

**WORKPLAN FOR WELL RELOCATION
UTILITY TRAILER MANUFACTURING COMPANY PROPERTY
17300 Chestnut Street
City of Industry, California**

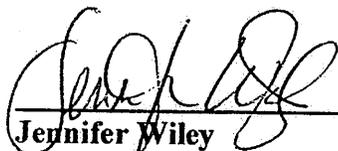
November 21, 2002

Prepared For:

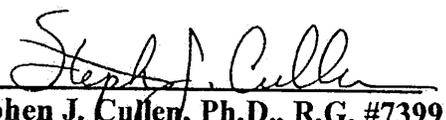
**INDUSTRY URBAN DEVELOPMENT AGENCY
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City of Industry, California**

Prepared By:

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INTRODUCTION

The Industry Urban Development Agency ("IUDA") plans to acquire a 22.18 acre parcel of real property from Utility Trailer Manufacturing Company ("Utility"), located at 17300 Chestnut Street and 942 Azusa Avenue, City of Industry, California (the "Property"). The Property is located within the Puente Valley Operable Unit ("PVOU") of the San Gabriel Valley Superfund Site, Area 4, in Los Angeles County, California (the "Site"). Utility currently operates 5 groundwater monitoring wells ("wells") on the Property under the supervision of the U.S. Environmental Protection Agency ("EPA"). However, IUDA believes that the location of some of these wells may potentially interfere with the ultimate contemplated development of the Property and IUDA or a developer of the Property may ultimately need to relocate certain wells existing wells.

MWH Americas, Inc. (MWH) has prepared this workplan for the IUDA for submittal to EPA to describe the well relocation rationale and methodology to be used in performing well abandonment and construction, and includes information pertaining to health and safety, permitting, and coordination. All field activities will be performed in accordance with the Health and Safety Plan included in Appendix A. Field activities will be conducted under the direction of a California-registered Civil Engineer or Geologist.

PERMITTING AND UTILITY CLEARANCE

Prior to initiating field activities, well destruction permits and well construction permits will be obtained from the County of Los Angeles Department of Health Services. Underground Service Alert (USA) will be contacted at least 48-hours before commencement of well destruction and construction activities to locate known public utilities in the vicinity of the existing and proposed well locations. In addition, proposed well locations will be hand augered to a minimum of 5 feet below ground surface (bgs) to clear the borehole.

WELL RELOCATION RATIONALE

IUDA has considered the relocation of five existing wells (MW-2, MW-3, MW-4, MW-5, and MW-6) at the Property. The recommendations and resultant relocation decisions are discussed below. Existing well locations and proposed new locations are shown on Figure 1. Boring logs and well construction details for the existing wells are included in Appendix B. A groundwater elevation contour map from the most recent groundwater monitoring event in May 2002 is included in Appendix C.

MW-1. Well MW-1 was previously abandoned and does not exist at the property.

MW-2. EPA has identified this well as historically encountering the highest levels of volatile organic compound (VOC) concentrations. Consequently, EPA desires to limit the distance between existing MW-2 and the location of the new replacement monitoring well. Because this existing well is located toward the middle of the property, it does need to be relocated a short distance to avoid conflicts with new development. Therefore, IUDA proposes to relocate this well a short distance to the northwest, which is downgradient in terms of the direction of groundwater flow, to the near side of Virgil Waters Way. Accordingly, this workplan proposes

that MW-2 be abandoned, and replaced by MW-2B, located approximately 120 feet to the northwest on the near side of Virgil Waters Way.

MW-3. The EPA prefers that this well remain unchanged because EPA has determined that the well has historically encountered relatively high levels of VOC concentrations. Since this well is already located close to the east property line, the well will not be relocated.

MW-4. While EPA has indicated it would consider allowing relocation of this well, it already is located near the south property line. Accordingly, this well will not be relocated.

MW-5. This well is located toward the middle of the property, and, therefore, needs to be relocated to avoid conflicting with new development. The EPA has indicated that it is willing to consider allowing this well to be relocated to the near side of the closest existing road, which is Azusa Avenue. Accordingly, the workplan proposes that MW-5 be abandoned and replaced with MW-5B, which will be located approximately 600 feet to the northwest on the near side of Azusa Avenue.

MW-6. . This well also is located toward the middle of the property, and, therefore, needs to be moved to avoid conflicting with new development. The EPA has indicated that it is willing to consider allowing this well to be relocated to the near side of the closest existing road, which is Virgil Waters Way. Accordingly, the workplan proposes that MW-6 be destroyed and replaced with MW-6B, which will be located approximately 550 feet to the northwest on the near side of Virgil Waters Way.

WELL DESTRUCTION

Three groundwater monitoring wells (MW-2, MW-5, and MW-6) will be abandoned by removing the surface completions, pressure grouting the well casing, overdrilling the top of the well to a depth of 5 feet below bgs, backfilling the borehole with grout, and resurfacing to match the existing surface grade.

Prior to grouting, the well boxes will be removed from the wells. Pressure grouting will then take place to seal the well. Cement grout will be placed by pumping through a rigid tremie pipe starting at the bottom of the well and working up to the top of the well casing. The tremie pipe will be slowly raised as the grout is placed to provide a continuous seal. Pressure shall then be applied to the top of the well casing to force the grout into the filter pack and formation.

A cumulative grout volume greater than or equal to the casing and filter pack volume (assuming a 30 percent filterpack porosity) will be pumped under pressure to seal the well screen, filter pack and casing. The MWH field geologist will track the volume of grout placed in the well to ensure that the grout volume is greater than or equal to the well volume listed in Table 1. Volumes shall be calculated according to the following equations:

Casing volume in gallons = $3.1416 \times (\text{radius in feet})^2 \times \text{height in feet} \times 7.48$ gallons per cubic foot
Filter pack volume in gallons = $3.1416 \times (\text{radius in feet})^2 \times \text{height in feet} \times 7.48$ gallons per cubic foot
Pressure grouting volume in gallons = Casing volume + (0.30) (Filter pack volume - Casing volume).

Immediately prior to pressure grouting, the wells will be sounded to confirm total depth of well casing, depth to static water, and to assess whether any obstructions exist in the well that might interfere with the filling/sealing of the well. Cement grout used for pressure grouting will consist of a mixture of Portland cement and potable water with bentonite powder (3 to 6 percent by weight) added to make the mix more fluid and to reduce shrinkage. An accelerator, such as calcium chloride, may be added to the grout if excess loss (i.e., loss of a volume greater than the volume of the pore space of the filter pack) occurs within the screened area into the surrounding formation. Calcium chloride may be added to the grout in quantities of no more than 2 percent in either powdered or flake form.

Following pressure grouting, the well and annulus materials will be overdrilled to a depth of 5 feet bgs using a mobile drill rig equipped with hollow-stem augers. The overdrilled 5 feet will be backfilled with cement grout and resurfaced to match the existing surface.

DRILLING, SOIL SAMPLING, AND WELL CONSTRUCTION

Three boreholes will be advanced in the proposed well locations using a truck-mounted hollow-stem auger drilling rig under the direction of an MWH field geologist. Soil samples will be collected at 5-foot depth intervals beginning at five feet bgs and continuing to the full extent of the boring for possible chemical analysis, volatile hydrocarbon headspace measurements in the field using a photoionization detector (PID), and Unified Soil Classification System lithologic logging.

Soil samples will be collected in a stainless steel split-spoon sampler driven 18-inches into undisturbed soil using a 140-pound hammer. The sampler will be lined with three 6-inch long stainless steel sleeves. The deepest undisturbed sample interval will be collected from the split-spoon sampler at each sample depth for possible chemical analysis. Samples will not be collected in saturated soil. Additional soil at each sample interval will be placed into a resealable plastic bag for headspace analysis with a PID. Soil sample sleeves will be packaged by wrapping both ends in Teflon™ sheets and tight-fitting plastic caps, and labeled with the sample identification, date, and time of collection. Samples selected for VOC analysis will be subcored using the EnCore™ sampling technique. All samples will be logged into chain-of-custody forms and stored in an ice-chilled cooler to maintain the samples at temperatures between 2 degrees Celsius (°C) and 6°C.

Two samples from each borehole will be selected for chemical analysis based on PID readings and/or field observations (such as staining). The samples will be analyzed for VOCs by EPA Method 8260B, California Assessment Manual metals by EPA Methods 6010B and 7471A, and total petroleum hydrocarbons, carbon chain analysis by EPA Method 8015 Modified. Additionally, equipment blank and trip blank samples will be collected each sampling day and analyzed.

The three relocated groundwater monitoring wells (MW-2B, MW-5B, and MW-6B) will be constructed in the same manner as the original wells. Proposed well construction diagrams including depths are included as Figure 2 (well MW-2B), Figure 3 (well MW-5B), and Figure 4 (well MW-6B). The wells will be constructed using 4-inch diameter schedule 40 polyvinyl chloride (PVC) casing having 30 foot long schedule 40 PVC screens with 0.010-inch slots. The annulus materials will consist of a filter pack of Number 0/30 Monterey Sand from 2 feet below the screens to 3 feet above the screens. Above the sands will be a minimum 4-foot thick annular seal consisting of hydrated bentonite chips. Above the annular seal will be cement grout to approximately 1 foot bgs. Each well will be completed with a 12-inch diameter, flush-mounted, traffic-rated well vault set in a concrete apron.

Drilling and sampling equipment will be decontaminated between borings and between samples. Sampling equipment will be decontaminated by washing in a laboratory-grade detergent bath, rinsing in potable water, then rinsing in distilled water. Auger flights and drill bits will be decontaminated by steam-cleaning/pressure-washing with potable water.

INVESTIGATIVE-DERIVED WASTE

Investigative-derived waste from the well destruction and relocation activities will include soil cuttings, well materials, concrete debris, personal protective equipment (PPE), and decontamination water. Soil cuttings, well annulus materials, and decontamination water will be contained onsite in appropriately labeled 55-gallon drums. Following profiling, the waste will be transported offsite for disposal. All PPE, concrete debris, PVC, and well boxes will be considered non-hazardous. The PPE will be double-bagged and discarded in a trash dumpster at the Property for later disposal at a sanitary landfill. All concrete and asphalt debris, PVC, and well boxes will be the responsibility of the well destruction contractor and will be taken offsite for disposal.

SURVEYING

Following well relocation, the wellhead elevations and horizontal coordinates of the newly installed wells will be surveyed by a California state licensed surveyor. Horizontal coordinates will be identified using California state coordinates and elevations will be measured from a local bench mark elevation.

REPORTING

A brief letter report summarizing the field methods and procedures, site geology, soil analytical data evaluation, and conclusions will be prepared by MWH. The report will include a location map of the relocated wells, boring logs, well construction logs, well destruction and construction permits, and analytical laboratory reports. A California-registered Civil Engineer or Geologist will sign the report on behalf of MWH.

Attachments: Figure 1, Site Plan
Figure 2, MW-2B Proposed Well Construction
Figure 3, MW-5B Proposed Well Construction
Figure 4, MW-6B Proposed Well Construction
Appendix A, Health and Safety Plan
Appendix B, Boring Logs and Well Diagrams – Existing Wells
Appendix C, Groundwater Elevation Contour Map – May 31, 2002

Tables



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TABLES

TABLE 1

MINIMUM GROUT VOLUMES REQUIRED FOR WELL DESTRUCTION VOLUMES
UTILITY TRAILER MANUFACTURING COMPANY, CALIFORNIA

Well ID	Borehole Diameter (inches)	Casing Diameter (inches)	Total Depth (feet bgs)	Casing Volume (gallons)	Height of Sandpack (feet)	Annular Volume (gallons)	Sandpack Volume (gallons)	Minimum Grout Volume (gallons)
MW-2	11.00	4	43.0	28.4	7.0	30.0	9.0	37.4
MW-3	11.00	4	38.0	25.1	5.0	21.4	6.4	31.5
MW-4	11.00	4	53.5	35.3	15.0	64.3	19.3	54.6
MW-5	11.00	4	44.5	29.4	10.0	42.8	12.9	42.2
MW-6	11.00	4	39.5	26.1	6.0	25.7	7.7	33.8

ID - identification

bgs - below ground surface

ft - feet

Figures

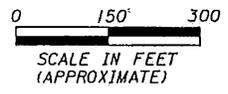
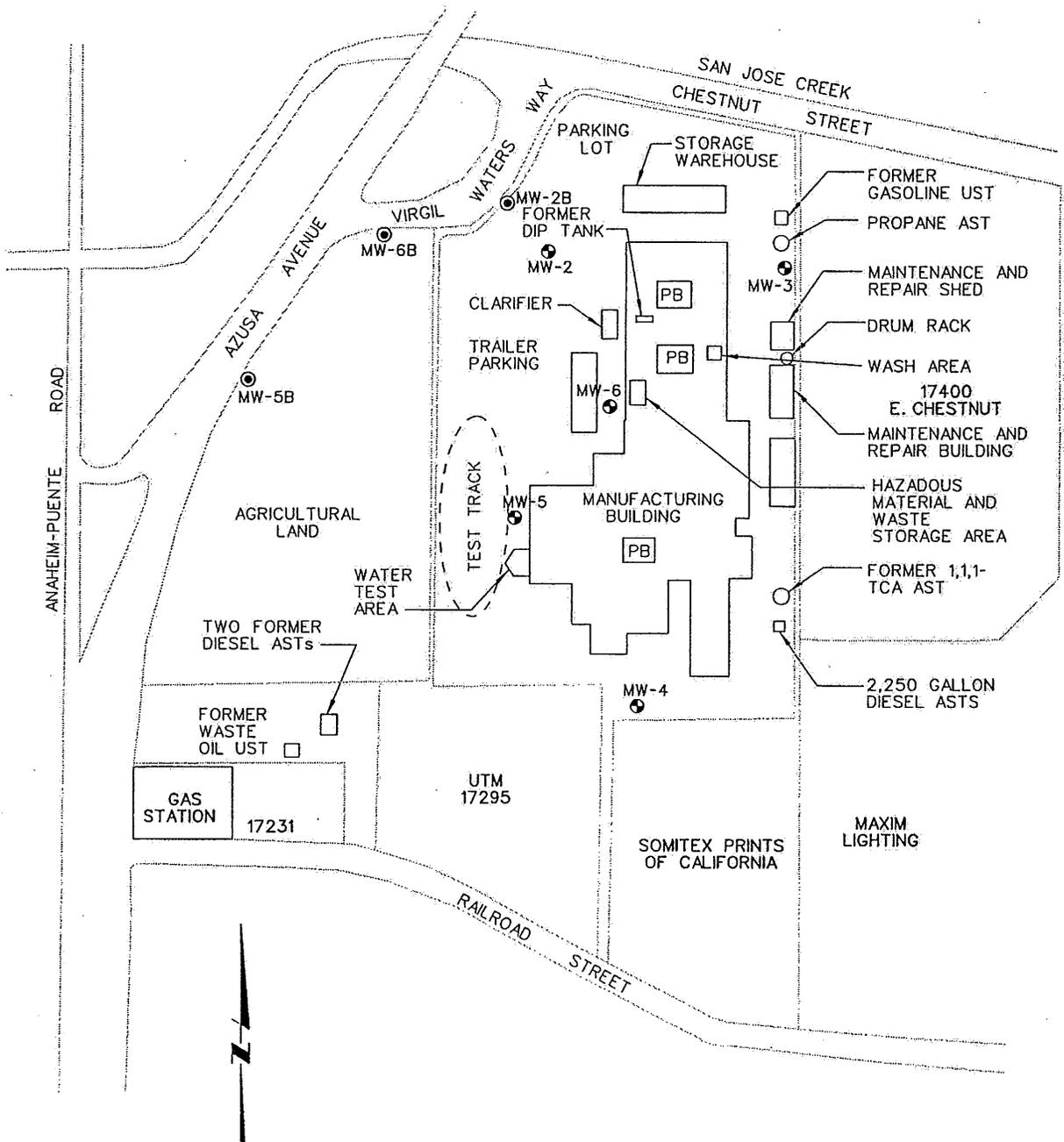


FIGURES

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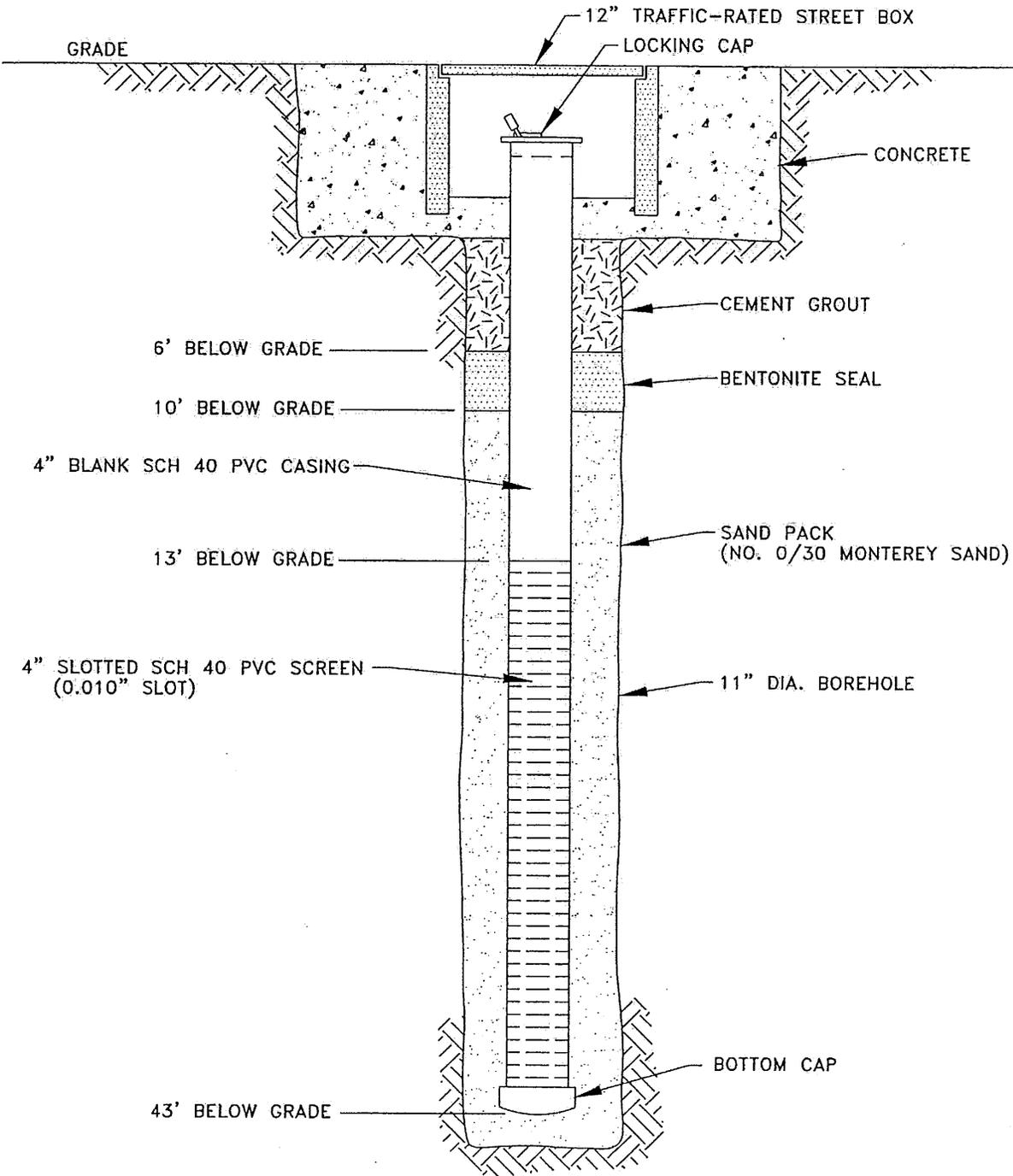


- LEGEND:**
- MW-5 ● EXISTING MONITORING WELL
 - MW-5B ● PROPOSED MONITORING WELL LOCATION
 - AST ABOVEGROUND STORAGE TANK
 - UST UNDERGROUND STORAGE TANK
 - PB PAINT BOOTH



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 17300 E. CHESTNUT STREET
 CITY OF INDUSTRY, CALIFORNIA

SITE PLAN
 FIGURE 1



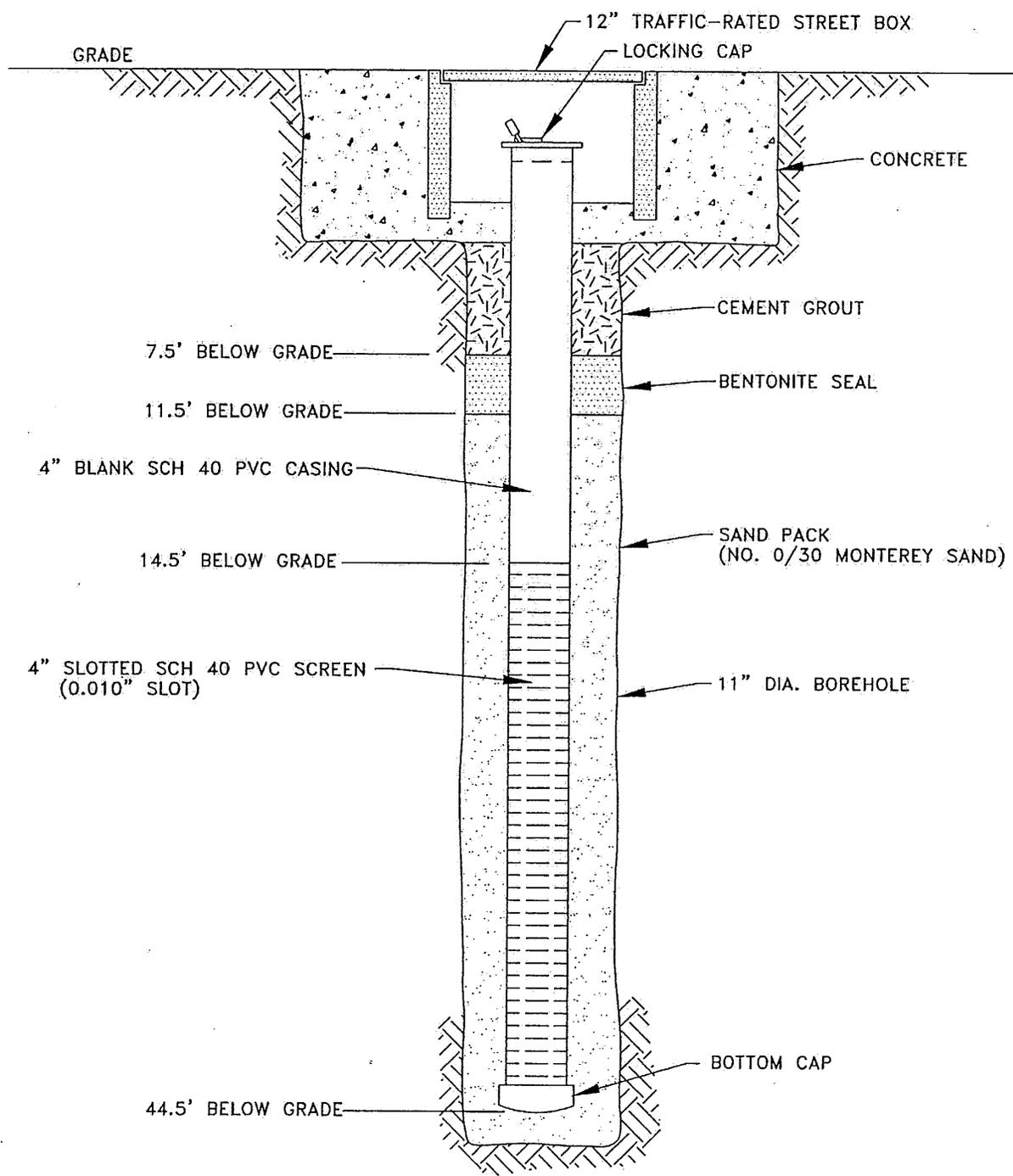
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 CITY OF INDUSTRY, CA
**MW-2B PROPOSED
 WELL CONSTRUCTION**
 FIGURE 2

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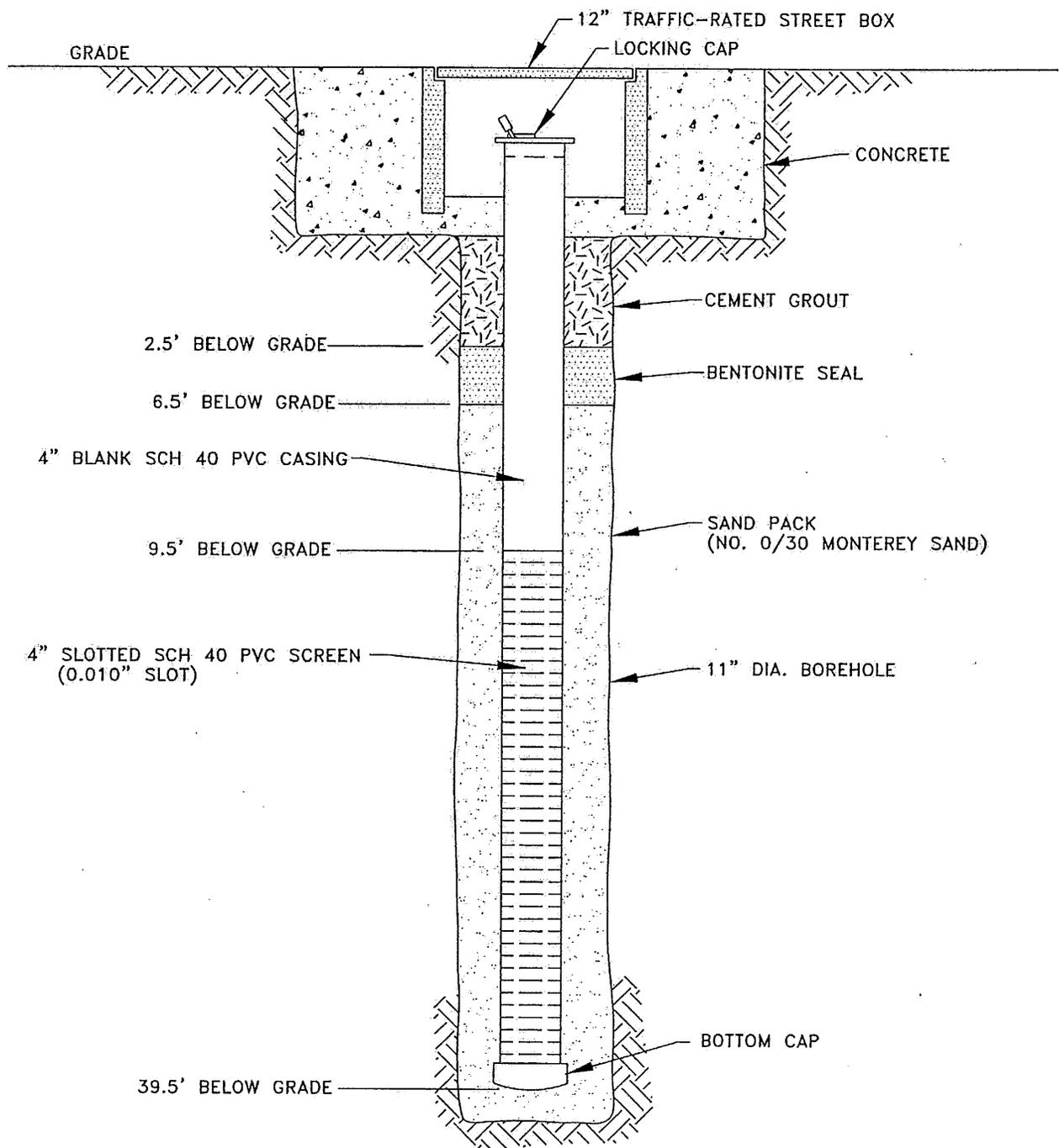


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**MW-5B PROPOSED
WELL CONSTRUCTION**

FIGURE 3



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**MW-6B PROPOSED
WELL CONSTRUCTION**

FIGURE 4

Appendix A



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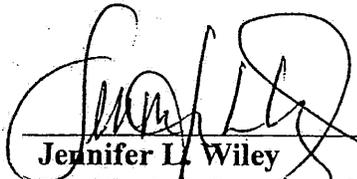
APPENDIX A

HEALTH AND SAFETY PLAN

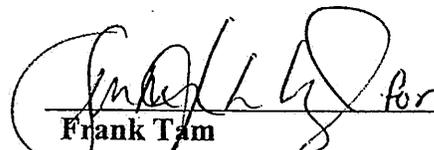
Site-Specific Health & Safety Plan

**UTILITY TRAILER MANUFACTURING COMPANY PROPERTY
17300 Chestnut Street
City of Industry, California**

November 14, 2002



Jennifer L. Wiley
Health & Safety Coordinator



Frank Tam
Project Manager



MWH
MONTGOMERY WATSON HARZA

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Table 1.4-1 Activity Hazard Analysis

Table 1.6-1 Action Levels for Upgrading PPE or Ceasing Work

ACRONYMS

APR	Air Purifying Respirator
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicators
CIH	Certified Industrial Hygienist
1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethene
DOT	Department of Transportation
EPA	(U.S.) Environmental Protection Agency
FTL	Field Team Leader
HEPA	High Efficiency Particulate Air
HSP	Health and Safety Plan
IDLH	Immediately Dangerous to Life or Health
IIPP	Illness and Injury Prevention Program
IUDA	Industry Urban Development Agency
LEL	Lower Explosive Limit
MWH	Montgomery Watson Harza
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OSO	On-site Safety Officer
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	Parts per million
PSO	Project Safety Officer
PVOU	Puente Valley Operable Unit
SLM	Sound Level Meter
SOP	Standard Operating Procedures
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
VOC	Volatile Organic Compound



SITE SPECIFIC HEALTH AND SAFETY PROCEDURES

Utility Trailer Manufacturing Company Property
17300 Chestnut Street
City of Industry, California
November 14, 2002

1.0 PURPOSE OF THE HEALTH AND SAFETY PLAN

This health and safety program has been prepared by MWH in support of the field efforts at the Utility Trailer Manufacturing Company Property located at 17300 Chestnut Street in the City of Industry, California on behalf of Industry Urban Development Agency. This document is designed to provide the general health and safety program support to all activities likely to be encountered in the execution of the groundwater well abandonment and installation of groundwater monitoring wells. This health and safety plan (HSP) will be re-evaluated prior to November 14, 2003.

