880 0 File: 541.460.000n <u>M.D.</u>



THE MEMPHIS DEPOT TENNESSEE

ADMINISTRATIVE RECORD COVER SHEET

AR File Number ____ 880



File: M.D. 541, 460, 600 g 880 1 880

REMEDIAL ACTION HEALTH AND SAFETY PLAN

Defense Depot Memphis, Tennessee

Prepared for:



Defense Logistics Agency



Air Force Center for Environmental Excellence Contract FA8903-04-D-8722 Task Order No. 0016



engincering-environmental Management, Inc.

April 2006 Revision 0

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

April 2006 Rev 0

HEALTH & SAFETY PLAN (H&SP)

for the

Project Name:	Remedial Action at Defense Depot Memphis, Tennessee
Project Location:	Defense Depot Memphis, Tennessee
Project No.:	<u>3202-016-01-01</u>

This H&SP, which must be kept on site, addresses the health and safety hazards of each task for this project, including the requirements and procedures for worker protection (per 29 the Code of Federal Regulations [CFR] 1910.120). The Site Health and Safety Officer (SHSO) can change or amend this document only with agreement from the e2M Health and Safety Manager. The SHSO must initial any change made to the H&SP at the relevant section and document the amendment date below.

Prepared by: Kevin Sedlak

e²M Managing Office: San Antonio, TX

Approved by:

SHSO

Thomas C Halmer

25 April 2006

DATE

25 April 2006

PROJECT MANAGER

TERALIS + Seattly &

HEALTH AND SAFETY MANAGER

Date(s) of Amendment(s):

All site workers shall read this H&SP. A pre-entry briefing conducted by the SHSO shall be held prior to initiating this project. All applicable sections of this H&SP shall be reviewed during this briefing. The SHSO shall review the information covered in the pre-entry briefing meeting with any worker not in attendance at the initial meeting prior to commencing work. Brief meetings will be held at the beginning of each workday to discuss important safety and health issues concerning tasks performed on that day. A brief description of topics discussed in the meetings shall be documented in the Field Logbook. After reading the H&SP and attending a pre-entry briefing, workers shall sign the following acknowledgment statement:

DATE

11 May 2006

DATE

1

ł

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

Remedial Action Health and Safety Plan Defense Depot Memphis, Tennessee

I have read and understand the information set forth in this H&SP. I have also attended a pre-entry briefing. I agree to perform my work in accordance with this H&SP.

NAME	DATE	NA	AME	DATE
			<u> </u>	<u>.</u>
		۰ 		
	<u> </u>	<u>,</u>		
		<u></u>		

April 2006 Rev. 0

TABLE OF CONTENTS

		<u>Page</u>
1.0	SITE DESCRIPTION AND CHARACTERIZATION	1-7
	1.1 SITE LOCATION AND HISTORY. 1.1.1 Installation History and Mission. 1.1.2 Regulatory Background	
	1.2 FIELD WORK SUMMARY	
2.0	KEY PERSONNEL AND HEALTH & SAFETY RESPONSIBILITIES	2-1
3.0	HAZARD ANALYSIS	3-1
4.0	WORKER TRAINING	4-1
5.0	MEDICAL SURVEILLANCE	5-1
6.0	SITE CONTROL AND ACCIDENT PREVENTION	6-1
	6.1 WORK ZONES	
	6.2 BUDDY SYSTEM	
	6.3 SITE ACCESS	6-1
	6.4 COMMUNICATIONS	
	6.5 SAFE WORK PRACTICES	
	6.6 ACCIDENT PREVENTION	
7.0	AIR MONITORING	
8.0	COLD/HEAT STRESS	8-1
	8.1 COLD STRESS	
	8.2 HEAT STRESS	8-1
9.0	PERSONAL PROTECTIVE EQUIPMENT	9-1
10.0	DECONTAMINATION	
11.0	EMERGENCY RESPONSE	11-1
	11.1 SITE MAP	
	11.2 EMERGENCY CONTACTS	
	11.3 EMERGENCY RESPONSE EQUIPMENT	
	11.4 COMMUNICATION	
	11.5 EMERGENCY RESPONSE PROCEDURES	
12.0	CONFINED SPACE ENTRY	
13.0	SPILL CONTAINMENT	
14.0	HAZARD COMMUNICATION	14-1
15.0	RECORD KEEPING	15-1
16.0	DDMT BACKGROUND REFERENCE DOCUMENTS	

880 April 2006 Rev. 0

LIST OF TABLES

<u>Table</u>

- 2.1 Key Personnel and Health and Safety Responsibilities
- 4.1 Training/Medical Surveillance/Respiratory Protection Records
- 6.1 General Safe Work Practices
- 7.1 Air Monitoring Action Guides
- 7.2 Air Monitoring Action Guides Main Installation
- 7.3 Dunn Field Compounds
- 11.1 Emergency Contacts
- 11.2 Emergency Procedures

LIST OF FIGURES

Figure

- 1.1 Site Map and Vicinity
- 11.1 Site Map/Hospital Route Map

LIST OF ATTACHMENTS

ATTACHMENT 1	CONTAMINANT FACT SHEETS
ATTACHMENT 2	HEALTH AND SAFETY MANAGER RESUME
ATTACHMENT 3	HAZARD ANALYSIS PER TASK(S)
ATTACHMENT 4	SPECIFIC SAFE WORK PRACTICES PER TASK(S)
ATTACHMENT 5	AIR MONITORING EQUIPMENT, FREQUENCY OF READINGS, AND ACTION GUIDELINES PER TASK(S)
ATTACHMENT 6	PERSONAL PROTECTIVE EQUIPMENT PER TASK(S) AND PERSONAL PROTECTIVE EQUIPMENT ASSESSMENT AND CERTIFICATION FORMS
ATTACHMENT 7	DECONTAMINATION PROCEDURES & EQUIPMENT PER TASK(S)
ATTACHMENT 8	INCIDENT RESPONSE FORM
ATTACHMENT 9	MATERIAL SAFETY DATA SHEETS
ATTACHMENT 10	SHSO SUMMARY

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

,

April 2006 Rev. 0 ____

LIST OF ACRONYMS

AFCEE	Air Force Center for Environmental Excellence
BPM	beats per minute
BRAC	Base Realignment and Closure
CEHNC	United States Army Engineering and Support Center, Huntsville
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COPC	chemical of potential concern
CWM	chemical warfare material
dBA	decibels A-weighted
°C	degrees Centigrade
°F	degrees Fahrenheit
DDMT	Defense Depot Memphis, Tennessee
DLA	Defense Logistics Agency
e ² M	engineering-environmental Management, Inc.
EPA	U.S. Environmental Protection Agency
FU	Functional Unit
HSM	e2M Health and Safety Manager
H&SP	Health and Safety Plan
LTM	Long Term Monitoring
MACTEC	MACTEC Engineering and Consulting Inc.
MI	Main Installation
MSDS	Material Safety Data Sheet
O&M	Operations & Maintenance
OSHA	Occupational Safety and Health Administration

880 7 April 2006 Rev 0

.

LIST OF ACRONYMS (continued)

OU	Operable Unit
РАН	polynuclear aromatic hydrocarbons
PC	project coordinator
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
РСР	pentachlorophenol
PID	Photoionization Detector
ppm	parts per million
РРЕ	personal protective equipment
SHSO	Site Health and Safety Officer
SVOCs	Semi-volatile organic compounds
TCE	Trichloroethylene
TDEC	Tennessee Department of Environment and Conservation
VOC	Volatile organic compound
WBGT	Wet Bulb Globe Temperature

.

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

1.0 SITE DESCRIPTION AND CHARACTERIZATION

engineering-environmental Management, Inc (e²M) was retained by the United States Air Force Center for Environmental Excellence (AFCEE) under Contract No. FA8903-04-D-8722 Task Order 0016 to conduct Interim Remedial Action Lactate Injection at Defense Depot Memphis, Tennessee (DDMT). This work will be conducted as described in the *Remedial Action Work Plan, Main Installation* (MACTEC, 2005). The field effort will include the following activities on the Main Installation: installation of injection wells and monitoring wells; groundwater sampling and analysis; renovations to the lactate storage and transfer building (Building 265); periodic lactate injections using a trailer-mounted injection-system; and sampling and disposal of investigation-derived waste (IDW). Future activities will include the operation and maintenance of the existing groundwater extraction system at Dunn Field including semi-annual and quarterly sampling of monitoring wells and system discharge, and installation and abandonment of monitoring wells on the Main Installation and Dunn Field. This Health and Safety Plan (H&SP) was developed from the existing *Site Safety and Health Plan* (MACTEC, 2004).

1.1 SITE LOCATION AND HISTORY

The DDMT is located in the south-central section of Memphis in Shelby County, Tennessee (Figure 1-1) at latitude 35°05'11" and longitude 89°59'18". The following is the site address:

Defense Depot Memphis, Tennessee 2163 Airways Boulevard Memphis, Tennessee 38114

The DDMT comprises of 642 acres in two areas: the Main Installation (MI) and Dunn Field. The MI consists of 578 acres bordered by Airways Boulevard to the east, Perry Road to the west, Ball Road to the south and Dunn Road to the north. The MI is developed and contains most of the buildings and material storage yards for the facility. At the time of closure in 1997, there were approximately 118 buildings, 26 miles of railroad tracks and 28 miles of paved streets at the DDMT. Approximately 126 acres were used for covered storage space and approximately 138 acres are used for open storage space. Dunn Field is located just to the north, across Dunn Road from the northwest quadrant of the MI. Dunn Field consists of 64 acres of mostly undeveloped land that was historically used for storage of bauxite and fluorspar and for waste disposal.

1.1.1 Installation History and Mission

The 642 acres of the DDMT were used for agriculture (cotton) until purchased by the U.S. Army in 1940. The initial mission and function of the DDMT was to provide stock control, storage, and maintenance services for the Army Engineer, Chemical and Quartermaster Corps. The installation was originally named Memphis General Depot, but has also been known as Memphis Quartermaster Depot, Memphis Army Service Forces Depot and Memphis Army Depot. During World War II, the DDMT served as an internment center for 800 prisoners of war and performed supply missions for the Signal and Ordinance Corps. From 1963 until closure on September 30, 1997, the DDMT was a principal distribution center for the Defense Logistics Agency (DLA) (formerly the Defense Supply Agency) for shipping and receiving a variety of materials including hazardous substances (pesticides, swimming pool chemicals, firearm cleaning and rust preventative chemicals), textile products, food products, electronic equipment, construction materials, and industrial, medical and general supplies. The DDMT received, warehoused and distributed supplies common to all U.S. military services in the southeastern United States, Puerto Rico and Panama. Approximately four million line items were received and shipped by the DDMT annually. The DDMT shipped approximately 107,000 tons of goods a year (CH2M Hill, 1995).

Activities at the MI included storing and shipping various materials and industrial supplies (e.g., hazardous materials). Several hazardous materials commonly used or stored at the MI during its operational period included: flammables, solvents, petroleum/oil/lubricants, paints, pesticides, herbicides, wood treating products, oxidizers, corrosives, and reactive. Types of past activities that led to the presence of hazardous materials in the environmental media at the facility included pesticide application, painting and sandblasting, vehicle maintenance, and hazardous material handling and storage. Other historical activities in open and enclosed storage areas included storing transformers with polychlorinated biphenyls (PCBs), storing and using pesticides/herbicides, and treating wood products with pentachlorophenol. These activities resulted in the presence of solvents, metals, pesticides, and other less frequently detected chemicals in the surface soil, surface water, and sediment above background concentrations CH2M Hill, 2001).

At Dunn Field, the initial disposal activities took place during the 1940s; mustard-filled German bomb easing and mustard-contaminated items (railcar wood, clothing, etc) were neutralized and buried. During the 1950s, Chemical Agent Identification Sets were allegedly disposed of and buried at Dunn Field at Site 1 in the Disposal Area portion of Dunn Field (USATHAMA, 1981). A search of the archived records indicated that the remains of destroyed (burned or detonated) explosive ordnance consisting of military

880 9

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

souvenirs, such as tear gas agents, canisters, and smoke grenades, were occasionally buried in pits in the Disposal and Stockpile Areas. In addition, other chemicals were buried in Dunn Field. Use and disposal of unknown quantities of chlorinated lime, super tropical bleach, and calcium hypochlorite is documented at Dunn Field. Food stocks, paints/thinners, petroleum/oil/lubricants, acids, herbicides, mixed chemicals, and medical waste were also reportedly destroyed or buried in pits and trenches at Dunn Field (USACE, 1995). Chemical warfare material (CWM) was buried in the Disposal Area of Dunn Field. Removal action were performed at the CWM sites in 2000 and 2001 and the area was reported to be cleared of CWM and exploded ordnance.

1.1.2 Regulatory Background

The DDMT facility is classified as a Superfund Site under the Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA) Section 120 (Federal Facilities) and was placed on the National Priorities List in October 1992. The DDMT has conducted environmental investigations and plans to conduct further environmental investigations under the requirements of the CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan. To assist further investigations at the DDMT, representatives of the DDMT, the CEHNC, U.S. Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation (TDEC) divided the facility into four potential Operable Units (OUs), and seven Functional Units (FUs) based on similar historical use for conducting baseline risk assessments. The M1 is divided into three OUs (2 through 4) and six FUs (1 through 6 with facility-wide groundwater being FU-7). OU-2 is located in the southwestern quadrant of the M1 area of the DDMT and is characterized as an industrial area where maintenance and repair activities took place. OU-3 is located in the southeastern quadrant of the M1 area and contains the entire southeastern watershed and golf course. OU-4 is located in the north-central section of the M1 area where material storage took place.

Dunn Field, located north of the MI and identified as OU-1, is the only known and documented burial area on the DDMT. To assist investigations at Dunn Field, the DDMT's contractors divided it into three exposure areas. The local reuse authority, originally the Memphis Depot Redevelopment Agency and now the Depot Redevelopment Corporation, further subdivided the DDMT property into parcels and further divided parcels into subparcels to delineate buildings and CERCLA sites.

