

Southwest Division  
Naval Facilities Engineering Command  
Contracts Department  
1220 Pacific Highway, Building 127, Room 112  
San Diego, CA 92132-5190

CONTRACT NO. N68711-98-D-5713  
CTO No. 0022

FINAL  
PROJECT WORK PLAN  
Revision 0  
December 18, 2000

PAVEMENT DEMOLITION ACTIVITIES AT  
INSTALLATION RESTORATION SITE 3,  
AND METALLIC DEBRIS DISPOSAL FROM IR SITE 1  
MARINE CORPS AIR STATION  
EL TORO, CALIFORNIA

DCN: FWSD-RAC-01-0065

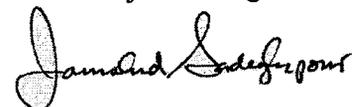
Prepared by:



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

1230 Columbia Street, Suite 640  
San Diego, CA 92101

  
Hamlet H. Hamparsumian  
Project Manager

  
Jamshid Sadeghipour, Ph.D., P.E.  
Deputy Program Manager



# FOSTER WHEELER

## FOSTER WHEELER ENVIRONMENTAL CORPORATION

### TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N68711-98-D-5713

Document Control No. 01-0065

File Code: 5.0

TO: Contracting Officer  
 Naval Facilities Engineering Command  
 Southwest Division  
 Mr. Richard Lovering, 02R1.RL  
 1220 Pacific Highway  
 San Diego, CA 92132-5190

DATE: 12/22/00  
 CTO: 0022  
 LOCATION: MCAS El Toro

FROM: Neil Hart (FOR)  
 Neil Hart, Program Manager

DESCRIPTION: Project Work Plan - Pavement Demolition Activities at IR Sites 3 and  
Metallic Debris Disposal From IR Site 1, 12/18/00

TYPE:  Contract/Deliverable  CTO Deliverable  Notification  
 Other

VERSION: Final REVISION #: 0  
 (e.g. Draft, Draft Final, Final, etc.)

ADMIN RECORD: Yes  No  Category  Confidential   
 (PM to Identify)

SCHEDULED DELIVERY DATE: 12/22/00 ACTUAL DELIVERY DATE: 12/22/00

NUMBER OF COPIES SUBMITTED: 0/5C/7E

COPIES TO: (Include Name, Navy Mail Code, and Number of Copies)

NAVY:  
C. Arnold (06CCCA) 0/1E  
D. Whittaker (06CCDW)  
1C/1E  
C. Asanti-Duah (06CC)  
1C/1E  
D. Gould (06CCDG) 1C/1E  
D. Silva (4MGDS) 1C/2E  
General Files (02R21) 1C/1E

FWENC:  
H. Hamparsumian  
Michael Wocknick,  
CIWMB

OTHER: (Distributed by FWENC)  
John Broderick, CA RWQCB  
Polin Modanlou, MCAS  
Triss Chesney, CA EPA  
Nicole Moutoux, US EPA

Date/Time Received

## Transmittal

Date: 21 December 2000

From: Content P. Arnold 

To: **Mr. John Broderick**  
**California Regional Quality Control Board**  
**Santa Ana Region**  
**3737 Main Street, Suite 500**  
**Riverside, CA 92501-3339**

**Ms. Triss Chesney**  
**California Environmental Protection Agency**  
**Department of Toxic Substances Control**  
**5796 Corporate Avenue**  
**Cypress, CA 90630-4700**

**Ms. Nicole Moutoux**  
**U.S. Environmental Protection Agency**  
**Region IX**  
**Mail Code STD-8-2**  
**75 Hawthorne Street**  
**San Francisco, CA 94105-3901**

Subj: Final Project Work Plan for Pavement Demolition Activities at Installation Restoration (IR) Site 3 and Metallic Debris Disposal from IR Site 1 at Marine Corps Air Station (MCAS), El Toro

Transmitted is the Final Project Work Plan for Pavement Demolition Activities at Installation Restoration (IR) Site 3 and Metallic Debris Disposal from IR Site 1 at Marine Corps Air Station (MCAS), El Toro and the associated response to DTSC's December 1, 2000 comments.

As you know the surface debris removal and demolition at IR Sites 1 and 3 is needed to facilitate the pending radiological assessment. Fieldwork for IR Site 1 is tentatively scheduled to begin on 22 January 01. The fieldwork schedule for IR Site 3 has not been

finalized yet. Once a final schedule is available it will be transmitted to the BRAC Clean-Up Team.

Your participation in finalizing this work plan is greatly appreciated. Please do not hesitate to call me at (619) 532-0790 or Dean Gould at (619) 532-0784 if you have any questions.

SOUTHWESTNAVFACENCOM  
Code 06CC.CA  
1220 Pacific Highway  
San Diego, California 92132-5190

finalized yet. Once a final schedule is available it will be transmitted to the BRAC Clean-Up Team.

Your participation in finalizing this work plan is greatly appreciated. Please do not hesitate to call me at (619) 532-0790 or Dean Gould at (619) 532-0784 if you have any questions.

Attachments:

- 1) Final Project Work Plan for Pavement Demolition Activities at Installation Restoration (IR) Site 3 and Metallic Debris Disposal from IR Site 1 at Marine Corps Air Station (MCAS), El Toro
- 2) Response To Comments To RTCs To The Draft Project Work Plan For Pre-Design Activities At Installation Restoration Sites 3 And 5, And Debris Disposal From Site 1 Marine Corps Air Station, El Toro, California,
- 3) Response To Comments To RTCs To The Draft Site-Specific Health And Safety Plan For Pre-Design Activities At Installation Restoration Sites 3 And 5, And Debris Disposal From Site 1 Marine Corps Air Station, El Toro, California

Copy to (with attachments):

Mr. Dean Gould (MCAS El Toro BRAC Environmental Coordinator)  
Mr. Michael Wochnik (California Integrated Waste Management Board)  
Ms. Polin Modanlou (MCAS El Toro Local Redevelopment Authority)  
Navy Team Members

**RESPONSE TO COMMENTS TO RESPONSE TO COMMENTS  
TO THE DRAFT PROJECT WORK PLAN FOR  
PRE-DESIGN ACTIVITIES AT INSTALLATION RESTORATION SITES 3 AND 5,  
AND DEBRIS DISPOSAL FROM SITE 1  
MARINE CORPS AIR STATION, EL TORO, CALIFORNIA**

**DCN: FWSD-RAC-01-0254**

December 14, 2000

Comments by: Triss M. Chesney, P.E., Remedial Project Manager, Department of Toxic Substances Control  
 Dated: December 1, 2000  
 Response by: Hamlet H. Hamparsumian, (Project Manager) Foster Wheeler Environmental Corporation

Number	Comment	Response
	<b>Comments to the Draft Work Plan</b>	
1	Response to DTSC's Comment #8 regarding Section 6.2.3 of the Draft Project Work Plan –Waste Disposal: The third paragraph identifies two Class I hazardous waste disposal facilities that will be considered for hazardous waste disposal. Please specify each waste stream and the anticipated disposal facility in the Work Plan. The response to this comment did not include this information.	<p>Because all references to the pre-design trenching activities at Sites 3 and 5 have been eliminated from the Project Work Plan, some of the section of the Project Final Work Plan have been rearranged, and can be found elsewhere. Therefore, Section 6.2.3 of the Draft Project Work Plan is Section 5.2.4 in the Final Project Work Plan. Furthermore, and as you have been informed during the BCT meetings, the soil beneath the metallic debris stockpile at Site 1 will not be removed as part of this project, and similarly the pre-design trenching activities at Sites 3 and 5, will no longer be conducted at this time. Therefore, waste soil is no longer anticipated to be generated from the remaining field activities described in the Work Plan. Metallic debris will be disposed of at a CERCLA approved and permitted Class I disposal facility. Two Class I landfills have been identified in the Work Plan, which would be considered for the disposal of the metallic waste. However, a final determination on the disposal facility to be used will be made once disposal rates from the respective facilities have been evaluated.</p> <p>In addition Table 1 (Waste Management Summary Requirements) of the Project Work Plan describes characterization, containment, storage, transportation, and disposal requirements for the waste types/streams potentially anticipated from the activities of this project.</p>

**RESPONSE TO COMMENTS TO RESPONSE TO COMMENTS  
TO THE DRAFT SITE-SPECIFIC HEALTH AND SAFETY PLAN FOR  
PRE-DESIGN ACTIVITIES AT INSTALLATION RESTORATION SITES 3 AND 5,  
AND DEBRIS DISPOSAL FROM SITE 1  
MARINE CORPS AIR STATION, EL TORO, CALIFORNIA**

**DCN: FWSD-RAC-01-0255**

December 14, 2000

Comments by: Julie Kim, M.S., Department of Toxic Substances Control, Industrial Hygiene and Field Safety Section (IHFSS)

Dated: December 1, 2000

Response by: Roger Margotto, CIH, Foster Wheeler Environmental, Hamlet H. Hamparsumian, (Project Manager) Foster Wheeler Environmental Corporation

Number	Comment	Response
	<b>Specific Comments to the Draft Work Plan</b>	
1	<p>Response #2. "The CIH preparing the plan had previous experience with the sites in question and used his experience from previous projects at the site, which more intrusive than the projects planned under this current plan. The type of contamination is soil. The contamination in soil was below limits that would pose an occupational health risk for inhalation and PPE is specified where there is direct contact with the soil".</p> <p>With the understanding that the contamination in soil was below limits that would pose an occupational health risk for inhalation, please include the maximum concentrations discovered in soil in previous investigations for each chemical of concern. What limits were these chemical concentrations in soil compared with? (Cal-OSHA PEL?)</p>	<p>Since your review of the Draft Work Plan and the response to your comments to the Draft Work Plan, certain portions of the scope of work that your comments relate to have been deleted from the project, and thus from the Work Plan. The canceled works are the pre-design exploratory trenching activities at Sites 3 and 5 landfills, and removal and disposal of a small stockpile of waste soil beneath the metallic debris located at Site 1. As a result the Work Plan and the Sites-Specific Health and Safety Plan have been revised and all references to the above referenced portions of the work have been eliminated from the Work Plan. Therefore, current project field activities are only limited to removal and disposal of the surficial metallic debris at Site 1 and demolition and disposal of asphalt and concrete pavement at Site 3. Therefore, exposure to chemicals is not considered to be a concern, since, the current field activities do not involve any intrusive work in areas with potential contamination.</p>
2	<p>Response #5. "There is a potential to use an air-purifying respirator. However, if such use is warranted as specified in the plan, the SHSS is to immediately call the PESM who is a CIH, to discuss the use of the respirator and the cartridge change schedule which the CIH will provide the SHSS at that time".</p> <p>Because the HASP does not discuss the use of respirators with specified cartridge-types and corresponding change-out schedules, the HASP must be amended if/when such use is warranted before work can further. Please include language in the Plan indicating such action will take place if/when warranted.</p>	<p>See response to comment #1 above. The HASP would be amended if respirators are used. As such, Foster Wheeler already has a written respiratory protection program. Said program would be implemented if dust action levels or PID action levels require implementation of the program.</p>

# TABLE OF CONTENTS

	<u>PAGE</u>
LIST OF TABLES.....	iii
LIST OF FIGURES .....	iii
ABBREVIATIONS AND ACRONYMS.....	iv
1.0 INTRODUCTION .....	1-1
2.0 SITE HISTORY AND BACKGROUND.....	2-1
2.1 SITE DESCRIPTION .....	2-1
2.1.1 Site 1 (Explosive Ordnance Disposal Range).....	2-1
2.1.2 Site 3 (Original Landfill) .....	2-2
3.0 PLANNED FIELD ACTIVITIES.....	3-1
3.1 SUBCONTRACTING/PROCUREMENT .....	3-1
3.2 NOTIFICATIONS .....	3-1
3.3 PREPARATORY ACTIVITIES.....	3-1
3.4 MOBILIZATION.....	3-2
3.5 WORKER HEALTH AND SAFETY .....	3-2
3.6 SITE 1 (EOD RANGE) DEBRIS SEGREGATION AND DISPOSAL ACTIVITIES.....	3-2
3.7 <del>28</del> DEMOLITION OF CONCRETE AND PAVEMENT .....	3-4
3.8 <del>29</del> FUGITIVE DUST CONTROL .....	3-5
3.9 <del>30</del> TRAFFIC CONTROL .....	3-6
3.10 <del>31</del> EQUIPMENT DECONTAMINATION .....	3-6
3.11 <del>32</del> DEMOBILIZATION .....	3-7
4.0 ENVIRONMENTAL PROTECTION PLAN.....	4-1
4.1 EXISTING BIOLOGICAL RESOURCES.....	4-1
4.2 WASTE MANAGEMENT AND DISPOSAL .....	4-1
4.3 SPILL RESPONSE .....	4-1
4.3.1 Spill/Release Reporting .....	4-2
5.0 WASTE MANAGEMENT PLAN .....	5-1
5.1 PROJECT WASTE DESCRIPTIONS.....	5-1
5.2 WASTE MANAGEMENT .....	5-2
5.2.1 Debris/Scrap Metal Waste Management .....	5-2
5.2.2 Waste Classification.....	5-2
5.2.3 Waste Accumulation And Storage.....	5-3
5.2.3.1 Material Stockpiles.....	5-3
5.2.3.2 Wastewater and Waste Fluids .....	5-3
5.2.3.3 Used PPE.....	5-4
5.2.3.4 Container Labeling.....	5-4
5.2.3.5 Waste Accumulation Areas .....	5-5

**TABLE OF CONTENTS**  
(Continued)

	<u>PAGE</u>
5.2.4 Waste Disposal.....	5-5
5.2.5 Waste Transportation.....	5-6
5.2.6 Waste Minimization.....	5-7
5.2.7 Waste Management Inspection and Documentation Program.....	5-7
5.2.7.1 Inspections.....	5-7
5.2.7.2 Documentation .....	5-8
5.2.7.3 Hazardous Waste Manifests and LDR Certification .....	5-8
5.3 UPDATING THE WASTE MANAGEMENT PLAN.....	5-9
6.0 PROJECT MANAGEMENT.....	6-1
6.1 PROJECT SCHEDULE.....	6-1
6.2 PROJECT RESPONSIBILITIES.....	6-2
6.3 PROJECT AND PERSONNEL TRAINING REQUIREMENTS.....	6-4
6.3.1 Personnel Training/Certification Requirements .....	6-4
6.3.2 Inspection and Audit Procedures .....	6-5
6.4 DATA MANAGEMENT.....	6-5
6.5 DOCUMENT CONTROL.....	6-5
6.6 MEETINGS AND REPORTS .....	6-5
7.0 REFERENCES .....	7-1

**ATTACHMENTS**

Attachment 1      Site-Specific Health and Safety Plan (SHSP)

## LIST OF TABLES

Table 1	Waste Management Summary Requirements
---------	---------------------------------------

## LIST OF FIGURES

Figure 1	MCAS El Toro Vicinity Map
Figure 2	Site Location Map
Figure 3	Site 1 (Explosive Ordnance Range Disposal) – Site Plan and Proposed Waste Removal Locations
Figure 4	Site 3 (Original Landfill) –Site Plan and Pavement Demolition Areas
Figure 5	Project Schedule
Figure 6	Project Organization Chart

## ABBREVIATIONS AND ACRONYMS

BCT	BRAC Cleanup Team
BMP	best management practice
BNI	Bechtel National, Inc.
BRAC	Base Realignment and Closure
CAB	crushed aggregate base
Cal/EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CQC	Contractor Quality Control
CSO	Caretaker Site Office
DON	Department of the Navy
DOT	Department of Transportation
EOD	explosive ordnance disposal
EPA	U.S. Environmental Protection Agency
ESQ	environmental safety and quality
FWENC	Foster Wheeler Environmental Corporation
GM	Geiger-Mueller
HDPE	high-density polyethylene
IDW	investigation-derived waste
IR	Installation Restoration
IRP	Installation Restoration Program
Jacobs	Jacobs Engineering Group, Inc.
LDR	Land Disposal Restrictions
MCAS	Marine Corps Air Station
msl	mean sea level
NaI	sodium iodide
OSHA	Occupational Safety and Health Administration
PjM	Project Manager
PPE	personal protective equipment
PVC	polyvinyl chloride

## ABBREVIATIONS AND ACRONYMS

(Continued)

QA	quality assurance
RAC	Remedial Action Contract
RASO	Radiological Affairs Support Office
RCRA	Resource Conservation and Recovery Act
RPM	Remedial Project Manager
SHSO	Site Health and Safety Officer
SHSP	Site-Specific Health and Safety Plan
STLC	soluble threshold limit concentration
SVOC	semivolatile organic compound
SWDIV	Southwest Division Naval Facilities Engineering Command
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbon
TSDF	treatment, storage, and disposal facility
USMC	U.S. Marine Corps
UXO	unexploded ordnance
VOC	volatile organic compound
WMP	Waste Management Plan

## 1.0 INTRODUCTION

This Project Work Plan (Work Plan) describes the objectives and procedures for debris removal and demolition activities at Installation Restoration Program (IRP) Sites 1 and 3, located at the Marine Corps Air Station (MCAS) El Toro, California. The work at Site 1 (Former Explosive Ordnance Disposal Range) and Site 3 (Original Landfill) is being conducted in order to prepare these sites for a radiological assessment. This document describes the planned field activities that will help accomplish this goal. This project was authorized by the Department of the Navy (DON), Southwest Division Naval Facilities Engineering Command (SWDIV), under Contract Task Order No. 0022 of the Remedial Action Contract (RAC) program, Contract No. N68711-98-D-5713.

A Site-Specific Health and Safety Plan (SHSP) (Attachment 1) that will be referenced as appropriate to provide further detail on the project activities support the Work Plan. The field activities will be conducted in accordance with the RAC Program Contractor Quality Control (CQC) Plan requirements.

Following approval of the Work Plan by the DON and concurrence by the regulatory agencies, Foster Wheeler Environmental Corporation (FWENC) will proceed with the fieldwork. The fieldwork at Site 3 involves demolition and removal of an asphalt pavement and a concrete bio-pile pad. The work at Site 1 is to dispose of the stockpiled metallic debris. The Installation Restoration (IR) Site 1 field activities would be limited to disposal of surficial metallic debris only. A number of pre-construction activities, such as notifications and procurement, will be performed as a part of field implementation planning. Subsequently, the field personnel and equipment will be mobilized to the site and the field activities will begin.

Following the completion of the fieldwork a Project Report will be prepared, which will contain the necessary information to document that the appropriate fieldwork has been completed. The Pre-Draft Project Report will be submitted to the DON for review and comments. The DON comments will be incorporated into a Draft Project Report that will be presented to the Regulatory Agencies for review and comments. Upon receipt of regulatory agencies comments, the comments will be incorporated into a Final Project Report.

## 2.0 SITE HISTORY AND BACKGROUND

This section presents a summary description of the site history and background. This information has been extracted from various sources including the Draft Phase II Remedial Investigation Reports for Site 3 [Bechtel National Inc. (BNI), 1997].

### 2.1 SITE DESCRIPTION

MCAS El Toro is located in a semi-urban, agricultural area of southern California, approximately 8 miles south of Santa Ana and 12 miles northeast of Laguna Beach (Figure 1). MCAS El Toro covers approximately 4,740 acres (Figure 2). Land northwest of MCAS El Toro is used for agricultural purposes. Land use around the MCAS includes commercial, light industrial, and residential.

MCAS El Toro was commissioned in 1943 as a Marine Corps pilot fleet operation training facility. The Station mission involved operation and maintenance of military aircraft and ground-support equipment. Historical activities on MCAS El Toro included aircraft maintenance and repair. These activities generated waste oils, solvents, paint residues, hydraulic fluid, used batteries, and other wastes [Jacobs Engineering Group, Inc. (Jacobs), 1991]. MCAS El Toro closed on July 2, 1999 as part of the Base Realignment and Closure (BRAC) Act. A brief description and operational history of Sites 1 and 3 is presented below.

#### 2.1.1 Site 1 (Explosive Ordnance Disposal Range)

IRP Site 1 is the former explosive ordnance disposal (EOD) range and is located in the northeast corner of MCAS El Toro in the foothills of the Santa Ana Mountains. Site 1 is situated within a tributary canyon of Borrego Canyon Wash at elevations ranging from approximately 610 to 760 feet above mean sea level (msl). A site plan is provided on Figure 3. Training in the disposal and detonation of munitions began at Site 1 in 1952 (Jacobs, 1993). Military ordnance used in training at the site has included hand grenades, land mines, cluster bombs, smoke bombs, and rocket warheads. Civilian and commercial explosives, such as trinitrotoluene, dynamite, and plastic and gelatinous explosives were also disposed at the EOD Range. Munitions were detonated in trenches and pits that were continually filled with soil and re-excavated. In 1982, approximately 2,000 gallons of sulfur trioxide chlorosulfonic acid (FS smoke) were reportedly disposed in trenches located in the northern portion of the site and ruptured with small explosive charges. The site was also normally used for disposal of small munitions (i.e., flares and small ordnance). An estimated 300,000 gallons of petroleum fuels were used during training activities from 1952 through 1993 (Jacobs, 1993). In addition, there are unsubstantiated reports that low-level radioactive material may have been used in training exercises at the site. Perchlorate was identified as a potential contaminant of concern at Site 1 due to its use in explosives and propellants.

### 2.1.2 Site 3 (Original Landfill)

Site 3, Original Landfill, comprises approximately 20 acres. The site is located on MCAS El Toro, between the Irvine Boulevard and North Marine Way (Figure 4). Irvine Boulevard forms the approximate northern boundary of the site; Desert Storm Road forms the approximate eastern boundary; and North Marine Way forms the southern boundary. The site is transected by Aqua Chinon Wash, which exists as a man-made channel flowing from north-northeast to south-southwest through the center of the site. Building 746, the Flight Simulator Building, is located on the boundary of Site 3 on the west side of the site and is a prominent feature.

Site 3 is reported to contain several fill areas. The site also includes two solid waste management units. The site is used as a staging area and as a 90-day accumulation area for environmental contractors performing services at the MCAS El Toro. These services include investigations and cleanup of contaminated sites on MCAS El Toro. The facility consists of decontamination pads, storage yards, and decontamination wastewater treatment units. West of the Aqua Chinon Wash, the surface consists of compacted soil and gravel. The soil layer is covered to a large extent by roads, parking areas, buildings, and concrete and asphalt pads. East of the Aqua Chinon Wash, the surface is mostly paved with concrete. The bio-pile pad is located in the east portion of Site 3. Fill material of unknown thickness covers the landfill beneath the surface. Neither liners nor a gas-venting system have been used at the landfill.

From 1943 to 1955, Site 3 was operated as cut-and-fill landfill disposal facility in conjunction with burning to reduce waste volume. The majority of the landfill material is found to the west and east of the Aqua Chinon Wash. An estimated 163,500 to 243,000 cubic yards of waste material was landfilled at this site. Suspected wastes and contaminants include metals, incinerator ash, solvents, paint residues, hydraulic fluids, engine coolants, construction debris, oily wastes, municipal solid wastes, and various inert solid wastes (BNI, 1997).

Site 3 is located at the base of the Santa Ana Mountains at the margin of the Tustin Plain. The site is relatively flat. Elevations at Site 3 range between 400 to 430 feet above msl.

### **3.0 PLANNED FIELD ACTIVITIES**

This section describes the specific activities and procedures involved in preparation for, and field implementation of, the planned debris removal activities at Site 1 and pavement demolition activities at Site 3. The preparatory activities for this project include subcontracting/procurement, notifying the responsible agencies, and a kickoff meeting with the DON project personnel. Subsequently, the required equipment, personnel, and material will be mobilized to the site, and the field activities will begin. Upon completion of the field activities, all solid and liquid waste generated during the field activities will be disposed of in accordance with approved procedures. All equipment and personnel will be demobilized from the site upon completion of the fieldwork.

#### **3.1 SUBCONTRACTING/PROCUREMENT**

All field activities will be performed under the direct supervision of FWENC with assistance from several specialty subcontractors. The procurement of appropriate subcontractors and required services and materials will be performed in a manner consistent with the terms of the contract and applicable Federal Acquisition Regulations.

Specialty subcontractors will be procured to assist in the specific aspects of the construction activities. These subcontractors include a pavement/concrete demolition contractor; a waste hauler/transporter; a Treatment, Storage, and Disposal Facility (TSDF); and an analytical laboratory. The demolition contractor will be responsible for removal and disposal/recycling of the concrete bio-pile pad and the asphalt pavement at Site 3. The waste hauler/transporter will transport the metallic and miscellaneous debris generated from the project activities to the identified regulatory approved TSDF. The laboratory will perform liquid analyses on any wastewater (decontamination water) that may be generated during the field construction activities.

Vendor procurement will involve leasing portable toilets and health and safety monitoring equipment. Other miscellaneous equipment, such as construction tools, polyethylene liners, sand bags, etc., will be procured on an as-needed basis.

#### **3.2 NOTIFICATIONS**

Prior to commencement of the field activities, FWENC will notify the MCAS El Toro Caretaker Site Office (CSO) Engineer about the nature of the anticipated work.

#### **3.3 PREPARATORY ACTIVITIES**

A kick-off meeting will be held between the DON Remedial Project Manager (RPM), FWENC Project Manager (PjM), Project Superintendent, CQC Engineer, and MCAS CSO Engineer. The purpose of this meeting is to develop a mutual understanding of the construction activities and the CQC details, including forms to be used, administration of on-site work, and coordination of

the construction management and production. Following the meeting, FWENC will prepare minutes of the meeting for submittal to the DON.

### **3.4 MOBILIZATION**

Mobilization activities include site preparation, movement of equipment and materials to the site, and training and site orientation of field personnel. At least one week prior to mobilization, the appropriate DON personnel, including the RPM and the MCAS CSO Engineer, will be notified about the planned schedule for mobilization and field activities.

The field personnel and temporary facilities will be mobilized to the site. Mobilization of temporary facilities will involve the establishment of a suitable staging area to support the project activities. The support facilities to be installed in the staging area will include restroom facilities for construction personnel, equipment lay-down area, and demolition and miscellaneous debris temporary stockpile areas. The support facilities will be located in an area determined by the MCAS CSO Engineer.

Equipment mobilization will be initiated with site preparation activities. In order to minimize storage requirements, equipment and materials will be mobilized to the site on an as-needed basis. A dedicated lay-down area will be used for short-term storage of equipment and materials.

All construction equipment will be delivered to the site in a clean condition. All equipment requiring decontamination will be decontaminated prior to leaving the site. Equipment decontamination records will be maintained for each piece of equipment. Decontamination procedures are presented in the SHSP (Attachment 1).

### **3.5 WORKER HEALTH AND SAFETY**

The SHSP (refer to the SHSP for Site 1 in Attachment 1) provides requirements and guidelines that will be utilized in the field to protect the health and safety of workers. A SHSO will provide full-time oversight of activities during construction to ensure compliance with Occupational Safety and Health Administration (OSHA) and the SHSP.

### **3.6 SITE 1 (EOD RANGE) DEBRIS SEGREGATION AND DISPOSAL ACTIVITIES**

The activities at Site 1 involve disposal of debris/scrap metal which is currently stockpiled at the northwestern area of the site and other scattered metallic debris stockpiled midway and along the west side of the main dirt access road within the site. The metallic debris consists of car parts, ordnance related materials, corrugated metal sheets, etc. There is a possibility of encountering unexploded ordnance (UXO) at this site.

The stockpiled debris/scrap metal at Site 1 is easily distinguishable and sits on top of a small mound of dirt. The footprint of the stockpile is roughly elliptical in shape with approximate dimensions of 35 feet long by 20 feet wide. The mound is approximately 7 feet high at the peak.

The material is stockpiled over a relatively flat ground. The immediate area around the stockpile is also relatively flat.

Only the surficial metallic debris on top of the stockpile will be removed and disposed of, in order to clear the site and the stockpile area for the upcoming Radiological Assessment. The small stockpile of soil beneath the metals will not be removed as part of this project.

A full-time FWENC UXO supervisor and technician will be at this site during the field activities to assist in identifying and segregating potential UXO and ordnance related material. At the request of the Navy, a U.S. Marines UXO representative will also be at the site to assist in determining the UXO material. The U.S. Marines will be responsible for the disposal of all UXO and ordnance related material.

Qualified UXO personnel will examine the stockpiled metallic debris to ascertain if UXO is present. When a potential ordnance item is discovered it will be examined by UXO personnel and a determination will be made as to whether explosive or pyrotechnic fillers are present. If the UXO is fused it will be considered in an armed condition, and will not be moved. This is due to the fact that these ordnance items were involved in possible detonations, which could have provided sufficient forces to arm the fusing without providing normal identification characteristics (such as the normal scoring of rotating bands on projectiles when fired). If the fusing is not installed, the UXO will be set-aside in a designated staging area for U.S. Marine Corps (USMC) EOD handling. If the condition of an ordnance item cannot be determined visually, then the item will be treated as UXO, considered armed and left in place for USMC EOD.

At first, all large size scrap metal will be picked up one piece at a time, and inspected by the UXO specialists. Any UXO material encountered will be visually examined and processed as identified above. Each piece of metallic scrap will be thoroughly examined to ensure no UXO or energetic materials are contained within the scrap materials. This will include the opening of any voids, which can not be visually inspected, to ensure no energetic materials inadvertently leave the site. Ordnance related materials such as practice bombs and bomb casings, will be thoroughly examined to ensure no energetic materials remain.

A radiological screening of all scrap metallic and miscellaneous debris will be performed during the UXO screening and inspection process at Site 1. An Eberline SPA-3 sodium iodide (NaI) scintillation detector and an Eberline HP-260 pancake Geiger-Mueller (GM) Detector or an approved equivalent will be used for radiological screening. An ambient air level will be established at the beginning of the day by taking measurements with the SPA-3 at a height of 1 meter, with the detector facing the soil. For the GM detector, the ambient air level will be established by taking measurements with the probe facing upward at a height of 1 meter. The daily ambient level will be determined and documented on a radiological survey sheet for each survey instrument. If, after loose soil and dirt have been brushed from the surface(s) of the

metallic debris, the debris measurements exceed 1-½ times the ambient levels, the material will be segregated and placed in containers or wrapped to protect it from the weather and to prevent personnel from coming in contact with the debris. The ultimate disposition of this segregated material will be determined after consultation with personnel from the Navy Radiological Affairs Support Office (RASO).

Any containers or drums encountered in the metallic debris stockpile will be visually inspected to determine whether or not they are empty, and safe to move. If a drum/container cannot be confirmed that it is empty, it will not be removed or disposed of as part of the field activities described in this Work Plan. Furthermore, no buried drum/container will be excavated. The Navy RPM will immediately be notified if any drum/container is found which cannot be moved.

All (non-UXO and non-radioactive) scrap metal and miscellaneous debris will be transferred and placed in sealed container(s) and certified by a FWENC UXO specialist that it does not contain UXO materials. After being certified, the material will be hauled off-site to a Class I Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)-approved and permitted landfill for disposal, unless directed otherwise by the Navy. All identified UXO material and any questionable material will be stockpiled within the site at a location approved by the Navy. UXO personnel will conduct a surface sweep of the work area to ensure no UXO is present in the work area. Any UXO discovered during the surface sweep would be left in place and flagged for USMC EOD specialists. The work area, which includes the equipment laydown area, the existing-stockpile, and the areas where the containers will be placed will be staked and cordoned with caution tape. Personnel working at Site 1 will be limited to work within the cordoned area and the dirt road, and will not be allowed access to other areas of the site. Travel within the work area will be limited to moving to and from the stockpile area and the dirt road only.

It is estimated that approximately 50 tons of scrap metallic debris may be generated from the activities at this site.

Any soil associated with the metallic debris stockpile remaining at Site 1 will be addressed in the Phase II Remedial Investigation.

### **3.7 DEMOLITION OF CONCRETE AND PAVEMENT**

The scope of this project involves demolition and recycling of the concrete bio-pile pad and the asphalt pavement at Site 3 in order to prepare the site for the Navy to conduct a radiological survey of the site. The concrete bio-pile pad is located on the east side of the Aqua Chinon Wash. The pad is rectangular-shaped and is approximately 482 feet long and 122 feet wide. The driveway apron is trapezoidal-shaped and is approximately 66 feet long by 33 feet wide (see Figure 4). The pad is constructed with reinforced concrete and has a minimum thickness of 7 inches. The pad is underlain with a layer of 7-inches-thick crushed aggregate base (CAB) placed over a 95-percent compacted sub-grade. The CAB material separates the bottom of the

concrete pavement and the existing landfill cover in the bio-pile area. Prior to demolition activities, the utility line connections (water and electric) to the pad will be identified, disconnected, and capped. The concrete will be broken using a pneumatic hammer or breaker and processor. The material will be broken into small enough sizes to facilitate loading into trucks and hauling away. It is estimated that approximately 1,300 cubic yards, or 2,100 tons, of concrete demolition material would be generated. The demolition material will be hauled off site for recycling.

The asphalt pavement covers an area of approximately 72,000 square feet and is located on the west side of Site 3 (see Figure 4). The thickness of the asphalt pavement may range from 2.5 to 4 inches. The asphalt pavement is constructed over a 4 to 6 inches thick CAB. It is estimated that approximately 850 cubic yards, or 1350 tons, of asphalt demolition material may be generated. Prior to demolition activities, FWENC's site superintendent and the MCAS CSO Engineer will conduct a site visit to mark and delineate in the field the limits of the paved asphalt areas that the Navy wants to be removed. A wheel or crawler loader will be used for loading the concrete and asphalt demolition material onto trucks for off-site transportation.

Concrete and asphalt surface cover, which was installed after contamination of the subsurface soil occurred and which is not in contact with the contaminated substrate, will be segregated from the substrate and disposed of as construction debris at a FWENC and Navy approved recycling facility. This material is not considered as CERCLA-regulated waste. Steel reinforcing rebars will be separated from the concrete and recycled. El Toro Materials Company located on Portola Parkway in Irvine, California is being considered as one of the recycling facilities where concrete and asphalt demolition material will be hauled for recycling.

In the highly unlikely event where the overlying asphalt or concrete surface cover may be in direct contact with the contaminated substrate, this material will be properly characterized for hazardous waste and will be disposed of accordingly.

Following the removal of the demolition debris from the site, the soils underneath the concrete pad, and the asphalt pavement will be graded to provide a relatively smooth surface in preparation for the radiological assessment.

### **3.8 FUGITIVE DUST CONTROL**

Fugitive dust emissions are expected from pavement demolition activities at Site 3. All activities must comply with substantive portions of South Coast Air Quality Management District Rules 401 (b)(1)(A), 403, 404, and 405 pertaining to fugitive dust emissions. Dust generated during demolition, and other construction activities will be controlled with water application.

A 2,000 gallon water truck will be utilized at the site during demolition activities. Water application will be conducted by either spraying or mist. During pavement and concrete breakup and demolition activities, water will be sprayed over the immediate areas where the equipment

would be working. In addition water would be sprayed over the demolition debris while it is being picked up by the loader and while being unloaded into the hauling trucks. Care will be taken to only use the necessary amount of water to control the dust, in order to minimize any percolation of water through the existing landfill cover.

### **3.9 TRAFFIC CONTROL**

Traffic controls will be utilized during the pavement and concrete demolition and hauling activities, to provide for efficient completion of the work in a safe working environment while minimizing the impact to normal traffic flow. An estimated 180 truckloads of demolition material will be hauled off site. Loading and hauling of the demolition material is anticipated to be completed within 5 to 6 working days. An estimated average of 30 truckloads of demolition material would be hauled off-site per day, or an average of 4 to 5 trucks per hour. This small number of additional vehicular traffic is not expected to adversely impact the current extremely light traffic conditions at MCAS El Toro. All vehicles will enter and exit the MCAS El Toro using the main MCAS El Toro entrance located at Trabucco Canyon, as per the Navy's request. All departing truck traffic will be routed from Site 3 to North Marine Way going west, then to West Marine Way to El Toro Boulevard, and to the main MCAS El Toro entrance at Trabucco Canyon Road and out. Incoming trucks will use the same route in the reverse order. Traffic controls will be implemented during demolition activities at Site 3, and in the demolition stockpile areas to provide for safe equipment operation and truck loading. A traffic spotter will be assigned to direct vehicular traffic within the site, and to and from the work areas.

Waste disposal and demolition material recycling facilities have been identified, but have not been chosen at this time. However, once these facilities are chosen, and if necessary, a Traffic Plan will be prepared to adequately discuss traffic control issues and the routes from MCAS El Toro sites to the disposal or recycling facilities. All traffic control activities will conform to the applicable specifications of the Manual of Traffic Controls for Construction and Maintenance Work Zones (Caltrans, 1996).

### **3.10 EQUIPMENT DECONTAMINATION**

All non-consumable equipment that comes into contact with potentially contaminated soil will be decontaminated in accordance with the provisions of this Work Plan. Heavy equipment that has come into contact with potentially contaminated soil will be brushed off and wiped clean or washed with water and a cleaning solution. Small tools and equipment will be decontaminated by a non-phosphate detergent scrub, followed by fresh water and distilled or de-ionized water rinses. Decontamination of heavy equipment (i.e., backhoe) will take place inside a containment area covered with 20-mil plastic sheeting.

Special attention will be paid to removal of material on and within the bucket and undercarriage of backhoe. Tools and items for which decontamination is difficult or impossible to verify

(e.g., rope and lumber) will remain on site, until completion of the work, for subsequent packing and off-site disposal at an approved disposal facility.

Prior to removal from the site, all decontaminated equipment and material will be inspected and accepted by the Site Health and Safety Officer (SHSO) and the Project Superintendent. These individuals will certify that decontamination was performed for all equipment and materials. A copy of each decontamination certificate will be provided to the DON RPM and vendors, if requested. The original certificate will be maintained in the project file.

All consumable equipment (e.g., gloves) and liquid and solid wastes (e.g., decontamination wastewater) will be discarded in accordance with the procedures prescribed in Section 5.2. .

The field team and backhoe operator will perform personnel decontamination prior to leaving the work site at the conclusion of each workday following procedures described in the SHSP (Attachment 1).

### **3.11 DEMOBILIZATION**

Demobilization consists of removal of all equipment, material, and personnel; cleaning the project site; inspection; and certification of completion. The activities will include decontamination and removal of all construction equipment and materials as well as collection and disposal of all contaminated material, including decontamination water and disposable equipment for which decontamination is inappropriate.

Site cleaning work will include removal of all materials, such as excess construction material, wood, debris, and other foreign material; and removal of all construction equipment. An inspection of the sites will be conducted with the RPM and the MCAS CSO Engineer at the completion of the fieldwork. A punch list of items will be prepared for any work deemed incomplete by the RPM and/or the MCAS CSO Engineer. Any deficiencies identified and noted on the punch list will be completed. A final walk through of the sites will be conducted with the RPM and the MCAS CSO Engineer following the completion of all the punch list items.

## **4.0 ENVIRONMENTAL PROTECTION PLAN**

This Environmental Protection Plan provides a program to protect existing environmental conditions and to facilitate the tracking of compliance requirements applicable to the site activities at MCAS El Toro. The plan describes the associated environmental compliance procedures and the specific environmental permitting, regulatory, procedural, and training requirements. This plan is also a primary component of FWENC Compliance Program, which includes onsite environmental compliance inspections.

### **4.1 EXISTING BIOLOGICAL RESOURCES**

The following paragraphs summarize the historical environmental or biological resources within the MCAS El Toro and general area of Site 3.

Site 3 landfill is no longer in use. Portions of Site 3 are paved, and the remaining areas are graded with a thin layer of gravel. Exposed soil areas contain non-native shrubs and sporadic perennial vegetation. The covering of the Site 3 is not conducive to native vegetation that would provide a habitat for wildlife.

MCAS El Toro supports a wide variety of wildlife species, including representatives from nearly all major vertebrate groups (reptiles, amphibians, birds, and mammals). Several sensitive species are known from MCAS El Toro. However, none that is federally listed will be affected by the project.

