challenges each employee on site to not wait for an accident to happen to our buddies. Instead, correct unsafe conditions or challenge unsafe behaviors around us.
 - a. Don’t let it pass. If you see that someone else is about to make a mistake or hasn’t recognized a hazard, take responsibility to challenge the situation.
 - b. It’s not enough to not be at fault. Stop looking on accidents as someone’s fault. Instead, look on an accident as everyone’s failure to prevent the accident.

G.3.e. Stopping Work

Each employee has the right to call for work to stop when they observe a serious potential for injury. The SSO in particular is responsible for stopping work if there is a hazardous condition. Short of stopping work, FE JV encourages employees to get involved before things escalate to a threat of injury. Employee “time-outs” and “challenges” help to identify changes in conditions or to challenge improper procedures.

- 1) “Time-Out” for Safety Authority:

Changes in conditions, deviations from plans, unexpected or surprise events that have not yet caused an accident, threaten the safety of an operation or job task. These are hazardous conditions that must be recognized and controlled.

The “time-out” authority is intended to challenge each employee to control these hazards by giving each member of the crew the authority to take a “time out” when they recognize such potential problems. Take a “time-out” when:

- a. Conditions change. Examples might include:
 - i. Changes in weather;
 - ii. Changes in soil types;
 - iii. Changes in the equipment you are using;
 - iv. Changes in other work performed nearby;
 - v. Changes in materials being used to do the work;
 - vi. Changes in the toxicity of wastes;
- b. Unexpected conditions are found.
- c. Personnel who have not signed the ATW move into an area where they could be exposed to hazard created by your work group.

- d. Work deviates from plans.
 - e. An unplanned event occurs that might lead to an accident.
 - f. You don't understand what the plan for work is.
 - g. The work plan no longer seems safe.
- 2) Taking a "Time-Out" Means:
- a. Identifying one of the conditions above exists;
 - b. Communicating a concern to your supervisor or safety officer;
 - c. Updating or preparing an ATW;
 - d. The supervisor or safety officer evaluate the concern;
 - e. An appropriate response is determined. This might include:
 - i. The plan is not being followed and the team must be regrouped to get back to the planned way of doing the work;
 - ii. The crew must regroup and revise plans/procedures;
 - iii. The crew must regroup and change PPE;
 - iv. The employee must be trained in the appropriate procedures;
 - v. The employee must be requalified for new equipment being used;
 - vi. The employee needs to be informed of the reason for the current plans/procedures and why they are best for the task.
 - f. Regroup the work team (when needed to revise plans, procedures, training, etc.).
 - g. Communicate revised plans to all concerned.
- 3) Employee Challenges:

The site safety and health program is the responsibility of all employees. Each employee is required to challenge unsafe conditions or behaviors in their work areas.

The "employee challenge" system is intended to encourage employees to take initiative in correcting unsafe conditions or behaviors. Where an unsafe condition or behavior poses an imminent threat that can be readily addresses without a change in procedure or policy, each employee is encouraged to challenge those responsible.

- a. Challenge another employee that is driving in the wrong direction.

- b. Challenge a visitor to the work area that might not have signed in or is not accompanied by a qualified worker.
 - c. Grab a roll of barrier tape to mark a broken step on a stairway and report it to your supervisor.
 - d. Flag traffic around a spill until a response crew arrives.
- 4) When an operation is stopped due to a safety hazard challenge, notify the site supervisor immediately. The Supervisor shall report the challenge to the Project Manager and Site HSO.

G.4. Clearing and Grubbing

G.4.a. Chain Saws, Tree Trimming/Removal

- 1) Chain Saw:
 - a. All chain saws must have an automatic chain brake or kickback device.
 - b. The idle speed shall be adjusted so that the chain does not move when the engine is idling.
 - c. Operators will wear the following PPE:
 - i. Steel toe leather boots;
 - ii. Safety glasses;
 - iii. Hardhat;
 - iv. Chainsaw chaps;
 - v. Hardhat visor;
 - vi. Hearing protection; and
 - vii. Leather gloves.
 - d. Chain saws will not be fueled while running, hot, or near open flame.
 - e. The operator will hold the saw with both hands during all cutting operations.
 - f. The chain saw must never be used to cut above the operator's shoulder height.
- 2) Tree Removal:
 - a. Prior to removal operations, the employee shall consider:
 - i. The tree and surrounding area for anything that may be potentially damaged during tree removal;

- ii. The shape of the tree, the lean of the tree, and decayed or weak spots;
 - iii. Wind force and direction;
 - iv. Location of other people;
 - v. Above-ground utility lines and electrical hazards; and
 - vi. Steps shall be taken during the removal of all trees to ensure that property improvements which are not planned to be removed as part of the remediation activities are not damaged.
- b. Prior to felling operations, the work area shall be cleared to permit safe working conditions and an escape route shall be planned.
 - c. Tree cutting teams will work in pairs.
 - d. Each worker shall be instructed as to exactly what he is to do.
 - e. All workers not involved in the operations shall be kept clear of the work area.
 - f. Before starting to cut, the operator shall be sure of his footing and must clear away brush, fallen trees, limbs and other materials that might interfere with cutting operations.
 - g. The employee shall work from the uphill side whenever possible.
 - h. Just before the tree or limb is ready to fall, an audible warning shall be given to all those in the area; all persons shall be safely out of range when the tree falls.
 - i. If there is danger that the trees being felled may fall in the wrong direction or damage property, wedges block and tackle, rope, or wire cable shall be used to lower limbs to the ground.
 - j. All limbs shall be removed from trees to a height and width sufficient to allow the tree to fall clear of any wires and other objects in the vicinity.
 - k. Special precautions shall be taken when roping rotten or split trees due to the potential for falling in an unexpected direction even though the cut is made on the proper side.
 - l. Persons shall be kept back from the butt of a tree that is starting to fall.
 - m. In general, trees are to be taken down and removed in sections or parts. Free falling of trees will not be allowed without prior approval from the Project Manager.
 - n. Working From Branches/Fall Protection.

- o. All cutting involving personnel working at heights greater than 4 feet above the base of the trunk will utilize fall prevention or fall protection systems.
- p. Options:
 - i. Hydraulic manlift; and
 - ii. Personnel secured to trunk of tree.

G.4.b. Debris Removal

- 1) Use approved paths only, clear existing walkways of debris, vegetation, and excavated material.
- 2) Use face shields and chaps when using hand held power equipment for cutting vegetation.
- 3) Wear cut resistant work gloves, when the possibility of lacerations or other injury may be caused by sharp edges or objects, watch where you are stepping.
- 4) Wear the proper PPE for the task that you are performing (i.e., rubber gloves, boots, poly coated Tyvek®).
- 5) Review hazardous properties of site contaminants before starting work.
- 6) Observe proper lifting techniques, obey sensible lifting limits (50 lb max. per person manual lifting).
- 7) Use mechanical lifting equipment (hand carts, trucks or machinery) to move large awkward loads.
- 8) Keep eye contact with operator, wear high visibility safety vests, and isolate equipment swing areas.
- 9) Stay out from under the dead side of the excavator or crane boom, and don't stand beneath suspended loads.
- 10) Secure loads tightly before you attempt to move it to the decontamination pad or off site.

G.5. Excavations, Trenching, and Other Intrusive Work

The OSHA standards for excavation safety (29 CFR 1926, Subpart P) shall be followed at all times during excavation activities. Excavations include “any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.” This includes trenches. This standard applies regardless of the depth of the excavation although NSPW confined space requirements do apply when personnel enter a depth exceeding 4 feet. Utility locates should be done at any depth for example.

The Envirocon Excavation and Trenching Plan is found in Appendix G.

G.5.a. NSPW Requirements

- 1) A competent person shall be designated and supervise all intrusive work.

G.5.b. Excavations that Personnel Will Be Entering

In excavations 4 feet deep or deeper, a competent person shall ensure that the following requirements are met.

- 1) An evaluation of excavation or trench as a confined space is made. Reference the Confined Space Plan, Appendix H.
- 2) Provide safe access and egress. This includes ladders or ramps. In trenches, a point of egress must be within 25 feet at all times while in the trench. Ramps shall be sloped so as not to require the use of hands to walk out of the excavation.
- 3) Employees must be protected from cave-ins.
 - a. In trench excavations the competent person must have all sides sloped in accordance with OSHA requirements on either side of the trench where personnel are working.
 - b. In excavations, at a minimum, employees within a distance equal to the depth of a cut face shall be protected. Where employees are in excavating equipment, at a minimum, the equipment shall not undercut a face in such a way that the cab is closer than the height above the cab.
- 4) Alternative protections, specified by OSHA include trench boxes or shoring.
- 5) In excavations where employees may be required to enter, excavated or other materials shall be effectively stored and retained at least 2 feet or more from the edge of the trench.

G.5.c. Water

Whenever, groundwater may be encountered; a specific classification and slope adjustment will be made on site by the competent person. At a minimum, an additional 1/2 to 1 slope will be added if flowing conditions are encountered at the toe of the slope where personnel are working.

G.5.d. General Excavation Practices

- 1) In excavations with potential airborne vapor hazards, where employees may be required to enter shall have the atmosphere tested before each entry and as conditions change.
- 2) Employees exposed to vehicular traffic shall be provided with and instructed to wear warning vests made of reflective or high visibility materials.
- 3) All employees in trenches shall wear the appropriate PPE, e.g., hard hats, safety glasses, hard-toed boots, etc.
- 4) No employees will be permitted under loads.

- 5) Dust conditions shall be kept to a minimum in accordance with the project dust control plan.
- 6) Where employees or equipment are allowed to cross over excavations, all walkways and/or bridges will have guardrails.
- 7) Adequate barrier protection will be provided at remotely located excavations (e.g., reflective cones or sawhorse barriers).
- 8) Each excavation must be inspected daily. If evidence of cave-ins or slides is apparent, all work in the excavation must cease until necessary precautions have been taken to safeguard employees.
- 9) Where vehicles or equipment operate near excavations or trenches, the sides of the excavation must be shored or braced as required to withstand the forces exerted by the superimposed load.

G.5.e. Utility Lines

Utility lines, both above and below ground, must be addressed in any excavation activity regardless of depth.

- 1) Be aware and always suspect the existence of underground utilities such as electrical power, gas, petroleum, telephone, sewer and water. Underground utilities are a concern at any depth. Then Superintendent shall call and document contact with Diggers Hotline: Wisconsin's One-Call Center CALL 811 or (800) 242-8511.
- 2) Utility markings must be clear, visible. Utility locates tickets must be maintained every 10 day if work isn't completed and/or markings are not maintained.
- 3) Refer to Envirocon Utility Location and Identification safety guidance documentation. Address above and below ground utilities in site planning COW - 1401.030 and 1403.011 form as well as JSA and crew CAP
- 4) Overhead and buried utilities should be located, noted and emphasized on all excavation and work plans (regardless of depth of excavation). Post warning barricades on the ground along the line of excavation in order to alert excavating equipment approaching overhead utilities.
- 5) When excavating within 6 feet of buried utilities, first locate and mark the expected location. Ideally, the utility should be shut off and excavating should be done with a spotter and extra care. Due to the inaccuracies of locating, if the utility cannot be shut off, hand digging (i.e., potholing) will be used to visually confirm the utility location before using heavy equipment.
- 6) When excavating within 6 feet of underground utilities, a spotter shall be used to assist mechanical excavating equipment in locating utilities.

- 7) When excavating within 6 feet of underground electrical, phone, flammable gas/liquid lines make every effort to de-energize lines.
- 8) The requirements above should be taken as a minimum. High volume or high pressure mains should be given a wider margin. Fiber-optical lines should be given additional margin. High pressure or high volume water lines should be approached in the same manner as “more dangerous” utilities.
- 9) Overhead Utilities:

When overhead electrical power lines exist at or near an excavation site, consider all wires to be alive and dangerous. Support overhead utility lines as necessary. Overhead electrical lines may induce a current without actually touching the lines. Be sure to maintain clearances from electrical lines of 50 kilovolt (kV) or greater in accordance with 29 CFR 1926.550(a)(15). Place ground markers to indicate overhead hazards as well as those below ground.

G.5.f. Competent Person

The excavation competent persons are assigned in the organization and key personnel section earlier in this document. The excavation competent person is authorized to, and shall take prompt action to correct unsanitary, hazardous, or dangerous working conditions. Other responsibilities include (but are not limited to):

- 1) The competent person will supervise each intrusive work permit and its attendant ATW.
- 2) The competent person will directly oversee all operations and be present on site at all times while employees are in the excavation.
- 3) The competent person will make a daily inspection of the excavation area before each shift begins, after any changes in the excavation area or after a rainstorm.
- 4) The competent person will ensure that personnel in excavations will not work under suspended loads.
- 5) The competent person will ensure that work activities on the surface of the excavated area will be restricted to prevent working above personnel.
- 6) The competent person will ensure that banner guard and barriers will be placed across public access to the excavation areas at night to protect and warn personnel as necessary.
- 7) The competent person will ensure that personnel exposed to high traffic areas will wear high visibility vests; orange for daytime and reflective for night operations.

G.6. Falling and Tripping Hazards

G.6.a. Falls – Housekeeping and Materials Storage

- 1) All material shall be stored in a manner that will ensure that the material is safe from unexpected movement, falling, rolling, blowing, or any other uncontrolled motion.

- 2) Materials and supplies shall be kept away from edges of floors, stairways and access/egress routes (36 inches minimum).
- 3) Forms and scrap lumber with protruding nails and all other debris shall be cleared from work areas, passageways, stairs, and in and around buildings or other structures.
- 4) Tripping hazards, protruding nails, oil slicks, scrap materials and other hazardous conditions occurring during the course of the job shall be eliminated as work progresses.
- 5) Tools and equipment shall not be strewn about where they might cause tripping or falling hazards and shall, at the end of each workday, be collected and stored or disposed of as appropriate.
- 6) All food waste and oily/greasy rag containers shall be equipped with tight closing lids.
- 7) Protruding reinforcing steel (rebar) shall be properly capped or otherwise protected to prevent a hazardous condition.
- 8) All non-hazardous trash, oily wastes, PPE, debris and trash of any kind shall be segregated according to the applicable waste segregation scheme; and shall be labeled accordingly.
- 9) Covers on all roll-offs, drums, and containers of any type shall be securely covered at the end of the day.

G.6.b. Falls – Slippery Surfaces, Unstable Surfaces, Uneven Terrain

- 1) Wet conditions on the site caused by rain and/or work activities are likely to be encountered during the project.
- 2) Employees will be informed of the hazards associated with walking on slippery and or uneven surfaces.
- 3) Mark or remove trip hazards.
- 4) Proper foot wear will be provided to all employees involved with work activities during these conditions.
- 5) When possible, pedestrian traffic will be redirected around potentially dangerous areas.
- 6) Everyone should keep the work area and other areas where people may walk clean and orderly.
- 7) Tools, debris, and other objects should not be left on the floor, decking, or other areas where they present hazards during a job or after a job is completed.
- 8) Oil spills and slippery spots shall be cleaned up immediately.
- 9) Extra precautions should be taken when walking on steel decking during wet/icy weather and/or oily conditions.

- 10) Never walk on piping, never take dangerous shortcuts, and avoid jumping from elevated places.

G.6.c. Falls – Ladders

- 1) Personnel must visually inspect each ladder for defects before use; defective ladders shall not be used.
- 2) When working from a ladder, wear fall protection if work requires your body to extend past the margins of the ladder sides.
- 3) While ascending or descending a ladder, carry nothing which will prevent holding onto the ladder with both hands.
- 4) Metal ladders will not be used if there are any existing or potential electrical hazards in the work area.
- 5) All ladders must be securely tied off or secured by an attendant while the ladder is in use.
- 6) When working from ladders, work facing the ladder with both feet on the rungs.
- 7) Workers shall not stand with their waist above the top step of a ladder without wearing a safety belt that is securely tied off to a local structure.
- 8) Short ladders shall not be spliced together to make a longer ladder.
- 9) The base of the ladder must be set back a safe distance from the vertical; approximately one-fourth the working length of the ladder.

G.6.d. Falls – Fall Protection Working From Elevated Surfaces

No worker shall willfully be exposed to fall hazards. When a worker observes a fall hazard, he or she will notify his or her supervisor of the hazard. Measures will be taken to immediately correct the hazard. One hundred percent continuous fall protection or prevention shall be required for fall hazards greater than 4 feet.

Personal fall arrest systems, when stopping a fall, shall be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level or obstruction.

For duties involving heights greater than 4 feet above the ground:

- 1) Utilize fall protection or restraint system as described in the Envirocon Fall Protection Program.
- 2) Append a task specific JSA to this plan to specify type and design of fall prevention or protection system on a case by case basis.

G.6.e. Scaffolds

- 1) The following requirements shall apply to all scaffold use:

- a. Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration.
 - b. Scaffold components shall be inspected for damage or defect prior to use. Defective components shall be immediately removed from service.
 - c. The Contractor’s employees shall be prohibited from working on scaffolds covered with ice, snow or other slippery materials, except as necessary for removal of such materials.
 - d. Debris shall not be allowed to accumulate on scaffold platforms.
 - e. A competent person shall be on-site anytime a scaffold is in use and shall inspect each scaffold prior to the start of each shift.
- 2) Scaffolds shall be clearly marked and identified using a three-tag system, such as:
- a. Green tag-shall indicate the scaffold is properly erected with no deficiencies, hazards or missing components.
 - b. Yellow tag-shall indicate the presence of an identified hazard, which indicates special precaution usage.
 - c. Red tag-shall indicate the scaffold is in the process of erection or dismantlement and shall not be accessed except by those performing either the erection or dismantlement.

G.6.f. Illumination

Light plants or other sources of light shall be used as necessary to maintain the requirements described in Table D 65.1 of 29 CFR 1926.65.

Table D-65.1 Illumination of Work Areas

Foot Candles	Area of Operations
5	General Site Areas
3	Excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: Warehouses, corridors, hallways, and exit ways.
5	Tunnels, shafts, and general underground work areas. (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine Safety and Health Administration approved cap lights shall be acceptable for use in the tunnel heading.

10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.
30	First aid stations, infirmaries, and offices.

G.7. Portable Tools

G.7.a. Deadman Switches

Portable electrical power tools will be equipped with constant pressure switches or controls that will shut off power when the pressure is released.

G.7.b. Guards

All tools will be equipped with appropriate guards, the guards will be properly adjusted, and the guards will be replaced if they are damaged.

G.7.c. Field Modifications

Hand/powered tools may be used only for their intended purpose. The design or guard capacity shall not be exceeded or circumvented by unauthorized attachments or modifications.

G.7.d. Electrical

- 1) All portable electrical powered tools shall be double insulated or grounded.
- 2) Ground Fault Interrupters (GFCI) will be used with all outdoor temporary wiring.
- 3) Power tools shall be hoisted or lowered by a hand line; never by the cord or hose.

G.8. Fire Prevention

G.8.a. Use of Gasoline in Vehicles and Small Containers

The use of gasoline is very common on and off the job. The familiarity of its use may lead to complacency regarding the properties of this highly dangerous fuel. Thousands of people are treated each year for burn injuries related to the misuse of gasoline. It is important to remember that gasoline has only ONE proper use - to power vehicles or machinery. Remember that gasoline is highly volatile. Just one gallon of gasoline is equivalent to 14 sticks of dynamite in explosive force.

Vapors from gasoline are also dangerous. Gasoline vapors are heavier than air; they flow invisibly along the ground and can ignite from a flame, spark, hot surface or static electricity causing a shattering explosion.

- 1) Before Refueling
 - a. Turn off your vehicle engine while refueling.
 - b. Put your vehicle in park and/or set the emergency brake.

- c. Disable or turn off any auxiliary sources of ignition such as a camper or trailer heater, cooking units, or pilot lights.

2) Ignition Sources

- a. Do not smoke, light matches or lighters while refueling at the pump or when using gasoline anywhere else.
- b. Turn off your cell phone or any other electrical devices that are not explosion proof or intrinsically safe.

3) Refueling

- a. Use only the refueling latch provided on the gasoline dispenser nozzle - never jam the refueling latch on the nozzle open.
- b. Do not re-enter your vehicle during refueling.
- c. In the unlikely event a static-caused fire occurs when refueling, leave the nozzle in the fill pipe and back away from the vehicle. Notify the station attendant immediately.
- d. Do not over-fill or top-off your vehicle tank, which can cause gasoline spillage.
- e. Avoid prolonged breathing of gasoline vapors.
- f. Do not “top off” tank (i.e., adding additional fuel after the automatic shutoff has tripped) in order to allow for expansion.
- g. Place cap tightly on the fuel tank - do not use caps that do not seal properly.
- h. If gasoline spills, make sure that it has been cleaned up before starting the vehicle or equipment.
- i. Report spills to your supervisor and the station attendant if refueling at a commercial gasoline filling station.

4) Store gasoline and other fuels in approved containers such as:

- a. OSHA fire safety containers of 5 gallons size or less.
- b. Manufacturer’s installed or approved equipment fuel tanks.
- c. Fuel depot tanks in accordance with fuel depot procedures.

5) Use gasoline in accordance with refueling procedures and flammable materials handling procedures.

- a. Use gasoline only in open areas that get plenty of fresh air.

- b. Keep your face away from the nozzle or container opening.
- c. When dispensing gasoline into a container, use only an approved portable container and place it on the ground when refueling to avoid a possible static electricity ignition of fuel vapors.
- d. Containers should never be filled while inside a vehicle or its trunk, the bed of a pickup truck or the floor of a trailer.
- e. When filling a portable container, manually control the nozzle valve throughout the filling process.
- f. Fill a portable container slowly to decrease the chance of static electricity buildup and minimize spilling or splattering.
- g. Fill container no more than 95% full to allow for expansion.
- h. Place cap tightly on the container after filling - do not use containers that do not seal properly.
- i. If gasoline spills on the container, make sure that it has evaporated before you place the container in your vehicle.
- j. Report spills to your supervisor and the station attendant if refueling at a commercial gasoline filling station.
- k. When transporting gasoline in a portable container make sure it is secured against tipping and sliding, and never leave it in direct sunlight or in the trunk of a car.
- l. Never siphon gasoline by mouth nor put gasoline in your mouth for any reason. Gasoline can be harmful or fatal if swallowed. If someone swallows gasoline, do not induce vomiting. Contact a doctor immediately.
- m. Keep gasoline away from your eyes and skin; it may cause irritation. Remove gasoline-soaked clothing immediately.
- n. Use gasoline as a motor fuel only. Never use gasoline to wash your hands or as a cleaning solvent.

6) Filling Containers Inside Vehicles or Pickup Beds

- a. The National Highway Traffic Safety Administration (NHTSA) has urged motorists to avoid risk of fire by placing portable gasoline containers on the ground while filling them because filling them while they are located in beds of pickup trucks or in trunks or passenger car compartments can be hazardous.
- b. Take the portable gas container out of your vehicle and set it on the ground while filling it with gasoline.

- c. Static electricity could cause fire to erupt while fueling when it is in your car or pickup bed, NHTSA Administrator says:
 - i. Adding to the danger is the location where these fires could occur -- at a gas station while getting fuel for your snow blower or emergency generator.
 - ii. Cold, dry days in winter increase the chance of ignition, so preventive measures are important.
 - iii. Pickups with bed liners require special concern. A bed liner is a plastic, protective lining that acts as an electrical insulator, allowing static electricity to build up on the gasoline container while it is being filled. The flow of gasoline through the pump nozzle can produce static electricity.
 - iv. During fueling, this can create a spark between the container and the fuel nozzle, igniting gasoline vapors and causing a fire or explosion. This danger also applies to other nonmetallic containers capable of building up a static charge.
 - v. Reports also describe fires that resulted while portable gasoline containers were being filled in trunks and passenger compartments of vehicles, when carpeting acted as an insulator.
- d. NHTSA recommends the following safe procedures for filling portable gasoline containers:
 - i. Dispense gasoline only into approved containers.
 - ii. Do not fill a container while it is inside a vehicle, a vehicle s trunk, pickup bed or on any surface other than the ground.
 - iii. Bring the fill nozzle in contact with the inside of the fill opening before operating the nozzle.
 - iv. Contact should be maintained until the filling operation is complete.

G.8.b. Extinguishers

- 1) Extinguishers will be readily available on site. At a minimum, extinguishers will be placed as follows. (Extinguishers of greater size or inclusive types may be substituted.)
- 2) Heavy equipment will be equipped with a 5# ABC fire extinguisher rated at 2-A:10-B:C.
- 3) Fuel depots and flammable liquid storage/handling areas.
 - a. 20# ABC fire extinguishers with a rating of 2-A:40-B:C will be provided within 75 feet of, but no closer than 25 feet to, all refueling depots and flammable storage areas.

- b. 10# ABC fire extinguishers with a rating of 2-A:40-B:C will be provided within 75 feet of, but no closer than 25 feet to, all mobile fueling stations, flammable liquid transfer areas, and generators.
 - 4) Trailers, buildings and work areas
 - a. All trailers and work areas will have at least a 5 # ABC fire extinguisher rated at 2-A:10-B:C.
 - b. Extinguishers in trailers will be mounted near a clear evacuation egress point (door).
 - c. Extinguishers on site will be located at the primary entrance to the work area.
 - 5) Access routes to fire extinguisher shall be kept clear at all times.
 - 6) All fire extinguishers shall be inspected monthly and serviced annually.

G.8.c. Fighting Fires

- 1) Personnel are authorized to fight fires in the beginning stages of development and only to the extent that they judge this can be done safely. Personnel are not required to fight fires.
- 2) When a fire is detected, first ensure that the area is safely evacuated and the supervisor is being notified so that the fire department can be summoned.
- 3) Ensure your own evacuation route before attempting to extinguish a fire.
- 4) If more people or more extinguishers are needed, the effort should be abandoned.
- 5) Contact the fire department if applicable.

G.8.d. Facility Systems

- 1) A site-specific procedure will be developed where project work (such as demolition) potentially jeopardizes facility systems.
- 2) Site managers will generally be notified when any work is done above facility systems such as fixed fire suppression systems for buildings, or where excavations encroach on facility systems such as fire hydrants or related piping.
- 3) When excavating or performing demolition near facility systems, the facility systems should be uniquely marked to avoid damaging these systems.

G.8.e. Flammable Liquids, Fuels, and Fueling

- 1) Protection of depots:
 - a. Depots will be located in such a manner as to provide clear access for fire trucks.

- b. Depots will be protected from damage from vehicle or equipment damage using bollards, bails, curbs or similar devices.
- 2) Portable containers:
- a. All portable fuel cans shall be free of deformities which threaten the integrity of the container.
 - b. All flammable storage cans of 1 gallon capacity or greater shall have self-closing lids and flame arresters (i.e., safety cans).
 - c. All flammable storage containers shall be labeled as to their contents, and shall include a warning regarding flammable contents.
 - d. Gasoline engines shall not be fueled while the engine is running.

G.8.f. Containments

- 1) All equipment shall be fueled through funnels or spouts that prevent spillage. All spouts and funnels must be of metal construction.
- 2) National Fire Protection Association (NFPA) flammables (e.g., gasoline) will not be stored in the same containment as NFPA combustibles (diesel fuels).
- 3) Containers and depot tanks in excess of 5 gallons will be held or stored in containments designed to collect spillage.
- 4) Covered containments must be capable of containing a volume equal to:
 - a. The capacity of the largest tank; plus
 - b. The combined displaced volumes of all tanks and containers stored in the containment.
- 5) Uncovered containments must be capable of containing a volume equal to:
 - a. The capacity of the largest tank; plus
 - b. The combined displaced volumes of all tanks and containers stored in the containment; plus
 - c. 25% excess capacity for rain collection.
 - d. Uncovered containments will be kept free of standing water.
 - i. Water in excess of 5% containment capacity will be pumped off within a 48-hour period.
 - ii. Water will not be discharged onto the ground unless free of visible residues or films.