1.1.3 Past Response Actions

For the MI, interim actions have been taken to remove soils containing pesticides, PCBs, and pentachlorophenol (PCP) surrounding the MI Housing Area, cafeteria (Building 274), and PCP dip vat area (Building 737), respectively. An additional removal action for surface soils containing metals and polynuclear aromatic hydrocarbons (PAHs) near the southwest corner of the MI (FU3) was completed in August 2000. Those interim actions at the MI are described in the Main Installation ROD (CH2M Hill, 2001).

At Dunn Field, a groundwater extraction system began operation in November 1998, as an interim remedial action for groundwater. The extraction system was installed to provide source reduction and hydraulic control, thereby reducing off-site migration of groundwater contaminants. However, as discussed in the Dunn Field RI report (CH2M Hill, 2002), groundwater capture zones for recovery wells are not complete and contaminated groundwater is able to pass through the hydraulic containment system. The *Five Year Review* for Dunn Field (CH2M HILL, 2003b) concluded that, while over 300 pounds of volatile organic compounds (VOCs) have been removed from groundwater by the IRA from 1998 to 2002, the extraction system does not provide adequate control over groundwater flow and the spread of contaminants of concern in the fluvial aquifer from the western perimeter of Dunn Field.

In March 2001, remedial actions took place to address the potential storage of CWM and was documented in the *Final Chemical Warfare Material Investigation/Removal Action Report* (UXB, 2001). Approximately 914 cubic yards of mustard contaminated soil were excavated, transported, and disposed offsite. In addition, twenty-nine bomb casings were recovered from the site. The *Dunn Field ROD* (CH2M Hill, 2004) provides additional information regarding the selected remedies (extraction and offsite disposal, soil vapor extraction, zero valent iron injection, and permeable reactive barrier) and the locations of historic disposal areas.

1.2 FIELD WORK SUMMARY

The activities associated with the MI Remedial Action (RA) include well installation, groundwater sampling and analysis, building renovations, lactate injection and IDW sampling and disposal. The chemicals of potential concern (COPCs) in groundwater at the MI include chlorinated VOCs (and associated degradation products).



In addition, well installation/abandonment and sampling activities will be conducted at the MI and Dunn Field. The COPCs in groundwater at Dunn Field are chlorinated VOCs (and associated degradation products), semi-volatile organic compound (SVOCs) and metals. Routine activities associated with the extraction system will also be performed, including O&M (pump maintenance and removal) and monitoring activities (effluent sampling).

Additional RA plans are being developed for Dunn Field. Addenda to this H&SP will be incorporated as necessary.

•



April 2006 Rev. O

Remedial Action Health & Safety Plan Defense Depot Memphus, Tennessee ;

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

• 1

April 2006 Rev. 0

2.0 KEY PERSONNEL AND HEALTH & SAFETY RESPONSIBILITIES

Table 2.1 describes health and safety responsibilities for key project personnel. The resume for the e2M Health and Safety Manager, Rob Klawitter, is included in Attachment 1.

TABLE 2.1

KEY PERSONNEL HEALTH AND SAFETY RESPONSIBILITIES AND REQUIREMENTS

HEALTH & SAFETY MANAGER (HSM) Rob Klawiter	PROJECT MANAGER (PM) Tom Holmes	SITE HEALTH & SAFETY OFFICER (SHSO) Kevin Sedlak	FIELD STAFF/FIELD TEAM LEADER	PROJECT TRAINING PERSONNEL AND OBSERVERS
Responsibilities:	Responsibilities:	Responsibilities:	Responsibilities:	Responsibilities:
Approve Site Health and	See that personnel receive this	 Implement H&SP: report to the Project 	Be familiar with and	 Be familiar with and
Safety Plan (H&SP) and	plan, are aware of its provisions.	Manager for action if any deviations from	abide by the H&SP	abide by the H&SP
Amendments	and are aware of the potential	the anticipated conditions exist, and	 Notify the SHSO of any 	Notify the SSHO of
 Verify that corrective actions 	hazards associated with site	authorize the cessation of work at site	special medical	any special medical
recommended on Incident	operations, are instructed in safe	investigations if necessary	conditions (e.g.,	conditions (e.g.,
Response Form have been	work practices, and are familiar	 Update the SHSO (Attachment 10) 	allergies)	allergies)
umplemented	with emergency procedures, and	summary after the completion of each	 Immediately report any 	 Immediately report
	these actions are documented	task.	accidents and/or unsafe	any accidents and/or
	 Determine that appropriate 	 Confirm that prior to a hazardous waste 	conditions to the SHSO	unsafe conditions to
	monitoring and personnel	site visit, site personnel meet the proper	 No individual shall go 	the SSHO
	protective equipment are available	medical requirements and have the health	on site where he/she	Not allowed in PPE
	 Monitor the Field Logbooks to 	and safety training to qualify them to	does not have the	restricted areas
	ensure the health and safety work	perform their assigned tasks. Identify all	required safety training	Must be under
	practices are employed	site personnel with special medical	Requirements.	supervision of project
	 Coordinate with SHSO so that 	conditions		personnel during
	emergency response procedures are	 Conduct pre-entry briefing and tailgate 	 40 hour certification 	training and/or
	implemented	safety meetings	 Annual 8 hour refresher 	observation activities
	Ensure corrective actions	 Verify that all monitoring equipment and 	training	
	recommended on Incident	personal protective equipment (PPE) is	Two employees with	Requirements:
	Response Form are implemented	operating correctly according to	first aid and CPR	 HAZCOM training
		manufacturer's instructions and such		
		equipment is utilized by on-site personnel.	FIELD TEAM LEADER	
		 Calibrate or verify calibration of all 	Will have all of the	
		monitoring equipment and record results.	above responsibilities	
		 Implement site emergency and follow-up 	and requirements	
		procedures	WIII act as	
		Will assign SHSO duties to the Field	representative for the SHSO	
		I CALLI LEAUET WITCH NOT ON-SHE	9	
		Requirements:		
		 40 hour certification 		
		 Annual 8 hour refresher training 		
		 8 hour supervisor training 		

April 2006 Rev. O 880 15

.

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

3.0 HAZARD ANALYSIS

Pertinent site information (e.g., records of chemicals used, records of disposal) and previous sampling data (e.g., ground water, soil, sediment) have been reviewed to determine the contaminants of concern for this project. Tables 3.1 and 3.2 are lists of constituents that are evaluated during the groundwater monitoring field events. However, an evaluation of the historic analytical results shows that few constituents are considered to be persistent at potentially elevated levels. Attachment 2 contains Contaminant Fact Sheets for the primary constituents of concern (tetrachloroethene [PCE] and trichloroethene [TCE]) at the MI as described in the Main Installation Record of Decision (CH2M Hill, 2001). In addition, the Contaminant Fact Sheet for Vinyl Chloride is provided. The COCs at Dunn Field include arsenic, antimony, 1,1,2,2- tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, cis-1,2dichlorothene, 1,2-dichloroethane, 1,2-dichloropropane, benzene, bromodichloromethane, carbon tetrachloride, chloroform, 1,1-dichloroethene, methylene chloride, dibromochloromethane, PCE, 1,2dichloroethene, trans-1,2-dichloroethene, TCE, vinyl chloride, and PAHs. However, an evaluation of the analytical results shows that few constituents are considered to be persistent at elevated levels. For simplicity, the Contaminant Fact Sheets for arsenic, antimony, PAHs, carbon tetrachloride, PCE, TCE and breakdown products including, 1,1,2,2-tetrachloroethane, cis-1,2-dichlorothene, 1,1-dichloroethene, and chloroform (Jacobs, 2004) are included as Attachment 2.

A hazard analysis (Attachment 3), including chemical (health, fire, and reactive), physical, and biological hazards, has been conducted for each task associated with this project per 29 Code of Federal Regulations (CFR) 1910.120(c). Health hazards shall be evaluated using air-monitoring equipment (Section 7.0) and controlled by implementing PPE (Section 9.0). Fire, reactive, physical, and biological hazards shall be controlled by utilizing Specific Safe Work Practices (Section 6.5).

Aprıl 2006 Rev. 0

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

TABLE 3.1 Analytical Constituents Main Installation

Parameters

1,1,1-Trichloroethane 1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 1,2-Dichloroethane 1,2-Dichloroethene 1,2-Dichloropropane 2-Butanone (MEK) 2-Hexanone (MBK) 4-Methyl-2-pentanone (MIBK) Acetone Benzene Bromodichloromethane Bromoform Bromomethane Carbon disulfide Carbon tetrachloride Chlorobenzene

Chloroethane Chloroform Chloromethane cis-1,2-Dichloroethene cis-1,3-Dichloropropene Dibromochloromethane Ethylbenzene m,p-Xylenes Methylene chloride o-Xylene Styrene Tetrachloroethene Toluene trans-1,2-Dichloroethene trans-1,3-Dichloropropene Trichloroethene Vinyl acetate Vinyl chloride tert-Butyl Methyl Ether

TABLE 3.2 Analytical Constituents Dunn Field

PARAMETERS

VOCs

1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethane
1,2-Dichloroethane
1,2-Dichloropropane
2-Butanone (MEK)
2-Hexanone (MBK)
4-Methyl-2-pentanone (MIBK)
Acetone

Benzene

2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 2.4-Dichlorophenol 2.4-Dimethylphenol 2,4-Dinitrophenol 2,4-Dinitrotoluene 2,6-Dinitrotoluene 2-Chloronaphthalene 2-Chlorophenol 2-Methylnaphthalene 2-Methylphenol (o-cresol) 2-Nitroaniline 2-Nitrophenol 3,3'-Dichlorobenzidine 3-Nitroaniline 4.6-Dinitro-2-methylphenol 4-Bromophenyl phenyl ether 4-Chloro-3-methylphenol 4-Chloroaniline 4-Chlorophenyl phenyl ether 4-Methylphenol (p-cresol)

Aluminum

Antimony

Beryllium

Cadmium Calcium

Chromium

Cobalt

Arsenic

Barium

Bromodichloromethane Bromoform Bromomethane Carbon disulfide Carbon tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane

cis-1,2-Dichloroethene cis-1,3-Dichloropropene Dibromochloromethane

SVOCs

4-Nitroaniline 4-Nitrophenol Acenaphylene Acenapthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,1)perylene Benzo(k)fluoranthene Benzoic acid Benzyl alcohol bis(2-Chloroethoxy)methane bis(2-Chloroethyl)ether bis(2-Chloroisopropyl)ether bis(2-Ethylhexyl)phthalate Butylbenzylphthalate Chrysene Dibenzo(a,h)anthracene Dibenzofuran Diethylphthate

Ethylbenzene m,p-Xylenes Methylene chloride o-Xylene Styrene Tetrachloroethene Toluene trans-1,2-Dichloroethene trans-1,3-Dichloropropene

Trichloroethene Vinyl acetate Vinyl chloride

Dimethylphthalate D1-n-butylphthalate Di-n-octylphthalate Fluoranthene Fluorene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachloroethane Indeno(1,2,3-cd)pyrene Isophorone Naphthalene Nitrobenzene N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Pentachlorophenol Phenanthrene Phenol Pyrene

METALS

Copper Iron Lead Magnesium Manganese Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Mercury April 2006 Rev 0

4.0 WORKER TRAINING

Table 4.1 will be used to summarize the training experience of the project field team with respect to 29 CFR 1910.120(e), 29 CFR 1910.38, and 29 CFR 1910.1200 and an updated copy will be maintained in the site office. Training for additional project field team members will be added to Table 4.1 as individuals are identified. Training certificates for designated project field team members will also be held at the site office.

& Safety Plan	, Tennessee
Remedial Action Health	Defense Depot Memphis

TABLE 4.1

TRAINING/MEDICAL SURVEILLANCE/RESPIRATORY PROTECTION RECORDS

			 	 	 · · · · · ·	 - 1	-		i
Respirator Brand (if applicable)	Name								
Respirator Fit Test (if applicable)	Date	-							
Medical Surveillance (if applicable)	Date		•						rogram.
First Aid/CPR* (if applicable)	Date								d-borne Pathogen I
Confined Space Entry (if applicable)	Date								e company's Bloo
Hazard Comm.	Date								meluded in th
8-Hour Refresher (latest)	Date								R and should be
8-Hour Supervisor (if applicable)	Date								nod in First Aid/CF
40-Hour Initial	Date								ther must he train
NAME									FA + Inset one wor

April 2006 Rev O

.

ľ

5.0 MEDICAL SURVEILLANCE

Table 4.1 will also be used to indicate project team members who participate in the company's Medical Surveillance Program [29 CFR 1910.120(f)]. A working copy of this table will be maintained by the SHSO. All workers who could potentially be exposed to concentrations of contaminants above the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits for 30 days per year or more must be included in the Medical Surveillance Program. Additional project team members will be added to Table 4.1 (which will be held at the site office) as individuals are identified. Training certificates and certification of fitness for designated project team members are also maintained by the SHSO.

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee Aprıl 2006 Rev 0

6.0 SITE CONTROL AND ACCIDENT PREVENTION

Site control procedures, as required by 29 CFR 1910.120(d), will be implemented **before** the start of site tasks to control worker exposures to contaminants.

6.1 WORK ZONES

Work zones (i.e., exclusion zone, contaminant reduction zone, and support zone) will be determined at the site by the SHSO. At this time it is anticipated that the work zones will be defined relative to the location of the work activity, i.e. around the groundwater sampling area.

The exclusion zone is generally defined as the area directly surrounding the well or location which may be contaminated by site operations or in this case by sampling activities. This area will encompass sampling equipment including drums and hand held instrumentation utilized in sampling activities. The exclusion zone will be defined as an approximate 5-foot radius surrounding the sampling area. The exclusion zone will be defined using red tape. The contaminant reduction zone shall serve as a buffer between the exclusion zone and the support zone and is intended to prevent the spread of contaminants from work areas. The contaminant reduction zone will be defined area in the non-contaminated or clean area. It shall contain the command post for field operations, a first aid station, and other elements necessary to support site activities. If a motorized vehicle is used to power the air compressor, ensure that the vehicle is located downwind of the wellhead during groundwater sampling to assure that sample contamination from the exhaust does not occur.