This document establishes the responsibilities, requirements, and procedures for the protection of personnel while conducting the activities at Utility Trailer Manufacturing Company Property. Site specific health and safety issues are addressed in Section 1, general health and safety program elements common to all MWH field efforts are contained in Section 2. Activities not already covered in this HSP specific to any MWH subcontractors are contained in Appendix F of this document, or are discussed during daily tailgate safety meetings.

The Occupational Safety and Health Administration (OSHA) requires employers involved in hazardous waste activities to comply with Title 29 (OSHA) of the Code of Federal Regulations, Part 1910, Section 120 (29 CFR 1910.120), Hazardous Waste Operations and Emergency Response. Recently OSHA has included the Hazardous Waste Operations and Emergency Response standard under the construction safety orders under 29 CFR 1926.65. This document has been designed to meet Federal OSHA standards (whether general industry or construction), U.S. Environmental Protection Agency, and other local health requirements. Working conditions may necessitate modification of this plan. **Except in emergency situations, no deviations from this plan may be implemented without the prior notification and approval of the designated MWH Project Safety Officer (PSO).** The purpose of this plan is to provide the field team, including any subcontractors, with a safe working environment during field activities. Specifically, the health and safety plan is developed to prevent and minimize personal injuries and illnesses and physical damage to equipment, supplies and property. It emphasizes management responsibilities, preplanning for all new jobs, as well as the following elements:

- General Health and Safety Policy Statement
- An organizational structure
- Safety and Health Training Program
- Medical Surveillance Program
- Standard Operating Procedures for site tasks presented in the accompanying workplan



- Safety and health risk or hazard analysis
- Personal Protective Equipment to be used for this project
- Frequency and types of air monitoring, personnel monitoring and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration
- Site description and contaminant characterization
- Personnel and equipment decontamination procedures
- Emergency response procedures, including equipment and first aid
- Permit required confined space entry procedures
- Spill containment program
- Contingency plan for severe weather, including heat and cold stress
- Plans for maintaining a clean job site
- Site control measures
- Logs, reports and recordkeeping
- Inspections and audits

Employees and subcontractors are required at all times to employ safe work practices and comply with all Federal and California OSHA, MWH and any subcontractor-specific requirements.

1.1 SITE DESCRIPTION AND OVERVIEW

The Industry Urban Development Agency ("IUDA") plans to acquire a 22.18 acre parcel of real property from Utility Trailer Manufacturing Company ("Utility"), located at 17300 Chestnut Street and 942 Azusa Avenue, City of Industry, California (the "Property"). The Property is located within the Puente Valley Operable Unit ("PVOU") of the San Gabriel Valley Superfund Site, Area 4, in Los Angeles County, California (the "Site"). Utility currently operates five groundwater monitoring wells ("wells") on the Property under the supervision of the U.S. Environmental Protection Agency ("EPA"). However, IUDA believes that the location of some of these wells may potentially interfere with the ultimate contemplated development of the Property and IUDA or a developer of the Property may ultimately need to relocate certain wells existing wells.

The three groundwater monitoring wells (MW-2, MW-5, and MW-6) will be abandoned by removing the surface completions, pressure grouting the well casing, overdrilling the top of the well to a depth of 5 feet below bgs, backfilling the borehole with grout, and resurfacing to match the existing surface grade.

Following abandonment of these wells, three boreholes will be advanced in the proposed well locations using a truck-mounted hollow-stem auger drilling rig under the direction of an MWH field geologist. Soil samples will be collected at 5-foot depth intervals beginning at five feet bgs and continuing to the full extent of the boring for possible chemical analysis, volatile hydrocarbon headspace measurements in the field using a photoionization detector (PID), and Unified Soil Classification System lithologic logging. The three relocated groundwater monitoring wells (MW-2B, MW-5B, and MW-6B) will be constructed in the same manner as the original wells.

The schedule of field activities will be determined. Specifically the following tasks may be performed for this project:

- Well abandonment (overdrilling and pressure grouting);
- Well installation by hollow-stem auger;
- Soil sampling;
- Air monitoring; and
- Waste management.

MWH is responsible for the following tasks:

- Well abandonment drilling oversight;
- Well installation drilling oversight;
- Air monitoring; and
- Soil sample collection.

MWH's subcontractor (to be determined) is responsible for the following tasks:

- Drill rig operation for well abandonment;
- Drill rig operation for well installation;
- Waste containment; and
- Aid MWH personnel in field tasks (sampling, air monitoring).

1.2 UNIQUE SITE SPECIFIC CONDITIONS, ACTIVITIES AND ISSUES

No confined space entry will be performed.

No excavation or trenching below 5 feet below ground surface (bgs) will be performed.

1.3 CONTAMINANTS OR SAFETY ISSUES OF POTENTIAL CONCERN

This section provides information pertaining to the nature and extent of chemical, biological and radiological hazards at the site.

1.3.1 Chemical Contaminants of Concern

Chemical contaminants of concern at the site may include volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), and Title 22 metals due to previous site activities and groundwater monitoring. Table 1.3-1 presents the toxicological information and exposure limits for the above mentioned chemical contaminants of concern.



**Table 1.3-1 – Master Tox Table
OCCUPATIONAL HEALTH EXPOSURE AND TOXICOLOGICAL PROPERTIES FOR
CONTAMINANTS OF OCCUPATIONAL HEALTH CONCERN**

Contaminant	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP eV	Vapor Pressure (mmHg)	Route of Exposure	Symptoms of Exposure
1,1-DICHLOROETHANE	100 ppm	100 ppm	100 ppm	NA	3,000 ppm	11.06	182	INH, ING, CON	Central nervous system depression; skin irritant; liver and kidney damage.
1,1-DICHLOROETHYLENE (VINYLIDENE CHLORIDE)	Carcinogen	Carcinogen	5 ppm	20 ppm	NA	10.0	500	INH, CON, ING, ABS	Central nervous system depression; irritant to eyes, skin and throat; nausea, dyspnea; inebriation; unconsciousness in high acute doses; liver and kidney damage; CARCINOGEN
1,2-DICHLOROETHANE	1 ppm	1 ppm Ca	10 ppm	2 ppm	400 ppm	11.05	NA	INH, CON, ING, ABS	Central nervous system depression; nausea, vomiting; dermatitis; eye irritant; corneal opacity; CARCINOGEN
1,2-DICHLOROETHYLENE	200 ppm	200 ppm	200 ppm	NA	1,000 ppm	9.65	180-265	INH, ING, CON	Irritant to eyes, respiratory system; central nervous system depression.
1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM)	350 ppm	350 ppm	350 ppm	450 ppm	700 ppm	11.0	100	INH, ING, CON	Headache, lassitude, central nervous system depressant, poor equilibrium; irritant to eyes; dermatitis; cardiac arrhythmia.
BARIUM	0.5 mg/m ³	0.5 mg/m ³	0.5 mg/m ³	NA	50 mg/m ³	NA	Low	INH, ING, CON	Upper respiratory tract irritant; gastroenteritis; muscle spasm; slow pulse, extrasystoles; hypokalemia; irritant to eyes, skin; skin burns.

INH = Inhalation ING = Ingestion ABS = Skin Absorption CON = Skin or mucous membrane contact
 NA = Not applicable or available Ca = NIOSH considered carcinogen CNS = Central Nervous System

Table 1.3-1 - Master Tox Table (Continued)

OCCUPATIONAL HEALTH EXPOSURE AND TOXICOLOGICAL PROPERTIES FOR
CONTAMINANTS OF OCCUPATIONAL HEALTH CONCERN

Contaminant	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP eV	Vapor		Route of Exposure	Symptoms of Exposure
							Pressure			
BENZENE	1 ppm	0.1 ppm	10 ppm	5 ppm OSHA/ 1 ppm NIOSH	500 ppm	9.24	75		INH, CON, ABS, ING	Irritant to eyes, nose and respiratory system; giddiness; headache; nausea; staggered gait; fatigue; anorexia; lassitude; dermatitis; bone marrow depression; CARCINOGEN.
CADMIUM	0.005 mg/m ³	Carcinogen (lowest possible)	0.01 mg/m ³	NA	9 mg/m ³	NA	NA		INH, ING	Pulmonary edema, dyspnea, cough, chest tightness, pain, headache; chills, muscle aches; nausea, vomiting, diarrhea; emphysema, mild anemia; CARCINOGEN.
CHROMIUM (VI)	0.1 mg/m ³	0.001 mg/m ³	0.05 mg/m ³	NA	30 mg/m ³	NA	NA		INH, ING, CON	Respiratory system irritant, nasal septum perforation; liver, kidney damage; leukocytosis, leukopenia, monocytosis, eosinophilia; eye injury, conjunctivitis; skin ulcer; sensitivity dermatitis; CARCINOGEN.
CHROMIUM (III)	0.5 mg/m ³	0.5 mg/m ³	0.5 mg/m ³	NA	25 mg/m ³	NA	Depends on compound		INH, ING, CON	Irritant to eyes; sensitizer, dermatitis.
COBALT	0.1 mg/m ³	0.05 mg/m ³	0.02 mg/m ³	NA	20 mg/m ³	NA	NA		ING, INH, CON	Cough; dyspnea, decreased pulmonary function; low-weight; dermatitis; diffuse nodular fibrosis; respiratory hypersensitivity.

INH = Inhalation ING = Ingestion ABS = Skin Absorption CON = Skin or mucous membrane contact
NA = Not applicable or available Ca = NIOSH considered carcinogen CNS = Central Nervous System

Table 1.3-1 - Master Tox Table (Continued)

OCCUPATIONAL HEALTH EXPOSURE AND TOXICOLOGICAL PROPERTIES FOR
CONTAMINANTS OF OCCUPATIONAL HEALTH CONCERN

Contaminant	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP eV	Vapor		Route of Exposure	Symptoms of Exposure
							Pressure	NA		
COPPER	1 mg/m ³	1 mg/m ³	1 mg/m ³	NA	100 mg/m ³	NA	NA	NA	INH, ING, CON	Irritant to nasal mucus membranes, pharynx; nasal perforation; eye irritant; metallic taste; dermatitis.
ETHYLBENZENE	100 ppm	100 ppm	100 ppm	125 ppm	800 ppm	8.76	7	7	INH, ING, CON	Irritant to eyes, mucus membranes; headache, dermatitis, narcosis, coma.
GASOLINE	300 ppm	NA	300 ppm	500 ppm	ND	Unknown	38-300	38-300	INH, ING, CON, ABS	Irritant to eyes, skin and mucous membranes; dermatitis; headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonia; possible liver, kidney damage; CARCINOGEN.
LEAD	0.05 mg/m ³	0.100 mg/m ³	0.15 mg/m ³	NA	100 mg/m ³	NA	NA	NA	INH, ING, CON	Weakness, lassitude, insomnia, facial pallor; pale eyes, anorexia; malnutrition, constipation; abdominal pain, colic, anemia; gingival lead line; tremors, paralysis of the wrist and ankles; encephalopathy; nephropathy; irritant to eyes; hypotension.

INH = Inhalation ING = Ingestion ABS = Skin Absorption CON = Skin or mucous membrane contact
 NA = Not applicable or available Ca = NIOSH considered carcinogen CNS = Central Nervous System

Table 1.3-1 - Master Tox Table (Continued)

OCCUPATIONAL HEALTH EXPOSURE AND TOXICOLOGICAL PROPERTIES FOR
CONTAMINANTS OF OCCUPATIONAL HEALTH CONCERN

Contaminant	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP eV	Vapor		Route of Exposure	Symptoms of Exposure
							Pressure	NA		
MERCURY	0.1 mg/m ³ (ceiling)	0.05 mg/m ³	0.05 mg/m ³	0.1 mg/m ³	10 mg/m ³	NA	0.0012	NA	INH, ABS, CON	Cough, chest pain, dyspnea, bronchial pneumonia; tremor, insomnia; irritability; indecision; headache, fatigue, weakness; stomatitis, salivation; gastro-intestinal disorders, anorexia, low-weight; irritation to eyes and skin.
NICKEL	1 mg/m ³ (soluble)	0.015 mg/m ³	0.1 mg/m ³	NA	10 mg/m ³ Carcinogen	NA	NA	NA	INH, ING, CON	Headache, vertigo; nausea, vomiting; epigastric pain; substernal pain; cough, hyperpnea; cyanosis; weakness; leukocytosis, pneumonia; delirium, convulsion; CARCINOGEN.
SILVER	0.01 mg/m ³	0.01 mg/m ³	0.1 mg/m ³	NA	10 mg/m ³	NA	NA	NA	INH, ING, CON	Blue-gray eyes, nasal septum, throat, skin; irritant to skin, ulceration; gastro-intestinal disturbance.
TETRACHLOROETHYLENE (Perchloroethylene)	100 ppm	Carcinogen	25 ppm	100 ppm	Carcinogen 150 ppm	9.32	14	NA	INH, ING, CON	Irritant to eyes, nose and throat; nausea; flush face, and neck; vertigo, dizziness, incoherence; headache, somnolence; skin erythema; liver damage; CARCINOGEN.

INH = Inhalation ING = Ingestion ABS = Skin Absorption CON = Skin or mucous membrane contact
NA = Not applicable or available Ca = NIOSH considered carcinogen CNS = Central Nervous System

Table 1.3-1 - Master Tox Table (Continued)

OCCUPATIONAL HEALTH EXPOSURE AND TOXICOLOGICAL PROPERTIES FOR
CONTAMINANTS OF OCCUPATIONAL HEALTH CONCERN

Contaminant	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP eV	Vapor		Route of Exposure	Symptoms of Exposure
							Pressure	Depends on compound		
THALLIUM	0.1 mg/m ³	0.1 mg/m ³	0.1 mg/m ³	NA	20 mg/m ³	NA	Depends on compound		INH, ING, CON, ABS	Nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peripheral neuritis, tremor; retrosternal tightness, chest pain, pulmonary edema; seizure, chorea, psychosis; liver and kidney damage; alopecia; paresthesia in the legs.
TOLUENE	200 ppm	100 ppm	50 ppm	150 ppm	500 ppm	8.82	21		INH, ING, CON, ABS	Fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, lactimation, nervousness, muscle fatigue, insomnia, paresthesia and dermatitis.
TOTAL PETROLEUM HYDROCARBONS (represented as gasoline because it is the closest compound with occupational exposure limits)	300	No REL	300	500	ND	NA	38-300		INH, CON, ING, ABS	Irritant to eyes; mucus membrane, headache, narcosis; dermatitis.
TRICHLOROETHYLENE	100 ppm	Carcinogen	50 ppm	100 ppm	Carcinogen 1,000 ppm	9.45	58		INH, ING, CON	Headache, vertigo; visual disturbance, tremors, somnolence, nausea, vomiting; irritation to eyes; dermatitis; cardiac arrhythmia; CARCINOGEN.

INH = Inhalation ING = Ingestion ABS = Skin Absorption CON = Skin or mucous membrane contact
 NA = Not applicable or available Ca = NIOSH considered carcinogen CNS = Central Nervous System

Table 1.3-1 - Master Tox Table (Continued)

OCCUPATIONAL HEALTH EXPOSURE AND TOXICOLOGICAL PROPERTIES FOR
CONTAMINANTS OF OCCUPATIONAL HEALTH CONCERN

Contaminant	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP eV	Vapor		Route of Exposure	Symptoms of Exposure
							Pressure	Pressure		
VANADIUM (AS VANADIUM PENTOXIDE) DUST	0.5 mg/m ³	0.05 mg/m ³ (ceiling)	0.05 mg/m ³	NA	35 mg/m ³	NA	NA	NA	INH, ING, CON	Irritant to the eyes; green tongue, metallic taste, eczema; cough; fine rales, wheezing, bronchitis, dyspnea; irritant to the throat.
VINYL CHLORIDE (CHLOROETHANE)	1 ppm	Carcinogen	5 ppm	5 ppm 15 min	Carcinogen	9.99	3.3 atm		INH, CON	Weakness; abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; CARCINOGEN.
XYLENE	100 ppm	100 ppm	100 ppm	150 ppm	900 ppm	8.44-8.56	7-9		INH, ING, CON, ABS	Dizziness; excitement; drowsiness; incoherence; staggering gait; irritant to eyes, nose and throat; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis.
ZINC (Zinc Oxide Fume)	5 mg/m ³	5 mg/m ³	5 mg/m ³	10 mg/m ³	500 mg/m ³	NA	NA		INH	Sweet, metallic taste; dry throat, cough; chills, fever; tight chest, dyspnea, rales, reduced pulmonary function; headache, blurred vision; muscle cramps, low back pain; nausea, vomiting; fatigue, lassitude and malaise.

INH = Inhalation ING = Ingestion ABS = Skin Absorption CON = Skin or mucous membrane contact
NA = Not applicable or available Ca = NIOSH considered carcinogen CNS = Central Nervous System

1.3.1.1 Previous Contamination Investigation Results.

Chemicals of Concern	Concentration
1,1-Dichloroethane (1,1-DCA)	60 µg/kg (soil)
1,1,1-Trichloroethane (1,1,1-TCA)	520 µg/kg (soil); 7.1 µg/L (GW)
1,1-Dichloroethene (1,1-DCE)	2,000 µg/kg (soil); 16 µg/L (GW)
Trichloroethene (TCE)	650 µg/kg (soil); 31 µg/L (GW)
Tetrachloroethene (PCE)	2,500 µg/kg (soil); 140 µg/L (GW)
Methylene chloride	300 µg/kg (soil)
Freon 11	480 µg/kg (soil)

1.3.1.2 Contaminant Driving the Air Monitoring Program.

Benzene will drive the air monitoring program as it has the lowest PEL. Even with 100% volatilization of all other compounds, their PELs would not be reached. It is not expected that the PEL of benzene will be reached either, but it is the lowest value.

1.3.2 Biological Hazards

See Section 2.13.2 for a discussion of general biological hazards. Biological hazards specific to the project site have not been identified.

1.3.2 Radiological Hazards

Radiological hazards are not expected at this site.

1.4 ACTIVITY HAZARD ANALYSIS

Based upon the anticipated field activities, this section provides information concerning the potential hazards associated with the planned field activities and recommended controls to minimize risk to site personnel. In particular, the potential hazards posed during each operation are presented in the attached Activity Hazard Analysis (Table 1.4-1).

1.5 SITE PERSONNEL

Section 2.2 presents the roles and responsibilities of the key personnel involved with health and safety for site activities. The name, title and business phone number for each person with the site specific positions are presented listed below:

- MWH Principal-in-Charge
Dr. Stephen J. Cullen
(805) 693-0613
- MWH Project Manager
Mr. Frank Tam
(626) 568-6339



**Table 1.4-1
ACTIVITY HAZARD ANALYSIS
Utility Trailer Manufacturing Company**

ANALYZED BY/DATE: Linda Tuley/November 18, 2002
REVIEWED BY/DATE:

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
<p>1. SOIL SAMPLING</p>	<p><u>Physical Hazards:</u> 1. Standing in one place for long periods of time, causing blood pooling in the lower extremities.</p> <p><u>Chemical/Toxicological Hazards:</u> Potential exposure to volatile organic compounds as described in the HSP.</p> <p><u>Chemical/Toxicological Hazards:</u> Potential exposure to volatile organic compounds as described in the HSP.</p> <p><u>Biological Hazards:</u> Possibly spiders or insects in covered areas.</p> <p><u>Radiological Hazards:</u> None associated with this sampling program</p> <p><u>Physical Hazards:</u> 1. Contact with overhead obstructions or underground utilities. 2. Vehicle sliding or tipping 3. Slip/trip/fall 4. Thermal stress</p>	<p><u>Physical Hazards:</u> 1. Avoid standing still for long periods of time – walk around the site, site if possible. Do deep knee bends and keep arms moving.</p> <p><u>Chemical/Toxicological Hazards:</u> 1. Air monitoring using a PID with a 10.2 or 10.6 eV probe 2. Level D or C PPE as described in the HSP, upgrading or downgrading pending air monitoring results.</p> <p><u>Chemical/Toxicological Hazards:</u> 3. Air monitoring using a PID with a 10.2 or 10.6 eV probe 4. Level D or C PPE as described in the HSP, upgrading or downgrading pending air monitoring results.</p> <p><u>Biological Hazards:</u> 1. Do not reach into covered areas without first looking for signs of spiders or using heavy gloves as protection. Break away webs with a stick or flashlight.</p> <p><u>Radiological Hazards:</u> Nothing required.</p> <p><u>Physical Hazards:</u> 1. Check for overhead obstructions prior to raising mast of rig. Maintain a 20- foot clearance from overhead power lines. The location of buried or underground utilities and services must be known before starting drill. 2. Always take the carrier unit out of gear and set emergency brake and block wheels before engaging remote ignition. Use caution when carrier vehicle is parked on loose or soft ground. Do not apply enough force to the probe foot to lighten the load on the carrier vehicle suspension. Reduce weight on the vehicle tires may allow the vehicle to shift or slide on loose surfaces. Never exert downward</p>
<p>2. HSA DRILLING/HSA WELL ABANDONMENT</p> <ul style="list-style-type: none"> • Mobilization of rig • Set up of rig • Set up of augers • Drilling of augers • Retract augers • Grout space • Cleanup/decontamination • Carrier Vehicle • Drill rig unit • Hand tools • Service truck 		

Table 1.4-1
ACTIVITY HAZARD ANALYSIS
Utility Trailer Manufacturing Company

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
		<p>pressure on the probe rod so as to lift the probe foot over six inches off the ground. Never exert down pressure on the probe rod so as to lift the rear tires of the carrier vehicle off the ground. Extend the probe unit out from the vehicle and deploy the foot to clear the vehicle roof line before folding the probe unit.</p> <ol style="list-style-type: none"> 3. Watch where you step, be aware of uneven terrain. Keep footwear and work area free of mud and drilling fluids. Maintain 3 points of contact when mounting and dismounting rig. All unattended bore holes must be covered or filled in. 4. Refer to HSP Section 2.11 for a thorough discussion on thermal stress and severe weather. 5. When lifting, be sure to size up the load, get assistance when possible and follow proper lifting techniques. 6. Use heavy work gloves when hand augering. Be watchful of the moving parts. 7. Hard hat, hearing protection, steel-toed footwear and safety glasses are required while operating or working around the machine. Operator must stand to the control panel of the probe machine, clear of the probe foot and derrick, while operating controls. Only one person should operate the machine. This ensures that one person will not accidentally engage the controls while an others person's hand, fingers, or other appendages are on or around any moving parts. Probe machines are equipped with a remote starting system. Ensure that everyone is clear of all moving parts before starting the engine. 8. Turn off the hydraulic system at the control panel while changing augers or attaching accessories. Shut down the hydraulic system and stop the vehicle before attempting to clean or service equipment. Do not wear loose clothing while operating or work on/near the machine. Never place hands on top of probe rod while rod is under probing machine. In the event of a problem, the operator should release all control levers. This will automatically return the lever to the neutral position and machine operation will cease. All crew members must familiarize themselves with the location of the Emergency Kill button before operating the machine.

**Table 1.4-1
ACTIVITY HAZARD ANALYSIS
Utility Trailer Manufacturing Company**

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p><u>Motor Vehicles</u> Before initial use vehicles will be inspected by a mechanic and found in safe operating conditions.</p> <p><u>Equipment</u></p> <ol style="list-style-type: none"> 1. Heavy lifting. 2. Pinch points to the hands 3. Being struck by equipment/vehicles. 4. Caught in or between 5. Before equipment is placed in use it will be inspected and tested by a competent person. 6. Inspections and test will be in accordance with manufacturer recommendations. 7. All equipment/tools will be inspected daily (when in use) to ensure safe operating conditions. A designated competent person will conduct the daily inspections or test. 8. The rig and all equipment used for drilling shall be inspected prior to use. Special attention shall be given to the hydraulic hoses, and fittings. 9. Defective equipment shall not be used 10. Inspections and test will be documented and the contractor will maintain records at the site. <p><u>Safety Inspections</u> The Site Safety Office will conduct daily site safety inspections to ensure that safety procedures are followed.</p>	<p><u>Site Specific</u></p> <ol style="list-style-type: none"> 1. General HAZWOPER (40-hour initial, plus 8-hour annual refresher). 2. Initial site and site specific indoctrination training. 3. Daily tailgate safety meetings 4. Hazard Communications training for hazardous substances brought onto the job site <p><u>Supervisor Personnel</u></p> <ol style="list-style-type: none"> 1. First Aid and CPR 2. 8-hour HAZWOPER supervisory training <p><u>Equipment General</u> Employees will be qualified and trained to operate or service mechanical equipment.</p>	

- MWH Project Safety Officer
Ms. Beth Darnell, CIH
(925) 975-3544
- MWH On-Site Safety Officer
Ms. Jennifer Wiley
(714) 646-2004
- Subcontractor Designated On-Site Safety Officer(s)
To Be Determined On Site

1.6 MONITORING REQUIREMENTS

Monitoring is a critical part of the on-site safety program for hazardous waste field activities.

