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ADDENDUM 2 TO BASEWIDE WORK PLAN NAVY EXCHANGE GAS STATION  
REMEDICATION MILLINGTON SUPPACT TN  
7/1/2001  
CH2MHILL

**Addendum 02 to Basewide Work Plan  
NEX Gas Station Remediation**

**Naval Support Activity Mid-South  
Millington, Tennessee**

**Revision 02**

**Contract No. N62467-98-D-0995  
Contract Task Order No. 0061**

Submitted to:

**U.S. Naval Facilities  
Engineering Command  
Southern Division**

Prepared by:



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July 2001

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**CH2MHILL**  
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June 2001

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# Acronyms

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ACO	Administrative Contracting Officer
AALA	American Association for Laboratory Accreditation
AASHTO	American Association of State Highway and Transportation Officials
AFCEE	Air Force Center for Environmental Excellence
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Corrective Action Plan
CCI	CH2M HILL Constructors, Inc.
CFR	Code of Federal Regulation
CLEAN	Comprehensive Long-term Environmental Navy
CO	Contracting Officer
COTR	Contracting Officer's Technical Representative
CPM	critical path method
CTO	Contract Task Order
DO	dissolved oxygen
DQO	data quality objective
EISOPQAM	EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
EPA	Environmental Protection Agency
FID	flame ionization detector
gpm	gallons per minute
IDW	investigation derived waste
IRCDQM	Installation Restoration Chemical Data Quality Manual
LDR	land disposal restriction
mg/L	milligrams per liter
MS/MSD	matrix spike/matrix spike duplicate
NAVFAC	Naval Facilities Engineering Command
NEX	Naval Exchange
NIST	National Institute of Standards and Technology
NSA	Naval Support Activity
NTR	Navy Technical Representative
NVLAP	National Voluntary Laboratory Accreditation Program
OOD	Officer of the Day
ORP	oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer
PID	photoionization detector
POTW	publicly owned treatment works
PPE	personal protective equipment
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RAC	Response Action Contract

RCRA	Resource Conservation and Recovery Act
RPM	Remedial Project Manager
TAT	turnaround time
TCLP	Toxicity Characteristic Leaching Procedure
TDEC	Tennessee Department of Environment and Conservation
TPH-GRO	Tennessee Gasoline Range Organics
TPH	total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
UST	underground storage tank

# 1.0 Introduction

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CH2M HILL Constructors, Inc. (CCI) was contracted by the Department of the Navy, Southern Division Naval Facilities Engineering Command (NAVFAC), to prepare this Work Plan Addendum to perform remediation activities at Naval Support Activity (NSA) Mid-South, Millington, Tennessee. This work is being performed under Response Action Contract (RAC) No. N62467-98-D-0995, Contract Task Order (CTO) 0061.

## 1.1 Work Plan Addendum Organization

This Work Plan Addendum is organized into sections of text and appendices as follows:

**Section 1.0 Introduction** describes how this Work Plan Addendum is organized and includes the site description and history.

**Section 2.0 Project Execution Plan** includes the scope of work, traffic control plan, project schedule and communications plan.

**Section 3.0 Sampling and Analysis Plan** includes specific information for the sampling and analysis of the site. The Basewide Work Plan addresses project specific sampling and analysis issues for the activities to be completed at NSA Mid-South.

**Section 4.0 Waste Management Plan** provides specific information for handling wastes. The Basewide Work Plan discusses the characterization, disposal, handling, and transportation of wastes encountered or generated during work at NSA Mid-South.

**Section 5.0 Quality Control Plan** includes task-specific quality control information and project organization for this CTO. All other quality control information is contained in the Basewide Work Plan, including information in the quality administrators, the project organization for work at NSA Mid-South, and the definable features of work for each project site.

**Section 7.0 References** lists the references used in developing this Work Plan Addendum.

The following support documents are presented as appendices to this Work Plan Addendum:

- Appendix A CPM Project Schedule
- Appendix B Health and Safety Plan
- Appendix C Submittal Register
- Appendix D Testing Plan and Log

The Environmental Protection Plan has been prepared as a standalone document.

### 1.1.1 Background Site Information

The Naval Exchange (NEX) gas station is presently closed. During its operation, two 25,000-gallon and one 10,000 gallon underground storage tanks (USTs) supplied fuel to the seven pump island dispensers. Pipe and pipe joints have leaked gasoline into the surrounding area. The contaminants of the gasoline (benzene and total petroleum hydrocarbon- gasoline range organics (TPH-GRO)) have been released to subsurface soils and groundwater. ENSAFE conducted a site assessment to determine the plume of subsurface contamination.

A Corrective Action Plan (CAP) was developed in December 2000, to evaluate remedial alternatives for the site. The primary objective of this remedial action is to clean up the groundwater. This will be performed in two phases, the first being soil removal and the second is for removal of contaminated groundwater by pumping. The soil cleanup limit of 5 milligrams per kilogram (mg/kg) benzene and 100 mg/kg TPH (TN-GRO) from 0 to 5 feet and TPH of 500 mg/kg from 5 or more feet should reduce a further source of contamination of the groundwater at the site. These soil cleanup limits are based upon the State of Tennessee regulatory drinking water aquifer limit. Once the soil has been removed and sump recovery wells installed in the excavations, pumping of the groundwater will occur. BTEX and TPH-GRO contaminated water will be remediated by pumping and processing into a frac tank, sampling the water, and discharging the frac tank water to an oil/water separator. The treated water from the OWS will then be discharged to the sanitary sewer connected to the City of Millington publicly owned treatment works (POTW). This procedure should reduce the presence of gasoline contaminants in the groundwater to acceptable standards. After a maximum of three pumping events, if the level of benzene and TPH GRO remains above the State of Tennessee action limits, CCI will develop a site specific standard document to submit to the base for disposition of the site.

## 2.0 Project Execution Plan

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The scope of work activities, project schedule, and plans for traffic control and communications are described in this section.

### 2.1 Scope of Work Tasks

The scope of work for this remediation will consist of excavation of approximately 6,978 cubic yards of petroleum contaminated soil. Groundwater from the excavation will be pumped into a portable tank and then to the existing oil/water separator, which will be utilized to dispose the collected groundwater through the City of Millington POTW. During performance of this work, partial demolition of the canopy covering the pump islands is anticipated, as well as the removal of one pump island.

This scope of work will consist of the following activities:

- Prebid site visit (already performed)
- Mobilization
- Site preparation
- Preconstruction comprehensive groundwater sampling of the wells shown on Figure 2-1 (MEM-757-1 through 19 and MEM-757-B3 and -B4)
- Excavations of four areas
  - Building 757 and Pump Island 4 Area
  - Interceptor Trench Area
  - Oil/water Separator Area
  - Repair Service Building Area
- Partial demolition of the canopy over Pump Islands 4 through 7
- Demolition of Pump Island 4
- Pumping of the excavation groundwater into portable tank (Frac type tank) supplied by subcontractor, sampling and analysis for benzene and TPH-GRO, then discharged into the existing oil/water separator for 6 days minimum, and final disposition to the City of Millington POTW
- Sampling of groundwater during pumping operations
- Site restoration
- Onsite management of wastes (including soil and water) and construction debris
- Final decontamination and demobilization
- Quarterly sampling of selected wells for a period of 1 year and preparation of draft and final quarterly sampling reports in accordance with TDEC report format

It is anticipated that the excavated wastes associated with these activities will be petroleum contaminated. Petroleum contaminated media are not hazardous waste, even if they fail Toxicity Characteristic leaching Procedure (TCLP) for certain compound, because they are part of state UST/petroleum cleanup activities (40 Code of Federal Regulation [CFR] 261.4(b)(10)).

Site preparation activities will include installation of construction and traffic barricades, removal of surficial debris and protection of all existing utilities and structures. As needed, the site preparation activities will also include installation of roadway signs and security fencing.

A digging permit is required before any work progresses with this contract at the site. The digging permit will be obtained from NSA Mid-South prior to work commencing. In addition, the progress of excavation conducted with heavy equipment will be continuously monitored for evidence of subsurface obstructions.

The excavation areas will be surveyed and marked according to the proposed excavation limits shown on Figure 2-1 with paint or stakes, as appropriate by CCI. All wells located onsite will remain and be protected from damage from excavation activities.

### **2.1.1 Preconstruction Comprehensive Sampling Event**

All monitoring wells at the site will be sampled prior to any construction activities as described in Section 3.0 Sampling and Analytical Plan. Comprehensive monitoring will be performed within 72 hours prior to starting corrective action. Results of this sampling event will be submitted immediately to Navy for approval to proceed with the remediation. State approval will be obtained prior to the start of any remediation work.

### **2.1.2 Excavations**

Protection of all buildings, structures and existing wells will be required throughout all phases of this scope of work, including all excavations. Asphalt will be removed and stockpiled as appropriate and in accordance with all applicable Federal, state and local requirements. Personnel are not anticipated to be required to enter the excavations, so sloping or layback areas may not be required, however protection of the excavation and surrounding structures is required.

Excavation areas are identified on Figure 2-1 and are as follows:

- Building 757 Area and Pump Island 4 Area
- Interceptor Trench Area
- Oil/Water Separator Area
- Repair Service Building Area

Conceptual cross sections of the excavations for the Building 757, OWS, and Interceptor Trench Areas are shown on Figure 2-2. Once the physical dimension limits identified in the figure have been reached, immunoassay field tests will be performed, one per side wall, to determine if the limit concentration of 5 mg/kg benzene has been reached. No direct measurement by immunoassay for benzene is available, so correlation between benzene, toluene, ethylbenzene, and total xylenes (BTEX) and benzene measurements will be utilized

It is anticipated that the excavated wastes associated with these activities will be petroleum contaminated. Petroleum contaminated media are not hazardous waste, even if they fail Toxicity Characteristic leaching Procedure (TCLP) for certain compound, because they are part of state UST/petroleum cleanup activities (40 Code of Federal Regulation [CFR] 261.4(b)(10)).

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### **2.1.2 Excavations**

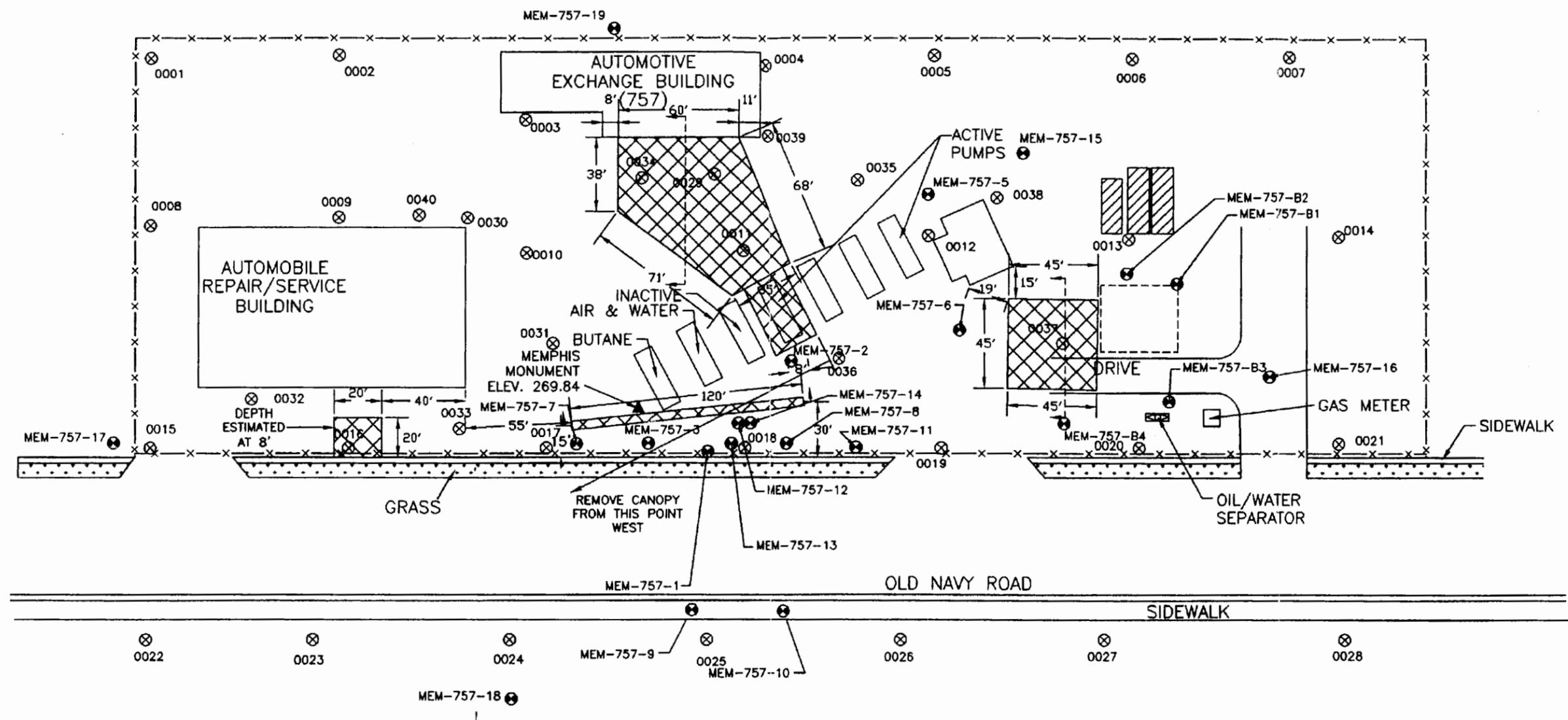
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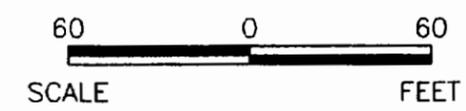
Conceptual cross sections of the excavations for the Building 757, OWS, and Interceptor Trench Areas are shown on Figure 2-2.

Approximately 100 linear feet of sheeting will be installed along the south wall of building 757 to prevent damage to the existing structure. In addition, 40 linear feet of sheeting will be installed south of Pump Island 4 if needed, only if contamination does not extend south of the Pump island. If contamination is present, no sheeting will be installed on the south side

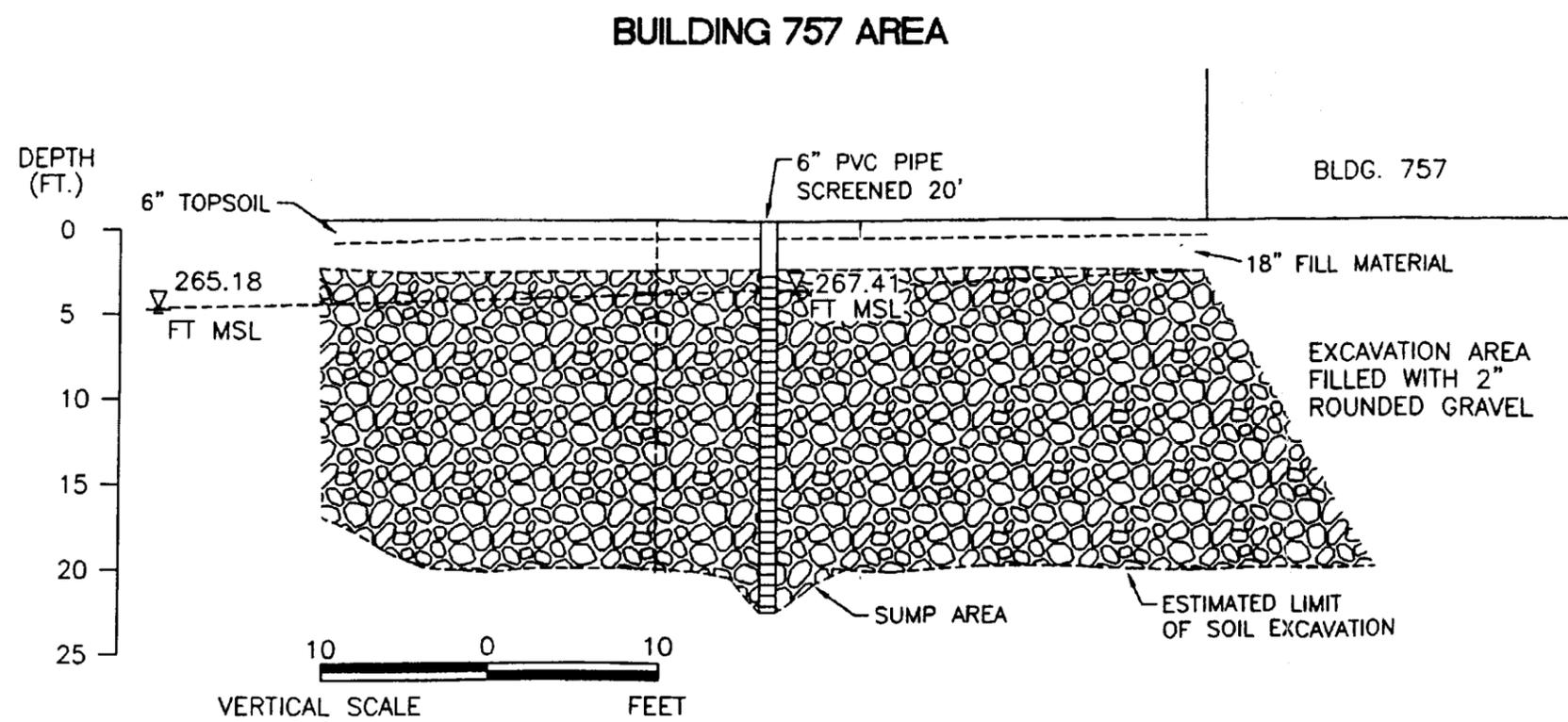
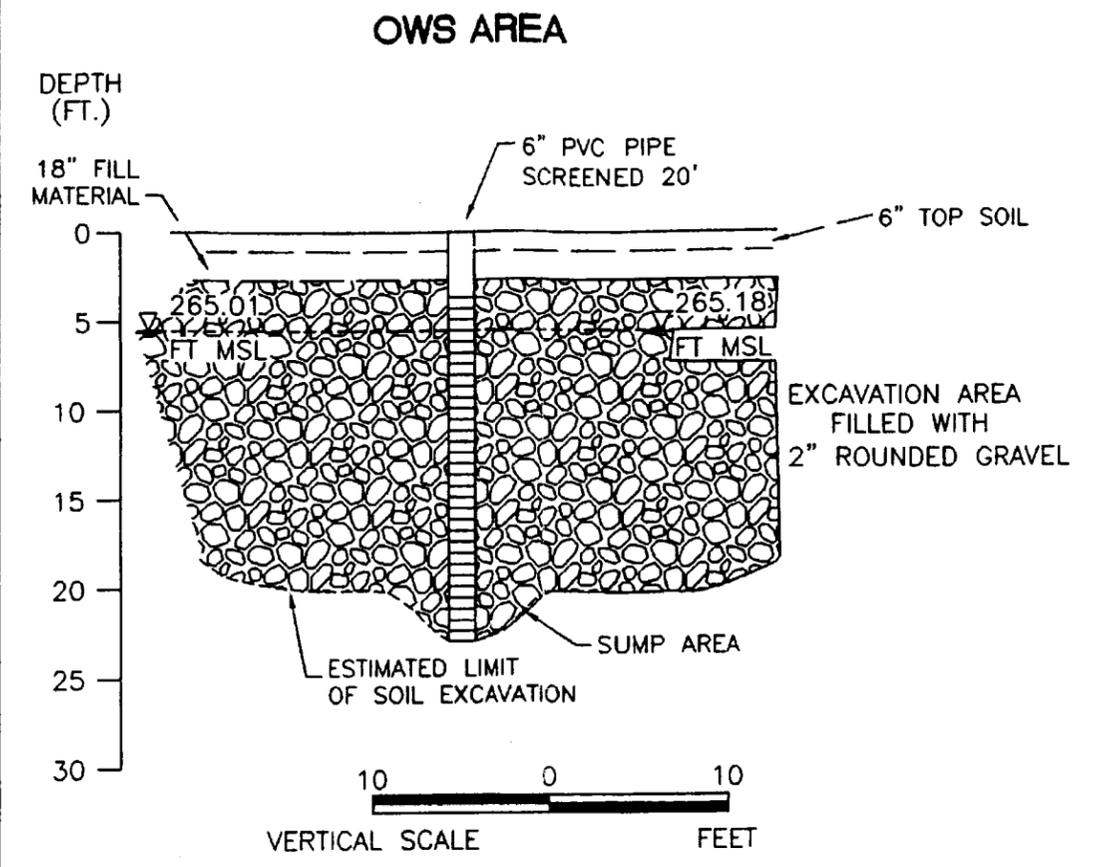
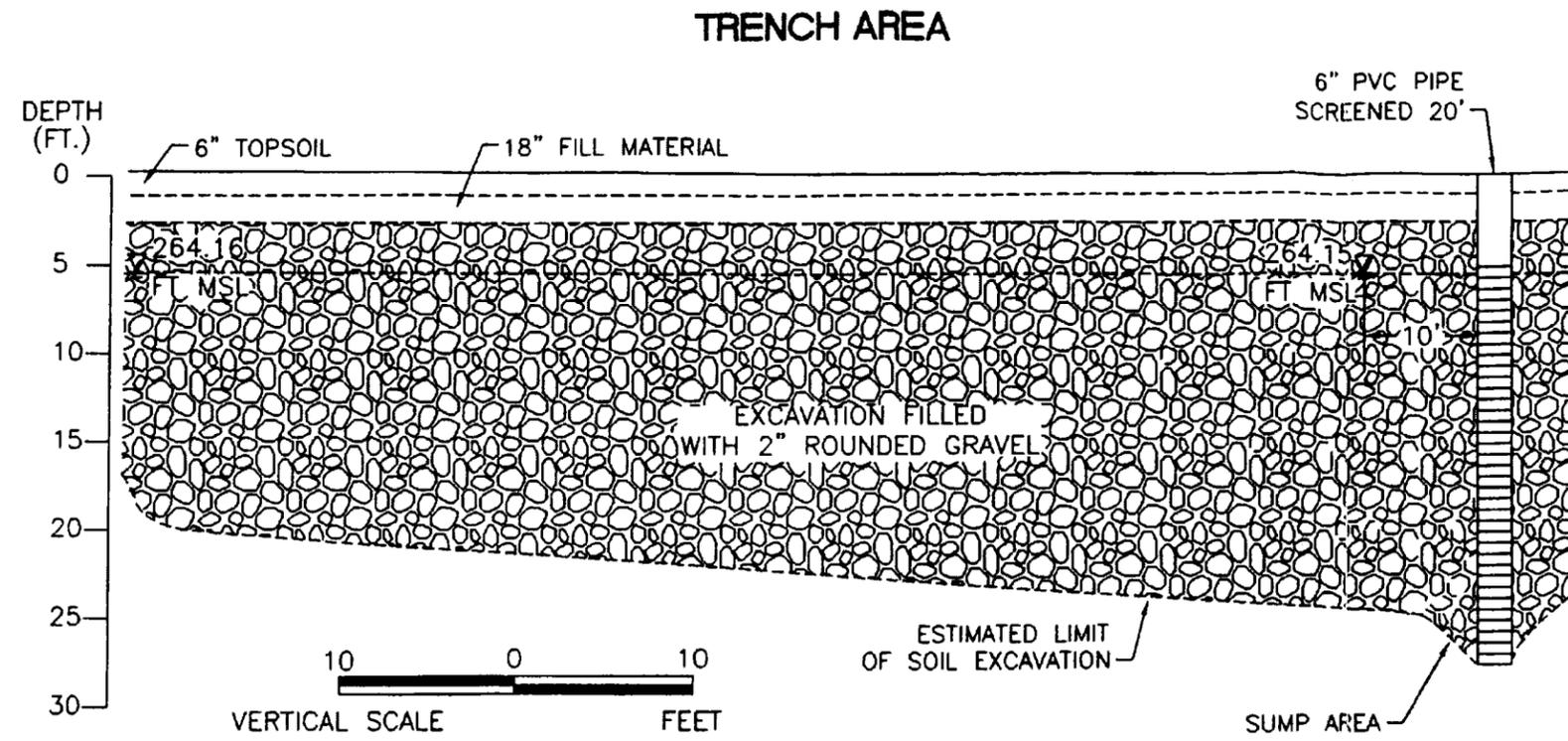


LEGEND

- MEM-757-1 - MONITORING WELL
- ⊗ - DPT LOCATIONS
- x—x—x— - FENCE
- ▨ - ESTIMATED AREA OF SOIL EXCAVATION
- ▧ - CURRENT UST LOCATION
- - FORMER UST LOCATION



**Figure 2-1**  
Monitoring Well Location Map  
NEX Gas Station  
NSA Mid-South  
Millington, TN



- LEGEND
- POTENTIOMETRIC SURFACE IN EXISTING MONITORING WELL (AUG. 2000)
  - 2-INCH ROUNDED GRAVEL

**Figure 2-2**  
Trench Area Detail  
NEX Gas Station  
NSA Mid-South  
Millington, TN

of Pump Island 4. If monitoring wells are present in the area of contamination, a determination will be required by the Navy at that time whether to install sheeting or remove the well and replace it at a later time.

The sheeting will consist of PZ27 steel sheet piling. It will be installed using a Foster vibratory hammer. No sheeting will be utilized at the Automotive Repair Building due to the proximity to existing utilities and danger of disturbing same.

Field IR is to determine if the limit concentration of 5 mg/kg benzene and 500 mg/kg TPH-GRO has been reached. IR is typically for TPH not benzene.

Since Field IR is for TPH, the readings from the Field IR will dictate when criteria cleanup levels have been met.

Limits of excavations will be based upon Field IR results collected from the walls of the excavations. An upper limit of 5 mg/kg benzene and 500 mg/kg TN GRO will delineate the area of excavation. Confirmatory sampling will be performed only after it has been determined through Field IR tests that the 5 mg/kg benzene 500 mg/kg TN GRO level has been met. The initial screening limit is anticipated to be 250 mg/kg; this limit may be adjusted upward or downward depending upon laboratory results. Confirmatory sampling will occur every 20 linear feet of excavation for both benzene and TPH-GRO. As shown on Figures 2-1 and 2-2, soil will be excavated to approximately 20 feet. From previous boring logs, it is assumed that the water table is at approximately 12 feet. The sump recovery wells must extend into the groundwater table for the pumps to operate properly.

The open excavation will be covered until after confirmatory sampling is received and approved. Groundwater infiltration will be pumped into the frac tank for disposal through the oil/water separator. CCI will schedule the time from opening the excavation to final backfill once final confirmation sampling data is provided by laboratory analysis and the excavation has been cleared for backfill by the Navy. The excavations will be covered and the surrounding terrain shaped to prevent the accumulation of stormwater in the open excavation.

If the excavation bottom is dry, soil samples for benzene and TPH will be taken on a 25-foot grid pattern for confirmation sampling. If the excavation bottom contains water, soil sampling will be biased, and results inaccurate. Therefore, if the bottom contains water, it will not be sampled.

Contaminated non-hazardous soil will be direct-loaded for disposal at the Waste Management Class I landfill in Tunica, Mississippi.

#### **2.1.2.1 Building 757 and Pump Island 4 Area**

CCI will excavate approximately 4800 cubic yards of petroleum contaminated soil in accordance with the CAP. Building 757 excavation will be within the limits shown on Figure 2-1. Initial excavation will begin directly to the south of Building 757 sheeting 20 feet to the East, 20 feet to the West and 20 feet to the South, at 20 feet deep. Once this section has been excavated, FID and Field IR tests will be performed on the east and west walls at a rate of one per 20 linear feet. If the Field IR test indicates that the soil is above the limit agreed to by the Navy, additional 10 foot increment of excavation shall proceed in the direction of the high reading. This sampling will continue until the Field IR indicate that the soil is below

clean up limits. Confirmation samples will then be collected from that side of the excavation at the midpoint depth of the excavation. The excavation will then proceed south 20 feet and the same procedures will be followed. This will continue until excavation is at Pump Island 4. Once the excavation starts in the Pump Island 4 area, the width will be 15 feet on each side and 15 feet deep yet will follow the above procedures for sampling and testing. If the plume extends beneath existing structures additional demolition may be necessary. In the Pump Island 4 area, once the canopy and pump island have been removed (see Sections 2.1.4 and 2.1.5), excavation of this area will proceed as described above. Initial excavation to the south of Pump Island 4 will proceed for approximately 5 feet until the excavation has come within 3 feet from monitoring well MEM-757-2. The depth of this excavation will be 15 feet. This area of excavation will be the Building 757 excavation area. As described above, shoring or other controls will be implemented as necessary to protect other pump islands and wells from damage.

Care will be taken around existing structures. Plumes that extend underneath the buildings or structures will be excavated up to the building or structure footprint. Limits of excavation will stop at the building footprint. Shoring and sheeting will be used around existing structures to protect them from damage and will conform to Occupational Safety and Health Administration (OSHA) requirements for protection of excavations and the existing structures. Shoring and sheeting will be designed and sealed by a State of Tennessee Professional Engineer and submitted to the Navy. When excavations are open, shoring and sheeting plans will be kept onsite in accordance with OSHA requirements. The engineer will oversee installation of any sheeting or shoring and will ensure safety and structural integrity of the excavation and supported facilities are maintained.

Recovery sump installation, as identified in the CAP for this area, will be in accordance with Section 2.1.3.

### **2.1.2.2 Interceptor Trench Installation**

The greatest concentration of groundwater contamination was found in the area where the inceptor trench will be installed. Care will be taken to protect all existing wells in the area. Trench installation will be performed to the depth and width shown on Figure 2-2. Protection of existing wells in the area is paramount. The approximate amount of excavation for this area is 560 cubic yards of material. It is not anticipated that additional excavation for the trench is required to the limit of 5mg/kg benzene or 500 mg/kg TN GRO. The area will be backfilled as described in Section 2.1.3. Identified was a 12" concrete sewer line running through the middle of this trench. Care will be taken to not damage this active line. Excavation will be from both sides of the trench to the middle. Once the sewer line has been identified, care will be taken to protect this structure while also excavating the trench to the limits shown in Figure 2-2. Backfill will begin immediately after the excavation.

Recovery sump installation, as shown on Figure 2-2 for this area, will be in accordance with Section 2.1.3.

### **2.1.2.3 Oil/water Separator Area**

CCI will excavate approximately 1500 cubic yards of petroleum contaminated soil using procedures identified above. The initial excavation will be 40 feet wide, 20 feet deep and 20 feet to the south. Sampling will commence as described above. Additional excavation

will continue 20 feet to the south. Any additional will be performed on 5-foot increments. The existing oil/water separator and structures will be protected from damage.

Recovery sump installation, as identified in the CAP for this area, will be in accordance with Section 2.1.3.

#### **2.1.2.4 Repair Service Building Area**

CCI will excavate approximately 118 cubic yards of petroleum contaminated soil in accordance with the CAP. Utilities are known to be in the proximity of this excavation and safety and care will be taken to protect any existing utilities. Excavation in this area will not have sheeting/shoring due to the close proximity of utility lines and roadway. The initial step will be to excavate along the south boundary to a depth of 4 feet below the surface. A 4-foot bench of soil will be left in place around the utilities for support. The excavation will then proceed down to 8 feet and proceed from west to east. This excavation will be protected by a 6- by 8-foot shoring box. Additional shoring boxes will be required to complete the excavation. Sampling will follow above procedures. Any additional excavation will be on 5-foot increments. The shoring boxes will be left in place until backfilling activities are initiated. The existing roadway structural subgrade will not be degraded.

No sump is to be installed in the repair service building area excavation; however, backfill operation will be performed as described in Section 2.2.3.

#### **2.1.3 Backfill and Sump Installation**

Backfill on all excavations will be in accordance with the CAP. First, 2-inch rounded gravel will be used to backfill to 24 inches to the ground surface in order to promote drainage to the installed sump recovery wells. The bottom of each excavation will be sloped to the 6-inch polyvinyl chloride (PVC) screened pipe used as the sump recovery well as shown on Figure 2-2. The screens will be 20-foot screened and 0.020-inch slotted. CCI will obtain a permit issued by Shelby County prior to installation of the recovery wells. Wells will be flush-mounted to the top of the final cover, protected from damage by concrete at the surface in accordance with Shelby County requirements. All wells at the site will be protected from aboveground activities. Above the gravel fill, a non-woven, water permeable geotextile liner will be positioned on top of the gravel. Limerock fill will then be placed on the liner in 1-foot increment lifts compacted to 90 percent of the proctor specifications. Compaction will be accomplished using a 5-ton Bomag SD40D vibratory roller. Existing wells and structures will be protected during these operations.

#### **2.1.4 Partial Demolition of Canopy Above Pump Islands**

CCI will demolish the metal canopy beginning above Pump Island 3 and extending to the end pump island, for a total of approximately 90 feet of canopy removal. Canopy and supports that are not demolished will remain in place and will be protected from damage. Removal of stanchion supports and all associated appurtenances is included in this removal. It is anticipated that limited lead paint abatement at the point of cutting is required. It is not hazardous and will be disposed of as construction and demolition debris. If additional lead based paint is identified, disposal will be in accordance with Section 4.0 Waste Management Plan and applicable regulations. Storage, segregation and disposal of all canopy material will be in compliance with all federal, state, and local regulations.

final cover of limerock will be free from roots, organic matter, debris and other deleterious materials.

#### **2.1.4 Partial Demolition of Canopy Above Pump Islands**

CCI will demolish the metal canopy beginning above Pump Island 3 and extending to the end pump island, for a total of approximately 90 feet of canopy removal. Canopy and supports that are not demolished will remain in place and will be protected from damage. Removal of stanchion supports and all associated appurtenances is included in this removal. It is anticipated that limited lead paint abatement at the point of cutting is required. It is not hazardous and will be disposed of as construction and demolition debris. If additional lead based paint is identified, disposal will be in accordance with Section 4.0 Waste Management Plan and applicable regulations. Storage, segregation and disposal of all canopy material will be in compliance with all federal, state, and local regulations.

#### **2.1.5 Demolition of Pump Island 4**

CCI will demolish Pump Island 4 after the canopy has been removed. Any soil material will be removed from the pump island material as a decontamination measure. It is anticipated that the concrete will then be able to be disposed of as construction and demolition debris. Storage, segregation and disposal of all pump island material will be in accordance with Section 4.0 Waste Management Plan and in compliance with all federal, state, and local regulations.

#### **2.1.6 Asphalt disposal**

CCI will recycle or dispose of asphalt as appropriate and in accordance with Section 4.0 Waste Management Plan and in compliance with all applicable federal, state, and local requirements.

#### **2.1.7 Groundwater Removal**

Prior to pumping, sump recovery wells will be tested to ensure they are working properly. Groundwater will be pumped from the sump recovery wells installed in the excavations, through a flexible or rigid conveyance to an aboveground storage tank (portable frac tank), and conveyed into the existing oil/water separator onsite prior to disposal.

Samples will be collected from the frac tanks and analyzed for benzene and TPH-GRO as listed in Table 2-1. The collected groundwater will be disposed of in accordance with limits placed upon disposal by the City of Millington, i.e., 15.7 milligrams per liter (mg/L) at flow rates of less than 50 gallons per minute (gpm). A flow meter will be attached to an outflow valve of the frac tank to regulate discharge into the oil/water separator. After 5 hours of flow into the oil/water separator, a sample will be taken from a manhole 30 feet downstream of the oil/water separator and analyzed for benzene.

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TABLE 2-1  
Sampling Event Summary

Sampling Event/Frequency	Before Remediation	During Remediation	End of Remediation
Comprehensive Preconstruction sampling event	All 21 wells for benzene and TPH-GRO and requirements in TN TGD 007, including vapor monitoring 72 hours prior to startup.		
Corrective action sampling event/Site status monitoring		All 21 wells for benzene and TPH-GRO, including vapor monitoring 6 months after preconstruction sampling (if duration of work is that long) and requirements in TN TGD 007	<i>Comp</i> <i>Daniel Street</i>
Pumping into Frac Tank evolution #1		Composite sample of the three wells from the frac tank analyzed for benzene and TPH-GRO. 24-hour turnaround time	
Sampling post oil/water separator from evolution #1		One sample taken from manhole 30 feet downstream from oil/water separator for benzene and TPH-GRO. 24-hour turnaround time	
Pumping into Frac Tank evolution #2		Composite sample of the three wells from the frac tank analyzed for benzene and TPH-GRO. 7-day turnaround time	
Sampling post oil/water separator from evolution #2		One sample taken from manhole 30 feet downstream from oil/water separator for benzene and TPH-GRO. 7-day turnaround time	<i>e-mail</i>
Pumping into Frac Tank evolution #3		Composite sample of the three wells from the frac tank analyzed for benzene and TPH-GRO. 7-day turnaround time	
Sampling post oil/water separator from evolution #3		One sample taken from manhole 30 feet downstream from oil/water separator for benzene and TPH-GRO. 7-day turnaround time	

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TABLE 2-1  
Sampling Event Summary

Sampling Event/Frequency	Before Remediation	During Remediation	End of Remediation
Closure Monitoring/ Comprehensive monitoring			1 <sup>st</sup> quarter post remediation. All 21 wells for benzene and TPH-GRO, including vapor monitoring and requirements of TN TGD 007.
Site Status monitoring/ Comprehensive monitoring			2 <sup>nd</sup> , 3 <sup>rd</sup> and 4 <sup>th</sup> quarter post remediation. All 21 wells for benzene and TPH-GRO, including vapor monitoring and requirements of TN TGD 007. Submittal of four sampling reports.
Comprehensive monitoring			4 <sup>th</sup> quarter post remediation. All 21 wells for benzene and TPH-GRO, including vapor monitoring and requirements of TN TGD 007.