### **4.2 WASTE MANAGEMENT AND DISPOSAL**

A Waste Management Plan (WMP) is prepared and included in Section 5.0. The purpose of the WMP is to present the waste management practices and procedures to be followed for the types and quantities of waste expected to be generated during the implementation of the project. The WMP identifies waste management activities conducted during the storage and the preparation and/or disposal of waste (including waste characterization, packaging, storage, and management while in storage). The transportation and disposition of waste materials at appropriate disposal and recycling facilities is also included.

The WMP provides information on how wastes, including potentially hazardous wastes such as debris, personal protective equipment (PPE), and decontamination wastewater associated with the project activities, will be managed and disposed.

### **4.3 SPILL RESPONSE**

In the event of a release of hazardous material into the environment, FWENC will initiate the response action, as specified in the SHSP (Attachment 1), to contain or control the release or evacuate the area if the spill is significant or represents an immediate health threat.

Absorbent pads, shovels, and 55-gallon drums will be kept at the site to address the possibility of spills.

#### 4.3.1 Spill/Release Reporting

The steps below outline the chain of communications to be followed if a significant spill of any hazardous substance occurs:

##### 1. Contact FWENC

Site personnel involved in the spill should immediately contact the FWENC Spill/Release On-Site Coordinator, Project Superintendent, or SHSO who will notify the PjM. At least one of these three individuals will be on site during all remedial activities:

Project Superintendent:	Abram Eloskof
On-Site Coordinator:	Will be determined at a later date
SHSO:	Carl Jones

The FWENC PjM or the Project Superintendent will contact the MCAS CSO Engineer, then the RPM identified below:

RPM:	Don Whittaker	(619) 532-0791
MCAS CSO Engineer:	Scott Kehe	(949) 726-2506

##### 2. If a release of a waste or hazardous substance, regardless of quantity, could threaten human health or the environment outside the facility, the PjM will verify with the RPM or the MCAS CSO Engineer that the following have been notified:

California State Department of Health Services:	(800) 852-7550
National Response Center:	(800) 424-8802
Local Emergency Response Coordinator (Fire Department, if necessary):	911

##### 3. Report releases and submit written follow-up emergency notice under Superfund Act and Reauthorization Amendments Title II requirements

##### 4. The following persons will also be contacted following a spill or release:

Jayne Fitzgerald  
Foster Wheeler Environmental Corporation  
Regional Environmental Safety and Quality Manager  
Office: (949) 756-7534

Craig O'Rourke  
Foster Wheeler Environmental Corporation  
Environmental Compliance Manager  
Office: (949) 756-7511

## 5.0 WASTE MANAGEMENT PLAN

The purpose of this WMP is to identify the types and amounts of waste expected to be generated during the metallic debris disposal activities at Site 1 and demolition activities at Site 3 located at MCAS El Toro, California. Waste management activities from generation through storage (including waste characterization, packaging, storage, and management while in storage) are identified and discussed in this section. The transportation and disposition of waste materials at appropriate disposal and recycling facilities is also described in this section. It is the responsibility of the PjM to verify that all project personnel are aware of the requirements stipulated in this plan.

The WMP provides information on how wastes, including potentially hazardous wastes such as debris, PPE, and decontamination water associated with project activities, will be managed and disposed. In addition, a secondary goal of the WMP is to ensure that waste minimization practices are followed, to the extent practical, to reduce the volume of waste that will be generated, stored, and removed from the site for disposal.

The WMP is also a primary component of Foster Wheeler Environmental Corporate Compliance Program, which includes on-site environmental compliance inspections. The WMP will be revised if the scope of this project or the applicable regulations change.

### 5.1 PROJECT WASTE DESCRIPTIONS

This section presents information and a corresponding description for each waste stream anticipated to be generated as a result of the activities of this project. Potential waste streams associated with the project activities can be categorized as follows:

- Non-UXO and non-radioactive scrap metal from the site 1 area.
- Demolished concrete, asphalt, and miscellaneous construction debris at Site 3
- Scrap metal from concrete rebar
- Wastewater resulting from equipment and personnel decontamination
- Non-hazardous solid waste, such as trash, empty calibration gas canisters, and inert construction debris
- Used oil (including engine oil, hydraulic fluid, greases, antifreeze/coolant, etc.) and fuel oil and air filters from equipment maintenance operations
- Used PPE
- Used polyethylene liners from debris or scrap metal stockpiles
- Debris/scrap metal potentially contaminated with radiological material

The landfill (Site 3), as well as the EOD Range (Site 1), were in operation during the years when the military utilized Ra-226 and Sr-90 in the instruments and luminescent markers, and radioisotopes, such as Co-60 and Th-232, in magnetron electronic tubes associated with aircraft. Although not encountered during previous investigations, debris/scrap metal will be subjected to radiological screening for these above target isotopes.

Table 1 presents a matrix summarizing applicable waste management, transportation, and disposal requirements for each of the aforementioned waste streams.

## **5.2 WASTE MANAGEMENT**

The substantive requirements of the state and federal hazardous waste generation, characterization, storage, treatment, and management regulations of Title 22, California Codes of Regulations (CCR), Sections 66261, 66262, and 66264, and 40 Code of Federal Regulations (CFR), Parts 261, 262 and 264, are applicable to the management of hazardous wastes generated during the project activities. A summary of the key aspects of the waste management program is provided below. Table 1 lists each waste stream anticipated to be generated and provides specific information concerning characterization, packaging, treatment, notification, estimated volume, and final disposition.

### **5.2.1 Debris/Scrap Metal Waste Management**

Debris/scrap metal will be visually inspected and certified by a minimum of two UXO qualified technicians to ensure no energetic materials remain in or on the metal casings, and then containerized for off-site disposal at a CERCLA-approved facility. This range residue for off-site disposal will be controlled, and provided secure storage on-site and provided to the disposal facility in sealed certified containers. Ordnance related materials such as case fragments, fins, etc., will also be visually inspected by UXO qualified technicians, segregated from non-UXO debris/scrap metals and stored in a Navy designated staging area for USMC EOD handling.

### **5.2.2 Waste Classification**

Debris/scrap metal at Site 1 is will be disposed of as hazardous waste at a CERCLA-approved Class I permitted landfill.

A radiological screening of the metallic debris at Site 1 will be conducted as described earlier in Section 3.5. If debris/scrap metal with radiation measurements exceeding 1-½ times the ambient level is encountered, the Navy will be notified. The material will be segregated and placed in containers or wrapped with 20-mil PVC liner to protect it from the weather and to prevent personnel from coming in contact with the material. The ultimate disposition of this segregated material will be determined after consultation with personnel from the RASO.

Waste classification requirements will apply to decontamination wastewater generated from daily decontamination activities and waste oils and fluids generated from the on-site project equipment. Wastewater resulting from decontamination water will be collected and contained in 55-gallon drums. Upon completion of field activities, collected decontamination water will be sampled to determine proper disposition of the wastewater. . Waste oil and other fluids generated during equipment maintenance activities will be collected, contained, and sent off site for recycling.

### **5.2.3 Waste Accumulation And Storage**

This project may result in the temporary accumulation of hazardous wastes. These wastes, which may include decontamination water, used PPE, used oil, and fluids from equipment, will be managed, accumulated, and inspected in accordance with the applicable regulations. Title 22 CCR, Section 66262, and Title 40 CFR, Part 262, consist of regulations applicable to the generation, storage, management, and accumulation of non-Resource Conservation and Recovery Act (RCRA) and RCRA hazardous wastes, respectively. Specific requirements apply to the accumulation time and labeling of hazardous wastes.

In addition, if, miscellaneous debris is encountered that exhibits elevated readings for radioactivity (see Section 3.6), based on screening with field instruments, the material will be segregated and accumulated and stored in a separate container(s) for additional characterization. The smaller size radioactive contaminated material will be stored in 55-gallon drum(s) and the larger scrap metal that won't fit in drums will be wrapped in 20-mil PVC liner. The container(s) and the wrapped material will be labeled and dose-rated accordingly and placed in a designated area with the appropriate markings.

#### **5.2.3.1 Material Stockpiles**

Metals and debris removed from the stockpile at Site 1 will be staged on minimum 20-mil liner in preparation for radiological screening and waste characterization.

#### **5.2.3.2 Wastewater and Waste Fluids**

Title 22 CCR, Section 66264, and Title 40 CFR, Part 264, contain applicable requirements for facilities that store hazardous wastes in tanks or containers for over 90 days. Decontamination water and stormwater that comes in contact with the waste stockpiles will be collected and stored on site in 55-gallon drums.

When possible, waste fluids generated from heavy equipment maintenance activities will be collected and removed from the site by the maintenance contractor for recycling. If waste fluids are required to be stored on site, they will be labeled accordingly, contained within 55-gallon drums, and situated within a pre-designated and properly designed hazardous waste container

storage area. Hazardous wastes containing free liquids have stringent secondary containment requirements. These requirements include:

- A base free of cracks or gaps and sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.
- The base will be sloped or the containment system will be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation. Alternatively, the containers may be elevated on pallets to prevent contact with accumulated liquids.
- The containment system must have sufficient capacity to contain 10 percent of the volume of containers, or the volume of the largest container whichever is greater.
- Spilled or leaked waste and accumulated precipitation will be removed from the sump or collection area in a timely manner to prevent overflow of the collection system.

### **5.2.3.3 Used PPE**

Used PPE will also be stored in 55-gallons drums within the designated hazardous waste container storage area, which will be designed and managed in accordance with the substantive requirements of the container management regulations codified in Title 22 CCR, Sections 66264.170 through 66264.178, and described in Section 5.2.3.4.

### **5.2.3.4 Container Labeling**

Containers of hazardous waste will be labeled with indelible ink with the following information: source and location; contents and quantity; potential health, safety, and environmental hazards; accumulation start date; date container sampled; parameters analyzed for; and the words "Analysis Pending – Potentially Hazardous." Once containers are determined to contain hazardous waste, they will immediately be labeled with a completed "Hazardous Waste" label, which will include:

- U.S. Environmental Protection Agency (EPA) Identification Number of the generator
- Name and address of the generator
- EPA waste code
- Department of Transportation (DOT) shipping name (prior to off-site shipment)
- Description of contents
- Date of generation (date first drop of waste was placed in container)

Drums containing materials impacted with radioactive isotopes in excess of regulatory levels will be labeled and dose-rated accordingly and placed in a designated area with the appropriate markings. An inventory of waste containers will be maintained for later submittal to SWDIV personnel. In addition, as discussed in Section 5.2.7.1, weekly inspections of container storage areas will be conducted and logged while wastes remain in these areas to ensure the integrity of the

containers and secondary containment, to check for leaks or spills, and to ensure labels and markings are in good condition.

#### **5.2.3.5 Waste Accumulation Areas**

Hazardous waste storage areas also require:

- A sign, with the legend “Danger Hazardous Waste Area-Unauthorized Personnel Keep Out” (written in English and Spanish), will be posted at each 90-day accumulation area in sufficient numbers to be seen from any approach. The signs will be legible from a distance of at least 25 feet.
- Aisle space will be maintained to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless aisle space is not needed for any of these purposes.
- The following emergency equipment will be located or available to personnel during active waste management activities at each accumulation area:
  - A device, such as a telephone or a hand-held two-way radio, capable of summoning emergency assistance
  - Portable fire extinguishers, fire and spill control equipment, and decontamination equipment
  - Water at adequate volume and pressure to supply water hose streams; or foam-producing equipment; or automatic sprinklers; or water spray systems

Bulk quantities of fuel, oil, or other hazardous materials will not be stored on site. Equipment fueling and maintenance activities will be performed by an off-site contractor and on an as-needed basis.

#### **5.2.4 Waste Disposal**

Metallic debris/scrap and miscellaneous waste generated from Site 1 activities will be disposed of off-site at an appropriately permitted and CERCLA-approved waste disposal facility.

Other wastes, which may include decontamination water, demolition debris/waste, construction debris, used PPE, refuse, used oil, and impacted storm water, will be managed in accordance with the regulations and transported off site for appropriate recycling and/or disposal. Each waste stream other than debris/scrap metal requiring off-site disposal will be sampled and analyzed to ensure that it is properly characterized and meets the waste acceptance criteria and packaging requirements for the proposed TSDF prior to transport. Used PPE., and construction debris (e.g., polyethylene liners, etc.) will be sent off-site to a CERCLA-approved Class I hazardous waste landfill facility. Clean construction debris (e.g., demolished concrete, asphalt, etc.) will be transported to an off-site recycling facility. Waste oil and other fluids generated during equipment maintenance activities will be collected, contained, and sent off site for recycling.

Debris/scrap metal impacted with radioactive isotopes will be disposed of by the Navy in accordance with regulatory requirements and at a facility permitted to accept such materials. The ultimate disposition of the radioactive contaminated material will be determined after consultation with personnel from the Navy RASO.

Hazardous waste will be disposed only at a hazardous waste disposal facility approved by SWDIV and FWENC Compliance Procedures (per FWENC Procedure EHS 1-4) and permitted for the disposal of the particular type of hazardous waste generated. Wastes disposed of off site will be sent to RCRA Subtitle C or RCRA Subtitle D facilities that meet the requirements of 40 CFR, Part 300.440 (CERCLA Off-site Policy). The Chemical Waste Management facilities in Kettleman City, California, and the Safety-Kleen facility in Westmoreland, California, are two Class I hazardous waste facilities that will be considered for disposal of the surficial metallic debris and other miscellaneous hazardous and non-hazardous waste.

### **5.2.5 Waste Transportation**

FWENC is responsible for shipping hazardous waste off site from MCAS El Toro. Hazardous wastes sent off site for disposal or recycling will be done so in accordance with the DOT Hazardous Material Transportation regulations of 49 CFR, Parts 171 through 177; 40 CFR, Part 262, Subpart B; and 22 CCR, Section 66262, which involve packaging, placarding, labeling, and manifesting requirements, and with appropriate Land Disposal Restrictions (LDR) certification notices per 40 CFR, Part 268, and 22 CCR, Section 66268. Personnel having the required DOT training will perform all DOT functions. In addition, all transporter and disposal contractors will be subject to FWENC's subcontractor qualification process. A SWDIV representative will sign all the manifests. Under no circumstances will FWENC personnel sign hazardous waste manifests.

Material that does not exhibit one of the DOT hazard class characteristics (i.e., explosives, gases, flammable/combustible liquids, flammable solids/spontaneously combustible materials/dangerous when wet materials, oxidizers and organic peroxides, toxic materials and infectious substances, radioactive materials, or corrosive materials) is not regulated under DOT rules for hazardous material transportation. If material is suspected to be hazardous, it will be shipped under the appropriate hazard class. All hazardous waste will be transported under DOT hazardous material regulations.

Each shipment of a suspected hazardous material will be properly classified using the Hazardous Materials Table in 49 CFR, Part 172.101. DOT-trained personnel will make all required and necessary determinations.

## **5.2.6 Waste Minimization**

To minimize the volume of waste, the following general guidelines will be followed:

- Materials will not be contaminated unnecessarily
- Work will be planned ahead, based on the work procedure to be used
- Only the material (i.e., chemicals) needed to perform the work activity will be taken
- Additional material can be brought to the work location if it is found to be necessary
- Materials can be stored in large containers, but the smallest reasonable container will be used to transport the material to the location where it is needed
- Cleaning and extra sampling supplies will be maintained outside any potentially contaminated area to keep them clean and to minimize additional waste generation
- Mixing of detergents or decontamination solutions will be performed outside potentially contaminated areas
- Drop cloths or other absorbent material will be used to contain small spills or leaks
- Containers will be used to minimize the spread of contamination
- Contaminated materials will not be placed with clean materials
- Wooden pallets inside the exclusion zone will be covered with plastic
- Material and equipment will be decontaminated and reused when practical
- Volume reduction techniques will be used when practicable
- Waste containers will be verified to ensure they are solidly packed to minimize the number of containers
- Only waste containers with adequate size to contain the volume of waste generated will be used
- Less hazardous substances will be used whenever possible (i.e., only the volume of standard solutions needed for testing will be brought; minimal amounts of decontamination water and solvent rinses will be used)

## **5.2.7 Waste Management Inspection and Documentation Program**

This section presents the waste inspection procedures and documentation program to be employed during the project field activities.

### **5.2.7.1 Inspections**

While all waste accumulation areas will be informally inspected on a daily basis, formal inspections of all accumulation areas will be conducted and recorded at least weekly in accordance with 40 CFR, Part 264, Subpart I, and 22 CCR, Section 66264. However, daily inspections will be conducted for tanks containing hazardous waste (wastewater). In addition, material stockpiles will be inspected daily to ensure liners are in place, stockpiles are adequately

covered, and covers are anchored sufficiently. The site supervisor or his designee will conduct inspections. Inspections will be logged in a field logbook and a weekly inspection checklist will be completed. The container storage area will be inspected to ensure the following:

- Containers are in good condition. If a container is not in good condition or appears to be leaking, the waste will be transferred to another container.
- Containers are made of materials that will not react with, and are otherwise compatible with, the hazardous waste to be stored.
- Containers are closed at all times, except when adding or removing waste.

#### **5.2.7.2 Documentation**

Documentation requirements apply to all waste managed during project activities. Field records will be kept of all waste generation activities. All pages of the field data logbook shall be signed and dated by the supervising field leader who is entering the data. In addition, the following information will be recorded in the logbook:

- Description of generating activities
- Location of waste generation (including depth, if applicable)
- Type and volume of waste
- Date and time of generation
- Description of any waste sampling, including:
  - Type of test
  - Laboratory where sample is to be sent
  - Sampling method
  - Name of sampler
- Name of person recording information
- Name of field manager at time of generation

#### **5.2.7.3 Hazardous Waste Manifests and LDR Certification**

All hazardous waste transported from the site will be accompanied by a Hazardous Waste Manifest. SWDIV personnel will be responsible for reviewing and signing all waste documentation, including waste profiles, manifests, and LDR notifications (manifest packages). Prior to signing the manifest, the designated Navy official will ensure that pre-transport requirements of packaging, labeling, marking, and placarding are met according to 40 CFR, Parts 262.30 through 262.33, and 49 CFR, Parts 100 through 178.

The Navy will receive one copy of the manifest; the remaining copies will be given to the transporter. The manifest will be returned to the Navy signatory official for Base Record-keeping requirements.

Copies of all manifests for waste generated at the site will be kept in a compliance file within FWENC project files. The PjM will also provide the Navy with the generator copy of the manifest for the Navy to submit to the State.

An LDR form will accompany the shipment of hazardous waste to the TSDF. The TSDF will be notified prior to the waste being sent. The following items must accompany the notification and will be included in one of the following facility specific forms:

- EPA Hazardous Waste Generator identification number for MCAS El Toro
- Manifest number, including State disposal application number
- Waste analysis data
- Corresponding concentration-based or technology based treatment standards will be identified if the waste is also land disposal restricted

RCRA record-keeping requirements, per 40 CFR, Parts 262.20 through 262.44, including retention of signed copies of manifests from the designated facility that received the waste, will be adhered to. Additionally, biennial and exception reporting information will be submitted, as necessary, according to 22 CCR, Sections 66262.41 and 66261.42, and 40 CFR, Parts 262.41 and 262.42. Additional reporting may be required in accordance with 22 CCR, Section 66262.43, and 40 CFR, Part 262.43.

### **5.3 UPDATING THE WASTE MANAGEMENT PLAN**

The WMP will be updated as changes in site activities or changes in applicable regulations occur.

## 6.0 PROJECT MANAGEMENT

The project management team will be responsible for all technical and administrative aspects of the upcoming field activities. The project management responsibilities also include developing and monitoring the project schedule, staffing, data management, document control, project meetings, and reporting.

### 6.1 PROJECT SCHEDULE

The proposed schedule for implementation of the field activities is included in this Work Plan as Figure 5. Fieldwork is anticipated to start in January 2001. Field activities for this project will begin upon approval of the Work Plan by SWDIV and concurrence by the regulatory agencies. The project fieldwork will span approximately 1 month. The schedule shown on Figure 5 is for planning purposes only and will be revised as needed.

The schedule is presented in a critical-path-method format. The schedule has been prepared using a PC-based cost, scheduling, and control system known as PRIMAVERA. PRIMAVERA has many features, including the identification of critical path and the ability to compare initial base plan to current project schedule.

The schedule includes pre-construction activities, preparatory activities, field construction activities, and preparation of a Project Report. Construction activities have been planned to start after approval of the Work Plan and procurement of the necessary equipment, materials, and subcontracting services.

A total of five primary activities will be followed during the course of this project:

- **Stage 1 – Pre-Construction Activities.** This stage includes preparation of project submittals that include the Work Plan and SHSP, project kick-off and other meetings, and Navy and regulatory review of the Work Plan. The Work Plan includes the WMP, Project Schedule, and Project Organization Chart.
- **Stage 2 – Preparatory Activities.** This stage includes procurement and mobilization at the site.
- **Stage 3 – Construction Activities.** This stage includes disposal of metallic and miscellaneous debris at Site 1, and demolition and recycling of the concrete and asphalt pavement located at Site 3.
- **Stage 4 – Demobilization.** This stage includes decontamination and demobilization of all project equipment and temporary facilities; and disposal of decontamination wastewater, used PPE, and other wastes.
- **Stage 5 – Project Report.** This stage includes preparation of a Project Report to document the results of all field activities performed at the project sites. Project Report(s) will be completed and submitted in a timely manner to the agencies for review. The

report(s) will describe and document the completed field activities and present any pertinent data and information. The Navy will consult with the BRAC Cleanup Team (BCT) regarding the submittal of the Project Report(s). The information for each site might be combined or reported individually based on BCT discussions.

## 6.2 PROJECT RESPONSIBILITIES

FWENC will have overall responsibility for the implementation of this project under the direction of the SWDIV staff. Figure 6, Project Organization Chart, illustrates the organization of the project team. Project Points of Contact, below, provides a list of names and phone numbers for SWDIV, FWENC, and other personnel involved with the project.

### PROJECT POINTS OF CONTACT

Agency	Contact	Project Title
Southwest Division Naval Facilities Engineering Command 1230 Columbia Street, Suite 870 San Diego, CA 92101	Content Arnold (619) 532-0790	Lead RPM
Southwest Division Naval Facilities Engineering Command 1230 Columbia Street, Suite 870 San Diego, CA 92101	Don Whittaker (619) 532-0791	RPM
MCAS CSO MCAS El Toro Building 368 El Toro, CA	Scott Kehe (949) 726-0506	MCAS CSO Engineer
Foster Wheeler Environmental Corporation Southwest Division RAC Site Trailer Gardeners Road and Industrial Road Naval Weapons Station Seal Beach 800 Seal Beach Boulevard Seal Beach, CA 90740	Jamshid Sadeghipour (562) 598-6150 ext. 5880	Deputy Program Manager
Foster Wheeler Environmental Corporation 1940 East Deere, Suite 200 Santa Ana, CA 92705	Hamlet Hamparsumian (949) 756-7520	PjM
Foster Wheeler Environmental Corporation Southwest Division RAC Site Trailer Gardeners Road and Industrial Road Naval Weapons Station Seal Beach 800 Seal Beach Boulevard Seal Beach, CA 90740	Abram Eloskof (562) 598-6150 ext. 5886	Project Superintendent

FWENC will be responsible for project management, quality assurance/quality control, health and safety, field construction activities, and preparation of final reports. FWENC will also directly coordinate and supervise the activities of the subcontractors. All subcontractors working on this project will have to abide by and comply with FWENC Health and Safety requirements in addition to their company Health and Safety requirements.

**Lead Remedial Project Manager (RPM).** The SWDIV Lead RPM, Ms. Content Arnold, is responsible for project management, and providing governmental oversight of technical issues. She is also responsible for interface with the BCT, community representatives, and Contractor to meet project objectives.

**Remedial Project Manager (RPM).** Mr. Don Whittaker, a SWDIV Environmental RPM, will be responsible for the technical oversight and review of the project documents and coordination of field activities with different Base personnel. He will ensure that the field and remedial activities are in compliance with the applicable rules and regulations.

**Quality Assurance Officer.** Mr. Nars Ancog provides governmental oversight of contractor's quality assurance (QA) program. He provides quality related directives through the RPM, and has authority to suspend project execution if QA requirements are not adequately met.

**MCAS CSO Engineer.** Mr. Scott Kehe is the MCAS CSO Engineer and is responsible for the technical oversight of field activities and quality control.

**BRAC Cleanup Team (BCT).** The BCT consists of representatives from local, state, and federal regulatory agencies who provide input to the Navy.

**SWDIV Contracting Officer.** Ms. Gracy Tinker represents the government in contractual, cost, and scheduling issues. She interfaces with the Lead RPM on performance and execution of the task order.

**RAC Deputy Program Manager.** Mr. Jamshid Sadeghipour will provide management oversight of execution of the task order in compliance with the program contract.

**Project Manager (PjM).** Mr. Hamlet Hamparsumian, FWENC PjM, is responsible for general project administration and for day-to-day management of the project budgets, staffing, deliverables, and schedule. He is responsible for ensuring the quality of all project activities and deliverables and for communicating with the RPM on technical issues.

**Project Superintendent.** Mr. Abram Eloskof will be responsible for managing the fieldwork and providing oversight to the subcontractors. Mr. Eloskof will coordinate the field activities with the senior technical staff and the Program Quality Control Manager (Mary Schneider) to ensure that all field activities are in compliance with the project specifications. He will also

coordinate these activities with the SHSO, interact with DON's personnel, and coordinate efforts among all subcontractors.

**Program Quality Control Manager.** Ms. Mary Schneider is responsible for executing the contractor's QA program. She is responsible for ensuring technical standards and specifications are met for each deliverable to the client. She also coordinates the peer and technical review of project deliverables and ensures standards and QA requirements are met.

**Health and Safety Manager.** Mr. Roger Margotto is responsible for ensuring that all field operations are conducted in accordance with safe operating practices and in compliance with federal and state requirements.

**Project Chemist.** Ms. Lisa Biancowski is responsible for managing the analytical laboratory services. She prepares planning documents, technical specifications, and quality assurance plans for collection of data. She oversees technical performance of laboratory subcontractors.

**Project Engineer** is responsible for overseeing field operations and evaluating technical data. Prepares planning documents and technical specifications for collection of data. Oversees technical performance of subcontractors.

### **6.3 PROJECT AND PERSONNEL TRAINING REQUIREMENTS**

FWENC personnel training requirements and inspection programs applicable to the field construction activities at the IR Sites at MCAS El Toro are described below. Protocols for inspections by regulatory agencies and third parties are also addressed below.

#### **6.3.1 Personnel Training/Certification Requirements**

- Site personnel must have OSHA 40-hour Health and Safety/Emergency Response Hazard Communication and RCRA training and current 8-hour refresher training. The onsite health and safety manager will also have an additional 8 hours of supervisor training.
- Site personnel performing DOT functions (including selecting, packaging, marking, labeling, preparing shipping papers, and loading) must be trained in accordance with the requirements of HM-126F. Subcontractors performing DOT functions must supply proof of training.
- All project personnel (subcontractors and FWENC) will be trained according to FWENC Compliance Policies and Procedures. FWENC personnel records will be verified along with the subcontractors training records prior to project activities.
- All project personnel performing waste management will be certified under FWENC Waste Management Training.

### **6.3.2 Inspection and Audit Procedures**

Site inspections and audits may occur during the field activities to assure compliance with the applicable state and federal regulations and the SHSP (Attachment 1).

### **6.4 DATA MANAGEMENT**

The following is a summary of the data management tools that will be employed for the duration of this project:

- PRIMAVERA and Harper Shuman accounting software will be utilized for all schedule and project cost tracking
- Home and field office staff will utilize Microsoft® Excel spreadsheets for technical data management. Microsoft® Word will be employed for word processing

### **6.5 DOCUMENT CONTROL**

In general, FWENC internal document control procedures will be adhered to for the duration of the project. Additional guidance provided by the DON will be utilized for document control, particularly for matters relating to regulatory compliance. Management of internal and external correspondence will be administered at the home office. The Contract Administrator will oversee coordination of home office document control. The document control will include assigning an alphanumeric coding to each piece of documentation that is logged in. The generator(s), recipient(s), date, and subject matter will be entered into a computer database. The database will be stored for the duration of the project and will be delivered to the DON at project completion. A central home office file will be established according to the corporate procedures. Complete project files will be maintained in a secure, dry area at the field office. Document control routing sheets will be utilized to maintain the flow of documentation between the field and home offices. At project completion, the project files will be delivered to the DON.

### **6.6 MEETINGS AND REPORTS**

Project status meetings will be held weekly at the field office during the field construction activities. The PjM, Project Superintendent, CQC Engineer, and other selected individuals will be required to attend these meetings with the Lead RPM, SWDIV Environmental RPM, and the MCAS CSO Engineer. The agenda of the progress meetings will include the following:

- Review and approval of minutes of previous meeting
- Review of work progress
- Field observations, problems, and conflicts
- Problems that impede construction schedule and proposed corrective actions
- Corrective measures and procedures to regain projected schedule
- Revisions to construction schedule

- Forecast of progress for next succeeding work period
- Coordination of schedules
- Review of submittal schedules, if any
- Review of quality/health and safety programs
- Pending changes and substitutions
- Review of proposed changes that affect construction, completion date, and other aspects of the project
- Other business

Minutes of the meetings will be prepared by FWENC and submitted to the DON. Daily reports will be prepared by the Project Superintendent and the CQC Engineer and submitted to the DON.

## 7.0 REFERENCES

- Bechtel National, Inc. (BNI). 1997. Draft Final Phase II Remedial Investigation Report Operable Unit 2C-Site 3, Marine Corps Air Station El Toro, California. San Diego, California. April.
- State of California, Department of Transportation (Caltrans). 1996. State of California Manual of Traffic Controls for Construction and Maintenance Work Zones.
- Jacobs Engineering Group, Inc. (Jacobs). 1991. Marine Corps Air Station El Toro, California. Phase I Remedial Investigation Work Plan.
- Jacobs. 1993. Marine Corps Air Station El Toro: Installation Restoration Program Phase I Remedial Investigation Draft Technical Memorandum.

# Tables

**TABLE 1**  
**WASTE MANAGEMENT SUMMARY REQUIREMENTS**

Waste Types	Characterization Requirements	Containment Requirements	Storage Requirements	Transportation Requirements	Disposal Requirements
Used Oil and Oil Filters	Spent oil filters and oil will be handled as a Specified California Hazardous Waste.  "Drained" oil filters may be managed as a non-hazardous solid waste. Recycling of the "empty" filters is the preferred method for removal of this material from site.	Used oil to be stored in 55-gallon containers.  "Drained" oil filters to be placed into plastic bags. Filters to be drained and stored within the secondary containment area.	Used oil to be stored in 55-gallon drums labeled <b>"USED OIL/HAZARDOUS WASTE"</b> and located within a secondary containment unit.  Spent oil filters will be completely drained and placed into plastic bags before being placed into non-hazardous solid waste dumpsters or retained for recycling.  A contracted waste oil recycler shall pick up used oil within 90 days of placement of first drop of oil.	Hazardous waste manifest required. Hazardous waste manifest to be signed by the Navy.	Contracted Recycler to pickup and recycle used oil and empty filters.  Secondary choice would be disposal of the bagged (drained) oil filters at an approved Class III solid waste landfill.
Decontamination Water/Sludge	Unless a waste determination (e.g., RCRA hazardous, non-RCRA hazardous, or non-hazardous) can be made based on generator knowledge, the material will be sampled to determine appropriate management and disposal procedures.  Samples will be run for potential contaminants including: VOCs, SVOCs, TPH, total metals, and STLC or TCLP.	DOT-approved 55-gallon metal drums or an aboveground tank.	Unless predetermined to be hazardous or known to be non-hazardous, containers will be marked as follows:  <b>POTENTIALLY HAZARDOUS DECONTAMINATION WATER/SLUDGE - ANALYSIS PENDING</b>  The storage accumulation clock starts from the date that waste is first put into the container.  Containers are to be labeled and stored in pre-designated hazardous waste storage area with secondary containment.	If material is a hazardous waste, a hazardous waste manifest and DOT vehicle placarding are required. Must use a Cal/EPA-permitted transporter. Must also have LDR certifications as necessary. Hazardous waste manifest to be signed by the Navy.  Individuals involved in overseeing or shipping hazardous materials must meet DOT training requirements.	The waste will be containerized and sent off site for treatment and/or disposal at an appropriate treatment, storage, or disposal facility approved under the CERCLA Off-site Rule.  An ESQ Scientist must approve any TSDF and/or transporter prior to shipment of waste.
Wastewater (Water collected from within stockpiles areas)	Unless a waste determination (e.g., RCRA hazardous, non-RCRA hazardous, or non-hazardous) can be made based on generator knowledge, the material will be sampled to determine appropriate management and disposal procedures.  Samples will be run for potential contaminants including: VOCs, SVOCs, TPH, and metals, analysis.	DOT-approved 55-gallon (bung-hole-type) metal drums (1A1) or aboveground tank.	The 90-day storage limit applies to tanks and containers containing hazardous waste. Containers and tanks will be marked as <b>"HAZARDOUS WASTE"</b> and include the accumulation date, composition and physical state of the waste, hazardous properties, and name and address of generator.  Containers and tanks will be sealed when not being filled/unloaded. Containers will be elevated to prevent contact with any ponded precipitation and/or liquids.  Store in pre-designated hazardous waste storage areas with secondary containment.	If material is a hazardous waste, a hazardous waste manifest and DOT vehicle placarding are required. Must use a Cal/EPA-permitted transporter. Must also have LDR certifications as necessary. Hazardous waste manifest to be signed by the Navy.  Individuals involved in overseeing or shipping hazardous materials must meet DOT training requirements.	The waste will be containerized and sent off site for disposal at an appropriate treatment, storage, or disposal facility approved under the CERCLA Off-site Rule.  An ESQ Scientist must approve any TSDF and/or transporter prior to shipment of waste.

**TABLE 1**  
**WASTE MANAGEMENT SUMMARY REQUIREMENTS**

Waste Types	Characterization Requirements	Containment Requirements	Storage Requirements	Transportation Requirements	Disposal Requirements
Used Fuel and Air Filters	<p>Use process knowledge to make a waste determination.</p> <p>Spent air and fuel filters (drained) will be handled as non-hazardous solid waste.</p>	<p>Spent air and fuel filters (drained) to be double bagged. Fuel filters to be drained by vendor responsible for vehicle maintenance within a secondary containment unit.</p>	<p>Spent fuel filters to be completely drained. All filters are to be placed into plastic bags and placed into non-hazardous solid waste dumpsters.</p>	<p>Contracted solid waste management company will collect trash.</p>	<p>Dispose of air and fuel filters in site dumpsters or roll-offs for non-hazardous solid waste and subsequent disposal at an approved Class III Landfill.</p>
Construction Debris (rock, demolished concrete, and asphalt)	<p>Unless a waste determination (e.g., RCRA hazardous, non-RCRA hazardous, or non-hazardous) can be made based on generator knowledge, the material will be sampled to determine appropriate management and disposal procedures.</p> <p>Debris not having contact with waste or contaminated soil may be characterized as a non-hazardous solid waste.</p>	<p>Hazardous debris moved from point of generation to the decontamination area.</p> <p>Hazardous debris stored in bins or covered stockpiles.</p> <p>Non-hazardous debris will be temporarily stored at the site.</p> <p>Non-hazardous solid waste will be temporarily stored at the site pending their removal to an off-site recycling facility.</p>	<p>Decontaminated debris (debris that meets the debris treatment standard and is not contaminated with a listed waste) and non-hazardous debris may be stored in non-hazardous solid waste roll-offs.</p> <p>Hazardous debris that cannot be decontaminated and does not meet the debris treatment standards will be stored in containers and/or bins and will be marked "<b>HAZARDOUS WASTE</b>" and include the accumulation date, composition and physical state of the waste, hazardous properties, and name and address of generator.</p> <p>Containers and/or bins will be sealed/ covered when not being loaded/unloaded. Containers will be elevated to prevent contact with any ponded precipitation and/or liquids.</p>	<p>No special transporter requirements for demolition debris (concrete and asphalt) determined to be non-hazardous. Demolition Contractor will load and haul the material to a recycling facility.</p> <p>If material is a hazardous waste, a hazardous waste manifest and DOT vehicle placarding are required. Must use a Cal/EPA-permitted transporter. Must also have LDR certifications as necessary. Hazardous waste manifest to be signed by the Navy.</p> <p>Individuals involved in overseeing or shipping hazardous materials must meet DOT training requirements.</p>	<p>Non-hazardous debris or debris treated to meet "Alternate Treatment" standards may be disposed off-site at an approved Class III solid waste landfill.</p> <p>Hazardous waste will be containerized and sent off site for disposal at an appropriate treatment, storage, or disposal facility approved under the CERCLA Off-site Rule.</p> <p>Demolished concrete and/or asphalt will be transported to an off-site recycling/crusher facility.</p> <p>An ESQ Scientist must approve any TSDf and/or transporter prior to shipment of waste.</p>
Non-hazardous waste (trash, inert construction debris, calibration canisters, clean polyethylene liners, etc.)	<p>Materials generated during pre-design field activities and not contaminated with any waste or waste residue may be characterized as a non-hazardous solid waste.</p>	<p>Waste to be stored in non-hazardous roll-offs or stockpiles.</p>	<p>Non-hazardous waste to be stored separate from hazardous waste and labeled accordingly to prevent commingling of hazardous and non-hazardous wastes.</p>	<p>No special transporter requirements for wastes determined to be non-hazardous. Contracted solid waste management company will collect material.</p>	<p>Non-hazardous waste to be disposed off site at an approved Class III solid waste landfill.</p>

**TABLE 1**  
**WASTE MANAGEMENT SUMMARY REQUIREMENTS**

Waste Types	Characterization Requirements	Containment Requirements	Storage Requirements	Transportation Requirements	Disposal Requirements
Polyethylene Sheeting (Contaminated)	Liners used for containing hazardous soil and/or refuse will be presumed to be hazardous.	Liners will be stored in roll-offs or DOT 55-gallon drums.	Labeling should consist of a completed commercial hazardous waste label. Roll-offs will be marked as " <b>HAZARDOUS WASTE</b> " and include the accumulation date, composition and physical state of the waste, hazardous properties, and name and address of generator.  Roll-offs will be sealed/covered when not being loaded/unloaded. Roll-offs will be elevated to prevent contact with any ponded precipitation and/or liquids.	If material is a hazardous waste, a hazardous waste manifest and DOT vehicle placarding are required. Must use a Cal/EPA-permitted transporter. Must also have LDR certifications as necessary. Hazardous waste manifest to be signed by the Navy.  Individuals involved in overseeing or shipping hazardous materials must meet DOT training requirements.	The waste will be containerized and sent off site for disposal at an appropriate treatment, storage, or disposal facility approved under the CERCLA Off-site Rule.  An ESQ Scientist must approve any TSDF and/or transporter prior to shipment of waste.
Scrap Metal [rebar, miscellaneous metallic parts, and structures (steel pipes, doors, etc.)]	Unless generator knowledge is sufficient to make a non-hazardous determination, metal debris will be decontaminated in accordance with the hazardous debris treatment standards before it can be managed as scrap metal for recycling.  Non-UXO, non-radioactive debris/scrap metal generated from IR Site 1 activities will be managed as hazardous waste.	Segregate scrap metal from other construction debris following decontamination.  Debris/scrap metal from Site 1 will be screened for UXO. Non-UXO, non-radioactive and not ordnance-related material will be placed in sealed containers. The material will be certified as non-UXO for off-site disposal.	Mark roll-off container as " <b>Scrap Metal Intended for Recycling</b> " to prevent commingling with hazardous wastes and construction debris.  Non-UXO, non-radioactive, and not ordnance-related material will be stored in sealed containers.  UXO and ordnance related material will be stored in a lined and bermed containment area at the site and covered with PVC liners.	No special transporter requirements for debris/scrap metal determined to be non-UXO, non-radioactive. The material will be transported in sealed/certified containers.	Debris scrap metal generated from IR Site 1 activities will be sent to a CERCLA-approved Class I landfill facility for disposal.  UXO and ordnance related material will be disposed of by USMC EOD.