- 6) Bonding and grounding:
 - a. Any transfer of a flammable liquid from one container to another requires bonding from one container to the other.
 - b. All flammable fuel depot tanks set up on site will be grounded.

G.8.g. Smoking, Fire, and Hot Work

- 1) Hot work permits shall be issued for all applicable hot work according to site requirements.
- 2) Smoking and hot work will not be allowed within 50 feet of fuel depots or other flammable liquid storage and/or transfer areas.
- 3) Fuel depots or other flammable liquid storage and/or transfer areas will be posted against smoking, open flames, or hot work.
- 4) Oily rags:
 - a. Oily rags, trash and other combustible scrap materials shall be placed in closed receptacles separate from other trash.
 - b. Oily rags shall be stored in containers approved for this purpose.

G.8.h. Welding, Cutting, and Hot Work

- 1) General:
 - a. All welding and hot work will be done in accordance with Envirocon's Health and Safety Procedures 1403.011 and 1403.012;
 - b. All welding and hot work will be done in accordance with facility requirements.
- 2) Equipment Operation:
 - a. Welding equipment shall be used only for operations for which it is approved, and as recommended by the manufacturer.
 - b. Workers assigned to operate or maintain oxygen/fuel gas supply equipment and resistance welding equipment shall be thoroughly instructed in the safe use of such equipment.
- 3) Personal Protective Equipment:
 - a. Eye and Face Protection:
 - i. Welding helmets and hand shields shall be used during all arc welding/cutting operations, excluding submerged arc welding.

- ii. Safety goggles or glasses (with side shields) are also worn during arc welding/cutting operations. The goggles or glasses may be either of clear or colored glass, depending upon the type of exposure in welding operations. Helpers or attendants wear proper eye protection.
- iii. Safety goggles or glasses with side shields and suitable filter lenses shall be permitted for use during gas welding operations on light work, torch brazing, or inspection.
- iv. All operators and attendants on resistance welding or brazing equipment will use face shields or goggles, depending on the particular job.

b. Protective Clothing:

- i. All welders/cutters shall wear flameproof gauntlet gloves.
- ii. Flameproof aprons made of leather, or other suitable material, must be used as protection against radiated heat and sparks.
- iii. Leather jackets will be utilized if personnel are performing hot cutting/welding work above their shoulders.
- iv. Nylon clothing is not permitted for welding/cutting operations.
- v. All outer clothing, such as jumpers or overalls, should be free from oil or grease.

c. Respiratory Protective Equipment:

- i. When respiratory protective equipment is required, the Respiratory Protection Program shall be adhered to.
- ii. Respiratory protection will be required depending on job duration and contaminant specific personal time weighted average air sample results.
- iii. Supplied air respiratory protection is required for cutting on lead paint until personal exposure sampling indicates exposure requiring lower levels of protection.

4) Gas Welding and Cutting Safety:

- a. Fuel gas hose and oxygen hose are easily distinguishable from each other.
 - i. The contrast is made by different colors or by surface characteristics readily distinguishable by touch.
 - ii. Oxygen and fuel gas hoses shall not be interchangeable.
 - iii. A single hose having more than one gas passage shall not be used.

- b. When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches shall be covered by tape.
- c. All hose in use shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.
- d. Hoses, cables, and other equipment shall be kept clear of walkways, ladders, and stairs.
- e. Clogged torch tip openings shall be cleaned with approved cleaning wires, drills, or other devices designed for this purpose.
- f. Torches to be used shall be inspected at the beginning of each working shift for leaking shutoff valves, damaged hose couplings, and clogged tip connections. Defective torches will not be used.
- g. Torches shall be ignited by friction lighters or other approved devices only. Matches, flame lighters, or hot work will not be used to ignite torches.
- h. Oxygen and fuel gas pressure regulators, including related gauges, shall be in proper working order.
- i. All oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces or greasy clothes, or used within a fuel oil or other storage tank or vessel.
- j. Flash back arresters shall be installed on all oxygen and fuel gas setups, at a minimum at the gauges.
- k. Torches and hoses shall be completely depressurized (bled) prior to storage, or at the end of each shift.
- l. Torches and hoses shall not be stored in enclosed areas (e.g., gang boxes, lockers) while connected to cylinders.
- m. Do not hang torches from the regulators attached to the cylinder.
- n. Release the hose pressure and close the cylinder valves when work is interrupted for an extended period (breaks, lunch).
- o. Don't leave a pilot flame burning at the tip of the torch during interruption of operations.
- p. When working in an elevated position:
 - i. Provide a screen to keep hot metal, electrode stubs, hot metal slag, etc. from falling below;

- ii. Provide toe boards when working from scaffolding under which workers may be passing or working; and
- iii. Restrict access to the area below the work site.

5) Arc Welding and Cutting Safety:

- a. Electrode holders shall be designed for arc welding/cutting and are capable of safely handling the maximum rated current required.
- b. Exposed current-carrying parts of electrode holders shall be insulated in a manner which provides full protection against electrical shock for operators of arc welders/cutters.
- c. All arc welding/cutting cables must be completely insulated and flexible, capable of handling the maximum current requirements of the work.
- d. Only cable free from repair or splices for a minimum distance of 10 feet from the electrode holder is used. Cables with standard insulated connectors or splices with insulating quality that is equal to that of the cable may be permitted.
- e. If it is necessary to splice lengths of cable, insulated connectors equivalent to that of the cable are used. If connections are made by cable lugs, they are securely fastened together and provide a good electrical contact. Exposed metal parts of the lugs must be completely insulated.
- f. If electrode holders are left unattended, the electrodes shall be removed and the holders placed so that they cannot make electrical contact with employees or conducting objects.
- g. Electrode holders shall not be dipped in water.
- h. The power supply to the equipment shall be turned off whenever the arc welder or cutter leaves work or stops work for any appreciable length of time, or when the arc welding/cutting machine is to be moved.
- i. Any faulty or defective equipment shall be reported to the supervisor and tagged out of service until repaired.
- j. All arc welding/cutting operations shall be shielded by noncombustible or flameproof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc or from arc flash.
- k. The frames of all arc welding and cutting machines shall be grounded.
- l. Never weld on any line or equipment until it has been connected to the ground connection of the welding machine.
- m. Never pull or disconnect a ground line while the arc is in use.

- n. Never let the live metal parts of the welding circuit touch damp skin or clothing.
 - o. All parts that are being cut must be supported in such a manner as to prevent them from falling during or at completion of the cut.
- 6) Storage and Handling of Compressed Gas Cylinders:
- a. Compressed gas cylinders shall be legibly marked with either the chemical or trade name of the gas. Such markings shall be stenciled, stamped, or labeled and are not easily removable. The marking shall be located on the shoulder of the cylinder.
 - b. Compressed gas cylinders shall be equipped with approved connections.
 - c. Acetylene cylinders shall always be used and stored in an upright position (valve end up) to prevent the acetone (a stabilizing agent) from draining into the valves or fittings. Acetylene should never be used at a hose pressure exceeding 15 pounds per square inch (psi). Above 15 psi, acetylene is extremely unstable, and the possibility of an explosion exists.
 - d. Oxygen cylinders shall not be stored near oil or grease or other highly combustible/flammable materials.
 - e. Oxygen cylinders in storage shall be separated from fuel gas cylinders by a minimum distance of 20 feet, or by a noncombustible barrier at least 5 feet high and having a fire resistance rating of at least 1/2 hour.
 - f. Cylinders shall not be dropped, struck by objects, or permitted to strike against each other violently.
 - g. Cylinder valves shall be closed before moving cylinders, at the end of the shift, or when work is finished.
 - h. Valves of empty cylinders shall be closed.
 - i. Cylinders shall be kept far enough away from the actual welding/cutting operation so that sparks, hot slag, or flames will not reach them.
 - j. Cylinder valves shall be opened slowly.
 - k. Acetylene cylinder valves shall not be opened more than one and one half turns of the valve stem and preferably no more than three fourths of a turn.
 - l. Where a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use. In the case of manifolded or coupled cylinders, at least one such wrench shall be available for immediate use.

- m. Regulators are removed, valve caps are in place, and valves closed when cylinders are transported by vehicles. All vehicles used to transport cylinders shall have a proper support rack installed.
- n. A suitable cylinder truck, chain, or other steadying device shall be used to prevent cylinders from being knocked over while in use or storage.
- o. Cylinders shall not be placed where they may become part of an electric circuit. Tapping of an electrode against a cylinder to strike an arc is prohibited.
- p. Cylinders shall be stored in shaded areas and secured in upright position with protector caps in place.
- q. Cylinders shall never be used as rollers or supports.
- r. Oxygen cylinders, when full, contain 2,400 psi at 70°F and must be treated with respect for the high pressure. The valve protector cap must always be in place when moving the cylinder.
- s. A spontaneous explosion is likely to occur when oxygen comes in contact with hydrocarbons. Keep oxygen and hydrocarbons separated. Never lubricate or allow oil or grease to get oxygen connections or use oxygen for compressed air or pressure.
- t. When handling cylinders by powered vehicles, they shall be secured in a vertical position. Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.
- u. Oxygen and acetylene must be stored separately or separated by a fire wall rated for a minimum of 30 minutes resistance. Plate steel may be used to separate cylinders in this manner.

7) Manifolding of Cylinders:

- a. Cylinder manifolds shall be installed under the supervision of an experienced person(s) and must comply with proper practices in construction and use.
- b. All manifolds and parts shall be appropriate for the gases for which they are approved.
- c. When acetylene cylinders are manifolded, approved flash arresters shall be installed between each cylinder and the coupler block. One flash arrestor installed between the coupler block and regulator is acceptable for outdoor use only if the number of cylinders coupled does not exceed three.
- d. Each cylinder lead shall be provided with a backflow check valve.

8) Welding/Cutting on Containers:

- a. **Used Containers:** No welding, cutting, or other hot work shall be performed on empty drums, barrels, tanks, or other containers until they have been cleaned thoroughly. (This is to ensure that there are no flammable materials present or any substances such as greases, tars, acids, etc., which might produce a hazard when subjected to heat.) Any connection to the drum or vessel shall be disconnected or blanked off.
- b. **Venting and Purging:** All hollow spaces, cavities, or containers shall be ventilated to remove gases before preheating, cutting, or welding. Purging with inert gas is recommended.
- c. All enclosed spaces to be welded on will be checked for flammability and oxygen content prior to any hot work.

9) **Fire Protection During Welding:**

- a. Objects to be welded, cut, or heated shall be moved to a designated safe location. If this is not possible, all movable fire hazards in the work space shall be taken to a safe place.
- b. If the object to be welded, cut, or heated cannot be moved and all fire hazards cannot be removed (e.g., equipment, walls, floors, etc.), positive means shall be taken to confine the heat, sparks, and slag to protect the immovable fire hazards.
- c. Welding, cutting, or heating shall not be performed where the application of flammable paint, the presence of other flammable compounds, or heavy dust concentration create a possible hazard.
- d. Openings or cracks in floors, walls, ducts, tanks, etc., shall be closed. Where openings or cracks cannot be closed, additional precautions shall be taken to prevent sparks from penetrating the openings. The same precautions shall be taken in the presence of open doorways and open or broken windows.
- e. Approved fire extinguishing equipment shall be present in the immediate work area.
- f. **Fire Watch:**
 - i. A fire watch shall be maintained for at least 30 minutes after completion of welding/cutting operations so that possible smoldering fire can be detected and extinguished.
 - ii. Fire watch personnel shall be instructed in the selection and use of appropriate fire extinguishers.
 - iii. Fire watch personnel shall be familiar with facilities and the procedures to be followed in the event of a fire. They watch for fires in all exposed areas and attempt to extinguish fires only when obviously within the capacity of the equipment available.

- iv. The requirement for a fire watch may be waived when, after completion of the Welding, Cutting, and Heating Permit, it has been determined that there is no possibility of sparks, slag, hot material, etc., coming into contact with flammable or combustible solids, vapors, liquids, or residues.

G.9. Lifting Heavy Objects

Heavy objects will be lifted using appropriate machinery or enough manpower as is required. Employees will be specifically instructed to seek assistance in lifting heavy objects.

G.9.a. Lifts Using Rigging

Lifts utilizing cranes, hoists, and other similar mechanical lifting devices shall:

- 1) A competent person shall conduct a lift assessment prior to the lift.
- 2) A written assessment and lift plan shall be developed for critical lifts (refer to Site Procedure 1403.105 Hoisting and Rigging Guidelines).
- 3) A critical lift is defined as follows:
 - a. A critical lift is any lift which meets the definition established for this site by the facility owner/manager.
 - b. A critical lift is any lift which:
 - i. Involves lifting of personnel;
 - ii. Involves loads greater than 30,000 lbs;
 - iii. Involves loads greater than 75% of the crane capacity in the boom configurations potentially required;
 - iv. Involves lifts for which the path of load travel is at any point out of the view of the crane operator;
 - v. Involves the use of two or more cranes or lifting devices;
 - vi. Involves non-routine or unusual rigging;
 - vii. Involves the potential for damage that would result in unacceptable delay to schedule or significant program impact;
 - viii. Involves the potential for a significant release of hazardous materials, radioactive materials, or other undesirable conditions;
 - ix. Involves the potential for unacceptable risk of personnel injury or significant adverse health impact (on-site or off-site); or
 - x. Any lift which the lifting equipment operator determines to be critical.

G.9.b. Manual Lifting

- 1) Before lifting:
 - a. Determine if the object can be moved by some other means (mechanical device).
 - b. Determine if the object is too bulky and would obscure vision; if so, get another person to help carry it. When handling material with others, everyone should agree on who will act as leader and give the signals. Loads should not be released until everyone is ready. Teamwork is important.
 - c. Determine if the object is within the lifter's capability (a preliminary "heft" will indicate this).
 - d. Determine if the footing around the object is solid.
- 2) Lifting:
 - a. Legs should be bent at knees, back nearly vertical, body as close to the object as possible, feet apart but not further than shoulder width. Take a firm hold and straighten knees. Back is still straight and upright. Pull load close to body and lean back slightly to keep center of gravity over feet.
 - b. Avoid twisting the body when lifting or carrying loads.

G.10. Environmental Hazards

G.10.a. Hanta Virus or Four Corners Disease

Hanta virus is associated with fecal and nesting materials of rodents. The following controls and information is based on guidelines from the Centers for Disease Control (CDC) and should be followed when working in areas of concern.

- 1) Use of wet methods would include simple dust control (no dry sweeping, no use of pressurized air, use water to keep surfaces from shedding dust).
- 2) Sanitizing methods are the same as above. Use a mixture of soap, water and bleach (e.g., chlorine bleach mixed in water with soap). Depending on the size of the operation this can be applied by hand held spray bottle, Hudson-type sprayer, back pack sprayer etc. Allow it to sit for 15 minutes for small scale work or longer for larger scale work. For extreme cases, a shock strength of 10% hypochlorite might be considered. Use of hypochlorite will normally require upgrading respiratory protection to full face respirators fitted with cartridges rated for chlorine as well as the requirements for the hanta virus itself.
- 3) Guidelines call for "HEPA" filters which have been replaced by new NIOSH designations. Any of the new respirator cartridge types may be used. These include N100 cartridges which must be discarded at the end of each day and cannot be used in oily environments. R100 cartridges must also be discarded at the end of each day's use but may be used in oily environments. P100 cartridges may be used in oily environments and

can be used until breathing resistance is uncomfortable to the wearer. For purposes of this application, they should be discarded at the end of each work week regardless of resistance.

- 4) Suspect areas should be cleaned under these guidelines before beginning other work.
- 5) This control will be determined by medical consultation.

Table G.10.a. Hanta Virus Control

Controls	Small Scale Cleanups or Exposures	Moderate Exposure	High Risk of Exposure
Use wet methods.	X	X	X
Pre-work sanitizing.	X	X	X
Respirators		X	X
Pre-work cleanup.		X	X
PPE (1)	Gloves	Gloves and boot covers (face protection for application of disinfectants)	Gloves, boots, face shields (or full-face respirators), water resistant coveralls.
Baseline Serum Sample			Case-by-case

G.10.b. Ticks and Spiders

- 1) Insect bites may cause localized pain, and in some cases an allergic reaction. Of greatest concern is tick bites (deer ticks carrying Lyme disease, and wood ticks carrying Rocky Mountain Spotted Fever), poisonous spider bites (black widows marked with a red hour-glass under the abdomen and brown recluse marked with a violin on their back) and scorpion stings.
- 2) Controls:
 - a. Repellents.
 - i. Use DEET repellents to avoid ticks.
 - ii. Do not apply to open wounds.
 - iii. Do not spray repellents onto face (spray on hands to apply to face or use liquid).
 - iv. Wash hands and clothing at the end of the day's use.
 - b. Long sleeved shirts and full length pants.
 - i. Wearing long sleeved shirts and full length pants will help to avoid all of the above.
 - ii. Wear light colored clothing to better see insects on your clothing.
 - c. Wear bands to seal pant legs at the sock.
 - d. Avoid or clean out their living areas.

- i. Proper clearing and grubbing helps to remove hiding and nesting locations.
- ii. Poisonous spiders will normally be found in quiet, secluded, dark, moist areas such as underneath trailers.
- iii. When entering or working near these locations clean them out first using a broom or other long handled device.

3) Signs and symptoms of injury:

a. Poisonous spider bites:

- i. Bite marks;
- ii. Swelling;
- iii. Pain;
- iv. Nausea;
- v. Difficulty breathing;
- vi. Difficulty swallowing.

b. Ticks:

- i. Body of tick remains;
- ii. Painful joints;
- iii. Fever;
- iv. Unusual rashes;
- v. Flu-like symptoms.

4) First Aid:

a. Poisonous spider bites and scorpion stings:

- i. Wash the wound;
- ii. Apply cold pack;
- iii. Seek medical attention.

b. Ticks:

- i. Use a tweezers to SLOWLY pull tick out of skin;

- ii. Grasp tick as close to the skin as possible before removing;
- iii. DO NOT attempt to burn tick off with matches or hot objects;
- iv. DO NOT attempt other home remedies such as coating ticks with Vaseline®;
- v. Seek medical attention at the first signs or symptoms;
- vi. Seek medical attention if you have difficulty removing tick.

G.10.c. Insect Stings (Bees, Wasps, Hornets, Mosquitos)

- 1) Insect stings can be very painful.
- 2) For those with allergic reactions to bees or wasps, a bite may be fatal.
- 3) Control (insect stings).
 - a. Thorough clearing and grubbing of work areas will help to reduce nesting areas. Use insect control sprays to clear out nesting areas.
 - b. If work is conducted near nesting areas. Personnel should be requested to identify allergies before entering the site.
 - c. Antivenin must be individual prescribed for sensitive individual and must be carried at all times. All personnel entering the site must complete the emergency medical information data sheet.
- 4) Signs and symptoms:
 - a. Stinger may be present;
 - b. Pain;
 - c. Swelling;
 - d. Allergic reaction (extreme symptoms).
- 5) First Aid:
 - a. Remove stingers by scrapping it out with the edge of knife blade, tweezers tips (DO NOT SQUEEZE the stinger), credit card, or similar device.
 - b. DO NOT use a tweezers to grasp a stinger to remove it (this may inject more poison).
 - c. Wash wound.
 - d. Cover.

- e. Apply cold pack.
 - f. Watch for allergic reaction.
 - g. Use Benadryl® or other non-prescription antihistamines and seek medical attention if allergic reaction develops.
- 6) Mosquitoes (*West Nile Encephalitis or Meningitis Carriers [WNV]*) – 80% of people infected with WNV will not show any symptoms at all. There is no specific treatment for WNV infection. In the case with mild symptoms, they tend to pass on their own. In more severe cases people need to go to the hospital where they can receive supportive treatment (i.e., intravenous fluids, breathing, nursing care).

G.10.d. Poisonous Plants

- 1) Poison ivy, poison oak, and poison sumac may cause varying degrees of allergic reaction in different individuals.
- 2) Control:
 - a. Staying in cleared areas should help prevent contact with cactus and poisonous plants.
 - b. Proper clearing and grubbing will help to minimize this hazard.
 - c. Heavy equipment should be used for clearing vegetation to the extent possible.
 - d. Equipment operators must also be protected during this operation.
 - e. Wearing long sleeves and pants legs can minimize skin contact with poisonous plants but offers little protection from cactus needles.
- 3) Signs and symptoms:
 - a. Itching;
 - b. Rash;
 - c. Weeping sores.
- 4) First Aid:
 - a. Gently but thoroughly wash the affected area and all around it.
 - b. Baking soda paste may be applied to sores.
 - c. Calamine or Caladryl® lotions helps soothe irritation.
 - d. Benadryl® or other non-prescription antihistamines help dry up sores.

- e. If condition continues to get worse or affect large portions of the body, seek medical attention.

G.10.e. Domestic and Wild Animal Bites, Rabies, and Plague

- 1) Bites inflicted by domestic and wild animals primarily pose a serious risk of infection. In some cases they may carry rabies as well.
- 2) Controls:
 - a. In order to prevent problems arising from these bites it is essential that site personnel stay away from all wild or domestic animals.
 - b. Dead animals shall be handled using equipment whenever possible.
 - c. Sanitize equipment or handle remains using the PPE and sanitizing practices.
- 3) First Aid (domestic and wild animal bites):
 - a. If bleeding is minor—wash the wound.
 - b. Control bleeding.
 - c. Apply antibiotic ointment.
 - d. Cover the wound.
 - e. Get medical attention.

G.10.f. Work Near, On, or In Water

Work near water is that work which involves a danger of drowning. As a rule of thumb work that is conducted within 6 feet of water more than 3 feet deep. It is anticipated that a significant portion of the work on this project will take place on or in water. An example list of anticipated JSAs for dredging activities for the Phase 2 Wet Dredge project is presented below. A program of rigorous planning is utilized for water work as well as water quality monitoring activities, dredging, barge movement, and barge unloading/loading activities. Since the Chequamegon Bay is an active waterway, attention is given to loading of materials on/off barges to ensure proper control. In addition, it is noted that any time a person is in the water diving, it increases the work-related hazards. Marine Contractor's site-specific HASP is provided as Appendix A further detailing work near, on, or in water. Personnel are expected to be trained, seasoned professionals with extensive experience complying with the following regulations:

- EPA Dive Safety Manual (April 2001)
- EPA Region 10 Dive Safety Plan (October 2011)
- OSHA commercial diving regulations 29 CFR 1910 Subpart T
- USCG commercial diving regulations 46 CFR Part 197
- USACE EM 385-1-1, Section 30 Diving Operations (revised March 17, 2008)

- Excerpts from preliminary JSA that will be required for the dredging project are presented in the table below.

Table G.10.b. Dredging JSA Examples

Activity Hazard Analyses
Coordination with Marine Traffic
Work on Water
Dredging Setup Operations and Breakdown
Dredging from Barge
Removing Materials from Barge
Water quality monitoring from boat
Restorative Layer Placement from Barge
Core Sampling from Barge
Diver Assisted Hydraulic Dredging

Personnel will “dirty up” the JSA as the task proceeds identifying new hazards and controls. Periodically, the “dirtied up” JSA will be turned in to the HSO who will revise the JSA (including the workers notes) and reissue the JSA with a revision number. The JSA will serve as the document record to ensure only trained signatories work at a given activity. FE JV supervisors and management will be responsible for identifying new activities or changes in activities requiring a task analysis:

- 1) Additional considerations may affect the need for these types of controls.
 - a. Wind conditions and wave height of the water.
 - b. Work on/near thin ice should also be considered a drowning hazard.
 - c. Potential for flooding and severe weather.
- 2) Related standards include:
 - a. Refer to the requirements of 29 CFR 1926.106.
 - b. U.S. Coast Guard standards for approved lifesaving equipment are defined in 46 CFR Part 160.
- 3) Personnel exposed to water related hazards shall be provided with radio communications and/or cell phones.
- 4) Strict adherence to the buddy system must be maintained in these areas.
- 5) Throwing rings:

- a. Type IV Personal Flotation Devices (PFD) are U.S. Coast Guard-approved “ring life buoys” typically referred to as “life rings” or “throwing rings.”
 - b. These devices are required for work near water.
 - c. The interval between rings shall not exceed 200 feet.
 - d. Throwing rings must be within 100 feet of work.
 - e. Maintain 90 feet of retrieval line attached to throwing rings.
- 6) Wear U.S. Coast Guard approved work vests and inspect work vests before each use.
- a. DO NOT use recreational boating PFDs such as ski jackets for work applications.
 - b. PFDs used as work vests may be Type I, II, III, or V PFDs. A Type V PFD, including Type V Hybrid PFDs, is acceptable only if it is U.S. Coast Guard approved and marked for use as a work vest, for commercial use, or for use on commercial vessels.
 - c. PFDs shall be fitted with a SOLAS (Safety of Life At Sea convention) compliant whistle or noise making device.
 - d. When worn at night, PFDs shall have SOLAS rated reflective tape/materials affixed to the PFD.
 - e. Safety nets, rope grab systems, or similar fall protection or positioning devices may be used in place of PFDs.
 - f. The use of PFDs is generally NOT appropriate for entrapment hazards such as deep muds.
 - g. In hypothermia conditions, PFDs should be insulated (e.g., “mustang suits”).
- 7) Rescue Skiffs:
- a. Rescue skiffs should be used judiciously and may pose an additional drowning risk for rescue personnel. Throwing rings should generally be used before launching a boat.
 - b. A flat bottom rescue skiff should also be used for rescue on thin ice. Rescue personnel should stay in the boat and slide it over the top of thin ice. Ropes from shore or stable ice may be used to help guide the boat.
 - c. The skiff must be in the water or capable of being quickly launched by one person.

- d. There must be at least one person present and specifically designated to respond to water emergencies and operate the skiff at all times when there are employees above water.
 - i. When the operator is on break another operator must be designated to provide the requisite coverage while employees are above water.
 - ii. The designated operator must either man the skiff at all times or remain in the immediate area such that the operator can quickly reach the skiff and get underway.
 - iii. The skiff operator may be assigned other tasks provided the tasks do not interfere with the operator's ability to quickly reach the skiff and get underway.
 - iv. If visual contact is not maintained by the skiff operator, a communication system, such as a walkie-talkie, must be in use to inform the skiff operator of an emergency and to inform the operator where the skiff is needed.
 - v. Skiff operators shall be qualified and shall operate the rescue skiff in a non-emergency situation before being qualified.
- e. Equipment in the skiff:
 - i. At least one paddle, attached by lanyard to the skiff (or a fixed oar) shall be included in the skiff (regardless of whether the skiff is powered or unpowered).
 - ii. At least one PFD for each rescue person.
 - iii. At least one throwing ring or throwing bag.

G.10.g. Crew Boat and Dredge-Barge Operations

- a. Operating crew boats and floating plants on the water carries the risk of having a crew member fall overboard and possibly drown, striking or being struck by other vessels operating in the area, losing power or steering and drifting into hazardous areas (i.e. shore, marine facilities etc.) and encountering severe weather and dangerous seas, to name a few. The risk of a boating accident can be reduced by ensuring that boat operators are experienced, and when applicable, licensed; operating the vessel in compliance with U.S. Coast Guard rules and regulations; maintaining the vessel in good mechanical order; avoiding bad weather and dangerous seas; and ensuring emergency equipment is available on-board (i.e. life vests, life rings, life boats, fire extinguishers, communication equipment etc.). A Float Plan will be filed with the FE JV HSO. A copy of the daily Float Plan will be posted on shore in a conspicuous area for inspection.
- b. To address these concerns, all work conducted from the excavator/restorative layer placement barges, hydraulic dredge, material barges and small vessels (crew,

monitoring, and work boats) will comply with applicable U.S. Coast Guard regulations. Crew, monitoring and work boats, excavator/restorative layer placement barges, hydraulic dredge, and material barges will be operated by experienced crew members and all equipment will be inspected prior to use to ensure that it is in proper working order. Vessel inspections will be conducted by the HSO initially at the start of the work and periodically thereafter throughout the duration of the project. Ultimately, though, the dredge superintendent and boat operators will be responsible for the safety and the integrity of their vessels.