These pumping events will be at a rate equivalent to the recharge rate within the well. Pumping will continue for 6 days or until no further recharge is realized. If groundwater contamination levels are still above regulatory limits, another pumping event will occur. This evolution of pumping will occur a maximum of three times.

### 2.1.8 Storage of Solid Wastes and Construction Debris

CCI will contain and store all construction debris, and contaminated solid wastes (such as PPE and plastic sheets used for decontamination, and canopy material) as described in Section 4.0 Waste Management Plan and in accordance with all applicable rules and regulations until it is disposed offsite. Specifically, CCI is responsible for storing all wastes within a regulated area designated by Navy, and in accordance with storage requirements as defined in applicable rules and regulations.

CCI will be responsible to make sure all containers are properly labeled, with labels visible, and to maintain good housekeeping again in accordance with all applicable regulations.

### 2.1.9 Solid Waste Management, Characterization, and Disposal

#### 2.1.9.1 Soil and Solid Waste

Soil and solid waste will be analyzed, stockpiled, transported, and disposed in accordance with all applicable federal, state, and local requirements as described in Sections 3.0 Sampling and analysis Plan and 4.0 Waste Management Plan.

Soil and solid waste sampling will consist of:

- MTBE – EPA SW-846 Methods 8260B/5030A
- Benzene – EPA SW-846 Methods 8260B/5030A
- Toluene – EPA SW-846 Methods 8260B/5030A
- Ethyl Benzene – EPA SW-846 Methods 8260B/5030A

- Xylenes-m,p – EPA SW-846 Methods 8021B/5030A
- Xylenes-o – EPA SW-846 Methods 8021B/5030A
- TPH-GRO- EPA SW-846 Method 8015 modified/5030A

In addition, the following analyses are anticipated by the disposal facility:

- Ignitability, Corrosivity, Reactivity – EPA SW-846 Methods 1010 or 1030, 9045B, chapter 7.3
- TCLP Volatiles – EPA SW-846 Method 1311/8260B
- TCLP Semi-volatiles – EPA SW-846 Methods 1311/8270C
- TCL PCB – EPA SW-846 Methods 8082
- TCLP Herbicides – EPA SW-846 Methods 1311/8151A
- TCLP Metals – EPA SW-846 Methods 1311/6010B/7471A

Analyses will be provided on a 7-day turnaround time basis. The results of the analyses will be forwarded to CCI within 1 day following receipt of the analytical results along with the waste profile package.

### **2.1.9.2 Transportation and Disposal**

CCI will identify and coordinate transporters and disposal facilities as described in Section 4.0 Waste Management Plan. For each waste, the disposal log will state the classification of the waste, amount, location, and name of the business receiving the solid waste. Documentation will be submitted for all waste transported for disposal.

## **2.1.10 Liquid Waste Management, Characterization, and Disposal**

### **2.1.10.1 Liquid Waste Management**

Decon water, groundwater, and stormwater will be addressed as follows. After it has been sampled for benzene and TPH-GRO, decon water will be processed through the oil/water separator.

As described in the Environmental Protection Plan submitted, CCI will apply appropriate erosion and sediment control measure to prevent the migration of dust and debris from the excavation areas and to limit storm water runoff from entering or eroding the excavations.

Groundwater from the excavation areas will be pumped into the frac tank by flexible or rigid conveyance. The frac tank will comply with all applicable rules concerning temporary above ground storage tanks. A flow meter with accuracy of 5 gpm will be installed on the outflow of the frac tank to the oil/water separator.

### **2.1.10.2 Liquid Waste Characterization**

For liquids (i.e., groundwater, decon fluid etc.), CCI will collect representative samples for waste characterization as described in Section 3.0 Sampling and Analysis Plan.

Representative samples from each sump recovery well will be collected and analyzed at a State- and Navy-approved laboratory for the following parameters using Level III QA/QC protocols:

- MTBE – EPA SW-846 Method 8260B/5030A
- Benzene – EPA SW-846 Method 8260B/5030A
- Toluene – EPA SW-846 Method 8260B/5030A
- Ethyl Benzene – EPA SW-846 Method 8260B/5030A
- Xylenes-m,p – EPA SW-846 Method 8260B/5030A
- Xylenes-o – EPA SW-846 Method 8260B/5030A
- TNGRO – TPH Method TNGRO 5030A

It is not anticipated that the City of Millington POTW will require additional sampling.

Analyses will be provided on a 3-day turnaround time basis. The results of the analyses will be forwarded to Navy within 2 days following receipt of the analytical results along with the waste profile package.

#### **2.1.10.3 Liquid Waste Disposal**

CCI assumes all liquid waste may be disposed through the oil/water separator. Prior to disposal, CCI will provide Navy with a waste sampling package for the liquid wastes. This package will include the waste characterization data summary, and letter of approval from the POTW to accept the waste (provided by NSA Mid-South), and any other applicable information necessary for Navy to complete its review of the disposal package.

#### **2.1.10.4 Spills of oil and gasoline materials**

CCI will take precautions to prevent spills of oil and gasoline materials. Any spill events will be managed in accordance with the Environmental Protection Plan (submitted as a separate document) and the Health and Safety Plan (Appendix B). In the event of a spill, during normal working hours, immediately notify Navy Public Works Department, and the environmental division of NSA Mid-South. If the spill is mobile or enters stormwater or sanitary sewer or is after hours, NSA Mid-South and the base fire department and the Officer of the Day (OOD) will be notified. Spill response will be in accordance with the base facility response plan and applicable federal, state and local regulations.

#### **2.1.10.5 Site Restoration**

The disturbed areas will be graded to existing drainage contours.

#### **2.1.10.6 Final Decontamination and Demobilization**

Personnel and equipment will be decontaminated in accordance with Section 4.0 Waste Management Plan prior to leaving the area to avoid the possibility of inadvertently spreading contamination. Equipment will be properly decontaminated to remove all contamination that may be adhering to the equipment components as a result of the interim remedial action. All debris generated by the decon will be properly containerized, sampled, analyzed, and disposed offsite as specified. Rinsate will be disposed in the same manner as previously described for groundwater.

Following approval from Navy, all personnel, equipment, temporary facilities and utilities will be demobilized from the site. In addition, any remaining debris or other wastes generated during the work will be removed and properly disposed.

### **2.1.11 Quarterly Sampling**

As described in Section 3.0 Sampling and Analysis Plan, quarterly sampling will be in accordance with the CAP and State of Tennessee regulations TGD 007.

### **2.1.12 Interim and Final Reports**

CCI will submit draft quarterly sampling reports within 15 days of sampling event completion and final quarterly reports within 30 days of sampling event completion, along with analytical data for each event. A final report documenting construction completion will be provided to Navy within 30 days after completion of construction.

### **2.1.13 Project Schedule**

CCI will provide the necessary resources to complete the scope of work tasks within the timeframe presented in the final project schedule. The proposed site operations are 7:00 a.m. to 5:00 p.m. Monday through Friday.

It is anticipated that mobilization to the site will begin within 30 days of approval of the cost proposal and Work Plan Addendum. A proposed schedule is provided as Appendix A.

Should inclement weather impact the schedule, time lost during the scheduled workweek may be made up on an accelerated schedule (including weekends) at the discretion of the Navy and CCI.

## **2.2 Traffic Control Plan**

Traffic control will be the responsibility of the CCI Site Superintendent. However, traffic control is not anticipated to be a major concern for NSA Mid-South at the NEX gas station site. CCI will consult with NSA Mid-South personnel to evaluate placement of equipment, temporary storage areas, and traffic flow to minimize the impact of this work. Further, CCI will review and follow all base regulations and standard operating procedures regarding vehicle movement and control inside the property.

## **2.3 Communications Plan**

A communication matrix outlining the lines of communications for the Southern Division, NAVFAC and CCI personnel for this work is presented in Table 2-2. Table 2-3 provides a project personnel directory.

**TABLE 2-2**  
Communications Matrix

CCI Position	Navy Direct Report
R. Scott Newman, Program Manager	Eva Clement, Contracting Officer
Marsha Robinson, Contracts Manager	Jimmy Jones, COTR Richard Stanley, ACO
Philip Altman, Senior Project Manager	Jimmy Jones, COTR Richard Stanley, ACO
Matt Haupt, CTO Project Manager	John Karlyk, RPM Frank Novitzki, NTR
CO – Contracting Officer	RPM – Remedial Project Manager
ACO – Administrative Contracting Officer	NTR – Navy Technical Representative
COTR – Contracting Officer's Technical Representative	

**TABLE 2-3**  
Project Personnel Directory

Contact	Company
Scott Newman, Program Manager	CH2M HILL Constructors, Inc 115 Perimeter Center Place, N.E. Suite 700 Atlanta, GA 30346-1278 770/604-9095
Philip Altman, Senior Project Manager	
Bob Nash, Health and Safety Manager	
Theresa Rojas, QA/QC Manager	
Marsha Robinson, Contract Administration Manager	
Matt Haupt, Project Manager	
Eva Clement, CO	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5518
Richard Stanley, ACO	As above 843/820-5939
Jimmy Jones, COTR	As above 843/820-5544
John Karlyk, RPM	As above 843-820-5624
Frank Novitzki, NTR	NSA Mid-South Mail: ROICC NSA Mid-South 5722 Integrity Drive Millington, TN 38054-5018 FedEx: ROICC NSA Mid-South 7700 Hornet Avenue Building 455 Millington, TN 38054-5018 901-874-5490
CO – Contracting Officer	RPM – Remedial Project Manager
ACO – Administrative Contracting Officer	NTR – Navy Technical Representative
COTR – Contracting Officer's Technical Representative	

# 3.0 Sampling and Analysis Plan

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The Sampling and Analysis Plan (SAP) provided in this Work Plan Addendum, outlines the required sampling activities associated with the removal of the benzene and TPH-GRO contaminated soil and groundwater at NSA Mid-South, Millington, Tennessee. This SAP outlines the required locations, frequency, and analyses for the groundwater and soil samples to be collected prior to, during, and after remedial activities. In addition, this Plan provides the required analyses for disposal characterization for wastes generated during removal activities. The Basewide Work Plan provides sample collection frequency and sampling methodology for waste characterization and incidental samples collected during the remedial phase of the project completed under this contract; sample quality assurance/quality control procedures to be maintained during all sample collection activities; and sample equipment decontamination procedures.

Samples will be collected in accordance with the EPA Region IV Environmental Investigative Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), 1996 and 1997 revisions and Tennessee Department of UST rules (CH 1200-1-15). The sampling team will be qualified under Tennessee requirements and the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM) sampling requirements.

## 3.1 Data Quality Objectives for Measurement Data

The data quality objectives (DQOs) for each sampling task described above are listed in Table 3-1. The sampling and analytical requirements, along with the required level of quality and data packages are listed in Table 3-2. A Navy-, United States Army Corps of Engineers (USACE)-, or Air Force Center for Environmental Excellence (AFCEE)- and Tennessee-approved laboratory will be used for all sample analyses.

**TABLE 3-1**  
Data Quality Objectives

Sampling Activity	Data Quality Objective Category
Confirmation soil sampling (offsite laboratory analyses)	Definitive
Preconstruction groundwater sampling (offsite laboratory analyses)	Definitive
Preconstruction vapor sampling (OVA/FID)	Screening
Corrective action sampling/site status monitoring for groundwater (offsite laboratory analyses)	Definitive
Corrective action sampling/site status monitoring for vapor (OVA/FID)	Screening
Sampling of recovery wells and manhole near OWS (offsite laboratory analyses)	Definitive
Post remediation groundwater sampling (offsite laboratory analyses)	Definitive
Post remediation sampling for vapor (OVA/FID)	Screening
Waste characterization of the solid waste (offsite laboratory analyses)	Definitive
Backfill characterization (offsite laboratory analyses)	Definitive

**TABLE 3-2**  
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Methods	Holding Time	Sample Preservation	Containers
<b>Excavation Soil Confirmation Sampling</b>													
Soil Immunoassay Sampling at 3 areas to determine limits of excavation	Bldg 757/Pump Island #4; OWS Area; Repair Service Bldg Area	Soil	Once per sidewall at each area	Once per sidewall per area + duplicates at 10%	Grab	SS spoon, SS bowl	ASAP	DQO Level II, Screening	Benzene (kit measures BTEX)	Immunoassay kit	N/A	N/A	(1) 8 oz amber glass
	Immunoassay sample points in order to determine correlation of BTEX results to actual benzene	Soil	Once per area	3 samples	Grab	SS spoon, SS bowl	24 hours	DQO Level III, CCI Level C	BTEX	8260B	48 hours	Cool to 4oC	(3) 5 gm Encores
Soil Confirmation Sampling at 3 areas	Bldg 757/Pump Island #4; OWS Area; Repair Service Bldg Area	Soil	Once per 20 linear feet	Once per 20 linear feet + duplicates at 10% + MS/MSD at 5% per each area	Grab	SS spoon, SS bowl	3 days	DQO Level III, CCI Level C	Benzene	8260B	48 hours	Cool to 4°C	(3) 5 gm Encores
									TN-GRO	8015B Modified	48 hours	Cool to 4oC	(3) 5 gm Encores
	Equipment Rinsate Blank	Water	1 per set of pre-cleaned equipment (10%)	10% per area	Prepared in Field	Analyte-free water, SS funnel	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
	Trip Blank	Water	1 per VOC cooler	As necessary	Prepared by Lab	N/A	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial

**TABLE 3-2**  
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Methods	Holding Time	Sample Preservation	Containers	
<b>Preconstruction Comprehensive Groundwater and Vapor Sampling Events</b>														
Sampling of all area wells and OWS 72 hours prior to remediation	21 wells as listed in Figure 3-1 of SAP	Water	72 hours prior to start of remediation	21 + 2 dups + 2 MS/MSDs	Grab	Peristaltic pump; Teflon tubing	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
	Equipment Rinsate Blank	Water	1 per set of pre-cleaned equipment (10%)	10% per area	Prepared in Field	Analyte-free water, SS funnel	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
	Trip Blank	Water	1 per VOC cooler	As necessary	Prepared by Lab	N/A	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
	Vapor Sampling of OWS	Vapor	Once 72 hours prior to remediation	1	Grab	OVA/FID	ASAP	DQO Level II; Screening	Organics	OVA/FID	N/A	N/A	N/A	
	<b>Corrective Action Sampling/Site Status Monitoring</b>													
	Sampling of all area wells and OWS 6 months after preconstruction sampling (if duration of work is that long)	21 wells as listed in Figure 3-1 of SAP	Water	Once; six months after preconstruction sampling	21 + 2 dups + 2 MS/MSDs	Grab	Peristaltic pump; Teflon tubing	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
TN-GRO										8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
Equipment Rinsate Blank		Water	1 per set of pre-cleaned equipment (10%)	10% per area	Prepared in Field	Analyte-free water, SS funnel	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
Trip Blank		Water	1 per VOC cooler	As necessary	Prepared by Lab	N/A	3 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
Vapor Sampling of OWS		Vapor	Once; six months after preconstruction sampling	1	Grab	OVA/FID	ASAP	DQO Level II; Screening	Organics	OVA/FID	N/A	N/A	N/A	

**TABLE 3-2**  
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Methods	Holding Time	Sample Preservation	Containers
<b>Groundwater Sampling for Approval to Discharge Groundwater to OWS/POTW</b>													
Recovery Well Sampling	3 recovery wells within each excavation	Water	Once each groundwater pumping event; max of 3 events	3 + 1 dup + 1 MS/MSD per event	Grab	Peristaltic pump; Teflon tubing	24 hours	DQO Level III, CCI Level C	BTEX + MTBE	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
	Equipment Rinsate Blank	Water	1 per set of pre-cleaned equipment (10%)	1 per event	Prepared in Field	Analyte-free water, SS funnel	24 hours	DQO Level III, CCI Level C	BTEX + MTBE	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
Trip Blank	Water	1 per VOC cooler	As necessary	Prepared by Lab	N/A	24 hours	DQO Level III, CCI Level C	BTEX + MTBE	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial	
Sample from manhole 30 ft from OWS	Within 5 hours of the beginning to pump from frac tank to OWS, sampling of water from manhole 30 ft from OWS	Water	Once each groundwater pumping event; max of 3 events	1 per event	Grab	Dip jar or Teflon Bailor	24 hours	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
	Trip Blank	Water	1 per VOC cooler	As necessary	Prepared by Lab	N/A	24 hours	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
<b>Post-Remediation Sampling</b>													
Groundwater Sampling	21 wells as listed in Figure 3-1 of SAP	Water	Quarterly for one year	21 + 2 dups + 2 MS/MSDs per quarter	Grab	Peristaltic pump; Teflon tubing	14 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
	Equipment Rinsate Blank	Water	1 per set of pre-cleaned equipment (10%)	2 per quarter	Prepared in Field	Analyte-free water, SS funnel	14 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
									TN-GRO	8015B Modified	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
	Trip Blank	Water	1 per VOC cooler	As necessary	Prepared by Lab	N/A	14 days	DQO Level III, CCI Level C	Benzene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40ml vial
	Vapor Sampling of OWS	Vapor	Quarterly for one year	4	Grab	OVA/FID	ASAP	DQO Level II; Screening	Organics	OVA/FID	N/A	N/A	N/A

**TABLE 3-2**  
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Methods	Holding Time	Sample Preservation	Containers		
<b>Waste Characterization of Solids</b>															
Lead-based Paint Sampling	Debris from Pump Island #4	Paint chips	Once	1 composite sample	Composite	Scraper, visqueen or bowl	7 day	DQO Level III, CCI Level B	Lead	6010B	6 months	Cool to 4°C	(1) 4 oz amber glass		
Soil/solids Characterization Sampling	Stockpiles (if needed)	Soil	As needed for disposal	1 per area per matrix (soil, concrete, etc) consisting of minimum of 5 grabs per composite	Composite (except for volatiles - grab)	SS Auger, SS Spoons, SS Bowl, chisel	7 day	DQO Level III, CCI Level B	TCLP Volatiles	1311/8260B	14 day TCLP extr, 14 day analysis	Cool to 4°C	(1) 4 oz amber glass		
									TCLP Semi-Volatiles	1311/8270C	14 day TCLP extr, 7 day extr, 40 day analysis			(2) 8 oz amber glass	
									TCLP Pesticides	1311/8081A	14 day TCLP extr, 7 day extr, 40 day analysis				
									TCLP Herbicides	1311/8151A	14 day TCLP extr, 7 day extr, 40 day analysis				
									TCLP Metals	1311/6010B, 7470A	6 month TCLP extr, 6 month analysis Hg: 28 day TCLP extr, 28 day analysis			Cool to 4°C	(3) 8 oz amber glass
									TCL PCBs	8082	14 day extr, 40 day analysis				
									Ignitability	1030	ASAP				
									Corrosivity	9045A	ASAP				
Reactivity	Chapter 7.3	ASAP													

**TABLE 3-2**  
**Sampling and Analysis Summary**

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Methods	Holding Time	Sample Preservation	Containers
<b>Imported Backfill Material Sampling</b>													
Characterization of Fill Material	Once per Offsite Source per Material	Soil	1 composite sample of 4 grabs  (1 grab for volatiles)	Once per source	Composite 5 random grabs into 1 sample  (1 grab for volatiles)	SS spoon, SS bowl, Encore samplers	7 day	DQO Level III, CCI Level B	TCL Volatiles	SW-846 5035/8260B	14 day	Cool to 4°C	(3) 5g Encore Samplers
									TCL Semi-Volatiles	SW-846 8270C	14 day extr; 40 day analysis	Cool to 4°C	(2) 16 oz amber glass
									TCL Pesticides	SW-846 8081A	14 day extr; 40 day analysis		
									Herbicides	SW-846 8151A	14 day extr; 40 day analysis		
									PCBs	SW-846 8082	14 day extr; 40 day analysis		
									TPH	FL-PRO	14 day extr; 40 day analysis		
									TAL Metals	SW-846 6010A/7471	6 month; Hg 28 days	Cool to 4°C	(1) 16 oz HDPE
									pH	SW-846 9045B	ASAP		

Target cleanup levels are as follows

- Benzene
  - Soil: 5 mg/kg
  - Groundwater: 0.07 mg/L
- TPH-GRO
  - Soil: 500 mg/kg
  - Groundwater: 1.0 mg/L

## 3.2 Soil Sampling at the Excavations

Four areas will be excavated to pre-determined limits as described in Section 1.0 of this Work Plan. Once these limits have been reached, grab samples will be collected from each sidewall of the excavations using the excavator or backhoe bucket. These samples will be analyzed onsite using an immunoassay field analysis kit for BTEX to determine if the limit of 5 mg/kg benzene and appropriate TPH-GRO levels have been reached. Because there is not an immunoassay field test kit available for only benzene, at least one soil sample, collected at the same time as the field test kit sample, will be sent offsite to correlate the BTEX results to the single analyte, benzene. Excavation will continue in accordance with Section 1.0 and 2.0 until immunoassay field test kit results show the benzene action limit of 5 mg/kg has been reached. Confirmation samples will then be collected at a rate of one per 25 linear feet. Confirmation samples will also be collected using the excavator or backhoe bucket and analyzed in accordance with Table 3-2. The immunoassay field test kits will be used and calibrated in accordance with manufacturer instructions.

### 3.2.1 Soil Sampling Procedures

Because the excavations will be too deep for entrance, samples will be collected from the sidewalls using the excavator or backhoe bucket.

1. Remove the top 2 to 3 inches of soil that is in bucket.
2. Collect the immunoassay field test kit samples in a 4-ounce jar, without headspace.
3. When collecting confirmation samples, open the Encore reusable package and remove the core device and cap.
4. Place into the T-handle and core the sample directly from the exposed soil in the bucket. (Take care not to collect sample that has come into contact with the bucket.)
5. Remove from the soil, brush off the sides, and put the cap seal onto the sampler.
6. Label and reseal in the original package.
7. Place into cooler for shipment.

Immunoassay field test kit results are for screening purposes only and need to be documented at a minimum in the samplers log book.

For confirmation samples, CCI Level C package will be required along with appropriate Quality Control samples for the soil samples. All analytical data will be submitted by both

hard copy and electronic files. Results will be validated by a third party to ensure data quality and validity.

### **3.3 Preconstruction Comprehensive Monitoring**

Preconstruction comprehensive monitoring will be performed within 72 hours prior to the start-up of the corrective action activities. This consists of, in sequence:

1. Obtain water and free product level measurements (if existing) from the 21 monitoring wells shown on Figure 2-1.
2. Sample all 21 monitoring wells shown on Figure 2-1.
3. Conduct vapor monitoring using an organic vapor analyzer (OVA)/flame ionization detector (FID) of the nearby oil/water separator (screening only).

These samples will be collected using low-flow methodology and analyzed in accordance with Table 3-2.

CCI Level C package will be required along with appropriate Quality Control samples for the groundwater samples. All analytical data will be submitted by both hard copy and electronic files. Results will be validated by a third party to ensure data quality and validity.

Corrective action sampling/site status monitoring will be done within 6 months of the preconstruction comprehensive monitoring only if the duration of the project will exceed the 6 months. This sampling consists of the same monitoring as described above.

### **3.4 Groundwater Sampling for Discharge Approval**

Groundwater samples will be collected using low-flow methodology and analyzed in accordance with Table 3-2.

One water sample per groundwater pumping event will also be collected from the frac tank. This sample will be collected using a dip jar or bailer. The appropriate containers will be filled and analyzed in accordance with Table 3-2.

CCI Level C package will be required along with appropriate Quality Control samples for the groundwater samples. All analytical data will be submitted by both hard copy and electronic files. Results will be validated by a third party to ensure data quality and validity.

### **3.5 Post-Remediation Sampling**

After the corrective action activities are complete, and with the approval of the Navy and State of Tennessee, post-remediation sampling will be required on a quarterly basis for one year. Post-remediation sampling consists of the requirements as outlined below:

1. Obtain water and free product level measurements (if existing) from the 21 monitoring wells and the three recovery wells shown on Figure 2-1.

2. Sample of all 21 monitoring wells shown on Figure 2-1 and the three recovery wells within each excavation.
3. Conduct vapor monitoring using an OVA/FID of the nearby OWS (screening only).

These samples will be collected using low-flow methodology and analyzed in accordance with Table 3-2.

CCI Level C package will be required along with appropriate Quality Control samples for the groundwater samples. All analytical data will be submitted by both hard copy and electronic files. Results will be validated by a third party to ensure data quality and validity.

## **3.6 Monitoring Well Sampling Collection Procedures**

### **3.6.1 Water-level Measurements**

Groundwater levels will be measured in monitoring wells prior to and during each sampling event. Water levels will be measured using an electronic sensor with tape graduated in 0.01 feet. Measurements will be recorded as depth to water from the mark on the top of the well casing. Well number, date and time of measurement, and depth to water will be recorded in the field logbook.

### **3.6.2 Well Purging**

Before sampling, each well will be purged using a low-flow pump to minimize both agitation of the groundwater and sample turbidity. The following methods are consistent with Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures (EPA, 1996). The intent of this procedure is to remove stagnant water from the well and introduce fresh groundwater into the well at a rate that does not produce drawdown of the water table in the well being sampled. This procedure also reduces the time it takes to purge the wells and the quantity of water removed as IDW. The field team should keep the pumping rate as low as possible, being careful not to lower the water table in the well. The anticipated pumping rate is 0.15 to 0.25 gpm. Water level measurements should be made concurrently with the water quality parameter measurements. Field measurements of dissolved oxygen (DO), oxidation-reduction potential (ORP), turbidity, pH, temperature, and specific conductance will be made before initial purging and at 5-minute intervals thereafter. The water quality parameters should be measured using an airtight flow-through cell. Measurement data will be recorded on the Well Purging Form and/or the field logbook. Purging will continue until field measurements are stable to within +/- 10 percent over three successive measurements. It should be noted that no more than five well volumes will be removed if parameters do not stabilize. The above parameters will be documented and the wells will then be sampled.

### **3.6.3 Groundwater Sampling**

Samples will be collected as soon as enough water recharges after purging. Water samples will be collected and preserved as required in Table 3-2 and will be delivered to a laboratory within the appropriate holding period.

Samples will be collected using the low-flow pump. Once the field parameters have stabilized per Section 3.6.2, the pump will be momentarily turned off and the tubing leading

to the flow-through cell will be removed. The pump will then be turned back on and the appropriate sample containers will be filled. Headspace in the volatile sample container must be minimized by filling the sample jar until a positive meniscus is present.

Containers should be quickly and adequately sealed; container rims and threads should be clean before tightening lids; unless otherwise specified, Teflon-lined screw lids should be used to seal the jar.

## **3.7 Waste Characterization and Incidental Wastestream Sampling and Analyses**

### **3.7.1 Debris Containing Possible Lead-Based Paint**

Pump Island 4 and canopy will be demolished in order to perform excavation activities in that area. This debris is believed to be coated with lead-based paint. Once the structure is demolished, disposal will be based on the results and obtained by previous sampling events by NSA Mid-South in accordance with Section 4.0, the Waste Management Plan.

### **3.7.2 Soil Characterization**

Waste characterization samples will be collected to evaluate the handling, transportation, and disposal requirements of any contaminated soil accumulated during soil and solids removal activities. Solid samples will be collected as follows, delivered to a Navy-, USACE-, or AFCEE- and Tennessee-approved laboratory and analyzed for the parameters listed in Table 3-2.

Excavated soil will be direct-loaded and transported offsite for disposal at the Waste Management Class I landfill in Tunica, Mississippi.

CCI Level B package will be required along with appropriate Quality Control samples for the required waste characterization and incidental wastestream samples. All analytical data will be submitted by both hard copy and electronic files.

## **3.8 Imported Backfill Sampling and Analyses**

Imported backfill material is currently anticipated and excavated material must be disposed offsite, analytical data must be provided showing uncontaminated material is being backfilled into the excavation. If no data is provided by the vendor providing the backfill material (backfill, limerock, etc.), then one sample will be collected per source and material. The samples will be collected using the same procedures as the confirmation samples and delivered to Navy, USACE, or AFCEE and Tennessee-approved laboratory and analyzed for the parameters listed in Table 3-2.

## **3.9 Field Quality Control**

Field duplicate samples and equipment blank samples will be collected at a minimum frequency of 5 percent times the total number of samples collected for an analysis and rounded to the nearest whole number. One trip blank sample will be provided at a

frequency of one per sample cooler containing volatile samples. Matrix spike/matrix spike duplicates (MS/MSD) will be required at a maximum frequency of one per area or a minimum frequency of one per 20 samples. Field QC will be collected as described in Table 3-2.

## **3.10 Analytical Methods**

### **3.10.1 Analytical Methods**

Samples will be collected for analytical methods summarized in Table 3-2.

Preliminary analytical results will be faxed to Jeff Wilmoth at the following fax number per the turnaround times listed in Table 3-2 from day of sample receipt. The final hardcopy data and electronic file will be delivered to Jeff Wilmoth within 14 days of sample receipt.

Jeff Wilmoth  
CCI  
115 Perimeter Center Place, Suite 700  
Atlanta, GA 30346  
(770) 604-9182 x268  
(678) 604-9282 (fax)  
[jwilmoth@ch2m.com](mailto:jwilmoth@ch2m.com)

# 4.0 Waste Management Plan

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The Waste Management Plan describes the waste management requirements and procedures for groundwater remediation activities at NSA Mid-South, Millington, Tennessee. These activities are anticipated to generate the following wastes:

- Petroleum contaminated soil
- Aqueous waste (including petroleum contaminated groundwater, and decontamination water)
- Demolition debris, including scrap metal, road materials (e.g., asphalt), concrete
  - Demolition debris with lead-based paint
  - Contaminated demolition debris (e.g., with petroleum)
  - Uncontaminated or decontaminated demolition debris
- Spent or contaminated sampling equipment
- Spent personal protective equipment (PPE)
- Uncontaminated construction waste (such as caution tapes, barricades, signs, packing materials)

## 4.1 Waste Characterization

Petroleum-contaminated media (e.g., contaminated soil) generated from these activities that fail the Toxicity Characteristic test for the organic compounds associated with the D018 through D038 waste codes are not hazardous waste because they are part of state UST/petroleum cleanup activities (40 CFR 261.4(b)(10)). However, media that contain other hazardous waste constituents at toxicity characteristic levels would be considered hazardous wastes. For example, soil that contains  $\geq 5$  mg/L lead (using [TCLP]) would be considered a D008 hazardous waste; groundwater that contains  $\geq 0.02$  mg/L of the pesticide Endrin would be considered a D012 hazardous waste.

Section 3.0 Sampling and Analysis Plan provides detailed information on the sampling and analysis requirements for waste characterization, as required for disposal. In some cases, offsite facilities may require additional analyses to evaluate the wastestream prior to acceptance. Uncontaminated wastes and debris will be characterized using process knowledge and generally will be classified as municipal solid waste.

## 4.2 Waste Profile

Except for water discharged to the City of Millington waste water treatment plant (via an oil water separator), waste characterization information will be documented on a waste profile form provided by the offsite treatment or disposal facility as part of the waste acceptance

process. An approved copy of the waste profile will be received prior to offsite transportation of the material. Tonya Barker, or a designated representative from the Environmental Department, NSA Mid-South, will provide necessary signatures.

The profile typically requires the following information:

- Generator (Navy) information including name, address, contact, and phone number
- Site name including street/ mailing address
- Activity generating waste (groundwater remediation)
- Source of contamination (petroleum underground storage tanks)
- Physical state of waste (e.g., soil, groundwater, etc.)

## 4.3 Waste Management

### 4.3.1 Waste Storage Time Limit

Hazardous waste must be removed within 90-days from the date of generation and other wastes will be removed from the site as soon as possible. The date of generation is the day that a waste is first placed in a container.

### 4.3.2 Labels

All containers, tanks, and roll-off containers will be labeled, and labels will be visible. Hazardous waste labels will be used where a site has been pre-characterized, and/or known to be contaminated with listed or characteristic hazardous wastes.

Pre-printed "Hazardous Waste" labels will include the following information:

- Accumulation start date
- Generator Name: U.S. Navy
- EPA ID number: TN 2170022600
- Waste codes:

For containers of less than 110 gallons, the manifest number must be on the label before transporting.

Containers of known non-hazardous waste will have pre-printed "Non-Hazardous Waste" labels that include the following information:

- Accumulation start date
- Generator Name: U.S. Navy
- EPA ID Number: TN 2170022600
- Waste-specific information (e.g., contaminated groundwater)

When waste characterization is unknown and analytical results are pending, the pre-printed "Analysis Pending" label will be used until analytical results are received and reviewed, and a waste designation determined. These wastes will contain the equivalent information provided on a Hazardous Waste label:

- Accumulation start date
- Generator Name: U.S. Navy

- EPA ID Number: TN 2170022600
- Waste-specific information (e.g., contaminated groundwater)

### 4.3.3 Waste Management Area Requirements

All wastes will be contained in a manner that prevents the spread of contamination. Wastes may be contained in drums, portable tanks, roll-off boxes, and stockpiles. Unless the Navy has designated a specific waste storage area, wastes will be accumulated (and stored) near the project site. These waste storage areas are under CCI control. Waste-specific requirements include:

- Groundwater and/or decontamination water will be contained in 55-gallon drums or aggregated in portable tanks.
- Contaminated soil will be contained in drums, stockpiles, or roll-off boxes.
- Construction/demolition debris will be contained in stockpiles or in roll-off boxes.
- Contaminated sampling equipment, PPE, and other debris will be contained in drums. If decontaminated, these wastes can be disposed as uncontaminated debris/solid waste; if not, these wastes will be managed and disposed at the source concentration.
- Uncontaminated general construction debris will be placed with in containers or placed in storage piles, pending offsite disposal.

A barrier, such as barricade tape or temporary fencing, will be provided for hazardous waste accumulation areas and for other waste storage areas that are accessible to the general public. All petroleum and hazardous waste storage areas will also have signs providing 24-hour emergency contacts and telephone numbers.

Hazardous and petroleum waste management areas will contain emergency equipment, including fire extinguishers, decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in storage area). **Spill control equipment (e.g., sorbent pads) will be available in all waste storage areas, and where liquids are transferred from one vessel to another.**

#### 4.3.3.1 Drums (or other small containers)

- Drums of hazardous waste will be transported onsite on wood pallets and will be secured together with non-metallic bonding.
- All drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- Adequate aisle space (e.g., 30 inches) between drums will be provided to allow the unobstructed movement of personnel and equipment. A row of drums should be no more than 2 drums wide.
- Each drum will be provided with its own label as described above.
- Drums will remain covered except when removing or adding waste to the drum. Covers will be properly secured at the end of each workday.

- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated prior to re-use or before leaving the site.

#### **4.3.3.2 Portable Tanks**

- Tanks will be inspected upon arrival onsite for signs of deterioration and contamination. Any tank arriving onsite with contents will be rejected.
- Tanks will be provided with covers.
- Each tank will be labeled, as described above.
- All tanks will be provided with secondary containment.

#### **4.3.3.3 Roll-off Boxes**

- Roll-off boxes will be inspected upon arrival onsite. Any roll-off box arriving onsite with contents will be rejected.
- Roll-off boxes for hazardous or excessively contaminated soils will be provided with disposable liners, which will be disposed of as contaminated debris.
- When not in use, securely fastened covers will be installed on all roll-off boxes.
- Old labels will be removed, and new labels will be attached as described above
- Roll-off containers will be inspected by the transporter after removal of the liner and decontaminated in the event of evidence of liner failure.

#### **4.3.3.4 Stockpiles**

The following procedures will be followed when using stockpiles:

- Stockpiled soil or contaminated demolition debris will be provided with secondary containment (i.e., a liner, and perimeter berm to prevent rupture and release or infiltration of liquids), and a cover.
  - Minimum 6-mil polyethylene sheeting will be used for liners and covers.
  - The perimeter berm, typically hay bales placed beneath the liner, will be constructed to allow for collection of any liquids draining from the stockpile.
  - Contaminated liquids that accumulate in the secondary containment will be pumped (or otherwise removed) to a container or tank.
- Covers and perimeter berms will be secured in-place when not in use and at the end of each workday, or as necessary to prevent wind dispersion or run-off from major precipitation events.
- Construction materials for the stockpiles that contact waste will be disposed of as contaminated debris.
- Accumulation start dates will be recorded on a log or a sign located at the stockpile.

### 4.3.4 Waste/Fuel Storage Area Inspections

Areas used for waste/container storage will be inspected for malfunctions, deterioration, discharges, and leaks that could result in a release. The following inspection schedule will be followed:

- Daily inspection of containers, tanks, roll-off boxes, stockpiles and applicable secondary containment systems for leaks, spills, signs of corrosion, or signs of general deterioration or releases
- Daily inspection of fuel storage areas (e.g., look for eroding containment systems and rusting tanks/ancillary equipment)

Waste storage areas will be inspected each day of operation during the scheduled shift (i.e., Monday through Friday). **If operations will suspend for more than 7-days, alternate inspection arrangements will be made, such that waste storage areas are inspected at least weekly. Prior to demobilization, all hazardous wastes or materials will be removed from the site. Inspections will be recorded in the Contractor Quality Control Report, and copies of the report will be maintained onsite, and available for review.**

## 4.4 Waste Transportation

Each transportation vehicle and load of waste will be inspected before leaving the site. The quantities of waste leaving the site will be recorded. A contractor licensed for commercial transportation will transport non-hazardous wastes. A copy of the documentation indicating that the selected transporter has appropriate licenses will be received prior to transport of any waste material.