**TABLE 1**  
**WASTE MANAGEMENT SUMMARY REQUIREMENTS**

Waste Types	Characterization Requirements	Containment Requirements	Storage Requirements	Transportation Requirements	Disposal Requirements
PPE	<p>Use process knowledge to make a waste determination.</p> <p>PPE from investigative activities are considered non-hazardous.</p>	<p>Use double plastic bags at point of generation to transport to the 90-day accumulation area.</p> <p>DOT-approved 55-gallon metal drums (1A2).</p>	<p>Labeling should consist of a completed commercial hazardous waste label. Containers will be sealed/covered when not being loaded/unloaded. Containers and roll-offs will be elevated to prevent contact with any ponded precipitation and/or liquids.</p> <p>Store in pre-designated hazardous waste storage areas with secondary containment.</p>	<p>If material is a hazardous waste, a hazardous waste manifest and DOT vehicle placarding are required. Must use a Cal/EPA-permitted transporter. Must also have LDR certifications as necessary. Hazardous waste manifest to be signed by the Navy.</p> <p>Individuals involved in overseeing or shipping hazardous materials must meet DOT training requirements.</p> <p>Decontaminated PPE may be placed into non-hazardous solid waste roll-off to be picked up by contracted solid waste disposal contractor.</p>	<p>Decontaminated PPE and/or IDW may be disposed at an approved Class III solid waste landfill.</p> <p>If a hazardous waste, the PPE will be containerized and sent off site for disposal at an appropriate treatment, storage, or disposal facility approved under the CERCLA Off-site Rule.</p> <p>An ESQ Scientist must approve any TSDF and/or transporter prior to shipment of waste.</p>
Miscellaneous Debris Potentially Contaminated with Radioactive Isotopes	<p>Unless generator knowledge is sufficient to make a non-radioactive contamination determination, metal debris suspected of being contaminated based on field instrument screening will be segregated from other materials and will be analyzed to determine what isotope is present.</p>	<p>Segregate potentially contaminated debris from other construction debris.</p>	<p>Mark container as "<b>Potentially Radioactive Contaminated Debris</b>" to prevent commingling with other hazardous wastes and construction debris.</p> <p>The drum(s) will be labeled and the dose-rated accordingly and placed in a designated area with the appropriate markings.</p>	<p>No special transporter requirements for debris determined to be <i>deminimisly</i> contaminated material.</p>	<p>Debris will be disposed of in accordance with regulations based on the level of radioactive contamination and at a disposal facility approved under the CERCLA Off-site Rule.</p> <p>Navy RASO will determine the ultimate disposition of material contaminated with radioactive isotopes.</p>

**TABLE 1**  
**WASTE MANAGEMENT SUMMARY REQUIREMENTS**

Waste Types	Characterization Requirements	Containment Requirements	Storage Requirements	Transportation Requirements	Disposal Requirements
Unidentified Waste Streams (i.e., waste streams that may be generated during site activities but have yet to be identified)	Unless a waste determination (e.g., RCRA hazardous, non-RCRA hazardous, or non-hazardous) can be made based on generator knowledge, the material will be sampled to determine appropriate management and disposal procedures.	DOT-approved 55-gallon metal drums (1A1 or 1A2) depending on whether a liquid or solid.	<p>If hazardous waste, labeling should consist of a completed commercial hazardous waste label. Containers will be sealed/covered when not being managed. Containers will be elevated to prevent contact with any ponded precipitation and/or liquids.</p> <p>If a hazardous waste, the storage accumulation clock starts from the date that waste is first put into the container destined for off-site disposal (90 day max. allowed).</p> <p>Store in pre-designated hazardous waste storage areas with secondary containment.</p>	<p>If material is a hazardous waste, a hazardous waste manifest and DOT vehicle placarding are required. Must use a Cal/EPA-permitted transporter. Must also have LDR certifications as necessary. Hazardous waste manifest to be signed by the Navy.</p> <p>Individuals involved in overseeing or shipping hazardous materials must meet DOT training requirements.</p>	<p>The waste will be containerized and sent off site for disposal at an appropriate treatment, storage, or disposal facility approved under the CERCLA Off-site Rule.</p> <p>An ESQ Scientist must approve any TSDF and/or transporter prior to shipment of waste.</p>

**Notes:**

BMP – Best Management Practice

Cal/EPA – California Environmental Protection Agency

CERLA – Comprehensive Environmental Response, Compensation, and Liability Act

CFR – Code of Federal Regulations

DOT – Department of Transportation

ESQ – Environmental Safety and Quality

IDW – investigative-derived waste

LDR – Land Disposal Restriction

PPE – personal protective equipment

RCRA – Resource Conservation and Recovery Act

STLC – Soluble Threshold Limit Concentration

SVOC – semivolatle organic compound

TCLP – Toxicity Characteristic Leaching Procedure

TPH – total petroleum hydrocarbon

TSDF – Treatment, Storage, or Disposal Facility

VOC – volatile organic compound

# Figures

DRAWING NO:  
01006501.DWG

DCN: FWSD-RAC-01-0065  
CTO #022

APPROVED BY: HH

CHECKED BY: HH  
REV: REVISION 0

DRAWN BY: MD  
DATE: 10/27/00

I:\1990-RAC\CTO-0022\DWG\010065\01006501.DWG  
PLOT/UPDATE: OCT 19 2000 14:55:34

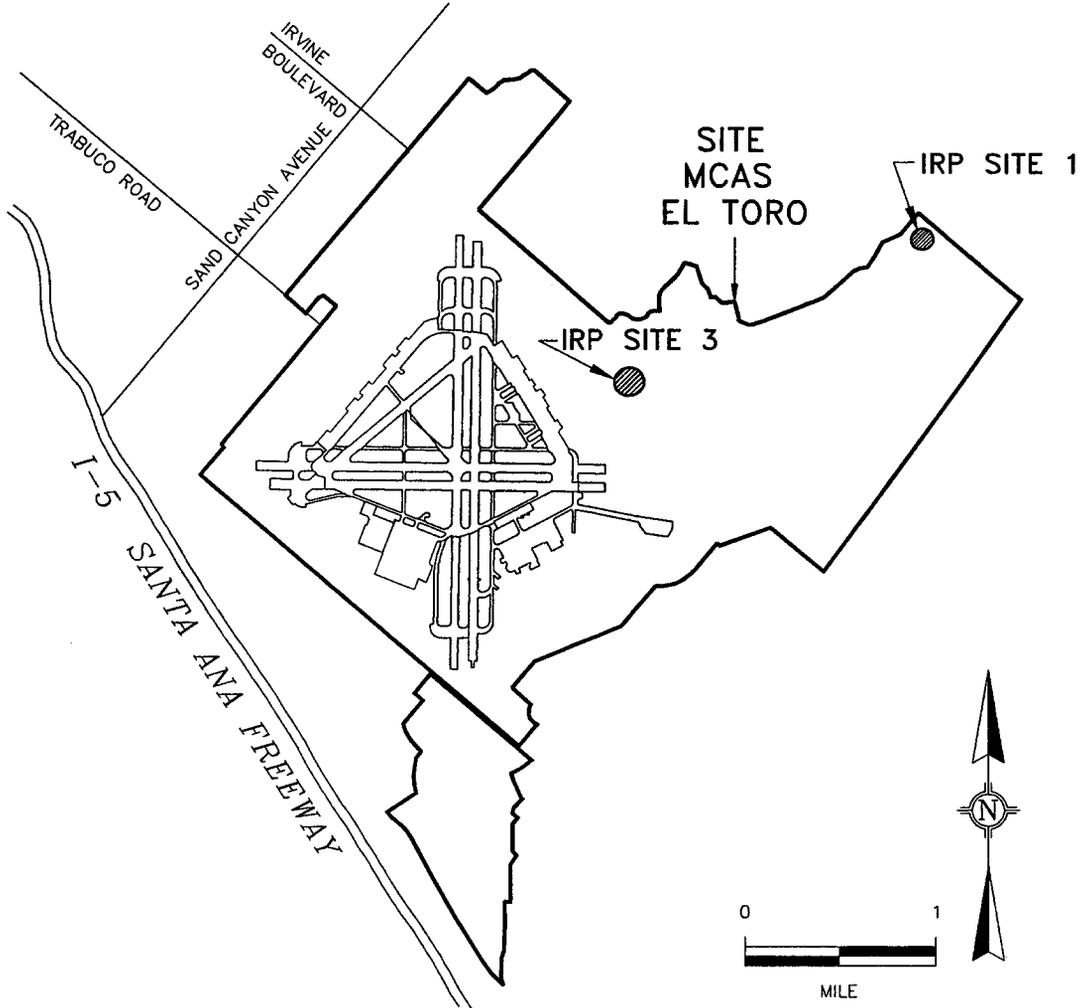
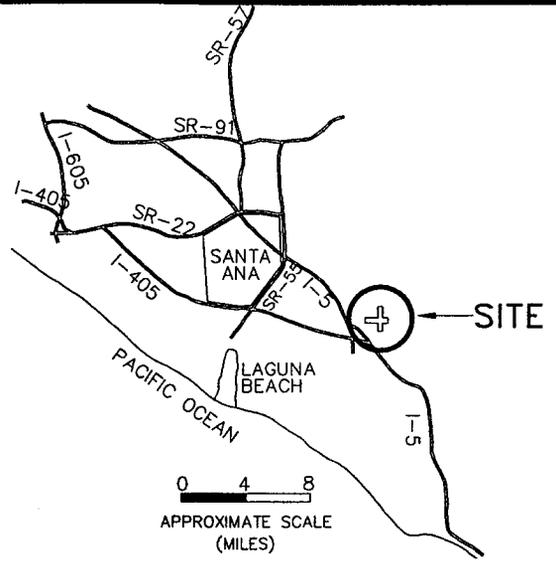


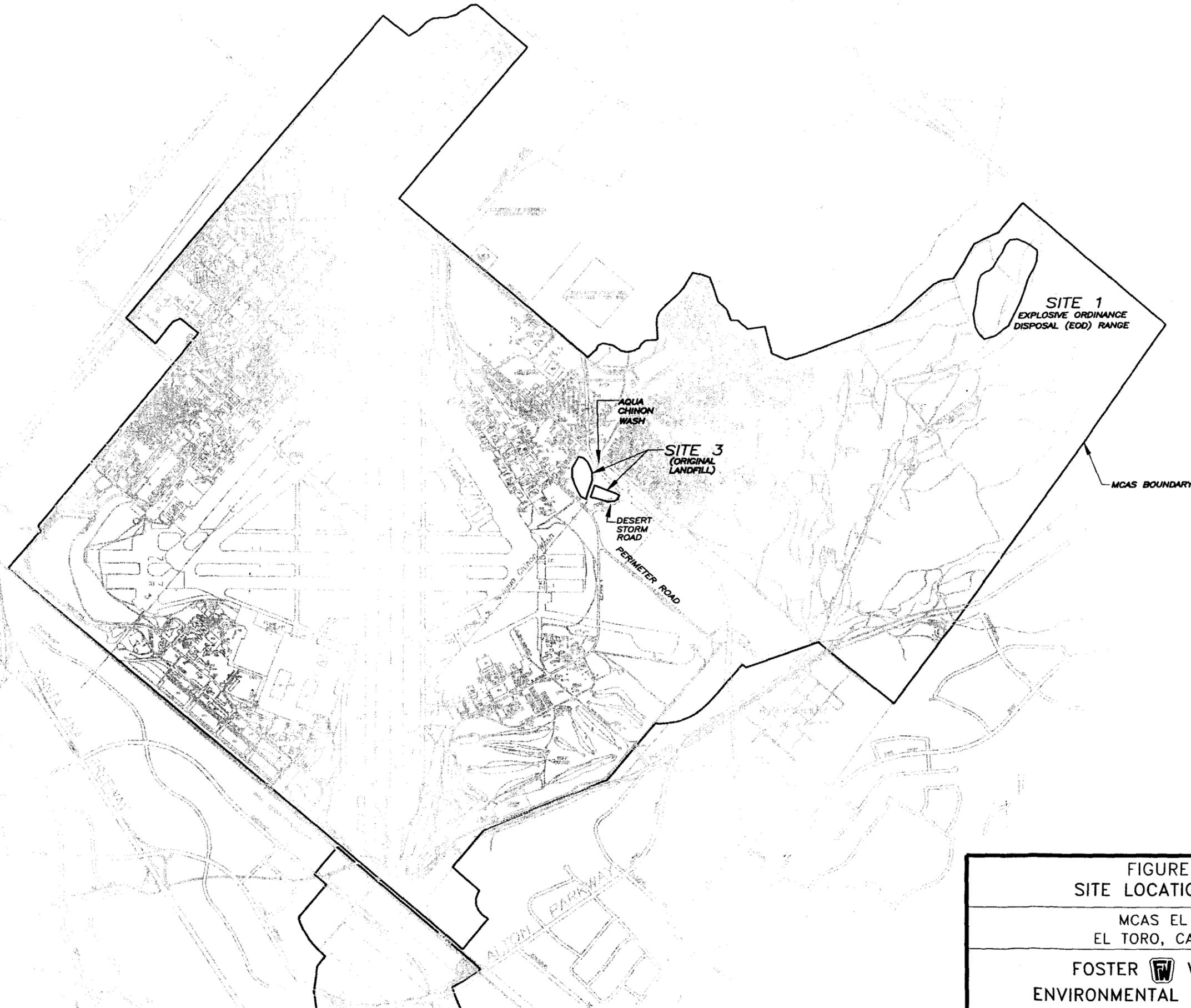
Figure 1  
MCAS EL TORO VICINITY MAP  
MCAS, EL TORO, CA

Southwest Division  
Naval Facilities Engineering Command

FOSTER  WHEELER  
ENVIRONMENTAL CORPORATION

DRAWN BY: MD	CHECKED BY: HH	APPROVED BY: HH	DCN: FWSD-RAC-01-0065	DRAWING NO: 01006502.dwg
DATE: 10/27/00	REV: REVISION 0		CTO #022	

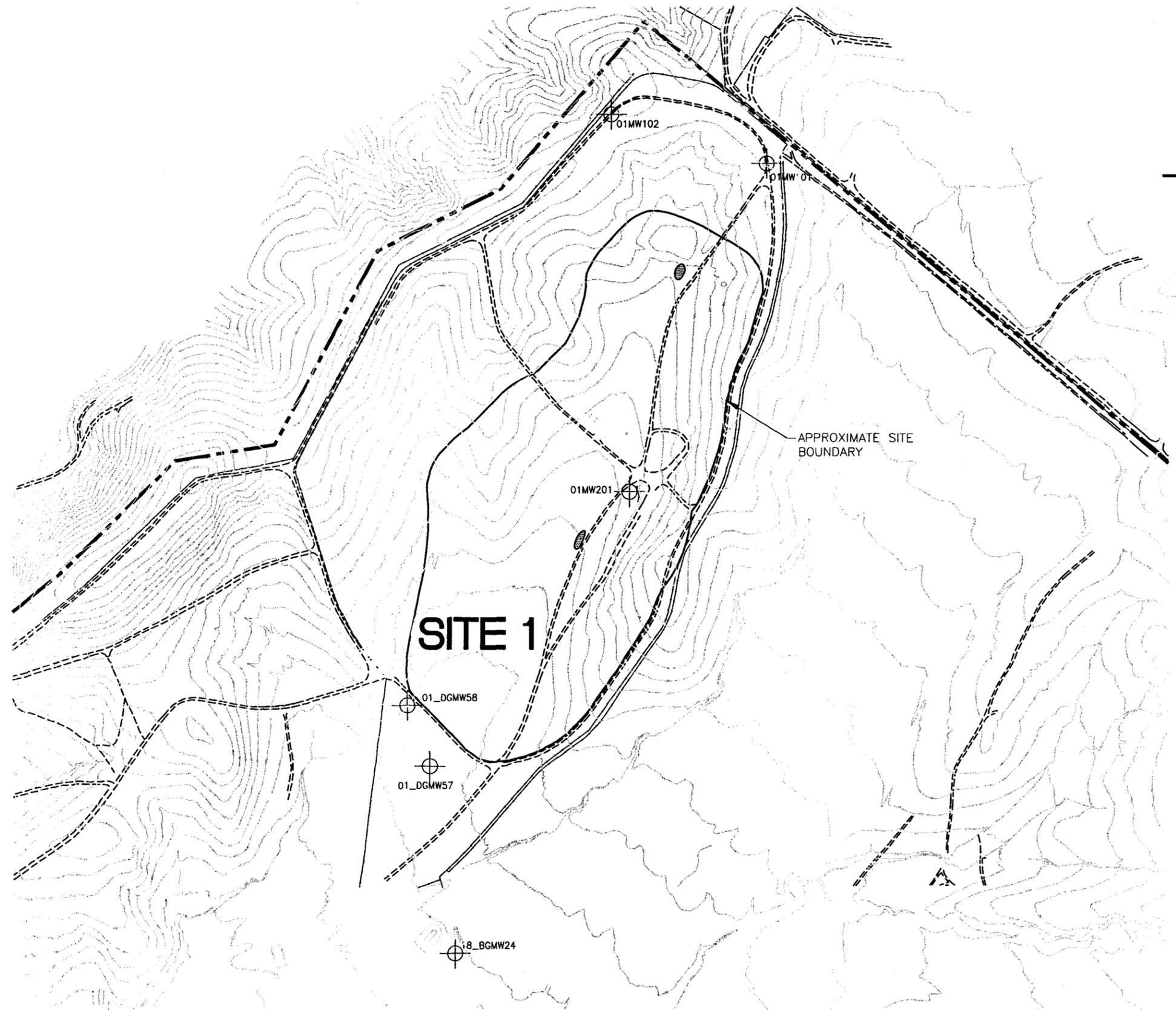
I:\1990-RAC\CTO-0022\DWG\010065\01006502.DWG  
 PLOT/UPDATE: OCT 19 2000 14:59:59



**FIGURE 2**  
**SITE LOCATION MAP**  
 MCAS EL TORO  
 EL TORO, CALIFORNIA  
 FOSTER  WHEELER  
 ENVIRONMENTAL CORPORATION

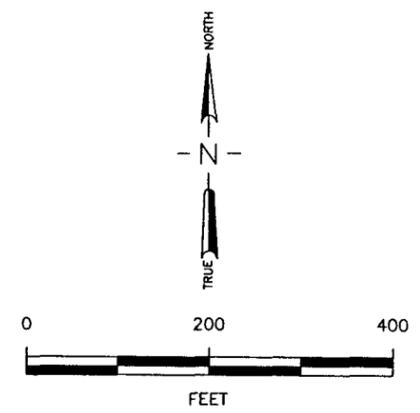
DRAWING NO: 01006503.dwg  
 DCN: FWSD-RAC-01-0065  
 CTO #022  
 APPROVED BY: HH  
 CHECKED BY: HH  
 REV: REVISION 0  
 DATE: 10/27/00

I:\1990-RAC\CTO-0022\DWG\010065\01006503.DWG  
 PLOT/UPDATE: DEC 14, 2000 15:08:33



**LEGEND**

- BUILDING
- UNIMPROVED ROADS
- FENCE
- ELEVATION CONTOURS (FEET ABOVE MEAN SEA LEVEL 10 FOOT INTERVAL)
- MCAS EL TORO BOUNDARY
- 01MW102 EXISTING GROUNDWATER MONITORING WELL
- APPROXIMATE AREAS OF SURFACE AND METALIC DEBRIS

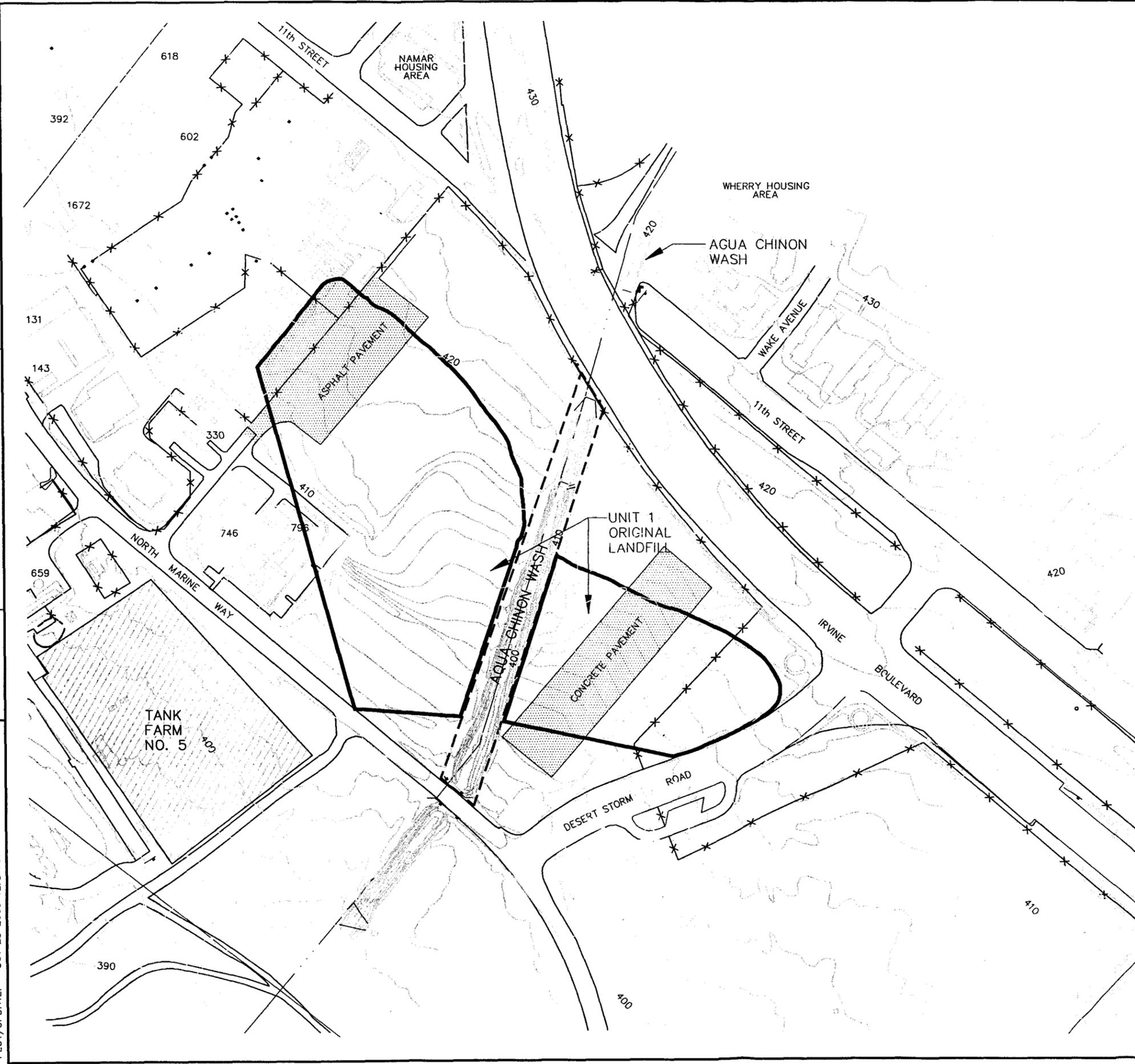


SOURCE : PRE-DESIGN INVESTIGATION-FINAL WORK PLAN  
 (EARTH-TECH, 2000a)

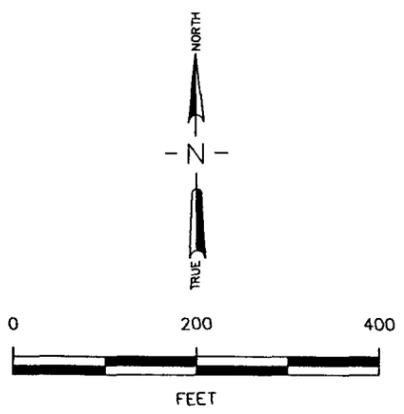
**FIGURE 3**  
**SITE PLAN & PROPOSED WASTE REMOVAL LOCATIONS**  
 SITE 1--EXPLOSIVE ORDNANCE RANGE DISPOSAL  
 MCAS, El Toro, California  
 FOSTER WHEELER  
 ENVIRONMENTAL CORPORATION

DRAWING NO: 01006504.dwg  
 DCN: FWS-D-RAC-01-0065  
 CTO #022  
 APPROVED BY: HH  
 CHECKED BY: HH  
 REV: REVISION 0  
 DRAWN BY: MD  
 DATE: 10/27/00

I:\1990-RAC\CTO-0022\DWG\010065\01006504.DWG  
 PLOT/UPDATE: OCT 23 2000 12:37:07



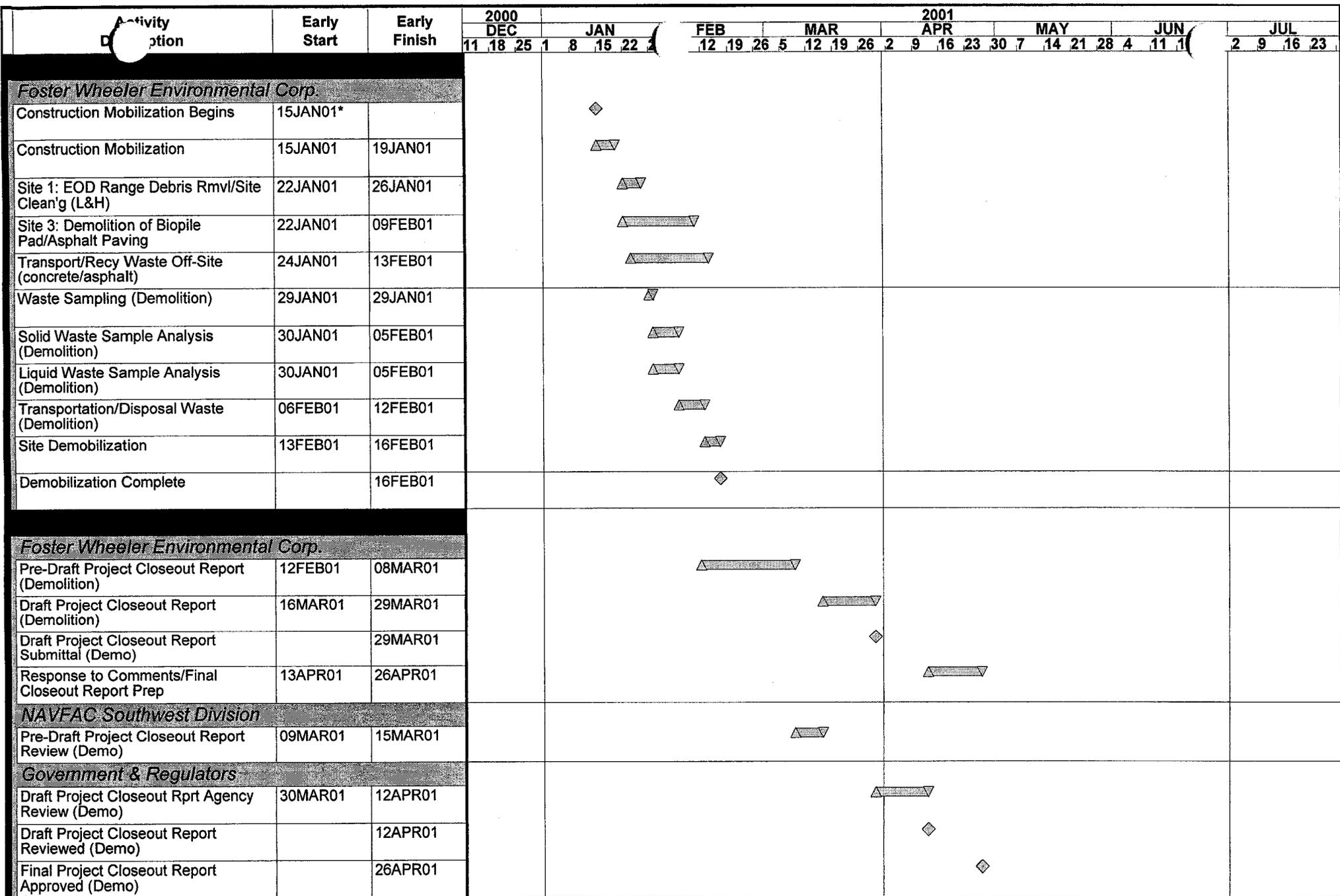
- LEGEND**
- BUILDING
  - IMPROVED ROADS
  - BOUNDARY OF NON-LANDFILLED UNITS OF THE SITE
  - \* \* FENCE
  - ELEVATION CONTOURS (FEET MEAN SEA LEVEL - 2 FOOT INTERVAL)
  - ESTIMATED LANDFILL BOUNDARY (BNI, 1997a)
  - PROPOSED ASPHALT PAVEMENT AND CONCRETE AREAS REQUIRING REMOVAL



PRIMARY MAP SOURCE: BNI, 1997a

**FIGURE 4**  
**SITE PLAN AND PAVEMENT DEMOLITION AREAS**  
 SITE 3-ORIGINAL LANDFILL  
 MCAS, El Toro, California

**FOSTER WHEELER**  
**ENVIRONMENTAL CORPORATION**



Start Date 20MAR00  
 Finish Date 15AUG01  
 Data Date 11DEC00  
 Run Date 19DEC00 16:19

▬ Early Bar  
 ▬ Progress Bar  
 ▬ Critical Activity

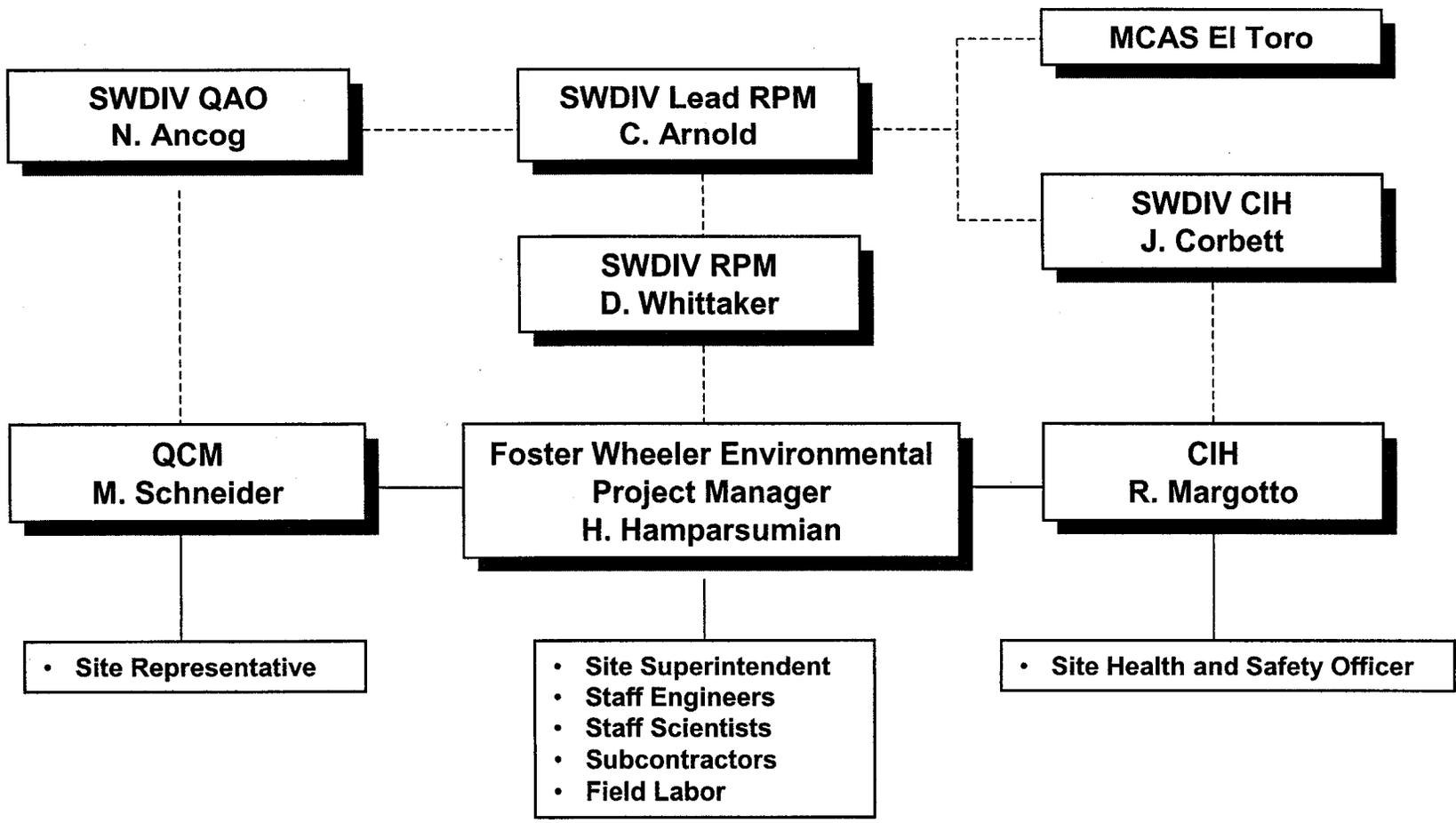
**Foster Wheeler Environmental Corp.**  
**Southwest Division Environmental RAC**  
**CTO 0022-Pre Design Activities, El Toro**

**Figure 5**  
**Project Schedule**



**Figure 6**

**Project Organization Chart**



Southwest Division  
Naval Facilities Engineering Command  
Contracts Department  
1220 Pacific Highway, Building 127, Room 112  
San Diego, California 92132-5190

CONTRACT NO. N68711-98-D-5713  
CTO No. 0022

**ATTACHMENT 1**  
**FINAL**  
**SITE-SPECIFIC HEALTH AND SAFETY PLAN**

**December 18, 2000**

**PAVEMENT DEMOLITION ACTIVITIES AT  
INSTALLATION RESTORATION SITE 3,  
AND METALLIC DEBRIS DISPOSAL FROM SITE 1  
MARINE CORPS AIR STATION  
EL TORO, CALIFORNIA**

**DCN: FWSD-RAC-01-0066**



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

1230 Columbia Street, Suite 640  
San Diego, CA 92101

*Roger M. Margotto*

\_\_\_\_\_  
Roger Margotto, CIH  
Program Health and Safety Manager

*Hamlet H. Hamparsumian*

\_\_\_\_\_  
Hamlet H. Hamparsumian  
Project Manager

# TABLE OF CONTENTS

	<u>PAGE</u>
LIST OF TABLES .....	iii
LIST OF FIGURES .....	iii
ABBREVIATIONS AND ACRONYMS .....	iv
1.0 INTRODUCTION .....	1-1
1.1 PURPOSE AND SCOPE .....	1-1
1.2 APPLICATION .....	1-1
1.3 SUMMARY OF MAJOR RISKS .....	1-1
2.0 ORGANIZATION OF THE PROJECT .....	2-1
3.0 SITE HISTORY AND PROJECT DESCRIPTION .....	3-1
3.1 SITE HISTORY .....	3-1
3.1.1 IRP Site 1 (Explosive Ordnance Disposal Range).....	3-1
3.1.2 IRP Site 3 (Original Landfill) .....	3-1
3.2 PROJECT DESCRIPTION .....	3-2
3.3 PROJECT DURATION .....	3-2
4.0 POTENTIAL HAZARDS.....	4-1
4.1 CHEMICAL HAZARDS .....	4-1
4.2 ENVIRONMENTAL HAZARDS .....	4-1
4.3 PHYSICAL HAZARDS.....	4-1
5.0 ACTIVITY HAZARD ANALYSIS .....	5-1
6.0 PERSONAL PROTECTIVE EQUIPMENT .....	6-1
7.0 AIR AND RADIATION MONITORING.....	7-1
7.1 DIRECT READING INSTRUMENTS.....	7-1
7.1.1 Photoionization Detector or Flame Ionization Detector .....	7-1
7.1.2 Explosimeter (LEL/O <sub>2</sub> ).....	7-1
7.1.3 Hydrogen Sulfide.....	7-1
7.1.4 Radiation Surveying.....	7-2
7.2 MONITORING STRATEGY .....	7-2
7.3 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC).....	7-3
7.3.1 Calibration and Maintenance Procedures .....	7-3
7.3.2 Documentation.....	7-3

**TABLE OF CONTENTS**  
(Continued)

	<u>PAGE</u>
8.0 SITE CONTROL .....	8-1
8.1 EXCLUSION ZONE.....	8-1
8.2 CONTAMINATION REDUCTION ZONE .....	8-1
8.2.1 Decontamination Procedures .....	8-1
8.2.2 Personnel Decontamination .....	8-1
8.3 SUPPORT ZONE.....	8-2
9.0 MEDICAL SURVEILLANCE PROCEDURES .....	9-1
10.0 SAFETY CONSIDERATIONS.....	10-1
11.0 DISPOSAL PROCEDURES .....	11-1
12.0 EMERGENCY RESPONSE PLAN .....	12-1
13.0 TRAINING .....	13-1
14.0 LOGS, REPORTS, AND RECORDKEEPING.....	14-1
15.0 FIELD PERSONNEL REVIEW.....	15-1
16.0 REFERENCES .....	16-1

**ATTACHMENTS**

- |              |                                  |
|--------------|----------------------------------|
| Attachment 1 | Material Safety Data Sheets      |
| Attachment 2 | Activity Hazard Analyses (AHAs)  |
| Attachment 3 | Forms                            |
| Attachment 4 | Site-Wide Health and Safety Plan |

## LIST OF TABLES

Table 1	Chemical Hazards Assessment
Table 2	Personal Protective Equipment
Table 3	Emergency Information

## LIST OF FIGURES

Figure 1	Vicinity Map
Figure 2	Site Location Map and Hospital Route
Figure 3	Site 1 – Site Plan and Emergency Assembly Areas
Figure 4	Site 3 – Site Plan and Emergency Assembly Areas

## ABBREVIATIONS AND ACRONYMS

AHA	activity hazard analysis
BTEX	benzene, toluene, ethylbenzene, xylenes
CIH	Certified Industrial Hygienist
CNS	central nervous system
cpm	counts per minute
CRC	contamination reduction corridor
CTO	Contract Task Order
dBA	decibels, A-scale
EHS	Environmental Health and Safety
EOD	explosives ordnance disposal
EPA	U.S. Environmental Protection Agency
ESS	environmental safety specialist
EZ	exclusion zone
FID	flame ionization detector
FWENC	Foster Wheeler Environmental Corporation
GFCI	ground fault circuit interrupters
GM	Geiger-Mueller
IRP	Installation Restoration Program
LEL	lower explosive limit
MCAS	Marine Corps Air Station
mg/m <sup>3</sup>	milligrams per cubic meter
MSDS	Material Safety Data Sheet
N/A	not applicable
NaI	sodium iodide
Navy	United States Navy
NTR	Navy Technical Representative
O <sub>2</sub>	oxygen
PAH	polynuclear aromatic hydrocarbons
PEL	permissible exposure limit
PESM	Project Environmental Health and Safety Manager
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride

## ABBREVIATIONS AND ACRONYMS

(Continued)

QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPM	Remedial Project Manager
SEC	Site Emergency Coordinator
SHSP	Site-Specific Health and Safety Plan
SHSS	Site Health and Safety Specialist
TLV	threshold limit value
UXO	unexploded ordnance
VOC	volatile organic compound

## **1.0 INTRODUCTION**

### **1.1 PURPOSE AND SCOPE**

This Site-Specific Health and Safety Plan (SHSP) applies to work to be performed under Contract N68711-98-D-5713 for Contract Task Order (CTO) No. 0022, Pre-Design Activities at Installation Restoration Program (IRP) Sites 3 and 5, and Waste Management Services at Other IRP Sites, Marine Corps Air Station (MCAS) El Toro, California.