6.2 BUDDY SYSTEM

A buddy system shall be implemented. Separation between sampling team members is allowed, provided line of sight and voice communications are maintained.

6.3 SITE ACCESS

Currently site access is not controlled. Site workers will be able to enter and leave the site when needed. The H&SP will include Material Safety Data Sheets (MSDS's) for products brought on-site for use in the sampling effort. Products will be stored in a manner consistent with manufacturer's recommendations while

on-site to avoid incidental spilling. Spilled material will be promptly and appropriately recovered with wastes properly disposed. Spills will be recorded in team leaders log book.

6.4 COMMUNICATIONS

On-site communications will be conducted through the use of:

<u>X</u>	Verbal			
	Two-way radio	<u>_X</u>	Horn	
<u>X</u>	Cellular phone	_	Siren	
<u>X</u>	Hand signals		Other:	

Off-site communications will be conducted through the use of:

- X Cellular phone
- Pay phone: Location
- ____Other:

6.5 SAFE WORK PRACTICES

General safe work practices to be implemented during work activities at this site are included in Table 6.1. Specific Safe Work Practices (Attachment 4) that workers shall follow while on the site have been developed for each hazard associated with each task as identified in Attachment 3.

6.6 ACCIDENT PREVENTION

Instructing respective employees in safe work practices and emergency procedures is the responsibility of the SHSO. Adherence to the H&SP and to standard safety operating procedures and practices described above shall be required of all personnel on site in order to minimize the risk of accidents resulting in injury or excessive chemical exposure.

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

1 e .

e d

April 2006 Rev 0

TABLE 6.1

GENERAL SAFE WORK PRACTICES

- Minimize contact with excavated or contaminated materials. Do not place equipment on the bare ground. Use plastic sheeting and work tables. Do not sit or kncel on potentially contaminated surfaces.
- Smoking, eating, or drinking after entering the work zone and before decontamination will not be allowed. Use of illegal drugs and alcohol are prohibited.
- Practice good housekeeping. Keep everything orderly and out of potentially harmful situations.
- Use of contact lenses on site will not be allowed within the exclusion zone.
- In an unknown situation, always assume the worst conditions.
- Be observant of your immediate surroundings and the surroundings of other team members. It is a team effort to notice and warn of impending dangerous situations. Withdrawal from a hazardous situation to reassess procedures is the preferred course of action.
- Conflicting situations may arise concerning safety requirements and working conditions and must be addressed and resolved rapidly by the SHSO and PM to relieve any motivation to circumvent established safety policies.
- Unauthorized breaches of specified safety protocol will not be allowed. Workers unwilling or unable to comply with the established procedures will be discharged.

7.0 AIR MONITORING

Environmental monitoring with a photoionization detector (PID) will be conducted during drilling, intrusive activities, and sampling events with potential exposures to VOCs. If a PID reading of 0.5 parts per million (ppm) or greater above background levels is maintained for 1 minute or more in the breathing zone, then detector tubes for vinyl chloride will be utilized to determine if the air contaminant is vinyl chloride and its concentration (see Table 7.1). If peaks of 5 ppm or greater occur in the breathing zone, then detector tubes for carbon tetrachloride and chloroform will be utilized to determine if they are present and at what concentration. The air monitoring action guidelines presented in Table 7.1 are protective of airborne exposure for trichloroethene and tetrachloroethene.

TABLE 7.1

AIR MONITORING ACTION GUIDES

			C = +-			
* PID (ppm)	AND / OR	Vinyl Chloride (ppm)	Carbon Tetrachloride	Chloroform (ppm)	Action	РРЕ
< 0.5					Continue PID	Modified D
0.5 - 5	AND	<0.5			Continue PID and Use DT	Modified D
5 - 25	OR	0.5 - <5	5 – 25	5 - 50	Notify SHSO, Continue PID and Use DT	Level C
> 25	OR	> 5	> 25	> 50	Stop Work, Notify	

SHSO

(All OUs and FUs)

*Sustained 1 minute or more above background levels DT - Detector Tubes

Although vinyl chloride is not a persistent constituent throughout the MI and Dunn Field, it was chosen as an indicator constituent because it is more volatile than the other chlorinated solvents present at the site and has a low exposure threshold. If the vinyl chloride detector tube readings are less than 0.5 ppm (and the PID reads from 0.5 to 5 ppm), then workers can remain in modified Level D PPE with periodic detector tube monitoring. If the PID reading is from 5 to 25 ppm OR the individual constituent detector tube readings exceed their unprotected thresholds (0.5 ppm for vinyl chloride, 5 ppm for carbon tetrachloride, or 5 ppm for chloroform), then upgrade to Level C PPE, notify the SHSO or designee and continue periodic detector tube monitoring. If the detector tube reading is greater than 5 ppm for vinyl chloride, 25 ppm for carbon tetrachloride or 50 ppm for chloroform, work will be stopped until the SHSO

880 <u>26</u>

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

:

can make further evaluations. At PID readings greater than 25 ppm, personnel will stop work immediately and notify the SHSO.

The AFCEE Contracting Officer's Representative will be notified if sustained PID readings of greater than 5 ppm are documented at the site. If PID breathing zone concentrations are maintained below 5 ppm, the frequency of PID monitoring may be reduced to 15-minute intervals. Air monitoring equipment, frequency of readings and action guidelines are summarized in Attachment 5. If respiratory protection is up-graded to full-face respirators or if evacuation occurs, the SHSO must notify e²M's RHSO.

At Dunn Field, SVOCs and metals are also considered to be COCs. Table 3-3 presents a list of the COCs that are analyzed for during the sampling event. Since, SVOCs and metals cannot be monitored with a PID, it is important to monitor dust levels in order to reduce the potential exposure to chemicals. In order to reduce the potential exposure to chemicals at the MI and Dunn Field, the dust levels at the site will be monitored visually. Dust suppression measures (i.e., water spray) will be utilized when there is visible dust in the air. Breathing zone conditions are not expected to reach sustained concentrations such that Level C PPE will be required. However, full-face respirators will be on site if needed. Provisions for supplied air operations are not included in this H&SP, and workers will evacuate the Exclusion Zone if such conditions occur.

8.0 COLD/HEAT STRESS

The SHSO will confirm that project personnel have the necessary training to prevent personal injury due to heat and cold, as dictated by weather conditions. The SHSO will also monitor ambient conditions at the site. This monitoring shall commence when the ambient environmental temperature exceeds 70 degrees Fahrenheit (°F) or falls below 40°F.

8.1 COLD STRESS

Fatal exposures to cold among workers have almost always resulted from exposures involving failure to escape from low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is the fall in the deep core temperature of the body. The deep core temperature should not fall below 36 degrees Centigrade (°C) (96.8°F). Lower body temperatures will likely result in reduced mental alertness, reduction in rational decision-making capability, loss of consciousness, or death.

Mild to severe pain in the extremities may be the first early warning of cold exposure. During exposure to cold, maximum severe shivering develops when the body core temperature has fallen to 35°C (95°F). Useful physical and mental work is limited when severe shivering occurs. Since prolonged cold exposure at temperatures well below freezing can lead to dangerous hypothermia, whole body protections must be provided. If work activities are performed in temperatures below 40°F, adequate insulating clothing to maintain core temperature must be worn by all workers. All workers should be aware of the effects of wind chill on exposed skin. The higher the wind speed, the lower the perceived air temperature in the work area.

8.2 HEAT STRESS

Heat stress can be a major hazard for field personnel, especially those wearing PPE. Depending upon the ambient conditions and the work being performed, onset of heat stress can be rapid.

Early signs of heat stress include heat rash, heat cramps (muscle spasms), discomfort and drowsiness. Continued heat stress can result in heat exhaustion, with symptoms including pale, cool, moist skin; heavy perspiration; dizziness; nausea; and fainting.

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

Extreme heat stress can result in heat stroke, as body temperature regulation fails and the body temperature rises to critical levels. Symptoms of heat stroke include red, hot, usually dry skin; absence of or reduced perspiration; nausea; dizziness and confusion; strong; rapid pulse; and coma. Measures to prevent the occurrence of heat stress consist of acclimatization; avoiding overprotection; training and monitoring of personnel wearing PPE; scheduling of work and rest periods; and frequent replacement of fluids.

Ambient monitoring for heat stress prevention will commence when the temperature exceeds 70°F. In addition, all field personnel will be provided rest breaks. The break areas shall be situated so that personnel may remove the chemical-protective clothing (if applicable), rest in a shaded area, and drink cool fluids. Working within protective clothing, such as may be required for this project, places a significant physiological stress upon the worker. For this reason, workers are anticipated to perform work in modified Level D PPE. The personnel and environmental measurements described below will be conducted for all field personnel on this project.

During hot working conditions, rest breaks shall be established based upon the results of physiological monitoring combined with environmental factors measured using a Wet Bulb Globe Temperature index (WBGT). WBGT values are calculated using the following equations:

- 1. Outdoors with solar load. WBGT = 0.7 NWB + 0.2 GT + 0.1 DB
- Indoors or outdoors with no solar load: WBGT = 0.7 NWB + 0.3 GT
 where: WBGT = Wet Bulb Globe Temperature
 NWB = Natural Wet Bulb Temperature
 GT = Globe Temperature
 - DB = Dry Bulb Temperature

The determination of WBGT will be performed by the SHSO, using a Heat Stress Monitor containing a black globe thermometer, a natural wet-bulb thermometer, and a dry-bulb thermometer. The WBGT and the Permissible Heat Exposure Threshold Limit Values from the TVLs and BEIs (Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices), ACG1H, 2003, will be used to determine the Work-Rest schedule. The Permissible Heat Exposure Threshold Limit Values are for workers not wearing chemical protective clothing (i.e., Tyvek).

Water and electrolyte replacement beverages will be available on ice in the field. Drinking enough fluids will be stressed by the SHSO while in the field on hot days. The work/rest regimen will follow the moderate unacclimatized workload category on the table represented below from ACGIH:

	Work Load Category								
		Acclimatized		Unacclimatized					
Work-Rest Regimen	Light	Moderate	Heavy	Light	Moderate	Heavy			
Continuous	29.5 (85.1)	27.5 (81.5)	26.0 (78.8)	27.5 (81.5)	25 (77)	22.5 (72.5)			
75% Work- 25% Rest, each hour	30.5 (86.9)	28.5 (83.3)	27.5 (81.5)	29 (84.2)	26.5 (79.7)	24.5 (76.1)			
50% Work- 50% Rest, each hour	31.5 (88.7)	29.5 (85.1)	28.5 (83.3)	30 (86)	28 (82.4)	26.5 (79.7)			
25% Work- 75% Rest, each hour	32.5 (90.5)	31.0 (87.8)	30.0 (86)	31 (87.8)	29 (84.2)	28.0 (82.4)			

[Values given in °C and (°F) WBGT] WBGT – Wet Bulb Globe Temperature

If symptoms of heat stress are exhibited by workers, the pulse rate will be monitored during all tasks (as deemed appropriate by the SHSO). Action guidelines are as follows:

• Pulse rate: Determine normal resting pulse rate prior to start of work. Monitor pulse rate as soon as possible at beginning of rest period. If the rate exceeds the determined normal resting pulse rate by 40 beats per minute (BPM), shorten the next work period by one-third without changing the rest period. If the pulse rate is greater than 40 BPM above the resting pulse rate at the start of the next rest period, shorten the following work cycle again by one-third. Repeat until pulse rate at beginning of rest period is less than 40 BPM above resting pulse rate.

9.0 PERSONAL PROTECTIVE EQUIPMENT

The PPE Protective Equipment Per Task and the PPE Assessment and Certification Form for the protection required for each task is provided in Attachment 6. Groundwater sampling activities are anticipated to be performed in modified Level D. During intrusive activities (drilling, soil sampling, well installation) Level D PPE with outer protective garments (i.e., Tyvek), will be required. PPE levels shall be indicated in the Field Logbook.

The use of Tyvek type protective garments will be required during all intrusive activities (i.e. drilling) to reduce personnel exposure to chemicals. However, if the site manager and SHSO believe there is an extreme risk of danger from heat-related incidents as opposed to chemical exposure, protective outer garments may be made optional. The decision to proceed without Tyvek will be decided by the site manager and SHSO and recorded in the logbook.

The use of appropriate PPE in conjunction with site entry, safety, and decontamination procedures will reduce the potential for worker exposure to hazardous substances present at the site. A PPE program established in accordance with 29 CFR 1910.120(g)(5) and 29 CFR 1910.134 will be implemented. The level of protection to be used during field work at the site will be determined based on conditions indicated by previous investigations at the site, and actual site conditions encountered and anticipated. Field personnel must be prepared to upgrade their PPE if an unexpectedly hazardous situation is encountered.

If respirators are worn, workers must adhere to the company's Respiratory Protection Program. Record of workers' respirator tests will be kept on site. Beards (e.g. facial hair interfering with the respirator seal) are not allowed when respirators are worn.

10.0 DECONTAMINATION

PPE shall be decontaminated as per 29 CFR 1910.120(k). The decontamination procedures, equipment, and decontamination solution required for each task are provided in Attachment 7. Disposable PPE shall be double bagged and screened with a PID. If the screening indicates that the level of contamination in the waste container (i.e., trash bag) is less than 10 ppm, the wastes will be placed in a municipal landfill. If the PID levels are greater than 10 ppm, the wastes may be tested further to evaluate other disposal options.

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

11.0 EMERGENCY RESPONSE

The following emergency response information is provided as per 29 CFR 1910.120(j).

11.1 SITE MAP

The Regional Medical Center is the closest Level 1 hospital with Emergency Room facilities prepared to treat potential traumas. It is approximately 7 miles from the study area and can be reached as follows:

- From FRONT GATE: Proceed left (North) Airways Blvd
- Turn left (North-West)on US 78
- Turn right (North) on I-240
- Take the Union Avenue West Ramp
- Turn Right onto Union Avenue
- Turn right onto S. Pauline Street
- Turn Left onto Jefferson Avenue

11.2 EMERGENCY CONTACTS

A list of contacts and telephone numbers for the applicable local off-site emergency responders is provided in Table 11.1. The nature of the site work and contaminants of concern should be reviewed with the off-site responders before work begins on this project. Each on-site vehicle used for sampling activities will contain a copy of the hospital directions, hospital map, and contact information.