- c. Prior to the start of field activities, the excavator/restorative layer placement barge, hydraulic dredge, material barge, and crew, monitoring, work boat operators will give a detailed health and safety briefing on the location and use of all vessel safety equipment and the procedures for addressing on-board emergencies (i.e. fire, mechanical failure, man overboard situation, etc.). Excavator/restorative layer placement barges, hydraulic dredge, material barges, and crew, monitoring, and work boats will meet U.S. Coast Guard license and registration requirements and be equipped to safely support maximum rated crew and passenger sizes. The maximum number of passengers and weight shall be conspicuously posted on each vessel. The number of passengers shall not exceed the number of available PFDs (personal flotation devices). Personnel riding in the crew, monitoring, and work boats and working in unguarded areas on the excavator/restorative layer placement barges and material barges will be required to wear a PFD at all times. During evening operations, the PFDs will be equipped with reflective tape, flashing beacons and whistles.
- d. The crew, monitoring, and work boats will have at least one sound signaling device (air horn), a fire extinguisher, sufficient number of PFDs for all passengers and crew, and a hand-held radio to communicate with shore-based support facilities. The excavator, restorative layer placement, and material barges and hydraulic dredge will be similarly equipped with portable fire extinguishers conspicuously staged at various locations throughout the vessel and inside the cab of the excavator. The material, restorative layer placement, and excavator barges and hydraulic dredge will also have a minimum of two (port and starboard side) throwable life rings with flashing beacon lights attached to 90 ft. of rope, one sound signaling device (air horn), and sufficient number of PFDs. The crew superintendent and operators will have portable radios for communicating with each other and with FE JV's site office. If it is necessary for a crewmember to approach the excavator while it is operating, the crew supervisor will call the operator and have him shut down the excavator (lower the bucket into the water, disengage the power drive, and set the brakes on the turntable) and make eye contact with the crewmember. At that point, the crewmember may approach the excavator. The area around the swing radius of the excavator's bucket and counter-weight will be roped off or otherwise demarcated with barriers and/or warning signs to alert crew of the struck by/crush hazard.
- e. To avoid collision with other vessels operating in the area, boat operators will review the schedule of vessel activity in the waterway before beginning work and notify applicable port authorities of their intended work location and activities, if

feasible. The excavator and restorative layer placement barges, material barges, and crew, monitoring, and work boats will also be equipped with regulation position lights and running lights as appropriate. The decks on these vessels will also be adequately illuminated (minimum 5 foot candles). Boat operators will also look for and avoid other vessels operating in the area at all times. Dredging operations will be suspended during severe weather or rough seas.

G.11. Sanitation and Hygiene

G.11.a. Drinking Water

- 1) An adequate supply of potable water will be provided on site.
- 2) Portable water containers will be capable of being tightly closed and equipped with a tap.
- 3) Water shall not be dipped from containers for drinking purposes. Single service, disposable drinking cups will be provided.
- 4) No one shall place any objects (e.g., soda pop, ice tea, etc.) in coolers.

G.11.b. Restrooms and Hygiene Facilities

Table D-65.2 Toilet Facilities

Number of Employees	Minimum Number of Facilities
20 or fewer	One
21 to 199	One toilet seat and one urinal per 40 employees
200 or more	One toilet seat and one urinal per 50 employees

Toilet facilities (sanitary sewer w/flushing toilets, chemical toilets, recirculating toilets, or combustion toilets) including hand washing stations will be provided in accordance with 29 CFR 1926.65(n) and Table D 65.2.

H. Recordkeeping

The health and safety-related documents for the project will be handled in the following manner:

H.1. Training and Safety Meeting Records

Certificates of completion for all mandatory training for FE JV and lower tier subcontractor employees will be maintained on site at this site. Minutes for safety and health meetings, including daily safety briefings, will also be maintained on site. These records are located in Envirocon's safety trailer office.

H.2. Injury/Illness

Copies of "Supervisor's Report of Injury or Illness" will be maintained on site. The official OSHA 300 log is maintained at the corporate office. See the emergency procedures below for accident reporting procedures. A first aid log will be used to document first aid cases as described below in the log keeping section.

H.3. Accident Reports

Accident investigation reports will be maintained on site. All injuries will be reported to the client as well. See the emergency procedures below for accident reporting procedures.

H.4. Medical Surveillance Records

All medical records received on site will be forwarded to the corporate office after review. No medical records will be maintained on site; Fitness for Duty forms, however, will be available on site for all personnel.

H.5. Written Programs

Written programs for compliance with the OSHA standards, such as respiratory protection, hearing conservation, and certain chemical exposure are maintained at the corporate office.

H.6. Health and Safety Plans

At least one copy of the plan and any amendments will be maintained on site.

H.7. Employee Access

All employees have a right to access most of the documents related to health and safety. Medical and training records are available only to individuals requesting their own records. Employees can receive copies of their medical records or air monitoring exposure records upon written request. Medical information can only be released upon the written consent of the individual.

H.8. Health and Safety Related Logs

The HSO is responsible for maintaining logs of health and safety activities, including safety inspections.

H.8.a. Health and Safety Log

This is a bound log of daily inspections and health and safety issues kept by the project HSO.

H.8.b. First Aid Log

Employees are required to report all injuries and illness regardless of how minor the incident may seem. These reports shall be documented on an injury/illness report form, or in the project first aid log where diagnosis and treatments involve only simple first aid diagnosis and/or treatments.

- 1) Treatment/diagnosis by third-party EMTs, physicians, nurses, or other medical professionals shall be reported using the injury/illness reporting procedures. Determination of OSHA recordable/first-aid shall be determined by the Corporate Director of Health and Safety in these cases.
- 2) This First Aid Log is a log of all reported injuries and/or illnesses reported to supervisors and/or the HSO. This log shall document the report, date, name of the injured employee, nature of the injury/illness, diagnosis and the treatment given.
- 3) If no treatment is given the incident shall still be noted in the log. This shall include any dispensing of first aid supplies or administered by a supervisor, HSO or other first aid trained employee.
- 4) Non-work related injuries/illness reports and use of prescription drugs should also be noted in this log.
- 5) Self-medication by employees with respect to non-prescription (i.e., Over-the-Counter [OTC]) pharmaceuticals, unrelated for colds headaches or other non-work related ailments, need not be documented.

H.8.c. Equipment Free Release Decontamination Log

Decontamination and release of equipment from site shall be logged. Use of the Equipment Decontamination Log, Appendix E, may be used for this purpose.

I. Incident and Emergency Procedures

This section documents procedures to be followed in the event of incidents and certain emergencies. Where possible these have been formatted to individual sheets for response training and ready reference when needed.

I.1. General Emergency Procedures

This subsection describes procedures which are common to a variety of incidents.

I.1.a. Responsibilities

- 1) The site supervisor is responsible for the overall conduct of emergency procedures. This includes maintaining an orderly succession of supervision; making necessary reports to all concerned parties; ensuring that the causes of accidents are identified and corrected; and ensuring that injured personnel (with or without life threatening injuries) are escorted to medical treatment by the HSO or other supervisory personnel.
- 2) The HSO has the responsibility for ensuring that the provisions of this *HASP* are adequate and implemented in the field. Changing field conditions may require decisions to be made concerning adequate protection procedures. The HSO is also responsible for conducting site inspections on a regular basis to ensure the emergency readiness. The HSO shall be notified of any on-site emergencies and shall be responsible for ensuring that the appropriate procedures are followed.

I.1.b. First Aid

- 1) First Aid Kits are located in each FE JV pickups, trailers; and decontamination facility.
- 2) A first aid trained individual will be on site at all times.
- 3) Emergency eye wash will be located at the decontamination facility.

I.1.c. Evacuation Procedures

The HSO shall select and maintain appropriate assembly points for evacuations. These shall be posted and employees informed of their locations. At least one primary and one secondary assembly point shall be established.

- 1) When an evacuation is called for, employees shall proceed in an orderly fashion to the primary or secondary evacuation assembly points.
- 2) Turn off equipment whenever possible. Avoid leaving hazardous conditions in the process of evacuating.
- 3) Evacuate in the safest direction indicated by wind, smoke, fire, or other hazards.
- 4) Take a head count and report to the supervisor.
- 5) Do not leave the assembly area without reporting to the supervisor.

I.2. Reporting and Investigating Incidents

All incidents at the site shall be reported. It is hoped that most incidents will be small and/or near misses. It is essential that these events be reported as well more serious incidents in order to learn from them and avoid the more serious accidents.

I.2.a. Project and Facility Requirements

- 1) An incident is defined as follows:
 - a. A work-related injury or illness;
 - b. An exposure to a hazardous substance above the allowable exposure limit;
 - c. Property/vehicle/equipment damage;
 - d. An uncontrolled fire or explosion;
 - e. An unplanned spill or release (including air releases) to the environment;
 - f. A permit exceedance;
 - g. Any unexpected contact or damage to aboveground or below ground utilities; and
 - h. A “near miss” or an unplanned event that has a reasonable probability in resulting in one of the outcomes described above had the circumstances been different and for which modifications to management programs will reduce the probability of occurrence or the severity of the outcome.
- 2) Verbal Notifications
 - a. In addition to immediate verbal (oral) reporting of all incidents to the client’s Project Manager.
 - b. A “serious” incident includes the following:
 - i. Imminent danger safety violations;
 - ii. Any incident involving the general public or visitors;
 - iii. Exposure to a hazardous substance above the allowable exposure limit;
 - iv. Work related injury requiring more than First Aid;
 - v. Work related illness;
 - vi. Spills of hazardous material in excess of 1 gallon or Reportable Quantity (RQ); and
 - vii. Any unplanned fire on the facility property.

- 3) Incident investigations. An incident investigation shall be performed for all incidents for which a report is required. The supervisor and the designated HSO shall perform the investigation and shall include participation by others as necessary. The investigation is to be initiated as soon as possible after the incident.

I.2.b. Reporting Incidents

Report all unplanned, unexpected, events or changes in conditions. Some examples include:

- 1) Personnel incidents, such as:
 - a. injuries;
 - b. Illnesses;
 - c. First aid cases;
 - d. Fights or other acts or threats of violence;
 - e. Fatalities; or
 - f. Any personnel injuries or incidents which might be the result of acts of other contractors, subcontractors, or facility personnel.
- 2) Accidents such as:
 - a. Motor vehicle accidents (with or without damages);
 - b. Equipment accidents (with or without damages); or
 - c. Property damage (including fires).
- 3) New, previously unknown, or unexpected potential hazards such as:
 - a. Buried drums, cylinders, or hazardous materials containers;
 - b. Unusual soil conditions (e.g., previously disturbed soils, soils with unusual odors, soils with unusual coloration);
 - c. Floating contaminants (e.g., oil, chemicals, or sheens on water).
- 4) Environmental incidents such as:
 - a. Oil or chemical spills;
 - b. Dead or injured wildlife on the site; or
 - c. Disturbed habitats.

5) Objects of potential cultural or historical importance such as:

- a. Bones;
- b. Buried coins or money;
- c. Arrow heads;
- d. Possible burial sites; or
- e. Finding articles of any potential cultural significance.

6) Unauthorized personnel in work areas such as:

- a. Unauthorized workers on site;
- b. Unescorted public visitors;
- c. Media personnel; or
- d. Unescorted government visitors.

I.2.c. Procedures for Reporting Incidents

1) First Responder's Report

- a. If your work is involved with the incident of interest, STOP WORK IMMEDIATELY.
- b. Ensure the safety of the area from any imminent hazards.
- c. Report to your immediate supervisor by radio or phone if at all possible.
- d. If you must leave the area to make a report, find someone to help secure the area if at all possible.

2) Supervisors

- a. Control imminent hazards as necessary.
- b. Ensure that injuries are being taken care of, and assign someone to escort injured employees leaving the site for medical evaluation/treatment.
- c. Ensure that the area is adequately secured.
- d. Ensure that the scene is not further disturbed.
- e. Visit the accident scene as soon as possible.
- f. Interview injured workers and witnesses as soon as possible.

- 3) Reporting requirements
 - a. Report all incidents verbally to the client as soon as the area has been secured.
 - b. Follow up with a written report before the close of business.
 - c. Follow up with a written investigation report within 48 hours.

I.3. Personnel Injury

I.3.a. First Aid

- 1) The Project Manager (or senior supervisor on site) and/or HSO shall ensure necessary first aid or medical attention is obtained. First aid shall be provided by qualified first aid providers or site Fire Department EMTs.
- 2) If personnel need medical evaluation, ensure that an HSO or supervisor is assigned to escort the employee.
- 3) Do not allow injured personnel to drive themselves unless a doctor determines they are fit to do so.
- 4) If a doctor prescribes medication determine if that medication limits ability to drive. Do not allow employees to drive themselves if the medication impacts on driving safety. (If an employee wants to drive themselves and has been prescribed medication that will impact on driving safety the employee can wait to take the medicine at home if the doctor allows this.)

I.3.b. Hazard Assessment

The Project Manager (or senior supervisor on site) and/or HSO shall immediately investigate the nature and cause of injury in order to assess the hazard to ongoing site work. This should include consideration of working short-handed if the injured person cannot resume work right away. It is the senior supervisor's responsibility to stop work if necessary to make corrective changes.

I.4. Heat Stress

I.4.a. Signs and Symptoms

- 1) The incidence and severity of heat strain will vary widely among people, even under identical heat stress conditions. Disabilities often arise from the combined effects of environmental heat loading and metabolic heat production.
- 2) Prolonged increases in deep body temperature during the first trimester of pregnancy may endanger the fetus and are associated with temporary infertility for people of both genders.
- 3) Profuse and extended sweating produces dehydration and loss of body electrolytes and may lead to heat exhaustion or muscle cramps.
 - a. Cold clammy skin is a sign of heat stress.

- b. Hot and dry skin is a sign of HEAT STROKE, a medical emergency.
- 4) Oral or tympanic temperature exceeds 99.6°F is an early warning sign and monitoring should be increased. If temperature exceeds 100.6°F remove the employee and rehab.
- 5) A prime objective of heat stress management must always be preventing heat stroke, which is life threatening and is the most serious of the heat-induced disabilities.
 - a. The **heat stroke** victim is often manic, disoriented, confused, delirious, or unconscious.
 - b. The victim's skin is hot and dry, sweating has ceased, and the body temperature is 40°C (104°F) or higher.
 - c. Immediate emergency care and hospitalization are essential if signs of heat stroke develop.

I.4.b. Treatment

- 1) Heat Stress:
 - a. Force fluids.
 - b. Remove PPE to allow evaporative cooling.
 - c. Seated rest (or lie down).
 - d. Rest in the shade to ensure removal from radiant heat.
 - e. Carefully monitor pulse to ensure that pulse is lowering.
 - f. If treatment fails to reduce pulse and temperature, or if these measures continue to increase, treat as a potential medical emergency, and call 911 for first responders.
- 2) Heat Stroke:
 - a. This is an extremely serious medical condition.
 - b. Treat as a medical emergency.
 - c. Remove PPE.
 - d. Lie down.
 - e. Watch for signs of shock and treat accordingly.
 - f. Keep skin moist with room temperature water (do not apply chilled water to skin surfaces unless instructed by emergency medical personnel).

I.5. Heavy Weather

I.5.a. High Winds

Outdoor equipment operations will be suspended as follows:

- 1) Sustained wind speeds of 40 mph;
- 2) Gusts exceeding 60 mph;
- 3) When dust control measures are no longer effective.

Wind risk operations at 25 mph:

- 1) Crane operations;
- 2) Work with sheet materials such as liners; or
- 3) Work with large-profile materials such as panels.

I.5.b. Lightning

Outdoor operations will be suspended when lightning is within a 20 second count of the site (i.e., the time difference between seeing a lightning strike and hearing the sound). High profile equipment operations shall be suspended when lightning is within 30 seconds or 10 miles of the site.

- 1) High profile operations include crane operations, drilling operations, or electrical wiring tasks.
- 2) Equipment operators shall stop their equipment and park it safely before heading for shelter.
- 3) No personnel will be left on the ground in an exposed location.
- 4) Preferred shelter is a permanent building. Personnel may also take shelter in trailers or low profile rubber tired equipment (e.g., pickups). Avoid driving pickups or any other equipment except to help evacuate personnel.
- 5) Work will resume after a 30-minute period without lightning.

I.5.c. Tornadoes

The supervisor will ensure that a dedicated watch is posted during periods of tornado watch or warning. Get clear of trailers and evacuate to the closer of the following:

- 1) The LTWTP, NSPW's main office building, or the basement of the Our Lady of the Lake School. If the above cannot be reached in time, lay low in nearest ditch or sunken area. Specific locations will be identified (e.g. signs) and discussed during site orientation.

I.6. Domestic and Wild Animal Bites, Rabies, and Plague

Bites inflicted by domestic and wild animals primarily pose a serious risk of infection. In some cases they may carry rabies as well.

I.6.a. First Aid (Domestic and Wild Animal Bites)

- 1) If bleeding is minor, wash the wound.
- 2) Control bleeding.
- 3) Apply antibiotic ointment.
- 4) Cover the wound.
- 5) Get medical attention.

I.7. Phone Threats

This includes bomb threats, threats against personnel, threats of violence or any other threatening communications made by phone or radio.

I.7.a. Do Not Hang Up

Try to remain calm. It is important not to hang up on threatening callers. This may provoke an act of violence.

- 1) Listen carefully to background noises or conversations.
- 2) Take notes on the callers exact words if possible.
- 3) Try to get someone else to report the call immediately to the phone company on another line before the caller hangs up.

I.7.b. Report the Call Immediately to the Senior Envirocon Supervisor On-Site

- 1) DO NOT discuss the call with anyone else.
- 2) The Envirocon supervisor shall immediately bring the call to the attention of the senior client's representative.
- 3) The senior supervisors from Envirocon and the client's Project Manager shall be responsible for determining if an evacuation will be called.

I.8. Emergency Contacts for Site

Table I.8. Important/Emergency Contacts

Fire Department	Ensure dispatcher is COA and not Ashland County	Emergency 911
Ambulance	Ensure dispatcher is COA and not Ashland County	Emergency 911
Police Department	Ensure dispatcher is COA and not Ashland County	Emergency 911
Utility Locate	Wisconsin Digger's Hotline	(800) 242-8511
Hospital: Memorial Medical Center - Ashland Wisconsin	1615 Maple Lane · Ashland, WI 54806 Directions: See Appendix I for Map and Directions	Phone: (715) 685-5500
Envirocon Work Comp	Montana State Comp Fund 5 South Last Chance Gulch P.O. Box 4759 Helena, MT 59604	Zurich American Phone: (877) 405-9045 Fax: (800) 622-8081 Email: USZ Care Center@zurichna.com
FE JV RA Project Manager	Denis Roznowski	(920) 496-6756
FE JV Site Supervising Construction Manager	Brad Hay	(678) 822-3568
FE JV Project Health & Safety Supervisor	Dan Allen	(720) 404-6325
Envirocon Corp. Dir Health & Safety	Frank Sullivan	(509) 0460-0798
Envirocon Loss Control and Investigations	Mel Lockridge	(406) 523-1179
Medical Monitoring	Melissa Barkell	(406) 523-1192
WorkCare Medical Monitoring	Ana Martinez	(800) 455-6155 x118
WorkCare Early Return To Work	WorkCare II (Incident Intervention)	1(888) II-XPRTS OR 1(888) 449-7787
Envirocon Corp Ofc. Missoula, MT		(406) 523-1150
Xcel Construction Manager (Site Primary Contact)	Tom Perry 301 Lake Shore Drive E Ashland, WI 54806	(906) 204-6680
Xcel Asst. Construction Manager (Site Secondary Contact)	Pat Carr	(218) 343-4471
Xcel Project Coordinator	Eric Ealy	(763) 276-6476
ENVIROCON SAFETY HOTLINE		(800) 224-7389

Foth Infrastructure & Environment, LLC Members

Name	Cell Phone	Function
Denis Roznowski	(920) 819-3513	Project Manager
Chris Seider	(920) 277-3613	Project Health & Safety Officer
Bellin OCC Health	(920) 430-4560	Consulting Physician

Appendix A

JF Brennan's Health and Safety Plan



Health and Safety Plan

Prepared for:

Ashland/NSP Lakefront Site Phase 2 Wet Dredge

Ashland, WI

Reviewed and Approved by:

Project Manager / Tyler Lee
Position / Name

Signature

11/27/2016
Date

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1. Site Description/ History/ Evaluation

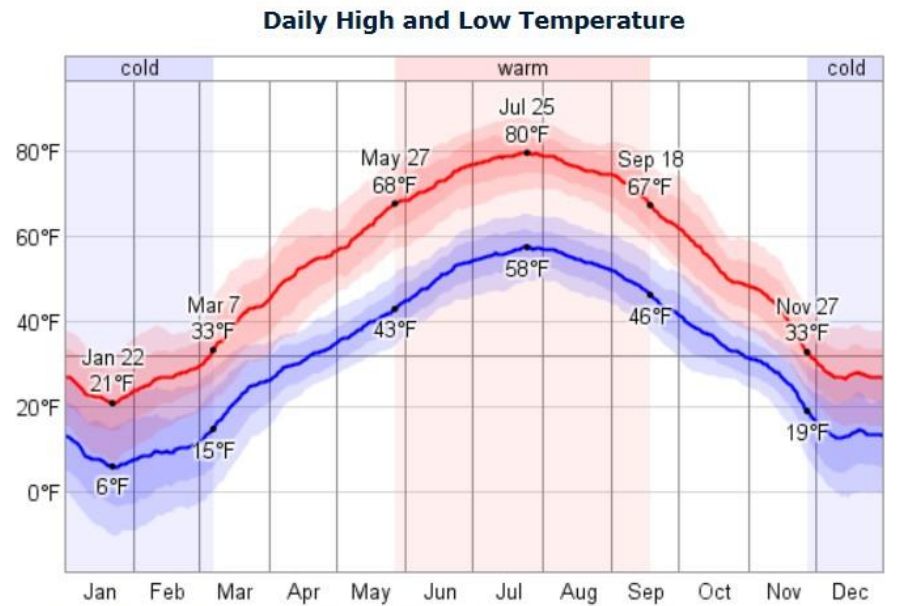
The Ashland/NSP Lakefront Project Site (CERCLIS # WISFN0507952) is located in Ashland, WI. The site consists of land located along the shore of Lake Superior and is owned by Xcel Energy. The site is bounded by US Highway 2 (Lake Shore Drive) to the south. Ellis Avenue and its extension to the City Marine to the west, Prentice Avenue and its extension to a boat launch to the east. The property is also known as Kreher Park. The project for which this Health and Safety Plan is implemented is for the Phase 2 Wet Dredge.

The upland site and near shore sediment deposits consist of soils, sediments, and groundwater contaminated by polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs). The most abundant constituents in each of these compounds include benzene, VOC, Naphthalene, and PAH. Additionally, free phase hydrocarbons derived from tars are present as non-aqueous phase liquids (NAPL). The free product, or NAPL, is present in underground pockets of tar and other materials and do not readily mix with water. Sediment contamination tends to be higher with depth below the sediment water/interface and is highest at the near shore area, decreasing with distance away from the shoreline towards the breakwater footprint.

In the event contaminants are encountered in heavy concentrations, proper procedures and personnel are in place with the necessary credentials to handle it accordingly.

Prevailing Weather:

Figures 1-3 provide the yearly temperature, precipitation, and wind trends for Ashland, WI. The source of the data for Figures 1-3 is Weatherspark.com.



The daily average low (blue) and high (red) temperature with percentile bands (inner band from 25th to 75th percentile, outer band from 10th to 90th percentile).

Figure 1. Average temperatures for Ashland, WI

Wind Speed

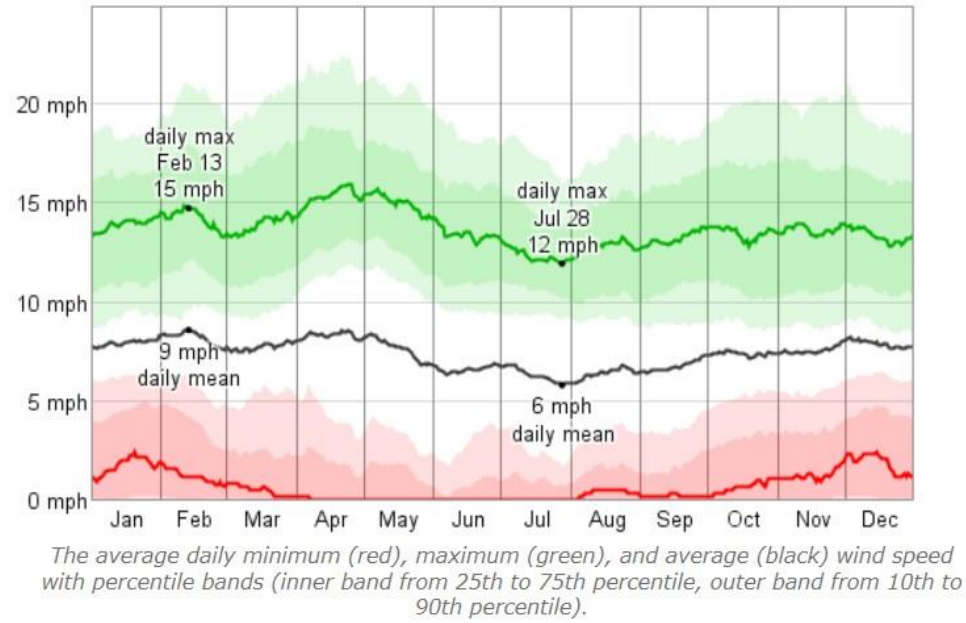


Figure 2. Average wind speeds for Ashland, WI

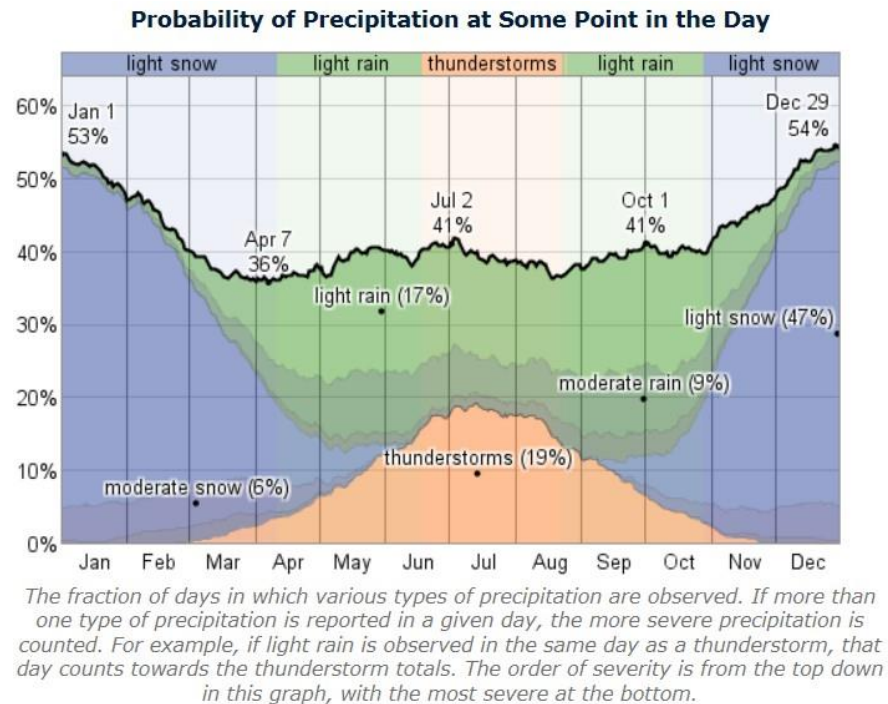


Figure 3. Average Precipitation Chances for Ashland, WI

2. Health and Safety Organization (responsibilities, qualifications, and chain of command)

This Health and Safety Plan (HASP) will be kept on the site during dredging activities and will be reviewed as necessary. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The below listed personnel comprise the Phase 2 Wet Dredge project leadership. All Brennan employees have completed a 40 hour Hazwoper course with the requisite 8 hour yearly refresher course.