### **1.2 APPLICATION**

This SHSP will be used with the MCAS El Toro Site-Wide Health and Safety Plan (Site-Wide Plan) [Foster Wheeler Environmental Corporation (FWENC), 1999] attached to this plan (Attachment 4) and is applicable to all work conducted by FWENC and its subcontractors under the basic contract and this CTO. Refer to the Site-Wide Plan for additional details common to all work performed at MCAS El Toro.

### **1.3 SUMMARY OF MAJOR RISKS**

The potential hazards associated with this project are associated with removal and handling of the debris/scrap metal, and miscellaneous debris located at Site 1 [Explosive Ordnance Disposal (EOD) Range], and the demolition of concrete and asphalt pads located at Site 3 (Original Landfill). Physical hazards include heavy equipment and the terrain in the designated work areas. There is potential exposure to contaminants associated with gasoline, jet fuel, and volatile organic compounds. There is also potential exposure to low-level radioactive material and unexploded ordnance (UXO).

## 2.0 ORGANIZATION OF THE PROJECT

This section identifies the individuals from the United States Navy (Navy), and FWENC who have responsibility for the oversight and/or implementation of this project. The following is a list of key contacts for individuals involved in the project:

### LIST OF POINTS OF CONTACT

Agency	Contact	Project Title
Southwest Division Naval Facilities Engineering Command 1230 Columbia Street, Suite 870 San Diego, CA 92101	Content Arnold (619) 532-0790	Lead Remedial Project Manager
Southwest Division Naval Facilities Engineering Command 1230 Columbia Street, Suite 870 San Diego, CA 92101	Don Whittaker (619) 532-0791	Remedial Project Manager
Southwest Division Naval Facilities Engineering Command 1230 Columbia Street, Suite 870 San Diego, CA 92101	G. Tinker (619) 532-0782	Contract Specialist
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92136-5198	Narciso A. Ancog (619) 532-2540	Quality Assurance Officer
Southwest Division Naval Facilities Engineering Command Marine Corps Air Station Building 368 El Toro, CA	Scott Kehe (949) 726-2506	MCAS El Toro Caretaker Site Office Engineer/ Representative
Foster Wheeler Environmental Corporation 1230 Columbia Street, Suite 640 San Diego, CA 92101	Neil Hart (619) 234-8696, ext. 211	Program Manager
Foster Wheeler Environmental Corporation Southwest Division RAC Site Trailer Gardeners Road and Industrial Road Naval Weapons Station Seal Beach 800 Seal Beach Boulevard Seal Beach, CA 90740	Jamshid Sadeghipour (562) 598-6150 ext. 5880	Deputy Program Manager

## LIST OF POINTS OF CONTACT

Agency	Contact	Project Title
Foster Wheeler Environmental Corporation 1940 E. Deere Ave. Suite 200 Santa Ana, CA 92705	Hamlet Hamparsumian (949) 756-7520	Project Manager
Foster Wheeler Environmental Corporation 1940 E. Deere Ave. Suite 200 Santa Ana, CA 92705	Abram Eloskof (949) 756-7521	Project Superintendent
Foster Wheeler Environmental Corporation 1230 Columbia Street, Suite 640 San Diego, CA 92101	Roger Margotto, CIH, CSP, CHHM (619) 234-8696, ext. 203	Project Environmental Health and Safety Manager
Foster Wheeler Environmental Corporation Southwest Division RAC Site Trailer Gardeners Road and Industrial Road Naval Weapons Station 800 Seal Beach Boulevard Seal Beach, CA 90740	Mary Schneider (562) 598-6150 ext. 5881	Project Chemist and Program Quality Control Manager
Foster Wheeler Environmental Corporation 1940 E. Deere Avenue, Suite 200 Santa Ana, CA 92705	Carl Jones (949) 756-7538	Site Health and Safety Specialist
Foster Wheeler Environmental Corporation 1230 Columbia Street, Suite 640 San Diego, CA 92101	Anthony Crino (619) 234-8696 ext. 203	UXO Safety Specialist

## **3.0 SITE HISTORY AND PROJECT DESCRIPTION**

The objectives of this project are to conduct pre-design activities at IRP Sites 1 (EOD Range) and 3 (Original Landfill). The activities at Site 1 involve collecting, loading, hauling, and off-site disposal of surficial debris/scrap metal. The activities at Site 3 include demolishing an asphalt pavement and a concrete bio-pile pad and hauling the demolition debris to an off-site recycling facility.

### **3.1 SITE HISTORY**

IRP Site 1 is located north of the main Station. The site is accessed from Magazine Road located to the north of Irvine Boulevard (see Figures 1 and 2). IRP Site 3 is within the Station and can be accessed from the Perimeter Road or the North Marine Way. A brief description and operational history of Sites 1 and 3 is presented below.

#### **3.1.1 IRP Site 1 (Explosive Ordnance Disposal Range)**

IRP Site 1 is the former EOD range and is located in the northeast corner of MCAS El Toro in the foothills of the Santa Ana Mountains. IRP Site 1 is situated within a tributary canyon of Borrego Canyon Wash at elevations ranging from approximately 610 to 760 feet above mean sea level. A site plan is provided on Figure 3. Training in the disposal and detonation of munitions began at IRP Site 1 in 1952 (Jacobs Engineering Group, Inc., 1993). Military ordnance used in training at the site has included hand grenades, land mines, cluster bombs, smoke bombs, and rocket warheads. Civilian and commercial explosives, such as trinitrotoluene, dynamite, and plastic and gelatinous explosives were also disposed at the EOD range. Munitions were detonated in trenches and pits that were continually filled with soil and re-excavated. In 1982, approximately 2,000 gallons of sulfur trioxide chlorosulfonic acid (FS smoke) were reportedly disposed in trenches located in the northern portion of the site and ruptured with small explosive charges. The site was also normally used for disposal of small munitions (i.e., flares and small ordnance). An estimated 300,000 gallons of petroleum fuels were used during training activities from 1952 through 1993 (Jacobs Engineering Group, Inc., 1993). In addition, there are unsubstantiated reports that ordnance with low-level radioactive material may have been used in certain ordnance training exercises at the site. Perchlorate was identified as a potential contaminant of concern at IRP Site 1 due to its use in explosives and propellants.

#### **3.1.2 IRP Site 3 (Original Landfill)**

Near the corner of Desert Storm Road (the former north gate for MCAS El Toro) and Irvine Boulevard, is located an asphalt paved area and concrete covered area which was used as a treatment bio-pile pad by other contractors at the Station. This unit is located within the fenced boundaries of MCAS El Toro and is designated as the Original Landfill (Site 3). Suspected wastes placed in the landfill and contaminants include metals, incinerator ash, solvents, paint

residues, hydraulic fluids, engine coolants, construction debris, oily wastes, municipal solid wastes, and various inert solid wastes. IRP Site 3 is shown on Figure 4.

### **3.2 PROJECT DESCRIPTION**

This project will have the following activities and tasks:

- Remove and demolish asphalt and concrete at IRP Site 3
- Remove objects and surficial metallic debris (IRP Site 1)

### **3.3 PROJECT DURATION**

This project is estimated to require up to 4 weeks of field activity.

## 4.0 POTENTIAL HAZARDS

The Site-Wide Plan identifies hazards that are common to all construction projects within MCAS El Toro. Station-specific hazards associated with this CTO are summarized below.

### 4.1 CHEMICAL HAZARDS

Previous site investigation studies show that the contaminants of concern are benzene, toluene, ethylbenzene, xylenes (BTEX); total petroleum hydrocarbon (gasoline); total petroleum hydrocarbon (diesel); arsenic; beryllium; Freon 113; tetrachloroethylene; trichloroethylene; 1,1-dichloroethene; and semivolatiles (most likely associated with diesel fuel). This SHSP has copies of Material Safety Data Sheets (MSDSs) for each contaminant (Attachment 1). Since the source of the BTEX is most likely gasoline, only the MSDS for gasoline is included to address the hazards associated with BTEX. The Site Health and Safety Specialist (SHSS) will also acquire MSDSs for other materials brought on to the site. The SHSS will ensure that all site personnel have received training on all of these chemicals. If materials other than those that are described above are encountered, the SHSS will contact the Project Environmental Health and Safety Manager (PESM) for additional guidance regarding these materials and the training and protection required. Table 1, Chemical Hazards Assessment, summarizes the chemical hazards at the project sites.

### 4.2 ENVIRONMENTAL HAZARDS

The project is to be performed in an outdoor area with weeds, grasses, shrubs, and trees. Workers may encounter poison oak, snakes, wild animals, bees, and other insects. During the summer months, workers in the area will likely experience higher temperatures. Heat stress procedures described in the Site-Wide Plan will be followed (Attachment 4). Workers in this area must take special precautions regarding exposure to the aforementioned hazards and other environmental hazards described in the Site-Wide Plan (Attachment 4).

### 4.3 PHYSICAL HAZARDS

The Site-Wide Plan identifies physical hazards associated with most projects at MCAS El Toro. This project requires work in an area that has uneven terrain with many unsafe slopes and eroded areas. There are numerous areas of debris. In some areas, debris that was placed in the landfill protrudes partially from the ground. Personnel must exercise care when walking through any area. Workers must wear boots with good traction soles.

Methane gas has been detected at the landfill site. However, the measurements were well below the explosive levels. It is possible that during the course of the concrete demolition and asphalt removal, a pocket of gas at explosive levels could be encountered. Therefore, methane gas monitoring of these areas is required at the time of the first intrusion into these covers. The SHSS

will inspect the area to insure there are no overhead power lines that will interfere with the planned operations. Underground Service Alert will be notified prior to any disturbance of the asphalt and concrete at Site 3.

An objective of this project is to support a radiological survey to be performed later by others. Since low-level radioactive materials are anticipated, use of a radiation survey meter during the removal of debris at Site 1 is required. This monitoring will be performed by the SHSS.

Site 1 may have UXO. Although the area has been pre-screened by military EOD personnel and another Navy subcontractor, FWENC personnel must be aware of the potential for UXO; and, if at any time they observe suspicious debris or objects, they will stop work and call EOD. The project will use the services of a FWENC UXO Supervisor/explosive safety specialist (ESS), and a UXO Technician II as an additional safety resource during the work at IRP Site 1 where there is a potential for finding UXO.

The EOD Range (Site 1) was in operation during the years when the military utilized Ra-226 and Sr-90 in the instruments and luminescent markers, and radioisotopes, such as Co-60 and Th-232, in magnetron electronic tubes associated with aircraft. Consequently, these isotopes are the targets of the screening efforts for this project. Therefore, every piece of debris/scrap metal will also be checked and screened for radiation. All material hauled off-site must be certified that it is not UXO or low-level radioactive material.

## **5.0 ACTIVITY HAZARD ANALYSIS**

The activity hazard analysis (AHA) for this project are included as Attachment 2. The SHSS will modify these AHAs as appropriate, add new AHAs for any changes in tasks, and ensure that all employees who perform the tasks receive a briefing on the appropriate AHA. The SHSS will forward any modified or new AHAs to the PESM for review and approval.

## 6.0 PERSONAL PROTECTIVE EQUIPMENT

Table 2, Personal Protective Equipment, lists the personal protective equipment (PPE) required for each task on this project. This table is prepared based on data provided prior to the start of the project. As additional testing, monitoring, and background information become available, the SHSS may adjust the action levels and PPE accordingly. Any changes to PPE require approval by the PESM. PPE levels were selected based on the presumption that there are low-level contaminants associated with organic vapors and metals.

## 7.0 AIR AND RADIATION MONITORING

Ambient air monitoring will be conducted during demolition and debris removal activities in order to determine airborne contamination levels. Personal air sampling is not planned at this time. The SHSS will contact the PESM if conditions change from those now anticipated.

### 7.1 DIRECT READING INSTRUMENTS

#### 7.1.1 Photoionization Detector or Flame Ionization Detector

A photoionization detector (PID) or flame ionization detector (FID) will be used to determine the presence and concentration of organic vapors.

- Instrument:** PID 10.2 eV or 10.6 eV probe; or FID  
**Action Level:** 10 parts per million (ppm) in breathing zone  
**Action:** Level C respiratory protection and notify PESM.

#### 7.1.2 Explosimeter (LEL/O<sub>2</sub>)

A Gastech Model 1314 or MSA Model 260 explosimeter or equivalent may be used to screen for the presence of flammable vapors, oxygen (O<sub>2</sub>)-deficient atmosphere, and O<sub>2</sub>-enriched atmosphere. If flammable vapors are at 10 percent lower explosive limit (LEL) or greater, work will cease and the area allowed to ventilate. If O<sub>2</sub> levels below 20.8 percent or above 22 percent are encountered, personnel will leave the area and the area will be ventilated.

- Instrument:** Gastech Model 1314 or MSA Model 260 or equivalent  
**Action Level:** 10 percent  $\geq$  LEL, <20.8 percent O<sub>2</sub> or >22 percent O<sub>2</sub>  
**Action:** Stop work, allow area to ventilate and notify PESM.

#### 7.1.3 Hydrogen Sulfide

Either a hydrogen sulfide sensor will be part of the explosimeter (a three or more sensor instrument) or a separate hydrogen sulfide direct reading instrument will be used for monitoring hydrogen sulfide levels in the work area, especially near exhaust vents.

Action Level =  $\frac{1}{2}$  Threshold Limit Value

- Instrument:** Hydrogen sulfide detector (either in combination with LEL/O<sub>2</sub> meter or as a separate instrument)  
**Action Level:** 5 ppm. At no time can level exceed 20 ppm.  
**Action:** Stop work, ventilate or wear supplied air respirator and notify PESM.

#### 7.1.4 Radiation Surveying

In order to minimize employee exposure to radiation, a radiological screening of all debris/scrap metal and miscellaneous debris will be performed during Site 1 activities. An Eberline SPA-3 sodium iodide (NaI) and an Eberline HP-260 pancake Geiger-Mueller (GM) Detector or equivalent will be used for radiological screening.

**Instrument:** Eberline SPA-3 NaI, and Eberline HP-260 pancake GM

**Action Level:** 1.5 times background

**Action:** Leave area, and contact PESM.

Additional instruments and action levels are described below.

#### 7.2 MONITORING STRATEGY

Background levels will be measured with the PID or FID before any work commences. Monitoring of the demolition of the concrete and asphalt will begin by taking background readings; and taking reading at least every 15 minutes to verify that no organic vapors are present. The PID/FID will also be used wherever odors are detected and will continue to be used until odors can no longer be detected and organic vapor levels are below 5 ppm. The SHSS, in consultation with the PESM and with concurrence of the Navy Technical Representative (NTR), will determine if further actions and/or measurements are warranted to prevent or minimize exposure of personnel. If organic vapors are detected in the work zone, the SHSS will also monitor the perimeter of the work area to ascertain that the levels of organic vapors will not impact personnel outside of the work area. If these levels exceed 1 ppm, the SHSS will consult with the PESM and the NTR for proper course of action. It is essential that odors and measurable levels of organic vapors be limited to the exclusion zone. The combustible gas meter will be used upon initial breaking of the concrete or asphalt and whenever using a concrete saw (if a saw is used) to insure that no unexpected pockets of methane gas are encountered. Methane gas has no odor, so it is possible for flammable gases to be present even when there is little or no odor.

Similarly, the radiation survey meter will be used whenever picking up or moving objects or debris (i.e. UXO). The objects, debris, or any attached soil will be surveyed as close as possible (within a few inches) using the survey meter probe. Since the scope of this project is not to identify or remove any radioactive items or soil, the use of the radiation survey meter is for employee protection only, to verify that employees are not being exposed to radioactive materials and that no radioactive debris is removed from the site. If the action level (1.5x background) with the Eberline SPA-3 detector, or the HP-260 GM detector occurs, personnel and equipment that had the potential to come in contact with radioactive material will be surveyed with an Eberline HP-260 GM as required by FWENC procedure RP 3-33, Contamination Surveys. The action level for the HP-260 is 100 counts per minute (cpm) above background.

The SHSS will use the hydrogen sulfide detector in the same manner as the PID using the action levels established for hydrogen sulfide.

### **7.3 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)**

Adherence to a proper quality assurance/quality control (QA/QC) plan is essential for a meaningful air sampling effort. The major concerns of a QA/QC plan are calibration of equipment and document control.

#### **7.3.1 Calibration and Maintenance Procedures**

The PID or the FID will be calibrated daily, or before and after each use. Calibration records will be kept detailing date, time, span gas or other standard, and the name of the person performing the calibration. The calibration gas for the PID is usually isobutylene. The calibration gas for the FID is benzene. The SHSS will ensure that the instrument is kept clean and will follow manufacturer's directions for keeping the lamp clean. The SHSS will perform no other maintenance procedures unless approved by the PESM.

The calibration gas for the LEL is usually a methane/air or a hexane/air mixture. O<sub>2</sub> is calibrated against normal air in a clean environment. A low-O<sub>2</sub> calibration gas can be used for calibrating the response of the O<sub>2</sub> sensor. Often, 100 percent nitrogen is used to "zero" the O<sub>2</sub> sensor. For purposes of this plan, calibration of the explosimeter means a daily field check with known calibration gases. The reading on the instrument must be within 3 percent of the stated value of the gas. If it is not, then formal calibration of the instrument must follow the manufacturer's calibration procedure.

The calibration gas for the hydrogen sulfide detector is a hydrogen sulfide gas of known concentration.

A check source will be provided for the radiological survey instruments. A daily source check is required prior to use each day as described in FWENC procedure RP 3-37, Portable Radiation Detection Instrumentation Operational Checks. The instrument calibration is valid for one year from the last calibration date.

#### **7.3.2 Documentation**

Strict adherence to document and data control procedures is essential for good QA/QC. Data and calibration records must be accounted for and retrievable all times. Types of documents that are essential include notes, logbooks, maps, data sheets, and reports. Forms required for this CTO are presented in Attachment 3. These must be placed in the project files. Copies of all field data reports and personal sampling records will be sent to the PESM for review.

## 8.0 SITE CONTROL

Site control requires the establishment of a regulated area and designated site work zones. To minimize the transfer of potentially hazardous substances from the site, project personnel will:

- Schedule operations that utilize minimum numbers of personnel
- Establish site work zones around each work site location
- Implement appropriate decontamination procedures

### 8.1 EXCLUSION ZONE

The exclusion zone (EZ) for this project is the areas at Site 1 where debris is removed and the areas at Site 3 where the asphalt and concrete are demolished. Barricades or cones will delineate the EZ. It should be noted that barricades would be required for any opening in the ground that is left unattended. Workers will place contaminated tools, if any, and equipment on plastic sheeting in this zone to prevent contamination of the surrounding area.

### 8.2 CONTAMINATION REDUCTION ZONE

In very close proximity to the EZ, workers will wrap any contaminated tools and equipment with plastic when preparing to leave the area. Workers will decontaminate the equipment and themselves in this area before moving to the next work area if there are any contaminants in the next area.

#### 8.2.1 Decontamination Procedures

The equipment, such as excavator or backhoe bucket, and other equipment that has come in contact with potentially contaminated soil or debris, will be either brushed off and wiped clean or washed with water and a cleaning solution. If radiological sources are detected, equipment that had the potential to come into contact with radioactive materials will be surveyed with an Eberline HP-260 GM (RP-3-33, Contamination Surveys). The action level for the HP-260 is 100 cpm above background.

#### 8.2.2 Personnel Decontamination

Before leaving the work areas, each worker will brush off work boots and remove any PPE that has been contaminated by coming in contact with the soil or groundwater. Brushing off should be done over a sheet of plastic to collect any contaminated soil. The plastic sheet and PPE will be wrapped up and placed in a plastic bag for subsequent disposal in a collection container, such as a 55-gallon disposal drum. Personnel will wash hands before leaving the area.

If radiological sources or contamination are detected, personnel that had the potential to come into contact with radioactive materials will be surveyed with an Eberline HP-260 GM (RP-3-33, Contamination Surveys). The action level for the HP-260 is 100 cpm above background.

### **8.3 SUPPORT ZONE**

The support zone will be arranged considering accessibility, utility availability, wind direction, and line-of-sight to work. Included in this area will be the vehicle parking, toilets, water, and a break/lunch area. Access to toilets and hand-washing facilities are also required in the vicinity of the work areas.

## **9.0 MEDICAL SURVEILLANCE PROCEDURES**

There are no additional medical surveillance procedures for this project at this time.

## 10.0 SAFETY CONSIDERATIONS

For safety considerations, refer to the Site-Wide Plan. In addition, these guidelines should be adhered to:

- Ensure that telephone communications function.
- Workers will work in sight of each other. If it is necessary for workers to work out of sight of each other, the buddy system will be used and each team will have a means of communicating with a team that has a telephone (i.e., either each team has a telephone or at least one team has a phone and other teams can communicate by radio with the team that has the telephone).
- Each work team will have an air horn to be used to summon help.
- All workers must comply with the FWENC Project Rules Handbook, Volume I and Volume II. Refer to the Site-Wide Plan for other rules.
- Workers are reminded to wear seat belts in all vehicles.
- Workers will wear reflective safety vests at all times when working in the area so that they are readily visible to other workers.
- Dig-Alert will be called before demolition of the concrete and asphalt begins.
- Ensure that the area is clear of personnel other than FWENC personnel and subcontractors. Ensure that organic vapors do not impact areas beyond the work area, otherwise notify the Project Manager and the PESM to determine whether the area should be evacuated.
- Use care when driving vehicles in and around the landfill where there are no obvious trails or roads. Be aware of what is ahead of you as the path you are on could drop off sharply with little to no warning.

## **11.0 DISPOSAL PROCEDURES**

Refer to the Site-Wide Plan (Attachment 4) for general guidelines and to the Waste Management (Section 5.0 of the Work Plan) for details on the types of waste streams to be generated and the appropriate methods for packaging and disposal.

## 12.0 EMERGENCY RESPONSE PLAN

Refer to the Site-Wide Plan (Attachment 4) for emergency response activities. Telephone service must be available at all times during the project. Figure 2 shows the route to the nearest civilian clinic and hospital. Figures 3 and 4 show the location of the evacuation assembly areas and the sites. Table 3 is the list of emergency contacts and phone numbers. Both Figure 2 and Table 3 must be placed on the dashboard of each vehicle and posted in the project office. The evacuation assembly area for the work area will be posted with a sign so that all personnel can identify the meeting point.

The Site-Wide Plan does not describe emergency response to an UXO incident. This project will have at least four workers who have experience with UXO. Two of these workers will be FWENC UXO Technicians. The Foster Wheeler UXO Supervisor/ESS will be in overall charge of any operations involving the handling or certification of UXO where Foster Wheeler employees are working, with the exception of UXO disposal operations that will be under the sole control of USMC EOD. The others include an EOD team member and a UXO specialist from Earth Technology, Inc.. If UXO should detonate, all personnel will stay away from the work areas. The UXO Supervisor/ESS will act as the Site Emergency Coordinator for any incident/accidents involving UXO.

During operations at Site 1 a minimum of two UXO personnel will be on-site at all times. In the event of an explosion during operations at Site 1, the Site Emergency Coordinator (SEC) will immediately activate the emergency response plan. Emergency assistance will be requested from medical and EOD. The SEC will direct any unaffected UXO Technician to report to the scene to provide immediate first aid and to determine if any additional explosive hazards exist. UXO personnel will provide a clear path of explosive hazards for emergency support to render assistance to the victims. Under no circumstance should personnel proceed to the detonation site without UXO escort.

## 13.0 TRAINING

All personnel will receive training in recognition of explosive ordnance and basic radiation-awareness training. Other required training is discussed in the Site-Wide Plan (Attachment 4).

## 14.0 LOGS, REPORTS, AND RECORDKEEPING

Refer to the Site-Wide Plan for requirements.

## **15.0 FIELD PERSONNEL REVIEW**

All personnel are required to review the Site-Wide Plan and this SHSP. Upon completion of their review, all project personnel will sign the SHSP review form.

## 16.0 REFERENCES

- Earth Technology, Inc. 2000. Final Health and Safety Plan, Pre-Design Investigation for Remedial Design IRP Site 2-Magazine Road Landfill, IRP Site 17-Communications Station Landfill, Marine Corps Air Station El Toro, California. Honolulu, Hawaii. March.
- Foster Wheeler Environmental Corporation. 1999. Site-Wide Health and Safety Plan, Geotechnical Evaluation of Borrow Sources for Landfill Covers, Marine Corps Air Station El Toro, California. May.
- Jacobs Engineering Group, Inc. 1993. Marine Corps Air Station El Toro: Installation Restoration Program Final RCRA Facility assessment.

## TABLES

**TABLE 1**  
**CHEMICAL HAZARDS ASSESSMENT**

<b>Chemical Name</b>	<b>PEL/TLV</b>	<b>Routes of Exposure</b>	<b>Symptoms of Exposure</b>	<b>Target Organs</b>
PAHs, coal tar pitch volatiles (chrysene, pyrene, phenanthrene etc.) from residuals of diesel fuel	PEL - 0.2 mg/m <sup>3</sup> TLV - 0.2 mg/m <sup>3</sup>	Inhalation, ingestion, contact	Acute: Skin contact may cause irritation, redness, burning, itching, dermatitis, burns. Photosensitization may occur (rash worsens with exposure to sunlight). Inhalation causes irritation to respiratory tract. Eye contact may cause conjunctivitis, keratitis, or corneal burns. Ingestion may result in nausea, vomiting, abdominal pain, respiratory distress, and shock. Exposure to large doses especially by ingestion may be fatal.  Chronic: Dermatitis, skin cancer, lung cancer.	Respiratory system, skin, bladder, kidneys (lung, kidney, and skin cancer)
Gasoline	PEL – none established TLV – 300 ppm	Skin absorption, inhalation, ingestion	Acute: Nose, throat, lung irritation; headaches; blurred vision; vomiting; dizziness; fever; slurred speech; unconsciousness.  Chronic: Appetite loss, nausea, weight loss, insomnia, sensitivity in digital extremities.	Skin, eye, respiratory, and CNS
Perchloroethylene	PEL – 100 ppm TLV – 25 ppm	Skin absorption, inhalation, ingestion	Acute: Liver damage, irritation of eyes and throat, CNS depression, headache, somnolence. Skin contact can cause dermatitis.  Chronic: Impaired memory, peripheral neuropathies, muscle cramps, liver damage, and kidney damage.	Liver, kidney, eyes
Trichloroethene	PEL – 100 ppm TLV – 50 ppm	Skin absorption, inhalation, ingestion	Acute: Eye, nose, throat irritation; nausea; headache; drunkenness; memory loss; irregular heartbeat; unconsciousness; death due to cardiac failure. Skin contact can cause dermatitis.  Chronic: Giddiness, irritability, headache, digestive disturbances, mental confusion, intolerance to alcohol, loss of smell, peripheral nervous system function impairment. Direct contact with liquid can cause temporary paralysis of fingers.	Respiratory, central, and peripheral nervous system; cardiovascular system; skin; heart; liver; and kidney
Diesel Fuel	PEL – none established TLV – none established	Skin contact, inhalation, ingestion	Acute: Eye irritation, skin irritation, nose/throat/lung irritation, nausea, vomiting, diarrhea, restlessness, drowsiness, and loss of coordination.  Chronic: Repeated contact with skin causes dermatitis.	Skin, CNS, respiratory system
1,1-dichloroethene (vinylidene chloride)	PEL – none TLV – 5 ppm	Inhalation	Acute: Narcosis and respiratory irritation.  Chronic: Hepatic and renal dysfunction. Kidney damage and death.	Skin, eyes, CNS, liver, kidneys

**TABLE 1**  
**CHEMICAL HAZARDS ASSESSMENT**

Chemical Name	PEL/TLV	Routes of Exposure	Symptoms of Exposure	Target Organs
Trichloro-trifluoroethane (Freon 113)	PEL – 1,000 ppm TLV – 1000 ppm	Inhalation, skin or eye contact, ingestion	Acute – Eye, nose, throat irritation; headache; drowsiness. High concentrations cause shortness of breath, pulmonary edema, irregular heart beat, unconsciousness, and death.  Chronic: Defatting of skin and dermatitis, light headedness, weakness, and pain (especially in legs).	Skin, CNS, cardiovascular system
Arsenic	PEL – 0.01 mg/m <sup>3</sup> TLV – 0.01 mg/m <sup>3</sup>	Skin contact, inhalation, ingestion	Human carcinogen.  Acute: Arsine gas is toxic. Otherwise, compounds of arsenic cause irritation of respiratory passages; ingestion causes metallic or garlic taste, thirst, vomiting, abdominal pain.  Chronic: Weight loss, hair loss, nausea, diarrhea, skin eruptions, neuritis, leukemia, aplastic anemia.	Liver, kidneys, skin, lungs, lymphatic system
Beryllium	PEL– 0.002 mg/m <sup>3</sup> TLV – 0.002 mg/m <sup>3</sup> Ceiling – 0.005 mg/m <sup>3</sup> 30-minute peak – 0.025 mg/m <sup>3</sup>	Inhalation	Human carcinogen.  Acute: respiratory distress, heart failure, and death. Conjunctivitis.  Chronic: Berylliosis; hacking cough; shortness of breath; chest pain; fatigue; weight loss; systemic diseases of the lymph nodes, liver, bone, and kidneys.	Eyes, respiratory system
Hydrogen Sulfide	PEL – Ceiling 20 ppm TLV – 10 ppm	Inhalation contact	Acute: Dizziness, headache, nausea, sore throat, sneezing, drowsiness, vomiting, cramps, diarrhea, excitability, pale complexion, dry cough. Prolonged exposure to 50 ppm can cause rhinitis, bronchitis, pharyngitis, and pneumonia. High levels leads to pulmonary edema, asphyxia, tremors, convulsions, unconsciousness, and death. Eye exposure causes keratoconjunctivitis.  Chronic: Not well established.	Eyes, respiratory, CNS

**Notes:**

PAH – polynuclear aromatic hydrocarbons

PEL – permissible exposure limit

TLV – Threshold Limit Value

mg/m<sup>3</sup> – milligrams per cubic meter

ppm – parts per million

CNS – central nervous system

**TABLE 2**  
**PERSONAL PROTECTIVE EQUIPMENT**

<b>Task</b>	<b>USEPA Level</b>	<b>Respiratory Protection</b>	<b>Head</b>	<b>Hand</b>	<b>Clothing</b>	<b>Boots</b>	<b>Face</b>	<b>Eye</b>	<b>Hearing</b>	<b>Additional</b>
Site setup, surveys	D	None required, unless dust exceeds action level	Hard Hat	Leather work gloves, as needed	Work uniform or Tyvek® coveralls to keep clean	Steel toe, leather	N/A	Safety glasses	Protection when noise levels exceed 84 dBA	Fall protection for work above 6-foot level or near edges of excavation. Reflective safety vests.
Sampling: soil, refuse, liquid. ( <i>Note: plan does not allow sampling of waste in containers</i> )	C mod	None required unless PID/FID levels exceed action level	Hard Hat	Nitrile inner gloves, Silver Shield® or equivalent gloves, leather work gloves over	Poethylene Tyvek® coveralls to keep clean	Steel toe, leather with PVC boot covers or PVC steel toe boots	N/A	Safety glasses	Protection when noise levels exceed 84 dBA	Reflective safety vests.
Removing debris	D	None required, unless dust exceeds action level	Hard Hat	Leather work gloves or puncture/cut resistant gloves	Work uniform or Tyvek® coveralls to keep clean	Steel toe, leather	N/A	Safety glasses	Protection when noise levels exceed 84 dBA	Fall protection for work above 6-foot level or near edges of excavation. Reflective safety vests.
Demolition and loading of debris onto trucks	D	None required, unless dust exceeds action level	Hard hat	Leather work gloves, as needed	Work uniform or Tyvek® coveralls to keep clean	Steel toe, leather	N/A	Safety glasses	Hearing protection required around heavy equipment unless noise levels are less than 84 dBA	Reflective safety vests.

**TABLE 2**  
**PERSONAL PROTECTIVE EQUIPMENT**

<b>Task</b>	<b>USEPA Level</b>	<b>Respiratory Protection</b>	<b>Head</b>	<b>Hand</b>	<b>Clothing</b>	<b>Boots</b>	<b>Face</b>	<b>Eye</b>	<b>Hearing</b>	<b>Additional</b>
Grading, site restoration	D	None required, unless dust exceeds action level	Hard hat	Leather work gloves, as needed	Work uniform or Tyvek® coveralls to keep clean	Steel toe, leather	N/A	Safety glasses	Protection when noise levels exceed 84 dBA	

**Notes:**

dBA – decibels, A-scale

USEPA – U.S. Environmental Protection Agency

FID – flame ionization detector

N/A – not applicable

PID – photoionization detector

PVC – polyvinyl chloride

**TABLE 3**  
**EMERGENCY INFORMATION**

**REPORT ALL FIRES, SERIOUS INJURY, OR UNCONTROLLED SPILLS  
IMMEDIATELY: 911**

<b>Hospital:</b>	Irvine Medical Center 16200 Sand Canyon Avenue Irvine, California (949) 753-2000 (949) 753-2250 (24-hour emergency)		
<b>Directions:</b>	Exit the job site toward Irvine Boulevard, turn right onto Irvine Boulevard to reach Sand Canyon Avenue. Turn left at Sand Canyon Avenue, continue west on Sand Canyon Avenue under Interstate 5 to Alton Parkway. The hospital is located on the corner to your left.		
<b>Fire/Police/EMS:</b>	911		
<b>Foster Wheeler Environmental Contacts:</b>	Project Manager Hamlet Hamparsumian office (949) 756-7520 cell (805) 501-0267	Project PESM (CIH) Roger Margotto (619) 234-8696 x203 pager (714) 810-3742	Project SHSS Carl Jones office (949) 756-7538 pager (714) 354-0290
<b>Lead RPM:</b>	Content Arnold (619) 532-0790		
<b>RPM:</b>	Don Whittaker (619) 532-0791		
<b>Regional Poison Control Center:</b>	(800) 764-7661 (all California)		
<b>CHEMTREC:</b>	(800) 424-9300		
<b>National Response Center:</b>	(800) 424-8802		
<b>RCRA Hotline:</b>	(800) 424-9346		

**Notes:**

PESM – Project Environmental Health and Safety Manager

CIH – Certified Industrial Hygienist

RPM – Remedial Project Manager

SHSS – Site Health and Safety Specialist

RCRA – Resource Conservation and Recovery Act

## FIGURES

DRAWING NO: 01006601.DWG  
 DCN: FWSD-RAC-01-0066  
 CTO #022  
 APPROVED BY: HH  
 CHECKED BY: HH  
 REV: REVISION 0  
 DRAWN BY: MD  
 DATE: 10/27/00

I:\1990-RAC\CTO-0022\DWG\010066\01006601.DWG  
 PLOT/UPDATE: OCT 19 2000 15:26:59

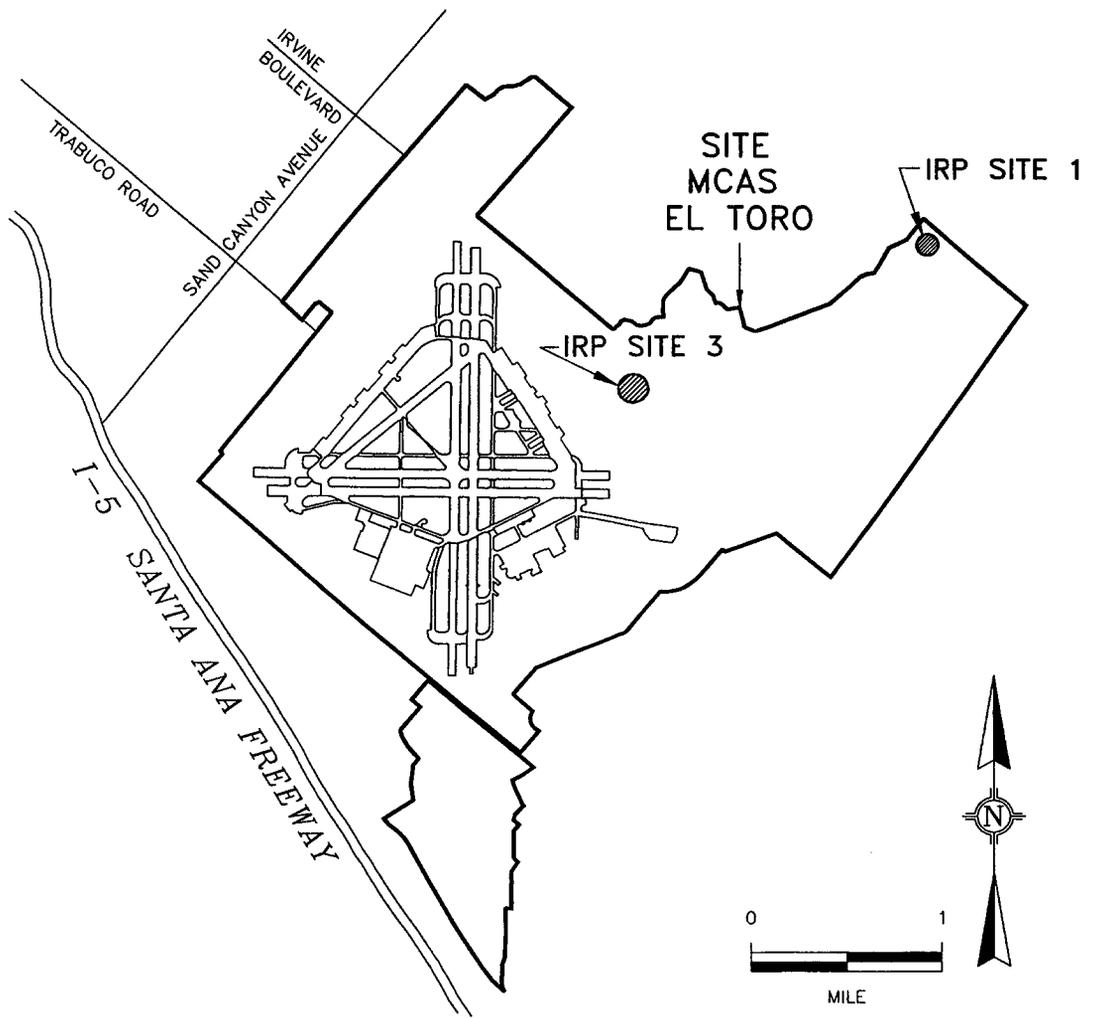
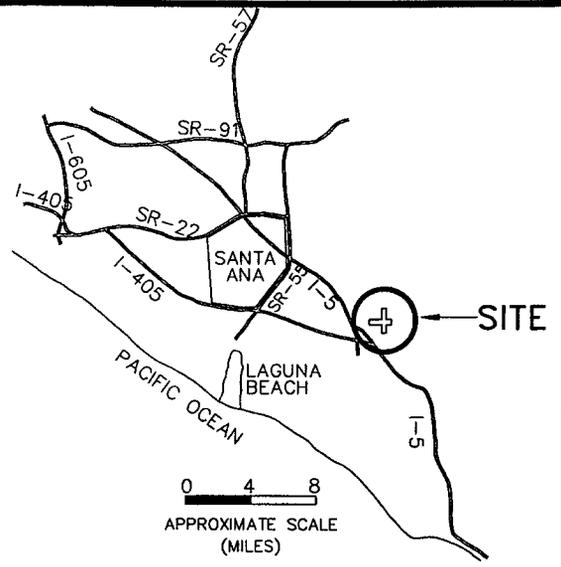
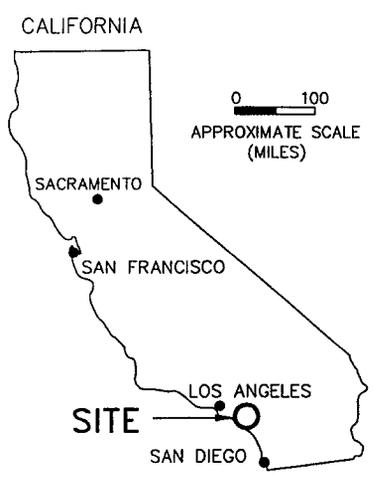
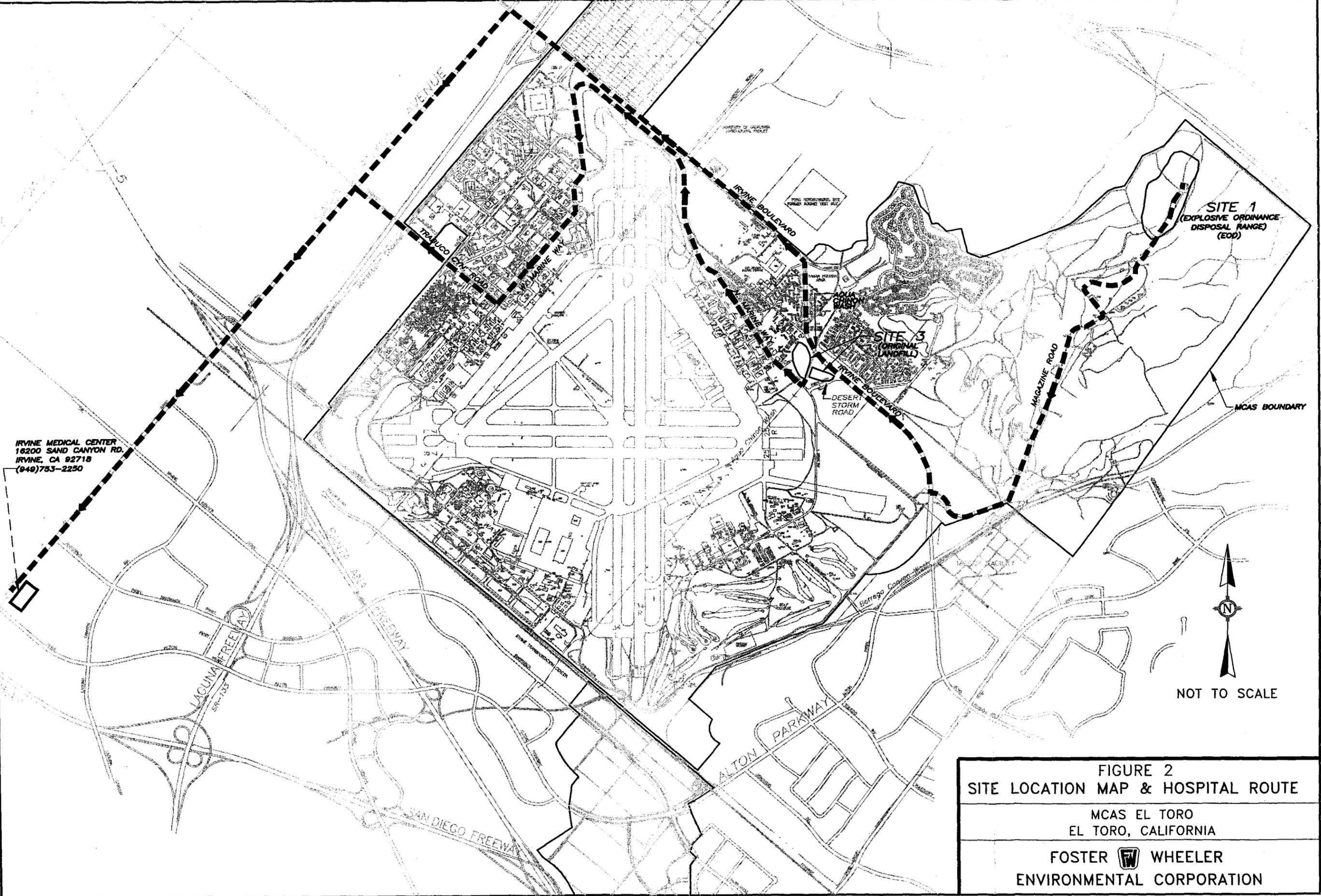