1.6.1 Instrumentation

The following pieces of equipment are required for conducting a health hazard assessment at the site:

- Photoionization Detector with a 10.2 or 10.6 electron volt (eV) lamp
- Colorimetric indicator tubes for benzene

1.6.1.1 Photoionization Detectors (PID). A PID with a 10.2 or 10.6 eV lamp will be used on site whenever organic vapor contaminants are thought to be present and invasive work is taking place. PID readings will be taken at the well heads, ground surfaces and worker breathing zone levels. PID readings will be collected during invasive activities at enough frequency so as to adequately characterize the amount of vapor emitting from an area of invasive work. For example, during the initial stages of equipment maintenance, groundwater elevation monitoring, and every 30 minutes thereafter. More frequent measurements may be required depending on site conditions. The PID will be calibrated with 100 ppm isobutylene calibration gas. Calibrations will be performed at the beginning and end of each day of PID use. The PID will be operated in accordance with the manufacturers instructions. During regular use, the meter will be kept on the most sensitive scale.

1.6.1.2 Colorimetric Indicator Tubes. Colorimetric indicator tubes for benzene will be used to supplement PID readings in an effort to isolate benzene vapor from the total hydrocarbon vapors detected by the PID. When compounds have very low occupational exposure limits it is difficult to determine a true PID reading from instrument noise, or if the vapor causing the reading is the toxic compound or another component of the contamination. It is recommended that the colorimetric indicator tubes be used. A colorimetric indicator tube will be used when the PID reads 1 meter unit (essentially ppm) above background. Additional readings may be collected at set intervals of time depending on site conditions, so as to adequately characterize exposure to benzene during invasive work. It should be noted that there is a reported +/- 25% accuracy associated with the colorimetric indicator tubes.

1.6.2 Action Levels

This section provides a rationale for selecting action levels for site contaminants. Table 1.6-1 presents the Utility Trailer Manufacturing Property action levels which are described herein.

The EPA in the Standard Operating Safety Guides for hazardous waste site work prescribe default values for determining the appropriate level of personal protective equipment, or evacuation of a site.

1.6.2.1 Organic Vapors. EPA standard default values for PPE ensembles:

- Level D—Background Readings
- Level C—Above Background to 5 ppm
- Level B—5 ppm to 500 ppm
- Level A—500 ppm to 1,000 ppm

The OSHA standard for action levels to implement engineering controls, work practice controls or protective equipment is one half the PEL.

The EPA default values are very conservative and could result in personnel trading physical hazards (heat stress, decreased visibility, decreased communication) for a perceived chemical protection. When information is known about the site contaminants, it is preferable to derive an action level based upon the OSHA action levels and professional judgment regarding acceptable exposure concentrations. Thus, site-specific organic vapor action levels are set for the site work, as follows:

- Petroleum contamination: Use a PID with a 10.2 or 10.6 eV probe and benzene colorimetric indicator tubes for monitoring subsurface activities. At 1 ppm above background (sustained for 15 minutes) on the PID, collect a colorimetric indicator tube sample for benzene:
 - if benzene is not detected continue in Level D up to 10 ppm, then don Level C with a half-face air purifying respirator (APR). Change cartridges at a minimum of every hour of active use. At 100 ppm organic vapors with benzene not detected, don Level C with full-face APR. Notify MWH on-site safety officer and MWH project manager during respiratory upgrade activities.
 - if benzene is detected between 1 and 10 ppm, upgrade to Level C with a half-face APR (organic vapor). If benzene is detected above 10 ppm and less than 25 ppm, don Level C with a full-face APR. At 25 ppm benzene upgrade to Level B. At 500 ppm organic vapors, evacuate the site. Notify MWH on-site safety officer and MWH project manager during respiratory upgrade activities.





**Table 1.6-1
Utility Trailer Manufacturing Company
ACTION LEVELS FOR UPGRADING PPE OR CEASING WORK**

Equipment	Meter Deflection	Action	Benzene Drager Test Results	Resulting PPE Level
Photoionization Detector (PID)	<1	No action required	Not required	Level D
PID with Benzene Drager Tube(a)	>1 - <10	Perform DBT(c)	Negative	Level D
	<1 - <10	Perform DBT(c)	Positive	Level C - Half-face
	>10 - <25	Continuous monitoring	Req. at 30 min. work int.	Level C - Full-face
	>25	Perform DBT(c)	Negative	Level C - Half-face
	>25 - <100	Continuous monitoring	Negative	Level C - Half-face or Full-face
	>25(b)	Notify OSO/PSO(c)	Positive	Evacuate site
	>100(b)	Continuous Monitoring	Negative	Level C - Full-face
	>500(b)	Notify OSO/PSO(c)	Not Required	Evacuate site

(a) All PID measurements will be taken in the worker breathing zone (4-6 feet above ground surface).
 (b) PID meter deflections are continuous for 15 minutes. Deflections >25 with positive indication on the Benzene Drager Test or >500 with no indication with the Benzene Drager Test will result in immediate evacuation.
 (c) Definition: OSO= On-site Safety Officer; PSO = Project Health and Safety Officer; DBT= Drager Benzene Test; NA = Not Applicable

1.6.2.2 Noise. The following limits are used for noise monitoring:

- < 85 dBA Continue work
- > 85 dBA Use hearing protection device rated at no less than the amount that would bring the exposure to under 85 dBA

<u>dBA Reading</u>	<u>Allowable Time Without Hearing Protection</u>
85	8 hours
90	4 hours
95	2 hours
100	1 hour
105	0.5 hour
110	0.25 hour

If noise monitoring is not conducted during drilling activities or near heavy equipment operation, hearing protection will be used at all times in these work areas.

1.7 PERSONAL PROTECTION AND MITIGATION

Level D has been chosen as the initial level of protection for all field tasks. From the previous field investigation conducted at the subject site, the concentrations of contaminants are expected to be in the Level D action level range.

1.7.1 Specifications To Level D Ensembles

For Level D, personnel will incorporate the following into the standard Level D ensemble:

Gloves: Nitrile gloves will be used when handling potential contaminated soil, water, or other materials.

1.7.2 Specifications To Level C Ensembles

For Level C, personnel will incorporate the following into the standard Level C ensemble:

Coveralls: Coated Tyvek, Saranex, or Barricade coverall inner.

Gloves: Nitrile inner and outer gloves will be used when handling potential contaminated soil, or other materials

Respirator: Half- or full-facepiece air purifying respirator with organic vapor cartridges.

1.8 EMERGENCY ASSISTANCE INFORMATION

ALWAYS PROVIDE YOUR EXACT LOCATION TO THE 911 OPERATOR

Utility Trailer Manufacturing Company
17300 Chestnut Street
City of Industry, California

The OSO will be responsible for taking necessary action and contacting the appropriate emergency contacts and MWH personnel in case of an emergency.

1.8.1 24-Hour Emergency Hospital

Emergency Room and General Number (562) 945-3561
Whittier Hospital Medical Center
9080 Colima Road
Whittier, California 90605

Figure 1.8-1 shows the location of the Hospital relative to the facility. The directions to Whittier Hospital Medical Center are as follows:

1. Start out going east on CHESTNUT STREET.
2. Turn left on ANAHEIM PUENTE ROAD.
3. Continue on S AZUSA AVENUE.
4. Turn right onto COLIMA ROAD
5. Continue east on COLIMA ROAD for approximately 5.5 miles.

1.8.2 Emergency Contact Numbers

Ambulance	911
Fire Department	911
Police Department	911
Poison Control	(800) 256-9822
National Response Center	(800) 424-8802
Utilities Underground Service Alert	(800) 422-4133

Client: Industry Urban Development Agency

MWH Workers' Compensation Insurance Information:

AON (Janice Johnson)	(213) 630-3200
The Hartford (Steve Tribucher)	(800) 826-7365 ext. 41347

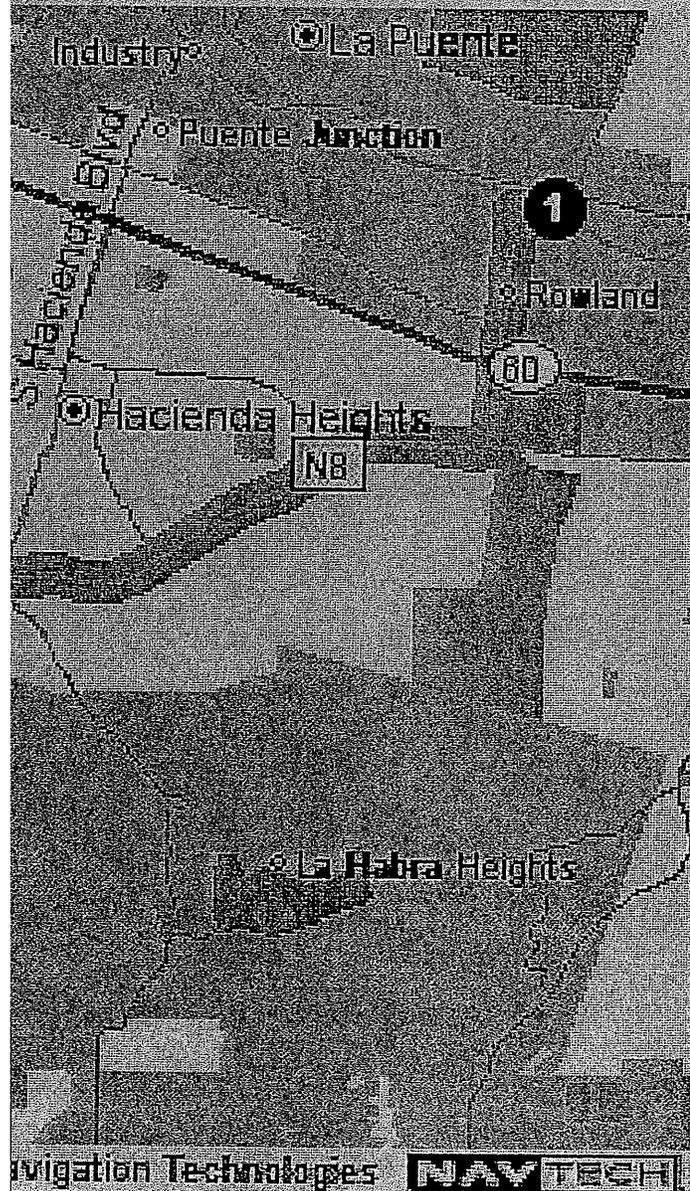
1.8.3 Key MWH Project Personnel

<u>Contact Person</u>	<u>Work Number</u>	<u>Home Number</u>	<u>Mobile</u>
Dr. Stephen J. Cullen Principal-in-Charge	805-693-0613	N/A	805-886-8770
Frank Tam Project Manager	626-568-6339	N/A	626-945-8025
Jennifer Wiley On-site Safety Officer	714-646-2004	N/A	818-266-0841
Beth Darnell Project Safety Officer	925-975-3544	925-825-9711	925-256-5490 (pager)



FIGURE 1.8-1

ASSISTANCE INFORMATION
TO THE HOSPITAL



2. Whittier Hospital Medical Center
9080 Colima Road
Whittier, California 90605
(562) 945-3561

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APPENDICES:

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- B - Personal Acknowledgment Form
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- D - Accident/Incident/Near Miss Reporting Procedures and Form
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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ANSI	American National Standards Institute
APR	Air Purifying Respirator
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicators
CIH	Certified Industrial Hygienist
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
CRZ	Contamination Reduction Zone
EKG	Electrocardiogram
EPA	(U.S.) Environmental Protection Agency
FEF	Forced Expiratory Flow
FEV	Forced Expiratory Volume
FID	Flame Ionization Detector
FSP	Field Sampling Plan
FTL	Field Team Leader
HEPA	High Efficiency Particulate Air
HSP	Health and Safety Plan
IDLH	Immediately Dangerous to Life or Health
IDW	Investigation-Derived Waste
IIPP	Illness and Injury Prevention Program
LEL	Lower Explosive Limit
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OSO	Onsite Safety Officer
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PPE	Personal Protective Equipment
PSO	Project Safety Officer
RI/FS	Remedial Investigation/Feasibility Study
RPM	Remedial Program Manager
SCBA	Self-Contained Breathing Apparatus
SLM	Sound Level Meter
SOP	Standard Operating Procedures
TLD	Thermo-luminescent Detectors
WBGT	Wet Bulb Globe Temperature



2.0 GENERAL HEALTH AND SAFETY PROCEDURES FOR HAZARDOUS WASTE OPERATIONS

2.1 GENERAL HEALTH AND SAFETY POLICY STATEMENT

It is the policy of MWH and the management organization assigned to field projects to provide a safe and healthful work environment for all assigned employees. MWH recognizes that injury, illness, or property/equipment loss impacts each of our lives through suffering and potential disability, as well as through lost wages and productivity.

A fundamental principle of industrial safety and loss prevention is that most all accidents causing injuries or illnesses and property damage are *preventable*. Examinations of the causes of accidents and industrial illnesses demonstrate that most injuries or illnesses are the result of an unsafe act or condition. MWH recognizes that it is both a moral obligation and a sound business practice to prevent workplace injuries and illnesses. This can be accomplished by recognizing, evaluating and controlling unsafe acts and conditions.

The health a safety program embodied in this portion of each MWH health and safety plan (HSP) has been developed in accordance with relevant occupational safety and health regulations and requirements, and applies to all field sites and workplaces associated with the referenced Contract.

Safety and loss prevention are a direct responsibility of all levels of management under all projects. Each level of onsite management has the responsibility to provide a safe and healthful work environment. This shall be achieved through strict adherence to the requirements of this site health and safety program and associated addenda.

The MWH Project Health and Safety Officer (PSO), assigned Onsite Safety Officers (OSOs), designated onsite safety officers and subcontractor designated onsite safety officers, will cooperatively implement the requirements of each company's Injury and Illness Prevention Program along with the requirements of this HSP. Management personnel at all levels shall, through personal example, create a work climate in which all assigned employees develop a concern not only for their own safety and health, but also for the safety and health of their fellow workers and the environment. While it is important to instill a sense of empowerment for innovation and efficiency, the knowledge of boundary conditions concerning the health and safety program by all personnel is vital. Common sense and good judgment always need to be applied to site work; however, it is not intended that the health and safety guidelines contained in this HSP or subsequent addenda be open to innovative interpretation.

The MWH Industrial/Hazardous Waste Operations Group Health and Safety Manager, or designee, will be available for consultation during the field work covered by this HSP.

2.2 HEALTH AND SAFETY ORGANIZATION

The efforts of multiple organizations are usually necessary for the completion of investigations and remedial objectives associated with hazardous waste site work. Each individual assigned to oversee or conduct field work will be responsible for conducting his/her job in a safe and healthful manner. However, in order to facilitate the implementation of this health and safety program, it is necessary to assign key responsibilities to specific individuals. Figure 2.2-1 presents the project organizational structure in relation to its responsibilities under the health and safety program.

2.2.1 Roles and Responsibilities

Implementation of the HSP will be accomplished through an integrated effort of the following personnel:

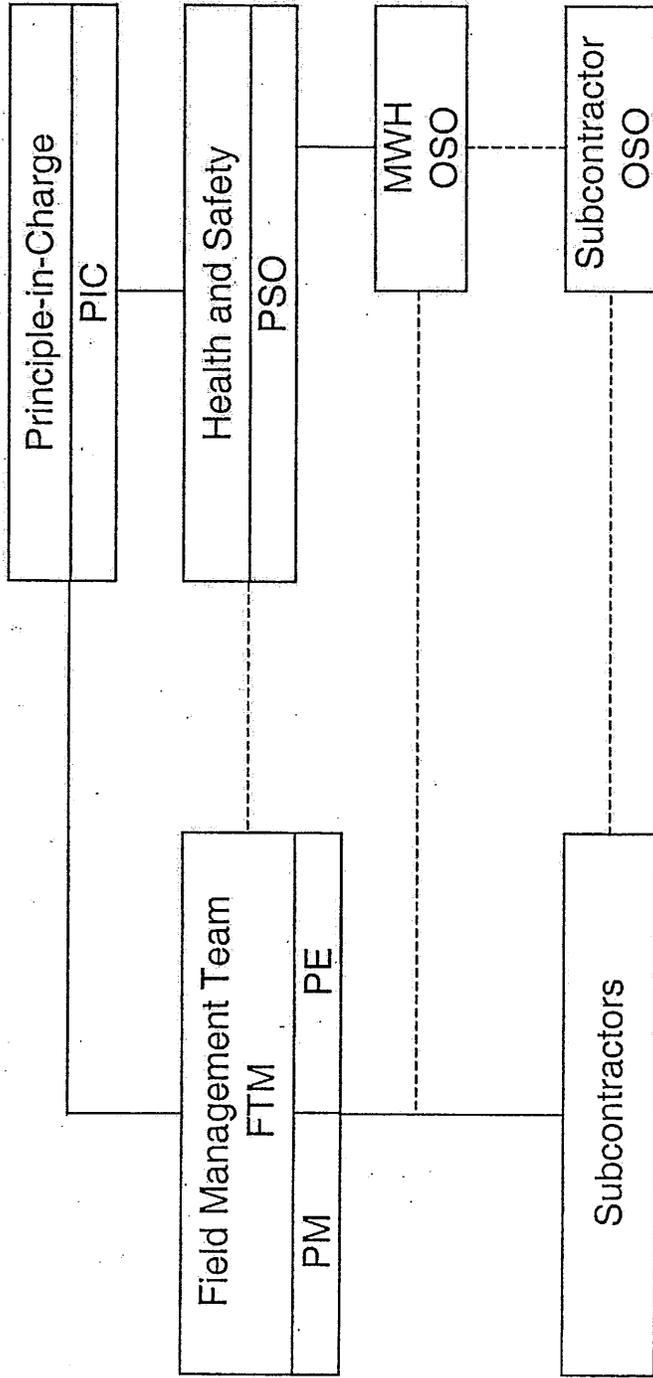
- MWH Principal in Charge
- MWH Project Manager
- MWH Project Engineer
- MWH PSO
- MWH Field Team Leader/Field Supervisor
- MWH OSO
- Subcontractor OSO

The roles of key personnel are further discussed in the following subsections.

2.2.1.1 Principal in Charge

As the key senior management representative on the project, the Principal in Charge is responsible for defining project objectives, allocating resources, determining the management organization, and evaluating program outcomes. Through the Project Manager, the Construction Manager/Engineering Manager, and assigned Project Engineers, the Principal in Charge is ultimately responsible for:

- provision of the necessary facilities, equipment, and budget to perform work safely;
- provision of adequate personnel and schedule to conduct activities safely;
- ensuring proper review and distribution of all health and safety documents
- supporting the efforts of onsite management; and
- providing for appropriate disciplinary action when unsafe acts or practices occur.



- Principle in Charge
- Project Manager
- Project Engineer
- Project Health and Safety Officer
- Montgomery Watson Harza
- Onsite Safety Officer
- Field Team Manager



MWH
MONTGOMERY WATSON HARZA

Figure 2.2-1
Health and Safety Organization

2.2.1.2 Project Manager

In addition to the general considerations described in Section 2.2.1.1, the Project Manager (PM) and the assigned Construction Manager and/or Engineering Manager is responsible for overall responsibility for the performance of their assigned portions of the project in a safe healthful manner, and is the central point of contact with client representatives. Should a health and safety issue develop in the performance of the contract requiring consultation with the client, they are responsible for immediately contacting the appropriate client representative and provide guidance in the selection of appropriate resources necessary for resolution of the issue(s).

2.2.1.3 Project Engineer

In addition to the considerations discussed in Section 2.2.1.1, individual Project Engineers are responsible for ensuring that the goals of their assigned tasks are attained in a manner consistent with HSP requirements. They shall coordinate with the PSO and assigned OSOs in the logistical aspects of implementing the HSP in support of all required site activities. Project Engineers may also serve as a secondary contact with client representatives regarding HSP implementation issues.

2.2.1.4 Project Health and Safety Officer

The MWH PSO is responsible for the preparation and update of the HSP. The PSO shall have and maintain the designation of Certified Industrial Hygienist (CIH) or Certified Safety Professional (CSP), or shall work under the supervision of a CIH or CSP, and shall ensure that all health and safety program documents comply with all state and local health and safety requirements. If necessary, the PSO can modify the HSP to adjust for on-site changes that affect health and/or safety. Prior to making any formal changes to the HSP, he/she will consult with the PM or client, as necessary. The PSO will coordinate with the OSO(s) on all modifications to the HSPs and will be available for consultation when required. The PSO shall prepare the materials to be used in the training program and ensure that OSOs are knowledgeable in all aspects of the HSP. The PSO may periodically visit the site during the project to evaluate the effectiveness of the health and safety program and compliance with the HSP through inspections and audits. Other responsibilities include:

- ensuring that medical monitoring, incident reporting, and recordkeeping meet all federal and state regulatory requirements;
- developing, implementing, and maintaining employee training and medical surveillance programs;
- reviewing and commenting on HSPs prepared by other project personnel;

-
- participating in professional organizations to obtain and exchange information to keep the health and safety program current; and
 - monitoring state and federal requirements to maintain the health and safety program in current status.

2.2.1.5 Field Team Leader and/or Subcontractor Supervisor

The MWH Field Team Leader and any Subcontractor Supervisors are responsible for:

- becoming knowledgeable about the background of their assigned sites;
- obtaining access to locations where access restriction exist and coordinating site activities with appropriate authorities;
- briefing field team members on their specific assignments and participating in daily "tailgate" safety meetings; and
- coordinating with the OSO to ensure that site safety and health issues are being met.

2.2.1.6 On-Site Safety Officer

The MWH OSO is responsible for facilitating and coordinating the field implementation of the HSP. Sites in California have the requirements of SB 198 or 8 CCR 1509 and 8 CCR 3203 Injury and Illness Prevention Programs. The OSO is responsible for implementing MWH's *Injury and Illness Prevention Program*; a copy is provided as Appendix A of this HSP. Copies of applicable subcontractor programs will be added to Appendix A or as separate addenda. The OSO will also maintain current certification in conducting CPR and first aid operations. The OSO has the responsibility and authority to halt or modify any working condition, or remove personnel from the site, if he/she considers conditions to be unsafe. The OSO will be the main contact in any on-site emergency situation, and will direct all field activities involved with safety. Specific tasks assigned to the OSO include:

- ensuring that all on-site personnel understand and comply with all safety requirements. Additionally, ensuring that a copy of the HSP is located at each active work zone;
- seeking guidance from the PSO when unanticipated conditions develop and obtaining approved amendments to the HSP, before implementing deviations from the existing health and safety program ;

- conducting or arranging for air monitoring operations at each site to verify that workers are wearing the appropriate level of protective clothing;
- ensuring that the specified protective clothing is available and in use by project team members;
- periodically inspecting protective clothing and health hazard assessment equipment for defects and signs of wear;
- ensuring that health hazard assessment equipment is calibrated and maintained in good working order;
- establishing, enforcing, and documenting decontamination operations for personnel and equipment;
- inspecting and maintaining first-aid kits and other emergency supplies;
- verifying the route to the emergency medical facility and ensuring that the information is posted for all site workers to use;
- participating in accident/incident and near miss investigations;
- controlling the entry and exit points to active work zones;
- confirm each person's ability to perform site work with the HSO or subcontractor company official and, maintain a file of current training and medical surveillance certificates. Enforcing written medical restrictions for site personnel, as necessary;
- conducting and documenting the daily tailgate safety meetings;
- monitoring the field team for signs of thermal stress and fatigue;
- monitoring on-site hazards and conditions;
- conduct periodic inspections to ensure the requirements of the health and safety program and Site HSP are being followed;
- enforcing the buddy system;
- coordinating with the subcontractor designated on-site safety officer to resolve unsafe behavior and unsafe conditions posed by subcontractor personnel.

Dismissing subcontractor personnel when resolution of unsafe acts and conditions fail; and

- knowing emergency procedures, evacuation routes, and telephone numbers of the ambulance, local hospital, poison control center, fire department and police department.

2.1.2.7 Subcontractor On-Site Safety Officer

The subcontractor's designated OSO is responsible for ensuring that all subcontractor personnel have read, understand and comply with the provisions of the HSP. Additionally, the subcontractor's OSO is responsible for implementing the subcontractor's injury and illness prevention program. Prior to the submission of each HSP, the subcontractor shall submit pertinent health and safety information regarding the subcontractor's activities and equipment. It is the responsibility of the subcontractor's OSO to ensure that the particular safety and health hazards associated with the subcontractor's work are made known to all other affected site personnel - this will be accomplished by participating in the daily tailgate safety meetings, or by holding a pre-project briefing. The subcontractor's OSO will be the primary contact for the MWH OSO in cases where subcontractor behavior has been determined to be unsafe and is creating unsafe conditions. The subcontractor's OSO will be responsible for following up on such notices and correcting unsafe conditions and disciplining unsafe behavior.

2.1.2.8 Field Personnel

All field staff are responsible for understanding and complying with all requirements of the HSP. Written acknowledgments for completion of reading and training of the HSP shall be required. Field staff will be requested to bring all perceived unsafe site conditions to the attention of the OSO during each daily "tailgate" safety meeting, or sooner as conditions warrant. Additionally, any subcontractor personnel who will be providing services shall inform the rest of the field team, during the daily tailgate safety meetings, of any additional hazards posed by the use of their equipment and procedures.

2.1.2.9 Site Visitors

Visitors may be present at the project site during field activities. These individuals may include MWH and subcontractor management staff, regulatory agency personnel, client personnel and visitors. These visitors most likely can be accommodated by providing a general viewing area at a safe location in the support zone. The OSO can provide a brief overview of the field activities to the site visitors.

Any visitor wishing to enter the site exclusion or contamination reduction zone must provide verification to the OSO that shows they meet the 29 CFR 1910.120/29 CFR 1926.65 (or applicable State) Standard. If unannounced visitors want to gain access to the project site, the OSO should inform the responsible MWH Project Manager or Project Engineer, who shall

contact the appropriate client representative to obtain permission or denial of access. If access is approved, the OSO will make arrangements for the proper personal protective equipment (with the exception of respiratory protection) to be used on the project. Prior to entry into the exclusion or contamination reduction zone, each site visitor will be required to review the HSP and attend a tailgate safety meeting.

2.2.2 Notification Requirements

Unanticipated field conditions may occasionally require modification of the Site HSP. Client notification and/or approval procedures will depend on actual field conditions. Any personal protective equipment upgrade (Level D to C) will be reported in the Tailgate Safety Meeting Forms. Minor changes to the HSP to accommodate on-site conditions can be implemented by the OSO upon review and approval of the PSO; this might include slight changes in decontamination and site control procedures.

The PM shall be immediately notified of the following:

- any required site evacuation - based on air monitoring data;
- any fatality or admission of one or more site personnel to the hospital; and,
- any site physical hazard where continued site work could lead to possible death or permanent injury.