Employee Name	Office	Responsibility
Tyler Lee	JFB	Project Manager (PM)
Steve Skau	JFB	Site Safety Coordinator (SSC)

Luke Ploessl	JFB	Brennan Corporate Health and Safety Manager (CHSM)
Dezy D Hajos	JFB	Brennan Safety Coordinator (SC)
Chad Defoe	JFB	Project Superintendent
Ross Johnson	JFB	Quality Control Technician

On a daily basis, the SSC will work in conjunction with Brennan Project Superintendent, administering the content of this site specific HASP. The SSC duties will include conducting daily tail-gate safety meetings, pre-task safety meetings, and updating Activity Hazard Analysis (AHAs) when unidentified tasks arise or when changes to identified tasks are appropriate. Furthermore, the SSC will interact on a daily basis with safety personnel reviewing safety document updates. Finally, on a frequent basis, Luke Ploessl (CHSM) will visit the site to ensure that this HASP is implemented in accordance with solicitation directives. Additionally Brennan’s shift foreman will act as Site Safety Coordinators when the Site Safety Coordinator is offsite. All personnel will attend the daily plan-of-day meeting conducted by Foth Infrastructure & Environment/Envirocon Joint Venture (FE JV) personnel.

Crews have received training based on their designated assigned tasks within the Brennan Health and Safety Program in addition to third party OSHA 10 hour, Hazwoper, First Aid/CPR/AED and Blood Borne Pathogen training. At a minimum two on site employees will have this training.

3. Site Control

As described above, Brennan and the FE JV will establish work zones controlling access to areas of operations. Only personnel pre-approved by the Brennan SSC will be allowed to enter Exclusion or Work Zones. Furthermore, all personnel required to enter either an Exclusion or Work Zone shall have the requisite 40 hour Hazwoper training. All visitors must receive prior approval from the client or their designee to enter the site.

All visitors to the project site will be required to contact the PM prior to arriving at the site. Once on site, all individuals will be directed to immediately report to the project office, so that site specific training and visitor sign-in may occur. The Brennan PM will maintain logs of site visitation for inspection.

4. Features of Work Activity

Project

1. Mobilization of equipment
2. Installation of water quality barriers
3. Mechanical dredging
4. Hydraulic dredging
5. Restorative layer installation
6. Demobilization of equipment

5. Hazard Assessment

This section provides safe work practices and control measures for identified hazards to reduce or eliminate potential risk to personnel and equipment. Upon initiation of work at the site, Brennan will manage all hazards in accordance with this HASP and associated AHA forms. Furthermore, newly identified hazards will also be included within the below list after the start of operations. All newly identified hazards affecting activities at the site shall have corresponding AHA's constructed and reviewed with project personnel that will be performing the work.

One of the primary hazards on this particular site has been identified as Adverse Weather Conditions. The exposure to open water with heavy marine equipment will be managed with preemptive shutdowns. In other words, constant monitoring of weather conditions will be performed in order to complete the shutdown and cover procedures as adverse weather moves through the area.

All hazards shall be identified and/or mitigated according to the following procedures:

- When observed or discovered.
- When an imminent hazard exists that cannot be immediately abated without endangering employees or property, Brennan will remove all exposed workers from the area except those necessary to correct the hazardous condition.
- All such actions and dates completed shall be documented on Hazard Analysis Forms.

If an incident or injury were to occur due to any of the listed hazards or due to an un-identified hazard, initiate primary care and notify the Brennan SSC immediately. All contractors, subs, and visitors are to report incidents immediately to onsite FE JV management and Xcel field representatives. The contact numbers for all onsite personnel to be informed can be found in the jobsite trailers or with one of the foreman.

Chemical Hazards and Controls

All chemicals employed at the site by Brennan personnel will be accompanied by the relative SDS and handled in accordance with product specific information. Chemicals will not be allowed onsite until the SDS is made available.

Biological Hazards and Controls

The following lists hazards associated with biological organisms possibly present at the worksite. When an employee encounters one of the following biological hazards, the prescribed actions described below should be initiated. In addition, any workers allergic to plants or insects should report such conditions to the SSC prior to working at the site.

Bacteria/Fungi

Bacteria/ fungi are natural inhabitants of soil and are readily introduced into cuts and scrapes. Any injuries involving the possible introduction of soil into a wound should be cleaned as soon as possible, disinfected, treated with antibiotic ointment, and personal protective equipment (PPE) applied to prevent further exposure to soil. Seek medical attention immediately if the area becomes warm and/or reddened. Complete a minor injury report.

Snakes

Snakes typically are found in underbrush and tall grassy areas such as the marsh like conditions. If you encounter a snake, stay calm and be aware, as there may be other snakes in the area. Turn around and walk away on the same path you used to approach the area. It should be noted that there are no known poisonous or venomous snakes at this geographical location.

Poison Ivy and Poison Sumac

Poison ivy, poison oak and poison sumac typically are found in brush or wooded areas. Poison ivy and poison oak are most commonly found in moist areas or along the edges of wooded areas. During toolbox safety meetings, photos of poison ivy and poison oak will be distributed, so that personnel may become familiar with the plants.

If skin comes in contact with either plant, wash the area with soap and water immediately. If a reaction occurs (e.g. redness, blistering, itching), the reaction and is severe, seek medical attention.

Ticks

Ticks are typically found in wooded areas, bushes, tall grass and brush. Ticks are black, red or brown and can be up to ¼-inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots. Spray **only outside** of clothing with permethrin or permanone and spray skin with DEET only. Check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing a tick, wash your hands, disinfect and press the bite area(s). Save the removed tick. Report the bite to the SSC for further medical attention if necessary.

Bees and Other Stinging Insects

Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people with allergies. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SSC and/or co-worker. If

stung, and a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it and apply ice. Seek medical attention if a reaction develops.

Blood-Borne Pathogens

Exposure to blood-borne pathogens may occur when rendering First Aid, CPR or when coming into contact with waste streams containing potentially infectious material. Exposure controls and personal protective equipment (PPE) are required as specified in the Brennan Health and Safety Manual.

Human illness from West Nile Virus is rare, even in areas where the virus has been reported. On rare occasions, West Nile Virus can result in a severe and sometimes fatal illness known as West Nile Encephalitis (an inflammation of the brain). The risk of severe disease is higher for persons 50 years of age and older.

Most infections of West Nile Encephalitis are mild and symptoms include fever, headache, body aches occasionally skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and in some cases death. The incubation period in humans (i.e., time from infection to onset of disease symptoms) for West Nile encephalitis is usually 3 to 15 days. If symptoms occur, see your doctor immediately.

Physical Hazards and Controls

The following is a list of physical hazards and controls associated with work being performed at this jobsite.

Marine Operations

- All marine work will follow all navigational rules and give right of way to vessels accessing the area. During the evening hours all marine equipment will employ fleet lighting as prescribed by the U.S. Coast Guard (USCG).
- All operations involving boating will be performed by a certified operator.
- Per Brennan's Corporate policy, all personnel operating a boat at the site must have completed the Coast Guard Auxiliary Boaters safety course and be approved for operating a boat by the SSC.
- All personnel shall wear their Personal Floation Device Type III (PFD) at all times while they are on the water or within 10' of the water's edge. (Inspect PFDs prior to use and do not use defective or damaged ones). Personnel working in the confines of a piece of machinery while on the water are exempted from this requirement. If working after dusk hours, PFDs should be equipped with strobe light and whistle.
- All personnel shall wear bright colors (for example: Hi-Vis with reflective strips orange, green, etc.) to enhance their visibility to one another.
- The Superintendent has final authority on operations with regards to weather and water conditions.
- One life ring buoy will be provided on all floating equipment for emergency rescue.
- Public exposure shall be minimized through the use of warning buoys, lights and signage. Underwater hazards shall be marked at the surface.
- Boats will be boarded from dock or pier unless suitable walking surface is available.
- Any boats operating in contaminated areas requires personnel to wear Tyvek when potential for dermal contact exists.
- The marine equipment must be operated according to U.S. Coast Guard (USCG) regulations for speed, lighting, right-of-way, etc.

Survey Lasers

- Laser beams used in surveying may be hazardous to the eyes.
- The severity of the hazard depends on the type of laser and its power.
- Avoid direct eye contact with the beam.
- This is most important when wearing corrective eyeglasses, which can intensify the beam's focus on the retina.
- Lasers used in surveying are usually low power.
- Lasers must be posted with safety warning signs.

Working on or over Water

- Fall protection should be provided to prevent personnel from falling into water. Where fall protection systems are not provided and the danger of drowning exists, U.S. Coast Guard-approved PFDs, shall be worn.
- Inspect PFDs prior to use. Do not use defective PFDs.
- A life-saving skiff or life raft must be provided for emergency rescue.
- A minimum of one ring buoy with 70 feet of 3/8-inch solid-braid polypropylene (or equal) rope must be provided for emergency rescue.
- Use all equipment according to the manufacturers' instructions and intentions.

Aerial Lifts

- Only authorized and trained personnel are permitted to operate aerial lifts.
- Inspect aerial lifts and test lift controls prior to use.
- Wear a full body harness with lanyard attached to the boom or platform. For scissors lifts where a standard guardrail system is installed and you are working within the confines of such a system, full body harness and lanyard are not required. Working over the water in a boom lift or similar will be discussed as agreed to as appropriate by on site management. If the discussion has not taken place prior to using the boom lift, the harness should always be worn.
- Do not attach lanyard to any adjacent structures or equipment while working from an aerial lift.
- Stand firmly on the floor of the platform and do not sit or climb on the railings of the platform or use planks, ladders, or other devices to increase working height.
- Remain in the platform at all times and do not leave the platform to climb to adjacent structures.
- Position aerial lifts on firm, level surfaces when possible, with the brakes set. Use wheel chocks on inclines. If outriggers are provided, position on solid surfaces or cribbing.
- Maintain safe clearance distances between overhead power lines and any part of the aerial lift or conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV (Reference Table 9-1).
- Do not exceed the boom and basket load limits.

- Do not use aerial lifts as cranes.
- Do not work or stand below aerial lift operations.
- Do not use aerial lifts when winds exceed 20 miles per hour.

Cranes, Hoists, and Rigging

- Only Certified Crane Operators are permitted to operate cranes.
- Prior to any use, cranes shall be inspected in accordance with all applicable regulations.
- Prior to any lifting operations, the SSC and the certified crane operator shall determine the necessary outrigger pad size/mats to prevent settling.
- Lifts plans shall be in place prior to utilizing the cranes.
- All rigging and use of rigging must be done under the supervision of a qualified rigger.
- At all times cranes shall maintain safe operating distances from energized power lines in accordance with Table 9-1.
- Maintain a safe distance from operating cranes and stay alert for crane movements. Avoid positioning between fixed objects, operating cranes and crane pinch points. Remain outside of the crane swing and turning radius. Crane swing radius shall be delineated with caution tape, signs, or barricades whenever possible to keep personnel out of the danger zone.
- Approach cranes only after receiving the operator's attention. The operator shall acknowledge your presence and stop movement of the crane. Never approach operating cranes from the side or rear where the operator's vision is compromised.
- When required to work in close proximity to operating cranes, wear high-visibility vests with reflective strips to increase visibility to operators.
- Stay clear of all hoisting operations. Loads shall not be hoisted over personnel.
- Cranes shall not be used to lift or lower personnel.
- The Utility Company or appropriate party will be notified to de-energize electrical lines near crane operations prior to working near them. If a crane becomes electrically energized, personnel shall not touch any part of the crane or attempt to touch any person who may be in contact with the electrical current. If at all possible, the operator should remain in the crane cab until the contacted line is de-energized.
- Do not exceed hoist load limits. When reviewing hoist limits the competent operator shall consider wind load, weather conditions, and ground pitch (angle).
- Insure load is level and stable before hoisting.
- Inspect all rigging equipment prior to use. Do not use defective rigging for any reason.
- Only use rigging equipment for the purpose it was designed and intended.
- Rigging shall be inspected and documented prior to use by a qualified rigger, signal person, or operator.
- Critical lifts will be performed in accordance with regulatory requirements.

Lockout/Tag-out

- Lock out/Tag out will follow procedures set forth in the Brennan Health and Safety Manual.
- Do not work on equipment when the unexpected operation could result in injury, unless lockout/tag-out procedures are implemented.

- Staff working under a lockout/tag-out procedure must complete the Brennan Lockout/Tag-out training course. Project-specific training may also be required on site-specific lockout/tag-out procedures.
- Standard lockout/tag-out procedures include the following six steps:
 - Notify all personnel in the affected area of the lockout/tag out
 - Shut down the equipment using normal operating controls
 - Isolate all energy sources
 - Apply individual lock and tag to each energy isolating device
 - Relieve or restrain all potentially hazardous stored or residual energy
 - Maintain a lockout/ tag out log.
 - Verify that isolation of the equipment has been accomplished. Once verified that the equipment is at the zero energy state, work may begin.
- Do not remove another person's lock or tag. Only a Brennan Supervisor, in conjunction with the SSC, may remove another person's lock or tag.

Welding and Cutting

- Only authorized and trained personnel are permitted to operate welding/cutting equipment.
- Prior to initiation of welding or cutting work, personnel must obtain hot work permits.
- Welding and cutting within a confined space is not allowed on this project.
- Do not enter areas where welding/cutting operations are taking place unless completely necessary and only after receiving permission from the welding/cutting operator.
- If you must be present in an area during welding/cutting operations, position yourself behind flash screens or wear glasses/goggles with lenses of appropriate tint.
- Do not look directly at the welding/cutting flash or at reflective surfaces surrounding welding/cutting operations.
- Avoid contacting compressed gas cylinders. Cylinders should be firmly secured in an upright position at all times.
- Prior to use and after a compressed gas cylinder has been spent, it shall be securely placed in an upright position, capped, and locked within a storage rack.
- Be aware of trip hazards created by welding hoses, power cables, leads and cords positioned on walking surfaces.
- Flashback arrestors are required on all torch equipment.
- Regulators shall be bled off when equipment is not in use.
- Hot work permits are required when on site.
- FIRE WATCH: must be present during the burning and 30 minutes after the last burn. This person shall have no others duties than maintaining fire watch.

Compressed Gas Cylinders

- Regulator must be removed and valve caps must be in place when cylinders are unused, transported, moved or stored.

- Prior to acceptance of any type of gas cylinders at the project location, personnel shall insure that cylinders are properly coded and labeled by the vendor.
- Cylinders must be secured in an upright position at all times.
- Cylinders must be shielded from welding and cutting operations. They must also be positioned to avoid being struck or knocked over, contacting electrical circuits or exposed to extreme heat sources.
- Cylinders must be secured on a cradle, basket or pallet when hoisted; they may not be hoisted by choker slings.
- When not in use cylinders must be separated a minimum of 25' or by a fire barrier.

Fall Protection

- Fall protection systems must be used to eliminate fall hazards when performing construction activities at a height of 4 feet or greater.
- The SSC shall act as competent person and shall inspect and oversee the use of fall protection systems. Follow all requirements established by the Brennan Corporate Health and Safety Manual for the use and limitation of fall protection systems.
- Remain within the guardrail system when provided. Leaning over or stepping across a guardrail system is not permitted.
- Do not stand on objects (boxes, buckets, bricks, blocks, etc.) or ladders to increase working height on top of platforms protected by guardrails.
- Inspect personal fall arrest systems prior to each use. Do not use damaged fall protection systems at any time, or for any reason.
- Set-up personal fall arrest systems so that you cannot free-fall more than 4 feet.
- Only attach personal fall arrest systems to anchor points capable of supporting at least 5,000 pounds.
- Use fall protection equipment for fall protection only. Never use fall protection equipment to hoist materials. Do not use personal fall arrest systems that have been subjected to impact loading.
- All personnel working in a man basket are required to tie-off within the confines of the basket.

Hand Tools

- Operate all tools according to the manufacturer's instructions and within design limitations.
- All hand and power tools shall be maintained in a safe condition.
- Tools are to be inspected and tested before use. If a tool is found to be defective, it is to be tagged "Do Not Use" and removed from service until repaired.
- Personal protective equipment, such as gloves, safety glasses, earplugs and face shields are to be used when exposed to a hazard from the tool.
- Power tools are not to be carried or lowered by the cord or hose.
- Disconnect tools from energy sources when not in use, before servicing and cleaning, and when changing accessories such as blades, bits and cutters.
- Safety guards on tools are to remain installed while the tool is in use and promptly replaced after repair or maintenance has been performed.
- Tools are to be stored properly where they will not be damaged or come in contact with hazardous materials.
- If a cordless tool is connected to its recharge unit, both pieces of equipment must conform strictly with electrical standards and manufacturer's specifications.

- Tools used in an explosive environment must be rated (i.e., intrinsically safe, spark proof, etc.) for work in such an environment.
- Impact tools, such as drift pins, wedges and chisels shall be kept free of mushroomed heads.
- Manual and pistol-grip hand tools may involve work with highly repetitive movement, extended elevation, constrained postures or positioning of body members (e.g., hand, wrist, arm, shoulder, neck, etc.). Consider alternative tool design, improved posture, selection of appropriate materials, work organization and sequencing to prevent muscular skeletal, repetitive motion and cumulative trauma stressors.
- Tools shall be tested each day before use to insure that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.
- Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard.
- All liquid fuel-powered tools shall be stopped while being refueled, serviced or maintained.
- All portable electrical tools and equipment shall be used in conjunction with a GFCI device or circuit.
- Chords and hoses associated with electrical hand tools shall be inspected prior to use.

General Practices and Housekeeping

- Good housekeeping must be maintained at all times in all project work areas.
- Nails will be bent over or removed from boards or loose stock.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

Hazard Communication

- All chemicals brought on site by Brennan shall be accounted for on a list which is cross referenced to respective safety data sheets (SDSs).
- Confirm that an inventory (i.e. a list) of chemicals brought on site by Brennan subcontractors is available.
- Request or confirm locations of SDS from the client, contractors, and subcontractors for chemicals to which Brennan employees potentially are exposed.
- Before, or as the chemicals arrive onsite, obtain an SDS for each chemical and retain a copy for submission to the Brennan CSM.
- Label portable chemical containers (i.e. chemicals transferred from a manufacturer's container to a smaller volume container for individual use) with the identity of the chemical and hazard warnings. Store all chemicals properly as directed by the SDS, paying special attention to 1)

compatibility (i.e. keeping acids separated from bases/caustics, and oxidizers from fuels, etc.), 2) quantity limits, 3) secondary containment, 4) fire prevention and 5) environmental conditions and restrictions.

Lifting

- Proper lifting techniques must be used when lifting any object.
 - Plan storage and staging to minimize lifting or carrying distances.
 - Split heavy loads into smaller loads.
 - Use mechanical lifting aids whenever possible.
 - Have someone assist with the lift—especially for heavy or awkward loads.
 - Make sure the path of travel is clear prior to the lift.
 - Use Brennan supplied work gloves when lifting objects.
 - The allowable individual weight limit on any given lift is 50 lbs.

Fire Prevention

- A-B-C Type Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. Extinguishers must:
 - be maintained in a fully charged and operable condition
 - be visually inspected each month
 - undergo a maintenance check each year
 - must be stored in a manner that does not allow for damage due to falling or contact with moving vehicles
- The area in front of extinguishers must be kept clear.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers and must be stored in an approved storage cabinet.
- Flammable liquid storage containers (i.e. 55 gallon drums or larger) shall be grounded, and portable metal containers shall be bonded to the main storage container prior to transferring flammable liquids.

Electrical

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tag-out procedures are implemented and potentially energized electrical equipment has been verified as de-energized.
- Inspect electrical equipment, power tools and extension cords for damage prior to use. Do not use defective electrical equipment. All defective equipment shall be removed from service immediately and tagged as “out of service”.

- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.
- Extension cords must be:
 - Equipped with third-wire grounding
 - Covered, elevated or protected from damage when passing through work areas
 - Protected from pinching if routed through doorways, windows, wall openings or any other through any other structural penetration
 - Not fastened with staples, hung from nails, secured with plastic zip-ties, or suspended with wire
- Electrical power tools and equipment must be effectively grounded or double-insulated and UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV (See Table 9-1).
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches and outlets from environmental elements.

Stairways and Ladders

- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precaution. Every effort must be considered before using a ladder. SSC/HSO will have to evaluate the use and perform a risk assessment. In addition to OSHA guidelines, ladders will not be used more than 30 minutes.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing and descending the ladder, keeping the belt buckle between side rails.
- Ladders shall not be moved, shifted or extended while in use.
- User must use both hands to climb. Materials and equipment should be raised and lowered using rope.
- Straight and extension ladders must be tied off to prevent displacement.
- Ladders that may be displaced by work activities or traffic must be secured or barricaded.
- Portable ladders must extend at least 3 feet above landing surface.
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder.
- Stepladders are to be used in the fully opened and locked position and must have one person holding the ladder to prevent movement.

- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder.
- Fixed ladders > 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than six feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

Heat Stress

- Drink 16 ounces of water before beginning work. Disposable cups and water will be available. Under severe conditions drink 1 to 2 cups of water every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced with efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- If possible, conduct field activities in the early morning or evening and rotate shifts of workers.
- Avoid direct sun whenever possible. Exposure to direct sun can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress.

SYMPTOMS AND TREATMENT OF HEAT STRESS					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thread pulse and low blood pressure; oral temperature normal or low	<u>Sweating has stopped</u> and skin is red, hot and dry; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Move to a cooler area, Rest lying down, Increase fluid intake, Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Move to a cooler area, Rest lying down, Increase fluid intake.	Move to a cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately

Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress.

- The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period.
- The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse.
- If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same.
- If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent.
- The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

Cold Stress

- Be aware of the symptoms of cold-related disorders. Wear proper layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the Brennan SSC to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast—be aware of predicted weather systems along with sudden drops in temperature, increase in winds and precipitation.

SYMPTOMS AND TREATMENT OF COLD STRESS			
	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Move victim to a warm place. Re-warm area quickly in warm— but not hot— water. Have the victim drink warm fluids, but not coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Move victim to a warm place. Have victim drink warm fluids, but not coffee or alcohol. Get medical attention.

Procedures for Locating Buried Utilities

- Utility services will be contacted prior to Pilot Study activities in order to locate utilities within the vicinity of operations. Once utilities are located, as-built drawings will be created by survey personnel who will place 50 foot offsets from the utilities on the drawings. These drawings will then be given to dredge operators prior to performing their activities in order for them to be aware of the existence of utilities and to maintain adequate distances to prevent potential hazards.
- Review locations of sanitary and storm sewers, electrical conduits, fuel tanks and lines, water supply lines and natural gas lines.

- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- When uncertain about a utility location within an area proposed for excavation, manually remove material if the utility is suspected to be within 3' of the surface.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SSC should confirm that arrangement.

Vehicle Safety—Operator Safety

- Operate vehicle only when in possession of valid driver's license.
- Prior to operating a vehicle, perform a localized inspection in the vicinity of the vehicle to insure that hazards do not exist or that there has not been a change in conditions.
- When operating a vehicle in tight spaces or operating a vehicle with a trailer use a spotter for additional guidance purposes.
- Do not use a cell phone or similar personal electronic device while driving.
- Employees shall not operate vehicles while under the influence of drugs or alcohol. Consumption of drugs or alcoholic beverages before or during work shift/driving is prohibited, as is possession of them within vehicle.
- All vehicle occupants must use seat belts at all times. Familiarize yourself with rental vehicle features (e.g., mirror & seat adjustments).
- Always drive within the speed limit.
- Do not drive if you are fatigued.
- Use tie-downs to secure equipment in large-cab vehicles such as vans.
- Exercise caution when entering or exiting a traveled way or parking along street—avoid sudden stops, use hazard lights when locating or stopping at work areas.
- Park in a manner that will allow for safe exit from vehicle, and if possible, park vehicle so that it can serve as a barrier.
- Before talking on a mobile phone, pull off of the roadway and park. Utilize hazard lights to make traffic aware.
- Park vehicles in a location where it can be accessed easily in the event of an emergency.

Working/Walking Adjacent to Vehicle Traffic

- All staff working adjacent to a traveled way or within work area must wear reflective strip/high-visibility ANSI Class 2 safety vests.
- When working next to an active roadway deploy cones, signs, or flagging to control the flow of traffic.
- Work as far from a road or traveled way as possible to avoid creating confusion for drivers.
- Remain aware of factors that influence traffic related hazards and require controls—sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.
- Always remain aware of an escape route.
 - Examples: behind an established barrier, parked vehicle, guardrail, etc.

- Always pay attention to moving traffic and do not assume drivers are looking out for you.
- Remain aware of approaching traffic for signs of erratic driving behavior.
- When workers must face away from traffic, a “buddy system” should be used. One worker should always be facing in the direction of oncoming traffic. Minimize the amount of time that you will have your back to oncoming traffic.
- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic.

Vehicles Entering/Exiting Site

- A trained or qualified flagman must be used when backing heavy equipment onto the jobsite.
- If the vehicle will impede the normal flow of traffic when pulling into/out of the site, a flagman must also be used. Once the vehicle is on the road way, a field vehicle equipped with flashing lights will follow the heavy equipment vehicle.
- It is imperative that truck operations do not pose a traffic hazard to pedestrians and normal road traffic.

Uneven Walking Surfaces

- Employees walking in ditches, swales and other drainage structures adjacent to roads or across undeveloped land must use caution to prevent slips and falls. Failure to use caution in these areas can result in twisted or sprained ankles, knees, and backs.
- Whenever possible observe the conditions from a flat surface and do not enter a steep ditch or side of a steep roadbed.
- If steep terrain must be traveled, sturdy shoes or boots that provide ankle support should be used.

Slips, Trips, and Falls

- Institute and maintain good housekeeping practices.
- Keep hands out of pockets when walking, so that they may be used to break a fall.
- Install proper illumination to areas when working inside or during the evening hours.
- Pick up tools and debris in the work area.
- Walk or climb only on equipment and/or surfaces designed for personnel access.
- Be aware of poor footing and potential slip and trip hazards in the work area.

Pressure Washing Operations

- Wear modified level D personal protective equipment when operating a pressure washer including steel-toed safety shoes or boots, face shield, hearing protection and protective clothing (PPE). Do not tie the dead man control in the “on” position
- Never spray yourself or another individual.
- When using a pressure washer for the purpose of cleaning contaminated equipment, insure to don the proper PPE (Tyvek) and that all rinse water is collected for post treatment.
- Prior to use of a pressure washer inspect the immediate vicinity for any electrical hazards.

- Follow manufacturer’s safety and operating instructions.
- Inspect pressure washer before use and confirm the “dead man” switch is fully operational.