Section of the Environmental Protection Plan (CCI, July 2001) describes how paint chips will be transported to NSA Mid-South.

### 4.4.1 Manifests/Shipping Documentation

Each load of waste material will be manifested prior to leaving the site. At a minimum, the manifest form will include the following information:

- Transporter information including name, address, contact and phone number
- Generator information including name, address, contact, and phone number
- Site name including street/ mailing address
- Description of waste
- Type of container
- Quantity of waste (volumetric estimate)
- Additionally, each shipment of waste will also have a waste profile, a **Land Disposal Restriction (LDR) Notification/Certification for hazardous wastes**, and a haul ticket.

If the signed hazardous waste manifest from the designated offsite facility is not received within 35 days, CCI will contact the transporter or the designated facility to determine the status of the waste. If the signed hazardous waste manifest has not been received within 45 days, CCI will prepare an "Exception Report" for the Navy to submit to the State of Tennessee, as required under 40 CFR 262.42.

#### **4.4.2 Transporter Responsibilities**

In general, the transporter will be responsible for weighing loads of non-hazardous waste at a certified scale. For each load of material, weight measurements will be obtained for each full and empty container or tanker truck (for bulked aqueous wastes). Disposal quantities will be based on the difference of weight measurements between the full and empty container or tanker truck. Weights will be recorded on the shipping documentation. The transporter will provide copies of weight tickets with the final manifest to CCI.

The transporter will observe the following practices when hauling and transporting wastes offsite:

- Minimize impacts to general public traffic.
- Repair road damage caused by construction and/or hauling traffic.
- Clean-up material spilled in transit.
- Line and cover trucks/trailers used for hauling contaminated materials to prevent releases and contamination.
- Decontaminate vehicles prior to re-use, other than hauling contaminated material.
- Seal trucks transporting liquids.

All personnel involved in offsite disposal activities will follow safety and spill response procedures outlined in the Health and Safety Plan.

No materials from other projects will be combined with materials from NSA Mid-South Millington.

#### **4.4.3 Transportation and Disposal Log**

Transportation of wastes will be inventoried the day of transportation from the site using the Transportation and Disposal Log. A carbon copy of the initial manifest form for each load will be retained onsite and attached to the Daily Production Report. All required transportation manifests will be prepared by CCI and signed by NSA Mid-South Millington representative.

### **4.5 Waste Disposal**

Offsite treatment or disposal facilities will use the waste profile and supporting documentation (e.g., analytical results and flow-rate data) to determine if they will accept a waste. The treatment or disposal facility will be responsible for providing a copy of the final waste manifest and for a certificate of treatment or disposal for each load of waste received.

- Soil that contains a hazardous waste will be disposed at a permitted hazardous waste facility (i.e., Subtitle C facility).
- Non-hazardous, contaminated soils and contaminated demolition debris, including petroleum contaminated soils will be disposed in a facility permitted to accept the types and quantities of contamination (e.g., Subtitle D landfills).

- Aqueous wastes may be discharged to the City of Millington POTW permitted with written approval from the facility. The point of discharge (e.g., oil/water separator connected to a sewer) will be designated by this facility. Otherwise, contained aqueous wastes will be disposed offsite at a facility permitted to accept the waste.
- Uncontaminated, or decontaminated, construction and demolition debris may be sent to municipal landfills, or landfills designated for construction/demolition debris.

## 5.0 Quality Control Plan

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The Quality Control Plan provided in the Basewide Work Plan details the quality administrators, the project organization for the work to be completed at NSA Mid-South, and the definable features of work for each project site.

The Submittal Register, included in Appendix C of this work plan addendum, documents submittals in accordance with CCI's Contract Management Plan (CCI, 1998). CCI, the Navy, or others will approve submittals as identified in the Submittal Register. All approved submittals will be distributed by CCI to the appropriate Navy personnel (CO, ROICC (in duplicate), etc.), the project site, and to the project file.

The site-specific project organization chart (Figure 5-1) depicts the chain-of-command for this CTO and the individuals responsible for executing the work as indicated. Individual roles and responsibilities of CTO personnel are summarized in Table 5-1.

### 5.1 Project QC Manager

The Project QC Manager is yet to be determined.

### 5.2 Testing Requirements

Construction testing and environmental analysis laboratories and their certifications; construction testing and environmental sampling and analysis; and test control are described in this section. The Testing Plan and Log is provided in Appendix D.

#### 5.2.1 Identification and Certification of Testing Laboratories

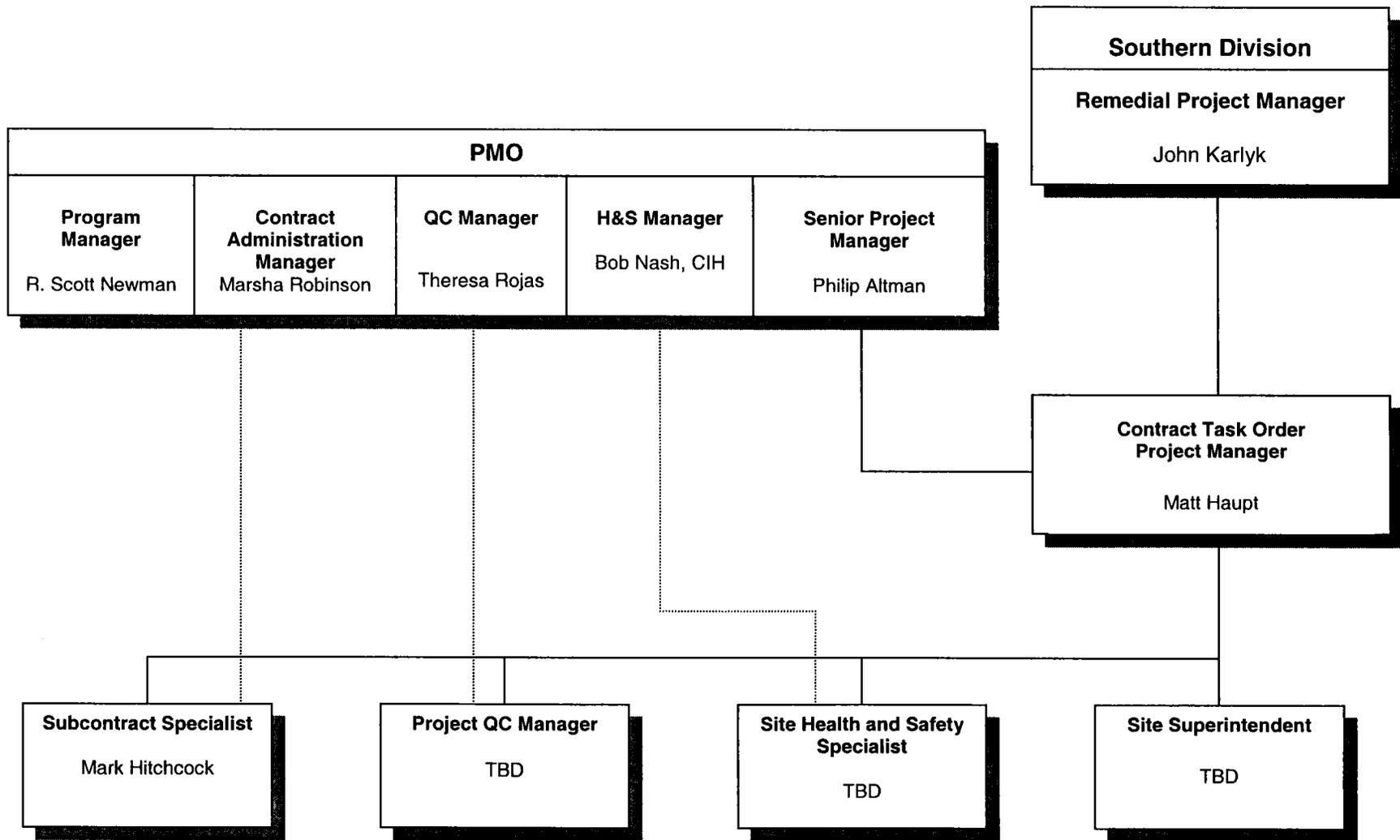
The construction testing and environmental testing laboratories utilized for this CTO project will function as a subcontractor or a lower tier subcontractor, and have not yet been identified.

#### 5.2.2 Construction

Construction testing laboratories will be National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP), American Association of State Highway and Transportation Officials (AASHTO), or American Association for Laboratory Accreditation (AALA) certified.

#### 5.2.3 Environmental

Laboratories performing analysis of environmental samples will be state- and Navy-approved.



- Field Engineer
- T&D Coordinator (as necessary)
- Project Assistant (as necessary)

**TABLE 5-1**  
Roles, Responsibilities, and Authorities of Project Personnel

<b>Role</b>	<b>Responsibility</b>	<b>Authority</b>
Project Manager	<ul style="list-style-type: none"> <li>• Management and Technical Direction of work</li> <li>• Communication with Southern Division RPM and NTR</li> <li>• Overview subcontractor performance</li> <li>• Select CTO staff</li> <li>• Develop CTO Work Plan and supporting plans</li> <li>• Meet CTO Performance Objectives</li> <li>• Prepare status reports</li> <li>• Prepare Field Change Requests</li> </ul>	<ul style="list-style-type: none"> <li>• Approve subcontractor selection</li> <li>• Approve invoices to Southern Division</li> <li>• Approve CTO baseline schedule</li> <li>• Stop work at the site for any reason</li> <li>• Approve payment to vendors and suppliers</li> <li>• Approve payment to subcontractors</li> <li>• Review technical qualifications of subcontractors</li> <li>• Respond to Design Change Notices</li> </ul>
Site Superintendent	<ul style="list-style-type: none"> <li>• Responsible for all site activities</li> <li>• Provide direction to subcontractors</li> <li>• Act for Project Manager</li> <li>• Provide daily status reports</li> <li>• Prepare CTO Work Plan</li> <li>• Conduct daily safety meetings</li> <li>• Review subcontractor qualifications</li> <li>• Stop work for unsafe conditions or practices</li> </ul>	<ul style="list-style-type: none"> <li>• Stop work for subcontractors</li> <li>• Approve corrective action for site work-arounds</li> <li>• Approve materials and labor costs for site operations</li> <li>• Resolve subcontractor interface issues</li> <li>• Approve daily and weekly status reports</li> </ul>
Project QC Manager	<ul style="list-style-type: none"> <li>• Monitor and oversee subcontractor compliance with scope of work</li> <li>• Review requests for changes in scope of work</li> <li>• Recommend improvements in work techniques or metrics</li> <li>• Recommend work-around to Site Superintendent</li> <li>• Monitor and report on subcontractor quality and quantities</li> <li>• Audit subcontractors offsite fabrication</li> <li>• Maintain Submittal Register</li> <li>• Participate in Incident-Free Operations conference call</li> </ul>	<ul style="list-style-type: none"> <li>• Complete daily compliance report</li> <li>• Monitor and report on subcontractor quality and quantities</li> <li>• Audit subcontractors offsite fabrication</li> <li>• Maintain Submittal Register</li> <li>• Stop work for non-compliant operations</li> <li>• Maintain Rework Items list</li> <li>• Stop work for non-compliant operations</li> </ul>
Site Health and Safety Specialist	<ul style="list-style-type: none"> <li>• Monitor and report on subcontractor safety and health performance</li> <li>• Record and report safety statistics</li> <li>• Conduct needed site safety and health orientation</li> <li>• Maintain Environmental Log</li> <li>• Stop work for unsafe practices or conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Stop work for unsafe practices or conditions</li> <li>• Approve subcontractor site specific health and safety plan</li> <li>• Set weekly safety objectives</li> <li>• Approve resumption of work for resolved safety issues</li> </ul>
Subcontract Specialist	<ul style="list-style-type: none"> <li>• Prepare bid packages</li> <li>• Purchase disposable materials</li> <li>• Maintain subcontract log</li> <li>• Approve payables for disposable items</li> <li>• Maintain government property records</li> </ul>	<ul style="list-style-type: none"> <li>• Provide project scheduling coordination</li> <li>• Responsible for site cost tracking and reporting</li> <li>• Maintain record of site purchases</li> </ul>

## **5.2.4 Testing and Sampling**

Soil, water, decontamination waste, and excavation contact water will be sampled under CCI or its subcontractors. Soil compaction testing and concrete testing (compressive strength) will also be performed under CCI or its subcontractors.

### **5.2.4.1 Construction Testing**

No physical testing is anticipated for NSA Mid-South; however, the topographical surveying performed will meet the following requirements:

- Horizontal
  - Mercator Projection
  - GRS 80
  - State Plane Coordinate System
  - North American Datum 1983
  - Lambert Zones 1 – 6
  - Feet
- Vertical
  - Mean Sea Level
  - North American Vertical Datum 1988
  - Feet

### **5.2.4.2 Recovery Well Installation**

The excavation bottoms will be graded to the down flow gradient direction in accordance with Figure 2-2. A sump will be installed to create a french drain, filling with rock in lifts averaging no greater than 18 inches. Precautions will be taken to avoid collapsing the perforated pipe. The material used to backfill the excavation areas to within 18 inches of land surface, will be rock averaging 2-inch diameters, free of debris and other foreign matter.

The upper 18 inches of fill will be granular soil placed in 6-inch loose lifts, as shown on Figure 2-2. Clay will be compacted to 85 percent standard proctor; no compaction testing is required for this project.

### **5.2.4.3 Environmental Sampling and Analysis**

Environmental sampling and analysis, including QC sampling and analysis, is specified in Section 3.0 Sampling and Analysis Plan. Samples will be collected in accordance with EPA methods and industry standards of practice. Additionally, personnel that perform sampling will meet the requirements stated in the Navy Installation Restoration Chemical Data Quality Manual – September 1999 (IR CDQM).

## **5.2.5 Test Control**

Environmental samples will be collected in accordance with EPA methods and procedures. Other controls will include, but are not limited to, maintaining a chain of custody; proper handling, packing, and shipping; and the use of qualified laboratories.

The Project QC Manager will verify the following items:

- Facilities and testing equipment are available and comply with testing standards.
- Test instrument calibration data, including the flow measuring device recording flow to the oil water separator, has been checked.
- Recording forms, including all of the test documentation requirements, have been prepared.
- The compactive effort for all areas backfilled is acceptable.
- The excavated areas have been approved for backfill.
- General survey services for locating the excavation boundaries and well points are complete.

### **5.3 CTO Support Organizations**

The supporting organizations are yet to be determined.

## 6.0 References

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CH2M HILL Constructors, Inc. July 1998. Contract Management Plan. Prepared for Southern Division, Naval Facilities Engineering Command, Contract No. N6246-98-D0995.

CH2M HILL Constructors, Inc. April 2001. Basewide Work Plan for Naval Support Activity Mid-South, Millington, Tennessee, Revision 01.

Ensafe, Inc. December 4, 2000. Corrective Action Plan Addendum, Navy Exchange Service Station Facility ID #0-791718, Naval Support Activity Mid-South Millington, Revision 1.

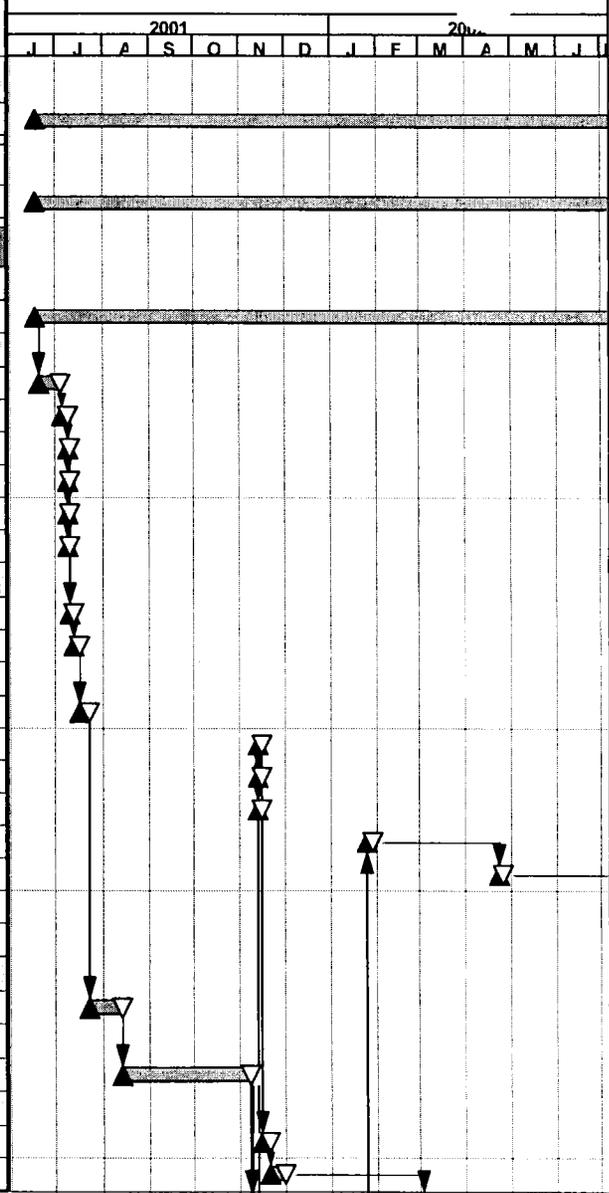
U.S. Environmental Protection Agency. 1996. Low-Flow, Minimal Drawdown Groundwater Sampling Procedures.

Tennessee Department of Environment and Conservation, Division of UST, Reference Handbook.

## **Appendix A**

### **CPM Project Schedule**

Activ. ID	WBS CHARGE #	% Comp	Activity Description	Orig Dur	am Dur	Early Start	Early Finish
<b>CTO #0061 - NAVSUPACT - MEMPHIS</b>							
Subtotal		0		333	333	18JUN01	15OCT02
<b>PHASE 3</b>							
Subtotal		0		333	333	18JUN01	15OCT02
<b>NEX GAS STATION</b>							
<b>PROJECT MANAGEMENT</b>							
BY99220101	992201.01	0	Project Management	333	333	18JUN01*	15OCT02
<b>MOBILIZATION &amp; PREPARATORY WORK</b>							
BY31010394	31.01.03.94	0	Subcontractor's Pre-Con Submittals	10	10	20JUN01	03JUL01
BY31010395	31.01.03.95	0	Review Subcontractor's Plans/Submittals	3	3	05JUL01	09JUL01
BY31010292	31.01.02.92	0	Subcontractor Mobilization	1	1	10JUL01	10JUL01
BY31221209	31.22.12.09	0	Subcontractor Bonds	1	1	10JUL01	10JUL01
BY98010290	99.01.02.90	0	CTO Kickoff Meeting	1	1	10JUL01	10JUL01
BY98010291	99.01.02.91	0	CCI Mobilization	1	1	10JUL01	10JUL01
<b>SITE SETUP</b>							
BY99010401	99.01.04.01	0	Initiate Job-Site Presence	2	2	11JUL01	12JUL01
BY31010490	31.01.04.90	0	Site Setup	2	2	13JUL01	16JUL01
<b>SAMPLING &amp; ANALYSIS</b>							
BY31020590	31.02.05.90	0	Pre-Construction Sampling	5	5	17JUL01	23JUL01
BY31020602	31.02.06.02	0	Confirmatory Sampling	3	3	13NOV01	15NOV01
BY31021490	31.02.14.90	0	Independent Data Validation	3	3	13NOV01	15NOV01
BY31021491	31.02.14.91	0	Data Evaluation & Management	3	3	13NOV01	15NOV01
BY31020594	31.02.05.94	0	Quarterly Sampling	2	2	25JAN02	28JAN02
BY31020595	31.02.05.94	0	Quarterly Sampling	2	2	24APR02	25APR02
BY31020596	31.02.05.94	0	Quarterly Sampling	2	2	23JUL02	24JUL02
BY31020597	31.02.05.94	0	Quarterly Sampling	2	2	11OCT02	15OCT02
<b>DEMOLITION</b>							
BY31080103		0	Demolition-Pavement, Pump Island & Canopy	15	15	24JUL01	13AUG01
<b>EXCAVATION</b>							
BY31080102	31.08.01.02	0	Excavation	60	60	14AUG01	07NOV01
<b>GROUNDWATER COLLECTION</b>							
BY31020592	31.02.05.92	0	Collected Liquids Sampling	3	3	16NOV01	20NOV01
BY31060790	31.06.07.90	0	Pump Collected Groundwater/Pump to POTW	6	6	21NOV01	30NOV01



Start Date 22AUG98  
 Finish Date 15OCT02  
 Data Date 30MAR01  
 Run Date 07MAY01 15:01

 Early Bar  
 Progress Bar  
 Critical Activity

NPAC - CO61

Sheet 1 of 2

CTO #0061 - NAVSUPACT - MEMPHIS  
 CTO COMPLETION SCHEDULE  
 NAVY RAC SOUTHERN DIVISION



## **Appendix B**

### **Health and Safety Plan**

**Health and Safety Plan  
NEX Gas Station Remediation  
Naval Support Activity Mid-South  
Millington, Tennessee**

**Revision 03**

**Contract No. N62467-98-D-0995  
Contract Task Order No. 0061**

Submitted to:

**U.S. Naval Facilities  
Engineering Command  
Southern Division**

Prepared by:



**CH2MHILL**  
*Constructors, Inc.*

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**August 2001**

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1	Employee Signoff
2	Project-Specific Chemical Product Hazard Communication Form
3	Chemical-Specific Training Form
4	Material Safety Data Sheets
5	Project Self-Assessment Checklist

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# Acronyms

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°F	degrees Fahrenheit
ALARA	as low as reasonably achievable
APR	air-purifying respirator
ATL	Atlanta, Georgia
BRAC	Base Realignment and Closure
CCI	CH2M HILL Constructors, Inc.
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dBA	decibel A-rated
DOT	Department of Transportation
FA	first aid
FID	flame ionization detector
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
lb	pound
LEL	lower explosive limit
mg/m <sup>3</sup>	milligrams per cubic meter
MSDS	Material Safety Data Sheet
mW/cm <sup>2</sup>	milliwatt per square centimeter
NAVFAC	Naval Facilities Engineering Command
NEX	Navy Exchange
NSA	Naval Support Activity
NDG	nuclear density gauge
NSC	National Safety Council
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PDF	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
RMSF	Rocky Mountain Spotted Fever
SAR	supplied-air respirator
SCBA	self-contained breathing apparatus
SHSS	Site Health and Safety Specialist
SOP	standard of practice
STEL	short-term exposure limit
SZ	support zone

TBD  
TSDf      to be determined  
            treatment, storage, and disposal facility

This health and safety plan (HSP) will be kept on the site during field activities and will be reviewed and updated as necessary. The plan adopts, by reference, the standards of practice (SOPs) in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*, and CH2M HILL Constructors, Inc. (CCI) Health and Safety Guidelines as appropriate. The Site Health and Safety Specialist (SHSS) is to be familiar with these SOPs and the content of this plan. Site personnel must sign Attachment 1. In addition, this plan adopts procedures in the work plan for the project.

# 1.0 Project Information and Description

---

**Client or Owner:** Southern Division, Naval Facilities Engineering Command (NAVFAC)

**Project No:** CTO-0061

**CCI Project Manager:** Matt Haupt

**Office:** Atlanta, Georgia (ATL)

**Site Name:** Naval Support Activity (NSA) Mid-South

**Site Address:** Millington, Tennessee

**Date Health and Safety Plan Prepared:** May 2001

**Date(s) of Initial Visit:** September 2000

**Date(s) of Site Work:** June – October 2001

**Site Access:** Access is not restricted as most of the facility has been turned over to the city of Millington.

**Site Size:** The site occupies about an acre. It is located on the north side adjacent to Old Navy Road.

**Site Topography:** flat plain with slight rolling hills

**Prevailing Weather:** hot humid summers with cold winter and potential for snow.

**Site Description and History:** The facility was closed under Phase III of the Base Realignment and Closure (BRAC) program in 1998 and turned over to the city of Millington. The Navy Exchange (NEX) gas station is the site of this activity. It is currently out of service.

# 2.0 Project Organization and Tasks to be Performed under this Plan

---

## 2.1 Project Organization

**Client:** Southern Division, Naval Facilities Engineering Command

**CCI:**

Project Manager: Matt Haupt/ATL

Field Team Leader: TBD/ATL

Refer to Section 4.0 for field staff.

**Contractors and Subcontractors:** Refer to Section 4.2.

## 2.2 Description of Tasks

Refer to project documents (i.e., work plan) for detailed task information. A health and safety risk analysis has been performed for each task and is incorporated in this HSP through task-specific hazard controls and requirements for monitoring and protection. Tasks in addition to those listed below require an approved amendment to this plan before additional work begins. Refer to Section 10.2 for procedures related to tasks that do not involve hazardous waste operations and emergency response (HAZWOPER).

### 2.2.1 HAZWOPER-Regulated Tasks

HAZWOPER-regulated tasks include:

- Well sampling
- Installation of interceptor trench
- Excavation of four areas for volatile organic compound (VOC) contamination including shoring near buildings
- Pumping of excavated groundwater
- Partial demolition of canopy over Pump Islands 4 through 7 (lead paint)
- Demolition of Pump Island 4

### 2.2.2 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state HAZWOPER regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-HAZWOPER-trained personnel. **Prior approval from the Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste sites.**

### TASKS

- General heavy equipment (excavation, grading, etc.)

### CONTROLS

- Brief on hazards, limits of access, and emergency procedures
- Post contamination areas as appropriate

A task hazard analysis is provided in Table 2-1.

**TABLE 2-1**  
Task Hazard Analysis

Potential Hazards	Tasks				
	Soil Excavation/ Trenching HS-32	Groundwater Monitoring	Shoring and Bracing	Demolition HS-45	Loading material for offsite disposal
Aerial Lifts HS-41					
Benzene HS-67	X	X			X
Buried Utilities, Drums, Tanks	X			X	
Compressed Gas HS-63	X			X	
Confined Space Entry HS-17	X				
Cranes, Hoist, Rigging HS-44			X	X	
Earthmoving HS-27	X			X	X
Electrical HS-23	X		X	X	
Excavation HS-32	X			X	
Fire Protection HS-22	X	X	X	X	X
Hand and Power Tools HS-50	X	X	X	X	
Heavy Equipment HS-27	X		X	X	X
Ladders HS-25	X		X	X	
Lead HS-57				X	X
Lockout/Tagout HS-33	X			X	
Manual Lifting HS-29	X	X	X	X	
Noise >85dBa HS-39	X	X	X	X	X
Respirators HS-08	X			X	
Rigging HS-44	X		X	X	
Scaffolding HS-73				X	
Traffic Control HS-24	X	X	X	X	X
Visible lighting	X	X	X	X	X
Welding and Cutting HS-63	X		X	X	

### **2.2.3 Hazard Controls**

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. Table 2-2 lists safe work practices and control measures used to reduce or eliminate potential hazards for the activities associated with this project. Inspection and training requirements for equipment are listed in Table 2-3. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CCI employees and subcontractors must remain aware of the hazards affecting them regardless of the party responsible for controlling the hazards. CCI employees and subcontractors who do not understand any of these provisions should contact the SHSS for clarification.

In addition to controls specified in this section, activity Self-Assessment Checklist is provided in Attachment 5. This checklist is to be used to assess the adequacy of CCI and subcontractors site-specific safety requirements. Objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing gaps. A Self-Assessment Checklist will be completed weekly and returned to the Senior Project Manager, with a copy to HSM.

**TABLE 2-2**  
Recommended Safety Controls

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Hazards	Reduce general safety hazards found at most sites; referenced in CH2M HILL SOP HS-20	<p>Site work will be performed during daylight hours whenever possible. Work conducted during hours of darkness will require enough illumination intensity to read a newspaper without difficulty.</p> <p>Hearing protection worn in areas where you need to shout to hear someone within 3 feet.</p> <p>Good housekeeping must be maintained at all times in project work areas.</p> <p>Common paths of travel established and kept free from accumulation of materials.</p> <p>Provide slip-resistant surfaces, ropes, and /or other devices to be used.</p> <p>Specific areas should be designated for the proper storage of materials.</p> <p>Tools, equipment, materials, and supplies will be stored in an orderly manner.</p> <p>As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.</p> <p>Containers should be provided for collecting trash and other debris and will be removed at regular intervals.</p> <p>Spills will be cleaned up. Oil and grease will be cleaned from walking surfaces.</p>
Hazard Communication	Comply with the Hazard Communication Standard informing worker about the chemical to which they may be exposed; referenced in 29 CFR 1926 and CH2M HILL SOP HS-05	<p>Complete an inventory of chemicals brought on site by CCI using the Project-Specific Chemical Hazard Communication Form provided in Attachment 2.</p> <p>Confirm inventory of chemicals brought on site by CCI subcontractors is available.</p> <p>Confirm locations of Material Safety Data Sheets (MSDSs) from client, contractors, and subcontractors for chemicals to which CCI employees potentially are exposed.</p> <p>Before or as the chemicals arrive onsite, obtain an MSDS for each hazardous chemical.</p> <p>Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.</p> <p>Give employees required chemical-specific HAZCOM training using the Chemical-Specific Tracking Form provided in Attachment 3.</p>
<b>Chemicals</b>		
Benzene (Soil contamination) If confirmed by Drager tubes in excess of 1ppm in breathing zone, Personnel Monitoring Required in addition to Real-time monitoring.	Exposure to Benzene above the PEL as listed in 29 CFR 1926.1128; referenced in 29 CFR 1910.1028 and CH2M HILL SOP HS-67	<p>Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.</p> <p>Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.</p> <p>Skin absorption is a potential route of benzene exposure.</p> <p>Benzene is considered a "Confirmed Human Carcinogen."</p> <p>An STEL of 15 minutes exists for this material of 5 ppm.</p> <p>Benzene has an aromatic odor.</p> <p>Respiratory protection and other exposure controls selection will be based on the most recent exposure monitoring results obtained from the competent person.</p>

TAL .2 (CONTINUED)  
Recommended Safety Controls

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Lead (Canopy Demolition) Respiratory Protection required for this activity as long as painted surfaces are involved. Burning or welding on painted surface may release additional lead fume.</p>	<p>Exposure to Lead above the PEL; referenced in 29 CFR 1926.62 and CH2M HILL SOP-57</p>	<p>Work activities involving cutting, grinding, burning, welding, and other abrasive operations performed on any painted and/or coated surfaces should be treated as having an increased potential for lead exposure.</p> <p>Surfaces suspected of containing lead will be treated as lead unless documentation and/or testing results indicate otherwise.</p> <p>Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.</p> <p>Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.</p> <p>Do not launder work clothes with ordinary clothes.</p> <p>Respiratory protection and other exposure controls selection will be based on the most recent exposure monitoring results obtained from the competent person.</p> <p>The following requirements pertain to lead contaminated soils: Work will progress in a sequence from less contaminated to more contaminated areas. Water should be added to soils prior to and during excavation, air rotary drilling, and other activities that create or have the potential to create airborne lead contaminated dust. For air rotary drilling operations, water can be added to the boring to reduce dust generation from the cyclone. Depending upon soil type, watering of soil may be required several days prior to commencing ground intrusive activities. Personnel working in the vicinity of lead contaminated soil will wear disposable coveralls or equal and exercise enhanced personal hygiene (i.e., frequent hand washing prior to eating, drinking, smoking; separation of work and street clothing/footwear; etc.).</p>
<b>Physical Conditions</b>		
<p>Aerial Lifts Canopy Demolition</p>	<p>Reduce risk to equipment and personnel when lifting materials; referenced in 29 CFR 1926, Subpart N, and CH2M HILL SOP-41</p>	<p>Only authorized and trained personnel are permitted to operate aerial lifts.</p> <p>Inspect aerial lifts and test lift controls prior to use.</p> <p>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.</p> <p>Do not attach lanyard to adjacent structure or equipment while working from aerial lift.</p> <p>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.</p> <p>Remain in platform at all times and do not leave platform to climb to adjacent structures.</p> <p>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.</p> <p>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.</p> <p>Do not exceed the boom and basket load limits.</p> <p>Do not use aerial lifts as cranes, unless specifically designed/approved by manufacturer.</p> <p>Do not work or stand below aerial lift operations.</p> <p>Do not use aerial lifts when winds exceed 30 miles per hour.</p>

**TABLE 2-2 (CONTINUED)**  
Recommended Safety Controls

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Buried utilities, drums, tanks (Excavations)	Reduce risk of contacting buried utilities, drums, or tanks during excavations	Contact local utility locator service or Base utilities service before excavations . Perform testing to locate buried tanks, drums or pipelines such as magnetometer or ground penetrating radar survey before excavation.
Confined Space Entry (Required if entering excavation over 4' deep)	Reduce risk of accident or injuries during a confined space entry; referenced in 29 CFR 1910.146 and CH2M HILL SOP HS-17.	<p>Confined space entrants, attendants, and entry supervisors must complete the CH2M HILL 8-Hour Confined Space Entry training.</p> <p>A Confined Space Entry Permit (CSEP), Alternative Procedure Certificate (APC), or Non-permit Certificate (NPC) must be completed and posted near the space entrance point for review.</p> <p>Each confined space entrant and attendant must attend a pre-entry briefing conducted by the entry supervisor.</p> <p>Each confined space entrant and attendant must verify that the entry supervisor has authorized entry and that all permit or certificate requirements have been satisfied.</p> <p>Only individuals listed on the Authorization/Accountability Log are permitted to enter the space.</p> <p>Each confined space entrant and attendant must verify that atmospheric monitoring has been conducted at the frequency specified on the permit or certificate and that monitoring results are documented and within acceptable safe levels.</p> <p>The following requirements must be met during confined space entry:</p> <p>Communication must be maintained between the attendant and entrants to enable the attendant to monitor entrant status.</p> <p>Entrants must use equipment specified on the permit or certificate accordingly.</p> <p>All permit or certificate requirements must be followed.</p> <p>Entrants must evacuate the space upon orders of the attendant or entry supervisor, when an alarm is sounded, or when a prohibited condition or dangerous situation is recognized.</p> <p>Entrants and attendants must inform the entry supervisor of any hazards confronted or created in the space or any problems encountered during entry.</p>
Compressed gasses	Reduce the hazards when working with compressed gasses	<p>Valve caps must be in place when cylinders are transported, moved, or stored.</p> <p>Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.</p> <p>Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.</p> <p>Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over; contacting electrical circuits; or exposed to extreme heat sources.</p> <p>Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.</p>
Energized Electrical	Reduce the hazards when dealing with energized electrical circuits; referenced in 29 CFR 1926.400 and CH2M HILL SOP-23.	<p>Only qualified personnel permitted to work on unprotected energized electrical systems.</p> <p>Electrical wiring and equipment will be de-energized prior to conducting work unless it can be demonstrated that de-energizing introduces additional or increased hazards or is unfeasible due to equipment design or operational limitations.</p> <p>Electrical systems will be considered energized until lockout/tagout procedures are implemented.</p>

**TAE 2 (CONTINUED)**  
**Recommended Safety Controls**

<b>Principal Steps</b>	<b>Potential Safety/Health Hazards</b>	<b>Recommended Controls</b>
Fire Protection	To reduce the incidents of fires and provide resources to fight fires; referenced in 29 CFR 1926.150 and CH2M HILL SOP-22	<p>Fire extinguishers will be provided so travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must: 1) be maintained in a fully charged and operable condition, 2) be visually inspected each month, and 3) undergo a maintenance check each year.</p> <p>The area in front of extinguishers must be kept clear.</p> <p>Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.</p> <p>Combustible materials stored outside should be at least 10 feet from any building.</p> <p>Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.</p> <p>Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.</p>
Ladders	Reduce the hazards from climbing and operating ladders; referenced in 29 CFR 1926, Subpart X and CH2M HILL SOP HS-25	<p>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.</p> <p>Portable ladders must extend at least 3 feet above landing surface.</p> <p>User must face the ladder when climbing; keep belt buckle between side rails.</p> <p>User must use both hands to climb, use rope to raise and lower equipment and materials.</p> <p>Straight and extension ladders must be tied off to prevent displacement.</p> <p>Ladders that may be displaced by work activities or traffic must be secured or barricaded.</p> <p>Fixed ladders greater than or equal to 20 feet in height must be provided with fall protection devices.</p> <p>Stepladders are to be used in the fully opened and locked position.</p> <p>Users are not to stand on the top two steps of a stepladder, nor are users to sit on top or straddle a stepladder.</p> <p>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.</p>
Lockout/Tagout (All electrical and pumps in area to be excavated or trenched)	Reduce the hazards of accidental machine startups while out of service; referenced in 29 CFR 1910.147, 29 CFR 1926. 417, and CH2M HILL SOP HS-33	<p>Do not work on equipment when the unexpected operation could result in injury, unless lockout/tagout procedures are implemented.</p> <p>Staff working under a lockout/tagout procedure must complete the CH2M HILL Lockout/Tagout training course. Project-specific training may also be required on site-specific lockout/tagout procedures.</p> <p>Standard lockout/tagout procedures include the following six steps:</p> <p>Notify all personnel in the affected area of the lockout/tagout,</p> <p>Shut down the equipment using normal operating controls,</p> <p>Isolate all energy sources,</p> <p>Apply individual lock and tag to each energy isolating device,</p> <p>Relieve or restrain all potentially hazardous stored or residual energy, and</p> <p>Verify that isolation and de-energization of the equipment has been accomplished. Once verified that the equipment is at the zero energy state, work may begin.</p> <p>All safe guards must be put back in place, all affected personnel notified that lockout/tagout has been removed, and controls positioned in the safe mode prior to lockout/tagout removal.</p> <p>Do not remove another person's lock or tag.</p>