2.2.3 Enforcement Of Safe Work Practices In A Multi-Employer Job Setting

Enforcing safe work practices at a multiple employer job setting presents many challenges. Under OSHA, each employer is required to provide a safe and healthful working environment for its employees. Most hazardous waste sites will require that several contractors work simultaneously on different project tasks. In this situation, the activities of one company could potentially cause harm to the employees of another company, and so forth. This portion of the project HSP has been established to provide general guidance for the safe conductance of site activities and Section 1 of this HSP is designed to acknowledge the particular safety and health hazards associated with the specific site. It is not possible to present every subtle hazard associated with a particular piece of equipment or process; therefore, it is necessary for each company to present the particular safety and health issues associated with each day's activities. The forum for disseminating this information is through the daily "tailgate" safety meetings.

When conducting site activities, it is possible for personnel to forget or ignore certain provisions of the HSP. Personnel noticing deviations from accepted safe work practices will gently remind the affected personnel of the proper procedures. Should this fail to correct the deviation, the subcontractor's OSO and the MWH OSO will be informed of the circumstances. *Under no conditions are deviations from safe work practices to be tolerated by anyone on site.* The subcontractor's OSO and MWH OSO will attempt to correct the unsafe behavior or unsafe

conditions at the site. Should this attempt fail, the MWH OSO shall halt site activities and dismiss non-cooperative personnel.

2.3 PERSONNEL TRAINING

2.3.1 General

Anyone who enters a hazardous waste site or construction site must recognize and understand the potential hazards to health and safety associated with clean up operations at the site. It is the intent of this health and safety program to provide every person engaged in on-site activities associated with field activities a level of health and safety training consistent with his or her job functions and responsibilities. Employees working on site exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site, shall, at the time of assignment to the field, meet the OSHA hazardous waste site workers training requirements as stated in 29 CFR 1910.120/29 CFR 1026.65 and like State laws. Workers are categorized as either:

- 1) A general site worker, defined as equipment operators, general laborers, and supervisory personnel, engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards.
- 2) An occasional site worker, defined as workers on site only occasionally for a specific limited task, such as but not limited to, groundwater monitoring, land surveying, or geo-physical surveying, and who are unlikely to be exposed over permissible exposure limits and published exposure limits.

In addition to the OSHA hazardous waste operations and emergency response regulations, there are other ancillary safety and health regulations governing certain training aspects of this project. These include the training requirements specified in:

- "Injury and Illness Prevention Program" (8 CCR 1509 and 8 CCR 3203)
- "Respiratory Protection" (1910.134)
- "Hearing Conservation" (1910.95)
- "Hazard Communication Standard" (1910.1200)
- "Bloodborne Pathogens" (1910.1030)
- "Confined Space Entry" (29 CFR 1910.146)

- "Excavation and Trenching" (1926 Subpart P)

When a State regulation exists for a standard presented above, the standards of the State regulation shall supersede the Federal equivalent.

2.3.2 Initial Training

Individuals meeting the general site worker requirements will receive 40 hours of off-site instruction, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor. Individuals meeting the occasional site worker requirements, and workers in an area which has been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, will receive 24 hours of off-site instruction and a minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

The on-site managers and supervisors responsible for supervising personnel engaged in site work must have at least 8 additional hours of specialized training on managing such operations. This specialized training includes the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedures and techniques.

Employers who can show by an employee's work experience and/or training that the employee has had the equivalent of the stated requirements will be considered as meeting these initial training requirements.

Training elements to be covered include:

- introduction to the governing regulations for health and safety at hazardous waste sites;
- names and roles of personnel responsible for site safety and health;
- safety, health and other typical hazardous waste site operation hazards present at a site;
- use of PPE;
- types and use of equipment used to monitor the breathing zone and work areas of site personnel (i.e., photoionization detectors, combustible gas indicators, colorimetric indicator tube systems, dust meters and noise monitors);
- work practices by which the employee can minimize risks from hazards;

-
- safe use of engineering controls and equipment;
 - medical surveillance program requirements, including recognition of symptoms and signs which might indicate overexposure to hazards;
 - decontamination set-up and procedures;
 - emergency response planning including proper PPE and equipment selection and use;
 - confined space entry procedures;
 - spill containment program elements;
 - general principles of toxicology and review of the major categories of typical hazardous waste site contaminants;
 - general industrial hygiene principles of recognition, evaluation and control of health and safety hazards;

2.3.3 Refresher Training

All site workers, whether general, occasional or supervisory, shall complete 8 hours of off-site refresher training annually on the items covered in the 40 hour or 24 hour initial training program, indicated above.

2.3.4 Site-Specific Training

Site-specific training will be provided for all employees, contractors, and subcontractors who plan to enter the exclusion and contamination reduction zones at the site and who have met the requirements of 29 CFR 1910.120/29 CFR 1026.65. Training will be conducted prior to job start-up and as needed thereafter. The PSO and/or the OSO will conduct initial site-specific training prior to job start-up to ensure that employees have a thorough understanding of the HSP, standard operating procedures (SOPs), and physical, safety, biological, radiological and chemical hazards of the site. This training will be conducted as necessary when new employees enter the exclusion and contamination reduction zones. Topics addressed in the initial health and safety training will include:

- names of employees and others responsible for safety and health;
- employee rights and responsibilities under OSHA;

- acute and chronic effects of exposure to hazardous substances that may be present, the potential routes of exposure and symptoms of exposure for these substances, the PEL and IDLH values, and the level of personal exposure that can be anticipated;
- air monitoring procedures, including the functions, limitations, use, and maintenance of monitoring equipment;
- discussion of action levels for changing site PPE or evacuating the site;
- review of the HSP;
- contractor Injury and Illness Prevention Programs;
- SOPs prepared specifically to address various aspects of this project;
- engineering controls, such as: dust suppression techniques;
- personal cleanliness and restrictions on eating, drinking, and smoking;
- personal protective equipment (PPE);
- medical surveillance program;
- decontamination;
- emergencies and review of emergency procedures and facilities, including bloodborne pathogens and universal precautions;
- fire prevention measures;
- site control measures;
- spill containment program for chemical handling locations ;
- proper use of heavy equipment and machinery;
- other physical hazards such as slip/trip/falls, noise, electrocution, being struck-by something and being caught in or between something; and
- heat and/or cold stress prevention, treatment and monitoring.

The OSO will maintain documentation that each site worker has successfully completed this training program. Each site worker must sign and date a Personal Acknowledgment Form Appendix B.

2.3.5 Daily Tailgate Safety Meetings

All personnel who plan to enter the exclusion and contamination reduction zones during any portion of the project must attend a daily tailgate safety meeting. This meeting, conducted by the OSO will cover specific health and safety issues, site activities, changes in site conditions, and a review of topics covered in the initial health and safety meeting as they apply to daily activities. Issues addressed in the daily tailgate meeting will be documented on a form which will be signed by the personnel who attend and be retained by the OSO. A copy of a form that can be used to document the daily tailgate safety meetings is presented in Appendix C.

2.3.6 Injury and Illness Prevention Program (IIPP)

In accordance with the Cal-OSHA regulation 8 CCR 1509 and 3203, each employer conducting work in California is required to develop and implement an injury and illness prevention program. This program must be in written form and communicated to all employees. The program is designed to identify workplace hazards to employees. Once the hazards are identified, specific training regarding the hazards and their control is required. This health and safety program and has been designed to specify the tasks and their associated hazards and controls anticipated for the project. The MWH IIPP is provided in Appendix A of this document; IIPPs from subcontractors will be added to Appendix A, or added as an addenda, after their subcontractor agreements are negotiated.

2.3.7 Respiratory Protection

Respiratory protection training is included in the initial 40 hour and 8 hour update training under the previously described hazardous waste operations and emergency response regulations. The regulations governing respiratory protection can be found in Federal OSHA 29 CFR 1910.134. Site-specific training will be provided for the use of air purifying respirators issued for contaminants of concern, and any supplied air respirators issued for emergency response and/or egress. Section 1 includes specific respiratory protection requirements for individual work tasks.

2.3.8 Hazard Communication

In accordance with the OSHA Hazard Communication Standard (Federal OSHA 29 CFR 1910.1200), copies of all material safety data sheets (MSDS) for hazardous chemical materials brought onto any project site by any of the project contractors and used during site operations, or found on-site, will be available in the site office or from the OSO. In particular, the MWH standard hazard communication program will be available for review from the OSO. General hazard communication training will be conducted either during the hazardous waste operations

and emergency response training or by each employer's safety contact, in accordance with 29 CFR 1910.20, "Access to employee exposure and medical records."

2.3.9 Bloodborne Pathogens and CPR/First Aid

Personnel assigned to conduct field work for this project do not conduct first aid or cardiopulmonary resuscitation (CPR) as a primary job function. Rather, selected employees have been trained in CPR and first aid for emergency use only. Acting in the capacity of a designated emergency first aid provider is not mandatory, and anyone who is uncomfortable with the possibility of being so designated should notify the OSO.

An indoctrination to the bloodborne pathogens standard (29 CFR 1910.1030) will be provided to all employees either during their first aid training, and/or during the initial site health and safety meeting. Hepatitis B and Acquired Immune Deficiency Syndrome (AIDS), among other pathogenic microorganisms can be contracted during emergency first aid and CPR through contact with blood. It is important to recognize the concept of universal precautions. Universal precautions require one to assume that all blood and bodily fluids contain pathogens and require the use of protective barriers to prevent exposure. Additionally, washing any body part or surface that has been contaminated with blood is an important part of the universal precautions. One last requirement, notify the OSO of any potential contact with blood or bodily fluids resulting from first aid or CPR administered on the job.

A vaccine exists for Hepatitis B. Should employees trained in first aid and CPR desire the vaccine, their employers will arrange to have the employee receive the series of inoculations. While less efficient, the Hepatitis B vaccine is effective when administered after exposure to blood containing the Hepatitis B virus. Latex gloves and CPR barriers will be available in the first aid supplies stored at each site and should be used prior to attending to a victim's needs.

2.3.10 Hearing Conservation

Hearing conservation is included in the initial 40 hour and 8 hour refresher training classes required for the hazardous waste operations and emergency response regulation. The regulations governing respiratory protection can be found in Federal OSHA 29 CFR 1910.95. Noise monitoring will be conducted during the initial phases of work at each of the work locations and activities anticipated to produce noise levels in excess of 85 dBA. To the extent possible, engineering controls will be used to dampen excessive noise. When necessary, personnel will be issued hearing protection to control noise exposure.

2.3.11 Confined Space Entry

Entry into confined spaces will be avoided when possible. However, there may be times when it is necessary to conduct a confined space entry. Under no circumstance will employees not specifically trained in confined space safety be permitted to enter a confined space. General awareness of confined space entry training is provided in the 40 hour initial and 8 hour refresher

training programs, however, a detailed confined space entry training program, in accordance with 29 CFR 1910.146 will be required prior to entries into confined spaces. Section 1 will contain detailed instructions for confined space entries when they are necessary for the project.

2.3.12 Excavation And Trenching

It is anticipated that excavations and trenches may be required during the execution of field operations. To this end, personnel entry into excavations and trenches will be limited to those few instances when a task can not be conducted without entry into an excavation or trench. When personnel entry is required into an excavation or trench, a person certified as a "Competent Person" will be required to verify that the trench is safe for entry. All trenching operations will be conducted in accordance with 29 CFR 1926 Subpart P. Section 1 will include the names of personnel who have received the "Competent Person" training and are so certified, as well as specific trenching and excavation information.

2.3.13 Emergency Response Procedures

Each project site will pose unique emergency response procedures. All employees will be made aware of the project emergency assistance network and the most probable route of evacuation from a site in the event of an emergency.

2.3.14 Site Specific Rules and Disciplinary Procedures

Prior to the initiation of site activities, all affected employees will be instructed in any specific safety rules and the project disciplinary procedures.

The "buddy" system will be used at all times when employees are within an exclusion or contamination reduction zone. The "buddy" system is a method of organizing work groups so that there is someone that is always available to:

- provide his or her partner with assistance in an emergency,
- observe his or her partner for signs of chemical or physical exposure,
- periodically check the integrity of his or her partner's PPE, and
- notify the emergency response personnel when an emergency situation occurs.

In general terms the "buddy" system usually requires two or more people working within visual range from one another. However, the "buddy" system can include radio contact if site conditions are such that a person could otherwise work alone. Any deviations to the buddy system as it is described here will be presented in Section 1.

2.3.15 Documentation of Training

Documentation of training requirements are the responsibility of each employer. Written documentation verifying compliance with the training requirements of this section must be

submitted to the MWH PSO or OSO, prior to entering the exclusion and contamination reduction zones. Documentation of worker's current training credentials will be kept in the field office and submitted to regulatory compliance personnel upon request.

2.4 MEDICAL SURVEILLANCE

2.4.1 Introduction

All personnel (including contractors, subcontractors, regulatory agency personnel, client personnel and visitors) entering the exclusion or contamination reduction zones as defined in this HSP, must have completed within the previous twelve months appropriate medical monitoring requirements required under 29 CFR 1910.120/29 CFR 1026.65, "Hazardous Waste Operations and Emergency Response, Medical Surveillance", and 29 CFR 1910.134, "Respiratory Protection." These requirements provide that all field personnel receive medical examinations:

- prior to hazardous waste site activities,
- annually,
- upon termination,
- following exposure or injury, and
- additionally as needed on a case-specific basis.

The medical surveillance programs for each company allowing personnel to conduct field work will be overseen by a licensed physician who is certified in Occupational Medicine by the American Board of Preventive Medicine, or who by necessary training and experience is Board-eligible.

Establishment of a medical surveillance program is essential for the protection of site personnel. The purpose of the program is threefold:

- to establish a baseline picture of health against which future changes can be measured;
- to identify any underlying illnesses or conditions that might be aggravated by chemical exposures or job activities, such as use of respiratory protective equipment; and
- to allow recognition of any abnormalities at the earliest opportunity, so that corrective measures can be implemented.

The MWH PSO will maintain copies of the physician's written authorization statements that all employees conducting hazardous waste site operations are fit for hazardous waste site duty and are able to wear respiratory protection. Any restrictions shall be clearly stated. No one shall be permitted to conduct hazardous waste site operations until a copy of their medical certification is

received by the MWH PSO. Copies of the physician's authorization for all site workers will be available for inspection in the designated field office or other project document repository.

An injury or illness (whether on or off the job) may require work restrictions after the employee returns to work. If the injury or illness required seeing a physician, either the attending physician or the physician giving the employment physical will be involved in the decision of when the employee will return to work, and if any work restrictions will apply.

2.4.2 Medical Evaluation

A medical surveillance program should include all of the evaluative techniques presented below:

2.4.2.1 Occupational History

A description of previous employment, work responsibilities, and off-the-job hobbies or activities that have involved potential exposure(s) to chemical, biological, physical, or ergonomic stressors. Additional information pertaining to specific incidents regarding known exposures to workplace or off-the-job exposures that resulted in an injury or illness must be provided.

2.4.2.2 Personal History

A compilation of information regarding height, weight, blood pressure, past illnesses (physical or mental), physical injuries (broken bones, surgeries), smoking history, respiratory illnesses (lung disorders, asthma, bronchitis, pulmonary restrictions), alcohol consumption, exercise rate, vaccinations, allergies (skin or lung disorders), and family medical history.

2.4.2.3 Physical Examination

Routine physical examination designed to screen for gross abnormalities. Height and weight are recorded for general appearance, physical development and posture.

2.4.2.4 Laboratory Blood Tests

On-site personnel shall receive a basic panel of blood counts and chemistries to evaluate metabolic, kidney, liver, endocrine, and blood-forming functions. The following blood tests are the desired minimum:

- Complete blood count
- White blood cell, differential cell count and platelet estimate
- Hemoglobin and/or hematocrit
- Albumin, globulin and total protein
- Total bilirubin
- Serum glutamic oxalacetic transaminase (SGOT)
- Lactic dehydrogenase

- Inorganic phosphate
- Alkaline phosphatase
- Calcium
- Phosphorus
- Iron
- Uric acid
- Creatinine
- Urea nitrogen
- Sodium, potassium and chloride
- Carbon dioxide
- Glucose
- Total cholesterol and LDH

2.4.2.5 Urine Tests

On-site personnel shall have a routine urinalysis that includes:

- Specific gravity
- Microscopic examination
- Acetone
- Albumin
- pH
- Protein
- Glucose

2.4.2.6 Pulmonary Function Test

Pulmonary function testing is a requirement for the use of respiratory protection. It tests various lung volumes and flow rates. These are compared to predications based on age, sex and height, and can indicate the presence of obstructive or restrictive pulmonary impairment. At a minimum, the tests shall include lung ventilation evaluations of forced expiratory volume in one second (FEV₁), forced expiratory volume in three seconds (FEV₃), forced expiratory flow (FEF), residual volume (RV) and forced vital capacity (FVC).

2.4.2.7 Vision Test

Vision testing that measures refraction, depth perception, and color vision shall be administered by a qualified technician or physician.

2.4.2.8 Hearing Test

Audiometric testing performed at 500, 1,000, 2,000, 3,000, 4,000, and 8,000 hertz pure tone should be conducted in an approved, calibrated, booth, by a qualified technician and the results read by a certified audiologist or a physician familiar with audiometric evaluation.

standard 14 x 17-inch P-A (posterior-anterior) exposure. However, no chest X-Ray shall be obtained if the employee has had one within the past three years, or is pregnant (or suspects she is pregnant). Records should be requested from the former examining physician, radiologist, or hospital. All films shall be read or reviewed by a board-certified "B" reader physician or other competent medical specialist.

2.4.2.10 Resting 12-lead Electrocardiogram (EKG)

An EKG provides baseline data on cardiac function. An EKG is recommended during the initial medical examination, and every three years thereafter. EKGs will be read by a board certified cardiologist.

2.4.3 Special Circumstances

Additional medical examinations may be required before an employee returns to work after a serious illness or injury. Such examinations may be necessary to assure the employee's continued ability to carry out assigned work activities. The need for these examinations will be determined by the MWH OSO in cooperation with the employee's company occupational health physician.

Employees will receive additional medical monitoring upon notification to the employer of symptoms consistent with over exposure to on-site contaminants, or if the employee is injured or exposed to on-site contaminants at concentrations in excess of the permissible exposure limit during emergency response operations.

2.4.4 Pathogenic Hazards

There may be occurrences when personnel encounter pathogenic microorganisms, either from biologically contaminated waste or from the outdoor environment. Immunizations that may be considered prior to the initiation of field work are for tetanus and hepatitis B. The tetanus immunization is recommended to provide protection in the event that a worker sustains a cut and is exposed to biologically contaminated wastes (medical waste or municipal sewage). The hepatitis B immunization is recommended in the event that a worker comes into contact with blood or other bodily fluids that could be contaminated with blood or blood products. Personnel assigned to provide First Aid and cardiopulmonary resuscitation (CPR) run the risk of contacting blood from another person. The hepatitis B immunization is effective in eliminating the chance of contracting hepatitis if administered before exposure. It is also effective in reducing or eliminating the chance of contracting hepatitis if administered after a potential exposure has occurred.

None of these immunizations are required by law or OSHA regulation; however they are recommended. (Note: In the case of Hepatitis B, the employee needs to sign a declination form if he/she refuses the immunization.)

2.4.5 Emergency Medical Assistance And First Aid

Prior to work start-up, an emergency medical assistance network will be established. The Fire Department, ambulance service, and clinic or hospital emergency room will be identified in Section 1. A vehicle shall be available on-site during all work activities to transport injured personnel to the identified emergency medical facility.

The MWH OSO and several other field team members will be certified to render both first aid and CPR, prior to the initiation of site activities. A first aid kit, including necessary protection against bloodborne pathogens, will be available at each site for use by trained personnel. Table 2.4-1 presents a list of first aid supplies that should be available for use during field work. An adequate supply of fresh potable water for emergency eye wash purposes or a portable emergency eyewash, will also be available at each site.

2.5 PERSONAL PROTECTIVE EQUIPMENT

2.5.1 Introduction

PPE that will be required during various tasks and procedures is identified in Section 1. Efforts will be made to eliminate workplace chemical exposure hazards during the project through the use of engineering controls are also stated in Section 1. However, it is recognized that to effectively control many of the potential exposure hazards the use of PPE will still be required. The U.S. Environmental Protection Agency terminology of Levels D, C, B and A (see Figure 2.5-1) for personal protective equipment is used to describe the general PPE ensembles that may be used throughout this project.

An appropriate ensemble of PPE will be selected for initial use on a site-specific and activity specific basis, accounting for the hazards and potential hazards likely to be encountered as a result of site work. Criteria for upgrading or downgrading a specified level of PPE will also be presented in the Site HSPs. Specific PPE elements will be listed in the Site HSPs and will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration. When specifying an ensemble of PPE, the following considerations will be evaluated and communicated to employees via this Base HSP, applicable Site HSPs, or during tailgate safety meetings:

- initial PPE selection based on anticipated site hazard;
- limitations of PPE;
- work mission duration;



MWH
MONTGOMERY WATSON HARZA

TABLE 2.4-1 EMERGENCY SUPPLIES

FIRST AID SUPPLIES

Container that will ensure that all supplies are kept clean and sanitary.

Aspirin or non-aspirin substitute

Eye drops

Burn spray or ointment

Cold spray or other topical anesthesia

Antiseptic spray, cream or ointment

Hydrogen peroxide 3% solution

Band-aids: knuckle bandaid, elastic strips (3"x7/8"), adhesive bandage (3"x3/4"),
finger tip (2"x13/4")

Triangle bandage and safety pins

Gauze bandages: 2 and 4 inch square pads and 1,2, and 4 inch rolls or compresses

First aid tape

Ace bandage

Clean wipes

Antiseptic hand cleaner

Sterile water

Antiseptic swabs

Eye dressing packet

Pressure dressings

Instant ice packs

Cotton balls

Scissors and tweezers

Latex gloves

CPR barricade, to prevent mouth to mouth contact

Tourniquet and forceps

S.A.M. - moldable splint

Ammonia inhalant

First aid guidebook

Blankets (mylar)

Burn sheet

Plastic sheeting, to be used for wrapping a contaminated victim

OTHER EMERGENCY SUPPLIES

Emergency eyewash station capable of delivering 15 minutes of uninterrupted flow

Flashlight

Potable water

Stokes stretcher

Tripod with winch, extraction lanyard and harness

Ladders (aluminum, wood or rope, as necessary)

10-minute escape breathing apparatus

Traffic control/safety devices (traffic vests, cones, flares)

Fire extinguishers (10 pound ABC minimum)

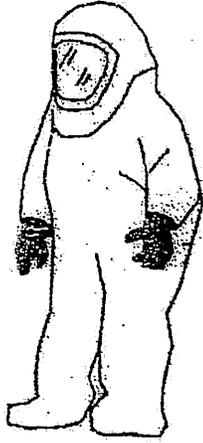
Water hoses

Spill absorbent

Rope

Spare shovels and tools

Two-way radios



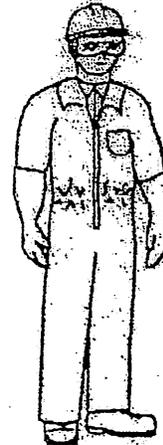
LEVEL A Protection
Totally encapsulating
vapor-tight suit with full-
facepiece SCBA or
supplied-air respirator.



LEVEL B Protection
Totally encapsulated suit
does not have to be vapor
tight. Same level of
respiratory protection



LEVEL C Protection
Full-face canister air-
purifying respirator.
Chemical protective suit
with full body coverage.



LEVEL D Protection
Basic work uniform, i.e.
longsleeve coveralls,
gloves, hardhat, boot,
faceshield or goggles.



Figure 2.5-1
Sample Protective Equipment Ensembles

-
- maintenance and storage instructions;
 - decontamination or disposal requirements;
 - PPE training and proper fitting;
 - donning and doffing procedures;
 - inspection of PPE prior to, during and after use;
 - evaluation of the effectiveness of the PPE program; and
 - effect of temperature extremes on PPE ensemble.

All respiratory protective equipment shall be National Institute for Occupational Safety and Health (NIOSH) and Mine Safety and Health Administration (MSHA) approved and use shall conform to California OSHA 29 CFR 1910.134 and 1910.120/1926.65(g) requirements. Each employer shall maintain a written respiratory protective equipment program detailing selection, use, cleaning, maintenance, and storage of respiratory protective equipment, as well as medical approval for individual use. Currently both California and Federal OSHA do not allow the use of contact lenses when respiratory protection is required. There has been some debate over this policy and in recent months there have been written indications that both California and Federal OSHA will repeal this requirement. Until the formal appeal is published, contact lenses are prohibited from use with respiratory protection. When the appeal is published, an amendment to this HSP will be written specifying the use of contact lenses with respiratory protective devices.

2.5.2 Level D Personal Protective Equipment

2.5.2.1 Level D Protection Use

Level D protection shall be used under the following conditions:

- the atmosphere contains no known hazard above individual or combined permissible exposure limits (PELs), essentially nuisance contamination only;
- the atmosphere must contain 19.5 percent oxygen;
- concentrations of airborne toxic organic compounds do not exceed normal background concentrations or specified action levels requiring use of respiratory protective equipment; and
- work functions preclude splashes, immersion in, unexpected inhalation of, or direct contact with hazardous concentrations of harmful chemicals.

2.5.2.2 Level D Protective Equipment

Level D protective equipment shall consist of the following, unless otherwise stated in Section 1:

- dedicated work uniforms with long pants and long sleeve shirt. These may include:
 - chemical-resistant coveralls
 - standard Tyvek coveralls
 - standard cotton (or cotton blend) work uniforms,
- steel-toed and shank safety shoes or boots (Leather, PVC or Rubber) meeting the specifications of American National Standards Institute (ANSI) Z41.
- gloves; these may include:
 - Heavy work gloves (e.g., cotton or leather)
 - Impervious gloves. Chemical-specific glove selection guidelines shall be provided in Section 1.
 - In general, it is recommended that an impervious glove be worn during all site activities that could result in direct contact with potentially contaminated soil, water or other items;
- safety glasses, goggles, face shield or other approved eye protection; all approved eye protection must meet the specifications of ANSI Z87.1. The use of contact lenses is discouraged during Level D operations, however, not prohibited. Rather, safety glasses or goggles which fit over prescription lenses or prescription safety glasses or goggles are recommended;
- hard hat, unless specifically stated otherwise; all approved hard hats must meet the specifications of ANSI Z89.1;
- escape breathing apparatus, as specified in Section 1 when potential site conditions warrant; and/or
- hearing protection (muff or plugs) as necessary depending on measured decibel readings in the field. The protective device must have a noise reduction rating capable of providing the wearer with enough protection so as to reduce the received noise level to below 85 dBA.

2.5.2.3 Modified Level D

Because of recent concerns over the newly identified Hantavirus, which has resulted in several deaths in the Southwestern part of the United States, respirators may be worn by site personnel in Level D ensembles. For this reason, personnel will be supplied with the following respirator to be used as a control device:

- air purifying respirator (APR), half-face or full-face, with either a dust filter or high efficiency particulate air (HEPA) filter. The dust filter will suffice, as the Hantavirus is typically transported via dust particles.

2.5.3 Level C Personal Protective Equipment

2.5.3.1 Level C Protection Use

Level C protection shall be used under the following conditions:

- concentration of known airborne organics or dust in the breathing zone is above the action levels given in Site HSPs for individual work tasks;
- the types of air contaminants have been identified, concentrations measured, and an APR, and chemically protective clothing are available that can protect against the identified contaminants;
- the substance(s) has adequate warning properties, and the criteria for the use of an APR have been met;
- the atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin; and
- the atmosphere contains at least 19.5 percent oxygen.