Inclement Weather

Adverse weather conditions have the ability to present sudden hazards to the worksite. It is critical that every step be taken to prepare and plan for an emergency situation resulting from adverse conditions. Upon startup of the project, an emergency action plan will be developed based on the layout of the worksite and critical areas of operation. Emergency procedures will be clearly defined and emergency shelters identified for all marine equipment.

Adverse weather conditions requiring immediate suspension of field work activities are defined as the following:

Lightning- Lightning watches or warning shall be enacted as the situation warrants. When electrical activity is detected in the area, a 30-minute stand-down will occur to allow the storm cell to pass the area. If lightning is observed within the stand down period, the 30-minute time frame is extended until 30 minute after the last observed electrical activity. If on barge lighting shelter is considered, careful on board structure evaluation and agreement should addressed.

- Boat operations during inclement weather will be reduced to only essential tasks. In the case of the small craft advisory boat operations will be limited to larger vessels or shutdown. If wave action effects sediment removal the marine equipment will be moved to a protected area to dredge.
- Local Tornado warnings or watches must be monitored to determine if a complete stoppage of work is needed.
- Tornados or Severe weather are likely to bring strong winds into the bay that will present safety concerns. It will be important to takes steps to secure work areas and take shelter in a secure location.
- The SSC can monitor multiple sources to track developing potential for lightning. These are the following:
 - Doppler radar reports from the internet
 - National Weather Service radio reports
- Field crews shall report any observations of lightning or thunder in their area to the SSC.
- If you are inadvertently caught outside in a thunder/lightning storm, take the following precautions:
 - Seek shelter among an area that provides the substantial protection
 - Avoid lone trees as shelter.
 - Avoid open, bare areas.
 - Do not cross water bodies.
- If caught in an open area, place feet close together and crouch down, without lying on the ground.

When working on the Water: the weather forecasts and radar should be regularly monitored to prepare for adverse conditions. Some of the following steps should be taken to prepare for severe weather:

- If the marine equipment is capable of being spudded down on the water, this should be done to stabilize the vessel. The spuds may help protect workers and act as a grounded method for the vessel in lighting situations.

- Shelter should be provided on all marine equipment to provide additional protection. If shelter is not available, personnel should remove themselves from the marine equipment and seek the closest safe shelter. If vessels or barges are not capable of being spudded down, they should be moored in a safe area at the captain's discretion.
- All marine equipment should be secured prior to the approach of the storm.
- The number one priority in any severe weather conditions is employee safety. All required marine safety equipment shall be utilized to protect against water hazards.
- Caution should be taken in low lying areas for potential flash flooding conditions. High ground should be sought if conditions are present.

6. Training

General Training Requirements

Prior to initiation of site work, all personnel shall be properly indoctrinated in site health and safety regulations. Furthermore, personnel shall receive appropriate training to safely perform work at the site. General training required to perform work at the site within an exclusion zone will include successful completion of a 40 hour Hazwoper course with requisite 8 hour yearly refresher courses. Additionally, all crane operators performing work at the site shall attain Certified Crane Operator status and obtain fork lift certification if a fork lift is required for project work. When occupying Bay Front for staging or launching equipment, plant orientation training will be required.

Site Specific Requirements

All leadership involved in day to day operations at the site, including the PM, Superintendents, Foreman, and Safety Personnel will coordinate a site specific orientation for those employees working under their supervision.

All personnel, leadership and professional craft, shall undergo the following site specific training prior to working at the site:

- **Operations Training-** Operations training will initially be enacted by the Brennan PM with subsequent training directed by the SSC. Training will include an overview of on-going operations, review of AHA sheets, verify successful completion of general training requirements, and review in emergency response training.

Daily and Weekly Safety Meetings

Each day, prior to the start of operations or shift, Brennan personnel and subcontractors will meet to discuss and coordinate upcoming work activities. The Brennan SM or Superintendent will perform all pre-work safety meetings. When a change in work arises or a new phase of work is set to begin, the SSC will use the daily operational meetings to discuss potential hazards associated with the new phase of work.

Before each start of work activity, a Weekly Toolbox Safety Meeting will occur at the project site. Weekly Toolbox safety meetings will entail discussion of site specific safety related issues, additional site specific training, and also additional safety related topics.

Refresher Training

As required by OSHA, all individuals performing work at the site will have completed yearly eight hour refresher training prior to beginning work at the site.

Records

Records of all site specific training, safety related meetings, personnel safety training credentials, and operator credentials shall be kept at the site for periodic inspection or as requested the FE JV.

First Aid/ Injuries

As stated above, Brennan employs the Zero Injury Philosophy within its safety program. Brennan is committed to providing the safest working environment, proper tools and training to its employees in order to achieve zero injuries. Accordingly, all operational or safety related incidents and near misses are reported, regardless of size and severity. Furthermore, in any instance where First Aid is required, reports are generated detailing the nature, root causes, involved personnel, severity of the incident, and corrective actions to prevent future occurrences. All injuries no matter how minor will be reported to the FE JV at the earliest opportunity.

Lost Time Injuries

All severe injuries that may preclude lost work time shall receive initial medical care at the Memorial Medical Center. Lost time injury documentation shall include a full investigation of the incident or accident leading to the loss time injury including personnel involved, equipment involvement, personnel interviews, and methods to prevent future loss time injuries. A pre-final report will be available for the FE JV inspection within 24 hours of the incident with a final report issued within five business days.

Individuals involved in a loss time incident shall not return to work until receiving clearance from a medical doctor or physician's assistant.

7. Industrial Hygiene Monitoring

Industrial hygiene monitoring will be performed on an as needed basis based on the exposures presented in the work tasks. The Brennan safety department will conduct sound monitoring of equipment as needed to identify any potential noise issues. Brennan will follow the FE JV site Health and Safety Plan to determine the proper level of PPE for the potential airborne contaminants.

8. Standard Operating Procedures/Engineering Controls/Work Practices

Throughout this Health and Safety Emergency Response Plan details have been prescribed for standard site operating procedures. Additionally, the following work restrictions and procedures shall be enacted during site operations.

Confined Space Entry System

Brennan will label all hatches and areas that meet the requirements of a confined space. When access is needed to these areas a confined space entry permit will be filled out prior to entry.

Personnel Teaming/ Buddy System

Brennan will maintain radio communication with each member of the crew on that shift during operations and use of the buddy system during certain hazardous operations. All individuals on each crew shall be responsible for assuring that crew members are accounted for during emergency situations.

Overhead Electrical Hazards

Prior to the start of Brennan operations, Brennan superintendents, crane operators, safety personnel, and site management will perform a site investigation to determine the extent of electrical hazards as they pertain to anticipated crane operations. Brennan site safety personnel will document the pre-work electrical hazard investigation and will periodically review results of the investigation with personnel. Additionally, as operations approach areas identified as potential hazards, pre-work meetings will specifically address overhead electrical hazards, hazard mitigation methods, and operating procedures required while working in the vicinity of overhead power lines.

At all times personnel shall not violate the standards set forth in ANSI B.30 2004, which governs crane operation near power lines. All operations need to stay 20 feet away from power lines unless the voltage is known and then follow Table 9-1.

<i>Table 9-1: Minimum Safe Working Distances to Overhead Power Lines</i>	
Normal Voltage (kV)	Minimum Required Clearance
Operation Near High Voltage Power Lines	
	(feet)
Up to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35
Over 750 to 1000	45
Over 1000	As established by the utility owner/operator or registered professional engineer

Loading and Unloading of Trucks

Loading and unloading of trucks will include equipment deliveries, and removal of any additional items. Equipment loading/ unloading and clean material deliveries will be coordinated prior to arrival of delivery trucks to the site. Trucks arriving to the site will meet Department of Transportation (DOT) standards. All unloading of equipment and material will be performed by competent individuals trained in proper techniques for safely removing equipment and materials from a truck.

Ignition Sources

Smoking will only be allowed in designated areas. However, cutting torches and welding equipment, may be used to facilitate welding and cutting of materials and other miscellaneous tasks at the site. All required “hot work permits” will be in place prior to the start of the work day. It shall be the responsibility of the Site Superintendent to attain all required “hot work permits” prior to the start of each work day.

Electrical Construction

Brennan will not perform any site electrical construction.

9. Personal Protective Equipment (PPE)

It is Brennan’s standard practice to provide required PPE to all individuals working on company projects excluding steel toed shoes and clothing. In accordance with Brennan’s practice, the following pieces of equipment shall be issued to project personnel:

1. Hard hat
2. Safety glasses with side shields
3. Hi-vis vests or shirts with reflective markings
4. Work gloves

Skin Protection

Personnel will employ the use of standard construction personnel protection equipment throughout the project period. On a daily basis steel toed boots, hard hats, eye protection, and gloves shall be required for work at the site. All items, except steel toed boots, shall be provided to individuals prior to site work. Employees will also be required to wear long pants and at minimum short sleeve shirts.

Working Over or Near Water

When operations require that personnel work over or near water at depths that could warrant hazardous conditions, personal flotation devices shall be required within 10 feet of the water.

10. Personnel Hygiene and Decontamination

All equipment and material that may have come into contact with the sediment must be decontaminated, inspected and documented prior to leaving the worksite. During removal of piling, laborers will wear proper level D protection to protect against dermal exposure.

The foremost area for worker exposure would be through dermal contact. Therefore, employees shall maintain good personal hygiene. Breaks and lunch shall be taken in the designated clean areas. If skin contact is made with the sediment, it should be cleaned off before eating, drinking or smoking.

11. First Aid Provisions and Emergency Equipment

Brennan personnel working at the site shall receive training in the use of Emergency First Aid kits to include deployment and location information. At a minimum, Brennan shall maintain routinely inspected Emergency First Aid kits at the following locations:

1. Marine Equipment
2. Inside the cabs of all heavy equipment
3. Inside the cabs of all company pick-ups located at the jobsite
4. Project specific field office

Fire extinguishers shall also be placed and secured throughout the jobsite at the following locations:

1. Marine Equipment
2. Inside the cabs of all heavy equipment
3. Inside the cabs of all company pick-ups located at the jobsite
4. Project specific field office
5. Near any flammable or combustible material

Life rings with lifelines shall be located at each location:

1. Barge/Marine plant
2. Site access to water
3. Crew, work, and survey boats

12. Emergency Response/ Contingency Plan and Procedures

In accordance with solicitation directives, Brennan has prepared the following emergency response procedures in the event of First Aid requirements, fire, or chemical exposure. Accordingly, the following plan is provided:

Pre-Emergency Planning

Prior to the first day of work, all Brennan and subcontractor personnel will undergo site orientation and site specific emergency response training. Pre-emergency planning shall be included with training procedures and consist of orientation on evacuation routes, emergency medical notification and procedures, emergency response to medical or fire instances and evacuation procedures and routes. A man overboard emergency drill will be performed at startup of activities along with periodic drills throughout the project.

Local Emergency Services

Medical Care Facility

Brennan has identified the nearest medical facility to be:

Memorial Medical Center
1615 Maple Lane
Ashland, WI 54806

Please see Appendix A for the route map from Kreher Park to the Memorial Medical Center East. In the event that an individual is taken to emergency care in a company vehicle, two individuals may be needed to accompany the patient if there is a likelihood of the patient going into shock. This facility will be used for all employee medical needs.

Fire Department

Ashland Fire Department
122 Lake Shore Drive East
Ashland, WI 54806

Police Department

Ashland Police Department
601 Main Street West
Ashland, WI 54806

Personnel Roles, Lines of Authority, Training and Communication

In the event of an emergency response, work shall cease and responding personnel shall notify a supervisor in the immediate vicinity prior to initiating response activities. The responding supervisor shall immediately notify the Brennan SSC who will notify the FE JV. Once immediate response or care has been given and the incident has been mitigated to the extent that personnel may return to work, the Brennan SSC shall submit a preliminary report to the FE JV followed within twenty four hours of the incident.

Similar to training provided for pre-emergency planning, all personnel will receive training in proper communication and notification techniques and requirements in the event of an emergency. All training shall be conducted prior to the first day of work at the site by Brennan or subcontractor personnel.

Emergency Recognition and Prevention

All personnel working at the site on behalf of Brennan and its subcontractors are trained union professionals knowledgeable in the identification of emergency situations.

On a weekly basis, Brennan's SSC will perform inspections of the all work areas in an effort to identify and mitigate situations that may lead to an emergency response.

Safe Distances and Places of Refuge

Prior to the initiation of site activities, Brennan personnel will meet with the FE JV safety personnel to identify appropriate muster locations in the event of an emergency. Furthermore, Brennan personnel will review survey findings with respect to utilities and overhead power lines and anticipated effects on machinery movement and project operations.

Evacuation Routes and Procedures

Prior to initiation of site activities, Brennan personnel will meet with the FE JV personnel to identify emergency evacuation routes and procedures. Subsequent to procedure and route identification, Brennan will incorporate routes and procedures into site personnel training.

Emergency Alerting and Response Procedures

In the event of an emergency that requires medical attention or professional response, personnel will first contact a supervisor in the immediate vicinity prior to initiating emergency response actions. Notified supervisors will immediately inform Brennan's SSC, through radio communications, prior to assisting with emergency response procedures. Brennan's SSC shall be responsible for notifying the FE JV personnel.

Critique of Response and Follow-Up

Within a week of an incident requiring an emergency response, the Brennan SSC shall submit a full report detailing the emergency response and factors that have been subsequently implemented to mitigate future events.

Emergency Fire Response

Fire extinguishers shall be placed at various designated locations throughout Brennan's work area. In the event of a "small fire", i.e. a fire which can be mitigated through the use of fire extinguishers, personnel shall be allowed to operate a fire extinguisher to engage the area of concern. However, in the event that it is questionable whether a fire extinguisher can affirmatively negate a fire, personnel will be directed to immediately leave the vicinity and make the proper notifications.

13. Heat and Cold Stress Monitoring

The SSC, Site Superintendent, and Foreman shall be trained in the recognition of heat stress and heat fatigue. Work may be performed during the summer months when the level of heat is at its highest. Therefore, throughout site work, water shall be readily available to project personnel. Furthermore, a cooling area will be provided in the work Support Zone for each crew performing work at the site, so that individuals may exit from direct sunlight. At a minimum, personnel shall take two fifteen minute and one half-hour break per ten hour day.

During the fall and spring, crews may be presented with the hazards that lead to cold stress. If these circumstances arise, personnel will be instructed to dress for the tasks assigned. In addition, designated break areas will be made available for use during to work day to reduce the likelihood of cold stress.

Drinking water shall be supplied to all areas of the site under Brennan control and refreshed daily to prevent employees from experiencing dehydration.

14. Hazard Communication Program

Brennan participates in an electronic Hazard Communication Program as a component of the OSHA Global Harmonization Program and SDS, where all personnel have immediate access to SDS data for chemicals employed at the site. As such, all routine chemicals envisioned for use at the site are catalogued prior to work. In the event that a chemical is brought to the site, which has not been pre-identified, Brennan's SSC will download all required SDS information through the Brennan electronic program. Finally, the electronic SDS program, including all anticipated site chemicals, is available for the FE JV inspection upon request.

15. Accident Prevention Plan

Safety Hazards

The anticipated safety hazards with hazard mitigating operations have been included as part of Section 5 of this HASP. Furthermore, AHAs for all anticipated and unanticipated tasks (as they occur) will be submitted to the FE JV for approval prior to the start of a task.

Corporate Safety Program Philosophy and Mission

The philosophy of the Brennan Corporate Safety Program is to ensure that all employees have the proper equipment, training, and atmosphere to safely perform their work. Without exception, ensuring that each individual can safely return home to his or her family is the primary mission of the Brennan Corporate Safety Program.

Corporate Safety Program Objective

Brennan's objective is to create a Culture of Safety, where all incidents, accidents, and injuries are eliminated from the workplace. A Culture of Safety can only be created when managers, superintendents, foremen, and employees receive necessary training, and apply it to field operations.

Each day safe work practices need to be communicated and reiterated to all employees. Before work starts, hazards need to be identified through the Activity Hazard Analysis process. All team members need to be clear on what is expected of them to perform work for Brennan and other team members.

All personnel are assigned responsibility for safe and healthy operations. This concept is the foundation for involving all employees in identifying hazards and providing solutions. For any operation, individuals have full authority to stop work and initiate immediate corrective action or control. In addition, each worker has a right and responsibility to report unsafe conditions/practices. This right represents a significant facet of worker empowerment and program ownership. Through shared values and a belief that all accidents are preventable, our employees accept personal responsibility for working safely.

Each project team member is responsible for the following performance objectives:

- All employees are required to treat safety as value. During any task, employees must consider the possible effects of their actions on themselves and others and take appropriate protective measures.
- All personnel are charged with aiding in the protection of the public including, as your job description dictates, installation and maintenance of signs, signals, buoys, lights, fences, guardrails, ramps, temporary sidewalks, barricades, and overhead protection, as may be necessary.
- Security fencing protects employees, the company and the general public. All fencing must be maintained by all employees to the extent of their job description. Report to your supervisor defects beyond your ability to repair.
- Complete an orientation prior to being authorized to enter the project work areas
- Employees are required to review, be familiar with, and adhere to site-specific jobsite health and safety plans, procedures, practices, precautions, and permits.
- Use only safe means of access to and from work areas.
- Perform work in a safe manner and produce quality results; complete work without injury, illness, or property damage.

Corporate Management and Division Manager Responsibility

Corporate Management and Division Managers are the basis for adherence to the Corporate Safety Policy. It is their responsibility to ensure each project is adequately staffed and equipped with proper safety items. Furthermore, it is the responsibility of Corporate Management and Division Managers to implement disciplinary actions, should they become necessary. The following list is a summary of individual duties for Senior Management and Divisional Managers:

1. Ensure each project's safety reviews have been completed prior to the start of a project.
2. Assure each project estimate properly captures required safety needs, i.e. equipment, safety personnel, competent people, training, certifications.
3. Staff each project with properly trained personnel.
4. Actively involve one's self with project Toolbox Safety Meetings when visiting a project.
5. Perform a quarterly safety review with each Project Manager or Superintendent.
6. Implement disciplinary procedures when required.
7. Perform follow-up with each new hire to insure that a safety orientation was performed.

Health and Safety Department

It is the primary function of the Corporate Safety Department to implement and enforce the Brennan Inc. Safety Policy. The Corporate safety department will report directly to the COO of Brennan with the following specific work objectives:

1. Understand and implement all safety requirements as they pertain to OSHA, U.S. Corps of Engineer, or other client standards.
2. Properly train personnel as necessary to meet all OSHA, U.S. Corps of Engineer, or other client standards.
3. Review site specific or project specific safety plans for adherence to OSHA, U.S. Corps of Engineer, or other client standards.

4. Maintain records of corporate safety performance.
5. Perform periodic safety reviews of project locations. Review project safety reviews with project, divisional, or senior management.
6. Maintain site specific project safety staffs as necessary.
7. Review quarterly corporate safety performance with CFO, COO, and CEO.
8. Semi-annually review new hire safety performance and make recommendations as to full-time hiring.

Project Management

Each individual working in project management, as a Project Engineer, or as a Project Manager is expected to implement the Corporate Safety Policy at his or her site. Proper documentation of skills, training, and orientation are performed at the project level, so it is imperative that project management personnel properly communicate all requirements to field personnel. Project management personnel are expected to perform the following specific work objectives:

1. Insure that each individual at the site is performing tasks commensurate with their capabilities.
2. Insure that the project specific Health and Safety Plan is consistent with project risks.
3. Ensure that the project site is properly equipped with personal protective equipment.
4. Perform new hire orientation or site-specific orientation to all employees prior to the start of a project.
5. Evaluate new hire safety performance and make recommendations as to full time employment.
6. Insure that toolbox meetings are being performed at the site and actively participate in toolbox safety meetings.
7. Enforce all safety regulations and the Corporate Safety Policy.
8. Continually inspect for unsafe work practices and correct all unsafe work practices.

Superintendent Responsibility

The success of our accident program depends on the sincere, constant, and cooperative effort of all Superintendents. A Superintendent, in many cases, represents the highest field level of leadership. Strict adherence to safety protocol and enforcement by a Superintendent is critical to the success of the Corporate Safety Program. A Superintendent will:

1. Lead by Example
2. Perform new hire orientation in the absence of a site safety manager or project manager.
3. Make recommendation as to full time employment for newly hired personnel after the 120 day initiation period as specified in the Employee Handbook.
4. Teach each employee what the hazards are on the job and how to avoid them.
5. Create, edit, or review Activity Hazard Analysis for each operation.
6. Enforcement of all safety regulations.
7. Continuous inspection for unsafe practices and conditions and prompt corrective action to eliminate causes of accidents.
8. Investigate all accidents promptly in order to discover their cause and provide proper corrective action.
9. Management of Toolbox Safety meetings.

10. Maintain a current First Aid and CPR card
11. See that needed safety equipment and protective devices are provided for each job.
12. Instruct new employees and review job safety practices.
13. Set the proper safety example.

Foreman's Responsibility

Effective and safe work can be accomplished when the foreman cooperates sincerely within the safety program. Foremen must consistently implement and enforce corporate safety policies. Foremen will:

1. Familiarize themselves with the company policy and safety program responsibilities.
2. Have the same responsibility for safety as for any other part of operations.
3. Instruct all new employees on the reporting of all accidents, first aid procedures and the use of safety devices and equipment.
4. Be responsible for the regular inspection of all tools and equipment used on work under his supervision.
5. Make certain that no work is assigned to an individual who is unqualified or incapable of doing the work safely.
6. Make certain that the project is in as safe a condition as possible, before leaving a job. They shall arrange adequate warning of any condition, which might endanger workers or the public.

Employee Responsibility

Your cooperation is necessary for the protection of yourself and fellow workers. All employees will:

1. Make safety job #1. Any employee at any time may stop work for an unsafe condition.
2. Strictly adhere to Corporate Safety Policy
3. Understand Corporate Safety Policy as it applies to their work.
4. In the case of an accident, inform the Foreman immediately, and seek first aid or medical assistance without delay.
5. Report any hazardous conditions to the Foreman.
6. Submit recommendations for safety.
7. Know your responsibilities in the case of an emergency.
8. Be familiar with and comply with safety practices listed in this manual.
9. Attend weekly safety meetings and comply with safety items discussed.
10. Properly handle, use and store all safety equipment and company tools.
11. Use the required safety equipment and wear the proper clothing.

Safety Meetings

Pre-Task Safety Meetings

Pre-task safety meetings are held when a new activity or a change in daily work activities is presented. A plan devised for the work and safety hazards are briefly discussed.

Daily Safety Meetings

Prior to the start of daily activities, a safety meeting shall be enacted to discuss upcoming work operations. Also, in addition to the job site related safety functions, daily safety meeting may include corporate or jobsite safety training.

Weekly Safety Meetings

Weekly safety meetings may be held with all crews collectively. The weekly meetings provide all crews with a chance to discuss scheduling for the following two weeks. As the schedule develops, safety hazards are identified and control measures are implemented. During this time, infractions from the previous week are discussed and how the situations were remedied. Additionally, as required weekly safety meetings may include corporate or jobsite training.

Subcontractor Supervision

Prior to a subcontractor's inclusion in work for Brennan, a Subcontractor Prequalification form must be completed and submitted to the Brennan Corporate Controller. At its sole discretion, Brennan may elect to contract work with a subcontractor based upon its prequalification information.

Brennan requires each of its sub-contractors to have a written safety policy specifically tailored to the sub-contractor's business. Furthermore, Brennan expects adherence to the following key safe work components:

Subcontractor Competent Individual

The sub-contractor is required to maintain a Competent Person on site at all times during sub-contractor work. The Competent Individual shall have a full understanding of project specific and construction industry safety practices.

Personal Protective Equipment

All Brennan subcontractors are, at a minimum, to have the following pieces of Personal Protective Equipment:

- a. Hard hats
- b. Steel-toed boots
- c. Life jacket (when working near the water)
- d. Eye protection with side shields
- e. Gloves
- f. Full-face shields (when grinding or using cutting equipment)

Subcontractor Medical Facilities

Prior to beginning work on a Brennan site, subcontractors are required to identify the nearest medical treatment facilities and contact means for use in the event of an emergency. Furthermore, Brennan requires that subcontractors provide their own First Aid equipment at the worksite.

Subcontractor Fire Prevention

Subcontractors must provide their own fire protection and suppression equipment. Furthermore, each piece of spark inducing equipment that a subcontractor brings to the site must have a clearly identified fire extinguisher, with a current inspection tag, dedicated to that piece of equipment.

Subcontractor Housekeeping

All Brennan subcontractors are required to keep their work areas neat and orderly.

Subcontractor Fall Protection

All Brennan subcontractors are expected to comply with OSHA fall protection standards. Any specific item not expressly identified above, shall not preclude the subcontractor from compliance. OSHA, U.S. Corps of Engineer, or private client standards, whichever is more stringent, shall govern subcontractor compliance standards.

Pre-Construction Subcontractor Safety Meeting

Prior to the initiation of onsite subcontractor work, a meeting shall take place between Brennan and the subcontractor to discuss safety and operational issues. At a minimum, the following individuals are required to attend the Pre-Construction Safety Meeting:

1. Brennan Division or Project Manager
2. Brennan Corporate Safety Director or Site Specific Safety Individual
3. Subcontractor Competent Individual

Daily and Weekly Subcontractor Safety Meetings:

Subcontractors working under Brennan are required to perform a daily Toolbox Safety Meeting with their employees. Documentation of topics, issues, and a personnel attendance list shall be submitted to Brennan immediately after the meeting on a weekly basis.

Additionally, throughout a subcontractor's work at the jobsite, all subcontractor personnel will attend the daily Brennan safety meeting prior to the start of work operations.

16. Cutting, Brazing and Welding Procedures

All Brennan personnel and Brennan subcontractor personnel shall strictly adhere to the requirements of the Brennan hot work program. It shall be the responsibility of the Brennan Site Superintendent or the Subcontractor Superintendent to ascertain required hot work permits each day before crews under their leadership begin work. The Brennan SSC shall enforce all permit requirements.

Hot Work Personal Protection Equipment

- Impact and heat resistant goggles or eye protection, in many cases, helmets.
- Lenses and filters in eye wear to protect against intense light or ultraviolet (UV) radiation.
- Gloves to be thermal and flame-resistant (leather preferred).
- Protective clothing to guard exposed skin from thermal and UV radiation.
- Flame-resistant leggings may be appropriate for additional leg protection.
- Other personal protective equipment, such as hearing protective devices may be appropriate.
- Individuals performing hot work at a location other than a permanent hot work station shall position at least one person (fire watch) to watch for and extinguish any blaze that starts.
- If hot work is being performed in an unoccupied area where combustible materials are present, a person shall remain for 20 minutes after completion of the operation and during operator's breaks (i.e. – lunch, coffee) to ensure that sparks do not start a fire.
- Fire watch shall warn the operator if hazardous conditions develop in the area affecting fire safety or personal safety of the operator.
- Fire watch shall have the appropriate fire extinguisher and shall be knowledgeable in its use.

Oxygen-Fuel Gas Welding and Cutting

- Hoses must be properly rated for the designed service, properly connected, and do not use clamps or wire for connections.
- All oxygen-acetylene or other fuel gas torch systems have a:
 - Flashback protection device between the hoses and the regulator on the bottle side to prevent flashback from passing the point where the protection device is installed on a torch.
- Operators shall use the manufacturer's recommended procedure for shutting off the torch being used.
- Operators shall inspect hot work equipment, including PPE, before use and replace defective equipment before proceeding.
- Regulators shall be bled off when the equipment is not being used.