ROUTE TO REGIONAL MEDICAL CENTER

DDMT

MEMPHIS, TENNESSEE



TABLE 11.1

EMERGENCY CONTACTS

NAME	TELEPHONE NUMBERS		
	OFFICE	HOME	CELL/PAGER
FIRE DEPARTMENT:	911		
HOSPITAL: Regional Medical Center	(804) 320-3911		
POLICE DEPARTMENT:	911		
SITE HEALTH AND SAFETY OFFICER: Kevin Sedlak	210-348-6000	210-639-9719	210-639-9719
DLA CLIENT CONTACT. Mike Dobbs	717-770-6950		
AFCEE CLIENT CONTACT: Roy Shrove	210-536-2409		
PROJECT MANAGER: Thomas Holmes	404-237-3982	404-237-0932	404-295-3279
HEALTH &SAFETY MANAGER: Roh Klawiter	303-754-7200 *204		303-748-6615
PROGRAM MANAGER Glen Turney	210-348-6000		210-317-5448
EPA RPM Turpin Ballard	404-562-8553		
TDEC RPM Evan Spann	901-368-791,6		
DEPOT REDEVELOPMENT CORP. Jim Covington or G C. Glance	901-942-4939		
OTHER: Ambulance	911		

.

11.3 EMERGENCY RESPONSE EQUIPMENT

The following emergency response equipment is required for this project and shall be readily available in each on-site vehicle used for sampling activities.

<u>_X</u>	Field First Aid Kit		
<u>_X</u>	Fire Extinguisher		Туре А
			Турс В
		<u></u>	Туре С
		<u>_X</u>	Type ABC
<u>X</u>	Eyewash		
	SCBA		
	Shower		
<u>_X</u>	Other: Respirator		

11.4 COMMUNICATION

The emergency response communication system for the site is:

<u>_X</u>	Verbal	
<u> </u>	Two-way radio	
<u>_X</u>	Cellular telephone	
<u>_X</u>	Hand signals:	
Hand gripping throat		
Grip partner's wrist or both hands around waist		Leave area immediately
Hands on top of head		
Thumbs up		OK, I am all right, I understand
Thumbs down.		No, negative
<u> X </u>	Horn	
	Siren	
	Other:	

11.5 EMERGENCY RESPONSE PROCEDURES

In the event that an on-site emergency develops, the procedures delineated in Table 11.2 are to be followed immediately.

Within 48 hours after an emergency response, the Incident Response Form provided in Attachment 8 shall be completed by the SHSO, who will submit copies to the HSM.
880 36

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee April 2006 Rev. 0

TABLE 11.2

EMERGENCY PROCEDURES

- The SHSO (or alternate) should be immediately notified via the on-site communication system. The SHSO assumes control of the emergency response.
- The SHSO notifies the Project Manager and client contact of the emergency. The SHSO shall then contact the HSM.
- If applicable, the SHSO shall notify off-site emergency responders (e.g. fire department, hospital, police department, etc.) and shall inform the response team as to the nature and location of the emergency on-site.
- If applicable, the SHSO evacuates the site. Site workers should move to the guard station at the front gate (See Site Map).
- For small fires, flames should be extinguished using the fire extinguisher. The Memphis Fire Department will be notified in the event of a large fire.
- In an unknown situation or if responding to toxic gas emergencies, appropriate PPE, including SCBAs, should be donned.
- If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and/or shower.
- If a worker is injured, first aid shall be administered by certified first aid provider.
- Before continuing site operations after an emergency involving toxic gases, the SHSO shall don
 a SCBA and utilize appropriate air monitoring equipment to verify that the site is safe.
- An injured worker shall be decontaminated appropriately.
- After the response, the SHSO shall follow-up with the required company reporting procedures, including the Incident Response Form (Attachment 8).

Yes

I

ī

ł

12.0 CONFINED SPACE ENTRY

<u>No</u> The task(s) for this project involve confined space entry.

<u>X</u>



13.0 SPILL CONTAINMENT

- Ycs No The task(s) for this project involve drum/tank/container sampling, excavation, transportation, etc.
- X This task is specific to IDW sampling and analysis.

14.0 HAZARD COMMUNICATION

The following procedures shall be followed for all chemicals brought on site (e.g., decontamination solution, sample preservatives, etc.):

Chemical containers (primary and secondary) shall be correctly and clearly labeled with the name of the chemical and the hazard(s) associated with that chemical (e.g. flammable, corrosive, etc.).

Workers have received training on the hazards of these chemicals as indicated in Table 4.1.

An MSDS for each chemical to be utilized during sampling should be readily available (i.e., attached as Attachment 9 to this Health and Safety Plan) at the site office.

Alconox	pH 4 Buffer
Gasoline	_pH 7_Buffer
Hydrochloric Acid (HCI)	pH 10 Buffer
Isobutylene	Sodium Hydroxide (NaOH)
Methanol	Sulfuric Acid (H ₂ SO ₄)
Liqui-nox	Turbidity Standards
Nitric Acid (HNO ₃)	Zinc Acetate

When chemicals are used on site, workers must adhere to the company's Hazard Communications Program (29 CFR 1910.1200).

880 40

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

,

,

,

15.0 RECORD KEEPING

At the end of the project, the following items shall be maintained in the project file:

- <u>X</u> H&SP
- <u>X</u> Incident Response Form (if applicable)
- <u>X</u> SHSO Summary (Attachment 10)
- X PPE Assessment and Certification Forms
- X Tailgate Safety Meetings Documentation

Rev. 0

16.0 DDMT BACKGROUND REFERENCE DOCUMENTS

- CH2M Hill, 1995. Generic Remedial Investigation/Feasibility Study Work Plan, Defense Distribution Depot Memphis.
- CH2M Hill, 2001. Memphis Depot Main Installation Record of Decision Revision 2. Prepared for the U.S. Army Engineering and Support Center, Huntsville. February 2001.
- CH2M Hill, 2002. Memphis Depot Dunn Field Remedial Investigation Report. Prepared for the Defense Logistics Agency and presented to U.S. Army Engineering and Support Center, Huntsville, Alabama. July 2002
- CH2M Hill, 2003a. Long-Term Groundwater Monitoring Plan. Prepared for the U.S. Army Engineering and Support Center, Huntsville. October 2003.
- CH2M Hill, 2003b. Memphis Depot Dunn Field Five Year Review Revision 2. Prepared for the U.S. Army Engineering and Support Center, Huntsville. January 2003.
- CH2M Hill, 2003c. Memphis Depot Dunn Field Record of Decision Revision 1. Prepared for the U.S. Army Engineering and Support Center, Huntsville. November 2003.
- CH2M Hill, 2001. Groundwater Interim Remedial Action, Defense Depot Memphis, Tennessee, Operations and Maintenance Plan," Amendment 3 (August 28, 2001) prepared by CH2M Hill.
- Jacobs, 2004. Semi-Annual Groundwater Quality Report (Year Five, Second Half) for the Groundwater Interim Remedial Action at Dunn Field. Prepared for Mobile District Corps of Engineers. Jacobs Federal Programs. January 2004
- MACTEC, 2004. Site Safety and Health Plan, Revision 0. Prepared for the Defense Logistics Agency. April 2004.
- MACTEC, 2005a. Base Realignment and Closure (BRAC) Cleanup Plan, Version 8, Revision 1. Prepared for the Defense Logistics Agency. March 2005.
- MACTEC, 2005b. Remedial Action Work Plan, Main Installation, Defense Depot Memphis Tennessee, Revision 1. Prepared for the Defense Logistics Agency. July 2005.
- U.S. Army Corps of Engineers (USACE), Huntsville, 1995. Archives Search Report Findings. Memphis Defense Depot, Memphis, Tennessee. Defense Environmental Restoration Program for Department of Defense Sites. Ordnance and Explosive Waste. Chemical Warfare Materials. January 1995.
- U.S. Army Toxic and Hazardous Materials Agency (USATHMA), 1981. Installation Assessment of Defense Depot Memphis, Tennessee. Report No. 191. Chemical Systems Laboratory, Environmental Technical Division, Installation Restoration Brach, Aberdeen Proving Ground, Maryland.
- UXB International, Inc., December 2001. Final Chemical Warfare Material Investigation/Removal Action Report.



April 2006 Rev. 0

ATTACHMENT 1 HEALTH AND SAFETY MANAGER RESUME

•



Robert H. Klawitter, Jr., CSP, REM Health and Safety Manager

Education: B.S./Safety Management/1985

Professional Certifications: Certified Safety Professional (CSP), April 2004 Registered Environmental Manager (REM), March 2002

Years with e²M: 6 Years with other firms: 10 Years of DoD Experience: 6

Specialized Training:

Office Ergonomics, 1997 DuPont Behavior Based Safety, 1995

Experience Summary:

Mr. Klawitter has 16 years of comprehensive environmental, occupational safety and health experience, including eight years within a corporate environment working with all organizational levels from plant employees through Senior Vice Presidents. He has managed large, complex, multi-disciplinary environmental, health and safety programs and projects worldwide and has extensive knowledge and expertise in regulatory compliance. As e²M's Corporate H&S Director, Mr. Klawitter ensures compliance with relevant Occupational Safety and Health Administration (OSHA) regulations, develops training programs and policy required by pertinent OSHA regulations, and conducts site inspections of various worksites, including the ongoing Fort Carson asbestos/lead abatement projects. Mr. Klawitter has conducted and/or managed over 275 health and safety compliance assessments at manufacturing facilities worldwide, as well as over 100 federal facilities in 15 states and territories of the United States. In addition, Mr. Klawitter has conducted and/or managed over 50 environmental compliance assessments at federal and state facilities in 16 states and territories of the United States.

Project Experience:

NOAA, Agency-wide (1999-Present). As Program and Project Manager, Mr. Klawitter assists NOAA in implementing their NOAA Environmental Compliance and Safety Assessment System (NECSAS). This includes organizing, scheduling, staffing, conducting and reporting of environmental, health and safety assessments throughout the United States and its territories. NECSAS Assessments encompassed 13 different protocols outlined in TEAM Guide, and 33 different health and safety protocols outlined in the AGSH Guide in addition to applicable local and state regulations. Assessments were accelerated, using a state-of-the-art Assessment Manager computer program specifically developed for the NECSAS Program, typically with 10-15 facilities assessed and a draft report produced in a one-week time frame. Mr. Klawitter has managed, conducted, and/or drafted reports for Health, Safety and Environment (HS&E) assessments at over 100 facilities in the following states and/or U.S. territories: Alaska, California, Connecticut, Florida, Guam, Hawaii, Oklahoma, Louisiana, Maine, Maryland, Massachusetts, North Carolina, Oregon, Pennsylvania, South Carolina, Texas, Virginia, and Washington. In addition, Mr. Klawitter has assisted in the development of NOAA's Web-Hosted Assessment Manager (WHAM). This integrated, web-based compliance assessment tracking system incorporates NOAA established business rules and quality control throughout the reporting process, while tracking findings to closure with the use of the internet.

880 44

Department of Commerce, Herbert C. Hoover Building (2003). Mr. Klawitter managed organized, scheduled, staffed, and completed an environmental, health and safety assessment at the Department of Commerce (DoC), Herbert C. Hoover Building (HCHB) in the District of Columbia. Assessors evaluated 1.8 Million square feet of office space, photo processing operations, industrial printing operations, and maintenance shops. In addition, the DoC HCHB is home to the National Aquarium. The DoC Assessments encompassed 13 different protocols outlined in TEAM Guide, and 33 different health and safety protocols outlined in the AGSH Guide in addition to applicable local and state regulations. Assessments were accelerated, using a state-of-the-art Assessment Manager computer program. The site assessment portion of the project was completed in a one-week time-frame and the draft report produced within 3 weeks of departure.

Pacific Air Forces (PACAF): Environmental Safety and Occupational Health Compliance and Management Program (ESOHCAMP) (2006). Mr. Klawitter assisted PACAF ESOHCAMP management in the organization and staffing of PACAF ESOHCAMP's at Kadena AB Japan, Hickam AFB Hawaii, and Misawa AB Japan, and completed assessments as part of the ESOHCAMP team at Kadena and Misawa Air Bases. The ESOHCAMP assessments encompassed 13 different environmental protocols outlined in both the Japan Environmental Governing Standards (JEGS) and US Team Guide. Hickam AFB Hawaii included state and local regulatory standards as part of the ESOHCAMP. In addition, 13 safety and occupational health and safety protocols were assessed.

United States Coast Guard (USCG), Various Facilities (2004). As Program and Project Manager, Mr. Klawitter assisted the USCG in implementing their Environmental Compliance Evaluation (ECE) program at two USCG facilities (Support Center (SUPCEN) Elizabeth City, Virginia and the Integrated Support Center (ISC) Portsmouth, Virginia. This included organizing, scheduling, staffing, conducting and reporting of environmental assessments for the two assessments. ECE assessments encompassed 13 different protocols outlined in TEAM Guide in addition to applicable local and state regulations. Assessments were accelerated, using a state-of-the-art Assessment Manager computer program specifically developed for the completion of compliance assessments.

U.S. Army National Guard; Environmental Compliance Assessments, Various Facilities Nationwide (1999-Present). Mr. Klawitter has been involved with over 100 environmental compliance assessments at various U.S. Army National Guard facilities throughout the continental United States as field project manager, QA/QC manager and/or assessment team lead. Assessments encompassed 13 different protocols outlined in TEAM Guide in addition to applicable local and state regulations including the evaluation of the following environmental management programs: asbestos, aboveground and underground storage tanks, hazardous waste storage and disposition, occupational health and safety, stormwater discharge permitting, and air permitting. Assessments were accelerated, using the state-of-theart WINCASS III computer program specifically developed for the National Guard ECAS/EPAS Program, typically with 50 facilities assessed and draft reports produced in a one week time-frame. Over 100 assessments have been conducted in the following states. Alaska, Colorado, Florida, Louisiana, Missouri, Montana, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, and Washington.