2.5.3.2 Level C Protective Equipment

Level C protective equipment shall consist of the following:

- chemical-resistant coveralls. This may include polyethylene coated Tyvek, Saranex, or other approved fabric as specified in Section 1;
- steel-toed and shank safety shoes with disposable boot covers or, Chemical-resistant steel toed boots, meeting the specifications of ANSI Z41;

- chemical-resistant gloves. This includes: disposable inner gloves, such as nitrile or latex; and disposable outer gloves, such as nitrile, viton, silver shield, 4H, butyl or nitrile, as specified in Section 1 for individual work tasks;
- work gloves as necessary to prevent cuts, scrapes and pinches;
- half-face or full-face APR with cartridges specified in Section 1 for individual work tasks;
- safety glasses, goggles or faceshield when wearing a half-face APR, meeting the specifications of ANSI Z87.1;
- hard hat, unless specifically stated otherwise, meeting the specifications of ANSI Z89.1;
- cuffs sealed to boots or gloves with duct tape, or equivalent; and
- hearing protection as necessary depending on measured decibel readings in the field. The protective device must have a noise reduction rating capable of providing the wearer with enough protection so as to reduce the received noise level to below 85 dBA.

2.5.4 Level B Personal Protective Equipment

2.5.4.1 Level B Protection Use

Level B protection shall be used under the following conditions:

- the type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection. This involves atmospheres:
 - with immediately dangerous to life and health (IDLH) concentrations of specific substances that do not represent a severe skin hazard, or
 - that do not meet the criteria for use of APRs.
- presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.
- confined-space entry is required.

-
- atmosphere contains less than 19.5 percent oxygen.
 - action levels specified in Section 1 for contaminants of concern are exceeded.

2.5.4.2 Level B Protective Equipment

Level B protective equipment shall consist of the following:

- chemical-resistant coverall, poly laminated, Barricade or Saranex, as indicated in Section 1;
- steel-toed and shank safety shoes with disposable boot covers or, Chemical-resistant steel toed boots, meeting the specifications of ANSI Z41;
- disposable, inner, surgical or nitrile gloves;
- disposable, outer, chemical-resistant gloves, such as viton or as specified in Section 1 for individual work tasks;
- pressure-demand self-contained breathing apparatus (SCBA) or airline system with five-minute egress bottle;
- hard hat, unless specifically stated otherwise, meeting the specifications of ANSI Z89.1;
- ankles/wrists secured with duct tape (or equivalent) to boots or gloves;
- hearing protection as necessary depending on measured decibel readings in the field. The protective device must have a noise reduction rating capable of providing the wearer with enough protection so as to reduce the received noise level to below 85 dBA; and
- two-way radio communications, or equivalent.

Use of Level B personal protective equipment requires that at least one person be available as a backup, ready to provide emergency assistance and to assist with the air supply.

2.5.5 Level A Personal Protective Equipment

Level A provides the highest protection available for respiratory, skin and eye protection.

Level A PPE is *not* anticipated to be required for use during any MWH field efforts. However, in the event that site conditions change and the use of Level A becomes warranted, a specialty

contractor will be subcontracted to provide assistance with the Level A equipment and work tasks.

2.5.5.1 Level A Protection Use

Level A protection shall be used under the following conditions:

- The chemical substance has been identified and requires the highest level of protection for skin, eye, and the respiratory system based on either:
 - Measured (or potential for) high concentration of atmospheric vapors, gases, or particulates. Or,
 - Site operations and work functions involving a high potential for splash, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin.
- Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible.
- Operations must be conducted in confined, poorly ventilated areas until the absence of conditions requiring Level A protection is determined.

2.5.5.2 Level A Protective Equipment

Level A protective equipment shall consist of the following:

- Fully encapsulating chemical-resistant suit, as specified in an amendment to a Site HSP.
- Steel-toed and shank safety shoes with disposable boot covers or, Chemical-resistant steel toed boots, meeting the specifications of ANSI Z41.
- Disposable, inner gloves. Disposable outer gloves may also be necessary.
- Pressure-demand, full facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA.
- Hard hat, unless specifically stated otherwise, meeting the specifications of ANSI Z89.1.
- Hearing protection as necessary depending on measured decibel readings in the field. The protective device must have a noise reduction rating capable of

providing the wearer with enough protection so as to reduce the received noise level to below 85 dBA.

- When heat stress is a concern, a cooling unit that can be worn inside of the fully encapsulating suit may be specified.
- Two-way radio communications or equivalent.

2.5.6 PPE Storage Procedures

Clothing and respirators must be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Potentially contaminated PPE should be stored separately from new PPE and street clothing. Always review the manufacturer's instructions for care and maintenance. PPE storage will be provided at the field office location, each individual is responsible for ensuring that his or her issued PPE is stored out of temperature extremes and such that the PPE will not become disfigured during storage.

All respirators are to be cleaned after use with either a sanitizing wipe pad or sanitizing soap and stored in a sealable container. When respirators are not in use, but have been worn, they must be stored in a sealable container, different than the clean storage container. At no time is it permissible to have a doffed respirator outside of a storage container.

2.6 SITE CONTROL

Site control is an important part of a field health and safety program. The purpose of site control is to minimize potential contamination of workers, protect the public from the site's hazards, and prevent vandalism to the site operations. Site control procedures involve site and security controls, staffing, monitoring air quality, respirator protection, dermal (skin) protection, hearing conservation, decontamination procedures, emergency procedures and incident reporting.

2.6.1 Premobilization Meeting

All employees, subcontractors and other employees entering the field sites will be involved in a premobilization meeting conducted by MWH. This meeting will describe the project plan to be utilized for the site, ensure that all involved parties understand the health and safety requirements, discuss site-specific health and safety concerns and recognize potential or existing health or safety risks. Appropriate client personnel may be requested to provide any site-specific health and safety information at this meeting.

2.6.2 Site Characterization

Section 1 will provide a preliminary PPE selection prior to mobilization to the field site. Once on site, the OSO and/or subcontractor's OSO will evaluate the work conditions and adjust PPE

controls as necessary to properly protect the workers. After this evaluation, the OSO and/or subcontractor's OSO will decide whether it is necessary to upgrade or downgrade the preliminary PPE levels of protection. Once workers arrive on site, the physical ambient conditions will be evaluated during field activities and background and worker breathing zone concentrations will be recorded in the safety field log book. These data will be collected by using direct reading air monitoring instruments and will be utilized to make critical path decisions regarding changes in levels of PPE.

Prior to mobilization, existing site characteristic information will be used for preplanning purposes. This information will allow the PSO, OSO and subcontractor's OSO to coordinate specific job tasks, and preplan site accessibility and mobilization for heavy equipment. The evaluation of background information on chemical and physical hazards at the field site will allow the PSO to preplan the necessary control measures to be instituted at the site. Other information such as wind speed, wind direction, soil conditions, and site hazards will provide useful information for the preparation of the emergency response plan.

2.6.2.1 Initial Entry Procedures

Preliminary background data on chemical concentrations will allow the PSO to provide a safe EPA PPE level to minimize worker exposures and maintain concentration levels below recommended OSHA PELs, NIOSH RELs, and ACGIH TLVs. Should the preliminary air monitoring data or physical site conditions change (for example, by increasing the airborne contaminant concentrations as a result of field activity), the PSO, OSO or subcontractor's OSO will direct the field staff to: (1) either evacuate the site until further air monitoring can be performed to assess workplace concentrations; or (2) to upgrade the level of PPE protection. The PSO, OSO or subcontractor's OSO will conduct the assessment to determine if workplace concentrations are immediately dangerous to life or health. Should the preliminary air monitoring data indicate that the conditions are IDLH, then the PSO, OSO and/or subcontractor's OSO will discontinue field activities until the situation can be further assessed and the appropriate EPA level of PPE selected.

2.6.2.2 Site Preparation

Any site-specific preparations necessary for the initiation of project objectives will be assessed in each Section 1.

2.6.3 Site Work Zones

The USEPA requires contaminated work sites to be divided into three working zones: exclusion zone, contamination reduction zone, and support zone. Site work zones are discussed below and represented in Figure 2.6-1, Site Control Zones.

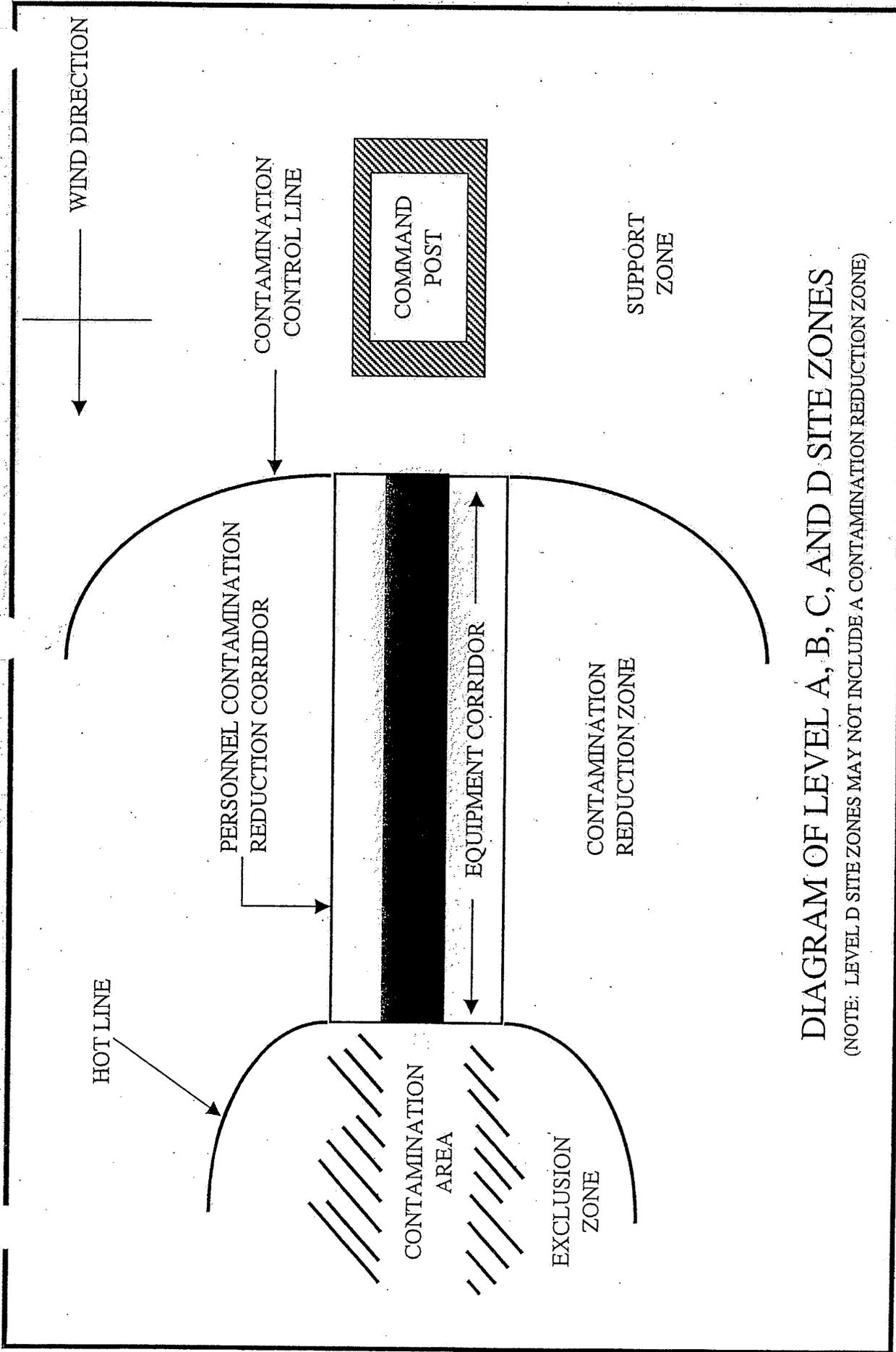


DIAGRAM OF LEVEL A, B, C, AND D SITE ZONES

(NOTE: LEVEL D SITE ZONES MAY NOT INCLUDE A CONTAMINATION REDUCTION ZONE)

2.6.3.1 Exclusion Zone

The exclusion, or "hot," zone is the zone where contamination or potential contamination exists. Since this zone has the potential for workers to be exposed to contaminants, all field staff entering this zone will wear the appropriate PPE, adhere to the training and medical surveillance requirements presented in Section 2.3 and 2.4 of this document. Areas with higher concentrations of contaminants within this zone will be identified with field stakes with colored flags. Field personnel entering the exclusion zone or the higher concentration part of the exclusion zone will enter and exit through a controlled center monitored by the OSO. Gross decontamination will take place near the "hotline," before proceeding to the Contamination Reduction Zone. Prior to field work occurring in this zone, the OSO will develop an emergency exit area. The exclusion zone will be demarcated by using lines, placards, hazard tape and/or signs, or enclosed by physical barriers, such as chains, fences or ropes.

2.6.3.2 Contamination Reduction Zone (CRZ)

The CRZ is the zone where field staff and equipment will undergo gross decontamination. This zone is located between the exclusion and support zones. The CRZ will serve as a buffer to further reduce the probability of the clean zone becoming contaminated or being affected by other existing hazards. It will provide additional assurance that the physical transfer of contaminants via personnel or equipment is limited through a combination of decontamination procedures and a minimum required distance between exclusion and support zones. Two lines of decontamination stations should be set up within the contamination reduction corridor (the designated area within the CRZ where decontamination takes place), one for personnel and one for equipment.

Initially, the CRZ will be considered to be a noncontaminated area. At the boundary between the exclusion and the CRZ, decontamination stations will be established, one for personnel and one for heavy equipment. Exit from the exclusion zone will be through a designated decontamination corridor. Personnel assisting with decontamination will wear a level of PPE at or one below that used by personnel in the EZ.

As operations proceed, the area around the decontamination station may become contaminated, but to a much lesser degree than the exclusion zone. On a relative basis, the amount of contaminants will decrease from the hotline to the support zone due to the distance involved and the decontamination procedures used. The "contamination control line" separating the CRZ and the support zone will be designated with yellow or orange surveyor tape, or other suitable material.

2.6.3.3 Support Zone

The support zone, the outermost part of the regulated area, is free from recognized site hazards. Support equipment such as the command post and safety vehicles, will be located in this area.

Since normal work attire is appropriate within this zone, potentially contaminated personal protective clothing, equipment and samples will not be permitted.

The location of the command post and other support facilities in the support zone at each site will depend on a number of factors, including:

- Accessibility: topography, open space available, locations of roads, or other limitations.
- Visibility: line of sight to all activities in the exclusion zone is preferable.
- Wind direction: the support facilities preferably should be located upwind of the exclusion zone. Shifts in wind direction and other conditions may be such that an ideal location based on wind direction alone does not exist.
- Resource: water, electricity, places of refuge.

Access to the CRZ from the support zone will be through a controlled access point. Personnel entering the CRZ to assist in decontamination will wear the prescribed PPE. Re-entrance into the support zone will require removal of any PPE worn in the CRZ.

Only authorized personnel will enter regulated areas associated with the field activities. The OSO, will establish the bounds of the regulated areas. The following measures will be taken to assure site security:

- All workers entering the regulated areas will be subject to the provisions of this HSP. The OSO will have the responsibility and authority to enforce this requirement.
- All workers entering the CRZ or the exclusion zone will have the appropriate training, PPE and respiratory protection and will be enrolled in an established medical surveillance program.
- The OSO will maintain a Site Visitor's Logbook, located in the support zone.

2.6.4 Site Security

Site control at project sites will vary from strict property perimeter controls to no controls at all. When possible client personnel will be requested to investigate any suspicious activities at the field sites. In some cases an independent security watch may be needed. Security at the sites will be the responsibility of the client during nonactivity times (including weekends) unless stated otherwise in Section 1.

To maintain security at the sites during working hours, the OSO will:

- Control all site entrances/exits through the support zone through installation of appropriate safety barricades, signs, and/or signal lights;

-
- Establish a personnel identification system, including limitations to an individual's approved activities;
 - Be responsible for enforcing entry/exit requirements;
 - Utilize temporary fencing, where feasible; and
 - Post warning signs around the perimeter of the support zone, should the utilization of temporary fencing not be feasible.

To maintain security during nonworking hours, the OSO will secure the site prior to leaving at the end of a working day. All equipment and supplies will be secured or stored in locked facilities, and open holes and trenches will be covered with plywood or similar materials.

2.6.5 The "Buddy" System

The "buddy" system is defined by OSHA as a system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency. All site activities will be conducted in accordance with the buddy system unless specifically stated otherwise in Section 1. In order to deviate from the buddy system, an explanation of the specific task to be completed is required, along with a procedure for assuring that single person work parties are safe.

2.6.6 Communication Systems

Two types of communications systems should be available for all workers assigned to field projects. Section 1 will specify which types of communication systems will be available. One system will ensure adequate communication between site personnel, and the other will ensure the ability to contact personnel and particularly emergency assistance off the site. Internal communication is used to:

- Alert team members to emergencies;
- Pass along safety information, such as weather conditions that could affect heat stress, cold stress or general safety, etc.;
- Maintain site control; and
- Facilitate site work by being able to call to the appropriate party for information, without having to decontaminate the work party and equipment and secure the site.

Verbal communication can be impeded by onsite background noise and the use of personal protective equipment. Thus, it is vital that pre-arranged signals of communication be arranged prior to the initiation of site activities, particularly when heavy equipment work is involved. Common types of internal communication devices include:

- Radios;
- Noisemakers: bell, compressed air horn, megaphone, siren, whistle; and
- Visual signals.

External communication systems between onsite and offsite personnel are necessary to:

- Coordinate emergency response efforts;
- Report to upper management about site activities; and
- Maintain contact with essential offsite personnel.

Primary means of external communication devices are telephones, radios, facsimile machines, and computer networks.

2.7 PERSONNEL AND EQUIPMENT DECONTAMINATION

2.7.1 Introduction

Decontamination procedures are implemented as a means for control of potential migration of chemicals or other site contaminants to clean areas, and to prevent personnel exposure to chemicals or pathogens which may contaminate clothing or protective gear. *Personnel entering exclusion zones during field activities must decontaminate upon exit from the exclusion zone.* All personnel, including visitors, must enter and exit the exclusion zone through the decontamination area, known as the contamination reduction corridor. In addition, before demobilization, contaminated equipment will be decontaminated before it is moved into the clean zone. Any material that is generated during decontamination procedures will be labeled and stored until final disposal arrangements are made.

Note: The type of decontamination solution to be used is dependent on the type of chemical or pathogenic hazard. Section 1 will specify decontamination materials when they are different than ordinary soap and water. All personnel will be required to wash their hands (and face optional) with soap before eating, drinking (unless specific procedures are in place to ensure that a drink can be taken without the possibility of contamination), and before leaving the contamination reduction zone. Decontamination solutions will be changed daily (at a minimum) and collected and stored on-site until disposal arrangements are finalized.

2.7.2 Portable Equipment Decontamination

Equipment used in the exclusion zone in areas where contact with site contaminants is likely to occur will be protected from contamination as much as possible by measures such as enclosure in plastic bags, or by preventing contact with contaminated materials. Equipment decontamination will be determined by the nature of the equipment and extent of contamination.

Equipment removed from the exclusion zone before the end of the job will undergo a gross decontamination step near the work site prior to proceeding to the decontamination area. This step will help to ensure that as many of the contaminants as possible remain in the area. This decontamination step will involve scraping and rough brushing to remove dirt and other visible contamination.

2.7.3 Heavy Equipment And Vehicle Decontamination

Heavy equipment and vehicles involved with site work or construction associated with potentially contaminated material will be decontaminated in a designated decontamination area upon leaving the exclusion zone. The equipment decontamination area will be segregated, lined with plastic, and bermed - as a minimum. All heavy equipment, non-disposable equipment, and supplies will be cleaned in this area. Employees engaged in equipment and vehicle decontamination will wear adequate PPE to protect from splashes.

2.7.4 Procedures For Personnel Decontamination

All personnel will go through decontamination before leaving the exclusion zone for the support zone or other clean areas. Personnel will also go through decontamination if their protective clothing becomes torn. Personnel may return to the exclusion zone after changing into clean protective gear. This decontamination procedure applies to personnel at this site wearing Level A, Level B, Level C, or Level D protection with chemically impervious clothing. Table 2.7-1 lists equipment necessary to perform the maximum level of decontamination that may be needed for a site; Table 2.7-2 lists equipment necessary to perform the minimum level of decontamination that may be needed for a site; Table 2.7-3 lists the measures necessary for performing the maximum decontamination activities for a site; and; Table 2.7-4 lists the measures necessary for performing the minimum, generally acceptable decontamination activities for a site. If radiation becomes a concern at any site, radiation-specific decontamination procedures will be included in Section 1. Assistance of a certified health physicist will be sought to plan an appropriate decontamination station.

2.7.4.1 Station 1: Equipment Drop

Deposit equipment used on site (tools, sampling devices, monitoring instruments, radios, etc.) on plastic drop cloths. These items must be decontaminated or discarded as waste prior to removal from the exclusion zone.



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TABLE 2.7-1

**EQUIPMENT NEEDED TO PERFORM MAXIMUM DECONTAMINATION
MEASURES FOR LEVELS A, B, C, AND D**

- | | | | |
|------------|---|-------------|---|
| Station 1: | a. Various Size Containers
b. Plastic Liners
c. Plastic Drop Cloths | Station 10: | a. Containers (20-30 Gallons)
b. Plastic Liners
c. Benches or Stools
d. Boot Jack |
| Station 2: | a. Containers (20-30 Gallons)
b. Decon Solution or Detergent Water
c. 2-3 Long-Handled, Soft-Bristled Scrub Brushes | Station 11: | a. Rack
b. Drop Cloths
c. Bench or Stools |
| Station 3: | a. Containers (20-30 Gallons)
OR
b. Water
c. 2-3 Long-Handled, Soft-Bristled Scrub Brushes | Station 12: | a. Table |
| Station 4: | a. Containers (20-30 Gallons)
b. Plastic Liners | Station 13: | a. Basin or Bucket
b. Decon Solution
c. Small Table |
| Station 5: | a. Containers (30-30 Gallons)
b. Plastic Liners
c. Benches or Stools | Station 14: | a. Water
b. Basin or Bucket
c. Small table |
| Station 6: | a. Containers (20-30 Gallons)
b. Plastic Liners | Station 15: | a. Containers (20-30 Gallons)
b. Plastic Liners |
| Station 7: | a. Containers (20-30 Gallons)
b. Decon Solution or Detergent Water
c. 2-3 Long-Handled Soft-Bristled Scrub Brushes | Station 16: | a. Containers (20-30 Gallons)
b. Plastic Liners |
| Station 8: | a. Containers (20-30 Gallons)
OR
b. Water
c. 2-3 Long-Handled Soft-Bristled Scrub Brushes | Station 17: | a. Containers (20-30 Gallons)
b. Plastic Liners |
| Station 9: | a. Air Tanks or Face Masks and Cartridge Depending on Level
b. Tape
c. Boot Covers
d. Gloves | Station 18: | a. Water
b. Soap
c. Small Table
d. Basin or Bucket
e. Field Showers
f. Towels |
| | | Station 19: | a. Dressing Trailer is Needed in Inclement Weather
b. Tables
c. Chairs
d. Lockers
e. Cloths |



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TABLE 2.7-2

**EQUIPMENT NEEDED TO PERFORM MINIMUM DECONTAMINATION
MEASURES FOR LEVELS A, B, C, AND D**

- | | | | |
|------------|--|------------|---|
| Station 1: | a. Various Size Containers
b. Plastic Liners
c. Plastic Drop Cloths | Station 5: | a. Containers (20-30 Gallons)
b. Plastic Liners
c. Bench or Stools |
| Station 2: | a. Containers (20-30 Gallons)
b. Decon Solution
c. Rinse Water
d. 2-3 Long-Handled, Soft-
Bristled Scrub Brushes | Station 6: | a. Plastic Sheets
b. Basin or Bucket
c. Soap and Towels
d. Bench or Stools |
| Station 3: | a. Containers (20-30 Gallons)
b. Plastic Liners
c. Bench or Stools | Station 7: | a. Water
b. Soap
c. Tables
d. Wash Basin or Bucket |
| Station 4: | a. Air Tanks or Masks and
Cartridges Depending Upon
Level
b. Tape
c. Boot Covers
d. Gloves | | |

TABLE 2.7-3
MAXIMUM MEASURES FOR LEVELS A, B, C AND D DECONTAMINATION

(Delete any unnecessary steps for Level D)

Station 1:	Segregated Equipment Drop	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. During hot weather operations, a cool-down station may be set up within this area.
Station 2:	Boot Covers and Glove Wash	Scrub outer boot covers and gloves with decon solution or detergent/water.
Station 3:	Boot Cover and Glove Rinse	Rinse off decon solution from station 2 using copious amounts of water.
Station 4:	Tape Removal	Remove tape around boots and gloves and deposit in container with plastic liner.
Station 5:	Boot Cover Removal	Remove boot covers and deposit in container with plastic liner.
Station 6:	Outer Glove Removal	Remove Outer gloves and deposit in container with plastic liner.
Station 7:	Suit and Boot Wash	Wash encapsulating suit and boots using scrub brush and decon solution or detergent/water. Repeat as many times as necessary.
Station 8:	Suit, Boot, and Glove Rinse	Rinse off decon solution using water. Repeat as many times as necessary.
Station 9:	Air Tank, Cartridge, Mask, or Canister Change	If an air tank, cartridge, mask or canister change is desired, this is the last step in the decontamination procedure. Air tank is exchanged, new outer gloves and boot covers are donned, and joints are taped. Worker returns to duty.
Station 10:	Safety Boot Removal	Remove safety boots and deposit in container with plastic liner.
Station 11:	Suit and Hard Hat Removal	Suit is removed with assistance of a helper and is laid out on a drop cloth or hung up. Hard hat is removed. Hot weather rest station may be set up within this area for personnel returning to site.
Station 12:	SCBA Backpack Removal	If in Level C or D, go to next Station. While still wearing facepiece, remove backpack and place on table. Disconnect hose from regulator valve and proceed to next station.
Station 13:	Inner Glove Wash	Wash with decon solution that will not harm the skin. Repeat as often as necessary.
Station 14:	Inner Glove Rinse	Rinse with water. Repeat as many times as necessary.
Station 15:	Face Piece Removal	Remove facepiece. Deposit in container with plastic liner. Avoid touching face with fingers.
Station 16:	Inner Glove Removal	Remove inner gloves and deposit in container with liner.
Station 17:	Inner Clothing Removal	Remove Clothing and place in lined container. Do not wear inner clothing off-site since there is a possibility that small amounts of contaminants might have been transferred in removing the fully-encapsulating suit.
Station 18:	Field Wash	Shower if highly toxic, skin-corrosive or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.
Station 19:	Redress	Put on clean clothes.



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TABLE 2.7-4

MINIMUM MEASURES FOR LEVELS A, B, C AND D DECONTAMINATION

(Delete any unnecessary steps for Level D)

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

2.7.4.2 Station 2: Outer Boot and Outer Glove Wash and Rinse

Scrub outer boots, outer gloves, and/or splash suit (if used) with decontamination solution or detergent water. Rinse off with water.