Figure 1  
 MCAS EL TORO VICINITY MAP  
 MCAS, EL TORO, CA  
 Southwest Division  
 Naval Facilities Engineering Command  
 FOSTER  WHEELER  
 ENVIRONMENTAL CORPORATION

DRAWING NO: 01006602.dwg  
 DCN: FWSO-RAC-01-0066  
 CTO #022  
 APPROVED BY: HH  
 CHECKED BY: HH  
 REVISION 0  
 DRAWN BY: MD  
 DATE: 10/27/00

I:\1990-RAC\CTO-0022\DWG\010066\01006602.DWG  
 PLOT/UPDATE: OCT 23 2000 12:42:21



NOT TO SCALE

**FIGURE 2**  
**SITE LOCATION MAP & HOSPITAL ROUTE**  
 MCAS EL TORO  
 EL TORO, CALIFORNIA  
 FOSTER WHEELER  
 ENVIRONMENTAL CORPORATION

DRAWING NO:  
01006603.dwg

DCN: FWSO-RAC-01-0066  
CTO #022

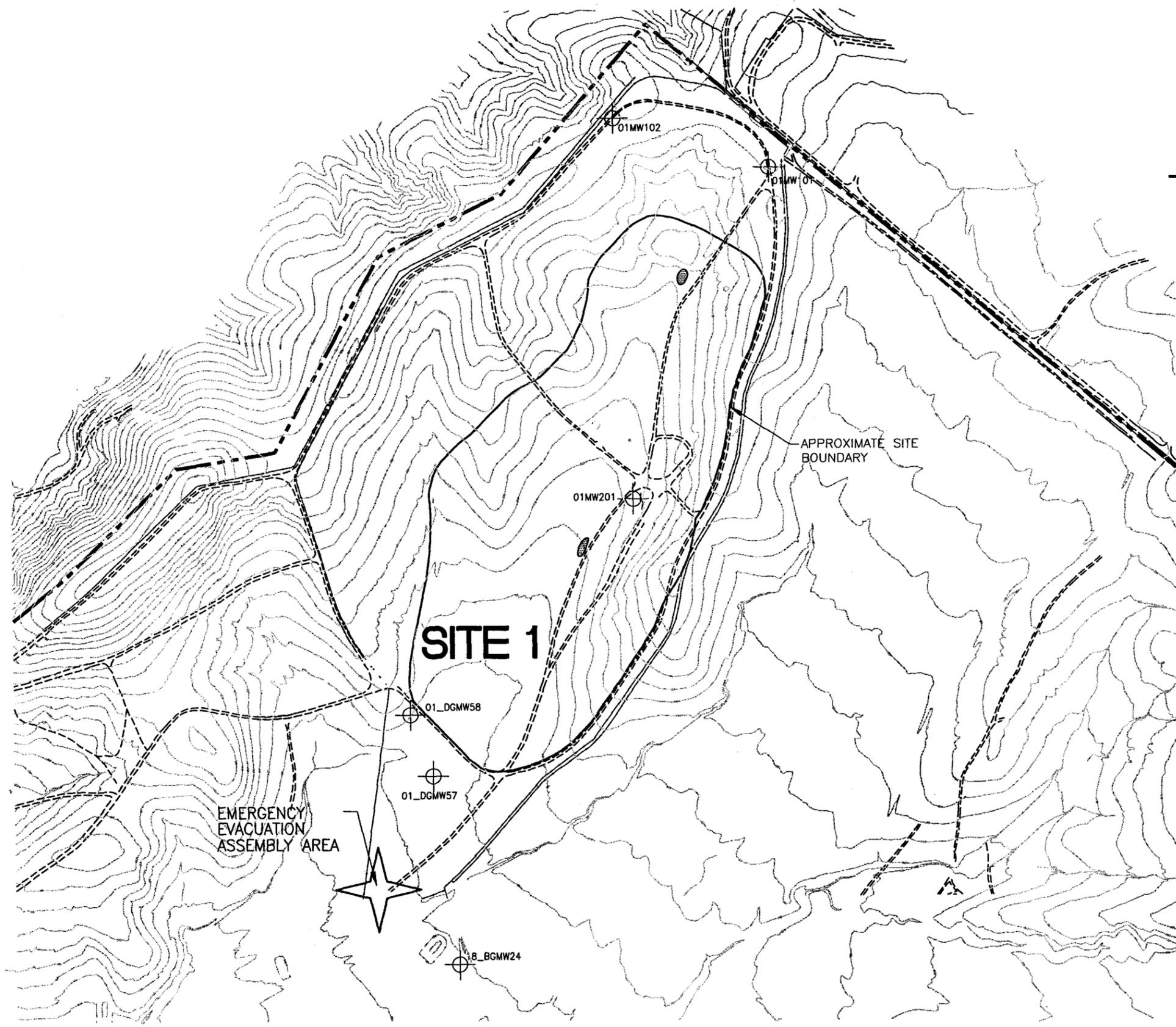
APPROVED BY: HH

CHECKED BY: HH

DRAWN BY: MD  
DATE: 10/27/00

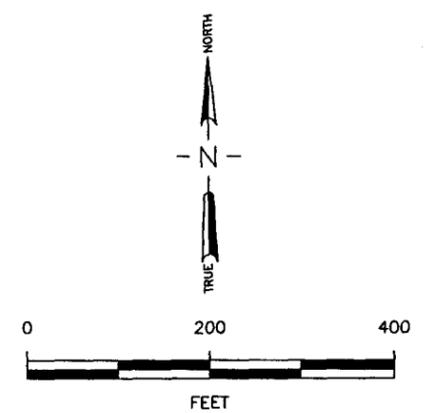
REV: REVISION 0

I:\1990-RAC\CTO-0022\DWG\010066\01006603.DWG  
PLOT/UPDATE: DEC 19 2000 09:38:41



**LEGEND**

- UNIMPROVED ROADS
- FENCE
- ELEVATION CONTOURS (FEET ABOVE MEAN SEA LEVEL 10 FOOT INTERVAL)
- MCAS EL TORO BOUNDARY
- 01MW102
- EXISTING GROUNDWATER MONITORING WELL
- APPROXIMATE AREAS OF SURFACE AND METALLIC DEBRIS

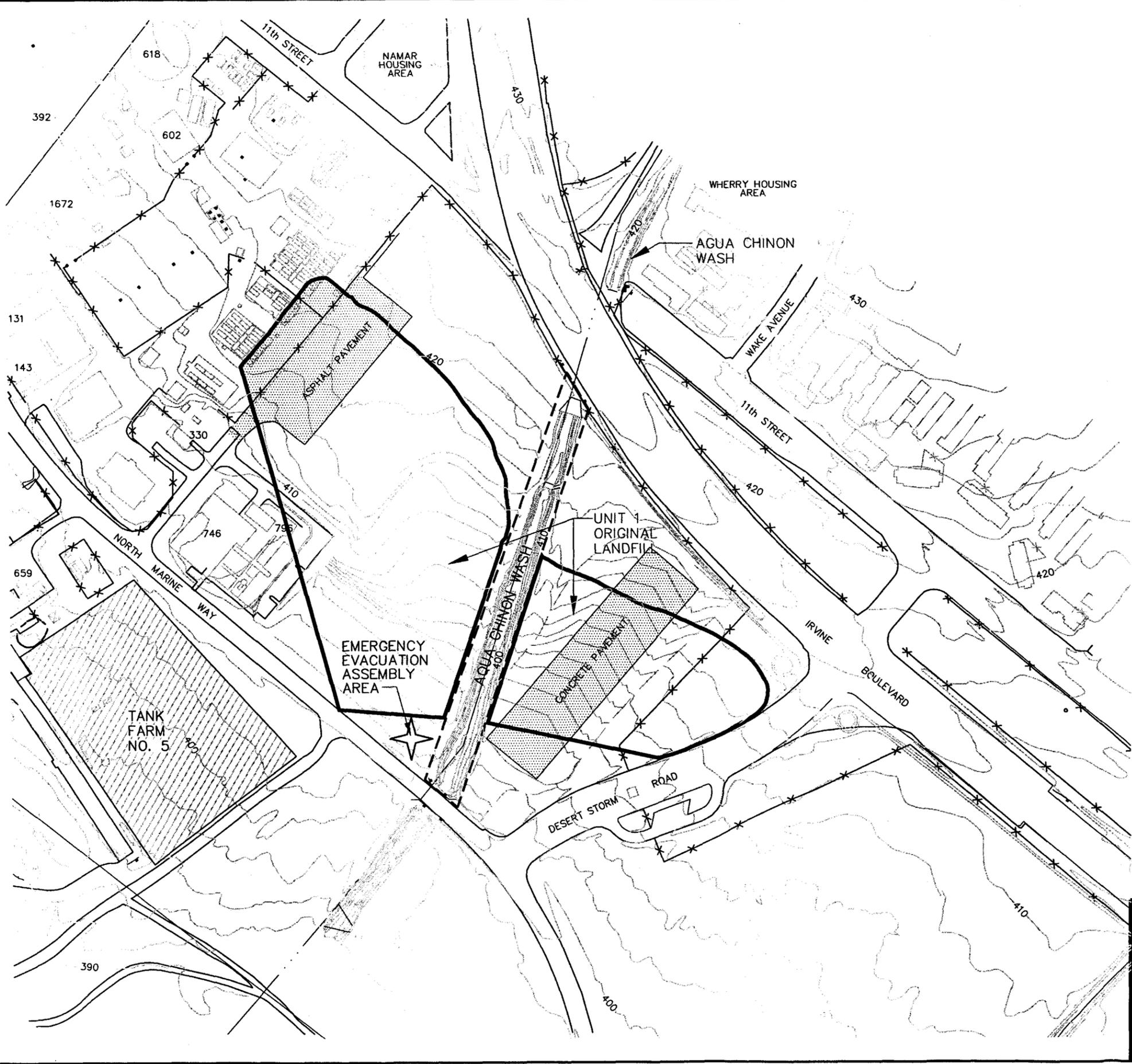


SOURCE : PRE-DESIGN INVESTIGATION-FINAL WORK PLAN  
(EARTH-TECH, 2000a)

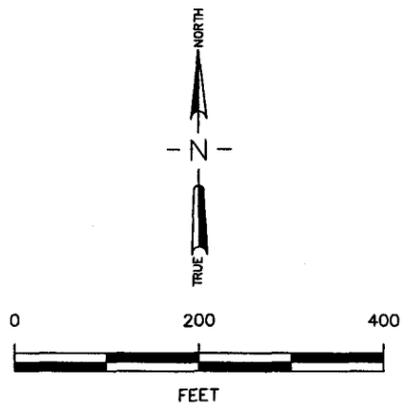
**FIGURE 3**  
**SITE PLAN & EMERGENCY EVACUATION ASSEMBLY AREA**  
SITE 1-EXPLOSIVE ORDNANCE RANGE DISPOSAL  
MCAS, El Toro, California  
**FOSTER WHEELER**  
ENVIRONMENTAL CORPORATION

DRAWING NO: 01006604.dwg  
 DCN: FWSO-RAC-01-0066 CTO #022  
 APPROVED BY: HH  
 CHECKED BY: HH REV: REVISION 0  
 DRAWN BY: MD DATE: 10/27/00

I:\1990-RAC\CTO-0022\DWG\010066\01006604.DWG  
 PLOT/UPDATE: OCT 23 2000 12:47:00



- LEGEND**
- BUILDING
  - IMPROVED ROADS
  - BOUNDARY OF NON-LANDFILLED UNITS OF THE SITE
  - FENCE
  - ELEVATION CONTOURS (FEET MEAN SEA LEVEL - 2 FOOT INTERVAL)
  - ESTIMATED LANDFILL BOUNDARY (BNI, 1997a)
  - PROPOSED ASPHALT PAVEMENT AND CONCRETE AREAS REQUIRING REMOVAL



PRIMARY MAP SOURCE: BNI, 1997a

**FIGURE 4**  
**SITE PLAN AND EMERGENCY EVACUATION ASSEMBLY AREA**  
 SITE 3-ORIGINAL LANDFILL  
 MCAS, El Toro, California  
 FOSTER WHEELER  
 ENVIRONMENTAL CORPORATION

**ATTACHMENT 1**  
**MATERIAL SAFETY DATA SHEETS**



# Genium Publishing Corporation

One Genium Plaza  
Schenectady, NY 12304-4690 USA  
(518) 377-8854

Sheet No. 467  
Automotive Gasoline, Lead-free

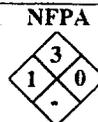
Issued: 10/81      Revision: A, 9/91

## Section 1. Material Identification

35

**Automotive Gasoline, Lead-free, Description:** A mixture of volatile hydrocarbons composed mainly of branched-chain paraffins, cycloparaffins, olefins, naphthenes, and aromatics. In general, gasoline is produced from petroleum, shale oil, Athabasca tar sands, and coal. Motor gasolines are made chiefly by cracking processes, which convert heavier petroleum fractions into more volatile fractions by thermal or catalytic decomposition. Widely used as fuel in internal combustion engines of the spark-ignited, reciprocating type. Automotive gasoline has an octane number of approximately 90. A high content of aromatic hydrocarbons and a consequent high toxicity are also associated with a high octane rating. Some gasolines sold in the US contain a minor proportion of tetraethyllead, which is added in concentrations not exceeding 3 ml per gallon to prevent engine "knock." However, methyl-tert-butyl ether (MTBE) has almost completely replaced tetraethyllead.

R 1  
I 2  
S 2\*  
K 4  
\* Skin absorption



HMIS  
H 2  
F 3  
R 1  
PPG†  
† Sec. 8

**Other Designations:** CAS No. 8006-61-9, benzin, gasoline, gasolene, motor spirits, natural gasoline, petrol.

**Manufacturer:** Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*<sup>(73)</sup> for a suppliers list.

**Cautions:** Inhalation of automotive gasoline vapors can cause intense burning in throat and lungs, central nervous system (CNS) depression, and possible fatal pulmonary edema. Gasoline is a dangerous fire and explosion hazard when exposed to heat and flames.

## Section 2. Ingredients and Occupational Exposure Limits

Automotive gasoline, lead-free\*

### 1990 OSHA PELs

8-hr TWA: 300 ppm, 900 mg/m<sup>3</sup>  
15-min STEL: 500 ppm, 1500 mg/m<sup>3</sup>

### 1990-91 ACGIH TLVs

TWA: 300 ppm, 890 mg/m<sup>3</sup>  
STEL: 500 ppm, 1480 mg/m<sup>3</sup>

### 1990 NIOSH REL

None established

### 1985-86 Toxicity Data\*

Man, inhalation, TC<sub>Lo</sub>: 900 ppm/1 hr; toxic effects include sense organs and special senses (conjunctiva irritation), behavioral (hallucinations, distorted perceptions), lungs, thorax, or respiration (cough)  
Human, eye: 140 ppm/8 hr; toxic effects include mild irritation  
Rat, inhalation, LC<sub>50</sub>: 300 g/m<sup>3</sup>/5 min

\* A typical modern gasoline composition is 80% paraffins, 14% aromatics, and 6% olefins. The mean benzene content is approximately 1%. Other additives include sulfur, phosphorus, and MTBE.

† See NIOSH, *RTECS* (LX3300000), for additional toxicity data.

## Section 3. Physical Data

**Boiling Point:** Initially, 102 °F (39 °C); after 10% distilled, 140 °F (60 °C); after 50% distilled, 230 °F (110 °C); after 90% distilled, 338 °F (170 °C); final boiling point, 399 °F (204 °C)

**Vapor Density (air = 1):** 3.0 to 4.0

**Density/Specific Gravity:** 0.72 to 0.76 at 60 °F (15.6 °C)

**Water Solubility:** Insoluble

**Appearance and Odor:** A clear (gasoline may be colored with dye), mobile liquid with a characteristic odor recognizable at about 10 ppm in air.

## Section 4. Fire and Explosion Data

**Flash Point:** -45 °F (-43 °C)

**Autoignition Temperature:** 536 to 853 °F (280 to 456 °C)

**LEL:** 1.3% v/v

**UEL:** 6.0% v/v

**Extinguishing Media:** Use dry chemical, carbon dioxide, or alcohol foam as extinguishing media. Use of water may be ineffective to extinguish fire, but use water spray to knock down vapors and to cool fire-exposed drums and tanks to prevent pressure rupture. Do not use a solid stream of water since it may spread the fuel.

**Unusual Fire or Explosion Hazards:** Automobile gasoline is an OSHA Class IB flammable liquid and a dangerous fire and explosion hazard when exposed to heat and flames. Vapors can flow to an ignition source and flash back. Automobile gasoline can also react violently with oxidizing agents.

**Special Fire-fighting Procedures:** Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode, and full protective clothing. When the fire is extinguished, use nonsparking tools for cleanup. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

## Section 5. Reactivity Data

**Stability/Polymerization:** Automotive gasoline is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.

**Chemical Incompatibilities:** Automotive gasoline can react with oxidizing materials such as peroxides, nitric acid, and perchlorates.

**Conditions to Avoid:** Avoid heat and ignition sources.

**Hazardous Products of Decomposition:** Thermal oxidative decomposition of automotive gasoline can produce oxides of carbon and partially oxidized hydrocarbons.

**Section 6. Health Hazard Data**

**Carcinogenicity:** In 1990 reports, the IARC list gasoline as a possible human carcinogen (Group 2B). Although the IARC has assigned an overall evaluation to gasoline, it has not assigned an overall evaluation to specific substances within this group (inadequate human evidence).

**Summary of Risks:** Gasoline vapors are considered moderately poisonous. Vapor inhalation can cause central nervous system (CNS) depression and mucous membrane and respiratory tract irritation. Brief inhalations of high concentrations can cause a fatal pulmonary edema. Reported responses to gasoline vapor concentrations are: 160 to 270 ppm causes eye and throat irritation in several hours; 500 to 900 ppm causes eye, nose, and throat irritation, and dizziness in 1 hr; and 2000 ppm produces mild anesthesia in 30 min. Higher concentrations are intoxicating in 4 to 10 minutes. If large areas of skin are exposed to gasoline, toxic amounts may be absorbed. Repeated or prolonged skin exposure causes dermatitis. Certain individuals may develop hypersensitivity. Ingestion can cause CNS depression. Pulmonary aspiration after ingestion can cause severe pneumonitis. In adults, ingestion of 20 to 50 g gasoline may produce severe symptoms of poisoning.

**Medical Conditions Aggravated by Long-Term Exposure:** None reported.

**Target Organs:** Skin, eye, respiratory and central nervous systems.

**Primary Entry Routes:** Inhalation, ingestion, skin contact.

**Acute Effects:** Acute inhalation produces intense nose, throat, and lung irritation; headaches; blurred vision; conjunctivitis; flushing of the face; mental confusion; staggering gait; slurred speech; and unconsciousness, sometimes with convulsions. Ingestion causes inebriation (drunkenness), vomiting, dizziness, fever, drowsiness, confusion, and cyanosis (a blue to dark purplish coloration of skin and mucous membrane caused by lack of oxygen). Aspiration causes choking, cough, shortness of breath, increased rate of respiration, excessively rapid heartbeat, fever, bronchitis, and pneumonitis. Other symptoms following acute exposure include acute hemorrhage of the pancreas, fatty degeneration of the liver and kidneys, and passive congestion of spleen.

**Chronic Effects:** Chronic inhalation results in appetite loss, nausea, weight loss, insomnia, and unusual sensitivity (hyperesthesia) of the distal extremities followed by motor weakness, muscular degeneration, and diminished tendon reflexes and coordination. Repeated skin exposure can cause blistering, drying, and lesions.

**FIRST AID**

**Eyes:** Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.

**Skin:** Quickly remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. For reddened or blistered skin, consult a physician. Wash affected area with soap and water.

**Inhalation:** Remove exposed person to fresh air and support breathing as needed.

**Ingestion:** Never give anything by mouth to an unconscious or convulsing person. If ingested, *do not induce vomiting* due to aspiration hazard. Give conscious victim a mixture of 2 tablespoons of activated charcoal mixed in 8 oz of water to drink. Consult a physician immediately.

**After first aid, get appropriate in-plant, paramedic, or community medical support.**

**Section 7. Spill, Leak, and Disposal Procedures**

**Spill/Leak:** Notify safety personnel, evacuate all unnecessary personnel, remove heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and liquid contact. Use nonsparking tools. Take up small spills with sand or other noncombustible adsorbent. Dike storage areas to control leaks and spills. Follow applicable OSHA regulations (29 CFR 1910.120).

**Aquatic Toxicity:** Bluegill, freshwater, LC<sub>50</sub>, 8 ppm/96 hr.

**Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**EPA Designations**

RCRA Hazardous Waste (40 CFR 261.21): Characteristic of ignitability

CERCLA Hazardous Substance (40 CFR 302.4): Not listed

SARA Extremely Hazardous Substance (40 CFR 355): Not listed

SARA Toxic Chemical (40 CFR 372.65): Not listed

**OSHA Designations**

Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

**Section 8. Special Protection Data**

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Since contact lens use in industry is controversial, establish your own policy.

**Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. There are no specific NIOSH recommendations. However, for vapor concentrations not immediately dangerous to life or health, use chemical cartridge respirator equipped with organic vapor cartridge(s), or a supplied-air respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*

**Other:** Wear impervious gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Materials such as neoprene or polyvinyl alcohol provide excellent/good resistance for protective clothing. **Note:** Resistance of specific materials can vary from product to product.

**Ventilation:** Provide general and local explosion-proof exhaust ventilation systems to maintain airborne concentrations below the OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.<sup>(103)</sup>

**Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

**Contaminated Equipment:** Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.

**Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

**Section 9. Special Precautions and Comments**

**Storage Requirements:** Store in closed containers in a cool, dry, well-ventilated area away from heat and ignition sources and strong oxidizing agents. Protect containers from physical damage. Avoid direct sunlight. Storage must meet requirements of OSHA Class IB liquid. Outside or detached storage preferred.

**Engineering Controls:** Avoid vapor inhalation and skin or eye contact. Consider a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Indoor use of this material requires explosion-proof exhaust ventilation to remove vapors. Only use gasoline as a fuel source due to its volatility and flammable/explosive nature. Practice good personal hygiene and housekeeping procedures. Wear clean work clothing daily.

**Transportation Data (49 CFR 172.101, .102)**

**DOT Shipping Name:** Gasoline (including casing-head and natural)

**DOT Hazard Class:** Flammable liquid

**ID No.:** UN1203

**DOT Label:** Flammable liquid

**DOT Packaging Exceptions:** 173.118

**DOT Packaging Requirements:** 173.119

**IMO Shipping Name:** Gasoline

**IMO Hazard Class:** 3.1

**ID No.:** UN1203

**IMO Label:** Flammable liquid

**IMDG Packaging Group:** II

**MSDS Collection References:** 26, 73, 89, 100, 101, 103, 124, 126, 127, 132, 133, 136, 138, 140, 143, 146, 153, 159

**Prepared by:** M Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** W Silverman, MD; **Edited by:** JR Stuart, MS

**Section 1. Material Identification**

39

**Hydrogen Sulfide (H<sub>2</sub>S) Description:** Formed as a byproduct of many industrial processes (breweries, tanneries, slaughter houses), around oil wells, where petroleum products are used, in decaying organic matter, and naturally occurring in coal, natural gas, oil, volcanic gases, and sulfur springs. Derived commercially by reacting iron sulfide with dilute sulfuric or hydrochloric acid, or by reacting hydrogen with vaporized sulfur. Used in the production of various inorganic sulfides and sulfuric acid, in agriculture as a disinfectant, in the manufacture of heavy water, in precipitating sulfides of metals; as a source of hydrogen and sulfur, and as an analytical reagent.

R	2
I	4
S	3
K	3



**Other Designations:** CAS No. 7783-06-4, dihydrogen monosulfide, hydrosulfuric acid, sewer gas, stink damp, sulfuretted hydrogen, sulfur hydride.

HMIS
H 3
F 4
R 0
PPE*
* Sec. 8

**Manufacturer:** Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*<sup>(73)</sup> for a suppliers list.

**Cautions:** Hydrogen sulfide is a highly flammable gas and reacts vigorously with oxidizing materials. It is highly toxic and can be instantly fatal if inhaled at concentrations of 1000 ppm or greater. Be aware that the sense of smell becomes rapidly fatigued at 50 to 150 ppm, and that its strong rotten-egg odor is not noticeable even at very high concentrations.

**Section 2. Ingredients and Occupational Exposure Limits**

Hydrogen sulfide: 98.5% technical, 99.5% purified, and CP (chemically pure grade)

**1991 OSHA PELs**

8-hr TWA: 10 ppm (14 mg/m<sup>3</sup>)

15-min STEL: 15 ppm (21 mg/m<sup>3</sup>)

**1990 IDLH Level**

300 ppm

**1990 NIOSH REL**

10-min Ceiling: 10 ppm (15 mg/m<sup>3</sup>)

**1992-93 ACGIH TLVs**

TWA: 10 ppm (14 mg/m<sup>3</sup>)

STEL: 15 ppm (21 mg/m<sup>3</sup>)

**1990 DFG (Germany) MAK**

TWA: 10 ppm (15 mg/m<sup>3</sup>)

Category V: Substances having intense odor

Peak exposure limit 20 ppm, 10 min

momentary value, 4/shift

**1985-86 Toxicity Data\***

Human, inhalation, LC<sub>Lo</sub>: 600 ppm/30 min; toxic effects not yet reviewed

Man, inhalation, LD<sub>Lo</sub>: 5700 µg/kg caused coma and pulmonary edema or congestion.

Rat, intravenous, LD<sub>50</sub>: 270 µg/kg; no toxic effect noted

\* See NIOSH. RTECS (MX1225000), for additional toxicity data.

**Section 3. Physical Data**

**Boiling Point:** -76 °F (-60 °C)

**Freezing Point:** -122 °F (-86 °C)

**Vapor Pressure:** 18.5 atm at 68 °F (20 °C)

**Vapor Density (Air = 1):** 1.175

**pH:** 4.5 (freshly prepared saturated aqueous solution)

**Viscosity:** 0.01166 cP at 32 °F/0 °C and 1 atm

**Liquid Surface Tension (est):** 30 dyne/cm at -77.8 °F/-61 °C

**Molecular Weight:** 34.1

**Density:** 1.54 g/L at 32 °F (0 °C)

**Water Solubility:** Soluble\*; 1g/187 mL (50 °F/10 °C), 1g/242 mL (68 °F/20 °C), 1g/314 mL (86 °F/30 °C)

**Other Solubilities:** Soluble in ethyl alcohol, gasoline, kerosine, crude oil, and ethylene glycol.

**Odor threshold:** 0.06 to 1.0 ppm†

**Appearance and Odor:** Colorless gas with a rotten-egg smell.

\* H<sub>2</sub>S solutions are not stable. Absorbed oxygen causes turbidity and precipitation of sulfur. In a 50:50 mixture of water and glycerol, H<sub>2</sub>S is stable.

† Sense of smell becomes rapidly fatigued and can not be relied upon to warn of continuous H<sub>2</sub>S presence.

**Section 4. Fire and Explosion Data**

**Flash Point:** None reported

**Autoignition Temperature:** 500 °F (260 °C)

**LEL:** 4.3% v/v

**UEL:** 46% v/v

**Extinguishing Media:** Let small fires burn unless leak can be stopped immediately. For large fires, use water spray, fog, or regular foam.

**Unusual Fire or Explosion Hazards:** H<sub>2</sub>S burns with a blue flame giving off sulfur dioxide. Its burning rate is 2.3 mm/min. Gas may travel to a source of ignition and flash back. **Special Fire-fighting Procedures:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Structural firefighter's protective clothing is not effective for fires involving H<sub>2</sub>S. If possible without risk, stop leak. Use unmanned device to cool containers until well after fire is out. Withdraw immediately if you hear a rising sound from venting safety device or notice any tank discoloration due to fire. Do not release runoff from fire control methods to sewers or waterways.

**Section 5. Reactivity Data**

**Stability/Polymerization:** H<sub>2</sub>S is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Hydrogen sulfide attacks metals forming sulfides and is incompatible with 1,1-bis(2-azidoethoxy) ethane + ethanol, 4-bromobenzenediazonium chloride, powdered copper + oxygen, metal oxides, finely divided tungsten or copper, nitrogen trichloride, silver fulminate, rust, soda-lime, and all other oxidants. **Conditions to Avoid:** Exposure to heat and contact with incompatibles. **Hazardous Products of Decomposition:** Thermal oxidative decomposition of hydrogen sulfide can produce toxic sulfur dioxide.

**Section 6. Health Hazard Data**

**Carcinogenicity:** The IARC,<sup>(164)</sup> NTP,<sup>(169)</sup> and OSHA<sup>(164)</sup> do not list hydrogen sulfide as a carcinogen. **Summary of Risks:** H<sub>2</sub>S combines with the alkali present in moist surface tissues to form caustic sodium sulfide, causing irritation of the eyes, nose, and throat at low levels (50 to 100 ppm). Immediate death due to respiratory paralysis occurs at levels greater than 1000 ppm. Heavy exposure has resulted in neurological problems, however recovery is usually complete. H<sub>2</sub>S exerts most of its toxicity on the respiratory system. It inhibits the respiratory enzyme cytochrome oxidase, by binding iron and blocking the necessary oxydo-reduction process. Electrocardiograph changes after over-exposure have suggested direct damage to the cardiac muscle, however some authorities debate this. **Medical Conditions Aggravated by Long-Term Exposure:** Eye and nervous system disorders. **Target Organs:** Eyes, respiratory system and central nervous system. **Primary Entry Routes:** Inhalation, eye and skin contact. **Acute Effects:** Inhalation of low levels can cause headache, dizziness, nausea, cramps, vomiting, diarrhea, sneezing, staggering, excitability, pale

Continued on next page

**Section 6. Health Hazard Data, continued**

complexion, dry cough, muscular weakness, and drowsiness. Prolonged exposure to 50 ppm, can cause rhinitis, bronchitis, pharyngitis, and pneumonia. High level exposure leads to pulmonary edema (after prolonged exposure to 250 ppm), asphyxia, tremors, weakness and numbing of extremities, convulsions, unconsciousness, and death due to respiratory paralysis. Concentrations near 100 ppm may be odorless due to olfactory fatigue, thus the victim may have no warning. Lactic acidosis may be noted in survivors. The gas does not affect the skin although the liquid (compressed gas) can cause frostbite. The eyes are very susceptible to H<sub>2</sub>S keratoconjunctivitis known as 'gas eye' by sewer and sugar workers. This injury is characterized by palpebral edema, bulbar conjunctivitis, mucous-puss secretions, and possible reduction in visible capacity.

**Chronic Effects:** Chronic effects are not well established. Some authorities have reported repeated exposure to cause fatigue, headache, inflammation of the conjunctiva and eyelids, digestive disturbances, weight loss, dizziness, a grayish-green gum line, and irritability. Others say these symptoms result from recurring acute exposures. There is a report of encephalopathy in a 20 month old child after low-level chronic exposure.

**FIRST AID Eyes:** Do not allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water. Treat with boric acid or isotonic physiological solutions. Serious exposures may require adrenaline drops. Olive oil drops (3 to 4) provides immediate treatment until transported to an emergency medical facility. Consult a physician immediately. **Skin:** Quickly remove contaminated clothing and rinse with flooding amounts of water. For frostbite, rewarm in 107.6°F (42 °C) water until skin temperature is normal. Do not use dry heat. **Inhalation:** Remove exposed person to fresh air and administer 100% oxygen. Give hyperbaric oxygen if possible. **Ingestion:** Unlikely since H<sub>2</sub>S is a gas above -60 °C. **Note to Physicians:** The efficacy of nitrite therapy is unproven. Normal blood contains < 0.05 mg/L H<sub>2</sub>S; reliable tests need to be taken within 2 hr of exposure.

**Section 7. Spill, Leak, and Disposal Procedures**

**Spill/Leak:** Immediately notify safety personnel, isolate and ventilate area, deny entry, and stay upwind. Shut off all ignition sources. Use water spray to cool, dilute, and disperse vapors. Neutralize runoff with crushed limestone, agricultural (slaked) lime, or sodium bicarbonate. If leak can't be stopped in place, remove cylinder to safe, outside area and repair or let empty. Follow applicable OSHA regulations (29 CFR 1910.120).

**Ecotoxicity Values:** Bluegill sunfish, TLM = 0.0448 mg/L/96 hr at 71.6 °F/22 °C; fathead minnow, TLM = 0.0071 to 0.55 mg/L/96 hr at 6 to 24 °C.

**Environmental Degradation:** In air, hydrogen sulfides residency (1 to 40 days) is affected by temperature, humidity, sunshine, and the presence of other pollutants. It does not undergo photolysis but is oxidized by oxygen containing radicals to sulfur dioxide and sulfates. In water, H<sub>2</sub>S converts to elemental sulfur. In soil, due to its low boiling point, much of H<sub>2</sub>S evaporates quickly if spilled. Although, if soil is moist or precipitation occurs at time of spill, H<sub>2</sub>S becomes slightly mobile due to its water solubility. H<sub>2</sub>S does not bioaccumulate but is degraded rapidly by certain soil and water bacteria. **Disposal:** Aerate or oxygenate with compressor. For in situ amelioration, carbon removes some H<sub>2</sub>S. Anion exchanges may also be effective. A potential candidate for rotary kiln incineration (1508 to 2912 °F/820 to 1600 °C) or fluidized bed incineration (842 to 1796 °F/450 to 980 °C). Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**EPA Designations**

Listed as a RCRA Hazardous Waste (40 CFR 261.33): No. U135

SARA Toxic Chemical (40 CFR 372.65): Not listed

Listed as a SARA Extremely Hazardous Substance (40 CFR 355), TPQ: 500 lb

Listed as a CERCLA Hazardous Substance\* (40 CFR 302.4): Final Reportable

Quantity (RQ), 100 lb (45.4 kg) [\* per RCRA, Sec. 3001 & CWA, Sec. 311 (b)(4)]

**OSHA Designations**

Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A & Z-2)

Listed as a Process Safety Hazardous Material (29 CFR 1910.119), TQ: 1500 lb

**Section 8. Special Protection Data**

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy. **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. For < 100 ppm, use a supplied-air respirator (SAR) or SCBA. For < 250 ppm, use a SAR operated in continuous-flow mode. For < 300 ppm, use a SAR or SCBA with a full facepiece. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. **Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.** If respirators are used, OSHA requires a respiratory protection program that includes at least: a written program, medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas. **Other:** Wear chemically protective gloves, boots, aprons, and gauntlets to prevent skin contact. Polycarbonate, butyl rubber, polyvinyl chloride, and neoprene are suitable materials for PPE. **Ventilation:** Provide general & local exhaust ventilation systems to maintain airborne concentrations below the OSHA PEL (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.<sup>(103)</sup> **Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Separate contaminated work clothes from street clothes and launder before reuse. Clean PPE. **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

**Section 9. Special Precautions and Comments**

**Storage Requirements:** Prevent physical damage to containers. Store in steel cylinders in a cool, dry, well-ventilated area away from incompatibles (Sec. 5). Install electrical equipment of Class 1, Group C. Outside or detached storage is preferred. **Engineering Controls:** To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to keep levels as low as possible. Enclose processes and continuously monitor H<sub>2</sub>S levels in the plant air. Keep pipes clear of rust as H<sub>2</sub>S can ignite if passed through rusty pipes. Purge and determine H<sub>2</sub>S concentration before entering a confined area that may contain H<sub>2</sub>S. The worker entering the confined space should have a safety belt and life line and be observed by a worker from the outside. Follow applicable OSHA regulations (1910.146) for confined spaces. H<sub>2</sub>S can be trapped in sludge in sewers or process vessels and may be released during agitation. Calcium chloride or ferrous sulfate should be added to neutralize process wash water each time H<sub>2</sub>S formation occurs. Control H<sub>2</sub>S emissions with a wet flare stack/scrubbing tower. **Administrative Controls:** Consider preplacement and periodic medical exams of exposed workers emphasizing the eyes, nervous and respiratory system.