Centers for Disease Control and Prevention (CDC), Agency Wide (1999-2002). As Program and Project Manager, Mr. Klawitter assisted CDC in implementing their Environmental Compliance Audit (ECA) program. This included organizing, scheduling, staffing, conducting and reporting of environmental assessments throughout the United States and its territories. ECAS assessments cncompassed 13 different protocols outlined in TEAM Guide in addition to applicable local and state regulations. Assessments were accelerated, using a state-of-the-art Assessment Manager computer program specifically developed for the CDC ECA Program, typically with 1-5 facilities assessed and draft report produced in a one to three-day time frame. Mr. Klawitter has managed, conducted, and/or drafted

reports for environmental assessments at over 10 facilities in the following states and/or U.S. territories: Alaska, Colorado, Georgia, Ohio, Pennsylvania, Puerto Rico, Washington, and West Virginia.

Guam Army National Guard (GUARNG); Emergency Action/Fire Prevention Plan and Fire Extinguisher Training, Barrigada, Guam (2002). Mr. Klawitter developed the Emergency Action-Fire Prevention Plan for the GUARNG. This plan included the development of facility specific emergency response procedures and fire prevention inspection procedures. In addition, Mr. Klawitter developed facility drawings identifying emergency evacuation routes and locations of all fire extinguishers. Mr. Klawitter also conducted OSHA required emergency action/fire extinguisher training for GUARNG personnel.

Peterson AFB Ozone Depleting Substances (ODS) Management Plan (2004). Mr. Klawitter managed the inventory of all ODS used and stored at Peterson AFB and the development of an ODS Management Action Plan for the elimination of Class I and Class II ODS's from Peterson AFB in accordance with the timelines established in Executive Order 13148.

Schriever AFB Ozone Depleting Substances (ODS) Management Plan (2006). Mr. Klawitter managed the inventory of all ODS used and stored at Schriever AFB and the development of an ODS Management Action Plan for the elimination of Class I and Class II ODS's from Schriever AFB in accordance with the timelines established in Executive Order 13148.

Lead Based Paint Management Plan, Fort Sill, Oklahoma (2003). Mr. Klawitter managed the development of a Lead Based Paint (LBP) Management Plan for Fort Sill where the handling of lead-containing substances presents a risk of being exposed to lead through inhalation or ingestion. The LBP Management Plan established the process for compliance with Lead Exposure in construction (29 CFR 1926.62) and Lead Exposure in general Industry (29 CFR 1910.1025) as it applies to work involving lead containing substances and work involving the disturbance of lead-based paint.

Johns Manville (JM) Corporation, Corporate (1991-1999). As a Senior Industrial Hygicnist/Safety Engineer, Mr. Klawitter conducted industrial hygiene, safety and health audits at JM plants worldwide ensuring compliance with applicable Federal, state, and local regulations. Mr. Klawitter coached plant safety coordinators and employees in behavior-based auditing techniques, and assisted plant management with program development, implementation and maintenance. Mt. Klawitter served as a resource/expert on safety compliance and interpretation of local, state, federal and international regulations, in addition to JM policies. He conducted pre-acquisition safety and health evaluations, evaluated plant policies and programs related to industrial hygiene, safety and occupational health, and then developed recommendations for plant and corporate management. Mr. Klawitter has managed, conducted, and drafted reports for industrial hygiene, safety and health audits at approximately 90% of existing JM manufacturing locations worldwide.



..

April 2006 Rev 0

ATTACHMENT 2 CONTAMINANT FACT SHEETS

.

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
	-1	Color: Physical State	Silver-grey or tir Solid X Liquid		Carcinogen: OSHA X IARC X NTP X ACGIH X	Source	TWA (units)	STEL (units)	C (units)
CONTAMINA FACT SHEE	Σ+	Odor:		rless	NIOSH X Skin absorbable: <u>yes no X</u> Skin corrosive yes no <u>X</u>	OSHA PELs	0.01 mg/m³		
Chemical Name Arsenic CAS Number: 7440-38-2		Udor Threshold Vapor Density:	VZ Z		Signs/Symptoms of Acute Exposure. Respiratory irritation. GI disturbances Dermatitis	ACGIH TLVs	0.01 mg/m³		
syronyms: Arsenia		Ionization Poten IDLH	111al (IP). NA	g/m²		NIOSH RELs			0 002 mg/m ³
	AIR MOI	NITORING	ľ		PERSONAL PROTECTIVE EQUIPMENT	FIR	E/REACTIVIT	Y DATA	
Туре	Brand/Model No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level	Recommended Protective Ctothing Materials: Suits Any chemical-resistant Gloves Any chemical-resistant	Flash Point. LEU/UEL Dry Chemical Water Stringuishir	NA / NA Ig Media: X	Foam C.O.	× >
Not Applicable					Boots Any chemical-resistant	Incompatibilities Strong oxidizers	bromine azid	6 60	4
					Service Limit Concentration (ppm). NA	Hydrogen gas ci form the highly ti	an react with a	arsenic to e	
					MUC 1/2 Mask APR = TWA x 10 = <u>0.05 mg/m³</u> MUC Full-Face APR = TWA x 10 ≃ <u>0.05 mg/m³</u>				
Checked by Emmet F Cu	rtıs	_	Date 12/5/03						
Note The recommended prote	ation of the second				2003 by MACTEC Engineering & Cons	sulting, Inc.]

judgement and knowledge of on-site hazards should be used in selecting PPE appropriate to the contaminant (trace vs percentage) to which the individual is likely to be exposed.

..

r

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA		-		
and the second s		Color. Color. Color.	Colortess Solid X		Carcinogen OSHA IARC X NTP ACGIH X	Source	TWA (units)	STEL (units)	C (units)
CONTAMINANT		Odor	Gas		N:OSH X N:OSH X Skin absorbable <u>yös X no X</u> Skin corrosive: yes no X	134 VHSO	10 ppm		25 ppm
Chemical Name Carbon Tetrachloride Cas Number 66.73-5		Odor Threshold Vapor Density	6 3 g	- 584 ppm //	Signs/Symptoms of Acute Exposure: Irritates eyes and skin, central nervous system depression, nausea, vormiting, drowsiness, dizzinesss and incoherence.	ACGIH ACGIH	5 ppm	10 ppm	
Synonyms Synonyms Tetrachloromethane carbon chloride carbon tet, Freon 10, Halon 14		Ionization Potent	tal (IP) 11.4	7 eV ppm		NIOSH RELs		2 ppm	
	AIR MOI	VITORING			PERSONAL PROTECTIVE EQUIPMENT	H	RE/REACTIV	ТҮ ДАТА	
Type	Brand/Model No	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level	Recommended Protective Clothing Materials. Suits Barricade, Responder, PE/EVAL, Viton Gloves Polyvinyl atcohol (do not use in water),	Flash Point ⁻ LEL/UEL <u>Fire Extinguis</u> Dry Chemical	NA NA / NA UNG Media X	Foam	NA
OId	Microtip 10 6 eV	Isobutylene 100 ppm	0.06	03	Nitrile Viton Nitrile	Water Spray Incompatibilitie	X	co	×
					Service Limit Concentration (ppm) 1000	Chemically - a aluminum. Fo exposed to fla	ictive metals, irms phosgen me.	e gas when	
					MUC 1/2 Mask APR=TWA x 10= 25 ppm MUC Full-Face APR=TWA x 10= 25 ppm	_			
Checked by Emmet F Curt	tis		Date: 12/5/03						
					2003 by MACTEC Engineering & Cons	sulting, Inc.		-	1

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

April 2006 Rev. 0

.

•••

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
		Color. Physical State:	Colorless Solid Liquid X		Carcinogen: OSHA IARC X NTP X ACGIH X	Source	TWA (units)	STEL (units)	C (units)
CONTAMINAL FACT SHEE	L L	- Odor.	Gas Swe	set, ethereal	NIOSH X Skin absorbable [.] <u>yes no X</u> Skin corrosive: yes no X	OSHA PEL			50 ppm
Chemical Name: Chloroform CAS Number 67-66-3		Vapor Density	133	- 276 ppm g/L	Signs/Symptoms of Acute Exposure: Dizziness, mental dulines, nausea, disorientation, headache, fatigue, anesthesia, irritation of eyes and skin.	ACGIH TLVs	10 ppm		
Synonyms. Methane trichlonde Trichloromethane		Ionization Poten IDLH:	11 (FP). 11 (t2 eV ppm		NIOSH RELs		2 ppm	
	AIR MO	NITORING			PERSONAL PROTECTIVE EQUIPMENT	FIRI	E/REACTIVI	TY DATA	
Type	Brand/Model No	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level	Recommended Protective Clothing Matenals; Barricade, Responder, PE/EVAL, Trellchem, Tychem Gloves Polyvinyl atcohol (Do not use in water), Tellon, Viton	Flash Point LEL/UEL. <u>P</u> Efre Extinguishir Dry Chemical Water Spray	NA VA / NA NA NA NA	- Foam CO2	A A MA
۵ł	HNU 11 7 eV	Isobutylene 100 ppm	0.315	3 15	Boots	Incompatibilities	.	•	
Detector Tube	Dräeger 6728861	2-10 ppm	0.7	1 4 ppm	Service Limit Concentration (ppm). 1000	Strong caustics, strong oxidizes	chemically -	active meta	<u></u>
					MUC 1/2 Mask APR=TWA x 10= 50 ppm MUC Full-Face APR=TWA x 10= 50 ppm				
Checked by: Emmet F Cu	rtis		Date 12/5/03						
		1			2003 by MACTEC Engineering & Consu	Iting, Inc.			

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

880

April 2006 Rev. 0

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
	<i>y.</i>	Color Physical State	coloriess Solid		Carcinogen. OSHA IARC NTP	Source	TWA (units)	STEL (units)	C (units)
CONTAMINAN	E.	Odor	Gas X	(above 89°F) oform-like	AUGIH X NIOSH X Skin absorbable <u>yes no X</u> Skin corrosive yes no X	OSHA PEL			
Chemical Name 1,1-Dichloroethene CAS Number 75-35-4		Odor Threshold Vapor Density	190p 4 0 g	pm J/L	Signs/Symptoms of Acute Exposure Irrntation of skin and eyes, dizziness, headache, nausea, drunkeness and anesthesia.	ACGIH TLVs	5 ppm		
Synonyms Vinylidene chloride 1,1-Dichloroethylene (1,1-DCE		Ionization Poten IDLH	tial (IP) <u>10.0</u> 1,2-DCE <u>1000</u>	0 eV Jopm		NIOSH RELs	Lowest Feasible		
	AIR MO	NITORING			PERSONAL PROTECTIVE EQUIPMENT	FIR	E/REACTIV	ΙΤΥ DATA	
Type	Brand/Model No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level	Recommended Protective Clothing Materials: Suits Teffon Gloves Teflon, Polyvinyl Alcohol (do not use in water)	Flash Point. LEL/UEL i <u>Fire Extinguish</u> Dry Chemical Water Spray	(-2')F 6 5%/15 5% ng Media:	Foam CO ₂	××
Qid	Microtip 10.6 eV	Isobutylene 100 ppm	66 0	4 95	Boots Teflon	Incompatibilities	نام		
DIG	НNu 10.2 eV	100 ppm	0.64	32	Service Limit Concentration (ppm): 1000	Aluminum, sun	ignt, air, col	ber, lieau	
					MUC 1/2 Mask APR=TWA x 10= 25 ppm MUC Full-Face APR=TWA x 10= 25 ppm				
Checked by Emmet F Cu	rtıs		Date 12/5/03]
Note The recommended pro knowledge of on-site hazards	tective clothing should be use	materials assumes 1 in selecting PPE a	s that potential for appropriate to the	direct contact	2003 by MACTEC Engineering & Const t (by splashing, dust inhalation, or other means) with the n of the contaminant (trace vs percentage) to which the i	ulting, Inc. • contaminants ex ndividual is likely	ists. Profes: to be expose	sional Judgm. ed	ent and

880 50

April 2006 Rev. 0

,

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
•		Colar.	Coloriess		Carcinogen: OSHA	Source	TWA	STEL	U
		Physical State:	Solid Licitie				(units)	(units)	(units)
۰ ۱ ۱									
					Skin absorbable. Ves no X	VHSC			
FACT SHEE		Odar	Ч С Р С	oroform-like	Skin corrosive. yes no _X	PELS	200 ppm		
ī		Odor Threshold	0.08	-17 ppm	Signs/Symptoms of Acute Exposure.				
Chemical Name. 1,2-Dichloroethylene 156-59-	5	Vapor Density	3.35	g/L	Irritant to eyes and respiratory system, CNS, depression	ACGIH TLVs	200 ppm -		
CAS Number、540-59-0, 156- Svnonvms	60-5	Ionization Potent		10			-		
Acetvlene dichloride									
cis -Acetylene dichlonde, trans-Acetylene dichlonde.		IDLH	100(Dpm		RELS	200 ppm		_
	AIR MON	UITORING			PERSONAL PROTECTIVE EQUIPMENT		RE/REACTIVI	TY DATA	
Type	Brand/Model	Calibrations	Relative	Meter	Recommended Protective Clothing Materials:	Flash Point	36-39°F		
	No	Method/Media	Response or	Specific	Suits Teflon, Viton, PE/EVAL,				
			Conversion Factor	Action Leviel	Barricade, CPF3, Tychem	LEL/UEL: 5	<u>6% / 12 8%</u>	I	
					Gloves VIIOn, Tellon, Polyvinyl Alcohol (do not use in water)	<u>Fire Extinguish</u> Dry Chemical	<u>IINg Media:</u>	Foam	×
	Microtip	Isobutvlene	T		Boots Tation Vitoo	Water Spray	×	ŝ	×
GId	10.6eV	100 ppm	1 45	290		Incompatibilitie	Ś		
						Strong oxidizer	rs, strong alkal	is, potassiur	۶
					Service Limit Concentration (ppm): 1000		Бď		
					MUC JUZ MASK APK = 1WA X 10 = 1000 ppm MUC Full-Face APR = TWA X 10 = 1000 ppm				
Checked by Emmet F. Cu	rtis]	Jate: 12/5/03						
					2003 by MACTEC Engineering & Cons	sulting, Inc.			