**TABLE 2-2 (CONTINUED)**  
Recommended Safety Controls

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Manual Lifting	Reduce hazards encountered when lifting loads; referenced in CH2M HILL SOP HS-29	<p>Proper lifting techniques must be used when lifting any object.</p> <p>Plan storage and staging to minimize lifting or carrying distances.</p> <p>Split heavy loads into smaller loads.</p> <p>Use mechanical lifting aids whenever possible.</p> <p>Have someone assist with the lift especially for heavy or awkward loads.</p> <p>Ensure that the path of travel is clear prior to the lift.</p>
Noise	Reduce the exposure to noise; referenced in 29 CFR 1926.101 and 29CFR 1910.95, and CH2M HILL SOP HS-39	<p>Noise areas will be evaluated at the start of the project and at any time new machinery is added to the process.</p> <p>Hearing protection will be worn whenever levels in excess of 85 dBA are exceeded as in areas where you must raise your voice to communicate at a distance of 3 feet or less.</p> <p>Personnel will be trained in the proper installation techniques for ear protection that fits in the ear canal.</p> <p>Hearing protective devices will be kept clean and sanitary between uses.</p> <p>Noise measurements may be required by the SHSS to determine protection areas. These areas need to be posted with appropriate warning signs.</p>
Respiratory Protection	Perform respiratory protection in a safe and healthful manner; referenced in 29 CFR 1926.103 and CH2M HILL SOP HS-0	<p>Respirator users must have completed appropriate respirator training within the past 12 months. SC training is required for air-purifying respirators (APR) use and Level B training is required for supplied-air respirators (SAR) and self-contained breathing apparatus (SCBA) use. Specific training is required for the use of powered air-purifying respirators (PAPR).</p> <p>Respirator users must complete the respirator medical monitoring protocol and been approved for the specific type of respirator to be used.</p> <p>Tight-fitting facepiece respirator (negative or positive pressure) users must have passed an appropriate fit test within past 12 months.</p> <p>Respirator use will be limited to those activities identified in this plan. If site conditions change that alter the effectiveness of the specified respiratory protection, the HSM will be notified to amend the written plan.</p> <p>Tight-fitting facepiece respirator users will be clean-shaven and will perform a user seal check before each use.</p> <p>Canisters/cartridges will be replaced according to change-out schedule specified in this plan. Respirator users will notify SHSS of any detection of vapor or gas breakthrough. SHSS will report any breakthrough events to HSM for schedule upgrade.</p> <p>Respirators in regular use will be inspected before each use and during cleaning</p> <p>Respirators in regular use will be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition.</p> <p>Respirators will be properly stored to protect against contamination and deformation.</p> <p>Field repair of respirators will be limited to routine maintenance. Defective respirators will be removed from service.</p> <p>When breathing air is supplied by cylinder or compressor, the SHSS will verify the air meets Grade D air specifications.</p> <p>The SHSS will complete the H&amp;S Self-Assessment Checklist – Respiratory Protection include in Attachment 5 of this plan to verify compliance with CH2M HILL’s respiratory protection program.</p>

**TAB. .-2 (CONTINUED)**  
**Recommended Safety Controls**

<b>Principal Steps</b>	<b>Potential Safety/Health Hazards</b>	<b>Recommended Controls</b>
Scaffolding	Reduce the potential for accident from the use of scaffolding; referenced in 29 CFR 1926 Subpart L and CH2M HILL SOP HS-73	<p>Do not access scaffolds until the competent person has completed the work shift inspection and has authorized access.</p> <p>Follow requirements established by competent person or as identified on scaffold tag.</p> <p>Do not access scaffolds that are damaged or unstable at any time and for any reason.</p> <p>Only access scaffolds by means of a ladder, stair tower, ladder stand, ramp, integral prefabricated scaffold access, or other equivalent safe means of access. Scaffold crossbracing will not be used to access scaffold platforms.</p> <p>Remain within the scaffold guardrail system when provided. Leaning over or stepping across a guardrail system is not permitted.</p> <p>Use personal fall arrest systems when required by the competent person and when working from suspension scaffolds or boatswains' chairs. CH2M HILL's fall protection training must be completed before using personal fall arrest systems.</p> <p>Do not stand on objects (bricks, blocks, etc.) or ladders on top of scaffold platforms to increase working height unless the platform covers entire floor area of the room.</p> <p>Do not work on scaffolds covered with snow, ice, or other slippery material or work on scaffolds during storms or high winds unless personal fall arrest systems or wind screens are provided and competent person determines it's safe to remain on scaffold.</p>
Shoring and Bracing	Reduce the potential for accidents from the installation and removal of shoring and bracing; referenced in 29 CFR 1926 Subpart P Excavations and 29CFR 1926.603 Pile Driving Equipment	<p>Only certified operators shall operate pile driving equipment</p> <p>Employees will be kept clear of area when piles are being lifted.</p> <p>When cutting piles, driving operations will be suspended in the area of the cutting.</p> <p>Engineers and winchmen shall accept signals only from the designated signalman.</p> <p>Sheet-piling may need bracing to support vertical walls of an excavation.</p>
Traffic Control	Reduce accidents related to control of traffic and impacts; referenced in CH2M HILL SOP HS-24	<p>Exercise caution when exiting traveled way or parking along street; avoid sudden stops, use flashers, etc.</p> <p>Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.</p> <p>All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.</p> <p>Eye protection should be worn to protect from flying debris.</p> <p>Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.</p> <p>Always remain aware of an escape route – behind an established barrier, parked vehicle, guardrail, etc.</p> <p>Always pay attention to moving traffic – never assume drivers are looking out for you</p> <p>Work as far from traveled way as possible to avoid creating confusion for drivers.</p> <p>When workers must face away from traffic, a "buddy system" should be used, where one worker is looking towards traffic.</p> <p>When working on highway projects, obtain copy of the contractor's traffic control plan.</p> <p>Work area should be protected by a physical barrier such as a K-rail or Jersey barrier.</p>

**TABLE 2-2 (CONTINUED)**  
Recommended Safety Controls

<b>Principal Steps</b>	<b>Potential Safety/Health Hazards</b>	<b>Recommended Controls</b>
Welding and Cutting	Reduce the physical hazards from welding and cutting; referenced in 29 CFR 1926, Subpart J and CH2M HILL SOP HS-63	<p>Only authorized/trained personnel are permitted to operate welding/cutting equipment.</p> <p>Do not enter areas where welding/cutting operations are taking place unless completely necessary and only after receiving permission from the welding/cutting operator.</p> <p>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 darkness.</p> <p>Do not look directly at the welding/cutting flash or at reflective surfaces surrounding welding/cutting operations.</p>

**TABLE 2-3**  
Equipment Inspection and Training Requirements

<b>Equipment To Be Used</b>	<b>Inspection Requirements</b>	<b>Training Requirements</b>
Forklifts, HS-48	<p>Forklifts will be inspected by the operator prior to use.</p> <p>No part of a load must pass over any personnel.</p> <p>Forklifts left unattended must be immobilized and secured against accidental movement and forks, buckets or attachments must be in lowered position or be firmly supported.</p> <p>No load may exceed the maximum rated load and loads must be handled in accordance with the height and weight restrictions on the load chart.</p> <p>When a load is in the raised position, the controls must be attended by an operator.</p> <p>If an operator does not have a clear view of the path, a signaler must be used.</p> <p>Loads must be carried as close to the ground or floor as the situation permits.</p> <p>Loads that may tip or fall must be secured.</p> <p>Where a forklift is required to enter or exit a vehicle to load or unload, the vehicle must be immobilized and secured against accidental movement.</p> <p>Forklifts will not be used to support, raise or lower workers.</p> <p>Forklifts operators will wear seatbelts at all times.</p> <p>Concentrations of carbon monoxide created by forklift operation indoors must be monitored when potential exists for reaching or exceeding permissible exposure limits.</p> <p>Barriers, warning signs, designated walkways or other safeguards must be provided where pedestrians are exposed to the risk of collision.</p>	<p>Only authorized and trained personnel are permitted to operate forklifts.</p>

**TABLE 2-3 (CONTINUED)**  
**Equipment Inspection and Training Requirements**

Equipment To Be Used	Inspection Requirements	Training Requirements
<p>Trackhoes            Backhoes            Excavators            Bucket Cranes            Bull Dozers            Pile Drivers            HS-27</p>	<p>Maintain safe distance from operating equipment and stay alert of equipment movement. Avoid positioning between fixed objects and operating equipment and equipment pinch points, remain outside of equipment swing/turning radius. Pay attention to backup alarms, but not rely on them for protection. Never turn your back on operating equipment.</p> <p>Approach operating equipment only after receiving the operator's attention. The operator will acknowledge your presence and stop movement of the equipment. Caution will be used when standing next to idle equipment; when equipment is placed in gear it can lurch forward or backward. Never approach operating equipment from the side or rear where the operator's vision is compromised.</p> <p>When required to work in proximity to operating equipment, wear high-visibility vests to increase visibility to equipment operators. For work performed after daylight hours, vests will be made of reflective material or include a reflective stripe or panel.</p> <p>Do not ride on earthmoving equipment unless it is specifically designed to accommodate passengers. Only ride in seats that are provided for transportation and that are equipped with seat belts.</p> <p>Earthmoving equipment will not be used to lift or lower personnel.</p> <p>If equipment becomes electrically energized, personnel will be instructed not to touch any part of the equipment or attempt to touch any person who may be in contact with the electrical current. The utility company or appropriate party will be contacted to have line de-energized prior to approaching the equipment.</p>	<p>Only authorized and trained personnel are permitted to operate earthmoving equipment.</p>
<p>Motor Vehicles (Off highway job site) HS-47</p>	<p>All vehicles will have working safety equipment including: two headlights, brake lights, audible warning device, and a reverse signal audible above surrounding noise levels.</p> <p>Cabs shall be equipped with windshields and powered wipers.</p> <p>All vehicles in use will be inspected at the beginning of each shift and a CCI Heavy Equipment Checklist completed (or the subcontractor's equivalent document.)</p>	<p>Only state licensed personnel may operate company vehicles.</p>

**TABLE 2-3 (CONTINUED)**  
**Equipment Inspection and Training Requirements**

<b>Equipment To Be Used</b>	<b>Inspection Requirements</b>	<b>Training Requirements</b>
Crane or Other Lifting Devices, HS-44	<p>Maintain safe distance from operating cranes and stay alert of crane movement. Avoid positioning between fixed objects and operating cranes and crane pinch points, remain outside of crane swing and turning radius. Never turn your back on operating cranes.</p> <p>Approach cranes only after receiving the operator's attention. The operator will 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.</p> <p>When required to work in proximity to operating cranes, wear high-visibility vests to increase visibility to operators. For work performed after daylight hours, vests will be made of reflective material or include a reflective stripe or panel.</p> <p>Stay clear of all hoisting operations. Loads will not be hoisted overhead of personnel.</p> <p>Cranes will not be used to lift or lower personnel.</p> <p>If crane becomes electrically energized, personnel will be instructed not to touch any part of the crane or attempt to touch any person who may be in contact with the electrical current. The utility company or appropriate party will be contacted to have line de-energized prior to approaching the crane.</p> <p>Do not exceed hoist load limits.</p> <p>Ensure load is level and stable before hoisting</p> <p>Inspect all rigging equipment prior to use. Do not use defective rigging for any reason.</p> <p>Only use rigging equipment for the purpose it was designed and intended</p> <p>Stay clear of all hoisting operations. Loads will not be hoisted overhead of personnel.</p> <p>Hoists will not be used to lift or lower personnel.</p> <p>Do not exceed hoist load limits.</p> <p>Ensure load is level and stable before hoisting</p> <p>Inspect all rigging equipment prior to use. Do not use defective rigging for any reason.</p> <p>Only use rigging equipment for the purpose it was designed and intended.</p>	Only certified crane operators are permitted to operate cranes..

## 3.0 Hazard Evaluation and Control

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### 3.1 Heat and Cold Stress

*Reference CH2M HILL SOP HS-09, Heat and Cold Stress*

#### 3.1.1 Preventing Heat Stress

The following guidelines relate to heat stress prevention:

- Drink 16 ounces of water before beginning work, such as in the morning or after lunch. Disposable (e.g., 4-ounce) cups and water maintained at 50 to 60 degrees Fahrenheit (°F) should be available. Under severe conditions, drink one to two cups every 20 minutes, for a total of 1 to 2 gallons per day. Take regular breaks in a cool, preferably air-conditioned, area. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours. Monitor for signs of heat stress.
- Acclimate to site work conditions by slowly increasing workloads; e.g., do not begin site work with extremely demanding activities.
- Use cooling devices, such as cooling vests, to aid natural body ventilation. The devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- During hot weather, conduct field activities in the early morning or evening if possible.
- Provide adequate shelter to protect personnel against radiant heat (sun, flames, hot metal), which can decrease physical efficiency and increase the probability of heat stress.
- In hot weather, rotate shifts of workers.
- Maintain good hygiene standards by frequently changing clothing and by showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should consult medical personnel.

### 3.1.2 Symptoms and Treatment of Heat Stress

The symptoms of heat stress are listed in Table 3-1.

**TABLE 3-1**  
Symptoms and Treatment of Heat Stress

	<b>Heat Syncope</b>	<b>Heat Rash (<i>miliaria rubra</i>, "prickly heat")</b>	<b>Heat Cramps</b>	<b>Heat Exhaustion</b>	<b>Heat Stroke</b>
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 thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to 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.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to 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!

### 3.1.3 Heat-Stress Monitoring

For field activities part of ongoing site work activities in hot weather, the following procedures should be used to monitor the body's physiological response to heat and to estimate the work-cycle/rest-cycle when workers are performing moderate levels of work. These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (greater than 50 percent), or when the 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 110 beats per minute, or 20 beats per 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 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 110 beats per minute, or 20 beats per minute above resting pulse.

### 3.1.4 Preventing Cold Stress

The following guidelines relate to cold stress prevention:

- Be aware of the symptoms of cold-related disorders, and *wear proper clothing for the anticipated fieldwork.*
- Consider monitoring the work conditions and adjusting the work schedule, using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- **Wind-Chill Index.** This measure relates the dry bulb temperature and the wind velocity. It is used only to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index sometimes is limited in its usefulness because the 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 is used only as a guideline to warn workers when they are in a situation that can cause cold-related illnesses. Used in conjunction with the NSC guidelines, the wind-chill index provides a starting point for adjusting work and warm-up schedules.
- **NSC Guidelines for Work and Warm-Up Schedules.** The cold-exposure limits recommended by the NSC can be used in conjunction with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; *workers should be monitored for symptoms of cold-related illness.* If symptoms are not observed, the work duration can be increased.
- The wind-chill index and the NSC guidelines are in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual, SOP HS-09.*

### 3.1.5 Symptoms and Treatment of Cold Stress

The symptoms and treatment of cold stress are listed in Table 3-2.

**TABLE 3-2**  
Symptoms and Treatment of Cold Stress

	<b>Immersion (Trench) Foot</b>	<b>Frostbite</b>	<b>Hypothermia</b>
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.	Remove victim to a warm place. Rewarm area quickly in warm—but <b>not</b> hot—water. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Get medical attention.

## 3.2 Locating Buried Utilities

### 3.2.1 Local Utility Mark-Out Service

The Base Civil Engineer will be responsible for marking utilities.

### 3.2.2 Procedures for Locating Buried Utilities

Procedures for locating buried utilities are listed as follows:

- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural-gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary, clear locations with a utility-locating instrument (e.g., metal detector).
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually. Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SHSS should confirm that arrangement.

## 3.3 Biological Hazards and Controls

Biological hazards and controls are listed in Table 3-3.

**TABLE 3-3**  
Biological Hazards and Controls

Hazard and Location	Control Measures
<b>Snakes</b> typically are found in underbrush and tall grassy areas.	If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. <b>DO NOT</b> apply ice, cut the wound, or apply a tourniquet. Carry the victim or have him/her walk slowly if the victim must be moved. Try to identify the type of snake: note color, size, patterns, and markings.
<b>Poison ivy, poison oak, and poison sumac</b> typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas.	Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.
Exposure to <b>bloodborne pathogens</b> may occur when rendering first aid/CPR, when coming into contact with medical or other potentially infectious material, or coming into contact with landfill waste or waste streams containing infectious material.	Training is required before a task involving potential exposure is performed. Exposure controls and personal protective equipment (PPE) are required as specified in CH2M HILL SOP HS-36, <i>Bloodborne Pathogens</i> . Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.
<b>Bees and other stinging insects</b> may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic.	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 SHSS and/or the buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.
<b>Other potential biological hazards</b>	None anticipated.

## 3.4 Tick Bites

*Reference CH2M HILL HS-03, Tick Bites*

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size.

**Prevention** against tick bites includes avoiding tick areas; wearing tightly woven light-colored clothing with long sleeves and wearing pant legs tucked into boots or socks; spraying **only outside** of clothing with insect repellent containing permethrin or permethrin, and spraying skin with DEET; and checking yourself frequently for ticks and showering as soon as possible. To prevent chemical repellents from interfering with sample analyses, exercise care while using repellents during the collection and handling of environmental samples.

**If bitten** by a tick, carefully remove the tick with tweezers, grasping the tick as close as possible to the point of attachment while being careful not to crush the tick. After removing the tick, wash your hands and disinfect and press the bite area. The removed tick should be saved. Report the bite to human resources personnel.

Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF): Lyme - a rash that looks like a bullseye with a small welt in the center; RMSF - a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, bone pain may develop. If symptoms appear, seek medical attention.

## 3.5 Radiological Hazards and Controls

Refer to CH2M HILL's Corporate Health and Safety Program, Program and Training Manual, and Corporate Health and Safety Program, Radiation Protection Program Manual, for standards of practice for operating in contaminated areas. There are no known radiological hazards associated with this project.

## 3.6 Hazards Posed by Chemicals Brought on the Site

### 3.6.1 Hazard Communication

*Reference CH2M HILL Hazard Communication Manual*

CH2M HILL's *Hazard Communication Program Manual*, which is available from area or regional offices and from the Corporate Human Resources Department in Denver, Colorado. The project manager is to request MSDSs from the client or from the contractors and the subcontractors for chemicals to which CCI employees potentially are exposed. The SHSS is to do the following:

- Give employees required site-specific hazard communication (HAZCOM) training.
- Confirm that inventory of chemicals brought on the site by subcontractors is available.
- Before or as chemicals arrive on the site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with identity of chemical and with hazard warnings, if any.

Chemical products listed in Table 3-4 will be used on site. Refer to Attachment 2 for MSDSs.

**TABLE 3-4**  
Chemical Hazards

Chemical	Quantity	Location
Isobutylene (calibration gas)	1 liter, compressed gas	Support Zone
Hydrochloric Acid (sample preservation)	1 liter, corrosive	Support Zone
Methanol (decontamination)	4 liters, flammable	Support/Decontamination Zone
Hexane (decontamination)	4 liters, flammable	Support/Decontamination Zone
MSA Cleaner/Sanitizer (respirators)	Powder packets	Support/Decontamination Zone
Alconox/Liquinox (detergent)	< 1 liter, powder/liquid	Support/Decontamination Zone

### 3.6.2 Shipping and Transportation of Chemical Products

*Reference CH2M HILL's Procedures for Shipping and Transporting Dangerous Goods*

Nearly all chemicals brought to the site are considered hazardous materials by the DOT. All staff who ship the materials or transport them by road must receive the CH2M HILL training in shipping dangerous goods. Hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

## 3.7 Contaminants of Concern

*Reference Project Files for More-Detailed Contaminant Information*

Contaminants of concern are listed in Table 3-5.

## 3.8 Potential Routes of Exposure

Potential routes of exposure include:

- **Dermal:** Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 5.0.
- **Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 5.0 and 6.0, respectively.
- **Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before eating, drinking, or smoking).

**TABLE 3-5**  
Contaminants of Concern

Contaminant	Location and Maximum <sup>a</sup> Concentration (ppm)	Exposure Limit <sup>b</sup>	IDLH <sup>c</sup>	Symptoms and Effects of Exposure	PIP <sup>d</sup> (eV)
Benzene	GW: 15.7 mg/l SB: 32.6 mg/kg	1 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
Ethyl Benzene	GW: 3.31 mg/l SB: 32.4 mg/kg	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Gasoline (TN-GRO)	GW: 37.1 mg/l SB: 968 mg/kg	300 ppm	CA	Irritation eyes, skin, mucus membranes; dermatitis, headache; fatigue; blurred vision; slurred speech; confusion; convulsions; chemical pneumonia; liver and kidney damage; carcinogen	NL
Lead (Canopy Paint)	UK but Present	0.05 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>	Weakness lassitude, facial pallor, pal eye, weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypertension	NL
Toluene	GW: 7.61 mg/l SB: 116 mg/kg	50 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Xylenes	GW: 7.61 mg/l SB: 114 mg/kg	100 ppm	900	Irritated eyes, skin, nose, and throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56

<sup>a</sup> Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil), SL (Sludge), SW (Surface Water).

<sup>b</sup> Appropriate value of PEL, REL, or TLV listed.

<sup>c</sup> IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.

<sup>d</sup> PIP = photoionization potential; NA = Not applicable; UK = Unknown.

ppm = parts per million

mg/m<sup>3</sup> = milligram per cubic meter

eV – electron volt

GW: from MEM-757-14

Soil: from NEXS001112, depth 12 feet

# 4.0 Personnel

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## 4.1 CCI Employee Medical Surveillance and Training

*Reference CH2M HILL SOP HS-01, Medical Surveillance, and HS-02, Health and Safety Training*

The employees listed in Table 4-1 are enrolled in the CH2M HILL Comprehensive Health and Safety Program and meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SHSS" have received 8 hours of supervisor and instrument training and can serve as SHSS for the level of protection indicated. An SHSS with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones that involve the potential for exposure to health and safety hazards. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and cardiopulmonary resuscitation (CPR). At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones that involve the potential for exposure to health and safety hazards. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL's SOP HS-04, *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform hazardous activities, before being assigned fieldwork.

**TABLE 4-1**  
Project Personnel Safety Certifications

Employee Name	Office	Responsibility	SHSS/FA-CPR
Matt Haupt	ATL	Project Manager	SC-HW, FA-CPR
TBD		Site Superintendent	
TBD		SHSS	
Eric Burrell	ATL	QC Manager	SC-HW SHSS; FA-CPR
Robert Nash	ATL	H&S Manager	SC-HW/C SHSS; FA-CPR

## 4.2 Field Team Chain of Command and Communication Procedures

### 4.2.1 Client

Contact Name: Eva Clement, Southern Division, NAVFAC

**Project Manager:** Matt Haupt/ATL

**Health and Safety Manager:** Robert Nash/ATL

**Site Superintendent:** TBD

**Site Health and Safety Specialist:** TBD

The SHSS is responsible for contacting the site superintendent and the project manager. In general, the project manager either will contact or will identify the client contact. The HSM should be contacted as appropriate. The SHSS or the project manager must notify the client and the HSM when a serious injury or a death occurs or when health and safety inspections by OSHA or other agencies are conducted. Refer to Sections 10 through 12 for emergency procedures and phone numbers.

## **4.2.2 Subcontractors**

*Reference Section 3, Corporate Health and Safety Program Manual*

When specified in the project documents (e.g., contract), this plan may cover CCI subcontractors. However, this plan does not address hazards associated with tasks and equipment that the subcontractor has expertise in (e.g., operation of drill rig). Specialty subcontractors are responsible for health and safety procedures and plans specific to their work. Specialty subcontractors are to submit plans to CCI for review and approval before the start of fieldwork. Subcontractors must comply with the established health and safety plan(s). CCI must monitor and enforce compliance with the established plan(s).

General health and safety communication with subcontractors contracted with CCI and covered by this plan is to be conducted as follows:

- Request that the subcontractor, if a specialty subcontractor, submit a safety or health plan applicable to their expertise (e.g., drill-rig safety plan or nuclear density gauge [NDG] health plan); attach the reviewed plan.
- Supply subcontractors with a copy of this plan, and brief them on its provisions.
- Direct health and safety communication to the subcontractor-designated safety representative.
- Notify the subcontractor-designated representative if a violation of the plan(s) is observed. Specialty subcontractors are responsible for mitigating hazards in which they have expertise.
- If a hazard condition persists, inform the subcontractor. If the hazard is not mitigated, stop affected work as a last resort and notify the project manager.
- When an apparent imminent danger exists, promptly remove all affected personnel. Notify the project manager.
- Make clear that consistent violations of the health and safety plan by a subcontractor may result in termination of the subcontract.

# 5.0 Personal Protective Equipment

Reference CH2M HILL SOP HS-07, Personal Protective Equipment; HS-08, Respiratory Protection

## 5.1 PPE Specification

TABLE 5-1  
PPE Specifications<sup>a</sup>

Task	Level	Body	Head	Respirator <sup>b</sup>
General work uniform when no chemical exposure is anticipated	D	Work clothes; steel-toe, steel-shank leather work boots; work gloves	Hardhat <sup>c</sup> Safety glasses Ear protection <sup>d</sup>	None required
Soil Excavation	Modified D	<b>COVERALLS:</b> Uncoated Tyvek® <b>BOOTS:</b> Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers <b>GLOVES:</b> Inner surgical nitrile glove & outer leather or arimid-fiber glove.	Hardhat <sup>c</sup> Splash shield <sup>c</sup> Safety glasses Ear protection <sup>d</sup>	None required
Soil Excavation, Canopy removal for lead	C	<b>COVERALLS:</b> Polycoated Tyvek® <b>BOOTS:</b> Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers <b>GLOVES:</b> Inner surgical-style AND outer chemical-resistant nitrile glove.	Hardhat <sup>c</sup> Splash shield <sup>c</sup> Ear protection <sup>d</sup> Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H <sup>e</sup> cartridges or equivalent
Soil Excavation for high Benzene in air levels	B	<b>COVERALLS:</b> Polycoated Tyvek® <b>BOOTS:</b> Steel toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers <b>GLOVES:</b> Inner surgical-style AND outer chemical-resistant nitrile glove.	Hardhat <sup>c</sup> Splash shield <sup>c</sup> Ear protection <sup>d</sup> Spectacle inserts	Pressure demand self-contained breathing apparatus (SCBA)

<sup>a</sup> Modifications are as indicated. CCI will provide PPE to only CCI employees.

<sup>b</sup> No facial hair that would interfere with respirator fit is permitted.

<sup>c</sup> Hardhat and splash-shield areas are to determined by the SHSS.

<sup>d</sup> Ear protection will be worn while around drill rigs or noise-producing equipment or when conversations cannot be held at distances of 3 feet or less without shouting.

<sup>e</sup> The GME-H cartridge is the new standard-issue cartridge. Available stock of the previously standard GMC-H cartridges may be used for tasks covered by this plan.

## 5.2 Upgrading or Downgrading Level of Protection

The reasons for upgrading or downgrading the PPE level are as follows:

- Upgrade
  - Request from individual performing task
  - Change in work that increase contact/potential contact with hazardous materials
  - Occurrence or likely occurrence of gas or vapor emission
  - Known or suspected presence of dermal hazards
  - Instrument action levels (Section 6) exceeded

- Downgrade
  - New information indicating that situation is less hazardous than originally thought
  - Change in site conditions that decreases the hazard
  - Change in work task that will reduce contact with hazardous materials

Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been specified in Section 5.0 and an SHSS who meets the requirements specified in Section 4.1 is present.

# 6.0 Air Monitoring Specifications

Reference CH2M HILL SOP HS-06, Air Monitoring

**TABLE 6-1**  
Air Monitoring Specifications

Instrument	Action Levels <sup>a</sup>	Frequency <sup>b</sup>	Calibration
PID MiniRAE with 10.6eV lamp or equivalent	0 – 1 ppm – Level D >1 - 5 ppm – Level C > 5 – 100 ppm Level B > 100 ppm – Stop Work	Initially and periodically during task	Daily
<b>Detector Tube:</b> Drager benzene specific 0.5/c (0.5 to 10 ppm range) with pre-tube or equivalent	<0.5 ppm – Level D 0.5-1.0 ppm – Level C >1 ppm – Level B	Initially and periodically when PID/FID >1 ppm	

<sup>a</sup> Action levels apply to sustained breathing-zone measurements above background.

<sup>b</sup> The exact frequency of monitoring depends on field conditions and is to be determined by the SHSS; generally, every 5 to 15 minutes is acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time and measurement result, personnel monitored, and place/location where measurement is taken (e.g., “Breathing Zone/MW-3,” “at surface/SB-2,” etc.).

ppm = parts per million

**Action Levels will be established in Site Specific HSP, when concentrations for Contaminants of Concern are evaluated.**

## 6.1 Calibration Specifications

Calibration specifications are listed in Table 6-2. Refer to the respective manufacturer’s instructions for proper instrument-maintenance procedures.

**TABLE 6-2**  
Calibration Specifications

Instrument	Calibration Gas	Span	Reading	Method
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF=53	53 ppm ±5 ppm	1.5 lpm REG T-Tubing

ppm = parts per million

## 6.2 Air Sampling

Sampling may be required by other OSHA regulations where exposure to certain contaminants may exist. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the HSM immediately if these contaminants are encountered.

### 6.2.1 Method Description

Real time air monitoring will be performed. Contact HSM if assistance is required.

## **6.2.2 Personnel and Areas**

Results must be sent immediately to the HSM. Regulations may require reporting to monitored personnel. Results reported to: HSM: Robert Nash/ATL.

# 7.0 Decontamination

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*Reference CH2M HILL SOP HS-13, Decontamination*

The SHSS must monitor the effectiveness of the decontamination procedures. Decontamination procedures found to be ineffective will be modified by the SHSS.

## 7.1 Decontamination Specifications

Decontamination specifications are listed in Table 7-1.

**TABLE 7-1**  
Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none"> <li>• Boot wash/rinse</li> <li>• Glove wash/rinse</li> <li>• Body-suit removal</li> <li>• Respirator removal</li> <li>• Hand wash/rinse</li> <li>• Face wash/rinse</li> <li>• Shower ASAP</li> <li>• <b>PPE-disposal method</b> Dispose in drums</li> <li>• <b>Water-disposal method</b> Dispose in drums</li> </ul>	<ul style="list-style-type: none"> <li>• Wash/rinse equipment</li> <li>• Solvent-rinse equipment</li> <li>• <b>Solvent-disposal method</b> Dispose in drums</li> </ul>	<ul style="list-style-type: none"> <li>• Power wash</li> <li>• Steam clean</li> <li>• <b>Water-disposal method</b> Dispose in drums</li> </ul>

## 7.2 Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SHSS should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

Figure 7-1 illustrates a typical establishment of work zones, including the decontamination line. Work zones are to be modified by the SHSS to accommodate task-specific requirements.

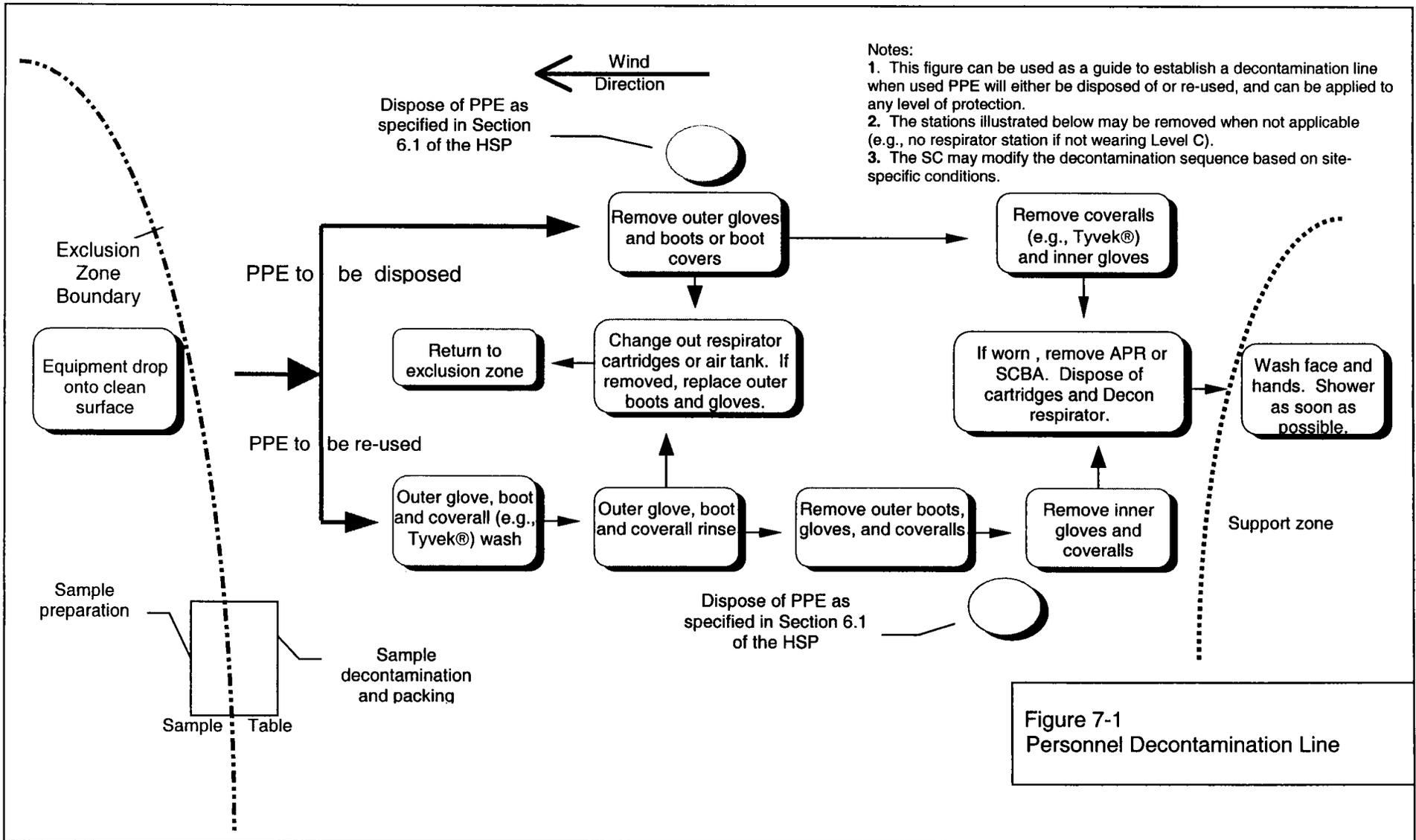


Figure 7-1  
Personnel Decontamination Line

# 8.0 Spill Prevention and Control Plan

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This Spill Prevention and Control Plan establishes minimum site requirements. Subcontractors are responsible for spill prevention and control related to their operations. Subcontractors written spill prevention and control procedures must be consistent with this plan. Spills must be reported to your supervisor, the site manager, and the Contract Manager.

## 8.1 Spill Prevention

Fuel and chemical storage areas will be properly protected from onsite and offsite vehicle traffic. Fuel storage tanks must be equipped with secondary containment. Fuel tanks must be inspected daily for signs of leaks. Accumulated water must be inspected for signs of product before discharge.

Incidental chemical products must be properly stored, transferred, and used in a safe manner. Should chemical product use occur outside areas equipped with spill control materials, adequate spill control materials must be maintained.

## 8.2 Spill Containment and Control

Spill control materials will be maintained in the support zone and at fuel storage and dispensing locations. Incidental spills will be contained with sorbent and disposed of properly. Spilled materials must be immediately contained and controlled. Spill response procedures include:

- Immediately warn any nearby personnel and notify the work supervisor.
- Assess the spill area to ensure that it is safe to approach.
- Activate site evacuation signal if spill presents an emergency.
- Ensure any nearby ignition sources are immediately eliminated.
- If it can be done safely, stop the source of the spill.
- Establish site control for the spill area.
- Use proper PPE in responding to the spill.
- Contain and control spilled material through the use of sorbent booms, pads, or other materials.

## 8.3 Spill Cleanup and Removal

Spilled material, contaminated sorbent, and contaminated media will be cleaned up and removed as soon as possible. Contaminated spill material will be drummed, labeled, and properly stored until material is disposed of. Contaminated material will be disposed of according to applicable federal, state, and local requirements. Contact the Base regulatory compliance person for the project or the program for assistance.

## 9.0 Confined-Space Entry

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*Reference CH2M HILL SOP HS-17, Confined Space Entry*

Confined-space entry requires health and safety procedures, training, and a permit. Entry into any excavation greater than 4' in depth requires a Confined Space Entry procedure.

When planned activities include confined-space entry, permit-required confined spaces accessible to CCI personnel are to be identified before the task begins. The SHSS will confirm that permit spaces are properly posted or that employees are informed of their locations and informed of their hazards.

When confined space entry is required, the SHSS will maintain a copy of SOP HS-17 onsite.