2.7.4.3 Station 3: PPE Removal

Remove outer boots and gloves. If outer boots (boot covers) are disposable, deposit in container with plastic liner. If non-disposable, store in a clean, dry place. Gloves are to be discarded daily unless appropriate decontamination is achieved. Remove the outer garment and deposit in a plastic-lined container. Then remove the respirator and dispose of cartridges. Wash respirator in detergent or sanitizer solution. Wipe off and store the respirator in a clean dry area. Finally, remove the inner gloves and deposit in a container for disposal. PPE shall not be removed prior to decontamination.

2.7.4.4 Station 4: Field Wash

Personnel will proceed to the washroom or a handwash station and wash thoroughly before eating or leaving the site. Facilities will be available in the decontamination area.

Personnel conducting in-sewer work will be required to take a shower before leaving the site for the end of the day or work shift. Shower facilities will be available at the central staging area. This area will include a location to discard work clothing and store street clothing.

2.7.5 General Decontamination Procedures

The following decontamination procedures and guidelines shall be implemented:

- Any respirators used will be inspected and washed in soapy water, if necessary, or at least at the end of each work shift. All respirators used will be disinfected with sanitary wipes or sanitizer solution every day. All respirators will be stored in sealable plastic bags in a location that is free from chemical or biologic hazards and temperature extremes.
- Use of disposable protective clothing will eliminate the need for extensive evaluation of clothing to determine the effectiveness of decontamination procedures.
- The decontamination sequence will be designed to prevent or minimize direct contact with waste materials.
- All contamination wash water and residues will be collected on site, tested, and disposed of accordingly.

-
- All disposable protective clothing and contaminated material will be collected in plastic sacks and disposed of appropriately. Nondisposable clothing will only leave the site for commercial laundering until the end of the project when it shall leave the site only after appropriate decontamination.
 - In addition to these decontamination facilities, adequate sanitary facilities will be provided.

Figure 2.6-1 shows a diagram of a designated decontamination area.

2.7.6 Emergency Decontamination

It is not anticipated that emergency decontamination of heavy equipment will be necessary. Emergency decontamination of site personnel may be necessary for medical reasons or in the event of major contamination by contact with contaminated material.

Emergency procedures will include:

- Assistance by on-site personnel for removal of contaminated protective clothing, when time permits.
- If the employee is injured and cannot be moved, attempts will be made to cut the clothing for removal.
- If the situation is life-threatening, decontamination or removal of protective clothing will be considered secondary to medical treatment. If appropriate, to minimize spread of contaminants, contaminated personnel will be wrapped in blankets and/or plastic sheeting (maintaining an open airway) during transport to the emergency treatment facility. Emergency personnel will be notified of the nature of the contaminated material and instructed on the importance of preventing skin contact.
- If the employee can walk or be moved without injury, all affected skin areas should be washed thoroughly with soapy water and rinsed.
- Disposal of equipment will be in appropriate collection containers.
- Non-disposable equipment will be placed and cleansed in the area provided for personnel to wash-down non-disposable equipment.

2.7.7 Contaminant Control

This section outlines the measures that will be taken to control contamination and prevent it from leaving the exclusion zone.

The decontamination procedures described above will be the primary sources of contaminant control. Also, as indicated previously, all wastewater generated from decontamination procedures will be collected on site, tested, and disposed of accordingly. In addition to these procedures, measures will be taken to limit the movement of dust and vapors that may be generated within the exclusion zone.

Eating, drinking, smoking, chewing, and application of cosmetics shall be restricted to the clean zone (support zone), except drinking of replacement fluids, which shall be permitted in designated areas of the contamination reduction zone, under strict protocol to prevent the ingestion of contaminated material.

Personnel returning from the exclusion zone or decontamination zone shall thoroughly cleanse their hands, faces and other exposed areas at the decontamination facility before smoking and eating.

Personnel who may be required to wear respiratory protective equipment, either on a routine or emergency basis, must be clean shaven (free from beards or other facial hair which would interfere with the proper fitting of respirators).

Fingernails must be kept trimmed to minimize the potential of accumulating contaminated solids.

2.7.8 Decontamination Waste Handling and Disposal

Wastes generated as a result of site activities will be handled in accordance with applicable environmental regulations.

Unless otherwise specified, water used during personnel decontamination activities will be considered to be contaminated. Specific procedures for handling investigation derived wastes and contaminated site materials will be handled and disposed of in accordance with the provisions of the accompanying workplan or client specifications. Unless, specifically stated, personnel are to treat decontamination wastes as part of the investigation derived wastes.

2.8 STANDARD OPERATING PROCEDURES

2.8.1 General

Standard operating procedures for equipment and project tasks, such as drilling, trenching, sampling and operating treatment systems, will be specified in the corresponding site-specific HSP(s). The following practices are expressly forbidden during on-site work:

- smoking, eating, drinking, applying cosmetics or chewing tobacco while in the exclusion zone, CRZ, or any potentially contaminated area;

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- ignition of flammable materials in the work zone; equipment will be bonded and grounded, sparkproof and explosion resistant, as appropriate;
 - contact with potentially contaminated substance; walking through puddles or pools of liquid; kneeling on the ground; or leaning, sitting or placing equipment on the contaminated soil should be avoided; and
 - performance of tasks in the exclusion zone individually; personnel will be required to work using the "buddy" system at all times. The "buddy" system will be strictly enforced.

Personnel must keep the following prudent guidelines in mind when on site conducting field activities:

- Hazard assessment is a continual process; personnel must be aware of their surroundings and constantly be aware of the chemical/physical hazards that are present.
- The number of personnel in the exclusion zone will be the minimum number necessary to perform work tasks in a safe and efficient manner.
- Team members will be familiar with the physical characteristics of each site including wind direction, site access, and location of communication devices and safety equipment.
- The location of overhead power lines and underground utilities must be established.

2.8.2 Standard Emergency Hand Signals

Team members will be familiar with emergency hand signals:

- Hand gripping throat: "Respirator problems, can't breathe."
- Grip team member's wrist or place both hands around waist:
"Leave site immediately; no debate!"
- Thumbs up: "OK, I'm alright; I understand."
- Thumbs down: "No, negative."
- Hands on face: "Put on respirator."

2.8.3 Injury and Illness Prevention Program

The prevention of accidents and minimization of risks are the responsibility of all site workers. Injury and illness prevention protocols are described below. Appendix A presents the MWH IIPP in its entirety. Appendix A will be updated as necessary to incorporate the IIPPs of all MWH subcontractors.

An IIPP is included in this HSP to comply with California OSHA requirements, and to assure a safe and healthful work environment for the on-site personnel. The OSO or subcontractor's OSO, as discussed in Section 2.2, will be responsible for implementation of company specific IIPPs and for determining relative effectiveness. All on-site personnel will be accountable for reading, understanding, and following the guidelines contained in this health and safety program and company specific IIPPs affecting onsite work. There are nine key components of an IIPP. A summary of each component is presented below:

- (1) **Identification and Evaluation of Hazards:** It is the intent of this HSP to identify and evaluate the potential hazards associated with each site and the remedial objectives/actions associated with the site.
- (2) **Inspections:** Inspections will be performed on a daily basis by the OSO or subcontractor's OSO, so as to assess the effectiveness of both the IIPP and HSP. The project health and safety officer (PSO), may be onsite periodically to conduct audits of the health and safety program and HSP compliance.
- (3) **Correction of Unsafe Conditions:** As a result of daily safety inspections and periodic site health and safety audits, unsafe conditions will be identified and a site-specific action plan developed to alleviate the unsafe condition. It is the responsibility of the OSO to coordinate the implementation of corrective site actions. Such corrective site actions will be considered a top priority and receive necessary support from MWH management. When immediate health or safety hazards exist on the site, it will be the responsibility of the OSO to halt site activities, until the immediate threat has been abated.
- (4) **Accident Investigation:** Appendix D of this document contains the recommended procedure for reporting and investigating site accidents, incidents and "near miss" accidents or incidents. All site personnel will be held responsible for reporting accidents, incidents and near misses. The OSO will begin the accident investigation procedure and determine if additional assistance is required. If required, the PSO will be come to the site and participate in the accident investigation. Reports will be disseminated to affected management and corrective actions will be communicated to all site workers.
- (5) **Communication:** Communication will take place on the site in accordance with the training provisions of Section 2.3 of this HSP. Emergency phone numbers

will be posted for the fire department, ambulance service and the nearest emergency medical clinic/hospital. As stated in Section 2.3, tailgate safety meetings will be conducted to discuss pertinent site safety topics at the beginning of each shift, whenever new personnel arrive at the job site, and as site conditions change. These meetings will be conducted by the OSO and, as a result of each meeting, a completed tailgate safety meeting form must be posted at the job site. A sample Tailgate Safety Meeting Form is found in Appendix C.

- (6) **Training:** Various training requirements exist for conducting hazardous waste operations field work. These requirements are detailed in Section 2.3 of this document.
- (7) **Recordkeeping:** Various records documenting training, tailgate safety meetings, site inspections, accident reports, medical surveillance examinations and general site safety and health information are required for this project. Section 2.10 of this document presents a detailed description of each of these recordkeeping issues.
- (8) **Responsibilities:** Clear assignment and definition of the various roles and responsibilities of this health and safety program are vital to its success. Section 2.2 of this document presents a detailed description of the various roles and responsibilities involved in the health and safety program. Section 1 will identify by name the individuals tasked with the various roles and responsibilities identified.
- (9) **Disciplinary Action:** All persons assigned to the field are expected to conduct themselves in a manner which promotes the health and safety of themselves and their fellow workers. Employees not able to conform to the safety and health protocols contained in this document will be subject to disciplinary action, up to and including termination. Disciplinary actions will be served to those personnel who knowingly disobey safe operating procedures. Depending on the nature of the infraction, the disciplinary action will progress from a verbal warning, to a written warning, to a suspension from site activities to dismissal from the site.

2.8.4 Engineering Controls

Where economically and practically feasible, engineering controls will be selected to reduce exposure of site personnel to health or safety hazards. Engineering controls which may be feasible during the course of any field project include use of pressurized cabs or control booths on equipment, use of remotely operated material handling equipment, dust suppression techniques (such as wetting down a surface with a water spray), noise insulation barriers and use of shoring devices for trench or excavation entry.

2.8.5 Administrative Controls

When engineering controls are not feasible, administrative controls in the form of work practices will be implemented to minimize risk to personnel from site hazards. Work practices which may be instituted include removing all non-essential personnel from the exclusion zone and locating employees upwind of the hot zone. While work rotation for the purpose of limiting exposure to site personnel from airborne chemical hazards is unacceptable, work rotation will be used to control exposures to extreme thermal stresses.

2.8.6 Unanticipated Work Practices

MWH does not typically conduct investigations of sites with unknown drums, explosives or chemical warfare agents. When such work is required, detailed procedures for health and safety are presented in Section 1.

2.9 EMERGENCY RESPONSE PLANNING

It is the objective of this Base HSP to minimize the potential for chemical, biological, and physical hazards, and operational incidents. As part of this program, emergency response planning provides procedures for responding to emergencies that may occur during the project. *It is not the intention of this program to include professional emergency response activities as part of the field operations. Thus, all site personnel are instructed to assess emergencies in terms of whether the problem can be solved safely with the personnel and equipment at the site, or not. If it is determined that site personnel are able to contain the emergency safely, they should do so. If it is determined that the emergency is out of the realm of abilities for existing site personnel, evacuation and notification must take place immediately.* This section provides general information for responding to emergency situations.

Emergency Medical Assistance Network: Emergency telephone numbers and a map showing the locations of the hospitals or emergency clinics capable of providing emergency service for hazardous waste site workers are provided at the end of Section 1. Additionally, telephone numbers for the Poison Control Center, local Police and Sheriff's Department, local Fire Department (including their emergency rescue squad), Office of Emergency Services, MWH management, and client contacts have been provided.

Standby Vehicles: Vehicles that can be used to transport injured personnel from work sites will be available during working hours.

Communication System: A telephone system will be available onsite for communication with offsite personnel. Onsite communication systems may include cellular phones, two-way radios or other suitable devices.



The On-site Safety Officer (OSO) or Subcontractor's Designated OSO : The MWH or subcontractor's OSO will be the lead person in emergency situations associated with onsite work.

First Aid and CPR: As many of the field team as is possible will be certified to render first aid and CPR prior to initiation of site activities. First aid supplies and potable water will be available at all sites. Additionally, portable emergency eye wash stations capable of supplying a continuous flow of water for 15-minutes, will be available at specific work locations where the possibility of contacting corrosive liquids or other eye splash hazards exist.

Project-specific Training: Prior to the start of work, all project personnel will receive training in the established emergency response procedures and associated equipment. A dry-run to each hospital will also be made, ensuring that each project team member knows the way to the nearest emergency facility.

Evacuation Routes: At each work site, evacuation routes will be clearly communicated to all project workers who will enter the decontamination or exclusion zone. This information will be posted at each work site and discussed during each tailgate safety meeting. A safe place of refuge will be determined on a site-by-site basis so that a headcount can be made following an emergency evacuation.

Emergency Alarm System: A compressed air horn will be carried into the exclusion zones for all operations to alert personnel of an emergency situation and pending evacuation.

Any unexpected vapor release, fire or explosion will cause all associated site work to cease and call for an immediate evacuation of the given worksite.

Project Health and Safety Reporting: All accidents, safety related incidents and safety-related near misses will be documented and reported to the MWH OSO and company-specific health and safety contacts.

2.10 DOCUMENTATION

Documentation of personnel credentials, site activities, and environmental monitoring will be maintained on-site at the project office. Examples of some of the recordkeeping forms are presented in the Appendices of this HSP. The MWH PSO or designated OSO will maintain and update these documents. Appropriate regulatory agency personnel shall be granted access to these records. Minimum project health and safety compliance documentation requirements are presented in the following subsections. Additional site-specific documentation requirements will be included in the Section 1.

2.10.1 General

- **OSHA Job Safety and Health Protection Poster:** A copy of this poster shall be hung in the field office or in an area where employees routinely congregate (see Appendix E).
- **The OSHA 200 log:** This is the log containing the required information for recording on-site injuries and illnesses. This record must be generated by each company safety contact, and a copy is maintained on-site and posted during the month of February.
- **Calibration records for all air and noise monitoring equipment:** This record should include the manufacturer, model and serial number of the equipment. The calibration method (span gas, electrical test, pure tone sound etc.), the instrument response to the calibration and a battery check (when applicable).
- **Records and/or logs of air and noise monitoring results:** All monitoring conducted in association with the field work must be documented. At a minimum the documentation shall include the instrument identification, date and time of measurement, result of measurement.
- **Accident/incident/near miss reports:** All accidents, safety/health incidents and near misses shall be investigated. All investigation reports shall be maintained at the site. A copy of the MWH Employee Injury Report Form and Procedure are included in Appendix D.
- **Safety problem/observations:** Records used to: 1) document unsafe behavior and initiate disciplinary action, and 2) document exemplary safety behavior.
- **Daily inspections:** Inspections of daily site operations will be conducted by the MWH OSO or subcontractor's OSO and will be recorded in a log book or other appropriate recording method.
- **Periodic health and safety audits:** Periodic health and safety audits will be conducted at MWH field sites, by the PSO and a report of the findings issued. These reports will be maintained in the field office.
- **The health and safety inspection log:** A log or other recordkeeping format to be completed daily to verify that site conditions and activities are in compliance with this health and safety program. Deficiencies will be noted and changes made immediately.

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- **Documentation of decontamination:** Records including the date, time, type of decontamination, equipment type, identification, name of operator, and signatures of operator and any authorized inspector.
 - **Certificates for the following:**
 - Initial 40-hour, or 24-hour, Hazardous Waste Operations and Emergency Response Training
 - Applicable annual 8-hour refresher health and safety training
 - Applicable 8-hour supervisory Hazardous Waste Operations and Emergency Response Training
 - On-the-job training, 3-day or 1-day
 - First Aid and CPR
 - Medical clearance for working on hazardous waste sites and wearing respiratory protection.

2.10.2 Hazardous Waste Operations And Emergency Response

- A sign-in sheet containing the date, name of each individual on-site, the employer, and the time entering and leaving the site. All personnel will sign this form, whether or not they enter an exclusion zone or contamination reduction zone.
- A Controlled Document Distribution/Reading Training Record, containing the date, names of the individuals, distributed document and revision level, employer, and the individuals' signature.
- The pre-entry site-specific health and safety training record containing the date, the individuals' names and signatures, and the company they are representing.
- The daily "Tailgate" Safety Meeting Record (see Appendix C) containing the date, topic discussed, individuals' names and signatures, and the company they are representing.
- The exclusion zone sign-in sheet containing the date, the individual's name, company they represent, time in and time out of exclusion zone.
- A copy of the Site HSP.

2.10.3 Respiratory Protection

- Respirator fit test certificates containing the employee's name, signature, date, testing challenge, respirator manufacturer, pass/fail results, and signature and title of qualified tester.
- The respirator log containing the date, names of individuals on-site, type and size of respirator.
- When using supplied air respirators. The SCBA Monthly Inspection Report containing a check list for inspections regarding case/storage area, general condition, face piece, head straps and harness, regulator/gauges, breathing air supply, repairs/ maintenance required, and date/inspector's signature. This requirement holds for those tasks performed in Level B, or for emergency SCBA equipment used.

2.10.4 Hearing Conservation

- Noise Survey Forms containing the date, dosimeter or sound level meter identification, location, employee name, equipment identification, work activity, and sample results.

2.10.5 Confined Space Entry

- Confined Space Entry Permits, when applicable, containing date of entry, date of permit expiration, location, PPE requirements, monitoring results, safety requirements, respiratory protection requirements, possible contaminants, signature, and time of entry approval.

2.11 THERMAL STRESS AND SEVERE WEATHER

2.11.1 Heat Stress

The stress of working in a hot environment can cause a variety of illnesses including heat exhaustion or heat stroke; the latter can be fatal. Personal protective equipment (i.e., EPA Level C protection) can significantly increase heat stress. To reduce or prevent heat stress, frequent rest periods and controlled beverage consumption to replace body fluids and salts may be required. It should be noted that heat stress can occur in people wearing regular, permeable, work clothing.

Additionally, quantitative physiological monitoring for heat stress may be conducted. Physiological monitoring for heat stress includes heart rate as a primary indicator and oral temperature as a secondary indicator. The frequency of monitoring depends on the ambient temperature and the level of protection used on-site. To determine the initial monitoring frequency, after a work period of moderate exertion, use the following information:

<u>Adjusted Temperature*</u>	<u>Level D</u>	<u>Level C</u>
90 F or above	after 45 minutes	after 15 minutes
87.5 to 90 F	after 60 minutes	after 30 minutes
82.5 to 87.5 F	after 90 minutes	after 60 minutes
77.5 to 82.5 F	after 120 minutes	after 90 minutes
72.5 to 77.5 F	after 150 minutes	after 120 minutes

* Adjusted air temperature (F) = observed temp + (13 x percent sunshine)

Air temperature measured with bulb shielded from radiant heat, percent sunshine is the time sun is not covered by clouds thick enough to produce a shadow (100 percent = no cloud cover and a sharp, distinct shadow; 0 percent = no shadows). The Industrial Environment, its Evaluation and Control; U.S. Department of Health and Human Services, 1973.

The following procedures and action levels are to be used for the physiological monitoring of heat stress:

Heart rate: Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle one-third and keep the rest period the same. If the heart rate exceeds the 110 beats per minute at the next rest period, shorten the following work cycle by another one-third and also monitor oral temperature.

Oral temperature: Use a clinical thermometer (3 minutes under the tongue) to measure the oral temperature at the end of the work period (before drinking). If oral temperature exceeds 99.6 F, shorten the next work cycle by one-third without changing the rest period. If oral temperature exceeds 99.6 F at the beginning of the next rest period, shorten the following work cycle by one-third. **DO NOT** allow a field team member to wear EPA Level C protection when oral temperature exceeds 100.6 F.

Personnel will be trained to recognize the symptoms of heat stress and the appropriate action to take upon recognition. Even though physiological monitoring is not always necessary, it is essential that personnel understand the significance of heat stress and its recognition.

Some of the symptoms which indicate heat exhaustion are:

- Clammy skin
- Lightheadedness
- Slurred speech
- Rapid pulse
- Weakness, fatigue
- Confusion
- Fainting
- Nausea (vomiting)

If these conditions are noted, the following steps should be performed:

- Remove the victim to a cool and uncontaminated area.
- Remove protective clothing.
- Give water to drink, if conscious.

Symptoms that indicate heat stroke include:

- Staggering gait
- Hot skin, temperature rise (yet may feel chilled)
- Incoherent, delirious
- Mental confusion
- Convulsions
- Unconsciousness

If heat stroke conditions are noted, immediately perform the following steps:

- Remove victim to a cool, uncontaminated area.
- Cool the victim, whole body, with water, compresses and/or rapid Fanning.
- Give water to drink, if conscious.
- Transport the victim to the designated medical facility for further cooling and monitoring of body functions. **HEAT STROKE IS A MEDICAL EMERGENCY!**

2.11.2 Cold Stress

On days with low temperatures, high winds, and humidity, anyone can suffer from the extreme cold. Severe cold exposure can be life-threatening. Several factors increase the harmful effects of cold: being very young or very old, wet clothing, having wounds or fractures, smoking, drinking alcoholic beverages, fatigue, emotional stress, and certain diseases and medications.

2.11.2.1 General

Cold weather injuries may either be local or systemic. Local cold weather injuries include chilblains (chronic injury of the skin and peripheral capillary circulation) and frostbite. Frostbite occurs in three progressive stages: frostnip, superficial frostbite, and deep frostbite. Systemic cold injuries, due to hypothermia, are those that affect the entire body system. Hypothermia is caused by exposure to cold and is aggravated by moisture, cold winds, fatigue, hunger and inadequate clothing or shelter. Precautionary measures that will be taken include:

- Providing field shelters or wind screens;
- Monitoring temperature and wind speed to determine appropriate cold stress personal safety measures;
- Adjusting work schedule based on weather conditions and temperature;

-
- Providing insulated clothing for field workers; and
 - Adhering strictly to the buddy system so that workers can assess cold stress symptoms in their coworkers.

2.11.2.2 Frostbite Monitoring

Frostbite is a potentially crippling condition which can occur when inadequately protected skin or body parts are subjected to freezing weather. All team members should continually be alert for signs of frostbite in coworkers and bring it to the attention of the OSO. A cold feeling, pain, and numbness precede the onset of frostbite. Frostbitten skin usually appears as gray or white waxy spots on skin. Areas most susceptible are nose, ears, and cheeks. The following steps should be taken to avoid frostbite:

- Dress warmly.
- Wear layers of clothes.
- Keep boots and gloves loose-fitting.
- Stay dry; carry extra clothing.
- Avoid touching cold metal with bare hands.
- Avoid spilling cold fuel, alcohol, or other liquids that freeze below 32°F on your body or clothing.

If a person suffers frostbite, get them to a hospital as soon as possible. If transport to a hospital is not immediately available, get the person to a warm shelter and immediately perform the following:

- Cover exposed areas with additional clothing while still exposed to the elements.
- Wrap the person in blankets or a sleeping bag.
- Give the person warm drinks (no liquor).
- Undress the frozen part and submerge the frozen part in a tub of warm water (102° F to 105°F), or put the frostbitten person in a large tub of warm water, if available, and stir the water.

- Warm with skin to skin contact such as: placing warm hands on frozen nose or ears, but do not rub.
- Get the person to a hospital as soon as possible.

Do *not* allow the following to occur:

- Do not rub the frozen part.
- Do not break any blisters that may form.
- Do not give the person liquor.
- Do not let the thawed part freeze again.
- Do not allow the person to walk on thawed feet; carry the person or seek additional help.
- Do not warm the frozen part in front of a source of dry heat (open fire, oven, etc.).
- Do not let the person smoke.

2.11.2.3 Hypothermia Monitoring

Hypothermia is a lowering of the body's temperature due to exposure to cold or cool temperatures. All team members should continually be alert for signs of hypothermia in coworkers and bring it to the attention of the OSO. Most cases of hypothermia occur at temperatures between 30° F and 50° F. If not properly treated, hypothermia can cause death in a victim. Safety equipment for hypothermia should include a synthetic sleeping bag and a hypothermia thermometer. Hypothermia is a medical emergency. Transport to a hospital as soon as possible, even if victim appears to be recovering.

To prevent hypothermia:

- Eat well prior to exposure.
- Dress warmly.
- Avoid becoming wet due to sweating, rain or snow, or falling in water.

Early signs of hypothermia may include:

- violent shivering
- unusually irritable behavior
- slurred speech
- strange behavior
- decrease in coordination
- tendency to drop or lose clothing or equipment
- confusion, inability to answer simple questions

As hypothermia progresses into more serious stages victims typically:

- develop trouble seeing clearly
- become sleepy and numb
- move with difficulty
- eventually become unconscious, if not properly cared for

The following actions should be taken to treat a hypothermia victim:

- Get the victim to a warm, dry shelter as soon as possible.
- Remove any wet or cold garments and dry the person thoroughly.
- Wrap the victim in blankets, sleeping bags or dry clothing to prevent more heat loss.
- If a warm area is not available:
 - Build a shelter and put the victim in the warmest, driest area available.
 - Remove any wet or cold garments.
 - Have one or more persons remove their clothing and lay next to the victim, providing skin to skin contact.
 - Wrap the victim and rescuers in dry warm blankets, sleeping bags or clothing.
- When the victim becomes conscious, place warm objects along the victim's sides to warm vital areas.
- When the victim is able to swallow easily, provide warm, sweetened drinks and food (preferably candy or sweetened food).
- Do not give the victim alcohol or allow to smoke.
- Do not rub the victim's skin.
- Keep checking the victim and give additional assistance as needed.

2.11.3 Severe Weather

While each project site will be subject to varying types of weather conditions, this section provides general information and controls on several types of severe weather. Section 1 will describe any adverse weather conditions to watch for.

2.11.3.1 Lightning

If a lightning storm is suspected or observed, all site activities must be stopped and evaluated in terms of providing a potential lightning rod. Drill rig mast provides a conduit for lightning to strike and injure workers. Personnel should wait indoors for the storm or lightning event to end. If the strike of lightning occurs and personnel are out in the field, the response should be to disband from one another and lay low to the ground by dropping to your knees and bending forward with your hands wrapped around your knees, away from any poles or trees.

Persons struck by lightning receive a severe electrical shock and may be burned, but they carry no electrical charge and can be handled safely. Someone who appears to have been killed by lightning often can be revived by prompt action. Those unconscious but breathing will probably recover spontaneously. First aid and CPR should be administered as appropriate until medical assistance arrives. Realize that victims who appear to be only stunned or otherwise unhurt also need attention. Check for burns, especially at fingers and toes and next to metal buckles, jewelry, or personal items that the victim is wearing. Remember to treat for shock.

2.11.3.2 Tornadoes

Tornadoes usually develop from thunderstorms and normally occur at the trailing edge of the storm. Most tornadoes occur in the months of April, May, June and July in the late afternoon and early evening hours.

When storms are predicted for the project areas, monitor weather conditions on a radio. A tornado watch is issued when favorable conditions exist for the development of a tornado. A tornado warning is issued by the local weather service office whenever a tornado has actually been sighted or is strongly indicated by radar.

If a tornado warning is issued, seek shelter immediately. If there are permanent buildings located on site, go there immediately, moving toward interior hallways or small rooms on the lowest floor.

If a tornado warning is issued and you are in a vehicle or a site trailer, leave and go to the nearest building. If there are no buildings nearby, go in the nearest ditch, ravine or culvert, with your hands shielding your head.