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

.

April 2006 Rev. O

1

. . . .

ATTACHMENT 2

CONTAMINANT FACT SHEET

			HEALTH HAZARD DATA		
المعني م المراجع المراجع	Color Physical State	<u>Black or dark-brown</u> Solid <u>Residue</u> Litourd	Carcinogen OSHA IARC X NTP X ACGIH X	Source TWA (units)	STEL C (units) (units)
CONTAMINANT	Odar	Gas NA	NIOSH X NOSH X NOSH X NO X N	OSHA 0.2 mg/m ³ PELs	
Chemical Name Polycyclic Aromatic Hydrocarbons	Odor Threshold Vapor Density.	NA >10 g/L	Signs/Symptoms of Acute Exposure Dermatuts, bronchitts	ACGIH 0 2 mg/m ³ TLVs	
Synonyms Synonyms Coal tar pitch volatiles (CAS 65996-93-2)	Ionization Poter	ntial (IP) NA 80 mg/m ⁴		NIOSH 0 1 mg/m ⁵ RELs	
A	IR MONITORING		PERSONAL PROTECTIVE EQUIPMENT	FIRE/REACTIVIT	Υ DATA
Type Brand/M No	Addel Calibrations Method/Media	Relative Meter Response or Specific Conversion Action Factor Level	Recommended Protective Clothing Materials Suits Tyvek Gloves Nitrile or Neoprene	Flash Point. NA LEL/UEL: NA <u>Fire Extinguishing Media</u> Dry Chemical <u>X</u> Water Spray	Foam CO2
Not Applicable			Boots Neoprene	Incompatibilities Strong oxidizers	
			Service Limit Concentration (ppm) ⁻		
			MUC 1/2 Mask APR = TWA x 10 = <u>1 mg/m³</u> MUC Full-Face APR = TWA x 10 = <u>1 mg/m³</u>		
Checked by Emmet F. Curtis		Date: 12/5/03			
		that satisfies for direct contact	2003 by MACTEC Engineering & Con: 4 //w solashing dust inhalation or other means) with the	ultırıg, Inc. contamırants exists Professio	nal judgment and

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

April 2006 Rev. 0

٠

•

880 52

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
		Color Physical State	colorless Solid Liquid X	1 1 1	Carcinogen OSHA IARC NTP X ACGIH X	Source	TWA (units)	STEL (units)	C (units)
CONTAMINA FACT SHEE	L.	Odor	Gas	sroform-like	NIOSH X Skin absorbable. <u>yes no X</u> Skin corrosive: yes no <u>X</u>	TEH VHSO	100 ppm		200 ppm
Chemical Name: Tetrachloroethene CAS Number: 127-18-4		Odor Threshold Vapor Density	47 <u>1</u>	opm g/L	Signs/Symptoms of Acute Exposure. Irritation of eyes, nose, and throat, nausea: flushing of the face and neck, vertigo; dizziness, incoherence,	ACGIH TLVs	25 ppm	100 PPm	
Synonyms tetrachloroethylene Perchloroethylene (Perc)		Ionization Poter IDLH	11al (IP). 9.37	2 eV ppm	headache, sleepness, and skin irritation	NIOSH RELs	Lowest Feasible	<u> </u>	
	AIR MON	VITORING			PERSONAL PROTECTIVE EQUIPMENT	FIR	RE/REACTIV	TY DATA	
Type	Brand/Model No	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level	Recommended Protective Ctothing Materials Suits Tetlon, Viton, CPF3, Barricade, Responder, Trellchem, Tychem Gloves Viton, Tetlon, and Polywinyl Alcohol (do not use in (water)	Flash Point LEL/UEL Fire Extinguishi Dry Chemical Water Spray	NA /	Foam CO ₂	×
PID	Microtip 10.6 eV	Isobutylene 100 ppm	1 04 ppm	26 ppm	Boots Nitrile Rubber	Incompatibilities			
OId	HNu 10.2 eV	Isobutylene 100 ppm	0 86	21.5 ppm		Strong oxidizers caustic soda, so	s, chemically- odium hydroxi	active metals ide, and pota	
Detecor Tube	Drager 8101 501	2 - 40 ppm		25 ppm	Service Limit Concentration (ppm): 1000				
					MUC 1/2 Mask APR=TWA × 10= <u>125 ppm</u> MUC Full-Face APR=TWA × 10= <u>125 ppm</u>				
Checked by: Emmet F. Cu	Irtis		Date: 12/5/03						
i					2003 by MACTEC Engineering & Consu	Itting, Inc.			

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

April 2006 Rev 0 r

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
		Color	Soloriess to pale Solid X	yellow	Caronogen. OSHA IARC NTP ACGIH X	Source	TWA (units)	STEL (units)	C (units)
CONTAMINAN		Odor	Gala	oform-like	NIOSH Xer absorbable. Yes no Xer No X	OSHA PEL	5 ppm		<u></u>
Chemical Name 1,1,2,2-Tetrachloroethane		Odor Threshold Vapor Density		0.5 ppm NA	Signs/Symptoms of Acute Exposure Vomting, abdominal pain, tremors, Jaundice, hepatitis, liver tenderness, dermatitis, kichey damage	ACGIH TLVs	1 ppm		
CAS Number 19-04-0 Synonyms Acteylene tetrachloride; symmetrical tetrachloroethane		Ionization Potent IDLH	iai (IP)	11.10 eV 100 ppm		NIOSH RELs	1 ppm		
	AIR MOI	VITORING			PERSONAL PROTECTIVE EQUIPMENT	E	IRE/REACTIV	ИТҮ ДАТА	
Type	Brand/Model No.	Calibrations Method/Media	Relative Response of Conversion Factor	Meter Specific Action Level	Recommended Protective Clothing Materials. Suits Tychem, Teflon, Barricade Gloves Teflon, Viton, Polyvinyl alchohol (Do not use in water)	Flash Point LEL/UEL: Fire Extinguis Dry Chemical Water Spray	NA NA / NA thing Media: X	Foam CO ₂	×
GIA	HNU 11.7eV	Isobutylene 100 ppm	0 48	168	Boats Teflan, Vitan	Incompatibiliti Strong causti	les: cs, chemically		
					Service Limit Concentration (ppm): 100	active metals magnesium p potassium, fu	such as. zinc lowders, sodit ming sutfuric	, aluminum, um, and acid	
					MUC 1/2 Mask APR=TWA × 10= 5 <u>5 pp</u> MUC Fuil-Face APR=TWA × 10= 5 <u>5 pp</u>	rl Cl			
Checked by: Emmet F. Cur	rtis		Date 12/16/03		2003 hu MACTEC Encineering & C	asulting Inc.			
					2003 מל ואואר ובר בוולווואגאוואל מ ר	Justing, are.			

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

April 2006 Rev. 0

.

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
	<u></u>	Color, Physical State:	Colorless Solid Liquid X		Carcinogen OSHA IARC NTP ACGIH	Source	TWA (units)	STEL (units)	C (units)
CONTAMINA FACT SHEE		Odor	Cals	oroform-like	NIOSH X Skin absorbable. <u>yes no X</u> Skin corrosive: yes <u>no X</u>	OSHA PELs	100 ppm		mqq 009
Chemical Name Trichloroethene CAS Number, 79-01-6		Vapor Density:	825	ррт Э/L	Signs/Symptoms of Acute Exposure Irritant to eyes and skin, headache nausea, vormiting, dermatitis, vertigo, visual disturbance, fatigue, giddiness,	ACGIH TLVs	50 ppm	100 ppm	
synonyms. Ethylene trachloride, TCE, Trachloroethylene, Trilene		Ionization Poten IDLH	ttal (IP) 945	o ppm	sleepiness	NIOSH RELs	25 ppm		
	AIR MOI	NITORING			PERSONAL PROTECTIVE EQUIPMENT	414	REACTIVI	LY DATA	
Type	Brand/Model No	Cattbrations Method/Media	Relative Response or	Meter Specific	Recommended Protective Clothing Materials. Suits Viton, PE/EVAL, Tychem,	Flash Point	Unknown		
			Conversion Factor	Action Level	Barrıcade, Trellchem, Teflon, Responder	LEL/UEL. 83	<u>6_/ 10 5%</u>		
					Gloves Viton, Teflon Polyvinyi atcohol (do not use in water)	<u>Fire Extinguish</u> Dry Chemical Water Sprav	<u>nq Media.</u> X	Alcohof re Foam CO,	sistant X
Öld	Microttp 10 6eV	Isobutylene 100 ppm	0 92	23	Boots Teflon, Viton	Incompatibilities	 	ı	
QId	HNu 10.2eV	Isobutyferre 100 ppm	06 0	22.5		Strong caustics active metals (s	and alkalis, c	hemicatly-	
Detector Tube	Drager 6828541	2 - 50 ppm		25	Service Limit Concentration (ppm). 1000	sodium, magne	sium, titanium	, and berylli	(m
					MUC 1/2 Mask APR = TWA × 10 = 250 ppm MUC Full-Face APR = TWA × 10 = 250 ppm				
Checked by: Emmet F. Cur	tis	1	Date: 12/5/03						
					2003 by MACTEC Engineering & Const	ulting, Inc.]

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

ATTACHMENT 2

CONTAMINANT FACT SHEET

					HEALTH HAZARD DATA				
		Color. Physical State. 5	Colortess Solid X	below 7 ⁰ F	Carcinogen. OSHA X IARC X NTP X ACGIH X	Source	TWA (units)	STEL (units)	C (units)
CONTAMINANT FACT SHEET		Odor	Sas X	ant	NIOSH X NIOSH X Skin absorbable. Yes no X Skin corrosive yes no X	OSHA PELs	1 0 ppm		5 0 ppm
Chemical Name Vinyl Chloride 768 Number 75-01-4		Odor Threshold. Vapor Density.	<u>2.15</u>	0 ppm g/L	Signs/Symptoms of Acute Exposure Weakness, abdominal pain, frostbite paleness or blueness of extremeties	ACGIH TLVs	1 0 ppm		
Synonymics: Solution Synonymics: Chloroethene, chloroethene, chloroethene, chloroethylene, ethylene monochloroethene		Ionization Potent IDLH.	lal (IP) <u>9 99</u> Not E	eV Determined		NIOSH RELs	Lowest Feasible		
	AIR MOP	VITORING			PERSONAL PROTECTIVE EQUIPMENT	4	IRE/REACTIVI	тҮ рата	
Type	rand/Model No	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Actron Level	Recommended Protective Clothing Materials: Suits Tychem, Teflon Gloves Teflon, Tychem Nitrile Rubber	Flash Point: LEL/UEL 3 Fire Extinguist Dry Chemical Water Spray	NA 6% / 33% <u>ing Media</u> X	Foam CO2	××
PID	Microtip 10 6eV	Isobutylene 100 ppm	0.67	0.67	Boots Nitrile Rubber, Tefton	<u>Incompatibilitie</u> Conner, oxidiz	<u>ss</u> ers. aluminum.	peroxides.	
DIG	10 2eV	100 ppm	0 32	0 32	Service Limit Concentration (num): 1000	iron, steel (pol	ymerizes in air, abilized by inhib	sunlight, or itors) Attack	
Old	11 7 eV	ISODUTYIENE 100 ppm	0 78	0 78		iron and steel	in presence of r	noisture	
Detector Tube	Drager 6728061	0 5 - 3 ppm		1 0 ppm	MUC Full-Face APR = TWA x 10 = 5 ppm				
Checked by Emmet F Curti	S		Date: 12/5/03						2
		-	r	, 	2003 by MACTEC Engineering & Cons	sulting, Inc. contaminant exis	ste Professions	-	

١

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

.

April 2006 Rev. O • •

.

April 2006 Rev. 0

ATTACHMENT 3 HAZARD ANALYSIS PER TASK(S)

,

.

April 2006 Rev 0

	НА	ZARD ANALYSIS	PER TASK		
HAZARD	INSTALLING MONITORING AND INJECTION WELLS	LACTATE SOLUTION MIXING AND INJECTION	GROUND- WATER SAMPLING	DATA LOGGER INSTALLATION	OPERATIONS AND MAINTENANCE ACTIVITIES *
I. CHEMICAL HAZARDS					
Inhalation	Х	Х	х	Х	Х
Skin absorption	х		Х	Х	Х
Ingestion	Х	Х	Х	Х	Х
Injection					
Fire	Х				
Reactivity/Explosivity					Х
II. PHYSICAL HAZARDS					
Heat Stress	Х	Х	Х	· X	Х
Cold Stress	Х	Х	х	Х	Х
Noise	Х	х			l
Radiation					l
Slipping/Tripping/Falling	Х	Х	Х	Х	Х
Electrical Hazards	Х	Х	Х	Х	Х
Adverse Weather	Х	Х	Х	Х	Х
Other: Water Related					
II. BIOLOGICAL HAZARD	S				1
Snakes	Х	Х	Х	Х	Х
Insects	Х	Х	Х	Х	Х
Poisonous Plants	Х	Х	Х	Х	Х
Medical Waste Hazards					
Other:					

*O&M Activities include well head repairs, pump replacements, transducer replacements, pump and treat systems repairs.