# 10.0 Site Control Plan

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## 10.1 Site Control Procedures

The following site control procedures will be implemented for this CTO:

- SHSS will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of health and safety plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- SHSS records attendance at safety briefings in logbook and documents topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location at sites where project field offices, trailers, or equipment storage boxes are established.
- Determine wind direction.
- Establish work zones: support, decontamination, and exclusion zones. Delineate zones with flags or cones as appropriate. The support zone (SZ) should be upwind of the site.
- Establish decontamination procedures, including respirator-decontamination procedures, and test the procedures.
- Use access control at the entry and exit from each work zone.
- Store chemicals in appropriate containers.
- Make MSDSs available for onsite chemicals to which employees are exposed.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the “buddy system.”
- Establish procedures for disposing of material generated on the site.
- Initial air monitoring is conducted by the SHSS in appropriate level of protection.
- SHSS is to conduct periodic inspections of work practices to determine the effectiveness of this plan -- refer to CH2M HILL SOP 18, *Health and Safety Checklist*. Deficiencies are to be noted, reported to the HSM, and corrected.

## 10.2 HAZWOPER Compliance Plan

*Reference CH2M HILL SOP HS-17, Health and Safety Plans*

The following procedures are to be followed when certain activities do not require 24- or 40-hour training. Note that prior approval from the HSM is required before these tasks are conducted on regulated hazardous waste sites.

- Certain parts of the site work may be covered by state or federal HAZWOPER standards and therefore require training and medical monitoring. Anticipated tasks must be included in Section 2.2.1.
- Air sampling must confirm that there is no exposure to gases or vapors before non-HAZWOPER-trained personnel are allowed on the site. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to Sections 3.8 and 6.2 for contaminant data and air sampling requirements, respectively.
- Non-HAZWOPER-trained personnel must be informed of the nature of the existing contamination and its locations, the limits of their access, and the emergency action plan for the site. Non-HAZWOPER-trained personnel also must be trained in accordance with other state and federal OSHA requirements, including 29 CFR 1910.1200 (HAZCOM). Refer to Section 3.7.1 for hazard communication requirements.
- Air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-HAZWOPER-trained personnel (e.g., in an adjacent area) are not exposed to volatile contaminants. Non-HAZWOPER-trained personnel should be monitored whenever the belief is that there may be a possibility of exposure (e.g., change in site conditions), or at some reasonable frequency to confirm that there is no exposure. Refer to Section 6.1 for air monitoring requirements.
- Treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the HAZWOPER standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only HAZWOPER-trained personnel (minimum of 24 hours of training) will be permitted to enter the site. All non-HAZWOPER-trained personnel must leave the site.

If HAZWOPER-regulated tasks are conducted concurrently with nonregulated tasks, non-HAZWOPER-trained subcontractors must be removed from areas of exposure. If non-HAZWOPER-trained personnel remain on the site while a HAZWOPER-regulated task is conducted, the contaminant/exposure area (exclusion zone) must be posted, non-HAZWOPER-trained personnel must be reminded of the locations of restricted areas and the limits of their access, and real-time monitoring must be conducted. Non-HAZWOPER-trained personnel at risk of exposure must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.

# 11.0 Emergency Response Plan

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*Reference CH2M HILL SOP HS-12, Emergency Response*

## 11.1 Pre-Emergency Planning

SHSS performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with the facility and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Locate the nearest telephone; determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Identify and communicate chemical, safety, radiological, and biological hazards.
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Post site map marked with locations of emergency equipment and supplies, and post OSHA job-site poster. The OSHA job-site poster is required at sites where project field offices, trailers, or equipment-storage boxes are established.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Evaluate capabilities of local response teams where applicable.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, chemical and vapor releases.
- Review notification procedures for contacting CCI's medical consultant and team member's occupational physician.
- Rehearse the emergency response plan once before site activities begin, including driving the route to the hospital.
- Brief new workers on the emergency response plan.

- The SHSS will evaluate emergency response actions and initiate appropriate follow-up actions.

## 11.2 Emergency Equipment and Supplies

The SHSS should mark the locations of emergency equipment on the site map and should post the map. Emergency equipment and its location are listed in Table 11-1.

**TABLE 11-1**  
Emergency Equipment

Emergency Equipment and Supplies	Location
20 lb (or two 10-lb) fire extinguisher (A, B, and C classes)	In Field Vehicle
First aid kit	In Field Vehicle
Eye wash	In Field Vehicle
Potable water	In Field Vehicle
Bloodborne-pathogen kit	In Field Vehicle

## 11.3 Emergency Medical Treatment

Emergency medical treatment procedures are as follows:

- Notify emergency response authorities listed in Sections 11.9 and 11.11 (e.g., 911).
- During a time of no emergency, contact CCI's medical consultant for advice and guidance on medical treatment.
- The SHSS will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving/first aid/medical treatment take priority.
- Notify the field team leader and the project manager of the injury.
- Make certain that the injured person is accompanied to the emergency room.
- Notify the Navy RAC Program manager and the Navy RAC health and safety manager. If neither can be contacted, call the SOUTHDIV Field Safety Manager. Contact numbers are listed in Table 11-4. Complete six question initial incident report and sent to PMO.
- Notify the injured person's human resources department within 24 hours.

- Prepare an incident report -- refer to CH2M HILL SOP 12, *Incident Report Form* on Virtual Office. Submit report to corporate director of health and safety, Navy RAC health and safety manager, and corporate human resources department within 24 hours.
- When contacting medical consultant, state that you are calling about a CCI matter, and give your name, telephone number, name of injured person, extent of injury / exposure, and the name and location of the medical facility where the injured person was taken.

## 11.4 Non-emergency Procedures

The procedures listed above may be applied to non-emergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CCI medical consultant.

When contacting the medical consultant, state that the situation is a CCI matter, and give your name, your telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken. Follow these procedures as appropriate.

## 11.5 Incident Response

In fires, explosions, or chemical releases, actions to be taken include the following:

- Shut down CCI operations and evacuate the immediate work area.
- Account for personnel at the designated assembly area(s).
- Notify appropriate response personnel.
- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

## 11.6 Evacuation

Evacuation procedures are as follows:

- Evacuation routes will be designated by the SHSS before work begins.
- Onsite and offsite assembly points will be designated before work begins.
- Personnel will leave the exclusion zone and assemble at the onsite assembly point upon hearing the emergency signal for evacuation.
- Personnel will assemble at offsite point upon hearing emergency signal for a evacuation.
- SHSS and a "buddy" will remain on the site after the site has been evacuated (if possible) to assist local responders and advise them of the nature and location of the incident.
- SHSS accounts for all personnel in the onsite assembly zone.
- A person designated by the SHSS before work begins will account for personnel at the offsite assembly area.

- The SHSS will write up the incident as soon as possible after it occurs and will submit a report to the corporate director of health and safety.

## 11.7 Evacuation Routes and Assembly Points

Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map posted at the site.

## 11.8 Evacuation Signals

Evacuation signals are listed in Table 11-2.

**TABLE 11-2**  
Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency—help me
Thumbs up	OK; understood
Grasping buddy's wrist	Leave area now
Continuous sounding of horn	Emergency; leave site now

## 11.9 Emergency Response Telephone Numbers

Emergency response telephone numbers are listed in Table 11-3.

**TABLE 11-3**  
Emergency Response Telephone Numbers

Site Address:	Phone:
<b>Police:</b> Millington Police Department	<b>Phone:</b> 911
<b>Fire:</b> Millington Fire Department	<b>Phone:</b> 911
<b>Ambulance:</b> Millington Fire Department	<b>Phone:</b> 911
<b>Hospital:</b> Baptist Memorial Hospital	<b>Phone:</b> 901/476-2621
<b>Address:</b> 1995 US 51, Covington, TN	

\*When using a cellular phone outside the telephone's normal calling area, exercise caution in relying on the cellular phone to activate 911. When the caller is outside the normal calling area, the cellular service carrier should connect the caller with emergency services in the area where the call originated, but this may not occur. Telephone numbers of backup emergency services should be provided if a cellular phone is relied on to activate 911.

### Route to Hospital:

Proceed out of Base and turn EAST on Navy Road to US 51	1.5 miles
Proceed NE up US 51 to Hospital	18.9 miles
Driving Time ~33 minutes	

### Route to Hospital:

The hospital location map is provided in Figure 11-1.

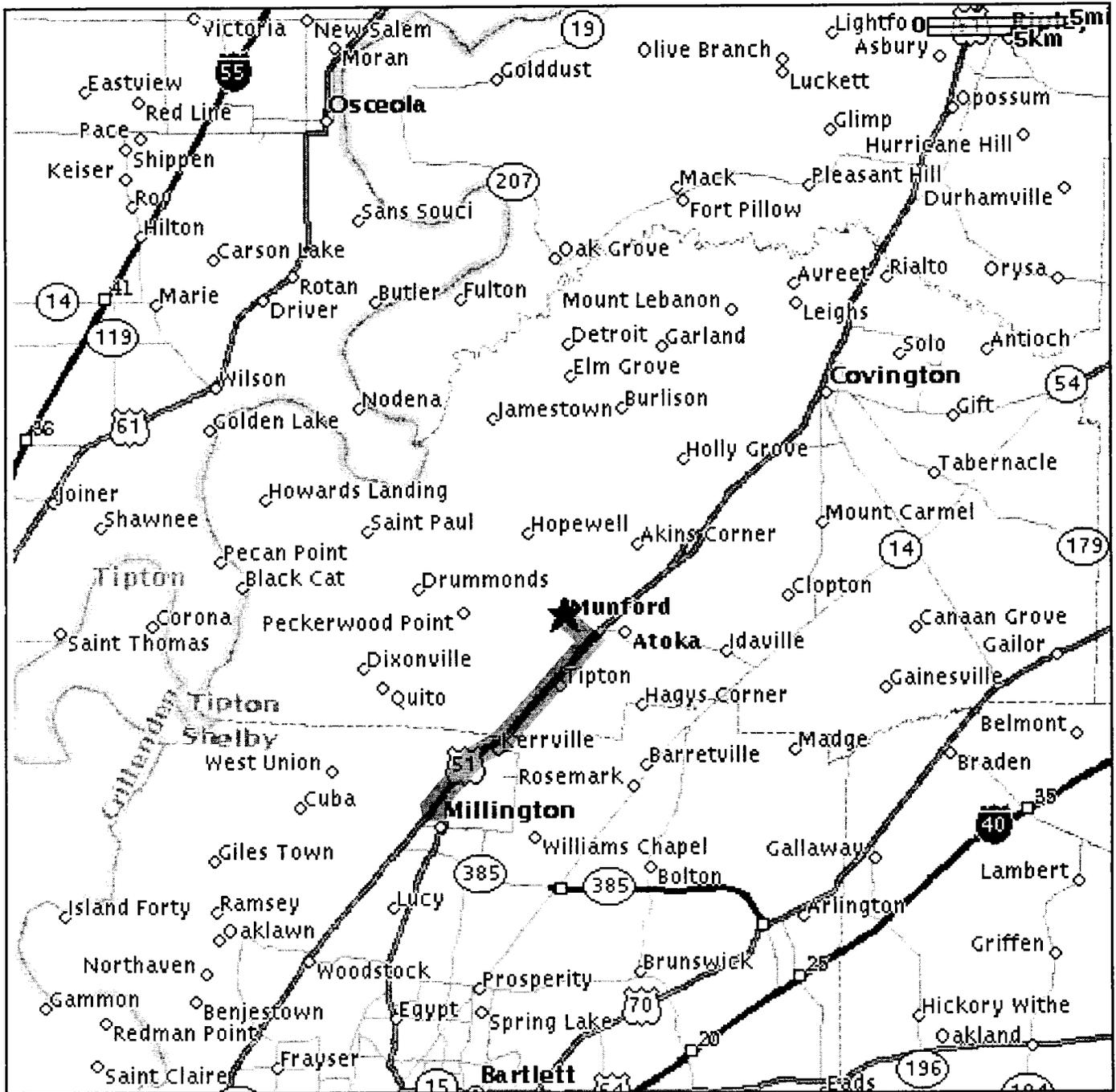


Figure 11-1  
Hospital Location Map

## 11.10 Emergency Contacts

If an incident occurs, notify the person's personnel office, the Navy RAC **Program Manager**, the Navy RAC **Health and Safety Manager**, and if neither is available contact the **Southern Division NAVFAC Field Safety Office**, as soon as possible after obtaining medical attention for the injured person. Notification **MUST** be made within 24 hours of the incident. Notification is for injuries or property damage greater than \$1,000. Emergency contacts listed in Table 11-4.

**TABLE 11-4**  
Emergency Contacts

<p><b>CCI Medical Consultant</b> Dr. Peter P Greany WorkCare Inc., 333 S. Anita Drive Orange, CA 92868, 800/455-6155 (After-hours calls will be returned within 20 minutes.)</p>	<p><b>Southern Division NAVFAC Field Safety</b> Contact: Mr. Fletcher Ballzigler; 843/820-5666 1<sup>st</sup> Alternate: Mr. David Driggers; 843/820-7466 2<sup>nd</sup> Alternate: Ms. Dolores Chester; 843/820-7462</p>
<p><b>CCI Drug-Free Workplace Program Administrator</b> Alicia Sweeney/ORL 407/423-0001</p>	<p><b>Site Safety and Health Specialist (SHSS)</b> TBD</p>
<p><b>Navy RAC Program Manager</b> Scott Newman/ATL 770/604-9182, ext. 519; Cel-phone: 678/488-5988</p>	<p><b>Project Manager</b> Matt Haupt/ATL 770/604-9095</p>
<p><b>Navy RAC Health and Safety Manager (HSM)</b> Robert Nash/ATL 770/604-9182, ext. 341</p>	<p><b>Navy RAC Environmental Compliance Manager</b> Nancy Ballantyne/DEN 303/771-0900 ext. 5561</p>
<p><b>CCI Health and Safety Manager</b> Angelo Liberatore 770/604-9182, ext. 592</p>	<p><b>Human Resources Manager</b> Nancy Orr /DEN 303/771-0925</p>
<p><b>Client</b> Eva Clements Naval Facilities Engineering Command</p>	<p><b>Corporate Human Resources Department</b> Julie Zimmerman/COR 303/771-0900</p>
<p><b>Federal Express Dangerous Goods Shipping</b> 800/238-5355 CH2M HILL Emergency Number for Shipping Dangerous Goods 800/255-3924</p>	<p><b>Worker's Compensation and Auto Claims</b> Sterling Administrative Services 800/420-8926 After hours 800/497-4566 Report fatalities &amp; report vehicular accidents involving pedestrians, motorcycles, or more than two cars.</p>

## 12.0 Approval

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This site-specific health and safety plan has been written for use by CCI only. CCI claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

### 12.1 Original Plan

Written by:

Date:

Approved by: Robert Nash

Date: May 2001

### 12.2 Revisions

Revisions Made by:

Date:

Revisions Approved by:

Date:

## **Attachment 1**

### **Employee Signoff**



## **Attachment 2**

### **Project Specific Chemical Product Hazard Communication Form**

## Project-Specific Chemical Product Hazard Communication Form

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SC will verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to CH2M HILL and subcontractor personnel. Labeling and MSDS systems will also be explained.

**Project Name:** NEX Gas Station

**Project Number:**

**MSDSs will be maintained at the following location(s):**

### *Hazardous Chemical Products Inventory*

Chemical	Quantity	Location	MSDS Available	Container labels	
				Identity	Hazard
Isobutylene	1 liter, compressed	Support Zone			
Hydrochloric acid	< 500 ml	Support Zone / sample bottles			
Methanol	< 1 Gallon	Support/Decon Zones			
Hexane	< 1 Gallon	Support/Decon Zones			
MSA Sanitizer	< 1 liter	Support/Decon Zones			
Alconox/Liquinox	< 1liter	Support/Decon Zones			

Refer to SOP HS-05 *Hazard Communication* for more detailed information.

## **Attachment 3**

### **Chemical-Specific Training Form**

## CCI CHEMICAL-SPECIFIC TRAINING FORM

Location:	NEX Gas Station	Project # :	
SSHS:		Trainer:	

### TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

### REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:


The HCC will use the product MSDS to provide the following information concerning each of the products listed above.

- Physical and health hazards
- Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants will have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program will be made available for employee review in the facility/project hazard communication file.

## **Attachment 4**

### **Material Safety Data Sheets**

# Alconox®

## MATERIAL SAFETY DATA SHEET

Alconox, Inc.  
9 East 40th Street, Suite 200  
New York, NY 10016

### I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 1998
Chemical Family:	Anionic Powdered Detergent

### II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in ALCONOX as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

### III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.

### IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO <sub>2</sub> , foam
Special Firefighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

### V. REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None

Hazardous Decomposition or Byproducts:	May release CO <sub>2</sub> on burning
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#### VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs readminister fluids. See a physician for discomfort.

#### VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

### VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

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THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED.

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SCOTT SPECIALTY GASES -- ISOBUTYLENE IN AIR - CALIBRATION GAS CYL  
MATERIAL SAFETY DATA SHEET  
NSN: 6665012148247  
Manufacturer's CAGE: 51847  
Part No. Indicator: A  
Part Number/Trade Name: ISOBUTYLENE IN AIR

=====  
General Information  
=====

Item Name: CALIBRATION GAS CYL  
Company's Name: SCOTT SPECIALTY GASES  
Company's Street: ROUTE 611 NORTH  
Company's City: PLUMSTEADVILLE  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 18949  
Company's Emerg Ph #: 215-766-8861; 908-754-7700  
Company's Info Ph #: 215-766-8861  
Record No. For Safety Entry: 003  
Tot Safety Entries This Stk#: 005  
Status: SMJ  
Date MSDS Prepared: 23APR92  
Safety Data Review Date: 27SEP94  
MSDS Serial Number: BVRGC  
Hazard Characteristic Code: G3

=====  
Ingredients/Identity Information  
=====

Proprietary: NO  
Ingredient: PROPENE, 2-METHYL-; (ISOBUTYLENE)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: UD0890000  
CAS Number: 115-11-7  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

-----  
Proprietary: NO  
Ingredient: AIR, REFRIGERATED LIQUID; AIR COMPRESSED (UN1002, DOT); AIR  
REFRIGERATED LIQUID (CRYOGENIC LIQUID) (UN1003) (DOT)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: AX5271000  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

=====  
Physical/Chemical Characteristics  
=====

Appearance And Odor: COLORLESS GAS W/POSSIBLE SLIGHT OLEFINIC ODOR.  
Boiling Point: -318F, -194C  
Vapor Pressure (MM Hg/70 F): N/A  
Vapor Density (Air=1): 1.2  
Specific Gravity: 0.88 (H\*20=1)  
Evaporation Rate And Ref: NOT APPLICABLE  
Solubility In Water: INSOLUBLE  
Percent Volatiles By Volume: 100

=====  
Fire and Explosion Hazard Data  
=====

Flash Point: NONFLAMMABLE  
Lower Explosive Limit: N/A  
Upper Explosive Limit: N/A  
Extinguishing Media: USE WHAT IS APPROPRIATE FOR SURROUNDING FIRE.  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). USE WATER SPRAY TO KEEP FIRE EXPOSED CYLINDERS COOL.  
Unusual Fire And Expl Hazrds: COMPRESSED AIR AT HIGH PRESSURES WILL ACCELERATE THE BURNING OF FLAMMABLE MATERIALS.

=====  
Reactivity Data  
=====

Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: NONE.  
Hazardous Decomp Products: NONE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT  
=====

Health Hazard Data  
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: ACUTE:CONCENTRATION OF ISOBUTYLENE IS THIS MIXTURE SHOULD NOT PRESENT ANY SYMPTOMS OF TOXICITY. CHRONIC:NONE.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT  
Signs/Symptoms Of Overexp: NONE SPECIFIED BY MANUFACTURER.  
Med Cond Aggravated By Exp: NONE.  
IMMEDIATELY FLUSH W/POTABLE WATER FOR A MINIMUM OF 15 MINUTES, SEEK ASSISTANCE FROM MD (FP N). SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INHAL:IMMEDIATELY REMOVE VICTIM TO FRESH AIR. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.  
=====

Precautions for Safe Handling and Use  
=====

Steps If Matl Released/Spill: EVACUATE & VENTILATE AREA. REMOVE LEAKING CYLINDER TO EXHAUST HOOD OR SAFE OUTDOORS AREA IF THIS CAN BE DONE SAFELY.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). RETURN CYLS TO SUPPLIER FOR PROPER DISP W/ANY VALVE OUTLET PLUGS/CAPS SECURED & VALVE PROT CAP IN PLACE. ALLOW GAS TO DISCHARGE AT SLOW RATE TO ATM IN UNCONFINED AREA/EXHST HOOD.  
Precautions-Handling/Storing: STORE IN WELL VENTILATED AREAS ONLY. KEEP VALVE PROT CAP ON CYLS WHEN NOT IN USE & SECURE CYL WHEN USING TO PROT FROM FALLING.  
Other Precautions: USE SUITABLE HAND TRUCK TO MOVE CYLS. PROT CYLS FROM PHYSICAL DMG. DO NOT DEFACE CYLS/LBLS. MOVE CYL W/ADEQ HAND TRUCK. CYL SHOULD BE REFILLED BY QUALIFIED PRODUCERS OF COMPRESSED GAS. SHIPMENT OF COMPRESSED GAS CYL WHICH HAS NOT (SUPDAT)  
=====

Control Measures  
=====

Respiratory Protection: USE NIOSH/MSHA APPROVED SCBA IN CASE OF EMERGENCY OR NON-ROUTINE USE.

Ventilation: PROVIDE ADEQUATE GENERAL & LOCAL EXHAUST VENTILATION.

Protective Gloves: RUBBER GLOVES.

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).

Other Protective Equipment: WEAR SAFETY SHOES. A SAFETY SHOWER & EYEWASH STATION SHOULD BE READILY AVAILABLE.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: OTHER PREC:BEEN FILLED BY OWNER OR WITH HIS WRITTEN CONSENT IS A VIOLATION OF FEDERAL LAW (49 CFR).

=====  
Transportation Data  
=====

Trans Data Review Date: 94269  
=====

=====  
Disposal Data  
=====

=====  
Label Data  
=====

Label Required: YES

Technical Review Date: 27SEP94

Label Date: 26SEP94

Label Status: G

Common Name: ISOBUTYLENE IN AIR

Chronic Hazard: NO

Signal Word: NONE

Acute Health Hazard-None: X

Contact Hazard-None: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: ACUTE:CONCENTRATION OF ISOBUTYLENE IS THIS MIXTURE SHOULD NOT PRESENT ANY SYMPTOMS OF TOXICITY. CHRONIC:NONE LISTED BY MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: SCOTT SPECIALTY GASES

Label Street: ROUTE 611 NORTH

Label City: PLUMSTEADVILLE

Label State: PA

Label Zip Code: 18949

Label Country: US

Label Emergency Number: 215-766-8861; 908-754-7700

ALDRICH CHEMICAL -- HYDROCHLORIC ACID 37% A.C.S REAGENT 32033-1  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N014447  
Manufacturer's CAGE: 60928  
Part No. Indicator: A  
Part Number/Trade Name: HYDROCHLORIC ACID 37% A.C.S REAGENT 32033-1

=====  
General Information  
=====

Company's Name: ALDRICH CHEMICAL CO  
Company's P. O. Box: 355  
Company's City: MILWAUKEE  
Company's State: WI  
Company's Country: US  
Company's Zip Code: 53201  
Company's Info Ph #: 414-273-3850  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 16MAR90  
Safety Data Review Date: 20JUL95  
MSDS Serial Number: BKKZK  
Hazard Characteristic Code: C1

=====  
Ingredients/Identity Information  
=====

Proprietary: NO  
Ingredient: HYDROGEN CHLORIDE (HYDROCHLORIC ACID) (SARA III)  
Ingredient Sequence Number: 01  
Percent: 37  
NIOSH (RTECS) Number: MW4025000  
CAS Number: 7647-01-0  
OSHA PEL: C 5 PPM  
ACGIH TLV: C 5 PPM; 9192

=====  
Physical/Chemical Characteristics  
=====

Appearance And Odor: COLORLESS LIQUID, PUNGENT ODOR.  
Boiling Point: 123F,51C  
Melting Point: 77.7F,25.4C  
Vapor Pressure (MM Hg/70 F): 3.23@21.1C  
Vapor Density (Air=1): 1.3  
Specific Gravity: 1.2  
Solubility In Water: SOLUBLE

=====  
Fire and Explosion Hazard Data  
=====

Flash Point: NONE  
Lower Explosive Limit: N/A  
Upper Explosive Limit: N/A  
Extinguishing Media: NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT TO PREVENT CONTACT WITH SKIN AND EYES. USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.  
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

Reactivity Data

=====  
Stability: YES  
Cond To Avoid (Stability): DO NOT ALLOW WATER TO ENTER CONTAINER BECAUSE OF VIOLENT REACTION.  
Materials To Avoid: BASES, AMINES, ALKALI METALS, COPPER, COPPER ALLOYS, ALUMINUM, CORRODES STEEL.  
Hazardous Decomp Products: TOXIC FUMES OF:HYDROGEN CHLORIDE GAS.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT  
=====

Health Hazard Data

=====  
LD50-LC50 Mixture: LD50:(IPR,MUS)1449 MG/KG;(SEE SUPP DATA)  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: ACUTE:MAY BE FATAL IF INHALED OR INGESTED. CAUSES BURNS. MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT, EYES AND SKIN. INHALATION MAY BE FATAL AS RESULT OF SPASM, INFLAMMATION & EDEMA OF LARYNX & BRONCHI, CHEMICAL PNEUMONITIS & PULMONARY EDEMA.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT  
Signs/Symptoms Of Overexp: BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA AND VOMITING.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: EYES:IMMEDIATELY FLUSH W/COPIOUS AMTS OF WATER FOR AT LEAST 15 MINUTES. ASSURE ADEQ FLUSHING BY SEPARATING LIDS W/ FINGERS. SKIN:IMMEDIATELY FLUSH W/COPIOUS AMTS OF WATER FOR 15 MINUTES WHILE REMOVING CONTAM CLTHG/SHOES. WASH CONTAM CLTHG BEFORE REUSE. DISCARD CONTAM SHOES. INHAL:REMOVE TO FRESH AIR. SUPPORT BRTHG (GIVE O\*2/ARTF RESP) , CALL MD. INGEST:CALL MD IMMEDIATELY (FP N).  
=====

Precautions for Safe Handling and Use

=====  
Steps If Matl Released/Spill: EVACUATE AREA. WEAR NIOSH/MSHA APPROVED SCBA, RUBBER BOOTS & HEAVY RUBBER GLOVES. COVER W/DRY-LIME, SAND, SODA ASH. PLACE IN COVERED CNTNRS USING NONSPARKING TOOLS & TRANSPORT OUTDOORS. VENT AREA & WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.  
Neutralizing Agent: SEE WASTE DISPOSAL METHOD.  
Waste Disposal Method: SMALL QYTS:SLOWLY ADD TO LG STIRRED EXCESS OF WATER. ADJUST PH TO NEUTRAL, SEPARATE ANY INSOLUBLE SOLIDS/LIQ & PACKAGE FOR HAZ WASTE DISP. FLUSH AQUEOUS SOLN DOWN DRAIN W/PLENTY OF WATER. HYDROLYSIS/NEUTRALIZATION RXN MAY GENERATE HEAT(SEE SUPP DATA)  
Precautions-Handling/Storing: STORE IN COOL, DRY PLACE. OPEN CAREFULLY. KEEP TIGHTLY CLOSED. AVOID PRLNGD/RPTD EXPOSURE. DO NOT GET IN EYES, ON SKIN OR CLTHG. AVOID BREATHING VAPOR.  
Other Precautions: POISON. CORROSIVE. REACTS VIOLENTLY WITH WATER. MAY DEVELOP PRESSURE. DO NOT PIPET BY MOUTH.  
=====

Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR IN NONVENTILATED AREAS AND/OR FOR EXPOSURE ABOVE ACGIH TLV.  
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Ventilation: MECHANICAL EXHAUST REQUIRED.  
Protective Gloves: NEOPRENE/PVC GLOVES.  
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).  
Other Protective Equipment: SAFETY SHOWER AND EYE BATH. FACESHIELD (8-INCH MINIMUM).  
Work Hygienic Practices: WASH HANDS THOROUGHLY AFTER USE AND BEFORE EATING, DRINKING, SMOKING OR USING SANITARY FACILITIES (FP N).  
Suppl. Safety & Health Data: LD50-LC50 MIX:LD50:(ORL,RBT)900 MG/KG. WASTE DISP METH:AND FUMES WHICH CAN BE CONTROLLED BY RATE OF ADDITION. DISPOSE OF I/A/W FEDERAL, STATE AND LOCAL REGULATIONS.

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Transportation Data  
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Trans Data Review Date: 91221  
DOT PSN Code: HJG  
DOT Proper Shipping Name: HYDROCHLORIC ACID, SOLUTION  
DOT Class: 8  
DOT ID Number: UN1789  
DOT Pack Group: II  
DOT Label: CORROSIVE  
IMO PSN Code: IHF  
IMO Proper Shipping Name: HYDROGEN CHLORIDE  
IMO Regulations Page Number: SEE 8183  
IMO UN Number: 1789  
IMO UN Class: 8  
IMO Subsidiary Risk Label: -  
IATA PSN Code: NPG  
IATA UN ID Number: 1789  
IATA Proper Shipping Name: HYDROCHLORIC ACID  
IATA UN Class: 8  
IATA Label: CORROSIVE  
AFI PSN Code: NPG  
AFI Symbols: T  
AFI Prop. Shipping Name: HYDROCHLORIC ACID, SOLUTION  
AFI Class: 8  
AFI ID Number: UN1789  
AFI Pack Group: II  
AFI Special Prov: A3,A6,N41  
AFI Basic Pac Ref: 12-5

=====  
Disposal Data  
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Label Data  
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Label Required: YES  
Technical Review Date: 06JUN91  
Label Date: 06JUN91  
Label Status: G  
Common Name: HYDROCHLORIC ACID  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Slight: X  
Contact Hazard-Severe: X  
Fire Hazard-None: X  
Reactivity Hazard-Moderate: X  
Special Hazard Precautions: ACUTE: INHALATION MAY BE FATAL AS A RESULT OF

SPASM, INFLAMMATION AND EDEMA OF THE LARYNX AND BRONCHI, CHEMICAL PNEUMONITIS AND PULMONARY EDEMA. EXTREMELY DESTRUCTIVE TO MUCOUS MEMBRANES, EYES, SKIN. CHRONIC: MAY DAMAGE EYES, LUNGS. WARNING! REACTS VIOLENTLY WITH WATER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: ALDRICH CHEMICAL CO

Label P.O. Box: 355

Label City: MILWAUKEE

Label State: WI

Label Zip Code: 53201

Label Country: US

ALDRICH CHEMICAL SUB OF SIGMA-ALDRICH -- 65550 METHANOL  
MATERIAL SAFETY DATA SHEET  
NSN: 681000F030311  
Manufacturer's CAGE: 60928  
Part No. Indicator: A  
Part Number/Trade Name: 65550 METHANOL

=====  
General Information  
=====

Company's Name: ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH  
Company's Street: 1001 W ST PAUL AVE  
Company's P. O. Box: 355  
Company's City: MILWAUKEE  
Company's State: WI  
Company's Country: US  
Company's Zip Code: 53233  
Company's Emerg Ph #: 800-325-5832-S/800-231-8327-A  
Company's Info Ph #: 800-325-5832-S/800-231-8327-A  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SE  
Date MSDS Prepared: 01APR92  
Safety Data Review Date: 30SEP93  
Preparer's Company: ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH  
Preparer's St Or P. O. Box: 1001 W ST PAUL AVE  
Preparer's City: MILWAUKEE  
Preparer's State: WI  
Preparer's Zip Code: 53233  
MSDS Serial Number: BRXZV

=====  
Ingredients/Identity Information  
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Proprietary: NO  
Ingredient: METHANOL (METHYL ALCOHOL), COLUMBIAN SPIRITS  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: PC1400000  
CAS Number: 67-56-1  
OSHA PEL: S,200PPM/250STEL  
ACGIH TLV: S,200PPM/250STEL; 93  
Other Recommended Limit: 200 PPM

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Physical/Chemical Characteristics  
=====

Appearance And Odor: COLORLESS LIQUID  
Boiling Point: 64.6C  
Melting Point: -98C  
Vapor Pressure (MM Hg/70 F): 97.68  
Vapor Density (Air=1): 1.1  
Specific Gravity: 0.791

=====  
Fire and Explosion Hazard Data  
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Flash Point: 52F  
Lower Explosive Limit: 6%  
Upper Explosive Limit: 36%  
Extinguishing Media: CO2, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.  
Special Fire Fighting Proc: WEAR SELF-CONTAINED BREATHING APPARATUS & FULL

PROTECTIVE CLOTHING.

Unusual Fire And Expl Hazrds: VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO 725F.

=====  
Reactivity Data  
=====

Stability: YES

Cond To Avoid (Stability): HEAT, SPARKS, OPEN FLAME OR OTHER SOURCES OF IGNITION.

Materials To Avoid: ACIDS, ACID CHLORIDES, ACID ANHYDRIDES, OXIDIZING/REDUCING AGENTS, ALKALI METALS.

Hazardous Decomp Products: CO, CO2

Hazardous Poly Occur: NO  
=====

Health Hazard Data  
=====

LD50-LC50 Mixture: ORAL LD50 (RAT): 5628 MG/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. VAPOR OR MIST IS IRRITATING TO THE EYES, MUCOUS MEMBRANES, SKIN, & UPPER RESPIRATORY TRACT. CAN CAUSE DAMAGE TO THE EYES, LIVER, HEART, KIDNEYS. GASTROINTESTINAL DISTURBANCES & CONVULSIONS. MAY CAUSE BLINDNESS IF INGESTED.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Signs/Symptoms Of Overexp: OPTIC NERVE NEUROPATHY, VISUAL FIELD CHANGES, HEADACHE, DYSPNEA, NAUSEA, VOMITING.

Med Cond Aggravated By Exp: CUTS, SCRATCHES

Emergency/First Aid Proc: EYES/SKIN: FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MINS WHILE REMOVING CONTAMINATED CLOTHING & SHOES. INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGESTION: WASH OUT MOUTH W/WATER PROVIDED PERSON IS CONSCIOUS. DISCARD CONTAMINATED CLOTHING & SHOES. OBTAIN MEDICAL ATTENTION IN ALL CASES.  
=====

Precautions for Safe Handling and Use  
=====

Steps If Matl Released/Spill: EVACUATE AREA. SHUT OFF ALL IGNITION SOURCES. USE PROTECTIVE EQUIP. COVER W/DRY-LIME, SAND OR SODA ASH. PLACE IN COVERED CONTAINERS USING NON-SPARKING TOOLS & TRANSPORT OUTDOORS. VENTILATE AREA & WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

Neutralizing Agent: DRY LIME, SAND OR SODA ASH

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS HIGHLY FLAMMABLE. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS. UN1230.

Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & AWAY FROM HEAT, SPARKS & OPEN FLAME. PRODUCT IS HYGROSCOPIC. STORE IN A COOL DRY PLACE. NO SMOKING. CANNOT BE MADE NON-POISONOUS

Other Precautions: AVOID CONTACT W/EYES, SKIN, CLOTHING & BREATHING OF VAPORS. DON'T USE IF SKIN IS CUT OR SCRATCHED.  
=====

Control Measures  
=====

Respiratory Protection: WEAR AN APPROPRIATE NIOSH/MSHA APPROVED  
RESPIRATOR.  
Ventilation: MECHANICAL EXHAUST  
Protective Gloves: CHEMICAL RESISTANT  
Eye Protection: SAFETY GOGGLES  
Other Protective Equipment: RUBBER BOOTS, SAFETY SHOWER, EYE BATH  
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.

=====  
Transportation Data  
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=====  
Disposal Data  
=====

=====  
Label Data  
=====

Label Required: YES  
Technical Review Date: 30SEP93  
Label Date: 17SEP93  
Label Status: F  
Common Name: 65550 METHANOL  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Severe: X  
Contact Hazard-Severe: X  
Fire Hazard-Severe: X  
Reactivity Hazard-Slight: X  
Special Hazard Precautions: MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED  
OR ABSORBED THROUGH SKIN. VAPOR OR MIST IS IRRITATING TO THEY EYES, MUCOUS  
MEMBRANES, SKIN, & UPPER RESPIRATORY TRACT. CAN CAUSE DAMAGE TO THE EYES,  
LIVER, HEART, KIDNEYS. GASTROINTESTINAL DISTURBANCES & CONVULSIONS. MAY  
CAUSE BLINDNESS IF INGESTED. TARGET ORGANS: EYES, SKIN, LIVER, HEART,  
KIDNEYS, RESPIRATORY & DIGESTIVE TRACTS. DIGESTIVE TRACTS, LIVER.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH  
Label Street: 1001 W ST PAUL AVE  
Label P.O. Box: 355  
Label City: MILWAUKEE  
Label State: WI  
Label Zip Code: 53233  
Label Country: US  
Label Emergency Number: 800-325-5832-S/800-231-8327-A  
Year Procured: UNK

ALDRICH CHEMICAL -- HEXANE ACS GRADE - N-HEXANE  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N040300  
Manufacturer's CAGE: 60928  
Part No. Indicator: A  
Part Number/Trade Name: HEXANE ACS GRADE

=====  
General Information  
=====

Item Name: N-HEXANE  
Company's Name: ALDRICH CHEMICAL CO  
Company's P. O. Box: 355  
Company's City: MILWAUKEE  
Company's State: WI  
Company's Country: US  
Company's Zip Code: 53201  
Company's Emerg Ph #: 414-273-3850  
Company's Info Ph #: 414-273-3850  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 04AUG92  
Safety Data Review Date: 03MAR93  
MSDS Serial Number: BRZJT  
Hazard Characteristic Code: NK

=====  
Ingredients/Identity Information  
=====

Proprietary: NO  
Ingredient: HEXANE  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: MN9275000  
CAS Number: 110-54-3  
OSHA PEL: 500 PPM  
ACGIH TLV: 50 PPM; 9293

=====  
Physical/Chemical Characteristics  
=====

Appearance And Odor: COLORLESS LIQUID  
Boiling Point: 154F,68C  
Vapor Pressure (MM Hg/70 F): 132@20C  
Vapor Density (Air=1): 3  
Specific Gravity: 0.661

=====  
Fire and Explosion Hazard Data  
=====

Flash Point: -10F,-23C  
Lower Explosive Limit: 1.2%  
Upper Explosive Limit: 7.7%  
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.  
Unusual Fire And Expl Hazrds: VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK. CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS. EXTREMELY FLAMMABLE.