**Transportation Data (49 CFR 172.101)**

**DOT Shipping Name:** Hydrogen sulfide, liquefied

**DOT Hazard Class:** 2.3

**ID No.:** UN1053

**DOT Packaging Group:** --

**DOT Label:** Poison Gas, Flammable Gas

**Special Provisions (172.102):** 2, B9, B14

**Packaging Authorizations**

**Exceptions:** --

**Non-bulk Packaging:** 304

**Bulk Packaging:** 314, 315

**Vessel Storage Requirements**

**Vessel Storage:** D

**Other:** 40

**Quantity Limitations**

**Passenger, Aircraft, or Railcar:** Forbidden

**Cargo Aircraft Only:** Forbidden

**MSDS Collection References:** 26, 73, 89, 100, 101, 103, 124, 126, 127, 132, 136, 140, 148, 149, 153, 159, 163, 164, 168, 171, 180

**Prepared by:** M Gannon, BA; **Industrial Hygiene Review:** PA Roy, MPH, CIH; **Medical Review:** AC Darlington, MPH, MD



# Genium Publishing Corporation

One Genium Plaza  
Schenectady, NY 12304-4690 USA  
(518) 377-8854

Sheet No. 470  
Diesel Fuel Oil No. 2-D

Issued: 10/81

Revision: A, 11/90

## Section 1. Material Identification

33

**Diesel Fuel Oil No. 2-D Description:** Diesel fuel is obtained from the middle distillate in petroleum separation; a distillate oil of low sulfur content. It is composed chiefly of unbranched paraffins. Diesel fuel is available in various grades, one of which is synonymous with fuel oil No. 2-D. This diesel fuel oil requires a minimum Cetane No. (efficiency rating for diesel fuel comparable to octane number ratings for gasoline) of 40 (ASTM D613). Used as a fuel for trucks, ships, and other automotive engines; as mosquito control (coating on breeding waters); and for drilling muds.

**Other Designations:** CAS No. 68334-30-5, diesel fuel.

**Manufacturer:** Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*<sup>(73)</sup> for a suppliers list.

**Cautions:** Diesel fuel oil No. 2-D is a skin irritant and central nervous depressant with high mist concentrations. It is an environmental hazard and moderate fire risk.

R	1	
I	-	
S	2	
K	2	
HMIS		
H	0	
F	2	
R	0	
PPG*		
* Sec. 8		

## Section 2. Ingredients and Occupational Exposure Limits

Diesel fuel oil No. 2-D\*

1989 OSHA PEL	1990-91 ACGIH TLV	1988 NIOSH REL	1985-86 Toxicity Data†
None established	Mineral Oil Mist TWA: 5 mg/m <sup>3</sup> † STEL: 10 mg/m <sup>3</sup>	None established	Rat. oral, LD <sub>50</sub> : 9 g/kg produces gastrointestinal (hypermotility, diarrhea) effects

\* Diesel fuel No. 2-D tends to be low in aromatics and high in paraffinics. This fuel oil is complex mixture of: 1) >95% paraffinic, olefinic, naphthenic, and aromatic hydrocarbons, 2) sulfur (<0.5%), and 3) benzene (<100 ppm). [A low benzene level reduces carcinogenic risk. Fuel oils can be exempted under the benzene standard (29 CFR 1910.1028)]. Although low in the fuel itself, benzene concentrations are likely to be much higher in processing areas.

† As sampled by nonvapor-collecting method.

‡ Monitor NIOSH, RTECS (HZ1800000), for future toxicity data.

## Section 3. Physical Data

**Boiling Point Range:** 340 to 675 °F (171 to 358 °C)

**Viscosity:** 1.9 to 4.1 centistoke at 104 °F (40 °C)

**Appearance and Odor:** Brown, slightly viscous liquid.

**Specific Gravity:** <0.86

**Water Solubility:** Insoluble

## Section 4. Fire and Explosion Data

**Flash Point:** 125 °F (52 °C) min.

**Autoignition Temperature:** >500 °F (932 °C)

**LEL:** 0.6% v/v

**UEL:** 7.5% v/v

**Extinguishing Media:** Use dry chemical, carbon dioxide, or foam to fight fire. Use a water spray to cool fire exposed containers. Do not use a forced water spray directly on burning oil since this will scatter the fire. Use a smothering technique for extinguishing fire.

**Unusual Fire or Explosion Hazards:** Diesel fuel oil No. 2-D is a OSHA Class II combustible liquid. Its volatility is similar to that of gas oil. Vapors may travel to a source of ignition and flash back.

**Special Fire-fighting Procedures:** Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode and full protective clothing. If feasible, remove containers from fire. Be aware of runoff from fire control methods. Do not release to sewers or waterways due to pollution and fire or explosion hazard.

## Section 5. Reactivity Data

**Stability/Polymerization:** Diesel fuel oil No. 2-D is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.

**Chemical Incompatibilities:** It is incompatible with strong oxidizing agents; heating greatly increases the fire hazard.

**Conditions to Avoid:** Avoid heat and ignition sources.

**Hazardous Products of Decomposition:** Thermal oxidative decomposition of diesel fuel oil No. 2-D can produce various hydrocarbons and hydrocarbon derivatives, and other partial oxidation products such as carbon dioxide, carbon monoxide, and sulfur dioxide.

**Section 6. Health Hazard Data**

**Carcinogenicity:** Although the IARC has not assigned an overall evaluation to diesel fuels as a group, it has evaluated occupational exposures in petroleum refining as an IARC probable human carcinogen (Group 2A). It has evaluated distillate (light) diesel oils as not classifiable as human carcinogens (Group 3).

**Summary of Risks:** Although diesel fuel's toxicologic effects should resemble kerosine's, they are somewhat more pronounced due to additives such as sulfurized esters. Excessive inhalation of aerosol or mist can cause respiratory tract irritation, headache, dizziness, nausea, vomiting, and loss of coordination, depending on concentration and exposure time. When removed from exposure area, affected persons usually recover completely. If vomiting occurs after ingestion and if oil is aspirated into the lungs, hemorrhaging and pulmonary edema, progressing to renal involvement and chemical pneumonitis, may result. A comparative ratio of oral to aspirated lethal doses may be 1 pt vs. 5 ml. Aspiration may also result in transient CNS depression or excitement. Secondary effects may include hypoxia (insufficient oxygen in body cells), infection, pneumatocele formation, and chronic lung dysfunction. Inhalation may result in euphoria, cardiac dysrhythmias, respiratory arrest, and CNS toxicity. Prolonged or repeated skin contact may irritate hair follicles and block sebaceous glands, producing a rash of acne pimples and spots, usually on arms and legs.

**Medical Conditions Aggravated by Long-Term Exposure:** None reported.

**Target Organs:** Central nervous system, skin, and mucous membranes.

**Primary Entry Routes:** Inhalation, ingestion.

**Acute Effects:** Systemic effects from ingestion include gastrointestinal irritation, vomiting, diarrhea, and in severe cases central nervous system depression, progressing to coma or death. Inhalation of aerosols or mists may result in increased rate of respiration, tachycardia (excessively rapid heart beat), and cyanosis (dark purplish discoloration of the skin and mucous membranes caused by deficient blood oxygenation).

**Chronic Effects:** Repeated contact with the skin causes dermatitis.

**FIRST AID**

**Eyes:** Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.

**Skin:** Quickly remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. If large areas of the body have been exposed or if irritation persists, get medical help immediately. Wash affected area with soap and water.

**Inhalation:** Remove exposed person to fresh air and support breathing as needed.

**Ingestion:** Never give anything by mouth to an unconscious or convulsing person. If ingested, *do not induce vomiting* due to aspiration hazard. Contact a physician immediately. Position to avoid aspiration.

**After first aid, get appropriate in-plant, paramedic, or community medical support.**

**Note to Physicians:** Gastric lavage is contraindicated due to aspiration hazard. Preferred antidotes are charcoal and milk. In cases of severe aspiration pneumonitis, consider monitoring arterial blood gases to ensure adequate ventilation. Observe the patient for 6 hr. If vital signs become abnormal or symptoms develop, obtain a chest x-ray.

**Section 7. Spill, Leak, and Disposal Procedures**

**Spill/Leak:** Notify safety personnel, evacuate area for large spills, remove all heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and liquid contact. Clean up spills promptly to reduce fire or vapor hazards. Use a noncombustible absorbent material to pick up small spills or residues. For large spills, dike far ahead to contain. Pick up liquid for reclamation or disposal. Do not release to sewers or waterways due to health and fire and/or explosion hazard. Follow applicable OSHA regulations (29 CFR 1910.120). Diesel fuel oil No. 2-D spills may be environmental hazards. Report large spills.

**Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**EPA Designations**

RCRA Hazardous Waste (40 CFR 261.21): Ignitable waste

CERCLA Hazardous Substance (40 CFR 302.4): Not listed

SARA Extremely Hazardous Substance (40 CFR 355): Not listed

SARA Toxic Chemical (40 CFR 372.65): Not listed

**OSHA Designations**

Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed

**Section 8. Special Protection Data**

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).

**Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use a NIOSH-approved respirator with a mist filter and organic vapor cartridge. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*

**Other:** Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.

**Ventilation:** Provide general and local explosion-proof ventilation systems to maintain airborne concentrations that promote worker safety and productivity. Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.<sup>(103)</sup>

**Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

**Contaminated Equipment:** Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.

**Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

**Section 9. Special Precautions and Comments**

**Storage Requirements:** Use and storage conditions should be suitable for a OSHA Class II combustible liquid. Store in closed containers in a well-ventilated area away from heat and ignition sources and strong oxidizing agents. Protect containers from physical damage. To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations. Use nonsparking tools and explosion-proof electrical equipment. No smoking in storage or use areas.

**Engineering Controls:** Avoid vapor or mist inhalation and prolonged skin contact. Wear protective rubber gloves and chemical safety glasses where contact with liquid or high mist concentration may occur. Additional suitable protective clothing may be required depending on working conditions. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Practice good personal hygiene and housekeeping procedures. Do not wear oil contaminated clothing. At least weekly laundering of work clothes is recommended. Do not put oily rags in pockets. When working with this material, wear gloves or use barrier cream.

**Transportation Data (49 CFR 172.101)**

**DOT Shipping Name:** Fuel oil

**DOT Hazard Class:** Combustible liquid

**ID No.:** NA1993

**DOT Label:** None

**DOT Packaging Exceptions:** 173.118a

**DOT Packaging Requirements:** None

**MSDS Collection References:** 1, 6, 7, 12, 73, 84, 101, 103, 126, 127, 132, 133, 136, 143, 146

**Prepared by:** MJ Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** AC Darlington, MD; **Edited by:** JR Stuart, MS

**ATTACHMENT 2**  
**ACTIVITY HAZARD ANALYSES (AHAs)**



## HAZARD ANALYSIS #1

Activity: Mobilization and Site SetupAnalyzed By/Date: Roger Margotto 9/29/00Reviewed By: Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
	<p>Noise Exposure.</p> <p>Slip, trip and fall hazards.</p> <p>Sharp objects/punctures.</p> <p>Strains from manually moving materials and equipment.</p> <p>Exposure to extreme temperatures.</p> <p>Eye Hazards.</p>	<ul style="list-style-type: none"> <li>• Hearing protection is required when sound levels exceed 84 dBA continuously. Areas where hearing protection is required shall display warning signs requiring hearing protection.</li> <li>• Work areas shall be visually inspected and slip, trip, and fall hazards shall be marked, barricaded, or eliminated, if feasible.</li> <li>• Maintain proper illumination in all work areas.</li> <li>• Refer to EHS Procedure 3-8 "Fall Protection".</li> <li>• Wear cut resistant work gloves when sharp edges or other objects may cause the possibility of lacerations or other injury. When possible sharp edges will be blunted.</li> <li>• Workers should not stand or walk on debris.</li> <li>• Personnel shall be directed to use proper lifting techniques such as keeping the back straight, lifting with the legs, limiting twisting, and getting help in moving bulky/heavy materials and equipment.</li> <li>• Use of hand truck shall be encouraged.</li> <li>• Employees will not lift more than 50 pounds.</li> <li>• Refer to EHS Procedure 3-1 "Ergonomics".</li> <li>• Monitor for heat and cold stress in accordance with EHS Procedure 4-6 "Temperature Extremes".</li> <li>• Provide fluids and rest breaks during warm weather and while wearing impermeable protective clothing.</li> <li>• Safety glasses are the minimum required eye protection for all work areas.</li> </ul>

## HAZARD ANALYSIS #1

Activity: Mobilization and Site SetupAnalyzed By/Date: Roger Margotto 9/29/00Reviewed By: Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
	Struck by or against heavy equipment.	<ul style="list-style-type: none"> <li>• Wear high visibility reflective vests.</li> <li>• Make eye contact with operators before approaching equipment.</li> <li>• Understand and review posted hand signals.</li> <li>• Traffic barricades, signs, flags, and backup spotters will be used during field activities.</li> </ul>
Installation of Utilities	Electrocution, improper installation	<ul style="list-style-type: none"> <li>• Only qualified electricians are allowed to hook up electrical circuits</li> <li>• Inspect all extension cords daily for structural integrity, ground continuity, and damaged areas.</li> <li>• Inspect extension cord connection.</li> <li>• Use GFCI on all outdoor 115 to 120 volts, 20 amps or less circuits.</li> <li>• Inspect the generator each day. Generator should have installed GFCI outlets. The generator does not have to be grounded if it is internally grounded. (Verify that generator is internally grounded)</li> <li>• Elevate or cover electric wire or flexible cord passing through work area to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching. (Cover only in accordance with National Electrical Code requirements.)</li> <li>• Keep plugs and receptacles out of water unless they are approved submersible type.</li> <li>• Ground all electrical circuits in accordance with the National Electrical Code or other applicable standards and regulations.</li> </ul>
Install barricades, and other support structures.	Power and hand tools.	<ul style="list-style-type: none"> <li>• Inspect all tools before each use.</li> <li>• Personnel will be trained in the proper use of hand tools.</li> <li>• All power tools will be connected to GFCI when in use.</li> </ul>

**HAZARD ANALYSIS #1**

**Activity:** Mobilization and Site Setup      **Analyzed By/Date:** Roger Margotto 9/29/00      **Reviewed By:** Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
	Material handling.  Strains from handling materials.	<ul style="list-style-type: none"> <li>• Identify and avoid pinch points.</li> <li>• Maintain communication with others involved in material handling.</li> <li>• Use appropriate PPE.</li> <li>• Personnel shall be directed to use proper lifting techniques such as keeping back straight, lifting with the legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment.</li> <li>• Use of hand trucks shall be encouraged.</li> <li>• Personnel shall work at a steady pace.</li> <li>• Refer to EHS Procedure 3-1 "Ergonomics"</li> </ul>

Equipment to be Used	Inspection Requirements	Training Requirements
Heavy equipment, hand tools	Daily and before use.	<ul style="list-style-type: none"> <li>• Only trained equipment operators may operate heavy equipment; only Department of Motor Vehicles-licensed personnel will operate trucks.</li> <li>• Insure the operation manuals for all equipment are available</li> <li>• Specific training for power tools, hand tools, and electrical safety.</li> </ul>

**Notes:**

- CRC – contamination reduction corridor
- dBA – decibel
- EHS – Environmental Health and Safety
- GFCI – ground fault circuit interrupters
- MSDS – Material Safety Data Sheet
- PPE – personal protective equipment
- SHSS – Site Health and Safety Specialist

## HAZARD ANALYSIS #2

Activity: Removal of DebrisAnalyzed By/Date: Roger Margotto 9/29/00Reviewed By: Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
Use heavy equipment to remove debris	Struck by or against heavy equipment.	<ul style="list-style-type: none"> <li>• Wear high visibility reflective vests when exposed to vehicle traffic.</li> <li>• Make eye contact with operators before approaching equipment.</li> <li>• Understand and review posted hand signals.</li> <li>• Use signs, flags, and backup spotters.</li> </ul>
Load and haul materials	<p>Hauling.</p> <p>Noise.</p>	<ul style="list-style-type: none"> <li>• Be sure materials are secured to vehicle transporting them.</li> <li>• If materials are consolidated into a truck for hauling to a disposal site ensure that all material is compatible and acceptable for the disposal site.</li> <li>• Do not mix chemical wastes with debris or containers containing any materials (dispose of these separately as required by the waste management plan).</li> <li>• Wear Hearing Protection</li> </ul>
Removing Debris	<p>Underground Utilities.</p> <p>Sharp objects and debris</p> <p>Strains from manually moving materials, pipes, and debris.</p>	<ul style="list-style-type: none"> <li>• Verify that there are no utilities.</li> <li>• Handle debris with leather/cut-resistant gloves</li> <li>• Personnel shall be directed to use proper lifting techniques such as keeping the back straight, lifting with the legs, limiting twisting, and getting help in moving bulky/heavy materials and equipment.</li> <li>• Use of mechanical assistance is recommended.</li> <li>• Employees will not lift more than 50 pounds.</li> <li>• Objects that are bulk with uneven distributed weight or objects heavier than 50-pound require more than one person</li> <li>• If material is lifted using chains, slings or wire ropes, these devices must be inspected and rated for the weight of the load being lifted regardless of the height the material is raised. Follow safe rigging techniques.</li> <li>• Refer to EHS Procedure 3-1 "Ergonomics".</li> </ul>

## HAZARD ANALYSIS #2

Activity: Removal of DebrisAnalyzed By/Date: Roger Margotto 9/29/00Reviewed By: Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
	Exposure to chemical, radiological or UXO hazards.  Exposure to insects, snakes, animals	<ul style="list-style-type: none"> <li>Inspect area carefully before moving any debris.</li> <li>Monitor area for VOCs and radiation.</li> <li>Carefully remove any debris observing the area as the debris is removed. Observe for any objects that require investigation by the UXO-trained safety technician.</li> <li>Refer to UXO operations AHA.</li> <li>Be aware that snakes often can take shelter near objects that are on the ground. Poke around or prod before moving the object with your hands.</li> <li>Bees, hornets and wasps often nest in various objects as well as in shrubs and trees. Before disturbing any object or area look for these insects. Anticipate.</li> </ul>
Handling contaminated soil, lead acid batteries, waste fluids from vehicles	Potential exposure to chemical hazards	<ul style="list-style-type: none"> <li>Perform air monitoring</li> <li>Wear required PPE.</li> </ul>

Equipment to be Used	Inspection Requirements	Training Requirements
Heavy equipment, hand tools, power tools	Daily or before use.	<ul style="list-style-type: none"> <li>Only trained equipment operators may operate heavy equipment; only Department of Motor Vehicles-licensed personnel will operate trucks.</li> <li>Specific training for power tools, hand tools, and electrical safety.</li> <li>Persons rigging objects for lifting must have been trained on proper rigging techniques.</li> </ul>
Chains, slings, wire ropes	Prior to each use	

**Notes:**

AHA – activity hazard analysis

EHS – Environmental Health and Safety

LEL – lower explosive limit

PESM – Project Environmental Health and Safety Manager

PPE – personal protective equipment

UXO – unexploded ordnance

VOC – volatile organic compound

## HAZARD ANALYSIS #3

Activity: UXO OperationsAnalyzed By/Date: Roger Margotto 09/29/00Reviewed By: Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
UXO Operations	Contacting UXO Materials  Hand excavation  Handling of UXO  Unplanned Explosion         Slips, trips and falls         Heavy equipment operation	<ul style="list-style-type: none"> <li>• Evacuate all non-essential personnel from the area before beginning operations</li> <li>• Conduct operations only under the direct supervision of qualified UXO personnel.</li> <li>• Use remote sensing equipment when available to detect UXO.</li> <li>• Performed by UXO- qualified personnel only.</li> <li>• Conducted via visual detection and/or use of probes.</li> <li>• Ensure the UXO Supervisor is present.</li> <li>• Performed by only UXO-qualified personnel.</li> <li>• Notify UXO Supervisor.</li> <li>• Allow only UXO-qualified personnel on-site. Under no circumstances will personnel work alone.</li> <li>• Keep all spark and flame producing materials away from energetic materials.</li> <li>• Do not handle ammunition and explosives roughly or carelessly. Extra care should be taken, because in most cases the hazards of the ammunition and/or explosives increase with age, deterioration, or damage</li> <li>• Take appropriate precautions to minimize the potential of electrostatic energy.</li> <li>• Conduct operations only under favorable weather conditions.</li> <li>• Identify, remove, and avoid slip/trip/fall hazards at the start of work.</li> <li>• Wear high traction boots.</li> <li>• Practice good housekeeping.</li> <li>• Use back-up alarms and spotters to avoid injury.</li> <li>• Always make eye contact with the operator before approaching. Never approach from the operators' blind side.</li> </ul>

**HAZARD ANALYSIS #3**

**Activity:** UXO Operations      **Analyzed By/Date:** Roger Margotto 09/29/00      **Reviewed By:** Roger Margotto, CIH

<b>Equipment to be Used</b>	<b>Inspection Requirements</b>	<b>Training Requirements</b>
Heavy equipment, hand tools, power tools	Daily or before use.	<ul style="list-style-type: none"> <li>• Only trained equipment operators may operate heavy equipment; only Department of Motor Vehicles-licensed personnel will operate trucks.</li> <li>• Specific training for power tools, hand tools, and electrical safety.</li> </ul>
Specialized equipment, e.g. for defining	Prior to each use	<ul style="list-style-type: none"> <li>• Review operational procedures</li> <li>• Have the operations manual available for each piece of equipment</li> </ul>

**ALL OPERATIONS INVOLVING UXO OR POTENTIAL UXO WILL FOLLOW SAFE WORK PRACTICES AS DESCRIBED IN FWENC EHS PROGRAM 7-1 through 7-5.**

*Notes:*  
 EHS – Environmental Health and Safety  
 FWENC – Foster Wheeler Environmental Corporation  
 UXO – unexploded ordnance

## HAZARD ANALYSIS #4

Activity: Removal of Asphalt Pavement & Concrete Analyzed By/Date: Roger Margotto 09/29/00 Reviewed By: Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
Use breaker or backhoe to break concrete and asphalt	Struck by or against heavy equipment.  Noise.  Underground utilities.  Potential underground gas pockets.  Exposure to dust and flying rubble.	<ul style="list-style-type: none"> <li>• Wear high visibility reflective vests when exposed to vehicle traffic.</li> <li>• Make eye contact with operators before approaching equipment.</li> <li>• Understand and review posted hand signals.</li> <li>• Use traffic barricades, signs, flags, and backup spotters during demobilization.</li> <li>• Wear Hearing Protection</li> <li>• Verify that there are no utilities, especially water lines, which are often placed in some concrete pads.</li> <li>• Note any abnormal smell indicating the presence of gases. <b>STOP WORK!</b> Use combustible gas meter to determine if gases are flammable. If the LEL is at 10% or greater, do not continue. Contact Project Manager and PESM.</li> <li>• Use dust control techniques such as spraying with water</li> <li>• Workers on the ground should stand well back of the work area.</li> </ul>
Load and haul materials	Hauling.	<ul style="list-style-type: none"> <li>• See Hazard Analysis for Excavation and Hauling</li> </ul>

Equipment to be Used	Inspection Requirements	Training Requirements
Heavy equipment, hand tools, power tools, concrete saw	Daily or before use.	Only trained equipment operators may operate heavy equipment; only Department of Motor Vehicles-licensed personnel will operate trucks.

**Notes:**

LEL – lower explosive limit

PESM – Project Environmental Health and Safety Manager

**HAZARD ANALYSIS #5**

**Activity:** Wastewater Sampling      **Analyzed By/Date:** Roger Margotto 09/29/00      **Reviewed By:** Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
Collecting liquid samples	<p>Back strains.</p> <p>Exposure to chemical contaminants.</p> <p>Slips, trips, and falls.</p> <p>Strains from use of tools such as shovels.</p>	<ul style="list-style-type: none"> <li>• Follow EHS Procedure 3-1 "Ergonomics".</li> <li>• Avoid prolonged repetitive motion. Rotate job tasks with other workers.</li> <li>• Use pivot and shift technique when shoveling soil into buckets.</li> <li>• Get help or use mechanical lifting devices for heavy loads.</li> <li>• Wear required PPE and respiratory protection as specified in the SHSP.</li> <li>• Visual inspection and ambient air monitoring will determine selection of PPE and respiratory protection.</li> <li>• Remove PPE properly and wash hands.</li> <li>• Maintain good housekeeping as per EHS Procedure 3-8 "Fall Protection".</li> <li>• Mark or remove all identified trip and slip hazards.</li> <li>• Maintain proper illumination in work areas.</li> <li>• Inspect all tools for damage before use.</li> <li>• Do not use damaged tools "out of service" and tag "out of service".</li> <li>• Maintain steady pace and follow the rest periods given on the job.</li> <li>• Use appropriate tools for the task and maintain in good condition.</li> </ul>
Sample handling	Atmospheric and contact hazards from contaminated soil and/or liquid samples.	<ul style="list-style-type: none"> <li>• Wear required PPE and respiratory protection.</li> <li>• Selection of PPE and respiratory protection will be determined by visual inspection and ambient air monitoring.</li> <li>• Decontaminate exteriors of sample containers. Avoid spills. Insure spill cleanup supplies are available.</li> </ul>

**HAZARD ANALYSIS #5**

**Activity:** Wastewater Sampling      **Analyzed By/Date:** Roger Margotto 09/29/00      **Reviewed By:** Roger Margotto, CIH

<b>Equipment to be Used</b>	<b>Inspection Requirements</b>	<b>Training Requirements</b>
Hand tools	Daily and before use.	<ul style="list-style-type: none"> <li>• Specific training for hand tools.</li> </ul>
Backhoe, hand tools, high-pressure water washer	Daily and before use.	<ul style="list-style-type: none"> <li>• Only trained equipment operators may operate heavy equipment; only Department of Motor Vehicles-licensed personnel will operate trucks.</li> <li>• Specific training for power tools, hand tools, and electrical safety.</li> </ul>

**Notes:**

EHS – Environmental Health and Safety  
 PPE – personal protective equipment  
 SHSP – Site-Specific Health and Safety Plan

## HAZARD ANALYSIS #6

**Activity:** Demobilization and Site Restoration      **Analyzed By/Date:** Roger Margotto 09/29/00      **Reviewed By:** Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
Decontaminate equipment	<p>Atmospheric and contact hazards.</p> <p>Slip, trip, and fall hazards.</p> <p>Exposure to high temperatures.</p> <p>Strains from manually moving materials and equipment.</p>	<ul style="list-style-type: none"> <li>• Wear required PPE.</li> <li>• Use ambient air monitoring and visual monitoring to verify PPE selection.</li> <li>• Visually inspect work areas and slip, trip, and fall hazards will be marked, barricaded, or eliminated as feasible.</li> <li>• Maintain proper illumination in all work areas.</li> <li>• Refer to EHS Procedure 3-8 "Fall Protection".</li> <li>• Monitor for heat stress in accordance with EHS Procedure 4-6 "Temperature Extremes"</li> <li>• Maintain fluid intake, take breaks as needed.</li> <li>• Use proper lifting techniques such as keep back straight, lift with legs, limit twisting, and get help in moving bulky/heavy materials and equipment.</li> <li>• Use of lifting devices whenever possible.</li> <li>• Refer to EHS Procedure 3-1 "Ergonomics".</li> <li>• Do not lift more than 50-pounds without help.</li> </ul>
Demobilization and site restoration	<p>Struck by or against heavy equipment.</p> <p>Electrocution.</p>	<ul style="list-style-type: none"> <li>• Wear high visibility reflective vests when exposed to vehicle traffic. Make eye contact with operators before approaching equipment.</li> <li>• Understand and review posted hand signals.</li> <li>• Use traffic barricades, signs, flags, and backup spotters during demobilization.</li> <li>• Allow only qualified electricians to disconnect electrical circuits.</li> <li>• Inspect all extension cords daily for structural integrity, ground continuity, and damaged areas.</li> <li>• Document extension cord inspection.</li> <li>• Use GFCI on all outdoor 115 to 120 volt, 20 ampere or less, circuits.</li> </ul>

**HAZARD ANALYSIS #6**

**Activity:** Demobilization and Site Restoration      **Analyzed By/Date:** Roger Margotto 09/29/00      **Reviewed By:** Roger Margotto, CIH

Principal Steps	Potential Hazards	Recommended Controls
	<p>Struck by or against heavy equipment.</p> <p>Material handling.</p> <p>Strains from manually moving materials and equipment.</p>	<ul style="list-style-type: none"> <li>• Cover or elevate electric wire or flexible cord passing through work area to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.</li> <li>• Keep plugs and receptacles out of water unless they are approved submersible type.</li> <li>• Ground all electrical circuits in accordance with the National Electrical Code or other applicable regulations or standards.</li> <li>• Temporary wiring is not allowed to pass through walls, doors, windows (extension cords are one type of temporary wiring).</li> <li>• Wear high visibility reflective vests.</li> <li>• Make eye contact with operators before approaching equipment.</li> <li>• Understand and review posted hand signals.</li> <li>• Use traffic barricades, signs, flags, and backup spotters during demobilization.</li> <li>• Identify and avoid pinch points.</li> <li>• Maintain communication with others involved in material handling.</li> <li>• Use appropriate PPE.</li> <li>• Use proper lifting techniques such as keep back straight, lift with legs, limit twisting, and get help in moving bulky/heavy materials and equipment.</li> <li>• Use lifting devices whenever possible.</li> <li>• Refer to EHS Procedure 3-1 "Ergonomics".</li> </ul>

**HAZARD ANALYSIS #6**

**Activity:** Demobilization and Site Restoration      **Analyzed By/Date:** Roger Margotto 09/29/00      **Reviewed By:** Roger Margotto, CIH

<b>Equipment to be Used</b>	<b>Inspection Requirements</b>	<b>Training Requirements</b>
Heavy equipment, hand tools, power tools	Daily or before use.	<ul style="list-style-type: none"> <li>• Only trained equipment operators may operate heavy equipment; only Department of Motor Vehicles-licensed personnel will operate trucks.</li> <li>• Specific training for power tools, hand tools, and electrical safety.</li> </ul>

**Notes:**

GFCI – ground fault circuit interrupters  
 EHS – Environmental Health and Safety  
 PPE – personal protective equipment

**ATTACHMENT 3**

**FORMS**

**DAILY BRIEFING SIGN-IN SHEET**



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**  
**DAILY BRIEFING SIGN-IN SHEET**

Date: \_\_\_\_\_ Project Name/Location: \_\_\_\_\_

Shift/Department: \_\_\_\_\_ Person Conducting Briefing: \_\_\_\_\_

**1. AWARENESS (e.g., special EHS concerns, pollution prevention, recent incidents, etc.):**

---

---

---

---

**2. OTHER ISSUES (EHS Plan changes, attendee comments, etc.):**

---

---

---

**3. ATTENDEES (Print Name):**

1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
10.	30.
11.	31.
12.	32.
13.	33.
14.	34.
15.	35.
16.	36.
17.	37.
18.	38.
19.	39.
20.	40.

Daily Briefing Sign-In Sheet (Continued)

41.	56.
42.	57.
43.	58.
44.	59.
45.	60.
46.	61.
47.	62.
48.	63.
49.	64.
50.	65.
51.	66.
52.	67.
53.	68.
54.	69.
55.	70.

Give completed documentation to ESO.

**SITE SAFETY BRIEFING FORM**

# SITE SAFETY BRIEFING FORM

Site: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

OFS No. \_\_\_\_\_

Task: \_\_\_\_\_

Health/Safety Officer: \_\_\_\_\_

Person Providing Briefing: \_\_\_\_\_

## TOPICS:

- Site SHSP
- Chemical Hazards
- Equipment Hazards
- Electrical Hazards
- Heat Stress
- Personal Decontamination
- Personal Hygiene
- Employee Rights/Responsibilities
- Hazard Evaluations
- Emergency Response Procedures

**PERSONS IN ATTENDANCE:**  
(Name/Organization)

---

---

---

---

---

---

---

---

**PERSONS IN ATTENDANCE:**  
(Name/Organization)

---

---

---

---

---

---

---

---

## NOTES/COMMENTS:

---

---

---

---

---

---

**FIELD TEAM REVIEW SHEET**



**ATTACHMENT 4**  
**SITE-WIDE HEALTH AND SAFETY PLAN**

**MEDICAL DATA SHEET**

# MEDICAL DATA SHEET

**Project:** \_\_\_\_\_

**Name:** \_\_\_\_\_

**Home Telephone Number:** \_\_\_\_\_

**Home Address:** \_\_\_\_\_

**Age:** \_\_\_\_\_ **Height:** \_\_\_\_\_ **Weight:** \_\_\_\_\_ **Blood Type:** \_\_\_\_\_

**Name of Emergency Contact:** \_\_\_\_\_

**Telephone Number of Emergency Contact:** \_\_\_\_\_

**Drug or Other Allergies:** \_\_\_\_\_

**Particular Sensitivities:** \_\_\_\_\_

**Do you wear contact lenses?** \_\_\_\_\_

**Provide a checklist of previous illness or exposures to hazardous chemicals:** \_\_\_\_\_

**What medications are you presently using?** \_\_\_\_\_

**Do you have any medical restrictions? If yes, explain:** \_\_\_\_\_

**Name, address, and phone number of personal physician:** \_\_\_\_\_

**ACCIDENT/INCIDENT REPORT FORMS**



CORPORATE ESQ REPORT # \_\_\_\_\_

**FOSTER WHEELER ENVIRONMENTAL CORPORATION****FOSTER WHEELER ENVIRONMENTAL CORPORATION  
INCIDENT/NEAR MISS REPORT AND INVESTIGATION****TYPE OF INCIDENT - CHECK ALL THAT APPLY**

- |   |  |   |                                |
|---|--|---|--------------------------------|
| <input type="checkbox"/> INJURY/ILLNESS | <input type="checkbox"/> VEHICLE DAMAGE    | <input type="checkbox"/> PROPERTY DAMAGE                    | <input type="checkbox"/> FIRE  |
| <input type="checkbox"/> SPILL/RELEASE  | <input type="checkbox"/> PERMIT EXCEEDENCE | <input type="checkbox"/> HIGH LOSS POTENTIAL<br>(NEAR MISS) | <input type="checkbox"/> OTHER |

**1. GENERAL INFORMATION**

PROJECT/OFFICE:	REPORT #:	DATE OF REPORT:
DATE OF INCIDENT:	MILITARY TIME: ____	DAY OF WEEK: ____
FW SUPERVISOR ON DUTY:	AT SCENE OF INCIDENT: <input type="checkbox"/> YES <input type="checkbox"/> NO	
LOCATION OF INCIDENT:		
WEATHER CONDITIONS:	ADEQUATE LIGHTING AT SCENE:	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A

**DESCRIBE WHAT HAPPENED (STEP BY STEP - use additional pages if necessary)****AFFECTED EMPLOYEE INFORMATION**

(Include injured person, driver/operator, or employee whose activities resulted in the incident. Use another page to provide information for additional employees)

NAME:	FWENC EMPLOYEE:	<input type="checkbox"/> YES <input type="checkbox"/> NO
HOME ADDRESS:		
SOCIAL SECURITY #:	HOME PHONE #:	
JOB CLASSIFICATION:	YEARS IN JOB CLASSIFICATION:	
HOURS WORKED ON SHIFT PRIOR TO INCIDENT:	YEARS WITH FWENC:	AGE:
DID INCIDENT RELATE TO ROUTINE TASK FOR JOB CLASSIFICATION: <input type="checkbox"/> YES <input type="checkbox"/> NO		

**INJURY/ILLNESS INFORMATION**

NATURE OF INJURY OR ILLNESS:

---

OBJECT/EQUIPMENT/SUBSTANCE CAUSING HARM:

FIRST AID PROVIDED:  YES  NO

IF YES, WHERE WAS IT GIVEN:  ON SITE  OFF SITE

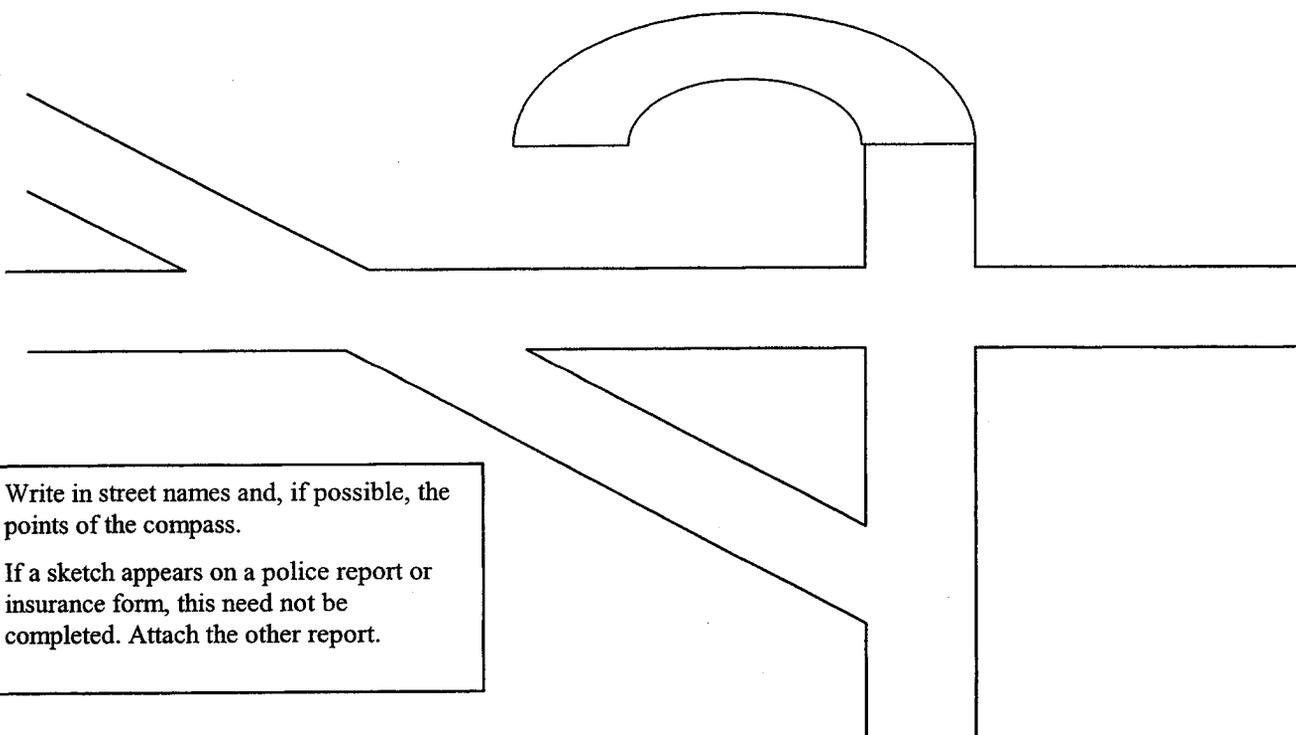
IF YES, WHO PROVIDED FIRST AID:

WILL THE INJURY/ILLNESS RESULT IN:  RESTRICTED DUTY  LOST TIME  UNKNOWN

<b>MEDICAL TREATMENT INFORMATION</b>		
WAS MEDICAL TREATMENT PROVIDED?:	<input type="checkbox"/> YES	<input type="checkbox"/> NO
IF YES, WAS MEDICAL TREATMENT PROVIDED:	<input type="checkbox"/> ON SITE	<input type="checkbox"/> DR.'S OFFICE <input type="checkbox"/> HOSPITAL
NAME OF PERSON(S) PROVIDING TREATMENT:		
ADDRESS WHERE TREATMENT WAS PROVIDED:		
TYPE OF TREATMENT:		
<b>VEHICLE AND PROPERTY DAMAGE INFORMATION</b>		
VEHICLE/PROPERTY DAMAGED:		
DESCRIPTION OF DAMAGE:		
<b>SPILL AND AIR EMISSIONS INFORMATION</b>		
SUBSTANCE SPILLED OR RELEASED:	FROM WHERE:	TO WHERE:
ESTIMATED QUANTITY/DURATION:		
CERCLA HAZARDOUS SUBSTANCE? YES <input type="checkbox"/> NO <input type="checkbox"/> RQ EXCEEDED? YES <input type="checkbox"/> NO <input type="checkbox"/> SPECIFY: _____		
REPORTABLE TO AGENCY? YES <input type="checkbox"/> NO <input type="checkbox"/> SPECIFY: _____		
WRITTEN REPORT? YES <input type="checkbox"/> NO <input type="checkbox"/> TIME FRAME: _____		
RESPONSE ACTION TAKEN		
<b>PERMIT EXCEEDENCE</b>		
TYPE OF PERMIT:	PERMIT #:	
DATE OF EXCEEDENCE:	DATE FIRST KNOWLEDGE OF EXCEEDENCE:	
PERMITTED LEVEL OR CRITERIA (e.g., Water quality):		
EXCEEDENCE LEVEL OR CRITERIA:	EXCEEDENCE DURATION:	
REPORTABLE TO AGENCY? YES <input type="checkbox"/> NO <input type="checkbox"/> SPECIFY: _____		
WRITTEN REPORT? YES <input type="checkbox"/> NO <input type="checkbox"/> TIME FRAME: _____		
RESPONSE ACTION TAKEN:		
<b>NOTIFICATIONS</b>		
NAME(S) OF FWENC PERSONNEL NOTIFIED:	DATE/TIME:	
CLIENT NOTIFIED:	DATE/TIME:	
AGENCY NOTIFIED:	DATE/TIME:	<input type="checkbox"/> NOT REQUIRED
CONTACT NAME:		
<b>PERSONS PREPARING REPORT</b>		
EMPLOYEE'S NAME: (PRINT)	SIGN:	
EMPLOYEE'S NAME (PRINT)	SIGN:	
SUPERVISOR'S NAME: (PRINT)	SIGN:	
<b>NOTE: Supervisor to forward a copy of Incident Report to immediate supervisor, PESM, ESS or ESC, and other personnel as identified in Table 1 of this procedure ASAP, but no later than 24 hours.</b>		

## INCIDENT SKETCH


## VEHICLE INCIDENTS



# INVESTIGATIVE REPORT

DATE OF INCIDENT: \_\_\_\_\_

DATE OF INVESTIGATION REPORT: \_\_\_\_\_

<b>INCIDENT COST:</b>		ESTIMATED: \$ _____	ACTUAL: \$ _____
<b>OSHA RECORDABLE(S):</b>		<input type="checkbox"/> YES <input type="checkbox"/> NO	# RESTRICTED DAYS _____ # DAYS AWAY FROM WORK _____
<b>CAUSE ANALYSIS</b>			
<b>Was the activity addressed in an AHA?</b>		<input type="checkbox"/> YES (Attach a copy)	<input type="checkbox"/> NO
<b>IMMEDIATE CAUSES</b> – WHAT ACTIONS AND CONDITIONS CONTRIBUTED TO THIS EVENT? (USE NEXT PAGE)			
<b>BASIC CAUSES</b> - WHAT SPECIFIC PERSONAL OR JOB FACTORS CONTRIBUTED TO THIS EVENT? (USE NEXT PAGE)			
<b>ACTION PLAN</b>			
<b>REMEDIAL ACTIONS</b> - WHAT HAS AND OR SHOULD BE DONE TO CONTROL EACH OF THE CAUSES LISTED? INCLUDE MANAGEMENT PROGRAMS (SEE ATTACHED LIST) FOR CONTROL OF INCIDENTS IF APPLICABLE.			
ACTION	PERSON RESPONSIBLE	TARGET DATE	COMPLETION DATE
<b>PERSONS PERFORMING INVESTIGATION</b>			
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
<b>MANAGEMENT REVIEW</b>			
PROJECT/OFFICE MANAGER (PRINT)	SIGN:		
COMMENTS:			
PESM or ESC (PRINT)	SIGN:		
COMMENTS:			
<b>NOTE:</b> Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or OM, PESM or ESC ASAP, but no later than 72 hours after the incident. A copy shall be sent to the Director, Health and Safety Programs within 24 hours of completion of the report.			