880 59

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

April 2006 Rev 0

٠

ATTACHMENT 4 SPECIFIC SAFE WORK PRACTICES PER TASK(S)

April 2006	Rev. 0	

مور م

SPECIFIC SAFE WORK Name of Jot	9: International of the second	A No.	Date: X Ne	>
PRACTICES Def Memohis. Te	oot I	rage <u>01</u> 01 <u>0</u>	1 4/24/00 Re	rised
JOB SAFETY ANALYSIS	son who does job: Su	1pervisor:	Analysis by:	
Monitoring Well Sampling Field Sample	er	evin Sedlak	Kevin Sedlak	
Company/Organization: Plant/Locat	ion: De	epartment:	Reviewed by: Tom Holmes	
e ² M, Inc Memphis, I		DIVIT FICIO LEATI		
Required and/or recommended	•	•.	Approved by:	
Personal Protective Equipment: Hard hat, steel-toe bc	oots, safety glasses, hearing pro	otection		
Sequence and Description of Basic Job Steps	s Potential H	azards	Recommended Action or Pr	ocedure
1). Travel to and from job site	1). Vehicle accident		 Employees should follow e²M veh policy 	icle operation
2). Set-up traffic control to alert the traveling public	c 2). Struck by moving vehic	cie	2). Wear traffic safety vest to increase v	sibility and be
when working in or near the Right-of-Way, if applicable	2) Deel inimae		alert to oncoming streed ingnway traine 3) Uhilize proper lifting techniques	
3) Off-toad sampling equipment, wors and supplies	4). Not knowing where (emergency facilities	4). Identify area medical facilities, em	ergency travel
	are located.		routes and phone numbers	
5). Moving equipment on site	5). Struck by moving vehic	cle	Utilize signs/flags to control street/h during road crossings; use heavy equi	ighway traffic ment backing
			alarms on heavy equipment	
6). General sampling duties at the job site	6A) Struck by debris or ed	quipment; slips, trips	6A). Proper training of personnel; 1	ise of proper
	& potential falls		personal protection equipment (Hard	nats, steel toe
			boots, safety glasses, gloves, etc.);	maintain site
		, , , , , , , , , , , , , , , , , , ,	housekeeping on arrii rig	
	6B). Back injuries		6B). Utilize proper lifting techniques	
	6C). Weather extremes:	heat, cold, rain &	6C). Wear appropriate clothing; consui	ne fluids, take
	lightning		necessary breaks; awareness of the hething: wait out hazardous situations	potential for
	6D). Outdoor safety: biolo	gical hazards	6D). Watch-where-you-step; wear prote	tive clothing
	6E). Electrical shock		6E). Employee should be careful to	turn off the
			generator before unplugging the e	lectrical cord
			cspectany during rain evenus.	ive equipment
	6F). Exposure to chemica	uls of concern	and monitor breathing air with a	hotoionization
			detector.	
Date of field verification and validation:	Names of personnel that	completed field verifi	cation and validation:	

			1	
SFECIFIC SAFE WORK	Defense Dense	JOA NO.	Date:	X New
PRACTICES	Veletise Depot	Z Rage 01 01	<u>14/24/06</u>	Doviced
JOB SAFETY ANALYSIS 🕂		•		
Oberations and Visintenance for	LIUE OF PETSON WIO GOES JOD: Fachnician/ Staff Engineer	Varie Callel	Analysis D	X
Pump and Treat System		I NEVIN SEGIAK	Kevin Sedi	ak
Company/Organization:	Plant/Location:	Denartment.	Deviawed	
e ² M, Inc.	Memphis, TN	Remediation Engineering	Tom Holm	
Required and/or recommended			Approved	bv:
Personal Protective Equipment: Hard hat	t, water or comparable refreshme	ents, heavy gloves,	Glen Turne	A
Sequence and Description of Basic	Job Steps Potent	tial Hazards	Recommended	Action or Procedure
1). Drive to and from job site.	1). Vehicle accident		1). Employees should for	ollow e ² M vehicle operation
			policy.	
2). Climbing on elevated surfaces	2A). Fall from ladde	er,	2A). Employees should	be properly trained in ladder
			safety. Ensure equipmer	It is in proper working order
			and implemented correctl	y.
	2B). Fall from eleva	ited surface.	2B). Employees should	be properly trained in fall
			protection standards.	Always be aware of
			surroundings and use g	good judgment. Employee
			should be properly equip	ped with proper footwear to
			prevent slipping and prop	er eyewear to prevent "snow"
	-		blinding and disorientatio	n.
3). Turn electricity off to pump and treat	t system or 3). Electrical shock		3). Employees should be	properly trained in electrical
applicable sections of the system.			hazards and proper opera	tion of system in accordance
			with the O&M Manual.	
4). Implement lock-out tag-out procedures	4). Another employe	ce restarting the system.	4). Employees should	be properly trained and
			equipped for lock-out tag-	out procedures.
5) Remove guards, hatches, manways, etc.	5A). Debris in eyes v	while removing parts.	5A). Employees should	were ANSI Z87.1 approved
			protective eyewear while	performing work.
	5B). Employee cut	ts hands while removing	5B). Employees should	wear heavy gloves or other
	parts		approved methods of hand	l protection.
	5C). Employee cut	ts knees while removing	5C). Employees should	I were knee pads while
	parts.		performing specific duties	· · ·

April 2006 Rev. O

⊸.

Safety Plan	ennessee
edial Action Health & S	nse Depot Memphis, Te
Rem	Defe

SPECIFIC SAFE WORK PRACTICES JC	DB SAFETY ANALYSIS	
Chorations and Maintenance for Pump and Treat	Style11	Page 02 of 02
 6). Perform inspections/evaluate/replace parts needing repairs 	6A). Debris in eyes while performing repairs.	6A). Employees should were ANSI Z87.1 approved protective eyewear while performing repairs.
	6B). Employee cuts hands while performing	6B). Employees should wear heavy gloves or other
	repairs,	approved memory of natio protection.
	6C). Employee cuts knees while performing repairs	oc.). Employees should wear knee paus white performing specific duties.
7) If vessels require inspection, implement confined	7A). Asphyxiation	7A). Employees should be properly trained in confined
space entry protocols		space entry and air monitoring. Always be aware of
		surroundings and use good judgment. Employee
		snouid oe property equipped with body harriess and life line.
	7B). Exposure to chemicals of concern	7B). Wear appropriate personal protective equipment
		and monitor breathing air with a photoionization
		detector.
8) Replace plards, hatches, manways, etc.	8A). Debris in eyes while removing parts.	8A). Employees should were ANSI Z87.1 approved
		protective eyewear while performing work.
	8B). Employee cuts hands while removing	8B). Employees should wear heavy gloves or other
	parts.	approved methods of hand protection.
	8C) Employee cuts knees while removing	8C). Employees should were knee pads while
	parts.	performing specific duties.
9) Re-energize the system and check out operation of	9). Electrical shock.	9). Employees should be properly trained in electrical
newly modified system		hazards and proper operation of system in accordance
		Will UIE OWINI INITIAL.
10). Clean-up and depart site.	10) Slip, trıp, and fall hazards	10). Employee should leave the site with no trash of debris from maintenance related activities which might
		cause a hazard for future operation and maintenance
		personnel.
Date of field verification and validation:	Names of personnel that completed field verifi	cation and validation:

.

,

					-		-	
SPECIFIC SAFE WORK	Name of Job:		JSA No.			Date: X	X New	
PRACTICES	Defense Depot Memphis, Teni	lessee	<u>۳</u>	Page <u>01</u> of <u>0</u>	<u>.</u>	4/24/06	Revise	p
JOB SAFETY ANALYSIS Drilling Well Installation/	Title of person Field Geologist	ı who does job:	Supervisor: Kevin Sedlak			Analysis by: Kevin Sedlak	-	}
Abandonment Company/Organization:	Plant/Location		Denartment			Reviewed by:		
e ² M, Inc.	Memphis, TN	:	DDMT Field	Team		Tom Holmes		
Required and/or recommended						Approved by:		
Personal Protective Equipment: Hard ha	t, steel-toe boots	s, safety glasses, heari	ing protection,	tyvek		Glen Turney		
Sequence and Description of Basic	c Job Steps	Potent	ial Hazards		Rec	ommended Action o	or Proce	edure
1). Travel to and from job site		1). Vehicle accident			1). Driver comply w	s complete e ² M Driving ith e ² M vehicle operation	Safet n guidelin	y Training; es
2). Set-up traffic control to alert the travelir working in or near the Right-of-Way	ng public when	2). Struck by movin	g vehicle		2). Wear t alert to on	raffic safety vest to incre coming street/highway tr	ease visibi raffic	lity and be
3). Off-load drilling equipment, tools and su	upplies	3A). Struck by movi	ing vehicle		3A). Be al	lert to oncoming street/hij	ighway tra	ffic
		3B). Back injuries			3B). Utiliz	ze proper lifting techniqu	les	
4). Hazard communication and recognition		4). Overhead and	l underground	d utilities:	4). Identi	ify utility locations pr	rior to I	nobilizing;
		electrical, gas, comn	nunications, w	ater, etc.	unterview utility loc	property owners and/oi ator; drill at adequate	r employ offsets fi	a private om utility
					locations; travel rout	identify area medical fates and phone numbers	acilities,	emergency
5). Moving equipment on site		5A). Struck by movi	ing vehicle		5A). Util	ize signs/flags to con	ntrol stre	et/highway
					trattic du backing al	ring road crossings; use arms on drill rig	e heavy	equipment
		5B). Falling trees &	limbs		5B). Use maintain a	of proper personal pro	otection e	equipment;
6) Site clearing		6). Cut by chain saw	/ & struck by d	ebris	6). Proper	training of personnel for	r chain sa	w use; use
					of proper safetvelas	 personal protection et ses, ploves, ear protection 	equipment	(hardhat,
					0	in the second se		

April 2006 Rev. 0

Safety Plan	ennessee
Health & S	lemphis, Te
al Action.	: Depot M
Remedu	Defense

SDECIFIC SAFF WORK PRACTICES IC	DR SAFFTV ANAL VSIS	
		Page 02 of 02
DTHENG YOURDERS INSTRUCT ADAULTON		ł
7). General drilling duties at the job site	7A). Struck by debris or equipment; slips,	7A). Proper training of personnel; use of proper
•	trips & potential falls	personal protection equipment (Hard hats, steel toe
	,	boots, safety glasses, gloves, etc.); maintain site
		housekeeping on drill rig
	7B). Back injuries	7B). Utilize proper lifting techniques
	7C) Weather extremes: heat, cold, rain &	7C). Wear appropriate clothing; consume fluids, take
	lightning	necessary breaks; awareness of the potential for
		lightning; wait out hazardous situations
	7D) Outdoor safety biological hazards	7D). Watch-where-you-step; wear protective clothing
	7E). Exposure to chemicals of concern	7E). Wear appropriate personal protective equipment
	•	and monitor breathing air with a photoionization
		detector.
Date of field verification and validation:	Names of personnel that completed field veri	fication and validation:

April 2006 Rev 0 ٠

Safety 2). Wear traffic safety vest to increase visibility and be vehicle operation 5A). Utilize signs/flags to control street/highway traffic during road crossings; run with 4-way flashers 5B). Always have a spotter in place while backing any 4). Identify area medical facilities, emergency travel **Recommended Action or Procedure** 3A). Be alert to oncoming street/highway traffic Revised 1). Drivers complete a defensive Driving New alert to oncoming street/highway traffic 3B). Utilize proper lifting techniques × Training; comply with e2M routes and phone numbers Reviewed by: Tom Holmes and headlights at all times Approved by: Analysis by: Kevin Sedlak Glen Turnev 04/24/06 Date: and all vehicles. guidelines Page 01 of 02 Department: DDMT Field Team Supervisor: Kevin Sedlak **Potential Hazards** Personal Protective Equipment: Hard hat, steel-toe boots, safety glasses, hearing protection JSA No. 4 3A). Struck by moving vehicle 5A). Struck by moving vehicle 2). Struck by moving vehicle 4). High pressure hose burst. 5B). Backing over obstacles I). Vehicle accident 3B) Back injuries Title of person who does job: Field Geologist/Site Safety Memphis, Tennessee Plant/Location: Defense Depot 2). Set-up traffic control to alert the traveling public when Name of Job: Memphis, TN Sequence and Description of Basic Job Steps Supervisor 3). Off-load injection equipment, tools and supplies 4). Hazard communication and recognition SPECIFIC SAFE WORK **JOB SAFETY ANALYSIS** working in or near the Right-of-Way **Required and/or recommended** njection of Sodium Lactate Engineering-environmental 1). Travel to and from job site 5). Moving equipment on site Company/Organization: **PRACTICES** Management, Inc..