=====  
Reactivity Data  
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Stability: YES  
Cond To Avoid (Stability): HEAT, SPARKS AND OPEN FLAME.  
Materials To Avoid: OXIDIZING AGENTS. CHLORINE, FLUORINE, MAGNESIUM  
PERCHLORATGE.  
Hazardous Decomp Products: TOXIC FUMES OF: CARBON MONOXIDE, CARBON  
DIOXIDE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT  
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Health Hazard Data  
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LD50-LC50 Mixture: LD50:(ORAL,RAT)28710 MG/KG  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: ACUTE: HARMFUL IF SWALLOWED, INHALED, OR  
ABSORBED THRU SKIN. VAPOR OR MIST IS IRRITATING TO EYES, MUCOUS MEMBRANES  
AND UPPER RESPIRATORY TRACT. CAUSES SKIN IRRITATION. MAY CAUSE NERVOUS  
SYSTEM DISTURBANCES. EXPOSURE CAN CAUSE: COUGHING, CHEST PAINS, DIFFICULTY  
IN BREATHING. LUNG IRRIT, CHEST PAIN (EFTS OF OVEREXP)  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT  
Signs/Symptoms Of Overexp: HLTH HAZ: & EDEMA WHICH MAY BE FATAL. GI  
DISTURBANCES, NAUSEA, HEADACHE AND VOMITING.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: EYES: IMMED FLUSH W/COPIOUS AMTS OF WATER FOR @  
LST 15 MIN & SEEK MED ADVICE. SKIN: IMMED FLUSH W/COPIOUS AMTS OF WATER FOR  
@ LST 15 MIN WHILE REMOVING CONTAMD CLTHG & SHOES. WASH CONTAMD CLTHG  
BEFORE REUSE. INHAL: REMOVE TO FRESH AIR. IF NOT BRTHG GIVE ARTF RESP. IF  
BREATHING IS DIFFICULT, GIVE OXYGEN. INGEST: WASH OUT MOUTH W/ WATER  
PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.  
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Precautions for Safe Handling and Use  
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Steps If Matl Released/Spill: EVAC AREA. SHUT OFF ALL SOURCES OF IGNIT.  
WEAR NIOSH/MSHA APPRVD SCBA, RUBB BOOTS & HEAVY RUBB GLOVES. COVER W/AN  
ACTIVATED CARBON ABSORB, TAKE UP & PLACE IN CLSD CONTRS. TRANSPORT  
OUTDOORS. VENT AREA & WASH SPILL SITE AFTER MATL PICKUP IS COMPLETE.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN  
AFTERBURNER AND SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL  
IS HIGHLY FLAMMABLE. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL  
REGULATIONS.  
Precautions-Handling/Storing: KEEP TIGHTLY CLSD. STORE IN A COOL DRY  
PLACE. DO NOT BREATHE VAP. AVOID CONT W/EYES/SKIN/CLTHG. IRRITANT. HARMFUL  
VAP. NEUROLOGICAL HAZARD.  
Other Precautions: KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.  
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=====  
Control Measures  
=====

Respiratory Protection: WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.  
Ventilation: USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves: CHEMICAL-RESISTANT GLOVES.  
Eye Protection: CHEMICAL SAFETY GOGGLES.  
Other Protective Equipment: OTHER PROTECTIVE CLOTHING, SAFETY SHOWER AND EYE BATH.  
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.  
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

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Transportation Data  
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Disposal Data  
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Label Data  
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Label Required: YES  
Technical Review Date: 03MAR93  
Label Date: 03MAR93  
Label Status: G  
Common Name: HEXANE ACS GRADE  
Chronic Hazard: NO  
Signal Word: DANGER!  
Acute Health Hazard-Severe: X  
Contact Hazard-Slight: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: STORE IN A COOL DRY PLACE. DO NOT BREATHE VAPOR. AVOID CONTACT W/EYES/SKIN/CLTHG. IRRITANT. HARMFUL VAPOR. HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THRU SKIN. VAPOR/MIST IS IRRITATING TO EYES, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. CAUSES COUGHING, CHEST PAINS, DIFFICULTY IN BREATHING, LUNG IRRITATION, CHEST PAIN & EDEMA WHICH MAY BE FATAL. GI DISTURBANCES, NAUSEA, HEADACHE AND VOMITING. CHRONIC: NONE LISTED BY MANUFACTURER.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: ALDRICH CHEMICAL CO  
Label P.O. Box: 355  
Label City: MILWAUKEE  
Label State: WI  
Label Zip Code: 53201  
Label Country: US  
Label Emergency Number: 414-273-3850

GEORGIA STEEL & CHEMICAL -- FK300 SPECIAL RESPIRATOR CLEANER PLUS -  
QUATERNARY AMMONIUM GERMICIDAL DETERGENT DISINFECTANT  
MATERIAL SAFETY DATA SHEET

NSN: 685000F046838

Manufacturer's CAGE: 3J051

Part No. Indicator: A

Part Number/Trade Name: FK300 SPECIAL RESPIRATOR CLEANER PLUS

=====  
General Information  
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Item Name: QUATERNARY AMMONIUM GERMICIDAL DETERGENT DISINFECTANT

Company's Name: GEORGIA STEEL & CHEMICAL CO INC

Company's Street: 10810 GUILFORD RD BAY 104

Company's City: ANNAPOLIS JUNCTION

Company's State: MD

Company's Country: US

Company's Zip Code: 20701-5000

Company's Emerg Ph #: 301-317-5502/800-296-0351

Company's Info Ph #: 800-296-0351/301-317-5502

Record No. For Safety Entry: 001

Tot Safety Entries This Stk#: 001

Status: SE

Date MSDS Prepared: 01JAN96

Safety Data Review Date: 31MAY96

Preparer's Company: GEORGIA STEEL & CHEMICAL CO INC

Preparer's St Or P. O. Box: 10810 GUILFORD RD BAY 104

Preparer's City: ANNAPOLIS JUNCTION

Preparer's State: MD

Preparer's Zip Code: 20701-5000

MSDS Serial Number: BYNPW  
=====

Ingredients/Identity Information  
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Proprietary: NO

Ingredient: QUATERNARY AMMONIUM COMPOUNDS, BENZYL-C12-18-ALKYLDIMETHYL,  
CHLORIDES \*96-1\*

Ingredient Sequence Number: 01

Percent: 5-10

NIOSH (RTECS) Number: 1001813QA

CAS Number: 68391-01-5  
-----

Proprietary: NO

Ingredient: OCTYL DECYL DIMETHYL AMMONIUM CHLORIDE; N,N-DIMETHYL-N-OCTYL-  
1-DECANAMINIUM CHLORIDE; AMMONIUM, DECYLDIMETHYLOCTYL

Ingredient Sequence Number: 02

Percent: 1-5

NIOSH (RTECS) Number: HD6520000

CAS Number: 32426-11-2  
-----

Proprietary: NO

Ingredient: DIDECYL DIMETHYL AMMONIUM CHLORIDE; DIMETHYLDIDECYLAMMONIUM  
CHLORIDE; BTC 1010; BARDAC 22

Ingredient Sequence Number: 03

Percent: 1-5

NIOSH (RTECS) Number: BP6560000

CAS Number: 7173-51-5  
-----

Proprietary: NO  
Ingredient: DIDECYL DIMETHYL AMMONIUM CHLORIDE  
Ingredient Sequence Number: 04  
Percent: 1-5  
NIOSH (RTECS) Number: RG8250000  
CAS Number: 5538-94-3

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Physical/Chemical Characteristics  
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Appearance And Odor: CLEAR BLUE LIQUID W/A PLEASANT SASSAFRAS ODOR.  
Boiling Point: 212F  
Vapor Pressure (MM Hg/70 F): AS WATER  
Specific Gravity: 1.01  
Evaporation Rate And Ref: (WATER =1): 1  
Solubility In Water: COMPLETE  
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Fire and Explosion Hazard Data  
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Flash Point: NONE TO BOILING  
Flash Point Method: TCC  
Special Fire Fighting Proc: NONE  
Unusual Fire And Expl Hazrds: NONE  
=====

Reactivity Data  
=====

Stability: YES  
Cond To Avoid (Stability): DON'T MIX W/CLEANING CHEMICALS.  
Materials To Avoid: STRONG OXIDIZING/REDUCING AGENTS.  
Hazardous Decomp Products: AMMONIA, NITROGEN OXIDES.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NONE  
=====

Health Hazard Data  
=====

Route Of Entry - Inhalation: NO  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
IRRITATION TO MUCOUS MEMBRANES. INGESTION: SEVERE IRRITATION TO MOUTH,  
THROAT, GI TRACT, CIRCULATORY SHOCK & RESPIRATORY DEPRESSION.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NONE  
Signs/Symptoms Of Overexp: REDNESS, TEARING, IRRITATION, BURNING IN MOUTH,  
THROAT, ABDOMEN, CIRCULATORY SHOCK, CONVULSIONS.  
Med Cond Aggravated By Exp: DERMATITIS.  
REMOVE TO FRESH AIR. SKIN: WASH W/MILD SOAP & WATER. OBTAIN MEDICAL  
ATTENTION IN ALL CASES. INGESTION: DON'T INDUCE VOMITING. GIVE PROMPTLY  
LARGE QUANTITIES OF EGG WHITES/GELATIN SOLUTION. IF UNAVAILABLE, DRINK  
LARGE QUANTITIES OF WATER. AVOID ALCOHOL. OBTAIN MEDICAL ATTENTION IN ALL  
CASES. NOTE TO PHYSICIAN: (SEE SUPP)  
=====

Precautions for Safe Handling and Use  
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Steps If Matl Released/Spill: MOP UP/ABSORB/USE SOLID ABSORBENT & SHOVEL  
INTO CONTAINERS FOR DISPOSAL.  
Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: KEEP CONTAINER CLOSED WHEN NOT IN USE. DON'T REUSE EMPTY CONTAINER.

Other Precautions: KEEP AWAY FROM FOOD & WATER SUPPLIES. OPEN DUMPING IS PROHIBITED.

=====  
Control Measures  
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Ventilation: MECHANICAL (GENERAL) IS SUFFICIENT  
Protective Gloves: RUBBER/NEOPRENE  
Eye Protection: GOGGLES  
Other Protective Equipment: NONE

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Transportation Data  
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Disposal Data  
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Label Data  
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Label Required: YES  
Label Status: G  
Common Name: FK300 SPECIAL RESPIRATOR CLEANER  
MAY CAUSE IRRITATION OF LUNGS & AIRWAYS. IRRITATION, STOMACH DISTRESS.  
Label Name: GEORGIA STEEL & CHEMICAL CO INC  
Label Street: 10810 GUILFORD RD BAY 104  
Label City: ANNAPOLIS JUNCTION  
Label State: MD  
Label Zip Code: 20701-5000  
Label Country: US  
Label Emergency Number: 301-317-5502/800-296-0351



TEXACO REFINING & MARKETING -- 02055, STARTEX ANTI-FREEZE COOLANT  
MATERIAL SAFETY DATA SHEET  
NSN: 685000N019837  
Manufacturer's CAGE: 2R503  
Part No. Indicator: A  
Part Number/Trade Name: 02055, STARTEX ANTI-FREEZE COOLANT

=====  
General Information  
=====

Company's Name: TEXACO REFINING AND MARKETING INC.  
Company's Street: 1111 RUSK STREET  
Company's P. O. Box: 4427  
Company's City: HOUSTON  
Company's State: TX  
Company's Country: US  
Company's Zip Code: 77002-3310  
Company's Emerg Ph #: 713-650-5206, CHEMTREC 800-424-9300  
Company's Info Ph #: 713-650-5206  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 12MAR91  
Safety Data Review Date: 04AUG95  
MSDS Preparer's Name: PRODUCT SAFETY MANAGER  
Preparer's Company: TEXACO INC  
Preparer's St Or P. O. Box: P O BOX 509  
Preparer's City: BEACON  
Preparer's State: NY  
Preparer's Zip Code: 12508  
MSDS Serial Number: BPJQD  
Hazard Characteristic Code: C4

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Ingredients/Identity Information  
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Proprietary: NO  
Ingredient: ETHYLENE GLYCOL (SARA III). % (WT): 95-99.99  
Ingredient Sequence Number: 01  
Percent: SEE ING  
NIOSH (RTECS) Number: KW2975000  
CAS Number: 107-21-1  
OSHA PEL: 50 PPM, C  
ACGIH TLV: 50 PPM, C

Proprietary: NO  
Ingredient: SODIUM BORATE, DECAHYDRATE; (BORAX)  
Ingredient Sequence Number: 02  
Percent: 1-3.99  
NIOSH (RTECS) Number: VZ2275000  
CAS Number: 1303-96-4  
OSHA PEL: 10 MG/M3  
ACGIH TLV: 5 MG/M3

Proprietary: NO  
Ingredient: VOLATILE ORGANIC COMPOUNDS  
Ingredient Sequence Number: 03  
Percent: 100  
NIOSH (RTECS) Number: 9999999V0  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: SUPP DATA: DEATH. (CHRONIC) RPTD INGEST MAY CAUSE KIDNEY DMG.  
OTHER REMARKS: ETHYLENE GLYCOL & DIETHYLENE GLYCOL (ING 5)

Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 4: ARE TOX WHEN SWALLOWED. LETHAL DOSE FOR AN ADULT IS 1-2  
LITER KG/ABOUT 4 OZ (1/2 CUP). SYMP INCL STAG, (ING 6)

Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 5: SLURRED SPEECH, LOSS OF COORD, CONFUSN, FAINTNESS, NAUS,  
VOMIT, INCR HEART RATE, DFCLTY BRTHG, DFCLTY SEEING, (ING 7)

Ingredient Sequence Number: 06  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 6: CONVULSN, & COLLAPSE. SYMP MAY BE DELAYED. DECREASED  
URINE OUTPUT, KIDNEY FAILURE, & NERV SYS DMG MAY ALSO (ING 8)

Ingredient Sequence Number: 07  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 7: OCCUR. ETHYLENE GLYCOL HAS BEEN SHOWN TO CAUSE BIRTH  
DEFECTS IN LAB ANIMALS. CONTINUOUS INGEST OF DIET (ING 9)

Ingredient Sequence Number: 08  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 8: CONTAINING 1% OR 2% ETHYLENE GLYCOL FOR TWO YEARS  
PRODUCED LIVER AND KIDNEY DAMAGE, AND BLADDER STONES IN RATS.

Ingredient Sequence Number: 09  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: FIRST AID PROC: ANYTHING BY MOUTH TO AN UNCON/CONVULSING  
PERSON. INHAL: IF IRRIT, HDCH, NAUS/DROW OCCURS, REMOVE (ING 11)

Ingredient Sequence Number: 10  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 10: TO FRESH AIR. GET MED ATTN IF BRTHG BECOMES DFCLT/SYMP  
PERSIST. NOTE TO PHYS: ETHYLENE/DIETHYLENE GLYCOL (ING 12)

Ingredient Sequence Number: 11  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 11: POIS MAY INITIALLY PRDCE BEHAVIOR CHANGES, DROW, VOMIT,  
DIARR, THIRST, & CONVULSIONS. RENAL DMG/FAILURE W/ (ING 13)

Ingredient Sequence Number: 12  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 12: METABOLIC ACIDOSIS ARE LATE SIGNS OF POIS. IMMEDIATE TREATMENT, MAY REDUCE TOXICITY, SUPPLEMENTED, IF NEEDED W/ (ING 14)  
Ingredient Sequence Number: 13  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 13: HEMODIALYSIS. IV ETHANOL IN SODIUM BICARBONATE SOLUTION IS RECOGNIZED ANTIDOTE; OTHER ANTIDOTES HAVE BEEN (ING 15)  
Ingredient Sequence Number: 14  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 14: REPORTED FOR ETHYLENE GLYCOL POISONING. CONTACT POISON CENTER FOR FURTHER TREATMENT INFORMATION.  
Ingredient Sequence Number: 15  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: WASTE DISPOSAL ETC. MAY RENDER RESULTING MATERIALS HAZARDOUS. USED ANTI-FREEZE SOLUTION, REGARDLESS OF QUANTITY, SHOULD NEVER BE DISCARDED (ING 17)  
Ingredient Sequence Number: 16  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 16: ONTO GROUND, INTO SURFACE WATERS, OR INTO STORM SEWERS. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE & LOCAL REGULATIONS (FP N).  
Ingredient Sequence Number: 17  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: HANDLING/STORAGE PRECAUTIONS: CONTAINERS CAN BE HAZARDOUS. EMPTY CONTAINERS CAN BE HAZARDOUS IF USED TO STORE TOXIC, FLAMMABLE/REACTIVE MATERIALS. CUTTING/ (ING 19)  
Ingredient Sequence Number: 18  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 18: WELDING OF EMPTY CONTAINERS MIGHT CAUSE FIRE, EXPLOSION/TOXIC FUMES FROM RESIDUES. DO NOT PRESS/EXPOSE TO OPEN FLAME/ (ING 20)  
Ingredient Sequence Number: 19  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 19: HEAT. KEEP CONTAINER CLOSED AND DRUM BUNGS IN PLACE.  
Ingredient Sequence Number: 20

NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: HYGIENE PRACT: AT LEAST ONCE A WEEK.  
Ingredient Sequence Number: 21  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE  
=====

Physical/Chemical Characteristics

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Appearance And Odor: FLUORESCENT GREEN LIQUID, MILD ODOR.  
Boiling Point: 388F,198C  
Vapor Pressure (MM Hg/70 F): <0.1  
Vapor Density (Air=1): 2.14  
Specific Gravity: 1.13 (H\*2O=1)  
Solubility in Water: SOLUBLE  
pH: 10.8  
=====

Fire and Explosion Hazard Data

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Flash Point: 240F,116C  
Flash Point Method: COC  
Lower Explosive Limit: 3.2%  
Extinguishing Media: ACCORDING TO NFPA GUIDE, USE WATER SPRAY, DRY  
CHEMICAL, FOAM, OR CARBON DIOXIDE.  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPRVD SCBA/FULL PROT EQUIP(FP  
N).USE H\*2O TO COOL FIRE-EXPOS CNTNRS. IF LEAK/SPILL HAS NOT IGNITED,USE  
H\*2O SPRAY TO DISPERS VAPS & TO (SUPDAT)  
Unusual Fire And Expl Hazrds: NONE.  
=====

Reactivity Data

-----  
Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: STRONG OXIDIZERS.DO NOT ADD/FORMULATE W/AMINES.  
NITRITES IN PROD MAY COMBINE W/AMINES TO FORM NITROSAMINES. MANY(SUPDAT)  
Hazardous Decomp Products: CO AND CO\*2 MAY BE FORMED ON BURNING IN LIMITED  
AIR SUPPLY. BORON, MOLYBDENUM AND SILICON CMPDS MAY ALSO BE RELEASED.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.  
=====

Health Hazard Data

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LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: (ACUTE)EYES: MAY CAUSE IRRIT,EXPERIENCED AS  
MILD DISCOMFORT & SEEN AS SLIGHT EXCESS REDNESS OF EYE. SKIN: PRLNGD/  
WIDESPREAD SKIN CONT MAY RSLT IN ABSORP OF POTNTLY HARMFUL AMTS OF MATL.  
BRIEF CONT MAY CAUSE SLIGHT IRRIT.PRLNGD CONT, AS W/CLTHG WETTED W/MATL,MAY  
CAUSE SEV IRRIT & DISCOMFORT,SEEN AS LOC (EFTS OF OVEREXP)  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT.  
Signs/Symptoms Of Overexp: HLTH HAZ: REDNESS & SWELLING. INHAL:VAPS/ MIST,  
IN EXCESS OF PERMISSIBLE CONC,OR IN UNUSUALLY HIGH CONC GEN FROM SPRAYING,  
HEATING MATL/AS FROM EXPOS IN POORLY VENT AREAS/CONFINED SPACES, MAY CAUSE  
IRRIT OF NOSE & THROAT, HDCH, NAUS,& DROW.INGEST: TOX.CAUSES HDCH, WEAK,  
CONFUSN, LOSS OF COORD, DIZZ, DFCLTY (SUPP DATA)

Med Cond Aggravated By Exp: REPEATED OVEREXPOSURE MAY AGGRAVATE EXISTING KIDNEY DISEASE. REPEATED SKIN CONTACT MAY AGGRAVATE AN EXISTING DERMATITIS. Emergency/First Aid Proc: EYES:IMMED FLUSH W/PLENTY OF H\*2O FOR AT LEAST 15 MIN. HOLD EYELIDS APART WHILE FLUSHING TO RINSE ENTIRE SURF OF EYE & LIDS W/H\*2O. GET MED ATTN.SKIN: WASH W/PLENTY OF SOAP & H\*2O FOR SEV MIN. GET MED ATTN IF SKIN IRRIT DEVELOPS/PERSISTS. INGEST: IF PATIENT IS CONSCIOUS & CAN SWALLOW, GIVE 2 GLASSES OF H\*2O (16 OZ). INDUCE VOMIT IMMED AS DIRECTED BY MED PERS. GET IMMED MED ATTN. NEVER GIVE (ING 10)

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: VENT AREA. AVOID BRTHG VAP. USE NIOSH/MSHA APPROVED SCBA/SUPPLIED AIR FOR LRG SPILLS OR CONFINED AREAS. CONTAIN SPILL IF POSS. WIPE UP/ABSORB ON SUITABLE MATL AND SHOVEL UP. PVNT ENTRY INTO SEWERS AND WATERWAYS. AVOID CONT W/SKIN, EYES OR CLOTHING. Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER. Waste Disposal Method: PROD DOES NOT MEET CRITERIA OF HAZ WASTE IF DISCARDED IN PURCHASED FORM.IT IS RESPONSIBILITY OF USER OF PROD TO DETERM AT TIME OF DISP, WHETHER PROD MEET RCRA CRITERIA FOR HAZ WASTE.THIS IS BECAUSE PROD USES, TRANSFORMATIONS, MIX, PROCESSES, (ING 16) Precautions-Handling/Storing: MIN FEASIBLE HNDLG TEMPS SHOULD BE MAINTAINED. PERIODS OF EXPOS TO HIGH TEMP SHOULD BE MIN. H\*2O CONTAM SHOULD BE AVOIDED. MISUSE OF EMPTY (ING 18) Other Precautions: KEEP OUT OF REACH OF CHILDREN AND PETS. SUCH PRODS SHOULD NOT BE USED IN POTABLE (DRINKING) WATER SYS OR OTHER SYSTEMS WHERE CONTAMINATION OF POTABLE WATER SUPPLIES IS POSSIBLE (E.G., RECREATIONAL VEHICLES, WINTERIZING POTABLE H\*2O SYS).

Control Measures

Respiratory Protection: AIRBORNE CONC SHOULD BE KEPT TO LOWEST LEVS POSS. IF VAP, MIST/DUST IS GEN, USE NIOSH/MSHA APPRVD RESP AS APPROP. SUPPLIED AIR RESP PROT SHOULD BE USED FOR CLEANING LRG SPILLS/UPON ENTRY INTO TANKS, VESSELS, OR OTHER CONFINED SPACES. Ventilation: ADEQUATE TO MEET COMPONENT OCCUPATIONAL EXPOSURE LIMITS. Protective Gloves: IMPERVIOUS GLOVES (FP N). Eye Protection: CHEM WORK GOG/FULL LGTH FACESHLD (FP N). Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER. Work Hygienic Practices: WORKERS SHOULD WASH EXPOS SKIN SEV TIMES DAILY W/ SOAP & H\*2O. SOILED WORK CLTHG SHOULD BE LAUNDERED/DRY-CLEANED (ING 21). Suppl. Safety & Health Data: FIRE FIGHT PROC: PROVIDE PROT FOR PERSONS ATTEMPTING TO STOP LEAK. MATLS TO AVOID: NITROSAMINES HAVE BEEN FOUND TO CAUSE CANCER IN LAB ANIMALS. EFTS OF OVEREXP: WALKING, NAUS, VOMIT, DECREASED BLOOD PRESS, INCR HEART RATE, PULM EDEMA, KIDNEY FAILURE, UNCON, CONVULN, & COMA. SYMP MAY BE DELAYED. SEV POIS MAY CAUSE(ING 4)

Transportation Data

Trans Data Review Date: 93026  
 DOT PSN Code: 222  
 DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION  
 IMO PSN Code: 222  
 IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION  
 IATA PSN Code: 222  
 IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION  
 AFI PSN Code: 222  
 AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION  
 Additional Trans Data: NOT REGULATED FOR TRANSPORTATION

Disposal Data

Label Data

Label Required: YES  
Technical Review Date: 29JUN92  
Label Date: 19JUN92  
Label Status: G  
Common Name: 02055, STARTEX ANTI-FREEZE COOLANT  
Chronic Hazard: YES  
Signal Word: WARNING!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Slight: X  
Fire Hazard-Slight: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: COMBUSTIBLE. KEEP AWAY FROM OPEN FLAME OR HEAT. ACUTE: EYE AND SKIN CONTACT MAY CAUSE IRRITATION. MAY BE ABSORBED THROUGH SKIN IN TOXIC AMOUNTS. INHALATION MAY CAUSE IRRITATION OF NOSE AND THROAT, HEADACHE, NAUSEA, AND DROWSINESS. INGESTION CAUSES HEADACHE, WEAKNESS, CONFUSION, LOSS OF COORDINATION, DIZZINESS, DIFFICULTY WALKING, NAUSEA, VOMITING, DECREASED BLOOD PRESSURE, INCREASED HEART RATE, PULMONARY EDEMA, KIDNEY FAILURE, UNCONSCIOUSNESS, COMA, AND DEATH IN SEVERE CASES. CHRONIC: REPEATED INGESTION MAY CAUSE KIDNEY DAMAGE. ETHYLENE GLYCOL HAS CAUSED BIRTH DEFECTS, LIVER AND KIDNEY DAMAGE, AND BLADDER STONES IN LABORATORY ANIMALS.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: TEXACO LUBRICANTS CO  
Label P.O. Box: 4427  
Label City: HOUSTON  
Label State: TX  
Label Zip Code: 77210-4427  
Label Country: US  
Label Emergency Number: 914-831-3400; 800-424-9300 (CHEMTREC)

COASTAL -- DIESEL FUEL NO 2  
MATERIAL SAFETY DATA SHEET  
NSN: 914000N017679  
Manufacturer's CAGE: 46684  
Part No. Indicator: A  
Part Number/Trade Name: DIESEL FUEL NO 2

=====  
General Information  
=====

Company's Name: COASTAL CORP  
Company's Street: 9 GREENWAY PLAZA  
Company's City: HOUSTON  
Company's State: TX  
Company's Country: US  
Company's Zip Code: 77046  
Company's Emerg Ph #: 713-877-1400  
Company's Info Ph #: 713-877-1400  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 07FEB90  
Safety Data Review Date: 22MAY95  
MSDS Serial Number: BLCNC  
Hazard Characteristic Code: F8

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Ingredients/Identity Information  
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Proprietary: NO  
Ingredient: PETROLEUM MID-DISTILLATE; (DIESEL FUEL NO. 2). TLV: 5 MG/M3;  
10MG/M3 STEL, OIL MIST.  
Ingredient Sequence Number: 01  
Percent: 100  
NIOSH (RTECS) Number: 1004302PE  
CAS Number: 68476-34-6  
OSHA PEL: 5 MG/M3, OIL MIST  
ACGIH TLV: SEE INGRED NAME

Proprietary: NO  
Ingredient: SUPP DATA: CLOSING VALVES, PRESS VACUUM BUNGS & FLAME  
ARRESTORS.  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: VENT; 3) TO PREVENT OXYGEN DEFICIENT ATMOSPHERES, ESPECIALLY  
IN CONFINED SPACES.  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: EYE PROT: CHEMICAL WORKERS GOGGLES (FP N), WHERE CONTACT WITH  
LIQUID OR MIST MAY OCCUR.  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Physical/Chemical Characteristics  
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Appearance And Odor: CLEAR TO LIGHT AMBER LIQUID, MILD PETROLEUM ODOR.  
 Boiling Point: 300F,149C  
 Melting Point: N/A  
 Vapor Pressure (MM Hg/70 F): 1.6  
 Vapor Density (Air=1): 8  
 Specific Gravity: 0.87  
 Evaporation Rate And Ref: 0.01  
 Solubility In Water: INSOLUBLE  
 Percent Volatiles By Volume: N/A  
 pH: N/A

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 Fire and Explosion Hazard Data  
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Flash Point: 125F,52C  
 Flash Point Method: PMCC  
 Lower Explosive Limit: 0.6%  
 Upper Explosive Limit: 7.5%  
 Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, FOAM, AND WATER SPRAY.  
 Special Fire Fighting Proc: USE A WATER SPRAY TO COOL FIRE-EXPOSED CONTRS.  
 USE A SMOTHERING TECHNIQUE FOR EXTING FIRE OF THIS COMBUST LIQUID. DO NOT  
 USE A FORCED WATER STREAM (SUPP DATA)  
 Unusual Fire And Expl Hazrds: FLOWING OIL CAN BE IGNITED BY SELF-GENERATED  
 STATIC ELECTRICITY.

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 Reactivity Data  
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Stability: YES  
 Cond To Avoid (Stability): HEAT, SPARK, FLAME, & BUILD-UP OF STATIC  
 ELECTRICITY.  
 Materials To Avoid: STRONG OXIDIZING AGENTS.  
 Hazardous Decomp Products: CARBON MONOXIDE, CARBON DIOXIDE, SULFUR  
 DIOXIDE, AND HYDROCARBONS.  
 Hazardous Poly Occur: NO  
 Conditions To Avoid (Poly): NOT RELEVANT

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 Health Hazard Data  
 =====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
 Route Of Entry - Inhalation: YES  
 Route Of Entry - Ingestion: YES  
 MODERATELY-EXTREMELY IRRITATING; CAUSING REDNESS, DRYING TO BURNS OR  
 BLISTERING. INHAL: IRRIT TO MUC MEMB & RESP TRACT. WILL PRDCE SYMP OF  
 INTOXICATION SUCH AS HDACH, DIZZ, NAUS, VOMIT & LOSS OF COORDINATION.  
 INGEST: STOMACH IRRIT, GASTRITIS, MILD EXCITATION, (EFTS OF OVEREXP)  
 Carcinogenicity - NTP: NO  
 Carcinogenicity - IARC: NO  
 Carcinogenicity - OSHA: NO  
 Explanation Carcinogenicity: NOT RELEVANT  
 Signs/Symptoms Of Overexp: HLTH HAZ: LOSS OF CONS, CONVULSIONS, CYANOSIS,  
 CONGESTION & CAPILLARY HEMORRHAGING OF THE LUNG & INTERNAL ORGANS.  
 ASPIRATION HAZARD IF VOMITING OCCURS. CHRONIC: PRLNG/RPTD SKIN CONT MAY  
 CAUSE DERMATITIS.  
 Med Cond Aggravated By Exp: MAY AGGRAVATE PRE-EXISTING DERMATITIS. MIDDLE  
 DISTILLATES HAVE CAUSED SKIN CANCER & KIDNEY DMG IN LAB ANIMALS. THE NIOSH,  
 BASE ON FINDINGS OF CARCINOGENIC & TUMORIGENIC RESPONSES OF MICE & (SUPP  
 DATA)  
 Emergency/First Aid Proc: EYE CONT: FLUSH THORO W/POTABLE WATER FOR AT  
 LEAST 15 MINUTES. GET MED ATTN. SKIN CONT: COOL THE EXPOSED AREA IMMED.  
 REMOVE TO FRESH AIR. APPLY ARTF RESP IF NOT BRTHG. GET MED ATTN. INGEST: DO  
 NOT INDUCE VOMITING. IF SPONTANEOUS VOMITING OCCURS, HOLD THE VICTIM'S HEAD  
 LOWER THAN HIPS TO PREVENT ASPIRATION.

=====  
 Precautions for Safe Handling and Use  
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Steps If Matl Released/Spill: REMOVE SOURCES OF HEAT OR IGNITION INCLUDING INTERNAL COMBUSTION ENGINES & POWER TOOLS. CLEAN-UP SPILL, BUT DO NOT FLUSH TO SEWER OR SURFACE WATER. VENTILATE AREA & AVOID BREATHING VAPORS OR MISTS.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSE THROUGH A LICENSED WASTE DISPOSAL COMPANY. FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS.

Precautions-Handling/Storing: STORE IN TIGHTLY CLOSED CONTRS IN A DRY COOL PLACE, AWAY FROM SOURCES OF HEAT/IGNIT. GROUND/BOND ALL TRANSFER/STORAGE EQUIP TO PVNT STATIC (SUPP DATA)

Other Precautions: EMPTY CONTRS MAY CONTAIN RESIDUE (LIQ &/OR VAP) & CAN BE DANGEROUS. DO NOT PRESSURIZE/CUT/WELD/BRAZE/SOLDER/DRILL/GRIND OR EXPOSED SUCH CONTRS TO HEAT/FLAME/SPARKS OR OTHER SOURCES OF IGNIT; THEY MAY EXPLODE & CAUSE INJURY OR DEATH.

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Control Measures  
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Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTIVE EQUIPMENT FOR CLEANING LARGE SPILLS OR ENTRY INTO LARGE TANKS, VESSELS OR OTHER CONFINED SPACES.

Ventilation: PROVIDE ADEQUATE VENT: 1) TO MEET OCCUP EXPOS LIMITS, 2) TO PREVENT THE FORMATION OF EXPLOSIVE ATMOSPHERES, AND (ING 3)

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: REMOVE CONTACT LENSES & WEAR (ING 4)

Other Protective Equipment: EMERGENCY EYEWASH & DELUGE SHOWER (FP N)

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: FIRE FIGHT PROC: DIRECTLY ON OIL FIRES AS THIS WILL SCATTER THE FIRE. FIREFIGHTERS SHLD WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP (FP N). MED CNDTNS: RATS EXPOSED TO WHOLE DIESEL EXHAUST, RECOMMENDS THAT WHOLE DIESEL EXHAUST BE REGARDED AS A "POTNTL OCCUP CARCINOGEN". HNDLG/STOR PREC: SPARKS & EQUIP W/SELF (ING 2)

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Transportation Data  
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Trans Data Review Date: 91308

DOT PSN Code: GJL

DOT Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S.

DOT Class: 3

DOT ID Number: UN1993

DOT Pack Group: III

DOT Label: FLAMMABLE LIQUID

IMO PSN Code: HIA

IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. o

IMO Regulations Page Number: 3345

IMO UN Number: 1993

IMO UN Class: 3.3

IMO Subsidiary Risk Label: -

IATA PSN Code: MCA

IATA UN ID Number: 1993

IATA Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. \*

IATA UN Class: 3

IATA Label: FLAMMABLE LIQUID

AFI PSN Code: MCA

AFI Prop. Shipping Name: FLAMMABLE LIQUIDS, N.O.S.