**EXAMPLES OF IMMEDIATE CAUSES**

SUBSTANDARD ACTIONS

1. OPERATING EQUIPMENT WITHOUT AUTHORITY
2. FAILURE TO WARN
3. FAILURE TO SECURE
4. OPERATING AT IMPROPER SPEED
5. MAKING SAFETY DEVICES INOPERABLE
6. REMOVING SAFETY DEVICES
7. USING DEFECTIVE EQUIPMENT
8. FAILURE TO USE PPE PROPERLY
9. IMPROPER LOADING
10. IMPROPER PLACEMENT
11. IMPROPER LIFTING
12. IMPROPER POSITION FOR TASK
13. SERVICING EQUIPMENT IN OPERATION
14. UNDER INFLUENCE OF ALCOHOL/DRUGS
15. HORSEPLAY

SUBSTANDARD CONDITIONS

1. GUARDS OR BARRIERS
2. PROTECTIVE EQUIPMENT
3. TOOLS, EQUIPMENT, OR MATERIALS
4. CONGESTION
5. WARNING SYSTEM
6. FIRE AND EXPLOSION HAZARDS
7. POOR HOUSEKEEPING
8. NOISE EXPOSURE
9. EXPOSURE TO HAZARDOUS MATERIALS
10. EXTREME TEMPERATURE EXPOSURE
11. ILLUMINATION
12. VENTILATION
13. VISIBILITY

**EXAMPLES OF BASIC CAUSES**

PERSONAL FACTORS

1. CAPABILITY
2. KNOWLEDGE
3. SKILL
4. STRESS
5. MOTIVATION

JOB FACTORS

1. SUPERVISION
2. ENGINEERING
3. PURCHASING
4. MAINTENANCE
5. TOOLS/EQUIPMENT
6. WORK STANDARDS
7. WEAR AND TEAR
8. ABUSE OR MISUSE

**MANAGEMENT PROGRAMS FOR CONTROL OF INCIDENTS**

- |   |  |
|---|--|
| <ol style="list-style-type: none"><li>1. LEADERSHIP AND ADMINISTRATION</li><li>2. MANAGEMENT TRAINING</li><li>3. PLANNED INSPECTIONS</li><li>4. TASK ANALYSIS AND PROCEDURES</li><li>5. TASK OBSERVATION</li><li>6. EMERGENCY PREPAREDNESS</li><li>7. ORGANIZATIONAL RULES</li><li>8. ACCIDENT/INCIDENT ANALYSIS</li><li>9. PERSONAL PROTECTIVE EQUIPMENT</li></ol> | <ol style="list-style-type: none"><li>10. HEALTH CONTROL</li><li>11. PROGRAM AUDITS</li><li>12. ENGINEERING CONTROLS</li><li>13. PERSONAL COMMUNICATIONS</li><li>14. GROUP MEETINGS</li><li>15. GENERAL PROMOTION</li><li>16. HIRING AND PLACEMENT</li><li>17. PURCHASING CONTROLS</li></ol> |
|---|--|

**NOTIFICATION REMINDER**

Fatalities or hospitalization (admittance) of three or more individuals requires notification to OSHA within 8 hours. Contact the Director, Health and Safety Programs or Director, ESQ Programs to make the notification. If unavailable, the senior operations person on site should make the notification.

## Incident/Near Miss Report and Investigation Instructions

**General:** The incident report (pages 1 and 2) must be completed within 24 hours. Do not delay the report if any information is unknown. It can be provided later by revising the Report.

**Type of Incident:** Check all that apply. A High Loss Potential (Near Miss) incident is one that does not result in loss, but under slightly different circumstances, could have resulted in an OSHA Recordable injury, spill, release, permit exceedence, fire, or vehicle/property damage in excess of \$500. All High Loss Potential (Near Miss) incidents are to be investigated.

### General Information

**Project/Office:** If the incident occurs on a delivery order contract, give the contract/program name, DO# and location. If the incident occurs on a C&E field project, give the Office location managing the project as well as the project/location.

**Report No.:** Optional numbering field for offices/projects.

**FW Supervisor:** The Foster Wheeler Supervisor responsible for the work effort involving the incident. Do not give a subcontractor supervisor or craft foreman name. If a Foster Wheeler Supervisor was the Affected Employee, this field should contain the name of his or her supervisor. The Supervisor is the project supervisor if the incident happens on a project, or the administrative supervisor if the incident happens in the office. E.g., a geologist, acting as an FOL gets injured on a job site, or in a motor vehicle in the course of project work. The FW Supervisor is most likely the Project Manager. If the same geologist gets injured lifting a box in his office, the FW Supervisor is likely the Office Science Lead.

**Location of Incident:** The specific location on the project, in the office, or off-site location.

**Weather Conditions:** Temperature, precipitation, approximate wind speed and direction, cloud cover, relative humidity. This information may be included in the description section, and must be given in detail whenever it is a factor in the cause or impact, e.g., spill, release, heat stress, wind blown material.

**Describe What Happened:** This section must be completed in sufficient detail to adequately describe the events and conditions leading up to and resulting from the incident. Try to answer the questions who, what, where, when, and how. This information is then used to determine why (cause). Provide details such as work objective, procedure being used, body position, and PPE. Include diagrams or sketches for all incidents involving vehicles/equipment and other incidents where they aid in providing detail or perspective. Consider attaching photographs. Follow the guidelines in Practical Loss

Control Leadership, and consider the impact of each of the following:

P - People  
E - Equipment  
M - Material  
E - Environment

To do an effective job, a visual inspection of the scene is usually necessary along with private interviews of affected employees and witnesses.

Where appropriate, use terms indicating the type of contact, e.g., struck by; struck against; fall from elevation; fall on same level; caught in; caught between or under; caught on; contact with; overstress; equipment failure; environmental release; fire.

### Affected Employee Information

**FWENC Employee:** Direct hire, whether professional, administrative, or craft; full-time or part-time; permanent or temporary. If the affected employee is not a FWENC employee, give the name of the employer and business relationship (e.g., client, subcontractor) in the description section above.

**Hours Worked on Shift Prior to the Incident:** Only include the amount of time the employee worked that shift or day prior to the incident.

**Years with FWENC:** For FWENC employees, give the number of years employed with FWENC. If the employee has worked for FWENC for less than a year, do not write <1. Give the answer in fraction of year, or specify the number of months, e.g., 0.1 or 1 month.

### Injury/Illness Information

**Nature of Injury or Illness:** If the incident resulted in an injury or illness, give a brief description of the body part affected and type of injury or illness, e.g., fractured thumb, left hand; carpal tunnel syndrome, right hand.

**First Aid Provided:** First Aid is any treatment that does not have to be provided by a health care professional, even if it is. E.g., a laceration that is cleaned and bandaged in a clinic may constitute first aid, if sutures are not given.

**Will the Injury Result In:** Do not delay the report if this information is unknown.

### Medical Treatment Information

**Was Medical Treatment Provided?** Medical treatment is that treatment that must be provided by a licensed medical practitioner, e.g., sutures, prescription medication, etc.

**Type of Treatment:** This information is important in determining OSHA recordability, since some forms of treatment would not constitute a Recordable case (e.g., one-time administration of prescriptions, negative diagnostic exams). Attach a copy of the treating professional's statement/work release.

### Vehicle and Property Damage Information

**Vehicle/Property Damaged:** For vehicles, indicate VIN and whether it is company owned or leased, business trip rental (Avis) or owned by others.

**Description of Damage:** Be specific as to the identity of damaged part, location and extent.

### Spill and Air Emissions Information

**Substance Spilled or Released:** For pure substances, list materials by common name/chemical. For wastes, indicate waste code. For mixtures or contaminated media, provide contaminant name, CAS No., concentration.

**RQ Exceeded?** Reportable quantity. Contact your ESQ representative for guidance. Specify the RQ for the material, whether you answer yes or no.

**Reportable to Agency?** If yes, specify the federal, state or local agency that must be provided with verbal and/or written notification.

**Written Report?** Answer yes if the release requires a written report to be filed and note the time frame.

**Response Action Taken:** Describe the mitigation efforts, as well as any reports made, beyond initial notification.

### Permit Exceedence

**Type of Permit:** List name of permit including the agency name where applicable (e.g., NPDES, PSAPCA NOC)

**Date of Exceedence:** Specify date exceedence occurred (e.g., date discharge in excess of permit limits occurred)

**Date First Knowledge of Exceedence:** Specify date when first knew there was an exceedence (i.e., date analytical received). This date may be different from the date of the exceedence listed above.

**Permitted Level or Criteria:** List numerical discharge or emission limit or narrative criteria specified in the permit (e.g.,

20% opacity limit, Best Management Practices (BMP) implementation per SWPPP).

**Exceedence Level or Criteria:** Specify actual numerical discharge/emission limit or narrative criteria which was exceeded (e.g., 22% opacity, failure of BMPs (silt fencing collapse) per SWPPP)

**Exceedence Duration:** Specify time frame by date and hours (using military time) during which exceedence occurred.

See "Spill/Release Information" (above) for description of remaining questions.

### Persons Preparing Report

**Employee's Name:** The affected employee described on page 1 should review the report and sign here, as well as other employees witnessing or involved in the incident.

**Supervisor's Name:** The FWENC Supervisor must review and sign the report indicating agreement. The FWENC Supervisor and the Investigator (next page) should be the same person.

### Investigative Report

**Report No.:** This is the same as the project/office optional report number from page 1 of the Incident/Near Miss Report.

**Date of Investigative Report:** This date should be within 72 hours of the incident. In cases where the investigation is not completed until a later date, submit the incomplete report within the 72 hours, and a revised report should be submitted when the missing information is obtained.

**Incident Cost:** For all vehicle/equipment or property damage cases, an estimated or actual loss value must be entered. If an estimated value is entered, the report must be revised when the actual costs are known.

**OSHA Recordables:** This section should be completed in consultation with the PESM. If it cannot be determined at the time of the report, the PESM should consult with the Director, Health and Safety Programs and revise the report when a determination is made.

**No. of Restricted Days:** This relates to days of restricted work activity, not restrictions on motion or physical capability. If the employee is capable of doing his normal job the day after the injury and thereafter, there are no restricted days, even if the physician indicates a physical restriction. It does not include the day of the injury.

**No. of Days Away from Work:** The number of days after the day of the injury that the employee was scheduled to work but could not due to an occupational injury. If the treating physician releases an employee to return to work, but the employee chooses not to come to work, do not count those

days. In this case the PESM should contact the Director, Health and Safety Programs.

### Cause Analysis

**Immediate Causes:** Determine the immediate causes, using the example on page 4. If one or more of the examples fits the circumstance, use those words in the cause description. This facilitates statistical analysis of the incident database for program evaluation/modification. However, do not confine your cause determination to the guide words. Explain, e.g., Improper Lifting – employee attempted to lift box by bending at the waist and twisting while lifting. Be sure that the incident description on page 1 is sufficiently detailed to support the causal analysis in this section. An assumption of cause (e.g., improper lifting) from the injury (low back pain) is not acceptable.

**Basic Causes:** Like the Immediate Causes, use the guide words in the attachment whenever appropriate and explain. For example, improper motivation may be because the correct way takes more time or effort; short cutting standard procedure is tolerated or positively reinforced; or the person thinks there is no personal benefit to always doing the job correctly.

**Note:** The investigator is encouraged to review the Practical Loss Control Leadership chapters on *Causes and Effects of Loss* and *Accident/Incident Investigation* before doing the causal analysis. As a check, the investigator may refer to the S.C.A.T. Chart available from the PESM.

**Remedial Actions:** Include all actions taken or those that should be taken to prevent recurrence. Be sure that actions address the causes. For example, training (safety meetings) may be a necessary response for lack of knowledge, but may be inadequate for improper motivation. If completion dates exceed the 72 hours reporting period, a revised report must be submitted when all remedial actions are complete.

**Persons Performing Investigation:** The primary investigator is the FWENC Supervisor in charge of the work where the incident occurred. Others participating in the investigation, such as the Project Manager, ESS, QC, site engineer, foreman, etc. should also sign the report.

**Management Review:** The Project or Office Manager and the PESM or office ESC must sign the report indicating their satisfaction with thoroughness of the investigation and the report, and their concurrence that the action items address the identified causes. This constitutes the peer review, and the report, particularly the description, should be clear to readers not familiar with the project or incident.

**SITE SAFETY PLAN CHANGE APPROVAL FORM**



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

**SITE SAFETY PLAN CHANGE APPROVAL FORM**

**N68711-98-D-5713**

**CTO:** \_\_\_\_\_

**Date** \_\_\_\_\_ **Amendment Number** \_\_\_\_\_

**Project Name:** \_\_\_\_\_ **Project Number:** \_\_\_\_\_

**Section of SHSP:** \_\_\_\_\_ **Page Number:** \_\_\_\_\_

**Change to read:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Reason for change:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Approvals:** \_\_\_\_\_

**Project Superintendent or Manager**

**SSHS**

**PESM (CIH)**

**Southwest Division  
Naval Facilities Engineering Command  
Contracts Department  
1220 Pacific Highway, Building 127, Room 112  
San Diego, California 92132-5190**

**CONTRACT NO. N68711-98-D-5713  
CTO No. 0022**

**FINAL  
SITE-WIDE HEALTH AND SAFETY PLAN  
Revision 0  
May 7, 1999**

**MARINE CORPS AIR STATION EL TORO  
EL TORO, CALIFORNIA**

**DCN: FWSD-RAC-00-0743**



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

**1230 Columbia Street, Suite 640  
San Diego, CA 92101**

*Roger M Margotto*

---

**Roger Margotto, CIH  
Program Health and Safety Manager**

# TABLE OF CONTENTS

	<u>PAGE</u>
LIST OF FIGURES .....	iv
LIST OF ACRONYMS .....	v
1.0 INTRODUCTION .....	1-1
1.1 PURPOSE AND SCOPE .....	1-1
1.2 APPLICATION.....	1-1
1.3 APPLICABLE STANDARDS, REGULATIONS, AND GUIDANCE DOCUMENTS .....	1-1
1.4 SUMMARY OF MAJOR RISKS .....	1-2
2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES .....	2-1
2.1 PROGRAM MANAGER.....	2-1
2.2 PROJECT MANAGER.....	2-1
2.3 PROJECT SUPERINTENDENT .....	2-1
2.4 PROJECT ENVIRONMENTAL HEALTH AND SAFETY MANAGER .....	2-1
2.5 SITE HEALTH AND SAFETY SPECIALIST (SHSS) .....	2-2
2.6 SITE PERSONNEL .....	2-3
2.7 SUBCONTRACTED PERSONNEL AND THIRD PARTIES .....	2-3
3.0 SITE HISTORY AND PROJECT DESCRIPTION .....	3-1
4.0 POTENTIAL HAZARDS.....	4-1
4.1 CHEMICAL HAZARDS .....	4-1
4.1.1 Hazard Communication Program .....	4-2
4.2 ENVIRONMENTAL HAZARDS .....	4-2
4.2.1 Weather and Heat Stress .....	4-2
4.2.2 Hearing Conservation Program.....	4-3
4.2.3 Biological Hazards.....	4-3
4.2.4 Storm Protection .....	4-4
4.3 PHYSICAL HAZARDS.....	4-5
4.3.1 Tripping, Slipping, and Falling Hazards.....	4-5
4.3.2 Head and Back Injuries.....	4-5
4.3.3 Falling Objects.....	4-5
4.3.4 Heavy Equipment and Traffic.....	4-6
4.3.5 Electrical Hazards .....	4-7
4.3.6 Confined Space Entry .....	4-7
4.3.7 Fire and Explosion Hazards .....	4-7
4.3.8 Drilling.....	4-7
4.3.9 Overhead Electrical Hazards.....	4-8
4.3.10 Excavation Safety .....	4-8

# TABLE OF CONTENTS

(Continued)

	<u>PAGE</u>
5.0 ACTIVITY HAZARD ANALYSES .....	5-1
6.0 PERSONAL PROTECTIVE EQUIPMENT .....	6-1
7.0 AIR AND NOISE MONITORING .....	7-1
8.0 SITE CONTROL .....	8-1
8.1 EXCLUSION ZONE.....	8-1
8.2 CONTAMINATION REDUCTION ZONE .....	8-1
8.2.1 Decontamination Procedures .....	8-2
8.2.2 Personal Decontamination .....	8-2
8.2.3 Equipment Decontamination .....	8-3
8.3 SUPPORT ZONE.....	8-4
9.0 MEDICAL SURVEILLANCE PROCEDURES .....	9-1
10.0 SAFETY CONSIDERATIONS.....	10-1
10.1 VEHICLE AND EQUIPMENT OPERATIONS: .....	10-1
10.2 MISCELLANEOUS SAFETY CONSIDERATIONS.....	10-2
10.2.1 General Information.....	10-2
10.2.2 Housekeeping.....	10-2
10.2.3 Fire Prevention.....	10-2
10.2.4 Personal Protective Equipment .....	10-3
10.2.5 Hand Tools.....	10-3
10.2.6 Material Hoists.....	10-4
10.2.7 Crane .....	10-4
10.2.8 Forklifts.....	10-4
10.2.9 Mechanical Material Handling .....	10-5
10.2.10 Manual Material Handling.....	10-5
10.2.11 Overhead Work.....	10-5
10.2.12 Portable Ladders .....	10-5
10.2.13 Compressed Gas Cylinders.....	10-6
10.2.14 Welding and Burning.....	10-6
10.2.15 Electricity.....	10-7
10.2.16 Decontamination.....	10-7
10.3 ERGONOMIC CONSIDERATIONS .....	10-8
11.0 DISPOSAL PROCEDURES .....	11-1
12.0 EMERGENCY RESPONSE PLAN .....	12-1
12.1 RESPONSIBILITIES .....	12-1
12.2 COMMUNICATIONS.....	12-1
12.3 ACCIDENT/INCIDENT REPORT .....	12-2

# TABLE OF CONTENTS

(Continued)

	<u>PAGE</u>
12.4 PRE-EMERGENCY PLANNING .....	12-2
12.5 EMERGENCY MEDICAL TREATMENT .....	12-2
12.5.1 First Aid .....	12-2
12.5.2 Minor Injury .....	12-3
12.5.3 Medical Emergency .....	12-3
12.5.4 Fatal Injury .....	12-3
12.6 DECONTAMINATION DURING MEDICAL EMERGENCIES .....	12-4
12.7 EMERGENCY SITE EVACUATION PROCEDURES .....	12-4
12.8 FIRE PREVENTION AND PROTECTION .....	12-5
12.9 SPILL CONTROL AND RESPONSE .....	12-5
12.9.1 Release Prevention and Minimization Measures .....	12-6
12.10 SIGNIFICANT VAPOR RELEASE .....	12-6
12.11 EARTHQUAKE RESPONSE .....	12-6
12.12 EMERGENCY EQUIPMENT .....	12-7
12.13 POSTINGS .....	12-8
13.0 TRAINING .....	13-1
13.1 MANAGER/SUPERVISOR TRAINING .....	13-1
13.2 ANNUAL 8-HOUR REFRESHER TRAINING .....	13-1
13.3 SITE-SPECIFIC TRAINING .....	13-1
13.4 ON-SITE SAFETY BRIEFINGS .....	13-2
13.5 FIRST AID AND CPR .....	13-2
14.0 LOGS, REPORTS, AND RECORDKEEPING .....	14-1
14.1 SITE HEALTH AND SAFETY PLAN CHANGE APPROVAL FORM .....	14-1
14.2 MEDICAL AND TRAINING RECORDS .....	14-1
14.3 ON-SITE LOG .....	14-1
14.4 EXPOSURE RECORDS .....	14-1
14.5 ACCIDENT/INCIDENT REPORTS .....	14-2
14.6 OSHA FORM 200 .....	14-2
14.7 HEALTH AND SAFETY FIELD LOG BOOKS .....	14-2
14.8 MATERIAL SAFETY DATA SHEETS .....	14-3
14.9 CLOSEOUT SAFETY REPORT .....	14-3
15.0 FIELD PERSONNEL REVIEW .....	15-1
16.0 REFERENCES .....	16-1

## LIST OF FIGURES

- Figure 1            MCAS El Toro Vicinity Map
- Figure 2            Route to Hospital from MCAS El Toro Main Gate

## LIST OF ACRONYMS

ABIH	American Board of Industrial Hygiene
ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
APR	Air Purifying Respirator
Cal-OSHA	California Health and Safety Administration
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
Corps	U.S. Army Corps of Engineers
COTR	Contracting Officer's Technical Representative
CPR	Cardiopulmonary Resuscitation
CRC	Contamination Reduction Corridor
CTO	Contract Task Order
EHS	Environmental Health and Safety
EPA	U.S. Environmental Protection Agency
ESQ	Environmental Safety and Quality
ESS	Environment Safety Specialist
FCR	Field Change Request
FOPS	Falling Object Protective System
Foster Wheeler Environmental	Foster Wheeler Environmental Corporation
GFCI	Ground Fault Circuit Interrupters
HEPA Filter	High Efficiency Particulate Air Filter
MCAS	Marine Corps Air Station
MSDSs	Material Safety Data Sheets
MSHA	Mine Health and Safety Administration
NIOSH	National Institute of Occupational Safety and Health
NTR	Navy Technical Representative
O <sub>2</sub>	Oxygen
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PESM	Project Environmental Health and Safety Manager
PjM	Project Manager
PM	Program Manager
PPE	Personal Protective Equipment
QC	Quality Control
RCRA	Resource Conservation and Recovery Act

## LIST OF ACRONYMS

(Continued)

ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager
RQ	Reported Quantity
SCBA	Self-contained Breathing Apparatus
SHSP	Site-Specific Health and Safety Plan
SHSS	Site Health and Safety Specialist
SWDIV	Southwest Division Naval Facilities Engineering Command
TLVs	Threshold Limit Values
TWA	Time Weighted Average
USACE	United States Army Corps of Engineers

# 1.0 INTRODUCTION

## 1.1 PURPOSE AND SCOPE

Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) has been contracted by the U.S. Navy to conduct remedial actions for the cleanup of hazardous waste sites in California, New Mexico, southern Nevada, and Arizona under Basic Contract N68711-98-D-5713. This Site-Wide Health and Safety Plan (Site-Wide Plan) applies to all work performed under this contract at Marine Corps Air Station (MCAS) El Toro. The Foster Wheeler Environmental Health and Safety Program for Marine Corps Air Station, El Toro, California consists of this document, the Foster Wheeler Environmental Corporate Health and Safety Program Manual, and Site-Specific Health and Safety Plans (SHSPs) to be written for individual Contract Task Orders (CTOs).

## 1.2 APPLICATION

The Contract Health and Safety Program is applicable to all work conducted by Foster Wheeler Environmental and Foster Wheeler Environmental subcontractors under the basic contracts and/or individual contract task orders. Essentially equivalent or additional health and safety procedures and practices may be approved by Foster Wheeler Environmental and implemented by Foster Wheeler Environmental subcontractors where necessary. Less restrictive or less conservative practices are not allowed without prior approval of the Foster Wheeler Environmental Project Environmental Health and Safety Manager (PESM) and the Navy Contracting Officer. The Foster Wheeler Environmental PESHM will review all Foster Wheeler Environmental and subcontractor SHSPs prior to the initiation of field work.

## 1.3 APPLICABLE STANDARDS, REGULATIONS, AND GUIDANCE DOCUMENTS

Adherence to applicable portions of federal, local, national consensus organization, and corporate health and safety standards, regulations, and guidance manuals is required during field activities. These include, but may not be limited to, the following:

- 29 CFR 1910, Occupational Safety and Health Standards, General Industry
- 29 CFR 1926, Occupational Safety and Health Standards, Construction Industry
- 10 CFR 20, Nuclear Regulatory Commission
- State Regulations including Title 8 California Code of Regulations (Cal-OSHA) and Title 24 California Code of Regulations (Health and Safety Code)
- Foster Wheeler Environmental Corporate Health and Safety Program Manual
- Navy/Marine Corps Installation Restoration Manual, February 1997
- U.S. Army Corps of Engineers (Corps) Safety and Health Requirements Manual, EM 385-1-1, 3 September 1996

- Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH), most current publication
- Occupational Safety and Health Guidance for Hazardous Waste Site Activities, U.S. Department of Health and Human Services et al., October 1985.

#### **1.4 SUMMARY OF MAJOR RISKS**

The SHSP for each CTO will describe the major risks for the specific work proposed in the project. Since MCAS El Toro historically supported aircraft operations, materials and wastes associated with such operations are anticipated.

## **2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES**

### **2.1 PROGRAM MANAGER**

The Program Manager (PM) has the overall responsibility for the health and safety of site personnel at all projects under this contract. The PM will ensure that adequate resources are provided to the field health and safety staff to carry out their responsibilities as outlined below. The PM will also ensure that field work is scheduled with adequate personnel and equipment resources to complete the job safely.

### **2.2 PROJECT MANAGER**

The Project Manager (PjM) is responsible for managing all technical and business aspects of the project. This includes the development of the best technical approach and budget for the contract task order scope, managing technical, cost, schedule, and project issues as work progresses, and subcontractor oversight. The PjM will also ensure that adequate personnel and resources are available to complete the project safely. The PjM will conduct monthly health and safety inspections of the job site.

### **2.3 PROJECT SUPERINTENDENT**

The Project Superintendent is responsible for ensuring that all work is performed in accordance with the contract requirements in a safe and healthful manner. The Project Superintendent will ensure that work crews have adequate resources to effectively conduct field activities, ensure [in conjunction with the Site Health and Safety Specialist (SHSS)] that proper protective equipment is being used by all personnel, enforce appropriate disciplinary actions when health and safety requirements are not being followed or when unsafe practices occur, and oversee work practices to verify they are in accordance with the SHSP. The Project Superintendent has the authority to suspend field activities if the health and safety of personnel are in danger.

The Project Superintendent will submit to the Navy COTR, upon request, copies of the certificates (or acceptable alternative documents) of most recent health and safety training required by 29 CFR 1910.120 for all the personnel who will be working on site. Copies of the training certificates (or acceptable alternative documents) will also be kept at the work site.

### **2.4 PROJECT ENVIRONMENTAL HEALTH AND SAFETY MANAGER**

The PESM is responsible for implementing and overseeing the Contract Health and Safety Program and to develop, implement, and approve all SHSPs. Any changes to the established Contract Health and Safety Program or SHSP is at the direction and approval of the PESM, with concurrence of the Navy Contracting Office. The PESM or designee will not necessarily be on site during all remedial activities, but will be readily available for consultation when required.

The PESM or designee is a Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene (ABIH). The PESM supervises and directs the activities of the SHSS. The PESM has the authority to stop unsafe operations, remove unqualified personnel from the work area, and approve changes to the SHSP. Duties of the PESM include:

- Responsible for all aspects of the SHSP from development to implementation.
- Advising the SHSS on all related health and safety aspects.
- Reviewing site-specific plans for completeness and compliance.
- Reviewing other site documents as they affect health and safety, e.g. Activity Hazard Analyses, Sampling Plans.
- Reviewing and evaluating all monitoring results.
- Establishing and monitoring all related health and safety procedures through site safety inspections and audits.

## **2.5 SITE HEALTH AND SAFETY SPECIALIST (SHSS)**

The SHSS will be present on site as required during the conduct of field operations and is responsible for all health and safety activities and the delegation of duties to the health and safety staff in the field. The SHSS is responsible for implementation of the SHSP, overseeing that appropriate personal protective equipment (PPE) is used relative to the hazard which may be encountered, verifying that communication systems are in place, monitoring conformance with safety and emergency response procedures, giving safety briefings, seeing that safety equipment is maintained, and conducting safety drills and exercises. The SHSS or designee is responsible for the setup and execution of decontamination procedures. The SHSS has stop work authorization which will be executed upon determination of an imminent safety hazard or potentially dangerous situation. Work cannot restart until clearance has been authorized by the SHSS. The SHSS is responsible for maintaining the site health and safety log books.

The SHSS possesses the knowledge and experience necessary to ensure that all elements of the approved SHSP are implemented and enforced on site. Foster Wheeler Environmental employs full-time personnel as Environmental Safety Specialists (ESS) and personnel who have been cross-trained as ESS. The ESS is the equivalent of the SHSS. Each Foster Wheeler Environmental SHSS has a minimum of one year work experience with hazardous materials and has completed a minimum of 40-hours additional specialized training in personal and respiratory protective equipment, program implementation, and in proper use of air monitoring instruments, air sampling methods, and interpretation of results. Every SHSS is certified as having completed training in first aid and cardiopulmonary resuscitation (CPR) by a recognized organization such as the American Red Cross Association.

## **2.6 SITE PERSONNEL**

A list of personnel authorized to have access to the remediation site will be compiled and maintained on site by the SHSS. This list will include employees of Foster Wheeler Environmental, subcontractors, and representatives of governmental agencies that may require access, where possible. All authorized personnel shall meet the requirements of the contract task order SHSP and be approved by the SHSS or project superintendent prior to entering any exclusion zone or controlled area when potentially hazardous activities are being conducted.

Although the employer is responsible for providing a safe and healthful work place, each employee is responsible for their own safety as well as the safety of those around them. Employees will use all equipment provided in a safe and responsible manner as directed by the Superintendent. All Foster Wheeler Environmental personnel will follow the policies set forth in this SHSP and in the Foster Wheeler Environmental Health and Safety Program Manual. Each employee is responsible for reporting any injuries, incidents, and safety infractions to a project supervisor or the SHSS so treatment can be obtained and/or corrective action taken. Equipment operators are responsible for the maintenance, inspection, and safe operation of their equipment. They will report any equipment malfunctions or necessary repairs to a project supervisor.

## **2.7 SUBCONTRACTED PERSONNEL AND THIRD PARTIES**

All subcontracted personnel are responsible for compliance with this SHSP and other applicable regulations. Subcontractor personnel must receive a briefing from the SHSS prior to unescorted access to the project site. They must fulfill the requirements established by this plan and the CTO site specific plans. They must acknowledge receipt of the plan and the hazard communication briefing. On-site subcontractors are responsible for providing their personnel with appropriate personal protective equipment as specified by the plan. Subcontractor and third party personnel have the authority to request a work area hazard assessment by the SHSS prior to the commencement or continuation of work.

### 3.0 SITE HISTORY AND PROJECT DESCRIPTION

MCAS El Toro is located in the south central portion of Orange County, California, encompassing approximately 4,700 acres. The facility is bordered on the northwest, south, and west by the City of Irvine, and on the east by the City of Lake Forest.

MCAS El Toro was commissioned in March 1943 as the Marine Corps pilot's fleet operation training facility. The station consists of 4,741 acres and includes runways, aircraft maintenance and training facilities, housing, shopping facilities, and other support facilities.

In 1950, MCAS El Toro was selected for development as a master jet air station and permanent center for marine aviation on the west coast to support the operations and combat readiness of Pacific Fleet Marine Forces. The station has been used for aviation activities for almost 50 years. Activities at the base have generated waste oils, paint residues, hydraulic fluid, used batteries and other wastes. In the past, there were few environmental rules and regulations and disposal technologies were limited. During those times, some wastes produced at station were disposed on the station. MCAS El Toro is listed as a base for closure, most of the military functions at the base are closed or will be closed in the next year. Most of the projects at MCAS El Toro are designed to prepare the station for transfer of property with mitigation of any environmental issues.

## 4.0 POTENTIAL HAZARDS

The Site-Specific Health and Safety Plan for each CTO will discuss the specific chemical, physical, and environmental hazards to workers on the each specific site. The SHSP will discuss each contaminant and include information such as exposure limits and signs and symptoms of exposure. The SHSP will discuss site specific physical hazards identified with the site including those associated with construction, use of heavy equipment, fire hazards, and electrical hazards. This station-wide plan discusses the general hazards associated with most projects. The SHSP will describe site specific environmental hazards, although most environmental hazards are associated with the physical location of the station and weather conditions such as heat stress, noise, and flora and fauna contact and are therefore described in this station-wide plan.

### 4.1 CHEMICAL HAZARDS

The chemicals believed to be on a specific site, based on analytical data provided by previous investigations will be discussed in each CTO SHSP. Material Safety Data Sheets (MSDS) for the contaminants and any additional chemicals found on a site or brought onto a site will be acquired and reviewed with all personnel during daily safety meetings. An attachment to the site SHSP will contain the MSDSs. The PESM and the SHSS will specify the levels of protection and air-monitoring requirements based initially on the data provided or obtained prior to remediation work. These requirements may change as site conditions are more fully evaluated when work is underway.

Foster Wheeler Environmental's protective equipment requirements combined with the requirement to wash arms, face, and hands before eating or smoking should prevent exposure through these routes. In addition, the project SHSS and project supervisors observe and warn the crew members to be aware of the initial symptoms of chemical exposure. The amount of exposure depends primarily on the specific activities undertaken and the care with which the activities are performed. A supervisor will remove any crew member from the work site and have the worker medically evaluated if these initial symptoms persist and are unexplained by other causes (such as allergy, common cold, heat stress etc.):

- Dizziness or stupor.
- Nausea, headaches, or cramps.
- Irritation of the eyes, nose, or throat.
- Euphoria.
- Chest pains and coughing.
- Rashes or burns.

#### 4.1.1 Hazard Communication Program

The purpose of a Hazard Communication or Employee Right-To-Know program is to ensure that the hazards of all chemicals located at this field project site are communicated according to 29 CFR 1926.59 and Cal-OSHA regulations to all Foster Wheeler Environmental personnel and subcontractors. Foster Wheeler Environmental Environmental Health and Safety (EHS) Procedure 4-2 is the written hazard communication program. This program requires:

- **Container Labeling** -- Personnel will ensure that all drums and containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced on site by operations. All incoming and outgoing labels will be checked for identity, hazard warning, and name and address of responsible party.
- **MSDSs** -- There will be an MSDS located on site for each hazardous chemical used or known to be on site.
- **Employee Information and Training** -- Training employees on chemical hazards is accomplished through formal safety training conducted annually and informal safety meetings. Project specific chemical hazards are communicated to employees through an initial site orientation meeting and during daily safety meetings held at field projects.

#### 4.2 ENVIRONMENTAL HAZARDS

The SHSS or a supervisor will discuss environmental hazards associated with each site at the orientation meeting prior to start up of remediation activities. As stated earlier, most environmental hazards are found station-wide and are a general concern to every project on the station.

##### 4.2.1 Weather and Heat Stress

With the possible combination of ambient factors such as high air temperature, high relative humidity, low air movement, high radiant heat, and protective clothing, the potential for heat stress is a concern. The potential exists for:

- Heat rash.
- Heat cramps.
- Heat exhaustion.
- Heat stroke.

The Foster Wheeler Environmental EHS Procedure 4-6 describes the heat stress management and prevention program. At 75°F., ambient temperature, the supervisor on site initiates the procedures in the program.

Heat stroke, heat cramps, and heat exhaustion are covered in detail during the 40-Hour OSHA 29 CFR 1910.120 pre-employment course. In addition, this information is discussed during a safety

"tailgate" meeting before each workday where heat stress may be a factor. Workers are encouraged to increase consumption of water and electrolyte-containing beverages such as Gatorade during warm weather. Water and electrolyte-containing beverages will be provided on-site and will be available for consumption during work breaks.

At a minimum, workers will break every two hours for 10 to 15 minute rest periods. In addition, workers are encouraged to take rests whenever they feel any adverse effects, especially those effects that may be heat-related. The frequency of breaks may need to be increased upon worker recommendation or decision of the SHSS and a supervisor.

The EHS procedure also describes a cold stress program; however, due to the location of the MCAS El Toro it is unlikely that there will be a need for this program.

#### **4.2.2 Hearing Conservation Program**

On projects where noise levels may exceed a time weighted average (TWA) of 84 dBA (decibels, A-scale), hearing protection will be made available to all exposed employees. Additionally, sound level monitoring may be conducted on-site. All Foster Wheeler Environmental personnel on project sites have annual audiograms. Personnel with a standard threshold shift will be restricted from high noise exposure or will be required to wear hearing protection at all times. Foster Wheeler Environmental, EHS Procedure 4-4, is a hearing conservation program in compliance with OSHA regulations (29 CFR 1910.95).