If a tornado is sighted or a warning issued while you are in open country, lie flat in a ditch or depression. Hold onto something on the ground, such as a bush or wooden fence post, if possible.

Once a tornado has passed the site, site personnel are to assemble at the designated assembly area to determine if anyone is missing or injured. Administer first aid and seek medical attention as needed.

2.11.3.3 Winter Storms

When snow or ice storms are predicted for the project area, site personnel should monitor weather conditions on a radio. A winter storm watch is issued when a storm has formed and is approaching the area. A winter storm warning is issued when a storm is imminent and immediate action is to be taken.

When a storm watch is issued, monitor weather conditions and prepare to halt site activities. Notify the project manager of the situation. Seek shelter at site buildings or leave the site and seek warm shelter.

If you are caught in a severe winter storm while traveling, seek warm shelter if road conditions prevent safe travel. If you are stranded in a vehicle during a winter storm:

- Stay in the vehicle. Disorientation comes quickly in blowing and drifting snow.
- Wait for help.
- Keep a window open an inch or so to avoid carbon monoxide poisoning.
- Run the engine and heater sparingly.
- Keep watch - do not let everyone sleep at the same time.
- Exercise occasionally.

2.11.3.4 Hurricanes

When conducting field work in southeast and gulf coast regions of the country, hurricanes may be a concern. Hurricanes typically are prevalent in the summer months with good warning. Field teams should watch the weather news and if a hurricane is indicated for the project site, field work shall be suspended until the hurricane has passed.

Hurricanes are preceded by heavy rains and result in extremely high winds. It is common for tornadoes to be produced from the winds of a hurricane. Refer to Section 2.11.3.3 above for information on tornadoes.

Evacuation of the project area should be conducted in accordance with the local authorities.

2.12 GENERAL SITE PROGRAMS

2.12.1 Hazard Communication Program

MWH has a Hazard Communication Program. This program appears as I/HW Procedure No. 630.11 and as Bulletin III-1 Revision A of the MWH Environmental/Occupational Health and Safety Manual. A copy of I/HW Procedure No. 630.11, Bulletin III-1 Revision A and Bulletin A-III Revision A, the MWH Employee Guide to Hazardous Materials, as well as material safety data sheets (MSDSs) for hazardous materials brought to typical MWH field sites (i.e., engineers fluorescent spray paint) are bound together and will be available at the project field office. As necessary, the hazard communication program of subcontractors will also be solicited for use as a project office reference. All site personnel, MWH and subcontractors, will be made aware of the

MWH Hazard Communication Program and have access to MSDSs for chemicals brought to any field site.

2.12.2 Spill Containment Program

Drums or other containers will be on site to store decontamination fluids and waste PPE. All field team members will exercise care when decontaminating equipment and personnel, and will treat any spilled decontamination water or fluid as a hazardous material. If a spill occurs, field team members will:

- Assess the need to don a higher level of PPE. This assessment will depend on the volume of the spill, nature of the spilled material, and measurements from air monitoring equipment.
- Obtain an appropriate drum or container to package the spilled material.
- Pump or scoop up the spilled material and any additional contaminated soil or articles, and place the material in a drum or other suitable container. This will be done in the appropriate level of PPE.
- In the event that the spill is too large to be handled safely by the field team, the area around the spill will be secured and the OSO will initiate clean-up activities by notifying the appropriate emergency or spill response organization. Once efforts to mitigate the spill are underway, the MWH Project Manager and appropriate client representatives shall be notified.

2.12.3 Fire Protection Plan

2.12.3.1 General

Field activities associated with hazardous waste operations could potentially result in a fire at a site. Cigarette smoking is expressly forbidden in the exclusion zone. Air monitoring equipment used to monitor for flammable mixtures will be intrinsically safe and measurements collected at a frequency which will allow for a reliable assessment of the fire hazards at a site. Invasive field activities will be monitored with direct reading air monitoring equipment, as specified in Section 1. At least one Class ABC dry chemical fire extinguisher, 10 pound minimum, will be available for use at each site.

All electrical wiring will be free from frayed ends and sections, and all hook-ups will be checked for loose fittings. Portable power tools will be connected to a ground fault circuit interrupter and care will be taken to ensure that electrical connections do not exceed the maximum load capacity for any one circuit.

2.12.3.2 Wild Fires

Areas (particularly the southwestern United States) with wide open spaces of natural brush, present the danger of wild fires when dry grasses and brush catch fire. Many project sites have structures that can provide enough of a fire break to prevent wild fires from endangering site personnel, but, it is not an absolute protective measure. For this reason, the MWH OSO will check regularly with the local fire department during the most common wild fire months (July through November). Should a wild fire threaten a work site, the MWH OSO will maintain vigilant watch for changing conditions and evacuate and secure each active site, in accordance with local fire department instructions.

2.12.3.3 Fire or Explosion Response Action

The actions listed below are in a general chronological sequence. Conditions and common sense may dictate changes in the sequence of actions and the addition, elimination, or modification of specific steps.

2.12.3.3.1 Immediate Action

Upon detecting a fire/explosion, employees will notify the fire department and determine whether or not the fire is small enough to readily extinguish with immediately available portable extinguishers or water, or if other fire-fighting methods are necessary.

Non-essential personnel will be directed away from the area of the fire.

If it is judged that a fire is small enough to fight with available extinguishing media, employees will attempt to extinguish the fire provided that:

- They are able to approach the fire from the upwind side, or opposite to the direction of the fire's progress.
- The correct extinguisher is readily available. Type ABC (10 pound recommended minimum) fire extinguishers will be provided in work areas and on vehicles.
- No known complicating factors are present, such as likelihood of rapid spread, imminent risk of explosion, or gross contamination.

Personnel leaving a fire/explosion area will notify the fire department and will account for all employees in that work area as soon as possible. The OSO or designee will perform a head count for that work area.

2.12.3.3.2 Notification

The MWH OSO will be notified as soon as possible of the location, size, and nature of the fire/explosion. A member of the MWH management team will notify appropriate agency personnel in the event of a fire or explosion resulting in a release of a hazardous material to the environment.

As conditions dictate, the OSO will declare an emergency, initiate the remedial procedures, request assistance from the fire department, and make the necessary on-site and off-site notifications. If assistance from the fire department is required, an escort appointed by the OSO will direct responders' vehicles over clean roads to the extent possible to limit contamination. Note: National Fire Protection Association (NFPA) guidelines call for notifying the fire department, even for small fires to ensure proper extinguishment.

2.12.3.3.3 Rescue

If employee(s) are unable to evacuate themselves from a fire/explosion area for any reason, their rescue will be the first priority of responders. The Project Supervisor and/or OSO will determine whether on-site resources are sufficient to proceed, or if rescue must be delayed until outside responders arrive.

2.12.3.3.4 Fire-Fighting Procedures

Planned fire-fighting procedures are described below. These apply to small fires that the project team members are able to control.

Fire During Working Hours: In the event a support zone fire occurs during working hours, the following measures will be taken to put out the fire. These measures are sequential, that is, if the first measure does not succeed in containing the fire, the next measure will be initiated.

- Utilize fire extinguishers.
- Confirm that request for assistance from the fire department has been made.
- Utilize earth moving equipment, foam unit, and water truck, as appropriate. Brush fires will be extinguished with water.

Fire During Non-Working Hours: In the event of a fire during non-working hours, existing alarms, site security (if applicable), or whomever from the project team is notified, will notify the MWH OSO or PSO. Additional actions will be consistent with procedures established for a fire during working hours.

2.12.3.4 Response Coordination

Upon arrival of outside responders from the fire department, the OSO will coordinate with the leader of the outside responders to direct fire-fighting activities. Once a municipal fire department responds to the scene, the control of the scene is under the leader of the responding fire department.

2.12.3.5 Protection of Personnel

The primary methods of protecting personnel from fire conditions will be by distance and remaining upwind.

Based on the conditions, the OSO will determine appropriate distances and the selection of personal protective equipment. For approach in close proximity to fire areas, Level B or greater protective equipment suitable for fire fighting will work. Level B equipment will entail, at a minimum, supplied air respirators and fire-fighting turn-out gear. Note: Only those SCBAs that comply with ANSI/NFPA 1981 can be used in firefighting.

2.12.3.6 Decontamination

At the conclusion of fire fighting activities, the OSO will:

- Determine to the extent practicable the nature of the contaminants encountered during the incident.
- Arrange for all outside responders' fire response equipment, and on-site equipment as necessary, to be processed through the site decontamination zone, using methods appropriate for the contaminants involved.
- Equipment not easily decontaminated shall be labeled and isolated for further action, such as determining specific contaminants by wipe sampling or awaiting the delivery of specific decontamination media and supplies.

2.12.3.7 Fire Extinguisher Information

The four classes of fire, along with their constituents, are as follows:

- Class A - Wood, cloth, paper, rubber, many plastics, ordinary combustible materials
- Class B - Flammable liquids, gases and greases
- Class C - Energized electrical equipment
- Class D - Combustible metals such as magnesium, titanium, sodium, potassium.

Examples of proper extinguishing agents are as follows:

- Class A - Water
Water with one percent AFFF Foam (wet water)
Water with five percent AFFF or Fluoroprotein Foam
ABC Dry Chemical
Halon 1211
- Class B - ABC Dry Chemical
Purple K
Halon 1211
Carbon Dioxide
Water with six percent AFFF Foam
- Class C - ABC Dry Chemical
Halon 1211
Carbon Dioxide
- Class D - Metal-X Dry Chemical

No attempt should be made to extinguish large fires. These should be handled by the fire department. The complete area of the fire should be determined. If human life appears to be in danger, or the spread of the fire appears to be rapidly progressing, move personnel further upwind away from the fire.

2.12.3.8 Use of Fire Extinguishers

Inspect the fire extinguisher on a monthly basis to ensure that the unit is adequately charged with extinguishing media. Do not store a fire extinguisher on its side. To use the extinguisher, follow the acronym PASS for below listed instructions:

1. Pull the pin on the top of the unit
2. Aim at the base of the fire.
3. Squeeze the handle on the top of the unit.
4. Sweep the extinguishing media along the base of the fire until the fire is out. Ensure that the fire is fully cooled before assuming it is completely extinguished.

2.12.4 Earthquake and Disaster Preparedness

If an earthquake or disaster occurs during working hours and the magnitude is such that site personnel or their families may be in danger, the MWH OSO will initiate site evacuation procedure. This action is to be taken only if in the judgment of project personnel and/or OSO that the earthquake is large enough to have potentially caused damage to any of the structures or equipment being used on the site.

If the earthquake or disaster occurs during non-working hours the OSO will determine whether safe entry into the exclusions zones can be made, or if an inspection is needed first.

If at any time, the inspection team feels that they need the assistance of the fire department, the inspection shall cease until the fire department is able to assist. The inspection will be conducted using the buddy system. The team will look at all structures, equipment and any chemical storage areas for signs of cracks or deterioration. When assessing areas known to contain chemicals, appropriate air monitoring equipment will be used to ensure that leaks are detected quickly and without injury to the inspection team. When inspecting areas where chemical releases could have occurred as a result in a breach of containment, Level B PPE is recommended.

In the event of a catastrophic earthquake or disaster, it is said that up to 72 hours could elapse before emergency assistance arrives. Therefore, it is advisable for the project team to maintain enough supplies (food, water, emergency supplies such as first aid kits, personal medication, and any other applicable supplies) for each person scheduled to work on a full-time basis. These supplies should be stored in a place that is not likely to be impacted by an earthquake or other type of disaster.

2.12.5 Sanitation

Work breaks, eating/drinking and conducting paperwork tasks will be performed in the field vehicle or other suitable location outside of the exclusion zone and contamination reduction zone. Field personnel will wash their hands prior to eating or drinking.

Project site toilet facilities may be available to site workers. If it is determined that an existing toilet facility is not located within a suitable distance (up to five minutes vehicle ride) to a particular site, portable toilet facilities will be rented and brought to the project site. It is anticipated that the size of the typical field crews will not be so large as to warrant the rental of two toilets, one for each sex. However, should it become necessary to have more than 20 people at a project site, separate sex toilet facilities will be required. Any rental toilet will be equipped with a door that is lockable from the inside and will be shared by all team members. Rental toilets will come equipped with a minimum of a weekly cleaning service so as to preserve the sanitary nature of the project site. A visual search for spiders (particularly black widow spiders) should be conducted prior to using any portable toilet.

Potable water will be available in the support zone for all field team members. The OSO is responsible for ensuring that an adequate supply of water is available at the site. During times of heavy labor and hot temperatures, it is recommended that approximately one liter of water per hour be ingested. While it may be difficult to ingest one liter of water per hour, the OSO is responsible for making that quantity of water available. Sport-type beverages may also be provided for site personnel. Non-potable water outlets must be clearly identified. When decontamination procedures are prohibitive for the purpose of ingesting water during work, field team members may drink water under the following stipulations:

- Water is dispensed from a cooler with a pull-lever pouring spout. Push-button pouring spouts are unacceptable as dirty fingers can easily contaminate the pouring spout.
- Minimum 3" tall disposable drinking cups must be used and discarded after each use.
- Drinking cups must be dispensed out of a plastic or metal dispenser attached to the cooler allowing the bottom of the cup to be grabbed without touching the rim of the top.

Support zone food handling activities must comply with local requirements governing the use of barbecues and vending. Remember to store food at either above 140 degrees F or below 40 degrees F so as to kill or retard foodborne pathogenic microorganisms. When in doubt, throw it out!

Sleeping quarters will be arranged by MWH management, when personnel must travel away from their home to work on site. Such quarters will be equipped with shower and changing facilities.

2.12.6 Illumination

Most site work will be done during daylight hours. However, it is recognized that work may be required to be completed during non-daylight hours. When performing work during non-daylight hours, personnel must be furnished with enough light to adequately see what they are doing. OSHA requires a minimum of five foot-candles of light for general work sites. Five foot-candles is likely to be inadequate for personnel to see clearly, therefore, rental of a light source will likely be required. Most equipment rental companies maintain light sources capable of providing enough light for site work. Ensure that all electrical lines are properly grounded (i.e., with a ground-fault circuit interrupter) and that explosion proof lighting is used in flammable atmospheres.

2.12.7 Confined Space Entry

When possible, confined space entries will be avoided. When confined space entry is required, detailed procedures will be included in Section 1. Only trained and experienced personnel will be permitted to conduct a confined space entry. MWH does not maintain a confined space rescue team. Subcontractors maintaining confined space rescue teams may use them in the course of confined space entry activities. All others will be required to utilize either the local fire department or contract a specialty company to provide such emergency standby services. All confined space entries will conform to the requirements of 29 CFR 1910.146.

2.12.8 Excavation and Trenching

Entry into excavations will be avoided when possible. Should an excavation or trench entry become necessary during the course of the project, specific details concerning the nature of the entry and safety precautions will be included in Section 1. At a minimum, the excavation will be overseen by a Certified "Competent Person." Protective measures such as sloping, benching or shoring will be implemented depending on the nature of the entry and soil classification. All trenching and excavation activities will conform to the requirements of 8 CCR 1504 and 1539 through 1547.

2.13 GENERAL INFORMATION ON CONTAMINANTS OF POTENTIAL CONCERN

This section provides general information pertaining to the occupational health limits for chemical, biological and radiological contaminants.

2.13.1 Chemical Contaminants of Concern

A summary of the results of previous investigations and information concerning the occupational exposure limits and toxicological information for chemicals of concern identified at are presented in Section 1.

Occupational Exposure Limits. The toxic hazards to site personnel associated with the suspected site contaminants can be assessed through comparison of actual exposures with several established occupational exposure limits. Permissible Exposure Limits (PELs) are established by federal OSHA. Recommended Exposure Limits (RELs) are established by the National Institute for Occupational Safety and Health (NIOSH). Threshold Limit Values/Time Weighted Averages (TLV/TWAs) are established by the American Conference of Governmental Industrial Hygienists (ACGIH). Immediately Dangerous to Life or Health (IDLH) values are established by NIOSH. These occupational exposure limits are described as follows:

- Permissible exposure limits are established by federal or OSHA. PELs may be expressed as an 8-hour TWA or as a ceiling limit. Ceiling limits may not be exceeded at any time. PELs are enforceable by law.

- RELs are developed by NIOSH. RELs are published guidelines that recommend employee exposure limits for airborne contaminants. RELs are expressed as a TWA or Ceiling Limit.
- The ACGIH TLV/TWA is defined as the airborne concentration of a substance to which nearly all workers (8 hours per day, 40 hours per week) may be repeatedly exposed, day after day, without experiencing adverse health effects. For some substances, the overall exposure to a substance is enhanced by skin, mucous membrane, or eye contact. These substances are identified by a notation (s) following the TLV/TWA values. Other substances have a ceiling value (c), which may not be exceeded during any part of the working exposure.
- IDLH: The maximum airborne concentration of a substance which one could escape within 30 minutes without escape-impairing symptoms or any irreversible health effects.

Table 1 presents occupational exposure limits and general toxicological information for the site contaminants, including-OSHA PELs, NIOSH RELs, ACGIH TLV/TWAs, and IDLH values. Alternate workplace standards recommended in publications related to workplace exposure criteria, such as the Threshold Limit Values and Biological Exposure Indices by the American Conference of Governmental Industrial Hygienists, shall be used in lieu of OSHA standards where OSHA standards are less stringent or do not exist.

2.13.2 Biological Hazards

Potential biological hazards at hazardous waste sites may consist of snakes, spiders, ticks and fleas, poisonous plants such as poison oak and poison ivy, and the newly identified hantavirus.

Spiders, snakes, and fleas exist in cool, dark, moist areas. The potential for encounters exist when reaching into dark, covered places. Suggestions for control include using a long stick to break apart webs or loosen soil from certain areas. A flashlight should also be used when reaching into a dark area. Field personnel shall be aware of their surroundings and avoid contact with all insects.

Rattlesnakes and scorpions are indigenous to many parts of the United States. The On-site Safety Officer (OSO) will inform field team members at the daily tailgate safety meetings to be on the lookout for rattlesnakes and scorpions. It should be noted that the American Red Cross does not advocate the use of snake bite kits for snake bite injuries. Rather, experience has shown that the victim has a better chance of recovery without permanent damage when the site of the wound is immobilized and the victim rushed to the closest emergency medical facility (preferably within 30 minutes).

Poisonous plants such as poison ivy and poison oak grow wild in dark, moist areas, and at the base or surrounding seedling or adult trees. Some individuals are prone to break out in dermal

(skin) rashes upon contact with the plant oil. A visual site inspection and identification of the plants should be completed prior to each workshift so that all individuals are aware of the potential exposure.

A recently identified disease, Hantavirus, has resulted in several deaths in the southwestern part of the United States. While there may not have been any outbreaks or notices of the virus at a particular project site, field team members should be aware of the cause and potential control methods. The Hantavirus has been shown to be transmitted through the aerosolization of dried rodent excreta. The newly recognized Hantavirus-associated disease begins with one or more symptoms including fever, muscle aches, headache, and cough and progresses rapidly to severe lung disease, often requiring intensive care treatment. To control potential contact with dust that may be carrying the rodent excreta, the field team will conduct a visual survey of the area around each site to note whether rodents are thriving in the area. If it is determined that non-domesticated rodents may be living near the work area, or the area is affected by wind blowing dust into the work area, dust suppression techniques and/or respiratory protection (dust mask or dual cartridge air purifying respirator with dust filters) will be required. The Center for Disease Control, in Atlanta Georgia, has established a hotline for inquiries regarding the Hantavirus: (800) 532-9929.

Any medical (biological) wastes as site contaminants are discussed in Section 1.

2.13.3 Radiological Hazards

When ionizing radiation hazards can not be reasonably eliminated as a site hazard, a program for the recognition, evaluation and control of radiation hazards will be presented in Section 1.

2.13.4 Other

Unexploded ordnance, explosive wastes and chemical warfare agents have been identified on many military sites and at formerly used defense sites. MWH I/HW Policy 630.25 discusses MWH's approach to these specialty sites. In summary, MWH does not maintain internal expertise in these specialty disciplines and requires that projects with these hazards be conducted with the help of a specialty contractor. Site specific approaches to these hazards are presented in Section 1 for such sites.

2.14 COMMON PHYSICAL HAZARDS AND CONTROLS

This section provides information concerning common physical hazards associated with hazardous waste operations and recommended controls to minimize risk to site personnel. Section 1 will list the hazards specific to this project.

2.14.1 Slip/Trip/Fall

All field team members are to be vigilant in providing clear footing, clearly identifying obstructions, holes, or other tripping hazards and maintaining an awareness of uneven terrain and slippery surfaces. If necessary shoes providing more elaborate tread will be worn to minimize slip, trip and fall hazards. Working at heights above six feet are not anticipated to be necessary during the course of this project. If work at such heights does become necessary, Section 1 of this plan will include a fall protection program.

2.14.2 Heavy Lifting

During manual lifting tasks, all personnel will remember to lift with the force of the load suspended on their legs and not their backs. They are to maintain a straight back and hold the object close to the body. Mechanical lifting devices or the help of a fellow field team member should be sought when the object is too heavy for one person to lift.

2.14.3 Electrical Hazards

The presence of underground and overhead utilities must be assessed before any field work involving heavy equipment with booms or extensions, or invasive work is permitted. An underground utility service in conjunction with a review of as-built construction drawings will identify and locate all utilities prior invasive activities. Invasive activities must be at least five feet away from marked underground utilities. In all cases, personnel will be vigilant in looking up for the presence of overhead lines before raising the mast of a drill rig, backhoe bucket or crane arm. Generally, clearances of 20 feet or more are recommended. Minimum distances from mast to overhead electrical lines, based on voltage, are as follows:

Nominal Power Line System (kV)	Minimum Required Clearance (feet)
0-50	10
51-100	12
101-200	15
201-300	20
301-500	25
501-750	35
751-1,000	45

Source: United States Army Corp of Engineers

Other electrical hazards include temporary office power supply, generators and lightning. Field personnel are responsible for ensuring that equipment brought to the worksite is grounded before use. Additionally, the use of groundfault circuit interrupters are required for all portable electrical tools and fixed electrical equipment to be used at the site.

2.14.4 Motor Vehicle Hazards

Motor vehicle accidents can occur any time people drive. All field staff are required to employ defensive driving techniques, and obey all client site speed limits and vehicle safety requirements. All accidents are to be reported to the MWH OSO.

2.14.5 Hot Work Permits

Any welding, torch cutting or other hot work will be performed in accordance with any client specific hot work permit procedures. Otherwise, all hot work must be done with the complete knowledge of the MWH OSO and a fire watch nearby with a suitable fire extinguisher.

2.14.6 Sharp Edges and Pinch Points

During the course of the field work, it is feasible that personnel will encounter sharp edges and pinch points. Sharps may include site debris, field tools, equipment or other objects. Pinch points are places where the hands may be caught between objects or moving parts. When danger of cuts to the hands or other body parts is probable, employees will either arrange paths where personnel may walk free of sharp edges, or ensure during the tailgate safety meeting that areas with known sharp edges are brought to the attention of the entire field crew. Heavy work gloves shall be used in conjunction with any chemical resistant gloves when handling sharp objects is required.

2.14.7 Noise

Noise levels will vary during the course of field activities at any site. For this reason, noise monitoring will be required during the initial stages of site work or when it is anticipated that noise levels will need to be characterized. If used, the sound level meter or noise dosimeter will meet the OSHA requirements [ANSI S1.4-1971 (R1976), Specifications for Sound Level Meters, Type 2] for measuring noise levels in decibels (dBA) with an A-weighted scale, in the slow response mode. Time-weighted average exposures greater than 85 dBA will necessitate implementing the hearing conservation requirements stated in 29 CFR 1910.95 (Occupational Noise Exposure). These include continued area noise monitoring, additional personnel training regarding noise hazards and protective measures, and the mandatory use of protective hearing devices (such as ear plugs with a noise reduction rating [NRR] greater than or equal to 25).

2.14.8 Heavy Equipment Use:

Drilling Operations. The following actions shall be adhered to during drilling operations to minimize exposure to site contaminants:

- Before drilling, the boring location must be adequately monitored for hydrocarbon vapors. Each site will be monitored for organic vapors and gases, as stated in Section 1 of this HSP. Chemical resistant gloves will be used when handling contaminated

soils and water. Protective clothing requirements for the field activities are also discussed in Section 1 of this HSP.

Potential hazards associated with drilling operations include electrical hazards such as overhead power lines and underground utilities; rolling, spreading, or sliding tools and supplies; and rotating machinery. A private utility locating service will be used and no drilling will be allowed within 5 feet of marked underground utilities or within 20 feet of overhead high-voltage electrical hazards. The following safety provisions will be adhered to by the drilling contractor:

- Before raising the mast, all drill rig personnel (with the exception of the operator) and field team members will be cleared from the area immediately to the rear and the sides of the mast. All drill rig personnel and other field team members must be informed that the mast is being raised prior to raising it.
- Before raising the drill rig mast in the vicinity of electrical power lines, the operator shall walk completely around the drill rig to determine the distance of the rig to the nearest power line when the mast is raised (this distance should be equal to or greater than 20 feet, see Section 2.14.3). Any questions regarding the appropriateness of a drilling location will be brought to the attention of the MWH OSO or the MWH Project Health and Safety Officer (PSO).
- Before the mast of a drill rig is raised and drilling is commenced, the drill rig must be first leveled and stabilized with leveling jacks or solid cribbing. The drill rig should be re-leveled if it settles after initial set-up. The mast will be lowered only when the leveling jacks are down and the leveling jack pads will not be raised until the mast is lowered completely.
- Prior to drilling, a hand auger will be used to clear the boring location to a depth of approximately 5 feet if there is any question of the location of underground utilities.
- Suitable storage for all tools, materials, and supplies will be provided. Pipe, casings, augers, and similar drilling tools will be arranged to prevent rolling, spreading, or sliding by using blocks.
- Work areas and drilling platforms will be kept free of materials, obstructions, and substances that could cause a surface to become slick or otherwise hazardous.
- Augers will be used in accordance with the manufacturer's recommended methods for securing the auger to the power coupling. Additionally, the operator and tool handler will be responsible for establishing safe procedures for drilling, auger connection and disconnection, and auger insertion and removal.

-
- Augers will only be cleaned when the drill rig is in neutral and the auger has ceased to rotate.
 - Unattended boreholes must be properly covered or otherwise protected.

Backhoe Operations for Trenching and Excavations

Potential hazards associated with trenching/excavation include exposure to organic vapors, metal dust, explosive decomposition gases, and dermal contact with site contaminants. The following safety precautions will be utilized when operating a backhoe conducting trenching or excavation activities:

- Air monitoring for oxygen content and combustible gases will be performed. When possible environmental samples will be collected from a backhoe bucket, obviating the need to enter a trench.
- No one will be permitted in the trench without contacting the PSO and adhering to the requirements in Section 1 for safe entrance procedures for trenches.
- The buddy system will be employed at all times.
- No trench will be left unattended or open without adequate barricades, caution tape, and safety signs.
- Personnel and equipment will maintain a minimum 2 foot clearance from the edge of the excavation.
- Suitable storage for all tools, materials, supplies will be provided by the contractor (or subcontractor).
- Work areas will be kept free of materials, obstructions, and substances that could cause a surface to become slick or otherwise hazardous.
- Tools and equipment will be used in accordance with the manufacturers recommended methods. The operators shall be responsible for establishing safe equipment use procedures.
- Unattended excavation must be properly covered or otherwise secured when work is not active.
- Soil shall be backfilled as soon as possible.