Fire- High Risk Locations

Potential cases would include:

- Fuel gas generator tanks and piping in rooms where fuel gas is generated.
- Exhaust ducts attached to wood, rubber, or fiber working machines and other ducts that may be coated on the inside with a flammable residue.
- Ducting in which flammable, toxic, or explosive vapors have been, or may be present.
- Area where combustible fibers are used or stored or in woodworking areas.
- Any area where wet-cell batteries are present.

Combustible Metals (or Alloys)

- Weld combustible metals, and alloys of combustible metals, only in areas specifically established for that purpose and equipped with inert arc welding equipment and special magnesium firefighting equipment.

- Place combustible metal dust, filings, and chips in closed, noncombustible containers, or remove them from the welding area before any welding begins.

Welding Procedures

Prior to initiation of welding operations, personnel must become familiar with types of materials on which weld work occurs. Vapors associated with welding operations may pose health risks to personnel. Accordingly, if an individual is not familiar with the types of material on which weld work occurs or the weld material itself, Brennan's SSC should be contacted for a task review.

17. Spill Control Provisions

Brennan and its subcontractors shall maintain the means at the project location to contain and mitigate fuel, oil, or chemical spills. In the event that a spill occurs, all mitigation efforts and reporting procedures shall strictly comply with Coast Guard, Department of Natural Resources, EPA, and the Ashland Bay Port District. Brennan will follow the Environmental Protection Plan (EPP) developed specifically for this site when handling spill prevention and environmental issues.

Spill kits shall be located within work areas near spill potential equipment. All spill kits shall include sorbent pads, containment booms, and sweeps. On a quarterly basis, spill kits shall be inspected by Brennan's SSC to ensure that degradation of containment equipment has not occurred.

Oil Spill Response Actions

1. Assess conditions in the area, and determine if there are injured persons, or if the situation makes it too hazardous to enter the area. Attempt to stop the source of the spill.
2. If the barge is leaking, make arrangements to remove the oil from the affected compartment. If possible, transfer the oil into another compartment on the barge. If this is not possible, make arrangements to off load the barge's contents into another barge, or facility.
 - Federal regulations require that a licensed tankerman supervise all cargo transfer on tank barges.
 - When transferring products from or within the tank barge, always follow the vessel transfer procedure on board.
3. Use absorbents and pads to prevent spilled oil from entering the water.
4. After attempting to stop the spill, contact the FE JV and the Qualified Individual. If unable to contact those individuals contact the National Response Center at 1-800-424-8802.

Incident Notification Procedures

After initial mitigation techniques have been enacted to contain a spill, contact Brennan's SSC who will enact notification procedures through the proper channels. As a matter of federal law, the National Response Center must be contacted after a spill event.

18. Water/ Boater Safety

Brennan will maintain various work boats at the site at all times. All individuals using work boats must have completed the Coast Guard Boaters safety course and be approved for operation by Brennan's SSC or Superintendent. Prior to operation, personnel must employ the use of a personal flotation device. Furthermore, at all times while the boat is in operation, personnel must fasten the emergency shutdown chord to their personnel flotation device.

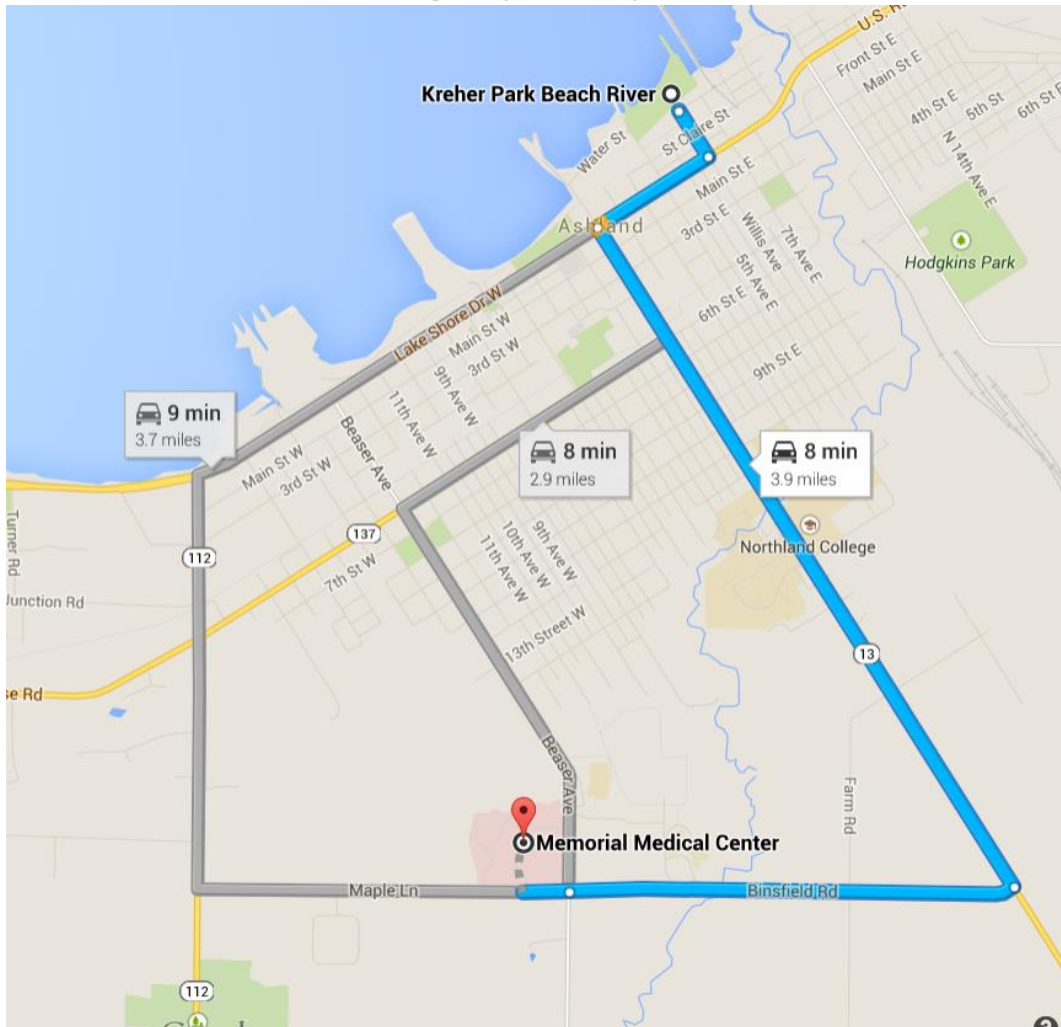
All work boats at the site shall have oars, fire extinguisher, horn, throw ring, and battery box, per Brennan policy and US Coast Guard (USCG) regulations. Boats should be inspected periodically, in the event that required items are missing, personnel should report deficiencies immediately.

Personal flotation devices shall not be required if the work area is contained within hand railing or the depth of water adjacent to the pier or dock would preclude drowning.

19. Dredging Around Utilities

Brennan will locate all utilities before dredging work starts. The individual utility companies will be contacted to located and provide as built drawings of the utilities. Once utility locations have been confirmed a 50 foot buffer will be put on both sides of the utility. The location of the utility and the buffer area will be displayed on the dredge computer so that the dredge does not dredge or spud into the utility area.

20. Appendix A – Emergency Facility Map



Appendix B

Voluntary Employee's Emergency Information Data Sheet

Voluntary Employee's Emergency Information Data Sheet

The following information is being gathered to help us respond to an emergency. **All questions are optional.** You may answer any of the questions you like or leave any blank. The original copy is sent to the Corporate safety office, and a copy will be maintained on site. If the information provided changes, you should submit a new sheet.

Employee Name (please print clearly): _____

Emergency Contacts (name as many as you like)

In the event of an emergency who should we contact to let them know? _____

What City and State do they live in? _____

What is their phone number? _____

What is their relationship to you? _____

Emergency Contact for YOU

How can we get in touch with you for project recalls, shutdowns, emergencies etc.?

Where are you staying while on site? _____

What is the phone number there? _____

Medical Conditions

Are you allergic to any medications? yes/no What are they? _____

Are you allergic to insect bites or stings? yes/no What are they? _____

Do you carry treatments or medicine(s) (e.g., insulin, sugar/candy/food, bee sting kits) that needs to be given in an emergency? yes/no What are they? _____

Where is it kept? _____

Are you or do you have:

- yes/no: Hypertension (Is it uncontrolled? yes/no)
- yes/no: Asthma (Is it uncontrolled? yes/no)
- yes/no: Diabetes (Is it uncontrolled? yes/no)
- yes/no: Hypoglycemia
- yes/no: Epilepsy/seizures
- yes/no: Fainting spells
- yes/no: Irregular heart beat
- yes/no: Narcolepsy (sleeping spells)

What company do you work for? _____

Safety Officer's Notes:

Appendix C

Authorization to Work Form

Appendix D

Job Safety Analysis (to be constructed in the field)

Appendix E

Decontamination Report/Log for Release of Equipment

Decon Report/Log for Release of Equipment

Method	Decon Method Description:						
Method 1	Dry decon using shovels, brooms, etc.				Project Name: Ashland/NSP Lakefront Site		
Method 2	Wet decon using high pressure washer				Project Number: 16X002		
Method 3	Wet decon using low pressure water hoses, hotsy and scrub brushes				Contaminants: BTEX, naphthalene, PAHs		
DECONTAMINATION ACTIVITIES					INSPECTION ACTIVITIES		
date & time	Equipment Description, Model, and serial number Owner			Decon Method	Decon Supervisor	Inspector	Notes
date	Description			<input type="checkbox"/> Method 1	name	name	<input type="checkbox"/> sat <input type="checkbox"/> unsat
	Owner	Make	Model	<input type="checkbox"/> Method 2	sig	sig	
time	serial			<input type="checkbox"/> Method 3			
date	Description			<input type="checkbox"/> Method 1	name	name	<input type="checkbox"/> sat <input type="checkbox"/> unsat
	Owner	Make	Model	<input type="checkbox"/> Method 2	sig	sig	
time	serial			<input type="checkbox"/> Method 3			
date	Description			<input type="checkbox"/> Method 1	name	name	<input type="checkbox"/> sat <input type="checkbox"/> unsat
	Owner	Make	Model	<input type="checkbox"/> Method 2	sig	sig	
time	serial			<input type="checkbox"/> Method 3			
date	Description			<input type="checkbox"/> Method 1	name	name	<input type="checkbox"/> sat <input type="checkbox"/> unsat
	Owner	Make	Model	<input type="checkbox"/> Method 2	sig	sig	
time	serial			<input type="checkbox"/> Method 3			
date	Description			<input type="checkbox"/> Method 1	name	name	<input type="checkbox"/> sat <input type="checkbox"/> unsat
	Owner	Make	Model	<input type="checkbox"/> Method 2	sig	sig	
time	serial			<input type="checkbox"/> Method 3			
date	Description			<input type="checkbox"/> Method 1	name	name	<input type="checkbox"/> sat <input type="checkbox"/> unsat
	Owner	Make	Model	<input type="checkbox"/> Method 2	sig	sig	
time	serial			<input type="checkbox"/> Method 3			

Appendix F
Contaminants of Concern

Contaminants of Concern

Contaminants	OSHA PEL	ACGIH TLV	Exposure Routes	Acute Symptoms	Chronic Symptoms	Target Organ	IP	Spec. gravity	V.P. mmHg	Flash point deg F	LEL %	UEL %
acenaphthene	?	?	Inhalation of aerosols and contact	eye irritation primarily a chronic skin and respiratory hazard	Cancer Cardiovascular disease	skin respiratory sys bladder kidneys skin	?	1.2	0.3	350		
benzene	1 ppm	0.5 ppm skin	Inhalation contact absorption	Irritation of eyes, nose, and respiratory system dermatitis, headache, nausea	Bone marrow depression anorexia, leukemia	Blood, CNS. skin, bone marrow, eyes, respiratory tract	9.24	0.88	75	12	1.3	7.9
coal tar pitch volatiles {polynuclear aromatic hydrocarbons (PNA); poly aromatic hydrocarbons (PAH)} {e.g., pyrene, phenanthrene, acridine, chrysene, anthracene, benzo(a)pyrene, and benzene soluble or benzene insoluble fractions}	0.2 mg/m3 see OSHA 1910. 1002	0.02 mg/m3	Inhalation of aerosols and contact	eye irritation primarily a chronic skin and respiratory hazard	dermatitis, bronchitis, some are carcinogens for lung, skin, and kidney cancers	skin respiratory sys bladder kidneys						
properties vary depending on individual compound												

Contaminants	OSHA PEL	ACGIH TLV	Exposure Routes	Acute Symptoms	Chronic Symptoms	Target Organ	IP	Spec. gravity	V.P. mmHg	Flash point deg F	LEL %	UEL %
ethyl benzene	100 ppm	100 ppm	Inhalation Ingestion Contact	irritation of eyes skin and mucus, headaches, coma, narcosis	dermatitis	CNS, eyes, respiratory system, skin, CNS	8.76	0.87	7	55	0.8	6.7
naphthalene	10 ppm	10 ppm skin	Inhalation Ingestion Contact Absorption	Irritation of eyes, Headache, Confusion, malaise, Nausea, vomiting, Abdominal pain, Irritated bladder, Profuse sweating,	Jaundice, hematuria (blood in the urine), hemoglobinuria, renal shutdown; dermatitis, optical neuritis, corneal damage	Skin, CNS, Eyes Liver Kidneys Blood	8.12	1.15	0.08	174	0.9	5.9
toluene	200 ppm	50 ppm	Inhalation Ingestion Contact	dermatitis, fatigue, weakness, confusion, muscular, fatigue	insomnia	CNS, liver, kidneys, skin	8.82	0.87	20	40	1.2	7.1
trichlorobenzene (syn: 1,2,4-trichlorobenzene)	? ppm	5 ppm ceiling	Inhalation Ingestion Contact Absorption	irritation of the eyes skin; and mucus membrane liver and kidney damage in animals	liver and kidney damage in animals	eyes, skin, respiratory system, liver, possible teratogen	?	1.45	1			10.5

Contaminants	OSHA PEL	ACGIH TLV	Exposure Routes	Acute Symptoms	Chronic Symptoms	Target Organ	IP	Spec. gravity	V.P. mmHg	Flash point deg F	LEL %	UEL %
Trimethylbenzene (mixed isomers)	? ppm	25 ppm	Inhalation Ingestion Contact	irritation of the eyes and Skin, nose, throat; Lassitude, dizziness nausea, vomiting,	liver injury	eyes, skin, respiratory system, CNS blood	-8.4	~0.88	1	120	0.9	6.4
xylene (mixed isomers)	100 ppm	100 ppm	Inhalation Ingestion Contact absorption	drowsiness, incoherence, anorexia, confusion, abdominal, pain, irritation of eyes skin, nose, throat, dizziness, excitement,	liver and kidney disease	CNS, liver, kidneys, skin G.I. tract blood	8.56 to 8.44	0.88 to 0.86	9 to 7	90 to 81	1.1 to 0.9	7.0 to 6.7

Appendix G
Excavation and Trenching Plan

Appendix G



Ashland/NSP Lakefront Excavation Trenching Plan

TITLE: Excavation and Trenching Safety Plan and Inspection Form

Reviewed and Approved By:
David Hardy, CHST, PHSM

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Ashland/NSP Lakefront Excavation Trenching Plan

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A. Purpose

The purpose of this plan is to help the site competent person comply with the requirements of 29 CFR 1926, Subpart P--Excavations, related safety issues such as heavy equipment use, the Ashland/NSP Lakefront Site Health and Safety Plan (HASP).

B. Applicability

This plan is intended to be used for all excavations and trenches. The competent person must decide specifically which sections apply and how all hazards presented by the excavation are being controlled.

B.1. Basis

B.1.a. Project HASP

The basis for this plan is the Ashland/NSP Lakefront Site Health and Safety Plan. This plan is considered to be an attachment to that plan and mandatory in the same manner as the project HASP.

B.1.b. NSPW Contractor Safety System

The NSPW Contractor Safety System also governs work on this facility and must be complied with.

B.1.c. ANSI Z 10.12

Where appropriate this procedure may also reference ANSI Z 10.12 Standards for Excavation in lieu of federal or state regulations.

B.1.d. OSHA Regulations

The primary applicable regulations governing the specific hazards addressed in this plan are 29 CFR 1926, Subpart P, applicable to excavations and trenches; and 29 CFR 1926, Subpart O, applicable to heavy equipment safety.

B.2. Conflicting Requirements

In general the intention of this plan is to comply with all of the basis requirements. In the event where this would result in a conflict (i.e., where following all of the requirements cannot be accomplished because one requirement precludes following of the other(s)) the basic hierarchy is as follows:

B.2.a. Hierarchy

- 1) Federal and state regulations preempt the others.
- 2) NSPW requirements will generally preempt Envirocon's is stricter.
- 3) Envirocon procedures must be followed to the extent that this does not produce a conflict with the above requirements.

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B.2.b. Hierarchy Results in a Reduction of Protection

In the event that a supervisor, competent person, or employee believes that the above hierarchy will result in a reduction of employee protection, a resolution shall be considered with the appropriate client representative. If this fails to resolve the conflict, notify the Envirocon Director of Health and Safety.

C. Excavation Competent Person(s)

A competent person must be designated before any excavation or intrusive work activity begins. This plan applies regardless of whether personnel will enter a trench or an excavation. The competent person will determine the safety measures needed.

C.1. Designation and Approval

Excavation competent persons at this project must be designated on the form attached at the end of this plan.

C.2. Competent Person Responsibilities

The competent person is defined as one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

C.2.a. Availability of Competent Person.

The competent person must be on-site during any excavation or intrusive work activity for which he is responsible.

C.2.b. Competent Person Tasks.

The competent person must also perform or be capable of performing the following tasks:

- 1) Application of 29 CFR 1926 Subpart P to the excavation or intrusive work activity;
- 2) Daily inspections of the excavation or intrusive work including an inspection after a hazard increasing event such as a thunderstorm;
- 3) Classifying soil at the excavation or intrusive work;
- 4) Determining proper protective requirements;
- 5) Determining the need for excavation or intrusive work de-watering operations and monitoring all de-watering activity;
- 6) Coordinate completion of any necessary local permits with a project engineer.

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D. Soil Classification and Type

Appendix A of 29 CFR 1926 Subpart P outlines the minimum requirements for the classification of soil. Upon determining the soil type, the competent person must then determine the protection system which will be used to protect any employee or lower tier subcontractor who may enter the excavation.

D.1. Competent Person

In a designed excavation, one where a PE certified engineer has designed the sloping and protective system requirements, the competent person is responsible for ensuring that the specified sloping/protective systems are followed on a daily basis and to conduct daily inspections for unexpected hazards or changes in conditions.

Where a PE has not determined protective systems, the competent person is responsible for determining soil classification.

Only a PE or qualified geologist, or similarly qualified person shall determine soil type of "stable rock."

D.2. OSHA Soil Classifications.

The following are the soil classifications recognized by OSHA in 29 CFR 1926 Subpart P. The competent person must classify the soil based on the manual and visual tests conducted at the excavation site. OSHA's Subpart B assumes that a Type C soil unless a written classification documents another classification.

D.2.a. Requirements.

OSHA requires written documentation of soil classifications other than Type C soils.

D.2.b. Type A soil means:

- 1) Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144kPa) or greater.
- 2) Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam.
- 3) Cemented soils such as caliche and hardpan are also considered Type A.
However, no soil is Type A if:
 - a) The soil is fissured; or
 - b) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
 - c) The soil has been previously disturbed; or
 - d) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or

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- e) The material is subjected to other factors that would require it to be classified as a less stable material.

D.2.c. Type B soil means:

- 1) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
- 2) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- 3) Previously disturbed soils except those which would otherwise be classed by Type C soil.
- 4) Soil that:
 - a) meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subjected to vibration; or
 - b) Dry rock that is not stable; or
 - c) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

D.2.d. Type C soil means:

- 1) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
- 2) Granular soils including gravel, sand, and loamy sand; or
- 3) Submerged soil or soil from which water is freely seeping; or
- 4) Submerged rock that is not stable; or
- 5) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

D.2.e. Stable Rock – Refer to Soil Types

Stable Rock is not a soil classification. Stable Rock is a soil type (see the OSHA soil type discussions below). A “stable rock” determination shall be determined by a qualified person as described in D.1 above.

D.3. Soil Classification Requirements.

The competent person must be able to classify each soil and rock deposit associated with a trench or excavation as to stable rock, Type A, Type B, or Type C soil.

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D.3.a. Basis of Classification.

The classification of soil type must be accomplished by at least one visual and one manual test. There are several allowable tests that can be used to determine soil type. This testing must be done by the competent person and performed prior to and during the job. Refer to Appendix A of Subpart P for manual and visual test procedures.

D.3.b. Reclassification.

If, after the soil has been classified, conditions change, the competent person is responsible for evaluating the situation and, if necessary, change the classification.

D.4. OSHA Soil Types.

D.4.a. Stable Rock.

- 1) A “stable rock” determination shall be determined by a qualified person as described in D.1 above.
- 2) Stable rock is not one of the texture classes. However, it is one of the OSHA classifications of soil.
- 3) Stable rock is solid mineral material which can be excavated; and the sides stand vertical and remain stable and vertical throughout construction.
- 4) Coral is not considered stable rock.

D.4.b. Cemented Soil.

- 1) Cemented soils are soils that are held together by a chemical agent such as calcium carbonate.
- 2) Examples of cemented soils would include caliche and hardpan. Cemented soils are classified as Type A soils with an unconfined compressive strength greater than 1.5 tsf.

D.4.c. Cohesive Soil.

- 1) Cohesive soils are basically fine grained soils. Cohesive soils range from clay through clay loam.
- 2) A cohesive soil will stand unsupported when excavated and is plastic when moist. That is, cohesive soil can be rolled into a ribbon.
- 3) A cohesive soil is hard to break up when it is dry.
- 4) Cohesive soils are classified as Type A soils with an unconfined compressive strength greater than 1.5 tsf.

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D.4.d. Granular Soil.

- 1) Granular soils are composed of coarse grained material that has very little cohesive strength.
- 2) Granular soils include loamy sand, sand and gravel.
- 3) A soil is classified as granular if more than 65% of the grains are distinguishable with the unaided eye.
- 4) Granular soils, when excavated will not stand and the walls of the excavation can crumble easily.
- 5) CAUTION:
 - a) Some granular soils will exhibit cohesion when wet, but when dry will fall apart.
 - b) This type of soil is especially dangerous when found at a construction site. The walls of a trench appear to stand with no support, however, when they dry they could crumble and fall into the trench bottom.
- 6) Granular soils are classified as soil Type B or C, and may require the highest degree of protection. Type C soils would have an unconfined compressive strength of less than 0.5 tsf.

D.4.e. Granular Cohesionless.

- 1) Soils that range from silt through sandy loam or are composed of angular particles are said to be granular cohesionless soils.
- 2) These are difficult soils to work with because the group ranges from a very stable Type B to the unstable Type C soil.
- 3) Course angular granular soils are classified as Type B soils and have an unconfined compressive strength range from 0.5 tsf to 1.5 tsf.

D.4.f. Layered Soil System.

A layered soils system is composed of two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered. The layers may lay on a horizontal plane or be sloped. When they are sloped into the excavation they represent a collapse hazard to the trench wall. A slope greater than 4H:1V would classify any soil as Type C. Sloped layers less than 4H:1V would be classified as Type B soil. No layered system can be Type A soil.

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E. Protective Systems

29 CFR 1926.652 requires that each employee in an excavation be protected from cave-ins by an adequate protective system unless excavations are made in stable rock or are less than five feet in depth and examination by the competent person provides no indication of potential cave-in. Additionally, whichever protective system is chosen must have the capacity to resist without failure all loads that are intended or could reasonably be applied to the system.

E.1. Design of Sloping and Benching Systems.

The slopes and configurations of sloping and benching systems must be determined by the competent person in accordance with the requirements of 29 CFR 1926(b)(1) through (b)(4) as well as 29 CFR 1926 Subpart P-Appendix B.

After the competent person has determined the soil type based on one visual and one manual test, the competent person may design the sloping and benching system for excavations that are less than 20 feet deep using the following table.

SOIL OR ROCK TYPE	EXAMPLES	MAXIMUM ALLOWABLE SLOPES HORIZONTAL TO VERTICAL FOR EXCAVATIONS LESS THAN 20 FEET DEEP *
Stable Rock	A "stable rock" determination shall be determined by a qualified person as described in D.1 above.	Vertical (90 Degrees)
Type A Cohesive	Clay, Hardpan, Silty Clay	3/4 : 1 (53 degrees)
Type B Cohesive/Granular	Silt, Unstable Rock, sandy Loam, Fissured type A	1 : 1 (45 degrees)
Type C Granular	Gravel, Submerged, Loamy, Sand	1.5 : 1 (34 degrees)

Notes:
* The design of any protective system, including benching or sloping systems, must be approved by a registered Professional Engineer (PE) for excavations deeper than 20 feet.
A "stable rock" determination shall be determined by a qualified person as described in D.1 above.

E.2. Support Systems.

E.2.a. Design of support systems, shield systems and other protective systems.

If the competent person determines that personnel will be protected from cave-ins by a protective system other than sloping and benching, the design of the support systems, shield

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systems, and other protective systems be based on the conditions at the project site and data provided by an Envirocon or subcontracted registered professional engineer or from tabulated data provided by the manufacturers of the protective systems.

E.2.b. OSHA requirements.

The design of the protective system must be in accordance with the requirements of 29 CFR 1926.652(c)(1) through (c)(4) and 29 CFR 1926 Subpart P-Appendices C, D, E respectively.

E.2.c. Protection for Exceptional Conditions.

In large/deep excavations where traditional shoring and sloping are not practical, alternate protective measures may be implemented to protect personnel in the excavation.

- 1) Additionally, the top of the excavation must be protected with stop logs, earthen berms, or other types of protective barriers which will keep pedestrians and vehicles from approaching the edge of the excavation.
- 2) Approvals.
 - a) Any deviations from traditional protective systems must be approved by a registered Professional Engineer (PE), or the Envirocon Director of Health and Safety.
 - b) Such protective systems shall be documented and submitted to the client's representative.

F. Excavation Safe Work Practices

Excavation activity exposes Envirocon personnel and lower tier subcontractors to many dangers which, if not recognized, can cause death or serious injury.

F.1. Surface Hazards.

The excavation area should be inspected and any debris, structures, and surface protrusions that are located so as to create a hazard to employees shall be removed as necessary to safeguard employees. Any buildings on the site should be evaluated for structural integrity and supported if necessary.

F.2. Underground Installations/Utility Locations.

Before conducting any excavation work, the location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined.

F.2.a. Contacting Utility Companies.

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Utility companies or the state utility protection service shall be contacted at least two working days prior to excavation activities to be advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.

F.2.b. Protection of Locate Markers.

Envirocon personnel and sub-contractors should be careful to protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations.

- 1) If the markings of utility locations are destroyed or removed before excavation commences or is completed, the Envirocon competent person must notify the utility company or other cognizant facility personnel.
- 2) Envirocon equipment operators shall maintain at least 3-foot clearance between any underground utility and the cutting edge or point of powered equipment.
- 3) Excavating within 18 inches of a utility locate should be avoided if possible (additional distance must be added for the dimensions of the utility as well). If materials must be excavated within two feet of a utility locate line it should be hand excavated (also referred to as "potholing"). Other acceptable means of excavation may be acceptable such as vacuum excavation. Refer to 29 CFR 1926.651(b)(3), ANSI Z 10.12 paragraph 2.5.3; and the applicable state laws governing one-call excavation procedures.

F.2.c. Supporting Utilities.

While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

F.3. Access and Egress.

Envirocon will provide a safe means of access to and egress from all excavations. The following are considered acceptable methods of entering and exiting excavations.