April 2006 Rev. O

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

SPECIFIC SAFE WORK PRACTICES JC	DB SAFETY ANALYSIS	Page <u>02</u> of <u>02</u>
6) General lactate neurarition and injection at the site	(A) Struck by broken equipment and using	7A) Proner training of nersonnel: use of proner
	high pressure fluids.	personal protection equipment (Hard hats, steel toe
		boots, safety glasses, gloves, etc.); maintain site
		housekeeping on injection trailer.
	6B). electrocution	7B). Utilize proper grounding equipment
	6C). Weather extremes heat, cold, rain &	7C). Wear appropriate clothing; consume fluids, take
	lightming	necessary breaks, awareness of the potential for
		lightning; wait out hazardous situations
	6D). Outdoor safety: biological hazards	7D). Watch-where-you-step; wear protective clothing
	6E). Exposure to chemicals of concern	7E). Wear appropriate personal protective equipment
		and monitor breathing air with a photoionization
		detector. Do not place face directly over valve on well
		when opening.
Date of field verification and validation:	Names of personnel that completed field veri	fication and validation:

·

ATTACHMENT 5

AIR MONITORING EQUIPMENT, FREQUENCY OF READINGS, AND ACTION GUIDELINES PER TASK(S)

April 2006 Rev 0

ATTACHMENT 5

AIR MONITORING EQUIPMENT/FREQUENCY OF READINGS/ACTION GUIDELINES

TASK(S): All Activities Scheduled for DDMT

<u>x</u> Explosime Brand/Model Monitoring F (for intrusive c	ter No. <u>Neotronics</u> requency: <u>Continuously</u> Irilling activities only)	<u>x</u> *Oxygen M Brand/Model Monitoring F (for intrusive d	leter No. <u>Neotronics</u> requency: <u>Continuously</u> Irilling activities only)	<u>X</u> Photoionization Detector Brand/Model No.: <u>Micro tip</u> Monitoring Frequency: <u>Continuously</u>		
Source Reading (% LEL)	Action	Source Reading (%)	Action	Breathing Zone Reading (ppm)	Action	
<u>1</u> to <u>10</u>	Continue with caution	<u><19.5</u>	Stop work. Evacuate the area.	<u>0</u> to <u>0.5</u>	Modified Level D PPE	
<u>210</u>	area. If action levels continue to be exceeded, contact HSO.	<u>19.5</u> to <u>23.5</u> ≥23.5	Continue to work with caution Stop work. Evacuate the area.	<u>>0.5</u> to <u><5</u> <u>>5</u> to <u><25</u>	Check with detector tubes (See DT below) Use Level C PPE and check with detector tubes (See DT below)	
		Note: <u>>25 ppm stop wo</u> SHSO prior to continuing				
<u>X</u> * Chemical Brand/Model f Monitoring Fr <u>detection on</u> <u>background su</u>	Detector Tube No.: <u>Drager (chloroform)</u> requency: <u>Every positive</u> <u>PID (0.5 ppm above</u> <u>istained for 1 minute)</u>	X * Chemical Brand/Model I (vinvl chloride Monitoring F <u>detection on</u> <u>background su</u>	Detector Tube No.: <u>Drager</u>) requency: <u>Every positive</u> PID (0.5 ppm above istained for 1 minute)	X Chemical Detector Tube Brand/Model No.: Drager (carbon tetrachloride) Monitoring Frequency: Every positive detection on P1D (0.5 ppm) above background sustained for 1 minute)		
Breathing Zone Reading Action (ppm)	1	Breathing Zone Reading (ppm)	Action	Breathing Zone Reading Action (ppm)		
<u>0</u> to <u><5</u>	Modified Level D PPE	<u>0</u> to < <u>0.5</u> Modified Level D PPE		<u>0</u> to <u><5</u>	Modified Level D PPE	
<u>5</u> to <u><50</u>	Level C and notify SHSO	<u>0.5</u> to < <u>5</u>	Level C PPE and notify SHSO	<u>5</u> to <u><25</u>	Level C PPE and notify SHSO	
Note: > 50 ppm	i stop work, notity SHSO	Note: > 5 ppm	stop work, notify SHSO.	Note: > 25 pp SHSO.	m stop work, notify	

Mark equipment required for this task with "X"

*

ATTACHMENT 6

PERSONAL PROTECTIVE EQUIPMENT PER TASK(S)

and

PPE ASSESSMENT AND CERTIFICATION FORMS

ATTACHMENT 6 PERSONAL PROTECTIVE EQUIPMENT TASK(S): All Activities on site

	-									 		
	MATERIAL/TYPE		Organic Vapor/DM (Cartridge type)	Tyvck, Tychem, CPF	Inner-Nıtrıle Outer-Nıtrıle/Neoprene		Nitrile/Rubber					
*LEVEL C	EQUIPMENT	REQUIRED:	 Full-faceptece, air-purifying, canister- automad secondor 	 Chemical-resistant clothing (overalls and long-sleeved tacket hooded, one- or two- 	 prece chemical splash suit; disposable chemical-resistant one-prece suit) inner and outer chemical-resistant gloves Chemical-resistant safety boots/shoes Hand hot 	OPTIONAL.	Coveralls Disposable boot covers	 Face shield Long cotton underwear Hearing protection 	OTHER			
0	MATERIAL/TYPE				Nunle							5
X *MODIFIED LEVEL	EQUIPMENT	REQUIRED.		 Satety boots suces Safety glasses or chemical splash face shields 	 Hard hat – if overhead hazards exist Chemical-resistant gloves Tyvek (if temperature conditions allow) 	OPTIONAL • Coveralls	Chemical-resistant ciotung Work Gloves Escape mask	• Face shield • Hearing Protection	OTHER:			· Mark initial level of protection with "X

...

April 2006 Rev. 0

•

.

,

April 2006 Rev. 0

PPE ASSESSMENT AND CERTIFICATION PART 1: ASSESSMENT AND SELECTION

Date: <u>12/16/03</u>

.

Des Mor	cription of process, task or operation: utoring well installation and abandonment group.	dwat	er monitoring and C	\&M ^f~	umn and	treat system			
Des	cription of engineering and administrative con-	uwat trole	to be used.	octive of p	ump and	ireat systen			
Hard hat, safety glasses, steel-toe boots, tyvek, nitrile gloves									
Employee(s) affected by this assessment:									
Samplers, drillers, maintenance personnel (while performing repairs)									
Eve	Eye/Face Protection:							COMMENTS	
	Potential for flying objects?				V	ŀ			
	Potential for chemical splash hazard?	Potential for chemical splash hazard?				Minimal	lue to	low flow sampling	
	Potential for airborne dust?								
	Potential for glare problems?								
	Welding, cutting, torch work?				, V				
	Laser use?				, V			· · · · · · · · · · · · · · · · · · ·	
	Potential of pressure release?				, V				
	Other eye or face hazard(s)?			J	· · · · ·	Miscellar	eous e	ດແບບນອກ	
-	Exe/Face Protection Required?			1		If yes indicate selection below			
7	Safety glasses with side shields	Jens shar	ade						
<u> </u>	Safety gauges - invented		Welding shield - h	me chulo	→ →		-	Welding lie met - lens slide	
	Safety goggles - induced venture		weiding shield - h	ins shade				I	
·	Safety goegles - vented	Laser safety glasses. Describe the glasses and identify person who selected the glasses.							
	Eaceshield with selection above	Other (describe)							
	Describe conditions of use.		other (deserve).	•••		I	·		
Foo	t/Lower Leg Protection:		•••	YES	NO			COMMENTS	
	Potential for handling or carrying heavy objects?			V	1.0			Completito	
	Potential for heavy objects to roll over foot?			J.		1			
	Potential for heavy objects to fall on foot?			- j	t				
	Potential to step on sharp objects?			1					
<u> </u>	Uneven terrain or other notential twist hazards?			1					
<u> </u>	Use of chain saw or machete?				·				
	Work in poisonous snake area?			1				· · · · · · · · · · · · · · · · · · ·	
	Other hazards to feet or lower lee?			Y	1				
					v	If you a	adacato	collection balance pultiple collections	
	Foot/Lower Leg Protection required?					indicate multiple requirements			
	Safety toe shoes				10			Snake boots or leggings	
V	Safety toe boots		Chemical resistant	boots – s	is – specify type			Cut resistant chaps or leggings	
	Penetration resistant soles			overboots - specify type:				Chain saw blade aanming chaps	
	Metatarsal guards		Chemical resistant					Welders' quick removal boots	
	Electrical protective		tee slip resist clamp- or pull-ons						
	Other (describe).								
	Describe conditions of use								
Har	nd Protection:			YES	NO			COMMENTS	
	Potential for contact with liquid chemicals?	otential for contact with liquid chemicals?							
	Potential for contact with dry chemicals?				1				
	Work with vibrating equipment?				1				
	Welding, cutting or torch work?				1				
	Work with open blade knives?			1					
	Potential for cuts, abrasions, blisters, etc.?			1					
	Other potential hand hazard(s)?			1		Maintena	nce act	avities	
	and Protection Required?			V		If yes, inc	licate s	election below	
	Cotton work gloves		Chemical resist glo	c below t	ow by material and thickness or make and model				
	Leather work gloves	\checkmark	Nitrile V Butvl						
	Cut resist specify		Neoprene	•				Other – specify	
	Welding gloves	-	Polyvinyl chloride						
	Vibration protective		Polyvinyl alcohol					- Specific make and model;	
	Other (describe)								
	Describe conditions of use:								
Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

. .

> Aprıl 2006 Rev. 0

PPE ASSESSMENT AND CERTIFICATION

Skin and Body Protection:			YES	NO	T.		COMMENTS		
<u>~</u>	Potential for contact with liquid chemicals?			1					
<u> </u>	Potential for contact with dry chemicals?				V				
	Potential for exposure to non-ionizing radiation?				1			······································	
	Potential for exposure to jonizing radiation?				1				
<u> </u>	Potential for exposure to other skip/body hazards?			1					
	Skin/Rody Protection Required?			V		If yes, indic	ate s	election below	
ノ	Uncoated Tyyek® (Intrusive Activities)							Nomex®	
⊢–́	Coated Tyyek®		Welder's outerwea	r				Other heat/fire resist – specify	
	Saranex								
	Other (describe).	L							
	Describe conditions of use.								
Res	piratory Protection:			YES	NO			COMMENTS	
	Are airborne contaminants anticipated?			1		l			
	Are levels and types of contaminants known?*			1		Known in s the field	oil a	nd groundwater/to be monitored in air In	
	If known, do they exceed Action Levels or Company established Exposure Limits?				4				
	Respiratory Protection Required?			1		If yes, indic	ate s	election below - check all that apply	
	½ facepiece		Continuous flow re	gulator				SCBA emergency escape – spec	
1	Full facepiece. Monitor with PID and follow	i	Pressure demand re	egulator				minimum time	
	upgrade procedures in H&S Plan, if required		i ressare demana re						
	Hood or helmet – select one		Air line – compress	sor syster	n				
	Powered air purifying respiratory (PAPR)	<u> </u>	Air line – bottle (ca	iscade) s	scade) system			Air purifying emergency escape	
	Type of air purifying cartridge.		SCBA – spec minimum time			Type of air purifying cardinge			
\checkmark	Other (describe) Monitor with PID and follo	ow upg	grade procedures in	H&S Pla	n, 1f requ	ured			
	Describe conditions of use								
* D	etermine by monitoring or predictive calculations'	2 By	whom and when?						
Hea	d Protection:			YES	<u>NO</u>			COMMENTS	
	Will construction activities take place?				V	l			
	Potential for falling objects?	1 for falling objects?			, I	· · · ·			
	Will work take place at levels above other perso	'ill work take place at levels above other personnel?			<u></u>				
	Potential for side impact? (If Yes, select Class I	Potential for side impact? (If Yes, select Class II below)			V				
ļ	Will work take place in heat or cold?			V		There and a		-lautean halaur	
- 1	Head Protection Required?	- T		N.		IT yes, marc	ate s	Other (describe)	
V	Class I Class II							Other (describe)	
	Describe conditions of use, overficad hazards pro	resent		VES	NO	1	_	COMMENTS	
Hea	Sound lovel many und during mark energies			ILO		-		dBA	
	Sound level measured during peak operations $\Gamma_{\rm exc}$				<u></u>			dBA	
<u> </u>	Eight hour time weighted average (TWA) Other hazard(s) to hearing? Hearing Protection Required?		1	···· ···	Paole lavale	n il	avcerd accentable levels during drilling		
			1		If yes indu	wine s	election below		
			v		dB	dB			
	Incorts (During drilling operation: unly)		Muffe	1		1 ub		Combined	
	Other (describe)	I	WILLIS					contened	
	Describe conditions of use								
<u> </u>	Describe conditions of use								
PA	RT 2: CERTIFICATION								
					Date	. 12/6/03			
The	undersigned has performed a hazard assessment	t and	evaluation for the ta	ask(s) de	scribed o	n the first pag	ge of	this form on the date shown above The	
pers eva	sonal protective equipment selected for use shall la luation performed and certified at a later date.	be bas	sed on this hazard a	ssessmen	r and ev:	aluation unless	s ove		
				. —					
	Emmet F. Curtis								
	Name							Signature	

I

April 2006 Rev. 0

•

ATTACHMENT 7

DECONTAMINATION PROCEDURES & EQUIPMENT PER TASK(S)



.

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee Aprıl 2006 Rev. 0

ATTACHMENT 7.1

DECONTAMINATION PROCEDURES & EQUIPMENT

Task(s) Drilling, Installation and Sampling Activities

Decontamination Solution: Detergent and Water

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

ATTACHMENT 7.2

DECONTAMINATION PROCEDURES & EQUIPMENT

Task(s) Drilling, Installation and Sampling Activities

Decontamination Solution: Detergent and Water

MODIFIED LEVEL D						
Station 1:	Equipment Drop	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.				
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	Scrub outer boots and outer gloves with decon solution or detergent water. Rinse off using copious amounts of water. If using disposable outer boots and protective garment (i.e. Tyvex) remove and double bag for disposal.				
Station 3:	Outer Boot and Glove removal	Remove boot lines (if applicable) and gloves. Deposit in container with plastic liner.				
Station 4:	Field Wash	Hands and face are thoroughly washed. Shower as soon as possible.				

880 76

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee Aprıl 2006 Rev. 0

ATTACHMENT 8 INCIDENT RESPONSE FORM

• •

Aprıl 2006 Rev 0

880

77

ATTACHMENT 8

Project Name: Project Number: e ² M Managing Office: Date of Incident: Location of Incident: Reported by:	Name	Date	
Project Manager:			
Injured Worker(s): (if applicable) Other Worker(s): (directly involved)			
Outside responders: (names & titles)			
Description of Incident:			
Description of Response:			
Corrective Action:			
Corrective Action Implementation Date ² Corrective Action Verified By:	Site Health & Safety Officer	Date	

INCIDENT RESPONSE FORM



Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee

·

Aprıl 2006 Rev. 0

ATTACHMENT 9 MATERIAL SAFETY DATA SHEETS

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee April 2006 Rev. 0

÷

Attach MSDSs here.

880 80

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee Aprıl 2006 Rev. 0

ATTACHMENT 10 SHSO SUMMARY

Remedial Action Health & Safety Plan Defense Depot Memphis, Tennessee April 2006 Rev 0

ATTACHMENT 10

SHSO SUMMARY

To be completed by SHSO following completion of each phase of field work.

During the work covered by this H&SP, there were:

(check one)

_____No violations of the Safety Plan provisions and no incidents involving injury, illness or personnel contamination.

_____The following violations of the Safety Plan provisions or incidents involving injury, illness or personnel contamination occurred. (*Provide details of type of violation or incident, who was involved, circumstances, and first aid or medical treatment required*).

If violation or incident occurred, describe corrective actions taken to prevent recurrence.

Project/Task Name:

Project/Task Number:

Dates in Field:

Signature:

Date:

(SHSO)



• · · · · ·

· · Faure mean