REFERENCES

American Red Cross. Standard First Aid. 1988.

California Code of Regulations Title 8. 1994.

Montgomery Watson (formerly Warzyn). Internal and External Health and Safety Plan Preparation. 1994.

U.S. Army Corps of Engineers. EM 385-1-1 Safety and Health Requirements manual. 1992.

U.S. EPA. Standard Operating Safety Guides. June 1992.

U.S. EPA. Health and Safety Audit Guidelines SARA Title I Section 126. December 1989.

U.S. EPA, NIOSH, OSHA, USCG. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. October 1985.

U.S. Department of the Army. 1100 Area RD/RA Site Safety and Health Plan prepared for the U.S. Department of Energy. June 1994.

U.S. Department of Labor - Occupational Safety and Health Administration. 29 Code of Federal Regulations Part 1910 and Part 1926. 1993 and 1991, respectively.

Appendix A:

Injury and Illness Prevention Program
(MWH and all subcontractors)

I/HW POLICY NO. 600.03

Subject: INJURY AND ILLNESS PREVENTION PROGRAM (IIPP)

I. PURPOSE

To describe the requirements of the Montgomery Injury and Illness Prevention Program (IIPP).

II. ATTACHMENT

A. Montgomery Injury and Illness Prevention Program Bulletin (TV-1)

III. DISCUSSION

As part of Montgomery's Corporate Environmental/Occupational Health and Safety Program, the IIPP requirements apply to all Montgomery work places (e.g., project worksites, offices).

I/HW Operations Group Offices: Montgomery Program Directors have the responsibility to assure that all Montgomery I/HW Operations staff understand the requirements of the IIPP and that it is effectively implemented and documented.

I/HW Operations Project Worksites: The requirements of the IIPP are effectively met by preparation of site-specific health and safety plans (including a description of project-specific health and safety authorities/responsibilities); conducting daily tailgate safety meetings; complete project health and safety documentation; periodic project health and safety compliance audits and correction of any unsafe conditions; timely and complete accident investigation; and, employee training and medical surveillance (in accordance with the requirements of 29CFR 1910.120: Hazardous Waste Operations and Emergency Response).

The designated project On-site Safety Officer (OSO) is responsible to assure that all provisions of an effective IIPP are carried out during the course of each field project.

IV. IMPLEMENTATION ASSISTANCE

In addition to the I/HW Operations Health and Safety Manager, the Montgomery Corporate Health and Safety Manager is available to assist I/HW Operations Program Directors in implementing their IIPP responsibilities.

Appendix B:

Personal Acknowledgment Form

PERSONAL ACKNOWLEDGMENT FORM

HEALTH AND SAFETY PROGRAM

PROJECT NAME/SITE

As a component of the MWH Health and Safety Program (which includes Site Specific Health and Safety Plans) designed to provide personnel safety during hazardous waste site operations, you are required to read and understand the entire Health and Safety Program (HSP) for this project. Upon completion of reading and understanding this document, please sign and date this personal acknowledgment form and return it to the On-Site Safety Officer.

Signature

Name (Printed)

Date

Appendix C:
Tailgate Safety Meeting Form

TAILGATE SAFETY MEETING FORM

Date: _____ Time: _____ Job Number: _____

Client: _____

Site Specific Location: _____

Safety Topics Presented

Protective

Clothing/Equipment: _____

Chemical

Hazards: _____

Physical Hazards: _____

Special Equipment: _____

Other (IIPP): _____

Emergency Procedures: _____

Hospital: _____ Phone: _____ Ambulance Phone: _____

Hospital Address and
Route: _____

ATTENDEES

NAME PRINTED

SIGNATURE

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Meeting Conducted By: _____

Name Printed

Signature

Project Safety Officer: _____ Project Manager: _____

I/HW PROCEDURE NO. 630.07

Subject: TAILGATE SAFETY MEETINGS

I. PURPOSE

To describe the value and use of the Tailgate Safety Meetings as an on-site pre-entry briefing tool.

II. ATTACHMENT

- A. Tailgate Safety Meeting Form
- B. OSHA Job Safety and Health Protection Poster

III. DISCUSSION

- A. Projects conducted by MWH involving hazardous wastes often require completion of a Site Safety Plan (see I/HW PROCEDURE 630.01). As an adjunct to Site Safety Plans, or as a stand alone safety measure, the Tailgate Safety Meeting (Form) provides shift specific safety information, a discussion of the site hazards and written documentation of the safety program.

The OSHA General Duty Clause, Injury and Illness Prevention Program, and Hazardous Waste Operations and Emergency Response regulations, require periodic safety meetings so that workers are provided a forum to address site specific safety and health hazards. Use of the Tailgate Safety Meeting Form (Attachment A) gives MWH a mechanism for providing a place of employment free from recognized hazards.

- B. OSHA requires that a copy of the Job Safety and Health Protection Poster be posted at every employer job site, in a location where employees are likely to see it. The poster briefly describes the OSHA program and the rights of employees under the OSH Act.

IV. PROCEDURE

- A. Tailgate Safety Meetings are conducted by MWH Site Supervisors, Field Team Leader, On-site Safety Officer (OSO), or other qualified person. Meetings shall be conducted at the beginning of each work shift, when site conditions change or when new employees arrive at the work site.
- B. Meetings shall be documented by completion of the Tailgate Safety Meeting Form. The completed Form shall be posted at the work site.

I/HW PROCEDURE NO. 630.07 (Continued)

- C. A copy of all completed Tailgate Safety Meeting Forms shall be maintained in each project's health and safety compliance documentation file. Such files must be maintained at the worksite for the duration of field activities and be available for review during project health and safety compliance audits (see I/HW PROCEDURE 610.03).
- D. Tailgate Safety Meeting Forms should be completed in the following manner:
1. Date - date of meeting
 2. Time - time meeting held
 3. Job Number - specific MWH number applied to the project
 4. Client - name of company/agency for whom work is performed
 5. Location - specific address and location of work at that address
 6. Safety Topics Presented:

Protective Clothing/Equipment - list all types of protective clothing, respiratory equipment and other safety devices to be used by personnel during the shift.

Chemical Hazards - list chemical names and adverse properties of all chemicals to be encountered (both site contaminants and raw materials introduced to the site). Indicate potential chemical incompatibilities. MSDSs.

Physical Hazards - address specific work site hazards including slip, trip or fall, uneven terrain, overhead hazards, heavy equipment operation, product transfer lines, etc. Thermal Stress (heat and cold).

Special Equipment - Use of drilling equipment, cranes, etc.

Other - discuss any other pertinent safety topics relevant to the work site (ie. emergency signals). Injury and Illness Prevention Program.

Emergency Procedures - discuss actions to be taken in case of employee injury, chemical spill/release, or other non-routine occurrence.

Hospital/Ambulance/Route - Explain the medical emergency services available locally. Discuss communications and transportation issues (ie. location of telephones, routes).

I/HW PROCEDURE NO. 630.07 (Continued)

7. Attendees

Print and sign the names of all attendees, print the person who conducted the meeting, the project safety officer, and the project manager.

E. OSHA Job Safety and Health Protection Poster

A copy of the federal or individual state OSHA Job Safety and Health Protection Poster shall be posted at all MWH field operations. When a project is large enough to have a field office or trailer, a copy of the poster shall be placed inside the office or trailer. When a project is small, a copy of the poster shall be placed on the window of a field vehicle, or other suitable, visible location.

Appendix D:

Accident/Incident/Near Miss Reporting Procedures and Forms



I/HW POLICY NO. 610.02

Subject: ACCIDENT INVESTIGATION PROCEDURE

I. PURPOSE

To describe MWH's policy regarding accident investigations and reporting.

II. ATTACHMENT

A. MWH Occupational Injury/Illness Reporting and Investigation (Bulletin VI-1)

III. DISCUSSION

As part of MWH's Corporate Environmental/Occupational Health and Safety Program, the attached occupational injury/illness reporting and investigation policy applies to all MWH I/HW Operations work places (e.g., project worksites, offices).

IV. ACCIDENT INVESTIGATION REPORT DISTRIBUTION

Upon completion of accident investigation report forms, copies must be provided with 24 hours to:

- Corporate Human Resources (Susie Day)
- Regional Health and Safety Coordinator (see I/HW Operations Policy No. 600.04)
- Program Director
- Corporate Health and Safety Manager (Beth Darnell)

For assistance in completing accident investigation report forms, contact the I/HW Operations Health and Safety Manager or the MWH Corporate Health and Safety Manager.

SUBJECT: OCCUPATIONAL INJURY/ILLNESS REPORTING AND INVESTIGATION

I. PURPOSE

To set forth the essential components and responsibilities for implementation of the Montgomery accident investigation procedure. Accidents are investigated to identify unsafe conditions and acts which contribute to injury, illness, and/or property damage so that solutions for accident prevention may be developed.

II. REFERENCES

- Title 29, Code of Federal Regulations, Part 1904
- Various States' Labor, Health and Safety, and Workers' Compensation Codes
- Bulletin IV-1 ('IIPP'), Montgomery Health and Safety

III. ATTACHMENT

- A. Montgomery Occupational Injury/Illness Report Form

IV. DEFINITIONS

- A. Accident/Incident is an occurrence in a sequence of events that usually produces unintended injury or illness, or death, and/or property damage.
- B. First Aid is any onetime treatment and any follow up visit for the purpose of observation of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care, but may be administered by a physician.
- C. Near-Miss Situations are accidents without injury, illness or property damage, but have the potential for serious harm.

V. DISCUSSION

Effective accident investigations have proven to provide information which, in turn, can be used to implement procedures to reduce occupational injuries and illnesses. It is important for Montgomery management and employees to understand and comply with the accident investigation procedures set herein.

VI. PROCEDURE

A. Summary of Accident Investigation Procedures:

Once an accident occurs, whether the victim is a Montgomery employee, contractor, or visitor, the below listed procedures are to be carried out. In the paragraphs to follow, more detailed information is provided for the Montgomery accident investigation procedure.

1. Attend to the victim's medical needs.
2. Secure the accident/incident area.
3. Get the Montgomery Occupational Injury/Illness Report Form.
4. Assemble the personnel and tools needed to perform an accident investigation.
5. Call the Corporate Human Resources Workers' Compensation Administrator, (818) 568-6759, and the Corporate Health and Safety Manager, (818) 568-6678, **immediately** after the scene is secure, to report the accident.
6. Begin the accident investigation.

B. Accident/Incident Investigations:

Every accident, regardless of whether it results in injury, property damage, or a near miss, should be investigated to determine the actual cause and to take proper action to prevent recurrence.

It is the responsibility of the Cost/Profit Center Supervisor to assure that a thorough investigation into the cause of each employee injury occurs immediately after the event, and to initiate corrective action to prevent a similar recurrence.

The Cost/Profit Center Supervisor must also comply with the Occupational Safety and Health Administration (OSHA) recordkeeping/reporting requirements for occupational injuries and illnesses. Corporate of Human Resources provides guidance on the OSHA 200 reporting log. See Bulletin VI-2 of the Montgomery Environmental/Occupational Health and Safety Manual.

C. Montgomery Occupational Injury/Illness Report Form (OIIR):

The OIIR, Attachment A, shall be completed by the designated Montgomery employee representative (e.g., Cost/Profit Center Supervisor, resident engineer,

project engineer, site geologist) immediately (within 24 hours) after an employee injury occurs.

Note: An equivalent form may be used if approved by the Corporate Health and Safety Manager.

The OIIR shall be promptly submitted to Corporate Human Resources Workers' Compensation Administrator (PAS-1), the Health & Safety Coordinator, and to the Corporate Health & Safety Manager.

D. Accident Investigation Report Format:

The various sections of the OIIR are intended to clearly identify the incident, describe its causes, and insure that there be no recurrence either for this particular instance or similar situations. While the OIIR is basically self-explanatory, it is important that the persons completing and reviewing the form observe the following:

1. Do not speculate as to the facts, nor make unsubstantiated accusations. We all, however, are free to make reasonable assumptions based on a good faith understanding of the facts at hand. Remember that this form becomes an official, Montgomery legal document.
2. Handle any samples or physical evidence with care, insuring against even inadvertent tampering.
3. Keep all handwritten notes used in gathering the facts of the case in the office master file, along with the completed OIIR. Raw data and notes may be helpful in a possible future evaluation.

E. Recordkeeping

Observe the following Company guidelines regarding OIIR records:

1. Insure prompt distribution of complete OIIR, i.e. within 24 hours, to:
 - a. Corporate Human Resources (i.e. Susie Day)
 - b. The Health and Safety Coordinator (see Bulletin I-2)
 - c. The Group Manager
2. FAX a copy to the Corporate Health and Safety Office, (818) 568-6619.

MONTGOMERY WATSON

OCCUPATIONAL INJURY/ILLNESS REPORT FORM

I. IDENTIFICATION	
A. EMPLOYEE (EE)	
Name: _____	Age: _____
Title: _____	Sex: _____
EE Number: _____	Seniority Date: _____
Cost Center: _____	
B. INCIDENT	
Date: _____	Location: _____
Time: _____	
Date Reported (If different from incident date): _____	Names of Any Witnesses: _____

II. DESCRIPTION
<p>DESCRIBE WHAT HAPPENED.</p> <p>Who: _____</p> <p>What: _____</p> <p>How: _____</p> <p>Other: _____</p> <p>Sketch layout on back of form. Attach any witness statements, photographs, or other relative documents.</p>

III. CORRECTIVE ACTION/RECOMMENDATIONS			
Be Specific _____			
	YES	If yes, give date	NO
Did this corrective action address separate, yet similar, conditions?	_____	_____	_____
Was this corrective action shared with the injured employee?	_____	_____	_____
Was this corrective action shared with all affected employees?	_____	_____	_____

IV. CERTIFICATION	
Form completed by: _____	Date: _____
Cost Center Manager approval: _____	Date: _____

MONTGOMERY WATSON

OCCUPATIONAL INJURY/ILLNESS REPORT FORM

I. IDENTIFICATION	
A. EMPLOYEE (EE)	
Name: _____	Age: _____
Title: _____	Sex: _____
EE Number: _____	Seniority Date: _____
Cost Center: _____	
B. INCIDENT	
Date: _____	Location: _____
Time: _____	
Date Reported (If different from incident date): _____	Names of Any Witnesses: _____

II. DESCRIPTION
DESCRIBE WHAT HAPPENED.
Who: _____
What: _____
How: _____
Other: _____
Sketch layout on back of form. Attach any witness statements, photographs, or other relative documents.

III. CORRECTIVE ACTION/RECOMMENDATIONS			
Be Specific _____			
	YES	If yes, give date	NO
Did this corrective action address separate, yet similar, conditions?	_____	_____	_____
Was this corrective action shared with the injured employee?	_____	_____	_____
Was this corrective action shared with all affected employees?	_____	_____	_____

IV. CERTIFICATION	
Form completed by: _____	Date: _____
Cost Center Manager approval: _____	Date: _____

MONTGOMERY WATSON

V. SPACE FOR SKETCH OR ADDITIONAL NARRATIVE

cc: Health and Safety Coordinator
Corporate Health & Safety Office (FAX to 818/568-6619 within 24 hours of incident)
Corporate Human Resources (Susie Day)
Group Manager

Appendix E:
OSHA Job Safety Poster



JOB SAFETY & HEALTH PROTECTION

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers by promoting safe and healthful working conditions throughout the Nation. Provisions of the Act include the following:

Employers

All employers must furnish to employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Employers must comply with occupational safety and health standards issued under the Act.

Employees

Employees must comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to their own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct onsite inspections to help ensure compliance with the Act.

Inspection

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or for otherwise exercising their rights under the Act.

Employees who believe they have been discriminated against may file a complaint with their nearest OSHA office within 30 days of the alleged discriminatory action.

Citation

If upon inspection OSHA believes an employer has violated the Act, a citation abating such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty

The Act provides for mandatory civil penalties against employers of up to \$7,000 for each serious violation and for optional penalties of up to \$7,000 for each non-serious violation. Penalties of up to \$7,000 per day may be proposed for failure to correct violations within the proposed time period and for each day the violation continues beyond the prescribed abatement date. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to \$70,000 for each such violation. A minimum penalty of \$5,000 may be imposed for each willful violation. A violation of posting requirements can bring a penalty of up to \$7,000.

There are also provisions for criminal penalties. Any willful violation resulting in the death of any employee, upon conviction, is punishable by a fine of up to \$250,000 (or \$500,000 if the employer is a corporation), or by imprisonment for up to six months, or both. A second conviction of an employer doubles the possible term of imprisonment. Falsifying records, reports, or applications is punishable by a fine of \$10,000 or up to six months in jail or both.

Voluntary Activity

While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries. OSHA's Voluntary Protection Programs recognize outstanding efforts of this nature.

OSHA has published Safety and Health Program Management Guidelines to assist employers in establishing or perfecting programs to prevent or control employee exposure to workplace hazards. There are many public and private organizations that can provide information and assistance in this effort, if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free assistance in identifying and correcting hazards and in improving safety and health management is available to employers, without citation or penalty, through OSHA-supported programs in each State. These programs are usually administered by the State Labor or Health department or a State university.

Posting Instructions

Employers in States operating OSHA approved State Plans should obtain and post the State's equivalent poster.

Under provisions of Title 29, Code of Federal Regulations, Part 1903.2(a)(1), employers must post this notice (or facsimile) in a conspicuous place where notices to employees are customarily posted.

More Information

Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from your employer or from the nearest OSHA Regional Office in the following locations:

Atlanta, GA	(404) 347-3573
Boston, MA	(617) 565-7164
Chicago, IL	(312) 353-2220
Dallas, TX	(214) 767-4731
Denver, CO	(303) 844-3061
Kansas City, MO	(816) 426-5861
New York, NY	(212) 337-2378
Philadelphia, PA	(215) 596-1201
San Francisco, CA	(415) 744-6670
Seattle, WA	(206) 442-5930

Lynn Martin

Lynn Martin, Secretary of Labor

U.S. Department of Labor

Occupational Safety and Health Administration

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To report suspected fire hazards, imminent danger safety and health hazards in the workplace, or other job safety and health emergencies, such as toxic waste in the workplace, call OSHA's 24-hour hotline: 1-800-321-OSHA.

Appendix F:

Subcontractor Safety Procedures



Appendix G:

Client Specific Health and Safety Protocols



Appendix B



MWH
MONTGOMERY WATSON HARZA

APPENDIX B

BORING LOGS AND WELL DIAGRAMS – EXISTING WELLS

LOG OF BORING

Drill Rig: B-53	Boring Diameter: 11 inches	Boring Elevation:	Boring Number: MW-2
Drilling Date: 5/4/89	Logger:	Registered Geologist:	This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.

SAMPLE		VAPOR READINGS	TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE								
		TLV PPM						ML	8" of concrete
		10	8:19a	8-12-16	5				CLAYEY SILT: dark brown, moist, medium dense
		10	8:25a	8-12-18	10				CLAYEY SILT: brown, moist, medium dense - grey mottling - numerous porous openings
		9.5	8:32a	8-22-26	15			SM	SAND: fine-grained, brown, moist dense - contains some silt
		15	8:38a	10-12-25	20				SAND: fine-grained, brown, moist, dense - contains some silt
		20	8:45a	12-22-28	25				SAND: coarse-grained, brown, saturated, dense - contains 10% subangular gravel up to 1 inch in diameter, averaging 0.5 inch diameter
		25	10:07a	12-33-50	35				CLAYEY SAND: medium-grained, brown/green, wet, very dense - orange mottling - contains clay lenses, 40% of total sample
		-	10:24a	9-10-16	40				SAND: medium to coarse-grained, brown, saturated, medium dense - contains minor silt and clay lenses
									NOTES - Ground water encountered at 23' - Driller reports strata from 32.5' to 38' is difficult to drill because of increased clay content. - TD at 44'

UTM 000300

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Project Number:
1614-04

Figure Number:
A-

LOG OF BORING

Drill Rig: B-53	Boring Diameter: 11 inches	Boring Elevation:	Boring Number: MW-3
Drilling Date: 5/2/89	Logger:	Registered Geologist:	This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.

SAMPLE		VAPOR READINGS	TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE								
		TLV PPM 20	7:53a	5-10-14	5			SM	8" of concrete
		45	8:04a	5-7-14	10				SILTY SAND: fine-grained, dark brown, moist, medium dense - contains some 0.5" diameter pebbles
		40	8:15a	5-7-12	15			CL	SILTY SAND: fine-grained, light brown, moist, medium dense - mottled - numerous porous openings - abundant root fragments CLAYEY SAND: fine-grained, light brown
		40	8:40a	10-12-23	20			SM	SANDY CLAY: light brown, moist, very stiff - contains numerous 1/4" to 1/2" diameter angular pebbles
			8:45a	8-10-12	25				SILTY CLAY: light brown, moist - moderate to high plasticity
			9:25a	12-16-18	30				SAND: coarse-to medium-grained, with 10% gravel, brown, wet, dense - contains cobbles up to 3" in diameter
			9:30a	10-12-18	35			CL	SAND: coarse to medium-grained, with 5% gravel, brown, saturated, medium dense. SILTY SAND: fine-to medium-grained, brown, saturated
									SILTY CLAY: brown/green, moist, very stiff - moderate to high plasticity - black mottling

NOTES:
 - No sample obtained at 20', cobble stuck in end of sampler
 - Ground water encountered at 23'
 - Driller reports cobbles encountered at 25' to

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UTM 000301

Project Number: 1614-04	Figure Number: A-a
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LOG OF BORING

Drill Rig: B-53	Boring Diameter: 11 inches	Boring Elevation:	Boring Number: MW-3
Drilling Date: 5/2/89	Logger:	Registered Geologist:	This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.

SAMPLE			TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE	VAPOR READINGS							
									30' - Samples taken at 36' and 38' with 1" OD sampler - TD at 38', sample taken from 38' to 39.5' to verify clay horizon at that depth

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Project Number:
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Figure Number:
A-b

LOG OF BORING

Drill Rig: B-53		Boring Diameter: 11 inches		Boring Elevation:		Boring Number: MW-4	
Drilling Date: 5/2/89		Logger:		Registered Geologist:		This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.	

SAMPLE		VAPOR READINGS	TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE								
		TLV PPM						ML	2" asphalt.
		0	1:53p	5-7-20	5				SANDY SILT: dark brown, moist, medium dense - minor amounts of angular pebbles
		35	2:14p	10-16-28	10				SANDY SILT: dark brown, moist, dense - contains a moderate amount of clay - numerous light grey fissures filled with calcium carbonate
		60	2:40p	8-10-16	15				CLAYEY SILT: dark brown, moist, very stiff - contains a minor amount of sand - numerous light grey fissures filled with calcium carbonate
		80	3:00p	8-10-14	20			SM	
		40	3:15p	5-7-14	25			CL SM	SAND: fine-grained, brown, moist, medium dense - minor amount of fines
		40	3:25p	12-16-23	30			CL	SILTY CLAY: dark brown, moist, moderately plastic
		75	3:46p	5-10-15	35			CL SM	SILTY SAND: fine-grained, dark brown, moist, medium dense - orange mottling SAND: fine-grained, brown/green with orange staining, wet, dense
					40				SILTY CLAY: brown/green with orange staining, moist - contains some fine sand
					45				CLAYEY SAND: fine-grained, dark brown, saturated, medium dense - moderate plasticity
					50				SAND: coarse-grained, brown, saturated,

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Figure Number:
A-1a

LOG OF BORING

Drill Rig: B-53	Boring Diameter: 11 inches	Boring Elevation:	Boring Number: MW-4
Drilling Date: 5/2/89	Logger:	Registered Geologist:	This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.

SAMPLE		VAPOR READINGS	TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE								
					11				medium dense - contains abundant 0.25" to 0.5" diameter pebbles - sample interval normally graded
									NOTES: - perched water encountered at 29.5' - ground water encountered at 33' - driller reports cobbles encountered at 41' to TD - sample taken at 50' with 1" diameter tool - TD at 54.5'

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Project Number:
1614-04

Figure Number:
A-1b

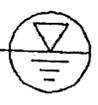
LOG OF BORING

Drill Rig: B-53		Boring Diameter: 11 inches		Boring Elevation:		Boring Number: MW-5	
Drilling Date: 5/3/89		Logger:		Registered Geologist:		This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.	

SAMPLE		TLV PPM	TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE								
		10	8:00a	6-15-22	5		CL	4" asphalt	SILTY CLAY: dark brown, moist to dry, dense
		20	8:05a	8-11-13	10		SM		SILTY SAND: fine-grained, brown, moist, medium dense
		5	8:10a	9-13-16	15				SILTY SAND: fine-grained, brown, moist, medium dense
		5	8:15a	8-8-30	20				- porous openings - root fragments - some interbedded lenses of sandy silt
		5	8:20a	5-8-13	25				SILTY SAND: fine-grained, wet, medium dense
		5	8:25a	6-12-17	30				- porous openings
			9:30a	5-5-10	35		GW		SANDY GRAVEL: with pebbles, graded fine-to-coarse
					40		SM		SILTY SAND: fine-grained, with some pebbles, brown, saturated, medium dense.
			10:00a	16-26-30	45		SC		CLAYEY SAND: fine-grained, brown, saturated, very dense - moderately plastic

NOTES: - ground water encountered at 27'
- sampler driven to 47' but unable to obtain a representative sample

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A-1a

UTM 000305

LOG OF BORING

Drill Rig: B-53		Boring Diameter: 11 inches	Boring Elevation:	Boring Number: MW-5
Drilling Date: 5/3/89	Logger:	Registered Geologist:	This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.	

SAMPLE		VAPOR READINGS	TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE								
									- TD at 45.5'

UTM 000306

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Project Number: 1614-04	Figure Number: A-1b
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LOG OF BORING

Drill Rig: B-53	Boring Diameter: 11 inches	Boring Elevation:	Boring Number: MW-6
Drilling Date: 5/3/89	Logger:	Registered Geologist:	This log is a representation of subsurface conditions at the time and place of drilling. The passage of time or other locations may cause consequential changes in conditions.

SAMPLE		TLV PPM	TIME	BLOW COUNTS	DEPTH, FEET	WELL CONSTRUCTION DETAIL	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	DESCRIPTION AND REMARKS
BULK	TUBE								
		10	12:50p	9-12-13	5			ML	8" concrete
		20	12:58p	8-16-17	10				CLAYEY SILT: dark brown, moist, medium dense
		45	1:08p	6-9-13	15			SM	CLAYEY SILT: dark brown, moist, dense - grey mottling
		34	1:15p	5-8-12	20				SILTY SAND: fine-grained, brown, moist, medium dense - contains some clay - numerous porous openings
		45	1:24p	8-28-38	25				CLAYEY SAND: fine-grained, brown, moist, medium dense - contains some silt - orange mottling
			2:55p	14-27-32	30				SAND: coarse-grained, brown, saturated, very dense - contains minor amounts of silt - contains minor amounts of gravel
			3:15p		40			CL	CLAY: green/brown, wet, hard - high plasticity - contains moderate amounts of silt - contains minor amounts of sand
									NOTES: ground water encountered at 23' sample taken at 25' saved for sieve analysis driller reports rocks at 32' TD at 40'

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A-1

Appendix C



MWH

MONTGOMERY WATSON HARZA

APPENDIX C

GROUNDWATER ELEVATION CONTOUR MAP – MAY 31, 2002