F.3.a. Structural Ramps

Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by the competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design or structural engineering, and shall be constructed in accordance with the design.

Structural members used for ramps and runways shall be of uniform thickness. Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping. Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

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F.3.b. Ladders and Stairways.

Ladders or stairways constructed in accordance with OSHA standards may also be used.

F.3.c. Trenches.

A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees. Any ramp used for employee egress must be sloped at an angle which would allow employees to walk upright out of the excavation.

F.4. Exposure to Vehicular Traffic.

Envirocon and subcontract personnel who may be exposed to vehicular traffic both on projects and public highways shall be provided with and shall wear warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

F.5. Exposure to Falling Loads.

No Envirocon employee or lower tier subcontractor shall be permitted underneath loads handled by lifting or digging equipment. Personnel must stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Truck drivers may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped with over-cab protective structures, in accordance with 29 CFR 1926.601(b)(6), to provide adequate protection for the operator from falling objects during loading and unloading operations.

F.6. Warning System for Mobile Equipment.

When heavy equipment and trucks operate adjacent to an excavation or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals or stop logs. If possible, the approach grade should be away from the excavation.

F.7. Hazardous Atmospheres.

Because there is a likelihood that excavation activity at this site involve hazardous materials, the Envirocon competent person must ensure that acceptable atmospheric conditions exist.

F.7.a. Airborne Hazards Associated With This Project Include:

- 1) Radioactive Materials
- 2) Organic Hydrocarbons

F.7.b. Air Monitoring.

Air monitoring shall be conducted in accordance with the Envirocon project HASP.

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- 1) The Envirocon competent person shall coordinate with the project health and safety officer to ensure that excavation monitoring is performed in accordance with the site-specific monitoring requirements.
- 2) Typically this monitoring will require direct reading atmospheric monitoring to determine entry requirements and TWA personal exposure monitoring to confirm direct reading results.
- 3) When atmospheric monitoring is required, the site safety officer must check the atmosphere for the following in the order shown, or as directed by the site-specific monitoring requirements:
 - a) Oxygen Content
 - i) acceptable conditions: 21% (i.e., ambient oxygen conditions)
 - ii) Conditions other than normal/ambient shall be evaluated to determine the reason for the difference. Controls shall be established accordingly.
 - iii) In any case where oxygen is 19.5% or less, it shall be considered IDLH (Immediately Dangerous to Life or Health in accordance with the requirements for respiratory protection).
 - b) Flammable Conditions
 - i) acceptable conditions: ambient (i.e., no deflection above normal background)
 - ii) Conditions other than ambient shall be evaluated to determine the potential source of flammable vapors and appropriate controls established.
 - iii) In any case where flammable vapors exceed 10% LEL work shall be stopped until appropriate controls can be established.
 - c) Toxic Atmospheres: Refer to site monitoring procedures.

F.7.c. Confined Space Conditions.

Any excavation or trench deeper than four (4) feet meets the definition of a confined space if a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations where contaminants of concern are recognized as being present. . Excavations over 4 feet in depth should be considered as confined spaces until all of the potential, associated hazards have been ruled out by a competent person.

F.7.d. Changing Conditions.

Based on the competent person's visual observation of the excavation and the soil and/or fill material, atmospheric monitoring may not be necessary. However, if conditions change, the competent person must re-evaluate whether atmospheric monitoring is required.

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F.7.e. Ventilation

Adequate precautions shall be taken, for example providing ventilation to prevent employee exposure to harmful atmospheres. When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, direct reading air monitoring shall be conducted periodically to ensure that the atmosphere remains safe.

F.7.f. Emergency Rescue Equipment

Emergency rescue equipment, such as self-contained breathing apparatus (SCBA), a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be kept close to the excavation for use in an emergency.

F.8. Water Accumulation.

Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.

F.8.a. General.

The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

F.8.b. Monitoring.

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

F.8.c. Surface Water Controls.

If excavation work interrupts the natural drainage of surface water (such as streams); diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

F.8.d. Heavy Rain Inspections.

Excavations must be inspected after heavy rain that could impact on the excavation. Inspections are discussed below.

F.9. Stability of Adjacent Structures.

Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

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F.9.a. Excavation below the level of the base or footing of foundations.

Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

- 1) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.
- 2) A support system, such as underpinning, designed by a registered professional engineer is provided to ensure the safety of employees and the stability of the structure; or
- 3) The excavation is in stable rock; or
- 4) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
- 5) If a support system has been put in place to stabilize an adjacent structure, it must be inspected for movement and structural integrity daily by the competent person.

F.9.b. Undermining Structures.

Sidewalks, pavements, and other structures shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

F.10. Fall Protection

Where employees or equipment are required or permitted to cross over excavations; walkways, or bridges with standard guardrails shall be provided.

F.11. Edges

F.11.a. Fall Protection

- 1) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails, which comply with 1926.502(b), shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.
- 2) Keep people and equipment away from excavation edges.
 - a) When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.
 - b) Adequate barrier physical protection shall be provided at all remotely located excavations.

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- c) All wells, pits, shafts, etc., shall be barricaded or covered.
 - d) Upon completion of exploration and other similar operations, temporary wells, pits, shafts, etc., shall be backfilled.
- 3) The competent person must determine a safe distance for personnel approaching the edges of excavations based on a careful inspection of the materials and conditions of the materials forming the edge. As a general rule these distances should not exceed the following:
- a) For edges along 6 foot vertical drops or less (including benched excavations):
 - i) Keep personnel at least 3 feet away from the edge of the excavation.
 - ii) Where there are cracks, fissures, or subsidence depressions indicating and unstable edge keep back at least 3 feet from the crack, fissure, or depression.
 - b) For edges along vertical drops greater than 6 feet where soils are cohesive:
 - i) Keep personnel at least 3 feet away from the edge of the excavation.
 - ii) Where there are cracks, fissures, or subsidence depressions indicating and unstable edge keep back at least 3 feet from the crack, fissure, or depression.
 - c) For edges along vertical drops greater than 6 feet where soils are non-cohesive:
 - i) Keep personnel at least 6 feet away from the edge of the excavation.
 - ii) Where there are cracks, fissures, or subsidence depressions indicating and unstable edge keep back at least 6 feet from the crack, fissure, or depression.

F.11.b. Highwalls

- 1) Employees shall be kept out of the areas below highwalls or excavation faces that are not stable rock, benched or sloped. As a general rule, employees on foot shall keep clear for a distance greater than or equal to the height of the wall face.
- 2) Equipment operating below highwalls that are not stable rock, benched or sloped shall keep cabs out from under overhanging cuts.

F.11.c. Protection of Employees From Loose Rock or Soil.

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face.

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- 1) Protective Systems. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the excavation face to stop and contain falling material; or other means that provide equivalent protection.
- 2) Spoils and Other Materials Near Excavation Edges.
 - a) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations.
 - b) Protection shall be provided by placing and keeping such materials or equipment at least 2 feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.
 - c) In accordance with the site HASP, in instances in which overpressure (the weight of nearby construction equipment, materials or existing buildings) a distance of 4 feet, measured from the edge of the cut to the bottom of the sloughing pile, shall be used.

F.12. Inspections.

Excavations, the adjacent areas, and protective systems shall be inspected by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.

F.12.a. Documentation.

All inspections shall be documented by the competent person. This may be documented in the site safety log or use the attached inspection form.

F.12.b. Daily/shift Inspections.

An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift.

F.12.c. Stop Work Conditions.

Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

F.12.d. Post-event Inspections.

Any event which potentially threatens the stability of protective systems requires an inspection by a competent person.

- 1) Heavy rain that could impact on the excavation is a common example.

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- 2) Snow, snow melt, earthquakes, or use of explosives nearby would be other examples.

F.13. Protection of the Public.

Since open excavations are often an attractive nuisance to the public, adequate barrier for physical protection shall be provided at all excavations. Remotely located excavations may require special protection including, but not limited to, highly visible snow fence, concrete barriers, chain link fence and flashing warning light. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be covered or backfilled.

F.14. Stop work conditions.

Excavations often occur in areas where articles, materials, or conditions may arise or be discovered in the process of excavating. All personnel must be aware of this potential and immediately stop work and report the circumstances in accordance with incident reporting procedures when these conditions arise.

F.14.a. New, previously unknown, or unexpected potential hazards such as:

- 1) buried drums, cylinders, or hazardous materials containers,
- 2) possible unexploded ordinance,
- 3) unusual soil conditions (e.g., previously disturbed soils, soils with unusual odors, soils with unusual coloration, soils which appear to be backfill, etc.), or
- 4) floating contaminants (e.g., oil, chemicals, or sheens on water).

F.14.b. Environmental incidents such as:

- 1) oil or chemical spills,
- 2) dead or injured wildlife, or
- 3) disturbance of protected habitats.

F.14.c. Objects of potential cultural or historical importance such as:

- 1) bones,
- 2) buried coins or money,
- 3) arrow heads,
- 4) possible burial sites, or
- 5) finding articles of any potential cultural significance.

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F.14.d. "Time-out" for Safety Authority.

Envirocon personnel are required to take personal responsibility for their safety, the safety of their buddy, and the safety of all others on/near the site. The "time-out" for safety is Envirocon's authorization to employees to take a moment to correct an unsafe condition, or contact their supervisor for clarification if they encounter a condition that they believe may be potentially hazardous.

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G. Excavation Inspection Checklist

The following checklist shall serve as a partial guideline for the competent person inspections.

Yes/Sat	No/Unsat	N/A	Competent Person:	Date:	Notes/Corrections
			Excavation Location:	Time:	
			Scope of Work:		
			Personnel will enter this excavation? <input type="checkbox"/> yes <input type="checkbox"/> no		
			Inspection items		
			Wisconsin one Call has been notified? Diggers Hotline: Wisconsin's One-Call Center CALL 811 or (800) 242-8511		
			Does this job require special training? Describe		
			<ul style="list-style-type: none"> personnel have received necessary training. 		
			What is the soil classification? _____		
			<ul style="list-style-type: none"> Will the soil be classified based on its properties and site conditions? If the answer is "NO" soil should be classified type C. If the answer is yes proceed with the remaining soil classification item below. 		
			<ul style="list-style-type: none"> Based on visual observation, which best describes the soil in this excavation? <ul style="list-style-type: none"> <input type="checkbox"/> Stable Rock; <input type="checkbox"/> Cemented Soil; <input type="checkbox"/> Cohesive Soil; <input type="checkbox"/> Granular Soil <input type="checkbox"/> Granular Cohesionless; <input type="checkbox"/> Layered System 		
			<ul style="list-style-type: none"> Based on visual observation, what is the moisture condition of the soil? <ul style="list-style-type: none"> <input type="checkbox"/> Dry Soil; <input type="checkbox"/> Moist Soil; <input type="checkbox"/> Wet Soil; <input type="checkbox"/> Saturated Soil 		
			<ul style="list-style-type: none"> Pocket penetrometer readings (if available) in tsf (tons per square foot): <ul style="list-style-type: none"> <input type="checkbox"/> > 1.5 tsf (type A); <input type="checkbox"/> 0.5 – 1.5 tsf (type B); <input type="checkbox"/> < 0.5 tsf (type C) 		
			<ul style="list-style-type: none"> What manual test was used to determine the soil type? <ul style="list-style-type: none"> <input type="checkbox"/> plasticity; <input type="checkbox"/> dry strength; <input type="checkbox"/> thumb penetration; <input type="checkbox"/> other 		
			<ul style="list-style-type: none"> Based on at least one manual test, what classification is the soil in this excavation? <ul style="list-style-type: none"> <input type="checkbox"/> Stable Rock; <input type="checkbox"/> Type A Soil; <input type="checkbox"/> Type B Soil; <input type="checkbox"/> Type C 		
			Are slopes, benches, or other protective systems as required for trenches?		
			<ul style="list-style-type: none"> Shoring / protective systems have been designed by a registered professional engineer or accompanied by tabulated data from the manufacturer? 		
			<ul style="list-style-type: none"> Shoring and other protective system checked/measured each day to detect movement and possible failure? 		
			<ul style="list-style-type: none"> Are stock pile slopes showing signs of instability and are people and equipment protected from such conditions? 		
			<ul style="list-style-type: none"> Are people and equipment adequately protected from, or kept away from excavation cuts that may slough or cave in non-trench excavations? 		
			Electrical Safety		

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Yes/Sat	No/Unsat	N/A	Competent Person:	Date:	Notes/Corrections
			Excavation Location:	Time:	
			Scope of Work:		
			Personnel will enter this excavation? <input type="checkbox"/> yes <input type="checkbox"/> no		
			Inspection items	Notes/Corrections	
			<ul style="list-style-type: none"> Are all electrical devices grounded and/or GFCI protected? 		
			<ul style="list-style-type: none"> Temporary electrical cords are rated (e.g. JS, S, JSO, SO, JSOW, SOW)? 		
			Surface Encumbrances and Adjoining Structures		
			<ul style="list-style-type: none"> Surface encumbrances located so as to create a hazard to employees have been removed or supported, as necessary, to safeguard employees? 		
			<ul style="list-style-type: none"> Are support systems such as shoring, bracing, or underpinning provided to ensure stability of adjoining structures (i.e., buildings, walls) endangered by excavation activities? 		
			<ul style="list-style-type: none"> Support system(s) have been designed by a registered professional engineer? 		
			Utilities		
			<ul style="list-style-type: none"> OVERHEAD utilities that may pose a hazard have been identified and marked? (NOTE: Marking overhead hazards on the ground may be more effective than elevated markers!) 		
			<ul style="list-style-type: none"> Have utility companies been contacted and advised of proposed work? 		
			<ul style="list-style-type: none"> Have the estimated locations of all underground installations been identified and marked prior to excavation? 		
			<ul style="list-style-type: none"> If underground installations are exposed, are they protected, supported or removed while excavation is open? 		
			Access and Egress		
			<ul style="list-style-type: none"> Are safe stairways, ladders, or ramps provided for worker access/egress (must be within 25' of travel for personnel in trenches)? 		
			<ul style="list-style-type: none"> Are structural ramps that are used for access and egress of equipment and/or personnel designed by a competent person qualified in structural design and constructed in accordance with the design? 		
			Is the equipment and vehicular traffic safe?		
			<ul style="list-style-type: none"> Are traffic patterns and speeds safe? 		
			<ul style="list-style-type: none"> Are warning systems utilized when mobile equipment is operated adjacent to or at the edge of an excavation? If yes, which type is being used? <input type="checkbox"/> Hand Signals; <input type="checkbox"/> Stop Logs; <input type="checkbox"/> Earthen Berm; <input type="checkbox"/> Other 		
			<ul style="list-style-type: none"> Are personnel exposed to public or project vehicular traffic wearing reflectorized or high visibility vests? 		

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Yes/Sat	No/Unsat	N/A	Competent Person:	Date:	Notes/Corrections
			Excavation Location:		
			Scope of Work:		
			Personnel will enter this excavation? <input type="checkbox"/> yes <input type="checkbox"/> no		
			Inspection items	Notes/Corrections	
			Overhead Hazards		
			<ul style="list-style-type: none"> • Employees are not exposed to overhead loads handled by lifting or digging equipment? 		
			<ul style="list-style-type: none"> • Are employees protected from rock falls and sloughing soils? 		
			<ul style="list-style-type: none"> • Are employees protected from excavated or other material and equipment by placing this material a minimum of two (2) feet from the edge of excavations or by the use of retaining devices? 		
			Is there a potential for hazardous atmospheres? Or, is this excavation deeper than 4-feet and considered a confined space?		
			<ul style="list-style-type: none"> • Confined Space Permit is appropriate? 		
			<ul style="list-style-type: none"> • Are atmospheric hazards adequately tested/controlled? Attach or reference necessary monitoring results data sheets. 		
			<ul style="list-style-type: none"> • Is emergency rescue equipment such as SCBA, safety harness and line, or basket stretcher readily available and attended when hazardous atmospheric conditions exist? 		
			Water Accumulation Hazards		
			<ul style="list-style-type: none"> • Has water accumulation been factored into the soil classification? 		
			<ul style="list-style-type: none"> • Is water being controlled or prevented from accumulating in excavation by the use of water removal equipment? 		
			<ul style="list-style-type: none"> • Is water control equipment operation being monitored by a competent person? 		
			Slips, Trips, Falls		
			<ul style="list-style-type: none"> • Are standard guardrails provided on walkways/bridges that cross excavations? 		
			<ul style="list-style-type: none"> • Are all remotely located excavations adequately barricaded or covered? 		
			<ul style="list-style-type: none"> • Are rope grabs or footing controls provided for steep/slippery slopes? 		
			<ul style="list-style-type: none"> • Housekeeping is adequate? 		
			Other notes:		

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Yes/Sat	No/Unsat	N/A	Competent Person:	Date:	Notes/Corrections
			Excavation Location:		
			Scope of Work:		
			Personnel will enter this excavation? <input type="checkbox"/> yes <input type="checkbox"/> no		
			Inspection items		Notes/Corrections

<p>Name of Competent Person:</p> <p>Verification Excavation is Safe for Activities and Conditions and Controls Noted: <input type="checkbox"/> yes</p> <p>Signature:</p>

Appendix H
Confined Space Plan

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TITLE: **Confined Space Entry Plan**

Reviewed and Approved By:
David Hardy, CHST, PHSM

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A. Purpose / Scope

The purpose of this program is to establish a minimum compliance program for Foth Infrastructure & Environment/Envirocon Joint Venture (FE JV) personnel to comply with OSHA's Confined Space Standard (29 CFR 1910.146).

In most confined space entry situations, FE JV personnel will be entering the confined spaces "host employer" NSPW (see 29 CFR 1910.146(c)(8)). In such cases, it is FE JV's intention to meet and/or exceed the requirements of NSPW Contractor Safety System as well as the OSHA Confined Space Entry Standard. With regard to permit forms, postings, labels, logs, and other administrative processes, FE JV will defer to NSPW forms and processes provided they comply with Envirocon's program and the OSHA standard(s).

Regardless of the of the host facility procedures, FE JV will designate a confined space supervisor for all confined space entries. This supervisor must be familiar with the host facility requirements as well as Envirocon's procedures; and ensure that the process practiced on the job site meets or exceed the requirements of both.

B. Reference Documents

- Federal OSHA Confined Space Standard 29 CFR 1910.146.
- NIOSH Criteria Document "Working in Confined Spaces" Dec. 1979
- American Petroleum Institute Publications 2217, 2217A and 2015.
- NSPW Contractor Safety System

C. Definitions

1. Atmosphere

Generic term for gases, vapors, mists, fumes, and dusts within a confined space.

2. Atmosphere Testing/Air Monitoring

The use of a combustible gas/oxygen meter and/or a gas-specific instrument to monitor the atmosphere inside a confined space.

3. Attendant

Attendant as defined in OSHA 29 CFR 1910.146, means an individual stationed outside the permit-required confined space who is trained as required by this standard and who monitors the authorized entrance inside the permit-required confined space. This person does not have duties that will take him/her away from the confined space while workers are inside.

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4. Confined Space

A space with one or more of the following traits:

- a. Limited openings for entry and exit
- b. Limited natural ventilation
- c. Toxic or oxygen-deficient atmospheres
- d. Potential for engulfment or entrapment
- e. An area that is not designed for continuous occupancy
- f. An excavation deeper than 4-feet

Examples are storage tanks, underground sumps, pipelines, pits, trenches, tunnels, ship holds, etc.

5. Confined Space Entry Permit

- a. A NSPW Contractor Safety System form which needs to be filled out prior to any confined space entry. Complete use of the form will insure that all health and safety considerations have been addressed prior to entry.
- b. This form is signed by the Confined Space Supervisor, attendant, and authorized entrants and acts as a permit for the entry.
- c. The second side of the form contains a section for recording air monitoring and equipment calibration data (see Section 28, Forms).
- d. This permit must be saved for 1 year.

6. Downgraded Space

Confined spaces may be downgraded to a non-permit space permanently or temporarily using one of the following means.

- a. (c) (7) downgrade to non-permit status

This is a permanent downgrade by reclassification of a confined space previously classified as a permit required confined space. This downgrade is accomplished in accordance with 29 CFR 1910.146(c) (7).

- b. (c) (5) downgrade space

A confined space which has been downgraded to a non-permit status based on the requirements of 29 CFR 1910.146(c)(5).

FE JV personnel will only downgrade a space under this rule on a temporary basis for a certain period of time. This downgrade must be documented in accordance with the host facility requirements OR by noting the downgrade status on an issued

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confined space entry permit. (e.g., under the rescue provisions of the permit indicate the use of (c)(5) alternate procedures.

7. Engulfment

The surrounding and effective capture of a person by a liquid or flowable solid substance with sufficient force to cause death by strangulation, constriction, or crushing.

8. Entry

The action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

9. Entry Supervisor

The person (such as the employer, foreman, Project Manager, etc.) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

10. Fall Protection

Equipment and procedures utilized to prevent falls while entering and exiting a confined space.

11. Hot Work

Any work being performed that presents an ignition or heat source. Examples are welding, grinding, burning, chop saw, abrasive disk usage, chipping, etc.

12. Inerting

- a. The process of purging the atmosphere of a space with an inert gas (one which will not support combustion) to eliminate the potential for fire or explosion.
- b. The typical gas used will be either carbon dioxide or nitrogen.
- c. Inerting does not remove the source of flammable vapor (i.e., flammable liquids), but instead removes the oxygen/flammable vapor **above the liquid**.

13. Intrinsically Safe/Explosion Proof

- a. Electrical equipment which does not present the potential for electrical spark and/or which is designed and constructed to contain any fire or explosion inside the unit preventing propagation of fire back into the general environment. This equipment has been certified as safe for use in flammable atmospheres.

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- b. The majority of equipment is certified by Underwriter Laboratories (UL) or Factory Mutual (FM).
- c. At a minimum, equipment must be rated as Class 1, Division 1 for use around flammable vapors.
- d. In addition, the equipment must be rated for the group type of atmosphere present. See Atmosphere Group definitions.
- e. At a minimum, all electrical equipment taken into a space containing (or previously containing) flammable liquids or vapors (in excess of 10% LEL) will be certified by the manufacturer for that purpose.

14. Isolation

The act of ensuring that the space cannot be accidentally refilled with product and/or re-energized electrically or mechanically while personnel is inside.

15. Local Exhaust Ventilation

The use of an exhaust system, at the point of contaminant generation to capture generated contaminants and keep them from dispersing into the overall area. Discharge from this system must be directed to a safe location. Note: some discharge airborne contaminants (i.e., asbestos, PCBs, lead) and will require HEPA filtration.

16. Lockout

- a. The act of physically locking out electrical, hydraulic, or pneumatic controls and/or mechanical linkage to ensure isolation.
- b. Typically performed by lock and key or the physical removal of key components that make it impossible for a system to be restarted while personnel are working on or inside the system.

17. Mechanical Ventilation

A method of providing dilution ventilation into a confined space. Typically provided by electrically powered or air-driven blowers.

18. Natural (Gravity) Ventilation

Ventilation provided to a space by nonmechanical means. Air diffusing into a space opening (without aid of blowers or fans) is considered natural ventilation. This is **not** an effective method for ensuring the safety of personnel and/or reducing the flammability potential inside the confined space.

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19. Non-Permit Confined Space

"Non-permit confined space" means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

20. Oxygen Deficiency

An atmosphere where oxygen concentration is less than 19.5% by volume. State and federal safety regulations require that personnel wear air-supplied respirators in oxygen-deficient atmospheres.

21. Oxygen Enriched

An atmosphere where oxygen concentration is greater than 23.5% by volume. Fire and explosion potentials are increased greatly.

22. Permit-required confined space (permit space)

A permit space means a confined space that has one or more of the following characteristics:

- a. Contains or has a potential to contain a hazardous atmosphere;
- b. Contains a material that has the potential for engulfing an entrant;
- c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- d. Contains any other recognized serious safety or health hazard.

23. Rescue Person

- a. A rescue team will be required for all permit-required confined space entries.
- b. A person trained in accordance with the requirements of 29 CFR 1910.146 for the purpose of conducting rescue.

24. Retrieval Equipment

- a. Mechanical hoist equipment designed to raise and lower personnel from a space. This equipment is attached to a tripod or other supporting structure which is capable of being a support platform for other fall protection equipment.
- b. All equipment used for raising or lowering personnel will be rated for such operations by the manufacturer.

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25. Saddle Vent

A piece of equipment that allows a ventilation duct to be placed in a manhole and still allow personnel to enter/exit without the duct being removed. This allows continuous ventilation inside the space.

26. Unknown Hazard

A space where the hazard potential is unknown. Air monitoring from outside the space is unable to determine if all areas inside are free of hazard. In these cases, personnel will consider the space high hazard.

27. Zero Mechanical State (ZMS)

The point where all power sources, that can produce a hazard to an employee, have been neutralized. This includes all pneumatic, electrical, and mechanical components.

D. Host Facility Requirements

The host facility requirements are documented in the OSHA standard beginning at 29 CFR 1910.146(c)(8).

“When an employer (host employer) arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

- Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section;
- Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;
- Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;
- Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by paragraph (d)(11) of the standard; and
- Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

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E. Training

A FE JV Competent Person will provide training to all personnel whose duties involve entry, supervision, or support duties for confined space entry.

1. Training will be provided:

- a. Before the employee is first assigned duties;
- b. Before there is a change in assigned duties (this includes in particular a change in host employer confined space entry program);
- c. Whenever there is a change in permit space operations that presents a hazard that the employee has not been trained in;
- d. Whenever there are deviations from the permit space entry procedures or inadequacies in the employee's knowledge.

2. Contents

FE JV 's training will contain the following:

- a. Respirator use (job specific);
- b. 29 CFR 1910.146;
- c. Envirocon's Confined Space Policy;
- d. Permit conditions at jobsite;
- e. Use of Ventilation System at jobsite;
- f. Atmospheric sampling and test devices;
- g. Combustible Gas Indicator; and
- h. Use of a PID.
- i. Use of rescue and support equipment;
- j. Emergency rescue procedures/practice;
- k. Duties of entrants
- l. Duties of attendants
- m. Duties of supervisors
- n. Required personal protective equipment; and
- o. Communication systems

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3. Rescue Training

Rescue teams will receive special additional training in accordance with the standard, and shall be certified accordingly.

4. Site-specific Training

In addition to the above listed training, employees shall also receive a site-specific training in the applicable host-employer's confined space entry program requirements for the work tasks to be performed on that facility.

5. Certification

Each employee will be issued a certificate upon completion of this training. The certificate will contain the following information:

- a. Name of employee trained;
- b. Date of training; and
- c. Signature of person who conducted the training.

F. Potential Hazards

The following represent the general hazards that can be expected in the variety of confined space jobs FE JV personnel have or will be exposed to. Each hazard must be assumed until proved otherwise:

1. Atmosphere

- a. Insufficient or enriched oxygen.
- b. Toxic dusts, mists, fumes, smoke, vapor, and gas.
- c. Flammable and explosive gases, liquids, vapors, and dusts.

2. Access

- a. Inadequate access opening for entry/egress and internal obstructions hampering movement.
- b. Inadequate illumination.
- c. Slippery surfaces including ladder rungs, baffles, and tank floors.

3. Mechanical

- a. Start up of agitators, tumblers, crushers, mixing blades, screw conveyors, saws, etc.
- b. Opening of feed lines which introduce corrosives, heated or gaseous substances such as steam, water, blast furnace gas, or other substances hazardous to health.

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4. Engulfment

- a. Avalanche of materials or falling objects.
- b. Pressurized lines containing hydraulic oil, gas, or other fluids.

5. Electrical

Electrical shock or electrocution from plug-in lights, tools, or other portable equipment.