AFI Class: 3

AFI ID Number: UN1993

AFI Pack Group: III

AFI Basic Pac Ref: 7-7

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Disposal Data  
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Label Data  
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Label Required: P  
Technical Review Date: 21AUG91  
Label Date: 21AUG91  
Label Status: G  
Common Name: DIESEL FUEL NO 2  
Chronic Hazard: YES  
Signal Word: WARNING!  
Acute Health Hazard-Slight: X  
Contact Hazard-Moderate: X  
Fire Hazard-Moderate: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: COMBUSTIBLE. KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAME. ACUTE:MODERATE TO EXTREME IRRITATION. CAUSES REDNESS, DRYING, BURNS, BLISTERING. SLIGHT TO MODERATE EYE IRRITATION. INHALATION IRRITATION, MUCOUS MEMBRANES AND RESPIRATORY TRACT. CAUSES SYMPTOMS OF INTOXICATION AS HEADACHE, DIZZINESS, NAUSEA, VOMITING, INCOORDINATION. INGESTION CAUSES STOMACH IRRITATION, GASTRITIS, EXCITATION, CONVULSIONS, CYANOSIS AND INTERNAL HEMORRHAGE. CHRONIC:PROLONGED/REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: COASTAL CORP  
Label Street: 9 GREENWAY PLAZA  
Label City: HOUSTON  
Label State: TX  
Label Zip Code: 77046  
Label Country: US  
Label Emergency Number: 713-877-1400

QUAKER STATE OIL REFINING -- SUPER QUADROLUBE 85W140 GEAR - LUBRICATING OIL, GEAR  
MATERIAL SAFETY DATA SHEET

NSN: 9150010355395  
Manufacturer's CAGE: 77493  
Part No. Indicator: B  
Part Number/Trade Name: SUPER QUADROLUBE 85W140 GEAR

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General Information  
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Item Name: LUBRICATING OIL, GEAR  
Company's Name: QUAKER STATE OIL REFINING CORP  
Company's Street: 255 ELM ST  
Company's P. O. Box: 989  
Company's City: OIL CITY  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 16301-1412  
Company's Emerg Ph #: 814-676-2726  
Company's Info Ph #: 814-676-2726  
Record No. For Safety Entry: 027  
Tot Safety Entries This Stk#: 029  
Status: SE  
Date MSDS Prepared: 15DEC94  
Safety Data Review Date: 24MAR95  
Supply Item Manager: CX  
MSDS Preparer's Name: D.W. CRALLEY  
MSDS Serial Number: BWPTB  
Specification Number: MIL-L-2105  
Spec Type, Grade, Class: 85W-140 GRADE  
Hazard Characteristic Code: N1  
Unit Of Issue: CN  
Unit Of Issue Container Qty: 5 GALLONS  
Type Of Container: CAN  
Net Unit Weight: 37.1 LBS

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Ingredients/Identity Information  
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Proprietary: NO  
Ingredient: SOLVENT DEWAXED RESIDUAL OIL (PETROLEUM)  
Ingredient Sequence Number: 01  
Percent: 90-95  
NIOSH (RTECS) Number: 1004315SD  
CAS Number: 64742-62-7  
OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: 5 MG/M3 (OIL MIST)

Proprietary: NO  
Ingredient: OLEFIN SULFIDE  
Ingredient Sequence Number: 02  
Percent: 2-4  
NIOSH (RTECS) Number: 1010657OS  
CAS Number: 72162-26-6  
OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO  
Ingredient: ALKYLAMINE SALTS OF PHOSPHORIC ACID ESTERS  
Ingredient Sequence Number: 03  
Percent: 0-2  
NIOSH (RTECS) Number: 1012398AS  
CAS Number: 71888-91-0

OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: NONE RECOMMENDED

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Physical/Chemical Characteristics

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Appearance And Odor: BROWN, VISCOUS LIQUID.  
Boiling Point: UNKNOWN  
Melting Point: UNKNOWN  
Vapor Pressure (MM Hg/70 F): UNKNOWN  
Vapor Density (Air=1): UNKNOWN  
Specific Gravity: 0.89-0.90  
Decomposition Temperature: UNKNOWN  
Evaporation Rate And Ref: UNKNOWN  
Solubility In Water: UNKNOWN  
Viscosity: 1759 SUS@100F  
Corrosion Rate (IPY): UNKNOWN

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Fire and Explosion Hazard Data

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Flash Point: 400F, 204C  
Flash Point Method: COC  
Lower Explosive Limit: UNKNOWN  
Upper Explosive Limit: UNKNOWN  
Extinguishing Media: WATER, CARBON DIOXIDE, DRY CHEMICAL, FOAM.  
Special Fire Fighting Proc: USE WATER SPRAY TO COOL FIRE-EXPOSED  
CONTAINERS AND AS A PROTECTIVE SCREEN. DO NOT POINT WATER STREAM DIRECTLY  
AT BURNING OIL, IT MAY SPREAD THE FIRE.  
Unusual Fire And Expl Hazards: "EMPTY" CONTAINERS RETAIN PRODUCT RESIDUE  
AND CAN BE DANGEROUS.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): EXCESSIVE HEAT, FORMATION OF MISTS.  
Materials To Avoid: STRONG OXIDIZING AGENTS (SUCH AS CHLORINE, PEROXIDES),  
STRONG ACIDS.  
Hazardous Decomp Products: CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF  
SULFUR, NITROGEN, BORON AND PHOSPHOROUS.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): WILL NOT OCCUR.

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Health Hazard Data

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LD50-LC50 Mixture: UNKNOWN  
Route Of Entry - Inhalation: NO  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: CONTACT MAY CAUSE EYE IRRITATION. PROLONGED  
OR REPEATED SKIN CONTACT MAY CAUSE IRRITATION OR DERMATITIS. INHALATION OF  
HIGH CONCENTRATIONS OF MISTS OR VAPOR MAY CAUSE UPPER RESPIRATORY TRACT  
IRRITATION; POSSIBLE CNS DEPRESSION. ASPIRATION DURING SWALLOWING OR  
VOMITING MAY CAUSE PULMONARY INJURY.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NO INGREDIENT OF A CONCENTRATION OF 0.1% OR  
GREATER IS LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN.  
Signs/Symptoms Of Overexp: EYES-REDNESS, BURNING SENSATION, TEARING.  
SKIN-IRRITATION, DERMATITIS. INHALED-IRRITATION, DIZZINESS, NAUSEA,  
HEADACHE, LOSS OF COORDINATION, WEAKNESS. INGESTED-PULMONARY INJURY.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: INHALATION-REMOVE TO FRESH AIR. GIVE MOUTH-  
TO-MOUTH RESUSCITATION IF NOT BREATHING. GET MEDICAL ATTENTION. EYE-FLUSH

WITH WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IMMEDIATELY. SKIN-WASH WITH SOAP & WATER. REMOVE CONTAMINATED CLOTHING. INGESTION-DO NOT INDUCE VOMITING. NOTHING BY MOUTH IF UNCONSCIOUS. GET MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ABSORB WITH INERT MATERIALS SUCH AS DRY CLAY, SAND, DIATOMACEOUS EARTH, OR RECOVER WITH PUMPS. SCOOP UP USED ABSORBENT INTO DRUMS. DO NOT ALLOW INTO PUBLIC DRAINAGE SYSTEM OR OPEN WATERWAYS. WEAR APPROPRIATE CLOTHING/EQUIPMENT.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: MATERIAL, IF DISCARDED, IS NOT EXPECTED TO BE A CHARACTERISTIC WASTE UNDER RCRA. USED OIL CAN BE RETURNED TO A COLLECTION POINT OR PROVIDED TO A LICENSED RECYCLER. ALL WASTES MUST BE HANDLED IAW LOCAL, STATE AND FEDERAL REGULATIONS.

Precautions-Handling/Storing: STORE AWAY FROM STRONG OXIDIZING AGENTS.

Other Precautions: EMPTY DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED & PROMPTLY RETURNED TO A DRUM RECONDITIONER OR PROMPTLY DISPOSED OF.

Control Measures

Respiratory Protection: IF ENGINEERING CONTROLS FAIL OR NON-ROUTINE USE OR EMERGENCY OCCURS; USE NIOSH/MSHA APPROVED RESPIRATOR OR SUPPLIED AIR RESPIRATOR OR SCBA, AS REQUIRED. USE IAW 29 CFR 1910.134 AND MANUFACTURER'S RECOMMENDATIONS.

Ventilation: USE GENERAL VENTILATION AND USE LOCAL EXHAUST WHERE POSSIBLE IN CONFINED OR ENCLOSED SPACES.

Protective Gloves: NITRILE, VITON.

Eye Protection: NONE NORMALLY REQUIRED.

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER. DLA-HMIS: EYE WASH STATION & SAFETY SHOWER AVAILABLE FOR EMERGENCY USE.

Work Hygienic Practices: WASH HANDS AFTER USE AND BEFORE EATING, DRINKING, OR SMOKING. LAUNDRY CONTAMINATED CLOTHES BEFORE REUSE.

Transportation Data

Trans Data Review Date: 94365

DOT PSN Code: ZZZ

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

IMO PSN Code: ZZZ

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

IATA PSN Code: ZZZ

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

AFI PSN Code: ZZZ

AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Additional Trans Data: PER SAMMS-CTDF; PACKAGE IAW PPP-P-704, TYPE I, CLASS 4. MARK IAW MIL-STD-290. BAR CODE IAW MIL-STD-129.

Disposal Data

Label Data

Label Required: YES

Technical Review Date: 31DEC94

Label Status: F

Common Name: SUPER QUADROLUBE 85W140 GEAR

Chronic Hazard: NO

Signal Word: CAUTION!

Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-Slight: X

Reactivity Hazard-None: X

Special Hazard Precautions: CONTACT MAY CAUSE EYE IRRITATION. PROLONGED OR

REPEATED SKIN CONTACT MAY CAUSE IRRITATION OR DERMATITIS. INHALATION OF HIGH CONCENTRATIONS OF MISTS OR VAPOR MAY CAUSE UPPER RESPIRATORY TRACT IRRITATION; POSSIBLE CNS DEPRESSION. ASPIRATION DURING SWALLOWING OR INHALATION-REMOVE TO FRESH AIR. GIVE MOUTH-TO-MOUTH RESUSCITATION IF NOT BREATHING. GET MEDICAL ATTENTION. EYE-FLUSH WITH WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IMMEDIATELY. SKIN-WASH WITH SOAP & WATER. REMOVE CONTAMINATED CLOTHING. INGESTION-DO NOT INDUCE VOMITING. NOTHING BY MOUTH IF UNCONSCIOUS. GET MEDICAL ATTENTION.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: QUAKER STATE OIL REFINING CORP

Label Street: 255 ELM ST

Label P.O. Box: 989

Label City: OIL CITY

Label State: PA

Label Zip Code: 16301-1412

Label Country: US

Label Emergency Number: 814-676-2726

CHEVRON ENVIRONMENTAL HEALTH CENTER -- HYDRAULIC OIL AW ISO 68 - HYDRAULIC FLUID, PE  
MATERIAL SAFETY DATA SHEET

NSN: 9150009857232  
Manufacturer's CAGE: 0AHD1  
Part No. Indicator: C  
Part Number/Trade Name: HYDRAULIC OIL AW ISO 68

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General Information  
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Item Name: HYDRAULIC FLUID, PETROLEUM BASE  
Company's Name: CHEVRON ENVIRONMENTAL HEALTH CENTER  
Company's Street: 15299 SAN PABLO AVE  
Company's P. O. Box: 4054  
Company's City: RICHMOND  
Company's State: CA  
Company's Country: US  
Company's Zip Code: 94804-0054  
Company's Emerg Ph #: 800-231-0623, 800-424-9300 (CHEMTREC)  
Company's Info Ph #: 800-822-5823/800-582-3835  
Distributor/Vendor # 1: CHEVRON CHEMICAL CO, CONSUMER PRODUCTS D  
Distributor/Vendor # 1 CAGE: 8X116  
Record No. For Safety Entry: 003  
Tot Safety Entries This Stk#: 013  
Status: SE  
Date MSDS Prepared: 01APR93  
Safety Data Review Date: 02MAY94  
Supply Item Manager: CX  
MSDS Preparer's Name: NONE  
MSDS Serial Number: BTHJD  
Specification Number: MIL-H-17672  
Spec Type, Grade, Class: MIL-2075-T-H SYMBOL  
Hazard Characteristic Code: N1  
Unit Of Issue: CN  
Unit Of Issue Container Qty: 5.0 GL/CAN  
Type Of Container: CAN  
Net Unit Weight: 36.7 LBS

=====  
Ingredients/Identity Information  
=====

Proprietary: NO  
Ingredient: LUBRICATING BASE OIL, SEVERELY REFINED PETROLEUM DISTILLATE.  
(MIXTURE ANY OF THE CAS NUMBERS SHOWN UNDER INGREDIENT # 2)  
Ingredient Sequence Number: 01  
Percent: >99.0  
NIOSH (RTECS) Number: 1011092B0  
OSHA PEL: 5MG/M3, AS OIL MIST  
ACGIH TLV: 5MG/M3 MIST 9394  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO  
Ingredient: ING.#1: CAS# 64741884, 64741895, 64741964, 64741975, 64742014,  
64742525, 64742536, 64742547, 64742627, 64742650, 72623837  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999Z2  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE  
Other Recommended Limit: NOT APPLICABLE

Proprietary: NO  
Ingredient: ADDITIVES  
Ingredient Sequence Number: 03  
Percent: < 1.0  
NIOSH (RTECS) Number: 1005728AD

OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: NONE RECOMMENDED

Physical/Chemical Characteristics

Appearance And Odor: PALE YELLOW LIQUID.  
Boiling Point: UNKNOWN  
Melting Point: UNKNOWN  
Vapor Pressure (MM Hg/70 F): UNKNOWN  
Vapor Density (Air=1): UNKNOWN  
Specific Gravity: 0.88  
Decomposition Temperature: UNKNOWN  
Evaporation Rate And Ref: NOT APPLICABLE  
Solubility In Water: INSOLUBLE  
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: 410F, 210C MIN  
Flash Point Method: COC  
Lower Explosive Limit: UNKNOWN  
Upper Explosive Limit: UNKNOWN  
Extinguishing Media: CO2, DRY CHEMICAL, FOAM, WATER FOG.  
Special Fire Fighting Proc: DO NOT ENTER ANY ENCLOSED OR CONFINED FIRE SPACE WITHOUT PROPER PROTECTIVE EQUIPMENT, INCLUDING SELF-CONTAINED BREATHING APPARATUS.  
Unusual Fire And Expl Hazrds: LEAKS/RUPTURES IN HIGH PRESSURE SYSTEM USING MATERIALS OF THIS TYPE CAN CREATE A FIRE HAZARD WHEN IN VICINITY OF IGNITION SOURCES.

Reactivity Data

Stability: YES  
Cond To Avoid (Stability): EXCESSIVE HEAT, OPEN FLAME, PILOT LIGHT, SPARKS, ELECTRIC ARCS, OTHER IGNITION SOURCES.  
Materials To Avoid: MAY REACT WITH STRONG OXIDIZING AGENTS, SUCH AS CHLORATES, NITRATES, PEROXIDES.  
Hazardous Decomp Products: NORMAL COMBUSTION FORMS CARBON DIOXIDE, OXIDES OF SULFUR AND PHOSPHORUS. INCOMPLETE COMBUSTION PRODUCES CARBON MONOXIDE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): WILL NOT OCCUR.

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT) IS UNKNOWN.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: ACUTE: EYES/SKIN: NOT EXPECTED TO CAUSE SIGNIFICANT IRRITATION. SHOULD BE PRACTICALLY NON-TOXIC TO INTERNAL ORGANS IF IT GETS ON SKIN. INHALATION: SHOULD BE PRACTICALLY NON-TOXIC TO INTERNAL ORGANS IF INHALED. INGESTION: SHOULD BE PRACTICALLY NON-TOXIC TO INTERNAL ORGANS IF SWALLOWED. CHRONIC: NONE KNOWN.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NONE  
PRACTICALLY NON-TOXIC TO INTERNAL ORGANS. INGESTION: PRACTICALLY NON-TOXIC TO INTERNAL ORGANS.  
Med Cond Aggravated By Exp: PRE-EXISTING CONDITIONS MAY WORSEN IF EXPOSED TO THIS PRODUCT..  
Emergency/First Aid Proc: EYES: REMOVE CONTACT LENSES IF WORN. FLUSH WITH LARGE AMOUNTS OF WATER. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

SKIN: REMOVE CONTAMINATED CLOTHING. WASH AREA WITH SOAP AND WATER.  
INHALATION: NOT EXPECTED TO BE A PROBLEM. INGESTION: GIVE WATER OR MILK TO  
DRINK. GET MEDICAL ATTENTION. INJECTION: IF INJECTED UNDER SKIN, GET  
MEDICAL ATTENTION IMMEDIATELY.

=====  
Precautions for Safe Handling and Use  
=====

Steps If Matl Released/Spill: STOP LEAK. CONTAIN LIQUID AND PREVENT  
CONTAMINATION OF SOIL, SURFACE WATER, OR GROUNDWATER. CLEAN UP SMALL SPILLS  
USING PUMPING AND ABSORBENTS. WHERE FEASIBLE, REMOVE CONTAMINATED SOIL.  
FOLLOW PROCEDURES FOR REPORTING SPILLS TO PROPER AUTHORITIES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSE OF WASTE IN ACCORDANCE WITH LOCAL, STATE  
AND FEDERAL REGULATIONS. CONTACT YOUR LOCAL ENVIRONMENTAL OFFICER FOR  
APPROVED DISPOSAL OF THIS MATERIAL.

Precautions-Handling/Storing: USE ONLY IN WELL VENTILATED AREAS. KEEP  
CONTAINERS CLOSED. KEEP AWAY FROM HEAT, OPEN FLAMES, SPARKS, HOT SURFACES,  
OXIDIZERS.

Other Precautions: DO NOT WELD, HEAT OR DRILL CONTAINER, REPLACE CAP OR  
BUNG. EMPTIED CONTAINER STILL CONTAINS HAZARDOUS MATERIAL, IT MAY IGNITE WITH  
EXPLOSIVE VIOLENCE IF HEATED SUFFICIENTLY. DO NOT USE PRESSURE TO EMPTY  
DRUM, IT MAY RUPTURE WITH EXPLOSIVE FORCE.

=====  
Control Measures  
=====

Respiratory Protection: NONE NORMALLY REQUIRED. HOWEVER, IF OPERATING  
CONDITIONS CREATE AIRBORNE CONCENTRATIONS WHICH EXCEED THE RECOMMENDED  
EXPOSURE STANDARDS, USE A NIOSH/MSHA APPROVED RESPIRATOR FOR ORGANIC  
VAPORS/MIST.

Ventilation: PROVIDE ADEQUATE VENTILATION TO KEEP AIRBORNE CONCENTRATIONS  
OF THIS MATERIAL BELOW RECOMMENDED EXPOSURE STANDARDS.

Protective Gloves: NONE NORMALLY REQUIRED.

Eye Protection: NONE NORMALLY REQUIRED.

Other Protective Equipment: NONE NORMALLY REQUIRED. AVOID PROLONGED/  
REPEATED SKIN CONTACT. SKIN CONTACT CAN BE MINIMIZED BY WEARING PROTECTIVE  
CLOTHS.

Work Hygienic Practices: WASH AFTER HANDLING AND BEFORE EATING, DRINKING,  
OR SMOKING. LAUNDRER CONTAMINATED CLOTHING BEFORE REUSE.

Suppl. Safety & Health Data: NONE  
=====

Transportation Data  
=====

Trans Data Review Date: 94122

DOT PSN Code: 222

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

IMO PSN Code: 222

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

IATA PSN Code: 222

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

AFI PSN Code: 222

AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION  
=====

Disposal Data  
=====

Label Data  
=====

Label Required: YES

Technical Review Date: 02MAY94

Label Status: F

Common Name: HYDRAULIC OIL AW ISO 68

Chronic Hazard: NO

Signal Word: CAUTION!

Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-Slight: X

Reactivity Hazard-None: X

Special Hazard Precautions: NOT EXPECTED TO CAUSE SIGNIFICANT EYE AND SKIN IRRITATION AND IS PRACTICALLY NON-TOXIC TO INTERNAL ORGANS IF ON SKIN OR INHALED OR IF SWALLOWED. KEEP AWAY FROM HEAT, OPEN FLAME, OXIDIZERS. CONTAIN SPILLS. PREVENT CONTAMINATION OF SOIL, SURFACE WATER, OR GROUNDWATER. CLEAN UP SPILLS USING PUMPING AND ABSORBENTS. REPORT SPILLS TO AUTHORITIES. FIRST AID: EYES: FLUSH WITH WATER. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH AREA WITH SOAP AND WATER. INGESTION: GIVE WATER OR MILK TO DRINK. GET MEDICAL ATTENTION. INJECTION: IF INJECTED UNDER SKIN, GET MEDICAL ATTENTION IMMEDIATELY. TARGET ORGANS: UNKNOWN.

Protect Eye: Y

Protect Skin: Y

Label Name: CHEVRON ENVIRONMENTAL HEALTH CENTER

Label Street: 15299 SAN PABLO AVE

Label P.O. Box: 4054

Label City: RICHMOND

Label State: CA

Label Zip Code: 94804-0054

Label Country: US

Label Emergency Number: 800-231-0623, 800-424-9300 (CHEMTREC)

TEXACO REFINING & MARKETING -- 00365 TEXACO UNLEADED - AUTOMOTIVE GASOLINE  
MATERIAL SAFETY DATA SHEET  
NSN: 9130001487102  
Manufacturer's CAGE: 2R503  
Part No. Indicator: B  
Part Number/Trade Name: 00365 TEXACO UNLEADED

=====  
General Information  
=====

Item Name: AUTOMOTIVE GASOLINE  
Company's Name: TEXACO REFINING AND MARKETING INC  
Company's Street: 1111 RUSK ST  
Company's City: HOUSTON  
Company's State: TX  
Company's Country: US  
Company's Zip Code: 77002-3310  
Company's Emerg Ph #: 914-831-3400 800-424-9300 (CHEMTREC)  
Company's Info Ph #: 512-459-6543  
Distributor/Vendor # 1: SCHULTE OIL CO (405-262-3121)  
Distributor/Vendor # 1 Cage: 4R019  
Record No. For Safety Entry: 024  
Tot Safety Entries This Stk#: 053  
Status: FE  
Date MSDS Prepared: 15DEC92  
Safety Data Review Date: 22JUL93  
Supply Item Manager: KY  
MSDS Preparer's Name: MANAGER, PRODUCT SERVICES  
Preparer's Company: TEXACO INC.  
Preparer's St Or P. O. Box: P. O. BOX 509  
Preparer's City: BEACON  
Preparer's State: NY  
Preparer's Zip Code: 12508  
MSDS Serial Number: BRFLK  
Specification Number: VV-G-1609  
Spec Type, Grade, Class: REGULAR UNLEADED  
Hazard Characteristic Code: F2  
Unit Of Issue: GL  
Unit Of Issue Container Qty: BULK  
Type Of Container: BULK  
Net Unit Weight: UNKNOWN  
NRC/State License Number: NONE  
Net Propellant Weight-Ammo: NONE

=====  
Ingredients/Identity Information  
=====

Proprietary: NO  
Ingredient: GASOLINE  
Ingredient Sequence Number: 01  
Percent: 95-99.9  
NIOSH (RTECS) Number: LX3300000  
CAS Number: 8006-61-9  
OSHA PEL: 300 PPM/500 STEL  
ACGIH TLV: 300 PPM/500 STEL; 9293  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO  
Ingredient: HYDROCARBON GAS CONTAINED IN INGREDIENT #1  
Ingredient Sequence Number: 02  
Percent: UNKNOWN  
NIOSH (RTECS) Number: MW3860000  
OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: NONE RECOMMENDED

-----  
Proprietary: NO  
Ingredient: OLEFINS  
Ingredient Sequence Number: 03  
Percent: UNKNOWN  
NIOSH (RTECS) Number: 10007950L  
OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: NONE RECOMMENDED  
-----

Proprietary: NO  
Ingredient: BENZENE (SARA III)  
Ingredient Sequence Number: 04  
Percent: .2-3.5  
NIOSH (RTECS) Number: CY1400000  
CAS Number: 71-43-2  
OSHA PEL: 1PPM/5STEL;1910.1028  
ACGIH TLV: 10 PPM; A2; 9293  
Other Recommended Limit: NONE RECOMMENDED  
-----

Proprietary: NO  
Ingredient: METHYL TERT-BUTYL ETHER (SARA III)  
Ingredient Sequence Number: 05  
Percent: 0-15  
NIOSH (RTECS) Number: KN5250000  
CAS Number: 1634-04-4  
OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: NONE RECOMMENDED  
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Physical/Chemical Characteristics  
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Appearance And Odor: LIQUID; LIGHT STRAW TO LIGHT RED; GASOLINE-LIKE ODOR  
Boiling Point: >90F, >32C  
Vapor Pressure (MM Hg/70 F): 465-775  
Vapor Density (Air=1): 3-4  
Specific Gravity: .7-.77  
Evaporation Rate And Ref: UNKNOWN  
Solubility In Water: SLIGHT  
Percent Volatiles By Volume: 100  
Autoignition Temperature: 850F  
-----

Fire and Explosion Hazard Data  
-----

Flash Point: -40F, -40C  
Flash Point Method: COC  
Lower Explosive Limit: 1.4  
Upper Explosive Limit: 7.6  
Extinguishing Media: DRY CHEMICAL, FOAM, CARBON DIOXIDE.  
Special Fire Fighting Proc: WATER MAY BE INEFFECTIVE ON FLAMES, BUT CAN BE USED TO COOL FIRE EXPOSED CONTAINERS. USE A SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.  
Unusual Fire And Expl Hazrds: VAPORS ARE HEAVIER THAN AIR AND TRAVEL ALONG THE GROUND, POSING A FLASHBACK HAZARD (FLOWING GASOLINE GENERATES STATIC ELECRICITY).  
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Reactivity Data  
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Stability: YES  
Cond To Avoid (Stability): HEAT, SPARKS ... OTHER SOURCES OF IGNITION.  
Materials To Avoid: STRONG OXIDIZERS.  
Hazardous Decomp Products: CARBON MONOXIDE, CARBON DIOXIDE, IRRITATING ALDEHYDES AND KETONES.  
Hazardous Poly Occur: NO  
-----

Conditions To Avoid (Poly): NONE

Health Hazard Data

LD50-LC50 Mixture: LD50 ORAL RAT(EST)=5 G/KG  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: EYES:IRRITANT.SKIN:THIS MATERIEL IS ABSORBED BY THE SKIN(HAZARD LEVEL HAS NOT BEEN DETERMINED);IRRITANT.INHAL:IRRITATES NOSE AND THROAT.MAY CAUSE ASPHYXIATION IN ENCLOSED SPACES.INGEST:MAY CAUSE LUNG DAMAGE IF VOMITTED AFTER SWALLOWING.CHRONIC:BENZENE CAUSES LEUKEMIA IN HUMANS.  
Carcinogenicity - NTP: YES  
Carcinogenicity - IARC: YES  
Carcinogenicity - OSHA: YES  
Explanation Carcinogenicity: CONTAINS Benzene [71-43-2] WHICH IS LISTED BY NTP AND IARC AND REGULATED BY OSHA AS A CARCINOGEN.  
HEADACHE, NAUSEA, VOMITING, DIZZINESS, DROWSINESS, EUPHORIA, LOSS OF COORDINATION, DISORIENTATION.  
Med Cond Aggravated By Exp: REPEATED SKIN CONTACT MAY AGGRIVATE EXISTING DERMATITIS.  
Emergency/First Aid Proc: EYES:FLUSH WITH WATER FOR 15 MINUTES WHILE LIFTING LIDS.CALL PHYSICIAN.SKIN:REMOVE CONTAMINATED CLOTHING;WASH WITH SOAP AND WATER.CALL PHYSICIAN IF IRRITATION PERSISTS.INGEST:DO NOT INDUCE VOMITING WITHOUT ADVICE OF A PHYSICIAN.GET PROMPT QUALIFIED MEDICAL ATTENTION.INHAL:REMOVE TO FRESH AIR.GIVE ARTIFICIAL RESPIRATION OR OXYGEN IF NEEDED.GET PROMPT MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ELIMINATE SOURCES OF IGNITION. VENTILATE AREA. AVOID BREATHING VAPORS; STAY UPWIND; USE A SCBA. REMOVE WITH A NON-FLAMMABLE ADSORBANT (EG. DIATOMACEOUS EARTH); PUT IN AN APPROPRIATE CONTAINER FOR DISPOSAL. KEEP OUT OF WATERWAYS.  
Neutralizing Agent: NONE  
Waste Disposal Method: THIS MATERIEL IS CONSIDERED TO BE HAZARDOUS PER RCRA, WITH REGARD TO BENZENE TOXICITY AND IGNITABILITY.  
Precautions-Handling/Storing: TRANSPORT, HANDLE AND STORE PER OSHA 1910.106. GROUND AND BOND SHIPPING CONTAINERS. USE SPARK-PROOF TOOLS.  
Other Precautions: USE CAUTION WHEN OPENING CONTAINERS WHICH MAY BE UNDER PRESSURE.

Control Measures

Respiratory Protection: IN THE ABSENCE OF ENVIROMENTAL CONTROLS A NIOSH ORGANIC VAPOR RESPIRATOR MAY BE USED; IN ENCLOSED SPACES A SELF-CONTAINED BREATHING APPARATUS SHOULD BE USED.  
Ventilation: ENVIRONMENTAL CONTROLS TO MAINTAIN TLV BELOW 500PPM.  
Protective Gloves: NITRILE, TEFLON, VITON.  
Eye Protection: GOGGLES/FACE SHIELD.  
Other Protective Equipment: CLOTHING TO PREVENT SKIN CONTACT.  
Work Hygienic Practices: WASH HANDS. SEPERATE WORK CLOTHES FROM STREET CLOTHES. LAUNDER WORK CLOTHES BEFORE REUSE. KEEP FOOD OUT OF THE WORK AREA.  
Suppl. Safety & Health Data: NONE.

Transportation Data

Trans Data Review Date: 93203  
DOT PSN Code: GTN  
DOT Proper Shipping Name: GASOLINE  
DOT Class: 3  
DOT ID Number: UN1203  
DOT Pack Group: II

DOT Label: FLAMMABLE LIQUID  
IMO PSN Code: HRV  
IMO Proper Shipping Name: GASOLINE  
IMO Regulations Page Number: 3141  
IMO UN Number: 1203  
IMO UN Class: 3.1  
IMO Subeidiary Risk Label: -  
IATA PSN Code: RMF  
IATA UN ID Number: 1203  
IATA Proper Shipping Name: MOTOR SPIRIT  
IATA UN Class: 3  
IATA Label: FLAMMABLE LIQUID  
AFI PSN Code: MUC  
AFI Prop. Shipping Name: GASOLINE  
AFI Class: 3  
AFI ID Number: UN1203  
AFI Pack Group: II  
AFI Basic Pac Ref: 7-7  
Additional Trans Data: NONE

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Disposal Data  
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Label Data  
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Label Required: YES  
Technical Review Date: 22JUL93  
Label Date: 15DEC92  
MFR Label Number: 00365TEX UNLEAD  
Label Status: G  
Common Name: 00365 TEXACO UNLEADED  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Moderate: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: EYES:IRRITANT.SKIN:THIS MATERIEL IS ABSORBED  
BY THE SKIN(HAZARD LEVEL NOT DETERMINED);IRRITANT.INHAL:IRRITATES NOSE AND  
THROAT.MAY CAUSE ASPHYXIATION IN ENCLOSED SPACES.INGEST:MAY CAUSE LUNG  
DAMAGE IF VOMITTED AFTER SWALLOWING.CHRONIC:BENZENE CAUSES LEUKEMIA IN  
HUMANS. FIRST AID: EYES:FLUSH WITH WATER FOR 15 MINUTES WHILE LIFTING LIDS.  
CALL PHYSICIAN.SKIN:REMOVE CONTAMINATED CLOTHING;WASH WITH SOAP AND WATER.  
CALL PHYSICIAN IF IRRITATION PERSISTS.INGEST:DO NOT INDUCE VOMITING WITHOUT  
ADVICE OF A PHYSICIAN.GET PROMPT QUALIFIED MEDICAL ATTENTION.INHAL:REMOVE  
TO FRESH AIR.GIVE ARTIFICIAL RESPIRATION OR OXYGEN IF NEEDED.GET PROMPT  
MEDICAL ATTENTION  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: TEXACO REFINING AND MARKETING INC  
Label Street: 1111 RUSK ST  
Label City: HOUSTON  
Label State: TX  
Label Zip Code: 77002-3310  
Label Country: US  
Label Emergency Number: 914-831-3400 800-424-9300 (CHEMTREC)

## **Attachment 5**

### **Self Assessment Checklist**



# JOBSITE SAFETY INSPECTION CHECKLIST

Revision.: 02

STANDARD OF PRACTICE HS-18 - HEALTH AND SAFETY CHECKLIST

Date: 05/01/00

Note: The following jobsite safety inspection checklist is to be used only at locations where CCI controls the work. It is not to be used at locations where others control the work.

Project Name: NEX Gas Station Remediation Project No.: \_\_\_\_\_  
 Location: Millington, TN Project Manager: Matt Haupt  
 Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

If an item is not applicable, the column titled "N/A" should be checked. If an item is applicable but the auditor does not observe it during the inspection, the "N/O" column should be checked. For each deficiency noted, a Health and Safety Audit Finding Form must be completed. The NAVY RAC Health and Safety Manager must be copied on the results of all audits.

Check "Yes" for Items Completed	Yes	No	N/A	N/O
---------------------------------	-----	----	-----	-----

## I. JOBSITE OFFICE

1. Posters and safety signs in place:				
a. OSHA safety poster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Emergency Telephone Number Form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Workers Compensation Form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. First aid kit:				
a. Fully stocked/sufficient supply	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. First-aid administered by a person with a valid certificate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Bloodborne-pathogen kit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Accident/injury reporting:				
a. Employees briefed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Forms available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Injuries and illnesses reported and logged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Accidents investigated and properly followed up to prevent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Accident reports and logs submitted promptly as required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Job safety rules and regulations available/posted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## II. HAZARD COMMUNICATION

1. Employee training:				
a. Employees' signed training certificates on file	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 2. Material safety data sheets (MSDSs): |                          |                          |                          |                          |
| a. MSDSs on file                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Log assigned to competent person     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Log complete and up to date          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Written program on file              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**III. EMPLOYEE TRAINING**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Site personnel have read the job safety rules and regulations and have signed the "Employee Signoff Sheet"                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Sufficient instruction given in recognition and avoidance of job hazards; unsafe conditions; and job rules, regulations, and procedures | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Sufficient instruction in proper use and maintenance of tools, equipment, and personal protective equipment                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Employees instructed to report unsafe or hazardous conditions to proper job supervisor  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Employees instructed to promptly report injury, illness, and accidents involving damage to equipment and materials                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Safety indoctrination held for new employees  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**IV. JOBSITE LOGISTICS AND LAYOUT**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Traffic routes around construction areas: |                          |                          |                          |                          |
| a. Warning signs, flagging in place          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Crane swing flagged                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Utility ditches:                          |                          |                          |                          |                          |
| a. Flagged or barricaded                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Trucks and heavy equipment:               |                          |                          |                          |                          |
| a. Good mechanical conditions                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Backup signals working                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Seat belts installed and used             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Motor graders and other earth movers:     |                          |                          |                          |                          |
| a. Good mechanical conditions                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Backup signals working                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Seat belts installed and used             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**V. PUBLIC PROTECTION**

- |                                       |                          |                          |                          |                          |
|---------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Warning signs in place around site | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. After-hours hazards:               |                          |                          |                          |                          |
| a. Open ditches protected             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Drop-offs protected                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

c. Ladders lowered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Hazard lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>VI. HOUSEKEEPING</b>				
1. Material storage yard:				
a. Stacked neatly and properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Aisles, walkways, roads clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Check work areas for:				
a. Loose and waste materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Vicinity of ladders, stairs, ramps, and machinery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Empty bottles, containers, papers, trash, bands, brick-bats, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Trash cans, dumpsters available and emptied regularly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Nails, boards, debris removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Trash receptacles provided for drinking cups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>VII. PERSONAL PROTECTIVE EQUIPMENT (PPE)</b>				
1. Hard hats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Safety shoes/boots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Eye/face protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Safety belts/lanyards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Ear protection:				
a. Noise level areas of 90 dBA and above identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Signs notifying personnel of "Hearing Protection Required" posted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Specialized equipment:				
a. Gloves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Chemical-Respirators (respirator use requires medical protocol, monitoring and training)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Chemical-resistant clothing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Tools:				
a. Handles in good shape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Tool guards in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Proper tools used for the job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

d. Tools maintained in functional condition

**VIII. SANITATION**

1. Temporary toilets:

a. Serviced regularly

b. Sufficient Quantity (20 or fewer employees - 1 required;  
20 or more employees - 1 toilet and 1 urinal per 40 workers)

2. Potable Water:

a. Tightly closed containers

b. Equipped with tap

c. Paper cups available

d. Containers labeled "Drinking Water"

**IX. FLOOR AND WALL OPENINGS GUARDS**

**XI. SCAFFOLDING**

1. Erected under proper supervision

2. All structural members adequate for use

3. All connections adequate, pins, crossbracing provided and support

4. Proper footings provided (sound, rigid, and secured)

5. Safely tied into structure

6. Access ladder or safe equivalent provided and used

7. Defective and damaged parts, planks, etc., removed from service

8. Ladders and working areas kept free of debris, ice, snow,  
chemicals, and grease

9. Complete platform, planks, close together and overlapped by  
at least 12 inches or secured by wire or proper cleating

10. Guard rails, mid-rails, and toe boards installed on all open  
sides of platforms 10 feet and over in height (applies to both maintenance and construction)

11. Frequent inspections made

**XII. ELECTRICAL**

1. Cords/devices have current inspection color code tape installed

2. Frayed cords, broken plugs fixed

3. Temporary wiring:

a. Panels secured and GFCIs working

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| b. Away from vehicle pathways  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Out of water/moisture   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. No broken receptacles found   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Sufficient outlets for all crafts   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Temporary lighting with cages   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Assured equipment grounding conductor program in place, if not using GFCIs                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Lock-out or tag-out system used when necessary  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Electrical dangers posted and guarded   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Fire hazards checked, proper extinguishers available                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Only qualified electricians work on electrical circuits and equipment                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Cords passing through work areas must be covered or elevated to protect them from damage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Extension cords must be hard or extra-hard usage   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XIII. TEMPORARY HEATERS**

**XIV. FIRE PROTECTION**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Office fire extinguisher in working order and inspected regularly         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. One extinguisher, 2A rating, for each 3,000 square feet of protected area | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. One extinguisher, 2A rating, on each floor adjacent to each stairway      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Trash, paper, other combustibles picked up                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Welders have extinguishers nearby and a fire watch is available if needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Fire alarm available/fire evacuation plan                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. "No Smoking" signs posted and enforced where necessary                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Supervisors and employees trained in proper use of extinguishers          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XV. MATERIAL STORAGE AND HANDLING**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Neat storage area, clear passageways                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Materials spotted to minimize rehandling and reduce transport distances | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Power equipment used to handle heavy/awkward loads                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 4. Stacks on firm footing and all tier stacked materials secured against sudden movement          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Storage platforms, skids, bins, shelves, etc. in good repair                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Protruding nails and wires removed and rugged metal edges protected before material is handled | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Lifting weights known before handling  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Employees using proper lifting methods, picking up loads correctly                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Proper number of employees for each operation, physically suited for task                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Tag lines used to control loads   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Protection provided against falling hazards   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Dust protection observed  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Extinguishers or other fire protection available  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Combustibles, flammable, and other unrelated materials separated and clearly identified       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. "No Smoking" signs posted where necessary   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Safe loading limits observed for indoor storage   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XVI. DEMOLITION WORK**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Operations planned ahead and checked for lead and asbestos if applicable        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Safety work permit required and necessary blinding of lines, etc., accomplished | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Adjacent structures shored or braced  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Electrical, water, sewer, steam lines cut off, locked out, or tagged            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Area roped off or barricaded  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Proper safety, danger, and warning signs provided and used                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Adequate lighting and ventilation provided where necessary                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Material chutes used  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Adequate safe access provided   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

10. Clear operating space provided for equipment and vehicles

11. Overhead protection provided where required

**XVII. STEEL ERECTION**

**XX. FLAMMABLE AND COMBUSTIBLE LIQUIDS**

1. Containers clearly marked to show contents (gas cylinders, cans, etc.)

2. Proper storage practices observed:

a. Storage areas enclosed or protected from heat and mobile equipment exposure

b. Fire hazards checked

c. Sufficient fire extinguishers

d. UL approved safety cans for 1 to 5 gallons of flammable liquids

e. Approved cabinet for indoor storage of liquids in excess of 25-gallons, but not more than 120-gallon storage

f. Sign labeled "Flammable - Keep Fire Away" posted on cabinet

**XXI. FLAMMABLE GAS (Oxygen/Acetylene)**

1. Cylinders:

a. Away from heat

b. Stored upright (secured)

c. Valves closed on empty cylinders

d. Valve protection caps in place if cylinder not in use

e. Valve key wrench available

f. Portable rack with bottles secured

g. Instruct project staff to never drag or slide bottles

h. Designated storage area

i. Oxygen bottles stored 20' from acetylene bottles or 1/2-hour fire barrier installed between them

j. "No Smoking" signs posted

2. Gauges/valves/hoses:

a. Good condition

b. Fire arresters installed (both hoses)

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 3. Eye protection available  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. All burning torches bled and free of oxygen and acetylene and/or other gases during lunch breaks and other extended periods of time | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 5. When in use, gas lines properly located to prevent tripping and falling   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 6. Ventilation adequate  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

**XXII. WELDING OPERATIONS**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Performed by qualified personnel  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Screens, shields, or eye protection provided and used to protect employees from welding operation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Employees wear sufficient clothing and PPE  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Equipment checked before use and in operative conditions  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Electrical equipment grounded   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Power cables protected and in good repair   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Power cables properly located to prevent tripping and falling hazards                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Dry chemical fire extinguisher within 30 feet   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Exposed combustible materials removed to safe location or properly protected from sparks and slag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Valid hot work permit required or provided   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Machines turned off at end of shift or when not in use for extended periods                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. "Danger - No Smoking, Matches or Open Lights" signs posted when required                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Overhead protection provided where required  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XXIII. HOISTS**

**XXIV. BLASTING**

**XXV. HAZARDOUS WASTE**

**Certification and Training of CH2M HILL Personnel**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Medical exam within last 12 months  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. 40-hour initial training, 3 days supervised field activities, 8-hour annual refresher           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. First aid and CPR certification   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Quantitatively fit tested (preferred method per NIOSH Publication 87-116, 87-116, Appendix B.3) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Attend pre-entry safety meeting   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Safety Coordinator with appropriate training  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Certification and Training of Subcontractor Personnel**

- 1. Medical exam within last 12 months
- 2. 40-hour initial training, 3 days supervised field activities, 8-hour annual refresher
- 3. First aid and CPR certification
- 4. Quantitatively fit tested (preferred method per NIOSH Publication 87-116, (Appendix B.3)
- 5. Attend pre-entry safety meeting

**Site Safety Documentation**

- 1. Site health and safety plan (HSP) prepared and approved
- 2. HSP onsite
- 3. All personnel onsite identified in HSP
- 4. Documentation of safety briefing
- 5. Hospital map posted
- 6. Phone numbers posted
- 7. Emergency vehicle identified
- 8. Material Safety Data Sheets (MSDSs) onsite
- 9. Work zones delineated (How? \_\_\_\_\_)
- 10. Wind direction flags in use
- 11. Documentation of calibration of monitoring equipment in Clean environment
- 12. Monitoring conducted and recorded as specified in HSP (Frequency? \_\_\_\_\_)
- 13. Monitoring for heat/cold stress
- 14. Buddy system in use
- 15. Decontamination procedures established as specified in HSP
- 16. No eating, drinking, or smoking in exclusion and contamination Reduction zones
- 17. Toilet facilities provided
- 18. No contact lenses

19. Work conducted during daylight hours only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Safety Briefing</u></b>				
1. All personnel attended (including new personnel)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Documentation of meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Chemical hazards and toxicology reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Physical hazards reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Biological hazards reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Heat/cold stress information reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Air monitoring requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Levels of protection reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Work zones reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Decontamination procedures reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Emergency response procedures reviewed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Site communications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Personal Protective Equipment (PPE)</u></b>				
1. Levels of protection being worn as specified in HSP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. All appropriate PPE available onsite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Hard hats being worn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Appropriate hand protection being used (What? _____ )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Appropriate body protection being used (What? _____ )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Appropriate eye protection being used (What? _____ )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Appropriate ear protection being used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Appropriate respirator protection being used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Respirators donned correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 10. TLD badges being used   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. If air purifying respirators (APRs) are being used, correct cartridges (Type? _____)      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. If self contained breathing apparatuses (SCBAs) are being used, is grade D air being used | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. If SCBAs are being used, are cylinders stored correctly                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. If PPE is not onsite, prepared to halt work   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Disposal methods in place for disposable PPE  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Decontamination Procedures</u></b>  |                          |                          |                          |                          |
| 1. Decontamination procedure established as specified in the HSP                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Decontamination zone clearly defined   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. PPE properly decontaminated (How? _____)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Sampling equipment properly decontaminated (How? _____)                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Monitoring equipment properly decontaminated (How? _____)                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Heavy equipment properly decontaminated (How? _____)                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Samples properly decontaminated (How? _____)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Decontamination fluids appropriately disposed of   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XXVI. CONSTRUCTION INSPECTIONS**

**XXVII. OFFICE TRAILERS/BUILDINGS**

**Employer Posting**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Is the OSHA (or state) job safety poster displayed in a prominent location where all employees are likely to see it?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Are emergency telephone numbers posted where they can be readily found in case of emergency?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Where employees may be exposed to any toxic substances or harmful physical agents, has appropriate information concerning employee access to medical and exposure records and Material Safety Data Sheets been posted or otherwise made readily available to affected employees? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are signs concerning exits, room capacities, floor loading, exposure to x-ray, microwave, or other harmful radiation or substances posted appropriately?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Are other required posters properly displayed, such as:  |                          |                          |                          |                          |
| a. Industrial Welfare Commission orders regulating wages, hours,  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- and working conditions?
- b. Discrimination in employment prohibited by law?
- c. Notice to employees of unemployment and disability insurance.
- d. Payday notice?

**Emergency Action Plan**

1. Are alarm systems properly maintained and tested regularly?
2. Is the emergency action plan reviewed and revised periodically?
3. Do employees know their responsibilities:
  - a. For reporting emergencies?
  - b. During an emergency?
  - c. For conducting rescue and medical duties?

**Fire Protection**

1. Is there a current fire prevention plan?
2. Does the plan describe the type of fire protection equipment and/or
3. Are practices and procedures established to control potential fire hazards and ignition sources?
4. Is local fire department well acquainted with facilities, location, and specific hazards?
5. Is there a fire alarm system and is it certified as required?
6. If you have a fire alarm system, is it tested at least annually?
7. Are fire doors and shutters in good operating condition?
8. Are automatic sprinkler system water control valves, air and water pressures checked weekly/periodically as required?
9. Is maintenance of automatic sprinkler systems assigned to responsible persons or to a sprinkler contractor?
10. Is an earthquake preparedness kit on site?

**Exiting or Egress**

1. Are all exits marked with an exit sign and illuminated by a reliable light source?
2. Are the directions to exits, when not immediately apparent, marked with visible signs?
3. Are doors, passageways, or stairways that are neither exits nor access to exits and which could be mistaken for exits, appropriately marked "NOT AN EXIT," "TO BASEMENT," "STOREROOM," etc.?
4. Are exit doors side-hinged?

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 5. Are all exits kept free of obstructions?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Where exiting will be through frameless glass door, glass exit doors, etc., are the doors fully tempered, and do they meet the safety requirements for human impact? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Are special precautions taken to protect employees during construction and repair operations?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Are there sufficient exits to permit prompt escape in case of emergency?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**General Work Environment**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Are all work sites clean and orderly?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Are work surfaces kept dry or appropriate means taken to assure the surfaces are slip-resistant? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Are all spilled materials or liquids cleaned up immediately?                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are the minimum number of toilets and washing facilities provided?                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Are all toilets and washing facilities clean and sanitary?                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Are all work areas adequately illuminated?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Walkways**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Are aisles and passageways kept clear?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Are aisles and walkways marked as appropriate?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Are holes in the floor, sidewalk, or other walking surface repaired Properly, covered, or otherwise made safe? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are wet surfaces covered with nonslip materials?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Medical Services And First Aid**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. If medical and first aid facilities are not in proximity to your workplace, is At least one employee on each shift currently qualified to render first aid? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Are medical personnel readily available for advice and consultation on Matters of employee health?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Have first aid kit supplies been approved by a physician, indicating they are adequate for a particular area or operation?                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are first aid kits easily accessible to each work area, with necessary Supplies available, periodically inspected, and replenished as needed?               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Are emergency phone numbers posted?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XXIII. CONFINED SPACE ENTRY**

**Confined Space Evaluation**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Personnel informed of location and hazards of existing confined-space (danger signs, verbal). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Determination made that work can not be completed without entering the confined space.        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Information obtained regarding the space (blue prints, potential hazards, energy sources).    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. Spaces classified as permit-required, alternative procedures, or non-permit confined space.

**Training**

5. Entrants, Attendants, and Entry Supervisor have completed confined-space entry training.
6. Employees performing lockout/tagout procedures have completed LOTO training.
7. Employees required to wear respirators have completed respiratory Protection training.

**Confined-Space Entry**

8. Complete permit or certificate posted at space entrance.
9. Pre-entry briefing conducted.
10. Entrants/Attendants verify that entry supervisor has authorized entry.
11. Entrants/Attendants verify that all requirements of the permit or certificate have been satisfied.
12. Atmospheric monitoring is conducted at frequency provided on the permit or certificate.
13. Entry not permitted if an atmospheric hazard is detected above acceptable safe levels.
14. Entrants evacuate space upon orders of the attendant or entry supervisor when an alarm is sounded, or when a prohibited condition is recognized.
15. Entrants/Attendant informs entry supervisor of hazards confronted or created in the space or any problems encountered during entry.
16. Entry supervisor informs the owner of such issues in item 15 above.

**Entry Under A Confined-Space Entry Permit (CESP) (6.4)**

17. CSEP completed by entry supervisor.
18. All expected hazards listed.
19. Entry supervisor and Attendant assigned.
20. Communication methods established between entrants and the Attendant. (6.7.1)
21. Cleaning requirements identified. (6.7.2)
22. Isolation requirements identified. (6.7.3)
23. Ventilation requirements identified. (6.7.4)
24. Protective equipment requirements identified. (6.7.5)
25. Rescue equipment requirements identified. (6.7.6)
26. Other requirements identified. (6.7.7)

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 27. Rescue and emergency procedures identified. (6.8)  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Atmospheric monitoring requirements identified.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. HS&E manager approve use by signing (CH2M HILL CSEP ONLY)  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Entry supervisor authorized entry by signing CSEP.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Authorized entrants have completed CSE training and attendant pre-entry briefing.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Only authorized entrants permitted to enter the space.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Entry supervisor sign the CSEP indicating its cancellation.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Problems encountered during the entry listed.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Entry Under An Alternative Procedure Certificate (APC) (6.5)</b>  |                          |                          |                          |                          |
| 35. APC completed by entry supervisor.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. All expected hazards listed.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Entry supervisor and attendant assigned.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Entry supervisor verifies that non-atmospheric hazards do not exist.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Communication methods established between entrants and attendants.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Covers removed safely.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Openings guarded from both fall hazards and from objects entering the space.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Continuous forced-air ventilation positioned to ventilate the immediate areas where employees are working and continue until they leave the space. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Ventilation from a clean source of air.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Atmospheric monitoring requirements identified.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Entry supervisor authorized entry by signature.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Authorized entrants have completed CSE training and attended pre-entry briefing.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Only authorized entrants permitted to enter the space.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Entry supervisor sign the APC indicating its cancellation.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Problems encountered during the entry listed.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Entry Under a Non-Permit Certificate (NPC) (6.6)</b>  |                          |                          |                          |                          |

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 50. NPC completed by entry supervisor.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 51. Entry supervisor assigned.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 52. Attendant or buddy assigned.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 53. Buddy remains in the space with the entrant.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 54. Entry supervisor verifies non-atmospheric hazards do not exist.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 55. Communication methods established between entrants and attendant or buddy.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 56. Entrants informed to exit the space immediately if hazards are observed.                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 57. Atmospheric monitoring requirements identified.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 58. Entry supervisor authorizes entry by signing.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 59. Authorized entrants have completed CSE training and attended pre-entry briefing.                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 60. Only authorized entrants permitted to enter the space.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 61. Entry supervisor will sign the NPC indicating its cancellation.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 62. Problems encountered during entry listed.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| <b>Rescue (6.8)</b>   |                          |                          |                          |                                     |
| 63. Entrants wearing body harness with attached retrieval line. (lifeline)                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 64. End of lifeline attached to retrieval device (when required) or fixed point outside space.        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 65. Mechanical retrieval device positioned at access point for vertical-type spaces >5 feet deep.     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 66. Rescue team established.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 67. Team members have completed confined-space entry training.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 68. Team members informed of the hazards that they may confront during rescue operations.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 69. PPE & rescue equipment necessary to conduct safe entry-rescue provided and readily available.     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 70. Team members trained on rescue duties and proper use of PPE and rescue equipment.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 71. All team members trained in First Aid and CPR, at least one member holding a current certificate. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 72. Team has made simulated rescue from a space of similar configuration within last 12 months.       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 73. Communications established & tested between team & entrants, and                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

emergency provider.

74. Local emergency medical provider notified in advance PRCS entry.

**Atmospheric Monitoring**

75. Qualified individual conducts atmospheric monitoring.

76. Monitoring results documented on permit or certificate.

77. Entrants do not enter until all monitoring requirements are completed.

78. Monitoring equipment calibrated prior to use.

79. Monitoring conducted for oxygen, flammability, and toxic air contaminants.

80. Monitoring conducted bottom to top at five foot intervals.

**Pre-entry Briefing**

81. Entry supervisor conducts the briefing and discusses the following:

82. Explanation of work to be performed and limitations.

83. Explanation of actual and potential hazards, including the possible behavioral effects and signs, symptoms, and consequences of exposure.

84. Review control measures & atmospheric monitoring requirements, as Specified on permit or certificate.

85. Review of entrant and attendant responsibilities.

**XXIX. STAIRWAYS AND LADDERS**

**Personnel Safe Work Practices (3.1)**

1. Employees have completed stairway and ladder training.

2. Carrying objects on stairs with both hands is avoided.

3. Pan and skeleton metal stairs not used until permanent or temporary treads/landings provided.

4. Ladders periodically inspected for defects by competent person.

5. Defective ladders tagged and removed from service until repaired.

6. Ladders used only for purpose for which they were designed.

7. Ladders not loaded beyond their rated capacity.

8. Only one person simultaneously climbing or working from an individual ladder.

9. Personnel face ladder when climbing.

10. Personnel climbing ladders maintain 3 points of contact with ladder.

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 11. Personnel not carrying tools, materials, or equipment while climbing. Tag lines used.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Ladders not moved, shifted or extended while in use.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Stepladders used in open and locked position only.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Stepladders top platform and top step not used as a step.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Stepladders cross-braced not used for climbing.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Fall protection considered when working from ladders over 6'.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Ladders:: General (3.2.3)</u></b>  |                          |                          |                          |                          |
| 17. Ladder components surfaced to prevent injury from puncture, laceration, or snagging clothing.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Ladders maintained free of oil, grease, and other slipping hazards.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Area around top and bottom of ladders kept free of obstructions.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Portable Ladders: Design and Construction (3.2.4)</u></b>  |                          |                          |                          |                          |
| 20. Only American National Standards Institute (ANSI) approved ladders.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Rungs and steps are parallel, level, and uniformly spread.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Ladders not tied or fastened together to created longer sections unless designed for such use.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Ladders with non-conductive side rails used near energized electrical equipment  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Extension ladders equipped with positive section stops.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Stepladders provided with metal spreader or locking device to hold open when in use.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Two or more ladders used to reach elevated work areas offset with platform or landing.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Double-cleated or two ladders provided if > 25 personnel use ladders as <u>only means of access, or when ladder serves simultaneous two-way traffic.</u> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Wood ladders not coated with opaque covering.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Portable Ladder: Positioning</u></b>   |                          |                          |                          |                          |
| 29. Ladders used only on stable, level, surfaces unless secured to prevent movement.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Ladders placed in areas where they can be displaced by work activities, secured or barricaded.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Extension ladder section overlap adequate distance.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Extension and straight ladders placed with both side rails supported equally.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Extension & straight ladders positioned at approximately 75° angle.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Ladders extend 3' above upper landings or are secured at top.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XXX. FALL PROTECTION**

**XXXI. EXCAVATIONS**

**Personnel Safe Work Practices (3.1)**

- 1. .Competent person has completed daily inspection and has authorized any entry.
- 2. Personnel aware of entry requirements established by competent person.
- 3. Protective systems are free from damage and in stable condition.
- 4. Surface objects/structures secured from falling into excavation.
- 5. Potential hazardous atmospheres have been tested and found to be at safe levels.
- 6. Precautions taken to prevent cave-in from water accumulation in the excavation.
- 7. Personnel wearing appropriated PPE, HSP.

**General**

- 8. Daily safety briefing/meeting conducted with personnel.
- 9. Excavation and protective systems adequately inspected by competent person.
- 10. Defective protective systems or other unsafe conditions corrected before entry.
- 11. Guardrails provided on walkways over excavations 6' or deeper .
- 12. Barriers provided at excavations 6' or deeper when not readily visible.
- 13. Barriers or covers provided for wells, pits, shafts, or similar excavation 6' or deeper.
- 14. Excavating equipment operated safely.

**Prior to Excavating (3.2.2)**

- 15. Location of underground utilities and installations identified.

**Excavating Activities (3.2.3)**

- 16. Rocks, trees, and other unstable surface objects removed or supported.
- 17. Exposed underground utility lines supported.
- 18. Undermined surface structures supported or determined to be in safe condition.
- 19. Warning system used to remind equipment operators of excavation edge.

**Excavation Entry (3.2.4)**

- 20. Trenches >4' deep provided with safe means of egress within 25'.
- 21. Structure ramps designed and approved by competent person.
- 22. Potential hazardous atmospheres tested prior to entry.

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 23. Rescue equipment provided where potential for hazardous atmosphere exist.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 24. Ventilation used to control hazardous atmospheres and air tested frequently.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 25. Appropriate respiratory protection used when ventilation does not control hazards.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 26. Precautions taken to prevent cave-in from water accumulation in the excavation.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 27. Precautions taken to prevent surface water from entering excavation.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 28. Spoil piles, equipment, materials restrained or kept at least 2' from excavation edge.                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 29. Protection provided from falling/rolling material from excavation face.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| <b><u>Excavation Protective Systems (3.2.5)</u></b>  |                          |                          |                          |                                     |
| 30. Protective systems used for excavations 5' or deeper.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 31. Protective systems for excavations deeper than 20' designed by Professional Engineer and signed off.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 32. If soil unclassified, maximum allowable slope is 34°.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 33. Protective systems free from damage.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 34. Protective systems used according to manufacturers recommendations and not subject to loads exceeding design limits. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 35. Protective system components securely connected to prevent movement or failure.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 36. Personnel removed from shielding systems when installed, removed, or vertical movement.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 37. Cave-in protection provided while entering/exiting shielding system.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| <b><u>Protective System Removal (3.2.6)</u></b>  |                          |                          |                          |                                     |
| 38. Protective system removal starts and progresses from excavation bottom.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 39. Protective systems removed slowly and cautiously.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 40. Temporary structure supports used if failure of remaining components observed.                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 41. Back-filling taking place immediately after protective system removal.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| <b><u>Excavating at Hazardous Waste Sites (3.2.7)</u></b>  |                          |                          |                          |                                     |
| 42. Waste disposal according to HSP and Environmental Protection Plan.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 43. Appropriate decontamination procedures being followed, per HSP.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

**XXXII. DRILLING**

**XXXIII. EARTHMOVING EQUIPMENT**

**Personnel Safe Work Practices (3.1)**

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Only authorized personnel operating earthmoving equipment.    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 2. Personnel maintaining safe distance from operating equipment. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 3. Personnel and equipment operator in close communication when personnel must be in proximity of earthmoving equipment. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Personnel approach operating equipment safely.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Personnel wearing high-visibility and/or reflective vests when close to operating equipment.                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Personnel riding only in seats of equipment cab and using seat belts.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Personnel not positioned under hoisted loads.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Personnel not hoisted by equipment.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Personnel instructed not to approach equipment that has become electrically energized.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Personnel wearing appropriate PPE, per HSP.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>General (3.2.1)</u></b>  |                          |                          |                          |                          |
| 11. Daily safety briefing/meeting conducted with crew.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Daily inspection of equipment and equipment accessories conducted before use.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. At least one fire extinguisher available at the equipment operating area.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Earthmoving Equipment Components (3.2.2)</u></b>   |                          |                          |                          |                          |
| 14. Backup alarm or spotter used when backing equipment.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Operational horn provided on bi-directional equipment.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Seat belts are provided and used.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Rollover protective structures (ROPS) provided.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Braking system capable of stopping full payload.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Headlights and taillights operable when additional lights required.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Brake lights in operable condition.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Cab glass provides no visible distortion to operator.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Dump truck operating levers provided with latch to prevent accidental dumping.                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Dump truck beds provided with positive means of support during <u>maintenance or inspection.</u>                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Hauling equipment (dump trucks) provided with cab shield or canopy.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Earthmoving Equipment Placement (3.2.3)</u></b>  |                          |                          |                          |                          |
| 25. Location of underground utilities identified.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Safe clearance distance maintained while working under overhead lines.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 27. Safe distance is maintained while traveling under powerlines.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Parking brake set when equipment parked and equipment chocked when parked on incline.                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Unattended equipment visibly marked at night.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Earthmoving Equipment Operation (3.2.4)</u></b>   |                          |                          |                          |                          |
| 30. Equipment operated on safe roadways and grades.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Equipment operated at safe speed.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Equipment not operated during inclement weather, lightning storms.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Using equipment to lift loads, other than earth, done according to equipment manufacturer specifications. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Lifting and hauling capacities are not exceeded.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Equipment components lowered when not in use.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. All machine guards are in place.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Air monitoring conducted per HSP for hazardous atmospheres.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Earthmoving Equipment Maintenance (3.2.5)</u></b>   |                          |                          |                          |                          |
| 38. Defective components repaired immediately.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Suspended equipment or equipment parts are supported prior to work under or between.                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Lockout/tagout procedures used prior to maintenance.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Tires on split rims removed using tire safety rack or cage.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Good housekeeping maintained on and around equipment.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Excavating at Hazardous Waste Sites (3.2.6)</u></b>   |                          |                          |                          |                          |
| 43. Waste disposal according to waste plan and HSP  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Appropriate decontamination procedures followed, per HSP.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**XXXIV. DEMOLITION**

**PERSONNEL SAFE WORK PRACTICES (3.1)**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Personnel remain safe distance from demolition zone (DZ) during work.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Personnel entering DZ, only when necessary.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Prior to DZ entry, competent person evaluates structure and authorizes Entry. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Personnel aware of entry requirements established by competent person.        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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| 5. Competent person escorts personnel during DZ entry, if possible.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Personnel removed from DZ prior to activities that could affect structural integrity or safety. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Personnel not positioned under hoisted loads.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Personnel wearing appropriated PPE per HSP.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>PERSONNEL ACTIVITIES (3.2)</u></b>   |                          |                          |                          |                          |
| 9. Demolition permit completed and submitted, as required.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Competent person completed engineering survey, available at site.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Regulated hazardous substances removed prior to demolition.                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Hazardous materials purged from tanks, pipes, and equipment.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Utility service lines shut off, capped, or otherwise controlled, utilities notified.           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Utilities needed for demolition temporary relocated.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>GENERAL (3.2.1)</u></b>  |                          |                          |                          |                          |
| 15. Daily safety briefing/meeting conducted with crew.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Daily inspection of demolition equipment conducted before use.                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Competent person inspecting DZ for hazards as work progresses.                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Competent person controls entry into DZ, unauthorized entry prohibited.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Multi-story structures provided with adequate canopy over entrances.                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Demolition starts at top of structure and proceeds downward.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Fire extinguisher available at demolition area.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>PROTECTION OF THE PUBLIC (3.2.2)</u></b>   |                          |                          |                          |                          |
| 22. Demo work not performed in area occupied by public, unless permitted By contract.              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Overhead protection provided for pedestrian traveled sidewalks.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Walking surfaces kept free of obstructions.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Standard guardrails provided on pedestrian bridges, ramps, runways, and platforms.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Signs posted informing pedestrians of hazards.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Temporary fence provided around perimeter of DZ adjacent to public areas.                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Watch placed at openings when DZ barricades temporarily removed.                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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| 29. Warning lights provided around DZ hazards at night, walkways lighted.               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>WORK AREA PROTECTION (3.2.3)</u></b>  |                          |                          |                          |                          |
| 30. Wall openings protected by guardrail 42" high.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Fall protection provided for fall hazards 6' or greater.                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Adequate barricades and signs provided when debris dropped through floor openings.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Floor opening, not used as material drops, adequately covered.                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Signs, barricades, flagging used to warn personnel of hidden hazards.               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Glass removed from structure, or personnel protected from fragments.                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Damaged structure's walls and floors shored and braced.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. All DZ accessways not meant to be accessed closed at all times.                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Multi-story structure stairways adequately covered and illuminated.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. DZ areas adequately illuminated.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Protruding reinforcing steel protected when personnel work above it.                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>DEMOLITION USING HEAVY EQUIPMENT OR CRANES (3.2.6)</u></b>                        |                          |                          |                          |                          |
| 41. Personnel removed from DZ during use of mechanical equipment.                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Mechanical equipment positioned on floors capable of supporting imposed loads.      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Working surface edges provided with curbs or stop-logs.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Heavy equipment operated safely.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Crane boom and loadline is as short as possible.                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Cranes operated safely.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>HOUSEKEEPING (3.2.9)</u></b>  |                          |                          |                          |                          |
| 47. Work areas, passageways, stairs, ladders, and exits kept free of debris.            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Demolition materials, tools, and equipment placed in an orderly manner.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Receptacles provided for disposal of miscellaneous trash.                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 50. Air, water, electrical, and welding lines positioned to eliminate tripping hazards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 51. Burning debris done according to local requirements.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Fires completely extinguished at least 1 hour before end of day's work.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**OTHER ACTIVITIES ASSOCIATED WITH DEMOLITION (3.2.10)**

- 53. Scaffolds erected and used safely.
- 54. Aerial lifts used safely.
- 55. Stairways and ladders used safely.
- 56. Control measures taken before welding/burning on hazardous coatings.
- 57. Welding and cutting performed safely.

**XXXVI. HAND AND POWER TOOLS**

**SAFE WORK PRACTICES (3.1)**

- 1. All tools operated according to manufacture's instructions.
- 2. All hand and power tools maintained in a safe condition and inspected before each use.
- 3. Defective tools are tagged and removed from service until repaired.
- 4. PPE is selected and used according to tool-specific hazards.
- 5. Power tools are not carried or lowered by cord or hose.
- 6. Tools are disconnected from energy sources when not in use.
- 7. Safety guards remain installed or are promptly replaced after repair.
- 8. Tools are stored properly.
- 9. Cordless tools and recharging units conform to electrical standards.
- 10. Tools used in explosive environments are rated for such use.
- 11. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stresses.
- 12. Knife or blade hand tools are used with the proper precautions.

**General (3.2.1)**

- 13. PPE is selected and used according to tool-specific hazards anticipated.
- 14. Tools are tested daily to assure safety devices are operating properly.
- 15. Damaged tools are removed from service until repaired.
- 16. Power operated tools designed to accommodate guards and used.
- 17. Rotating or moving parts on tools are properly guarded.

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| 18. Machines designed for fixed locations are secured or anchored.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 19. Floor and bench-mounted grinders are provided with work rests.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 20. Guards are provided at point of operation, nip points, rotating parts.                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| <b><u>Electric-Powered Tools (3.2.2)</u></b>  |                          |                          |                          |                                     |
| 22. Electric tools are double insulated or grounded according to SOP HS-23.                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 23. Electric cords are not used for hoisting or lowering tools                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 24. Hand-held tools are equipped with appropriate on/off controls.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 25. Electric tools used in damp/wet locations are approved or use GFCI.                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 26. Portable, power-driven circular saws are equipped with proper guards.                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| <b><u>Abrasive Wheel Tools (3.2.3)</u></b>  |                          |                          |                          |                                     |
| 27. Employees using abrasive wheel tools are wearing eye protection.                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 28. Grinding machines are supplied with sufficient power to maintain spindle speed.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 29. Abrasive wheels are closely inspected and ring-tested before use.                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 30. Grinding wheels are properly installed.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 31. Cup-type wheels for external grinding are protected by proper guard.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 32. Portable abrasive wheels used for internal grinding are protected by safety flange.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 33. Safety flanges are used only with wheels designed to fit the flange.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 34. Safety guards on abrasive wheel tools are mounted properly.                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| <b><u>Pneumatic-Powered Tools (3.2.4)</u></b>   |                          |                          |                          |                                     |
| 35. Tools are secured to hoses or whip by positive means to prevent disconnect.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 36. Safety clips or retainers are installed to prevent attachments being expelled.              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 37. Safety devices are installed on automatic fastener feed tools.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 38. Compressed air is not used for cleaning unless reduced to <30 psi, with PPE and guarded.    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 39. Manufacturer's safe operating pressure for hoses, pipes, valves, are not exceeded.          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 40. Hoses >1/2 inch diameter have safety device at source to reduce pressure upon hose failure. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 41. Airless spray guns have required safety devices installed.                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

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| 42. Blast cleaning nozzles are equipped with operating valves, which are held open manually.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Supports are provided for mounting nozzles when not in use.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Air receivers drains, handholes, and manholes are easily accessible.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Air receivers are equipped with drainpipes, and valves for removal of Accumulated oil and water. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Air receivers are completely drained at required intervals.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Air receivers are equipped with indicating pressure gauges.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Safety valves are tested at regular intervals for assure good operating condition.               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Safety, indicating, and controlling devices are installed as required.                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Liquid Fuel-Powered Tools (3.2.5)</u></b>  |                          |                          |                          |                          |
| 50. Liquid fuel-powered tools are stopped when refueling, servicing, or for maintenance.             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 51. Safe operating pressures of hoses, valves, pipes, filters, and other Fittings are not exceeded.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Liquid fuels are stored and transported according to SOP HS-21.                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Jacking Tools (3.2.6)</u></b>  |                          |                          |                          |                          |
| 54. Rated capacities are legibly marked on jacks and not exceeded.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 55. Jacks have a positive stop to prevent over-travel.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Base of jacks are blocked or cribbed to provide a firm foundation.                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Wood blocks are placed between the cap and load to prevent slippage.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. After load is raised, it is cribbed, blocked, or otherwise secured Immediately.                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 59. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 60. Jacks are properly lubricated.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 61. Jacks are inspected as required.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 62. Repair or replacement parts are examined for possible defects.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 63. Jacks not working properly are removed from service and repaired.                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><u>Hand Tools(3.2.7)</u></b>  |                          |                          |                          |                          |
| 64. Wrenches are not used when jaws are sprung to the point of slippage.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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| 65. Impact tools are kept free of mushroomed heads.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 66. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

**XXXV. CONCRETE AND MASONRY**

**XXXVI. AERIAL LIFTS**

**Safe Work Practices (3.1)**

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Only authorized and trained personnel operating aerial lifts.                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 2. Aerial lifts inspected by the operator prior to use.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 3. Lift controls tested by the operator each day prior to use.                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 4. Personnel wearing full body harness with lanyard attached to boom or platform.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 5. Lanyards not attached to adjacent structures or equipment while in aerial lift.        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 6. Personnel standing firmly on the floor of lift platform.                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 7. Personnel remain in the platform at all times and do not climb to adjacent structures. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 8. Standard guardrail or equivalent protection provided on lift platform.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 9. Aerial lifts provided with upper and lower controls.                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Lower controls operated only with permission of personnel in lift, unless emergency.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 11. Lift controls properly marked and legible, and capacity rating posted.                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 12. Modifications to aerial lift certified in writing by manufacturer.                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

**Aerial Lift Positioning (3.2.2)**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 13. Aerial lifts positioned on firm, level surface with brakes set.                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Wheel chocks used on inclines.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Outriggers positioned on solid surfaces or cribbing when used.                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Safe clearance distance maintained while working near overhead powerlines.           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Safe clearance distance maintained while traveling under overhead powerlines.        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Aerial lifts not moved when boom is elevated and personnel are working in platforms. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Boom is properly cradled and outriggers stowed prior to moving lift.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Aerial Lift Operation (3.2.3)**

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 20. Safe operating manual should be available for review and use by | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

- aerial lift operators.
21. Aerial lift operators know boom and basket load limits and do not exceed them.
  22. Aerial lift platforms are free of slippery conditions.
  23. Personnel not standing or working below aerial lift operations.
  24. Warning signs or barricades provided under aerial lift operations.
  25. Counterweight swing radius barricaded or flagged.
  26. Aerial lifts not being used as cranes.
  27. Platforms free of attachments such as cables, wires, chains, or ropes.
  28. Aerial lifts not operated in winds exceeding 30 miles per hour.
  29. Platform foot switch physically operated and not mechanically blocked.
  30. Aerial lifts used indoors have exhaust properly vented to control carbon monoxide exposures.
  31. Insulating portion of aerial lift is not altered in any manner.

## **Appendix C**

### **Submittal Register**

# Submittal Register

Contract Number: N62467-98-D-0995		CTO No.: 0061			CTO Title: NSA Mid-South					Location: Millington, TN			Contractor: CH2M HILL Constructors, Inc.			
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Spec Section	Item Description	Para. Number	Approving Authority	Other Reviewers	Submittal Number	Scheduled Submission Date	CCI Review Date	CCI Disposition	CCI Transmit Date	QC Admin Received Date	QC Disposition	QC Admin Transmit Date	Contracting Officer Received	Contracting Officer Disposition	Contracting Officer Return	Remarks
SD-01	<b>Data</b>															
SD-02	<b>Manufacturer's Catalog Data</b>															
	Oil Water Separator															
	Recovery Sump															
	Frac Tank															
	Flow Meter															
SD-04	<b>Drawings</b>															
	Interceptor Trench System															
	Shoring and Sheeting Drawings															
	Excavation Drawings															
SD-05	<b>Design Data</b>															
	Interceptor Trench Design															
	Shoring and Sheeting Design															
SD-07	<b>Schedules</b>															
	Construction Schedule															
SD-09	<b>Reports</b>															
	Analytical Laboratory Reports															
	Lead Paint Core Sampling Results															
	Monitoring Well Sampling Results															
	Soil Sampling Results															
	Construction Testing Lab Reports															
	Pre-construction Testing Results															
SD-12	<b>Field Test Reports</b>															
	Soil Compaction															
	Vapor Monitoring															
SD-13	<b>Certificates</b>															
	Analytical Lab Certification															
	Construction Testing Lab Certification															
	Certificate of Clean Fill Material															
	State of TN P.E. License															
SD-18	<b>Records</b>															
	POTW Discharge Permit															
	Contaminated Soil Disposal Manifests															
	Contaminated Water Disposal Manifests															
	Certificates of Disposal															
	Certificates of Destruction															
	Environmental Conditions Reports															

## Submittal Register

	Status Reports															
	List of Contractor Personnel															
	<b>SD-10 O &amp; M Manuals</b>															
	Oil Water Separator															
	Recovery Sump															
	Frac Tank															

**Appendix D**  
**Testing Plan and Log**