6. Physical

- a. Temperature extremes.
- b. Naturally occurring radioactive materials (NORM).
- c. Bites from snakes, spiders, insects, and/or rodents.

7. Chemical

- a. Contact with contaminated soil or water

G. FE JV Procedures

Failure to follow this policy will be considered a serious violation of FE JV safety policy and will result in disciplinary action.

1. NSPW Facility Procedure

Follow all NSPW procedures at a minimum. Where FE JV procedures are more protective, follow FE JV procedures. Where FE JV procedures are more protective, and following the FE JV procedures would result in a conflict with the host facility procedures, notify your supervisor immediately and do not proceed with entry until a FE JV CIH or CSP has resolved the conflict.

2. Training

- a. Every person tasked with working in or providing support for confined space entries shall have training in the hazards and correct procedures before initial entry into confined spaces.
- b. Project Managers are responsible for ensuring that all personnel entering a space are thoroughly trained in this procedure. Special emphasis must be placed on ensuring that personnel can perform rescue operations efficiently.

3. Classification

The host facility will have classified their confined spaces in accordance with their procedures and program. The designated FE JV safety competent person (e.g., site safety officer) shall independently re-assess client postings prior to allowing FE JV personnel to enter a potential confined space.

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- a. A confined space entry decision must be based upon the results of air monitoring and knowledge of chemical properties (odor thresholds and other warning properties) and the limitations or respiratory protection (cartridge maximum allowable concentrations and breakthrough times).
- b. Lack of knowledge concerning the airborne concentrations of contaminants or the type of contaminant present will be reason to classify the space as most hazardous.
- c. OSHA stipulates that a confined space is categorized as permit or non-permit required. **FE JV considers all confined spaces as permit required, until a hazard evaluation form has been completed to downgrade the space to a non-permit required space.**
- d. In most cases it is preferable to downgrade spaces temporarily using the (c)(5) rules. Even though the space is technically a non-permit space, a confined space permit shall be used to document the applicable period of temporary downgrade, to document that the downgrade conditions have been tested and met, and to control entry into the space.

4. No Entry Conditions

Envirocon's policy forbids entry into confined spaces under any one of the following conditions:

- a. LEL > 10%; or
- b. Oxygen < 19.5% or > 23.5% (no entry into inerted or enriched spaces); or
- c. Unable to monitor space prior to entry; or
- d. Entry sizes that require PPE removal; or
- e. Spacial configurations that prevent rescue.

5. IDLH Atmospheres

- a. Oxygen Deficient Atmospheres

Any oxygen concentration less than 19.5% by volume could be considered IDLH because:

- (a) Some LEL meters will not function below 19.5%, and therefore will not give accurate readings.
- (b) In the event of airline failure, individual would have limited time to accomplish self-rescue.

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FE JV personnel are not to enter (the whole body passing through the Plane of Entry) oxygen IDLH atmospheres, including tanks that have deliberately been inerted by removing oxygen for the purpose of making them safe for hot work, **until oxygen levels are brought up to at least 19.5%**. Note that 19.5% is safe for entry, but would still require Level B respiratory protection.

b. Toxic Gas or Vapor Atmospheres

Decisions to enter a space deemed IDLH (referring to a toxic gas or vapor) must be made in conjunction with the Envirocon Industrial Hygienist or Corporate Health and Safety Director.

As a general rule, Envirocon policy will be to avoid entry in these conditions. However, many chemicals have extremely low IDLH levels that cannot feasibly be lowered by ventilation.

Note that an IDLH atmosphere resulting from a toxic gas or vapor does not necessarily offer the same immediate hazard as extreme oxygen deficiency

6. Ventilation

- a. The need for ventilation will be dependent upon LEL/PEL levels.
- b. All ventilation and pumping equipment will be bonded and grounded.
- c. Mechanical ventilation will be initiated prior to entry in any spaces to dilute or maintain flammable levels at 10% LEL or less or reduce purge/dilute toxic atmospheres below IDLH.

7. Entry Requirements

All entries into spaces with known or potentially hazardous conditions will be directly supervised by a FE JV Manager completely familiar with this procedure. This Manager will be in attendance whenever personnel are inside the space and is responsible for enforcing all the provisions contained in this procedure, host facility requirements, and 29 CFR 1910.146.

a. Entry Opening Size

An 18- to 24-inch diameter opening will be the minimum size for the majority of personnel.

In no case will it be acceptable that personnel remove protective equipment (with the intent on donning it once inside) to facilitate entry into a small opening.

And in no case will a person be allowed to enter if, by virtue of their size, they are the only employee small enough to enter.

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b. Fire and Explosion Prevention

No matches, lighters, items capable of producing a spark or flame, non-approved radios or monitoring equipment, flashlights, lanterns, etc., shall be used in or within 25 feet of a confined space containing or potentially containing flammable vapors or gases.

c. Termination of Operation

Entry operations will be terminated (or not started) in the event of failure of:

Air monitoring equipment

PPE including respiratory protection; and

Rescue equipment.

Operations will not resume until all repaired equipment is repaired or replaced.

d. Any deviations from this procedure will require the approval of the Corporate Safety Manager.

H. Entry Procedure

1. Confined Space Hazard Identification

- a. Before employees are permitted to enter a confined space, the hazards must be identified and evaluated.
- b. The severity of hazards will be determined in order to classify the confined space entry as a high hazard or low hazard entry.
- c. Each space will be monitored prior to entry.
- d. A space will always be classified as worse case if air monitoring data is not available.

2. Required Level of Protection

Will follow standard 29 CFR 1910.120 guidelines and the Ashland/NSP Lakefront Site HASP.

- a. Classification of contaminant environment regarding chemical properties and routes of entry, IDLH, and cartridge limitations. .
- b. Level C or D respiratory protection will require supportive air monitoring documentation.

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3. Confined Space Entry Permit System

Where required, FE JV will use the established host facility permit system. When allowed by NSPW, FE JV will use its own permit forms.

- a. FE JV permits shall be used for the following:

Authorizing entry into a permit-required confined space.

Temporarily (for a specified period of time) downgrading a space under the 29 CFR 1910.146(c)(5) rules.

- b. A FE JV Entry Permit shall be completed prior to entry into any confined space.

- c. This permit must be signed by the responsible FE JV Supervisor.

- d. The permit shall be available at the worksite location of the confined space and shall be dated and valid for one shift only. Contact Corporate Health and Safety for additional copies.

- e. All questions on the form must be filled out.

- f. When answering the questions on side 1 of the permit:

In some cases, a "n/a" is appropriate and would indicate that the specific item does not apply to the situation. Use caution when deciding that the item is "n/a"; and

Special attention must be directed to any question where the answer is "no". A "no" answer may indicate that adequate precautions have not been taken or that a hazard possibly continues to exist.

- g. The Entry Permit cannot be completed until all pre-entry testing and sampling have been accomplished. **The permit must be filled out at the site under actual working conditions.**

- h. The project Safety Officer, as named on the entry permit, shall evaluate, plan, and implement the procedures necessary to safeguard the personnel assigned to the job. He/she has responsibility to evaluate/approve any "n/a" or "no" answers on the permit.

- i. OSHA 29 CFR 1910.146 requires that all permits be saved for 1 year.

4. Required Personnel

- a. Entry Supervisor

FE JV Project Manager is responsible for evaluation of the confined space and authorization of personnel to enter. Duties include:

Enforcing the confined space procedures and permit requirements;

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Ensuring Confined Space Entry Permits are posted and that a confined space authorized Attendant is present during all entry activities;

Ensuring that all personnel have received proper training in confined space entry procedures and proper use of safety retrieval equipment in an emergency;

Ensuring that all necessary safety retrieval equipment is on site, operational, and properly deployed prior to entry;

Ensuring that appropriate measures are implemented so that confined spaces will not be inadvertently entered by employees in the area; and

Authority must be documented in writing on the confined space permit.

b. Support Personnel

Entry into a confined space shall be made only when enough outside support personnel are available to handle communication, support equipment, and to provide assistance or emergency aid as necessary.

The number of personnel needed for support will be based on the complexity of the project.

Complex projects can require five supporting personnel for one entry person.

c. Attendant

All space entries require an Attendant assigned to the project. This person's duties include maintaining communication and providing necessary assistance to workers inside.

Communications with inside personnel **must be direct** (either radio or audible voice).

This individual's primary responsibilities are:

- (a) Remain outside the space;
- (b) Know hazards that may be present;
- (c) Maintain count and communication with entrants;
- (d) Observe space for changing conditions;
- (e) Prevent unauthorized entry while space is open; and
- (f) Calls for rescue if emergency occurs.

The assigned Attendant(s) cannot leave a confined space area unless they are immediately replaced with another attendant.

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d. Authorized Entrant(s)

Specific employees (named on the Confined Space Permit) that are trained, correctly attired, and authorized by the supervisor to enter the confined space.

e. Rescue Person/Team

A team of qualified rescuers is required to be specifically identified and provided for in accordance with 29 CFR 1910.146 for all permit-required spaces.

For circumstances where an IDLH or flammable atmosphere may be encountered; and for entries into unknown atmospheres, and awkward spacial configurations preventing unaided remote rescue the following additional requirements shall be met:

This individual must be dressed in the same level of protection as the entry person.

He/she must be stationed at the opening to the space **in direct line of sight** or contact with those inside.

This person will be on station the entire time that operations are being conducted.

Complex entries **may require** two Rescue Persons; this person will be equipped with supplied air respirator and harness/retrieval line.

5. Atmosphere Air Monitoring

a. Prior to entry, all spaces will be initially tested for flammable gases, vapors, and oxygen deficiency, plus toxic vapor or gases (based on the potential for toxics being present).

b. OSHA requires that the monitoring be conducted in the following specific order:

Oxygen;

LEL; and

Toxic gases and vapors.

c. The person assigned the task of monitoring shall know the proper procedure for calibration and operation of all sampling equipment in accordance with manufacturer's or Envirocon's Standard Operating Procedures for Combustible Gas/Oxygen Meters and Toxic Gas Specific Monitoring Instruments.

d. Each instrument used will be thoroughly tested prior to daily use to ensure that it is properly calibrated and that it is functioning properly.

e. CGIs or direct reading Toxic Gas Meters will **not** be used for certifying an area "safe for entry" if their calibration has not been confirmed with the appropriate calibration gas.

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- f. Monitoring readings will be made from bottom to top and in all remote sections of the space.

Remote monitoring lines will be utilized to negate the need to enter the space for monitoring.

- g. Monitoring personnel must always confirm that a lack of LEL reading is not caused by low oxygen concentrations.
- h. All air monitoring results and equipment calibrations will be recorded on the back of the FE JV Entry Permit Form.
- i. It is recognized that the condition in some spaces may change over time. Initial testing may underestimate hazards in these situations.
- j. Continuous monitoring inside the space for flammables, oxygen deficiency, and/or toxic gas and vapors:

Will be necessary where inside conditions could rapidly change.

Example situations would include when welding or cutting inside the space; using solvents to clean inside surfaces; cleaning operations disturb contaminants so that previously covered contaminants could become airborne; dismantling pipe work or other structures that could contain contaminants; etc.

- k. Once ventilation is started, periodic checks should be made of the surrounding area (where the contaminated air is exhausted) to ensure that no hazard is presented to people or equipment.
- l. Personnel will be removed from the area if monitoring demonstrates that ventilation is not sufficient to maintain the atmosphere below 10% LEL or if oxygen levels dip below 19.5%.

6. Isolation/Lockout/Zero Mechanical State (ZMS)

- a. Before entering any confined space, personnel will take sufficient steps to ensure that it is impossible for toxic contaminants or potentially hazardous products to re-enter a space and that all potentially hazardous conditions (involving electricity or other stored energies) are brought to a ZMS.
- b. All requirements of the OSHA Lockout/Tagout Operating Procedure will be followed.
- c. While performing work at a non- FE JV location, it is not always possible to have total control over a client's employees or property. The Project Manager will stop operations if there is any doubt concerning employee safety and will contact the Corporate Health and Safety Manager to ensure that adequate steps are being taken.

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Ashland/NSP Lakefront Confined Space Entry Plan

TITLE: **Confined Space Entry Plan**

Reviewed and Approved By:
David Hardy, CHST, PHSM

7. Mechanical Ventilation

- a. The method chosen to ventilate the space (making it positive pressure by blowing air into it or making it negative pressure by drawing air out of the space) will be made based on site conditions. Either method can effectively dilute contaminant concentrations to acceptable levels.
- b. Any ventilation equipment or duct work exposed to flammable gases or dusts **must** be bonded and grounded prior to use.
- c. Electrical fans

Will not be placed inside a space that contains flammable vapors.

Do not draw (suck) flammable vapors from a space through a fan regardless of the distance of the motor from the confined space. This presents a hazard of drawing flammable vapors through an ignition source producing an explosion or flashback.

When using fans, flexible tubing or duct work will be used to distribute air into the space.

- d. Continuous ventilation criteria

General dilution ventilation will be continuous at a minimum rate of five (5) air changes per hour for oxygen deficiency and 10 air changes per hour for toxic or flammable atmospheres.

Dilution ventilation is not always sufficient to ensure that toxic environments are rendered safe (below PEL or IDLH concentrations).

Initial or continuous ventilation is not needed if there is **NO** possibility of contaminant generation while personnel are inside.

- e. Contaminants displaced from a space:

Will present exposure potentials to outside personnel;

This discharge can possibly accumulate and form flammable or explosive concentrations;

Any potential exposure must be monitored with appropriate PPE upgrades being made as necessary;

Contaminated air needs to be discharged in an area that is not occupied and/or in an downwind location. This is accomplished by directing the exhaust from the space through plastic flex hose to a safer area; and

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Be aware of local air pollution district requirements prior to tank ventilation.

- f. Local exhaust ventilation (inside the space at the point of contaminant generation) shall be provided when mechanical dilution ventilation is not capable of preventing the point source contaminant from producing unacceptable high concentrations throughout the area. Example: spreading a flammable solvent on a surface inside a tank.
- g. **It is not acceptable that ventilation equipment block the entrance of a confined space.**

When entering manholes or other small openings, a saddle vent can be utilized if the duct work will interfere with entry/egress.

An alternative is to use flexible poly tubing which can be easily compressed which will allow passage without removal.

- h. Fans or blowers used for mechanical ventilation shall be located so they will not discharge exhaust gases from vehicles, heaters, furnaces, or adjacent operations capable of generating airborne contaminants into the space.
- i. Duct work should be placed so that unnecessary bends are eliminated. Metal elbows or corners may be purchased to avoid pinching the airflow.
- j. Negative pressure can be provided by placing the inlet of the blower inside the space with the discharge directed outside. This method is effective in drawing clean air into the space, but is not as effective (in producing uniform dilution of contaminants) as blowing directly into the space.

8. Safety Equipment

The following equipment requirements are to be considered minimum. The equipment must be present and operational prior to start up and initial entry of the individual.

- a. Oxygen and Combustible Gas Indicators, calibration kit, all accessories including remote sample line and in-line filters, instruction manual, and response charts and graphs to test for and interpret the flammable atmosphere.
- b. Photo Ionizing Detector, detector tubes, or direct reading toxic gas meters as appropriate to determine toxic content of atmosphere.
- c. Mechanical ventilation equipment, i.e., blowers, compressor, hoses, and auxiliary equipment as designated for the confined space.
- d. Respiratory/face protection

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The exact level and type shall be determined by the Project Health and Safety Officer based upon the conditions and test results of the confined space and the work activity performed.

All respirators shall be NIOSH/MSHA-approved devices and shall be fitted and maintained in accordance with the Envirocon Respiratory Protection Policy.

Eye protection will always be worn when a splash or flying object hazard exists.

An additional standby air source with attached airline and regulator

Will be necessary for entries into Restricted Entry spaces, where there is any possibility that the 5-minute egress will not provide a good margin of safety for getting out in an emergency. Lines will be coiled and ready for immediate use near the opening.

e. Body/hand/foot protection

All workers entering a confined space shall wear protective clothing sufficient to protect the wearer against known or suspected toxic or irritating materials.

Specific types of suit material will be described in the Confined Space Permit.

f. Hearing protection

Equipment operation and ventilation system operation results in increased noise levels in confined spaces. Hearing protection shall be used when elevated noise levels are present.

g. All workers shall wear a hard hat.

h. Rescue equipment

The specific type and degree of rescue equipment will depend upon the nature of the confined space with regard to access/egress. This decision would take into account the exact manner in which the individual can be feasibly extracted (i.e., by the wrists, waist, straight up) and the accompanying strain to the persons body.

A body harness/belt is required when an employee is working in an area that, for purposes of rescue, is considered restricted and when any failure of ventilation could allow the build-up of toxic or explosive gases within the time necessary to vacate the area.

A full-body harness is required for any vertical entry greater than 5 feet.

An ANSI-approved restraint belt will usually be satisfactory for horizontal entry.

If the worker in the confined space is required to wear a harness, the Rescue Person shall also have a safety harness and air supplied respirator immediately available.

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Ashland/NSP Lakefront Confined Space Entry Plan

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Mechanical rescue/extraction equipment:

Such as tripod, block and tackle, and lifelines will be available, set-up, and in working order prior to entry if needed to remove a worker from a confined space; and

This equipment must be capable of being hand operated and reversible.

The Safety Officer on the project can make a decision to disconnect lifelines if it is felt that the lines present an undue hazard or hindrance to routine operations.

i. Radio communication

Radios should be provided as the primary means of direct communication with personnel inside a confined space if direct visual contact is impractical.

Confined Space Entry Permit

JOB NAME: _____ Location: _____				
DESCRIPTION OF SPACE: _____				
TASK: _____				
CONTAMINANTS: _____				
SPECIAL HAZARDS: _____				
	Print Name:	Pre-entry Briefing Signature		
Supervisor:				
Attendant:				
Entrants:				
Classification of Space: <input type="checkbox"/> NO ENTRY: if any of the following conditions: _____ LEL > 10% _____ Oxygen < 19.5% or > 23.5% _____ Unable to monitor _____ > IDLH <input type="checkbox"/> PERMIT REQUIRED CONFINED SPACE (RESTRICTED ENTRY): Requires Escape Provisions <input type="checkbox"/> (c)(5) Alternate rules (temporary downgraded of space, rescue provisions not required). Document/monitor conditions as follows: <input type="checkbox"/> space has been ventilated to airborne hazards less than established exposure limits <input type="checkbox"/> no other serious (i.e., confined space) hazards exist (e.g. engulfment hazards or converging walls). <input type="checkbox"/> NON-PERMIT CONFINED SPACE <input type="checkbox"/> ENCLOSED SPACE				
PRE-ENTRY CHECKLIST		YES	NO	N/A
Training:	All workers have completed training in Confined Space Procedure?			
	All personnel listed above have been briefed on permit procedures prior to entry?			
	Communication procedures are thoroughly understood?			
Permits:	All chemical and gas delivery lines are disconnected and/or capped?			
	Stored electrical, mechanical, pneumatic power sources reduced to zero energy?			
	All Lockout/Tagouts in place and permits issued as needed?			
	Gas hazard addressed and hot work permits issued as needed?			
Monitoring:	Monitoring equipment has been calibrated/span checked?			
	Initial Testing Completed (19.5%<O2<23.5% and LEL < 10%)			
	Ventilation has been established for and adequate or work which may generate gas hazard?			
	Exhausted air is ducted to a safe location?			
	Gas Hazardous locations have adequate ventilation to control vapor production?			
	Ventilation and liquid pumping equipment is bonded and grounded?			
	Is adequate explosion-proof lighting available?			
	All required safety equipment is available, tested - functional?			
	Rescue Procedure (if required for space classification) has been established?			
	Is there non-entry extraction for vertical depths >5 feet as part of plan?			
	Rescue personnel notified or standing by?			
	Support personnel trained in CPR/First Aid if rescue provisions required?			

Confined Space Entry Permit

PPE Requirements		Respiratory Protection Requirements	
<input type="checkbox"/> hard hat <input type="checkbox"/> safety glasses <input type="checkbox"/> face shield <input type="checkbox"/> steel toed safety boots <input type="checkbox"/> flashlight <input type="checkbox"/> radio <input type="checkbox"/> emergency whistle/horn/other:		<input type="checkbox"/> SCBA, <input type="checkbox"/> Airline respirator, <input type="checkbox"/> with escape air <input type="checkbox"/> Air Purifying Respirator, <input type="checkbox"/> full face, <input type="checkbox"/> full face or half mask	
Chemical Protective Clothing (CPC). <input type="checkbox"/> outer garment <input type="checkbox"/> inner garment: <input type="checkbox"/> outer gloves: <input type="checkbox"/> inner gloves: <input type="checkbox"/> inner boots: <input type="checkbox"/> outer boots: <input type="checkbox"/> other:		<input type="checkbox"/> Cartridge type: <input type="checkbox"/> P100/HEPA, <input type="checkbox"/> organic vapor, or <input type="checkbox"/> other/combination: Cartridge change schedule: <input checked="" type="checkbox"/> change if odors detected or if difficult to breath <input type="checkbox"/> change cartridges beginning of each week <input type="checkbox"/> change cartridges daily <input type="checkbox"/> change cartridges as follows:	
		<input type="checkbox"/> Voluntary use for comfort of employee from odors or nuisances.	
Rescue Provisions (Optional for non-permit spaces and (c)(5) downgrade spaces.)			
<input type="checkbox"/> Tripod with Winch <input type="checkbox"/> Auxiliary Fall Block <input type="checkbox"/> Full body harness <input type="checkbox"/> Waist Belt <input type="checkbox"/> Ankle Cuff <input type="checkbox"/> Wrist Cuff <input type="checkbox"/> Rope Grab/Life Line <input type="checkbox"/> (c)(5) downgraded space alternate rules		Fire Department: Hospital: Ambulance: Emergency Decon:	
Monitoring Requirements			
Air Monitoring Requirements (initial and follow-up air monitoring must be documented on data form):			
	initial	during entry	action level
oxygen (first test)	<input checked="" type="checkbox"/>	<input type="checkbox"/> continuous <input type="checkbox"/> before re-entry <input type="checkbox"/> other:	< 19.5% or >23.5% requires special permit
combustible gas (2nd)	<input type="checkbox"/>	<input type="checkbox"/> continuous <input type="checkbox"/> before re-entry <input type="checkbox"/> other:	> 10 % LEL requires special entry permit
toxic (specify):	<input type="checkbox"/>	<input type="checkbox"/> continuous <input type="checkbox"/> before re-entry <input type="checkbox"/> other:	
		<input type="checkbox"/> continuous <input type="checkbox"/> before re-entry <input type="checkbox"/> other:	
APPROVAL: _____ / _____ <div style="display: flex; justify-content: space-between;"> supervisor's signature and name date / time </div> This permit expires at the end of the shift issued, or <input type="checkbox"/> other:			

Appendix I
Map to Hospital

Emergency Routes

Directions for medical evacuation and hospital routes: (see attached map)

301 Lake Shore Drive East, Ashland, Wisconsin 54806

Depart US-2 / Lake Shore Drive east toward 3rd Avenue East

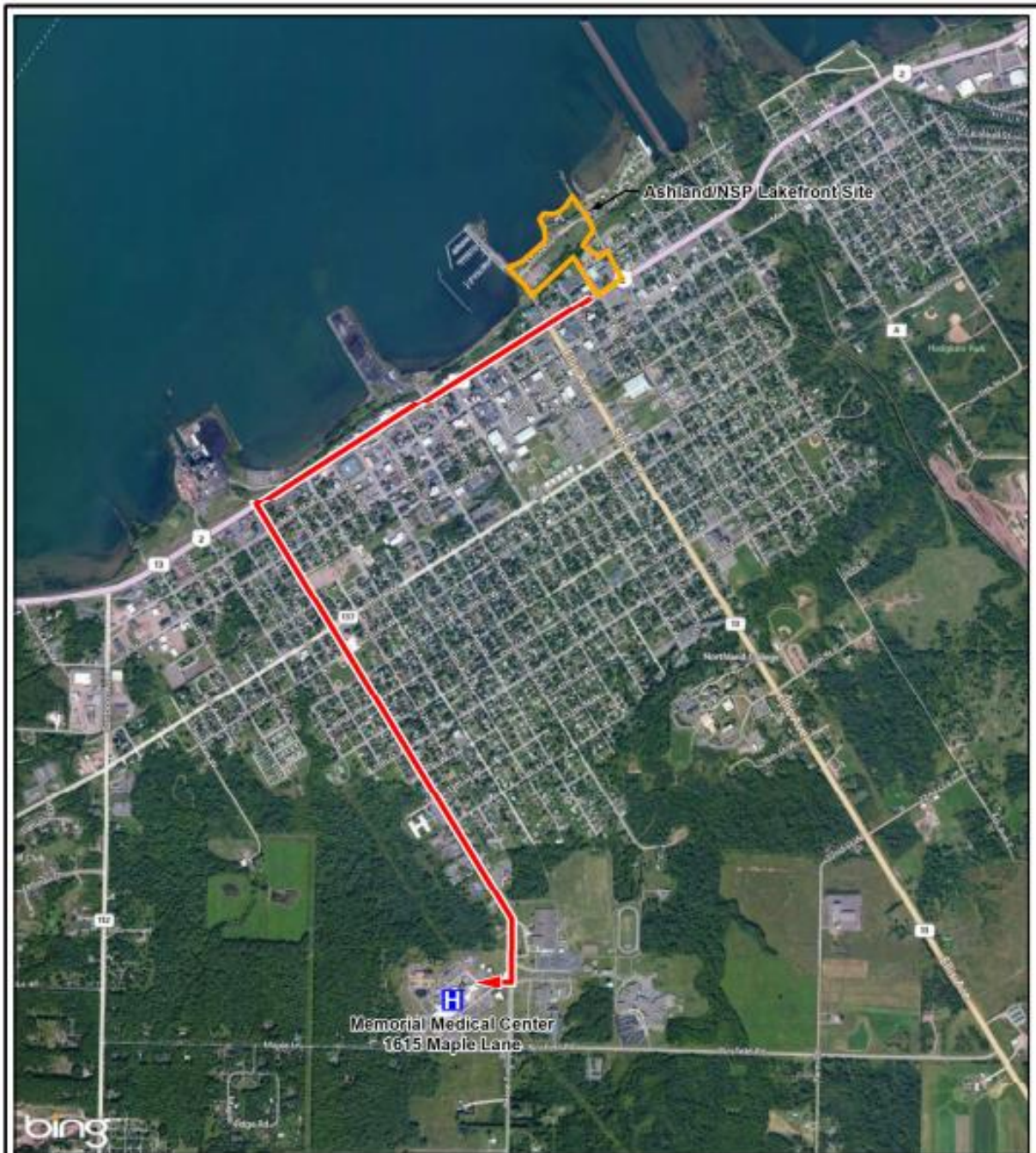
Turn left onto WI-13 / Ellis Avenue

Turn right onto 22nd / Ellis Avenue

Road name changes to Farm Road

Turn right onto Binsfield Road

Arrive at 1615 Maple Lane, Ashland, Wisconsin 54806

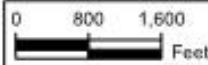


NOTES:

1. Base map from esri.com, courtesy of the Microsoft Corporation and its data suppliers.



This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only.



NORTHERN STATES POWER COMPANY

FIGURE 1
HOSPITAL ROUTE MAP
HEALTH AND SAFETY PLAN - ADDENDUM 1
ASHLAND/NSP LAKEFRONT SITE

Date: DECEMBER 2013

Revision Date:

Drawn By: BJW1

Checked By: JSK

Scope: 12X001

Path: X:\GB\IE\2012\12X001\GIS\mxd\hospital_route_map_a-size.mxd Date: 12/13/2013