#### **4.2.3 Biological Hazards**

The following biological hazards may be encountered on site although such encounters are not anticipated to pose a significant risk to site personnel:

- Animal bites and insect stings can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. In sensitized individuals, however, effects can be more serious such as anaphylactic shock which can lead to severe reactions in the circulatory, respiratory, and central nervous system, and in some cases, even death. The SHSS will identify personnel with a known reaction to bites and stings at the pre-job safety orientation meeting. Personnel will not attempt to capture any wild or semi-wild animals such as cats or rats due to the possibility of a bite or parasitic infestation.
- Poison oak causes discomfort, irritation, and inflammation of the skin. Personnel will be warned to prevent contact with unknown plants. Protective clothing worn by site personnel should reduce the probability of such exposure. Cleaning the skin thoroughly with soap and water after contact will also reduce risk of severe symptoms.
- Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard including lung diseases and allergies. Personnel will not touch visual droppings, and wear gloves and Tyvek protective wear at a

minimum when going into normally limited access areas such as crawl spaces and high ceilings that may have become refuges or nesting areas.

- The hanta virus is sometimes transmitted by rodents found in the Southwestern United States, and causes respiratory distress, sometimes with fatal consequences. Transmission of the hanta virus occurs with exposure to rodent droppings. Good hygiene practices such as washing hands and face prior to eating and drinking will help to minimize the potential for exposure to the hanta virus. While work is in progress, use of HEPA cartridges and work practices, which minimize generation of dust and aerosols, will help protect employees. Exposure to the hanta virus, for example, is minimized by avoiding areas where there are concentrations of mouse droppings. The virus can be inhaled in the dust from areas where mice have nested or left their droppings. Obviously, minimizing dust inhalation or avoiding these areas will lessen the risks of exposure. Any work in such areas should be done only with full Level C protection, including, at a minimum HEPA air-purifying respirator. Thorough washing of hands and face after removing the PPE will further minimize the potential for exposure.
- Snakes. Personnel must use extreme caution when walking through an area and around buildings. If a snake is encountered, slowly and quietly back away from the snake and inform all personnel of its location. Do not attempt to move or kill a snake as certain snakes are protected under state and federal laws. In the event of snakebite, do not try to move the affected individual. Wipe off the skin, as the venom will attack intact skin. Do not suck out the venom. Do not cut open the wound. Do not apply ice or ice packs. Do not use a tourniquet. Do not administer alcohol or medications. Call for medical assistance.

#### **4.2.4 Storm Protection**

If a warning of gale-force winds is issued, take precautions to minimize danger to persons, and protect the work and any nearby property. Precautions will include closing of all openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close all openings in the work site if storms of a lesser intensity pose a threat to property. The SSHS will ascertain predicted daily weather conditions by listening to daily weather forecasts on radio or television. If particularly ominous weather conditions are predicted, the SSHS will monitor radio broadcasts regularly or through National Weather Service reports. Workers will not enter any excavations during a rainstorm. The supervisor or SHSS will stop all work when wind speeds are 25 miles per hour or higher. The supervisor and the SHSS will assess what work procedures can be safely performed when wind conditions exceed 25 miles per hours. They will give consideration to fugitive dust and odor emissions, the safety of equipment in high winds, and protection of workers from flying debris and dust in windy conditions. No crane or boom work is permitted in winds at 25 miles per hour or higher. (Certain crane manufacturers may specify lower wind speed limitations for safe operations. The SHSS must assure that operational limitations of these cranes are not exceeded.)

### **4.3 PHYSICAL HAZARDS**

There are numerous physical hazards associated with a project, which if not identified and addressed, could present accidents and personal injury to the work force, as well as operational problems. In order to minimize physical hazards, Foster Wheeler Environmental has developed standard safety protocols, which will be followed at all times. Failure to follow safety protocols or continued negligence of these policies will result in discipline of the employee. The Foster Wheeler Environmental Corporation Project Rules Handbook states the Health and Safety Project Rules and Guidelines. Some of these are described in this section of the plan and in Section 10 of this plan. Any site-specific rules are stated in the CTO-specific SHSP. All Foster Wheeler Environmental personnel will follow these requirements as specified here and in the Project Rules Handbook. Supervisors will observe the general work practices of each worker and enforce safe procedures to minimize physical hazards. Hard hats, safety glasses, and safety boots are required in all areas of the work site, unless specifically exempted by the PESM, SHSS or a supervisor.

#### **4.3.1 Tripping, Slipping, and Falling Hazards**

Supervisors will remind personnel and subcontractors daily to maintain sure footing on all surfaces. The supervisor and/or the SHSS will inspect all work areas prior to the start of work to look for hazards. Any personnel working six feet above any surface, including man lifts, are required to wear safety harnesses and safety lanyards. The SHSS will inspect these before use. In order to minimize tripping hazards caused by debris, job supplies, and equipment, material, personnel will remove this material from the work areas daily and stockpile the materials and place equipment in storage areas. The SHSS will enforce this "housekeeping" effort throughout the day. Workers will not work near the edges of excavations without fall protection equipment.

#### **4.3.2 Head and Back Injuries**

As minimum workers will don hard hats, safety boots and safety glasses prior to performing any site activities. This will prevent minor injuries caused by bumping one's head while working around and under piping and other process related structures or equipment. Personnel are instructed in proper lifting techniques and will not lift heavy items without assistance per Foster Wheeler EHS Procedure 3-1. Each worker will not lift more than 50 pounds. Object heavier than 50 pounds require assistance from another person. Supervisors will use mechanical lifting equipment whenever possible to minimize worker exposure to lifting hazards.

#### **4.3.3 Falling Objects**

All items raised will be slowly lowered to the ground using a grapple and/or skip bucket. No personnel will work under equipment at any time. Also, the SHSS will ensure that an adequate area is clear of personnel while the equipment is in operation. Dump truck drivers will remain in their trucks while soil and debris is placed in their trucks, if their trucks are equipped with a Falling Object Protective System (FOPS). If their trucks are not equipped with FOPS, the

drivers will get out of their trucks and stand clear of the loading operation. Worker will not work under other workers who are on scaffolds or levels higher than them unless those levels have protection to prevent objects from falling on workers below.

#### **4.3.4 Heavy Equipment and Traffic**

The use of heavy equipment for debris removal, excavation, and lifting presents the greatest potential for injury to personnel. In order to minimize these hazards, the project manager and supervisor will designate routes for mobilization through the facility and establish specific traffic patterns. All trucks and heavy equipment will have spotters for backing maneuvers. Only qualified personnel will operate heavy equipment. Those crew members directly involved with spotting for the operator are the only personnel allowed in the vicinity of the heavy equipment. All others will remain a safe distance away from these operations. Personnel needing to approach heavy equipment while operating will observe the following protocols:

- Make eye contact with the operator (and spotter).
- Signal the operator to cease heavy equipment activity.
- Approach the equipment and inform the operator of intentions.

All Foster Wheeler Environmental personnel will follow all local traffic rules. Company vehicles will yield to all bikes and pedestrians. Personnel working in areas subject to vehicular traffic (i.e. streets, parking lots, etc.) will wear orange safety vests. Flashing light barricades will be used for all roads that are blocked due to equipment or excavation. Coordinate all traffic management issues with the Remedial Project Manager (RPM), the Resident Officer in Charge of Construction (ROICC) and base security.

##### **4.3.4.1 Site Pre-Inspection of Equipment**

The projects will only use heavy equipment that is in safe working order. To maintain this policy, the project supervisor(s), the SHSS and the equipment operator will inspect all equipment brought onto the project site for structural integrity, smooth operational performance, and proper functioning of all critical safety devices in accordance with the manufacturer's specifications and safety regulations. All equipment not conforming to the operational and safety requirements set forth during this inspection will not be put into service until all necessary repairs are made to the satisfaction of the inspection group.

##### **4.3.4.2 Operator Qualifications**

Only qualified operators familiar with the equipment to be used will be permitted to operate. Subcontractors will supply proof of their operator's capability and experience to operate the equipment in a safe manner. Foster Wheeler Environmental reserves the right to remove from the project site any operator if there is question or doubt concerning the operator's capabilities. There are specific training requirements for industrial truck (forklift) operators and for crane operators.

These requirements are specified in the Foster Wheeler Environmental EHS procedures and the USACE EM 385-1-1 Safety and Health Requirements Manual.

#### **4.3.5 Electrical Hazards**

In order to prevent accidents caused by electric shock, the project SHSS will inspect all electrical connections on a daily basis. The SHSS will shutdown and lockout any equipment that is found to have frayed or loose connections until a qualified electrician is contacted and repairs are made. The equipment will be de-energized and tested before any electrical work is done. All equipment will be properly grounded prior to and during all work. In addition, Ground Fault Circuit Interrupters (GFCI) will be installed for each circuit between the power source and tool. In the event that generators are used to supply power, these generators will contain GFCIs.

#### **4.3.6 Confined Space Entry**

A confined Space is any enclosed area having a limited means of egress where ventilation is not adequate to remove a toxic or flammable atmosphere or oxygen deficiency, which may exist. Examples of confined spaces include, but are not limited to the following: tanks, boilers, vessels, bins, manholes, tunnels, pipelines, underground utility vaults, or any open top space more than four feet in depth such as pits, tubes, trenches, or vessels.

EHS Procedure 6-1 outlines procedures in detail. No confined space entry is allowed per this plan. Prior to the start and during the conduct of each CTO, the PESM, the SHSS and the project supervisor(s) will identify confined spaces or confined spaces created by the nature of the work. The SHSS will identify these confined spaces and will not allow entry into these spaces. If a confined space requires entry, the plan will be modified and approved per the amendment procedure described in this plan.

#### **4.3.7 Fire and Explosion Hazards**

Atmospheric testing with a combustible gas indicator must be performed to determine the potential for a flammable atmosphere. A hot work permit must be issued to control the presence of equipment or operations producing open flames or sparks. Hot work permits and procedures are found in EHS Procedure 6-5. Permits are issued both by the SHSS and by MCAS El Toro. (Ensure that a hot work permit is obtained from both). The SHSS must establish a fire prevention and protection program by insuring that flammable materials are properly stored and that safe work procedures and rules are followed. Smoking is not permitted anywhere on a project site except in designated areas.

#### **4.3.8 Drilling**

Any drilling will be performed in accordance with EM 385-1-1, 16.M. A survey of the job site to identify overhead electrical hazards, potential ground hazards, and underground utilities must be performed before placement of the drilling equipment. MSDSs for drilling fluids must be

provided to the SHSS before the start of work. Supervisors will insure that a call has been made to "Underground Service Alert (Dig Alert)" and to Public Works to verify that there are no underground utilities that will be disturbed by the drilling operation.

#### **4.3.9 Overhead Electrical Hazards**

Overhead power lines may present a hazard to equipment and personnel. To prevent equipment contact with power lines and to prevent arcing, adequate clearance must be maintained. For lines rated 50 kV or below, the minimum clearance between the lines and any part of the crane or load will be 10 feet. For lines rated more than 50 kV, the minimum clearance between the lines and any part of the crane or load will be 10 feet plus 0.4 inches for each kV more than 50 kV.

#### **4.3.10 Excavation Safety**

Any excavation or trenching operation that is four feet or more in depth will be performed in accordance with EM 385-1-1 and EHS Procedure 6-3. A Foster Wheeler Environmental excavation permit must be completed by a competent person before excavation commences and at least each day thereafter. This permit requires daily inspections of the operation and adjacent areas. Specific situations addressed in these inspections are possible cave-ins, indications of failure of protective systems (benching, sloping, or shoring), hazardous atmospheres and other hazardous conditions. If the competent person finds evidence of any of these situations, exposed employees will be removed from the hazardous area until the necessary precautions have been taken to ensure their safety. In addition to the excavation permit, a Cal-OSHA Activity Notification Form for Holders of Annual Excavation Permits must be filed with Cal-OSHA. Foster Wheeler Environmental has an annual permit for excavations in the state of California. Also, Dig-Alert must be notified before any excavation work begins regardless of depth. Exploratory techniques, such as "pot-holing" will be performed to insure that any excavation near utilities can be performed safely. Dust suppression measures may include the use of a compound, which will make the soil less likely to dust or use water. However, work procedures as soil is moved and especially as it is lifted and loaded must be performed in such a way to minimize the generation of dust. For example, loaders dumping soil into a dump truck or a stockpile may have to lower the bucket as close as possible to the truck or stockpile before dumping to reduce the drop height of the soil and thereby reduce the amount of dust generated.

## 5.0 ACTIVITY HAZARD ANALYSES

Each CTO SHSP will have a section that evaluates the risks and associated precautions for remediation activities associated with the site-specific activities. An Activity Hazard Analysis (AHA) is developed for each planned activity and operation occurring in each major phase of work. This Hazard Analysis identifies the sequence of work, specific hazards anticipated, and the control measures to be implemented to minimize or eliminate each hazard. This Hazard Analysis is used to augment daily safety meetings intended to heighten safety and hazard awareness on the job. This pre-task briefing will be documented and may be combined with the daily tailgate safety meeting. Activity Hazard Analyses are the focal point for safe conduct of work on a project. Since each task is described and evaluated workers should be better prepared to perform work safely.

The SHSS will discuss the risks and precautions associated with each task identified in the CTO and in the work plan. Daily "Tailgate" safety meetings are held at the start of each shift. Prior to the day's remediation activity the safety meeting discusses the potential chemical, physical, and environmental hazards and preventive safety measures. During a workday, if there are any changes or new conditions, the SHSS will insure that the Activity Hazard Analysis is updated and that workers review the amended AHA. Attendance is mandatory for all employees involved in the specific work.

If there are changes required due to changing conditions or requirements, this CTO SHSP may be modified by using the change form attached to the safety plan and by obtaining the approval of the Project Manager or Superintendent, the Project SHSS, and the PESM.

## 6.0 PERSONAL PROTECTIVE EQUIPMENT

PPE for site workers will be selected and used based upon the existing and potential hazards anticipated and the requirements of 29 CFR 1910.120. Different levels of personal protection will be provided to workers at the site depending on specific work tasks performed. The selection of PPE requires an evaluation of chemical contaminants, concentrations of these chemical contaminants, and physical hazards that may be encountered.

The initial PPE and action levels for each site activity will be established for each contract task order assignment based on available data and defined in the SHSP. As additional testing, monitoring and background information become available, the SHSS may adjust the action levels and PPE accordingly. The PESM will be consulted for approval to changes in the action levels. The decision to upgrade or downgrade the level of protection allowed in the field and will be communicated as appropriate to all site personnel. The decision and justification for the change in level of protection will be recorded in the health and safety logbook.

The SHSP will comply with 29 CFR 1910.132, which states that all PPE for eyes, face, head, and extremities, protective clothing, respiratory protection devices, and protective shields and barriers shall be provided, used, and maintained in a sanitary and reliable condition. PPE is required wherever it is necessary by reason of hazards from processes or environment, chemical hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.

Respiratory protection is of primary importance in the protection of employee health since inhalation of air contaminants is a potential major route of exposure. The Foster Wheeler Environmental respiratory protection program is administered pursuant to the requirements established by 29 CFR 1910.134. The SHSS is assigned responsibility as the Respirator Program Administrator for the project. Selection, use, and maintenance of PPE at the project shall be in accordance with EHS Procedure 5-1 Personal Protective Equipment and EHS Procedure 5-2 Respiratory Protection. The SHSS may upgrade or downgrade the level of protection based on the hazard anticipated, evaluation of site monitoring data, and established action levels by the SHSP and with the concurrence of the PESM.

The ensuing list briefly describes the EPA Level categories:

- **Level A:** Used when the greatest level of skin, eye, and respiratory protection is needed and consists of a totally encapsulated suit with supplied breathing air.
- **Level B:** Used when the highest level of respiratory protection is needed but a lesser level (than Level A encapsulated suit) of skin protection is required.
- **Level C:** Used when criteria for using air-purifying respirators are met and a lesser level of skin protection is required.

- **Level D:** Used only as a work uniform and in an area without respiratory hazards.

Level D is used during site reconnaissance, mobilization, geophysical survey, base line surveying, and other activities that have no potential for exposure to chemical hazards. PPE for Level D includes:

- Coveralls, cotton and/or disposable coveralls.
- Boots, leather or rubber, steel toe and shank.
- Neoprene overboots or disposable booties (as required).
- Safety glasses or goggles.
- Hard hat.
- Gloves as required by task, e.g. leather work gloves.
- Hearing protection (as required).

Level C Protection is used during RCRA and non-RCRA soil excavation, temporary storage, loading, backfilling and compaction, decontamination of equipment, and other activities where there is a potential for chemical exposure but where that exposure is below permissible exposure levels with the provided PPE. If air-monitoring information dictates that a higher degree of PPE is necessary, levels of protection are increased. PPE for Level C includes:

- Full facepiece air purifying respirator (APR).
- NIOSH/MSHA approved air purifying respirator cartridges (approved for use with the specific types of contaminants).
- Emergency escape respirator (optional, depending on the potential for emergency conditions).
- Coveralls, inner cotton.
- Coveralls, outer, chemical-resistant, disposable (e.g. Tyvek).
- Gloves, (outer), chemical-resistant (e.g. nitrile).
- Gloves, (inner) (cotton or nitrile).
- Boots, chemical-resistant, rubber, w/steel toe and shank, or Boots, leather, w/steel toe and shank with chemically resistant rubber overboot.
- Hard hat.
- Hearing protection (optional or as required).

Level B Protection is selected and implemented when it is determined through real time air monitoring and/or personnel sampling that the highest level of respiratory protection is necessary for site personnel. This level of protection is also used when the atmospheric contaminant(s) identified does not meet the selection criteria permitting the use of air purifying respirators or when contaminants are unknown. There is a possibility that this may occur for some CTO specific work.

Personnel Protective Equipment for Level B includes:

- Pressure-demand, self-contained breathing apparatus (SCBA) or airline respirator (with attached 5-minute escape bottle).
- Coveralls, inner, cotton.
- Coveralls, outer, chemical-resistant, disposable (e.g., Tyvek).
- Gloves, (outer), chemical-resistant (e.g. nitrile).
- Gloves, (inner), (e.g. nitrile).
- Boots, chemical-resistant, rubber, w/steel toe and shank, or Boots, leather, with steel toe and shank with chemically resistant rubber overboot.
- Hard hat.
- Hearing protection (optional or as required).

Subcontractors are responsible for supplying, maintaining, their own personnel protective equipment according to the manufacturers' procedures and guidelines and their own policies and procedures which must be at least as protective as required by regulations and those procedures described in this plan.

Most projects usually require the use of either Level D or Level C protection. With each level of protection there is a degree of variability or modification dependent on the specific tasks and the nature and concentration of contaminants. For example, different tasks on the same site may require gloves of different materials, length, or thickness. Variations of a level of protection will be indicated by a qualifier, e.g., "Modified Level D" and specify the modification required. Level A protection, if ever required, will require specific discussion in the CTO SHSP.

For site work under this contract, Foster Wheeler Environmental or subcontractors will maintain on site protective equipment for use by government visitors as specified in each contract task order.

## 7.0 AIR AND NOISE MONITORING

The SHSS will conduct monitoring to ensure that each site worker is adequately protected. Required monitoring will be defined in the CTO SHSP. Site monitoring and sampling may include personal air sampling, real-time air monitoring, perimeter monitoring, radiation monitoring, noise monitoring, and heat stress monitoring.

The SHSS shall have experience using the required monitoring or sampling equipment. The PESM shall ensure that each SHSS is qualified to operate all assigned instruments. The SHSS shall ensure that each piece of equipment is properly maintained and calibrated.

Personal sampling requirements will be defined in the CTO SHSP, and will be based on potential airborne hazards and OSHA requirements. Personal sampling methods will be in accordance with National Institute for Occupational Safety and Health (NIOSH) methods, OSHA Instructions, or good industrial hygiene practice when established methods are not available or feasible. A laboratory accredited by the American Industrial Hygiene Association will conduct all laboratory analysis of industrial hygiene samples. Results will be compared to the ACGIH TLVs or OSHA Permissible Exposure Limits, whichever is more stringent. Results will be communicated to employees in accordance with OSHA requirements. All exposure records will be kept in accordance with 29 CFR 1910.20.

Real-time air monitoring will be used, as appropriate, to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of employee protection needed on site. Real-time monitoring may be necessary for airborne hazards such as flammable vapors, specific target compounds, organic vapors, and total dust. Real-time monitoring requirements will be documented in the CTO SHSP and based on the probability of encountering potential contaminants at each site. The PESM will establish action levels and the action required if levels should be reached or exceeded.

All instruments (both real-time and time-weighted average) shall be calibrated according to the manufacturers' recommendations. All equipment shall be calibrated before and after use. A calibration log shall be kept to record all calibrations.

The CTO SHSP may specify the use of colorimetric tubes for direct reading of specific contaminants. The details will be discussed and action levels established.

The need for radiation monitoring will be established in the SHSP. Radiation monitoring procedures, action levels, and recordkeeping will be in accordance with 10 CFR 20 and 29 CFR 1910.96.

Noise monitoring and hearing conservation requirements will be defined in the CTO SHSP and implemented in accordance with Procedure EHS 4-4, Hearing Conservation Program, and 29 CFR 1910.95.

The SHSS will insure that all data is documented in logs or log books including calibration, types of calibrants used, the manufacturer, model number of instruments used, the date and time of calibration and monitoring events, the area or personnel monitored, the atmospheric conditions and weather, unique site conditions, equipment operating in area, initials of individuals performing the monitoring, and any other information which affects the data or the actions taken based on the data.

## 8.0 SITE CONTROL

The Project Manger, Project Superintendent, and the SHSS will implement site control measures at each site. These measures will consist of general site control and specific work location site control. Site control measures are specified in the SHSP for each contract task order.

General site control measures pertain to the overall site and may include the use of security guards, perimeter fencing, sirens, posting of warning signs, and illumination. These control measures are geared toward visitors and the general public. The project superintendent and the SHSS implement control measures as necessary.

Work location-specific control measures are designed to control contamination and worker entrance and exit from individual work areas. Prior to the commencement of any on-site work, controlled zones of activity will be established by the SHSS. This will reduce the spread of contamination to off-site areas and protect the health and safety of workers. The controlled zones will be included in one of the following categories: 1) exclusion zone—where contamination does or could occur, 2) contamination reduction zone—where decontamination will occur, and 3) support zone—clean zone outside the contamination reduction zone. Each work zone will be clearly identified and delineated by cones, rope, fences, signs, or barricades.

### 8.1 EXCLUSION ZONE

The exclusion zone may include all areas within the boundaries of a contaminated work area or merely the areas immediately surrounding the site of intrusive activity. Access points are provided to the exclusion zone. During activities where the possibility of airborne contaminants being carried outside the exclusion zone exists, the exclusion zone will be expanded to include areas of possible contamination. Only designated project team members and authorized government agency personnel shall be allowed in the exclusion zone. All personnel entering the exclusion zone must wear the appropriate level of protection designated for the work area. Personnel must also meet medical surveillance requirements, training requirements, and respirator fit test requirements. All personnel exiting the exclusion zone must be fully decontaminated in the contamination reduction zone.

### 8.2 CONTAMINATION REDUCTION ZONE

All personnel and equipment that may have been contaminated in the exclusion zone will be subject to decontamination in the contamination reduction zone. Temporary or field decontamination stations for personnel and equipment will also be located in the contamination reduction zone as needed. The contamination reduction zone is intended to be a buffer between the exclusion zone and the support zone and will be designed to prevent the transfer of contaminants from the exclusion zone to the support zone and off site. Within this zone is

usually located a “Contamination Reduction Corridor” (CRC). In the CRC, workers will find decontamination equipment, supplies and stations.

### 8.2.1 Decontamination Procedures

Personal hygiene practices for field personnel will be described in the CTO SHSP. At a minimum, site workers will be provided with adequate restroom and handwashing facilities and be required to wash exposed areas of the skin (i.e., hands and face) upon exiting potentially contaminated areas. Smoking, eating, or drinking will not be allowed in exclusion zone or contamination reduction zone work areas.

The SHSS is responsible for the functional activities of the decontamination facilities and shower trailer if one is required on the site. The SHSS will train site personnel in the steps used for decontamination. The SHSS will periodically inspect for compliance with decontamination procedures and correct any deficiencies.

Separate areas will be designated for equipment decontamination and personnel decontamination. These areas will be separated to minimize contamination of the personnel in the contamination reduction zone by overspray from equipment decontamination.

### 8.2.2 Personal Decontamination

Personnel departing the exclusion zone are required to proceed through a decontamination line. The following decontamination procedure is an example and will be modified to meet site-specific requirements in the CTO SHSP:

- **Station 1**—Segregated Equipment Drop: Drop equipment onto plastic liner or shelf.
- **Station 2**—Boot Cover Wash/Rinse and Removal: Wash and rinse outer boot covers with detergent and water. Remove boot covers and discard into proper container for disposal.
- **Station 3**—Boot Wash/Rinse, Outer Suit Wash/Rinse and Removal: Wash and rinse protective suits. Wash and rinse safety boots. Remove and discard outer suit and place into disposal containers.
- **Station 4**—Outer Glove Wash/Rinse and Removal: Wash and rinse outer gloves. Remove and discard into disposal container, leaving inner gloves on.
- **Station 5**—Respirator Removal: Decontaminate, remove, and sanitize respirator and backpack assembly. Place on the table.
- **Station 6**—Remove Boots and Inner Gloves: Remove boots, then inner gloves and discard inner gloves.
- **Station 7**—Field Wash: Wash hands and face with water. At shift's end, personnel are then required to enter the decontamination trailer and shower thoroughly (if a trailer and shower are required on the site).

In case of an emergency, gross decontamination procedures will be implemented and the person will be transported to the nearest medical facility immediately at the direction of the SHSS according to the Site Emergency Response Plan. The medical facility will be informed that the injured person is on the way, and has not been fully decontaminated. The medical facilities will be notified of the potential chemicals present and of the exposure-prevention measures that can be used while treating the victim.

A commercial vendor will launder reusable protective clothing (cotton overalls). If the coveralls are contaminated with a hazardous waste, the vendor will be notified of the type of waste.

### **8.2.3 Equipment Decontamination**

Heavy equipment, PPE, monitoring equipment decontamination, and sampling equipment may require decontamination. Procedures may be modified based on actual site conditions or contract task order requirements.

Decontamination of heavy equipment (including under carriage, chassis, and cab) will be performed using a high-pressure washer sprayer, and/or steam cleaner and appropriate biodegradable solvents. All equipment will be decontaminated on a pre-constructed decontamination pad designed to collect and store washings. The equipment will first be sprayed and scrubbed with water (and a low-sudsing detergent as required). Secondly, the equipment will be rinsed with water. If persistent contamination exists after cleaning based on visual assessment, other cleaning methods may be necessary. Air filters on equipment used in the exclusion zone will be removed and disposed with the materials used for decontamination if warranted. Depending on the contaminants, a simple scraping and brushing off of the equipment may be acceptable.

Outer PPE (such as protective suits, boot covers, and outer gloves) will be washed and rinsed with trisodium phosphate and water. These items will all be discarded at the end of the day. If they have become grossly contaminated during work operations, they will be changed as necessary during the day. Respirators will be sanitized by rinsing in a germicidal rinse followed by a clean water rinse, then air drying in a clean area.

Each person will be responsible for the gross decontamination of their own respirators at the end of each shift. A thoroughly trained SHSS will perform respirator maintenance.

Reasonable precautions will be taken to minimize monitoring equipment contamination. Decontamination will be accomplished using materials that will not damage the instrument(s). Delicate air monitoring and surveying equipment will be wiped off with alcohol or soap and water and protected from contamination when in use.

The following procedure will be used for cleaning sampling equipment used for chemical tests or sampling:

- Steam clean and/or pressure wash.
- Wash and scrub with laboratory grade detergent.
- Rinse with water.
- Rinse with other reagents according to the site work plan or quality control plan.

Decontaminated sampling equipment will be protected from contamination before use by wrapping with aluminum foil or placing in a clean container.

If decontamination pads are used, they will be constructed to facilitate containment and collection of all potentially contaminated water and decontamination fluids. The waste liquids will be transferred to appropriate drums, holding facilities, or waste systems. All PPE wastes generated will be bagged, labeled, and stored for off-site disposal or incorporation into other waste materials. Foster Wheeler Environmental will store waste in a manner and in an area designated by the facility. In no case will storage exceed 90 days from the start date of accumulation of the waste. Some facilities require that storage not exceed a period of time less than 90 days, e.g. 45 days. Each project manager will ensure that the specific requirements of each base, station or facility are followed.

### **8.3 SUPPORT ZONE**

The support zone will be arranged considering accessibility, utility availability, wind direction, and line-of-sight to work. Included in this area will be the main office trailer, administration area, vehicle parking, security, toilets, water, electricity, and a break/lunch area. The support zone will be outside the contamination reduction zone and will be the area where support workers will provide assistance to workers inside the exclusion zone and contamination reduction zone. The support zone normally will begin at the exit from the decontamination line. Only clean or appropriately containerized equipment, material or personnel can enter the support zone from the contamination reduction zone.

## 9.0 MEDICAL SURVEILLANCE PROCEDURES

Foster Wheeler Environmental requires that site workers participate in a medical surveillance program that meets the requirements of 29 CFR 1910.120(f). The medical surveillance program, managed by the Foster Wheeler Environmental Corporate Medical Consultant, shall be instituted for the following employees:

- All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.
- All employees who wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134.
- All employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

All workers who must enter exclusion zones or who meet the criteria listed above must provide the SHSS with a written opinion from a licensed physician attesting to the employee's fitness for duty at a hazardous waste site. A physician's written opinion of the employee's ability to wear a respirator will also be required when there is reasonable possibility that a respirator may be required for site work. The physician's written opinion must be dated within the previous 12-month period, or an alternate time period as determined by the physician, for continued work. Additional medical surveillance requirements specific to the site or site contaminants may be required and will be defined in the CTO SHSP. The PESM will implement additional medical surveillance requirements when specified in applicable OSHA standards (e.g., the lead standard), when recommended by consulting physicians, or when considered prudent to monitor potential employee exposure.

The SHSS will maintain a file for each person on site. This file will have a copy of the physician's statement of employee's fitness for duty, the employee's ability to wear a respirator and if there are any work restrictions. The SHSS will insure that the employee and project supervisors comply with medical work restrictions, if any. The SHSS will also ask each employee to complete a form to indicate any known allergies, prescription medications and any other medical information that will allow the SHSS to respond to any medical emergency in an appropriate manner. Personnel will notify the SHSS regarding any medications, including over-the-counter, they are using on each day of work. The SHSS in consultation with the PESM and/or a medical consultant will determine if any medications may have an effect on a worker that would impair the ability of the worker to perform work safely.

## 10.0 SAFETY CONSIDERATIONS

All workers must comply with the Foster Wheeler Environmental Project Rules Handbook, Volume I and Volume II. The following are some of these rules:

The following practices will be expressly forbidden during field operations:

- Entrance onto the site or into designated restricted area(s) without formal authorization, compliance with medical monitoring and training requirements, and/or compliance with this SHSP.
- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material in any area designated as contaminated.
- Approach or entry into areas or spaces where toxic or explosive concentrations of gases, vapors, or dusts exist without prior approval of the Site Health and Safety Officer (SHSO) and/or utilization of proper protective equipment.
- Facial hair, which interferes with the satisfactory fit of the mask-to-face seal of respirators, is prohibited for personnel required to wear respiratory protection equipment.
- The use/wearing of personal stereo headphones. Their use may preclude reception of audible warning signals and/or hazard communication.

The following practices are required:

- Personnel and equipment in the contaminated area will be minimized, consistent with effective site operations.
- Equipment shall be bonded and grounded, spark-proof and explosion resistant, as appropriate to minimize or prevent the ignition of flammable materials in the work zone.
- A minimum of two employees, in constant communication (either visual or voice) with each other, will be required to perform any work within the Exclusion Zone.

### 10.1 VEHICLE AND EQUIPMENT OPERATIONS:

Dust suppressants will be used to the extent possible for controlling airborne dust generation to the extent possible. In addition, vehicular traffic speed on non-paved roads will be restricted to 15 miles per hour. Motor vehicles and material handling equipment assigned to this site shall conform to the requirements of 29 CFR 1926.601, and 1926.602. Crews utilizing personnel transport vehicles to and from the work site shall use the vehicle's safety belts. Drivers of vehicles shall be responsible for passenger utilization of the safety belts. Personnel are not allowed to ride in the bed of pick up trucks unless there is an approved restraint system installed and used. The Project Superintendent is responsible for maintaining a clean job site free from

hazards and for providing safe access and egress from the site. Traffic cones and/or high visibility barrier tape will be utilized, where appropriate, for traffic control into/out of hazardous or restricted. Personnel will wear reflective, orange safety vests whenever working in and around vehicles and on all roads.

## **10.2 MISCELLANEOUS SAFETY CONSIDERATIONS**

The following is a list of precautions to minimize the possibility of injury-related accidents from occurring during field operations.

### **10.2.1 General Information**

- Be your brother's keeper. Consider what you do in terms of the hazard it may create for others.
- Ask the SHSS if you do not know how or are in doubts as to the safe way of doing your job.
- No running at any time, except in extreme emergencies.
- Throwing of any object at personnel or equipment is prohibited.
- Minimum requirements on construction sites and in shop are long pants, a shirt with the shoulders covered, and good work shoes. Torn, ragged, or frayed items should not be worn because they can catch on obstructions or machine parts, or otherwise cause you to trip or fall.
- Know where emergency exits are, and how to get to them. Don't block them with material or equipment.

### **10.2.2 Housekeeping**

- Clean work areas and storage areas encourage better incident prevention, and make the work easier to do.
- Dispose of trash and scrap in proper containers. This includes lunch papers, soft drink cans, banding straps, wood, rags, paper cups, etc.
- Keep tools, material, and equipment stored in an orderly manner, and in their proper places. This prevents unnecessary damage, and helps you to find them when you need them.
- Keep stored material, scrap, and other tripping hazards out of roads and walkways and away from emergency equipment. If it's in a walkway and it's not moving, it does not belong there.
- Cords, cables, and hoses crossing roads or walkways are to be covered to prevent tripping or damage, or are to be supported overhead, at least 7 feet above walkways, 14 feet above roads.

### 10.2.3 Fire Prevention

- Control "open flame" tools and equipment.
- Protect nearby combustible materials from heat, flames, sparks, and slag by moving or covering them.
- Keep flammables in closed containers. Use safety cans.
- All site workers will have training on the use of portable fire extinguishers.

### 10.2.4 Personal Protective Equipment

- Head
  - Hard hats are required at all times on construction sites. They are also required at other locations where overhead hazards exist. Bump hats are not permitted.
- Eyes and Face
  - Spectacle type safety glasses are required when hitting steel on steel, grinding, drilling, sawing, vibrating concrete, etc., or when working near someone else who is creating flying particles.
- Fall Protection
  - Safety harnesses and a fall restraint system, such as lanyards, attached to an approved support point are required when working from any support or surface where possibility of falls exist, or where guardrails are not installed.
  - Tie off to a solid, approved support. Tie off as short as possible allowing no more than a 36 inches for fall.

### 10.2.5 Hand Tools

- Every tool is designed for a specific use. Do not misuse. Inspect daily for defects.
- Keep tools in proper working condition - clean, sharp, oiled, dressed, and adjusted.
- Mushroomed chisels, drills, etc. cause dangerous flying objects. Keep them dressed.
- Never hit hardened steel with hardened steel, such as hitting a hatchet with a hammer.
- Don't use "cheaters" to increase capacity. Get a bigger sized tool.
- Carry tools in proper sheath, belt bag, or box. Points down.
- Know how to shut it off before turning it on. No locked "on" switches on hand held power tools.
- Eye protection is required for protection from flying particles.
- Power activated tools shall be inspected daily before use for proper operation of their safety devices. You must be authorized by your foreman to operate this equipment.
- Power supply must be properly attached to tool, and to source. Electric tools must be grounded (or "double insulated").

- Check area for other people before starting tool. Warn people nearby.
- Be prepared for jamming of rotating tools. Have good footing, good balance, and watch out for nearby obstructions. Check yourself for loose clothing.
- Shut off and bleed down air hose before disconnecting air tools. Never point an air hose toward another person or yourself.
- Unplug electric cords.
- Store in safe place when not in use. Protect from weather, dirt, and water.
- Power tools must be GFCI (ground fault circuit interrupter) protected.

#### **10.2.6 Material Hoists**

- Not to be used for hoisting people.
- Secure material to prevent it from shifting.
- Use tag lines.

#### **10.2.7 Crane**

- General
  - Know the crane capacity and the weight to be lifted before lifting.
  - Be sure air space and walkway are clear before moving bridge or trolley.
- Mobile
  - Solid footing. Use outriggers with rubber tired cranes.
  - Barricade area of swing of counterweight.
  - Keep boom, lines, and loads at least 15 feet away from electric power lines. Minimum distance increases above 50,000 volts. Power lines must be de-energized to work closer than the minimum distance.
  - The operator shall avoid swinging loads over workmen's heads. Only one signalman at any one time
  - Equipment shall be inspected before each use and all deficiencies corrected before further use.

#### **10.2.8 Forklifts**

- You must be authorized by your supervisor before operating this equipment.
- Keep forks spread as far apart as possible. Check stability of load before moving it.
- Look in direction of travel before moving and during moving. Watch out for overhead hazards!!
- Back down grades when carrying a load.
- No riders, unless a passenger seat is provided.
- Forks are not be to be used as an elevator or as a work platform.

- Lower forks all the way down before leaving the equipment.
- Do not drive along the edge of raised docks, platforms, or ramps.

#### **10.2.9 Mechanical Material Handling**

- Know the weight of the load to be moved.
- Know the capacity of the equipment to be used to move the load.
- Use tag lines to control the load. Keep tag line free of your body, and free of obstructions during movement of the load.

#### **10.2.10 Manual Material Handling**

- Leg muscles are stronger than back muscles. Lift with your legs not your back. Bend knees, keep back straight, tighten abdomen, using legs, make a smooth controlled lift.
- Plan before you lift - consider weight, size, shape, path of travel, and set down location. Get help if necessary.
- Protect your hands and fingers from rough edges, sharp corners, metal straps. Keep hands and fingers out of pinch points between the load and other objects.

#### **10.2.11 Overhead Work**

- No one is to be unprotected under overhead work.
- Erect barricades, signs, or other devices to warn people of the work overhead. Respect the barricades or signs put up by others.
- Covered walkways are needed where people must pass under overhead work.

#### **10.2.12 Portable Ladders**

- General - All Portable Ladders
  - Inspect for defects. (When defects are found the ladder is to be withdrawn immediately from use). Set ladder feet on solid foundation.
  - Only one person is allowed on a ladder at one time.
  - Use ladders for climbing -not for material skids, walkways, or work benches.
  - Face the ladder while climbing up or down, and while working from it. Use safety harness or fall protection when falls are possible.
  - Both hands are needed for climbing. Use a hand line for material.
  - No metal ladders are to be used.
  - Store safely to prevent damage from vehicles, materials, etc.

- Straight and Extension Ladders
  - Correct slope of ladder is 1:4.
  - Secure ladder from slipping. Non-slip feet on bottom, and tie off with rope at top.
  - Extend ladder 3 feet above top landing where ladder is to be used for access to the landing.
  - Do not take extension ladders apart to get two ladders.
  - Keep hands off rungs while extending or lowering extension section. Be sure latches are in place before climbing.
- Stepladders
  - Open fully. Lock spreaders. Do not use as a straight ladder.
  - Do not stand or step on top platform.
  - Keep loose tools off steps and top platform.
  - Tie off stepladder if longer than 12 feet.

### 10.2.13 Compressed Gas Cylinders

- Always keep cylinders upright. Tie off vertically with strong wire, rope or chain, or keep chained in cylinder cart.
- Do not drop or roll the cylinders.
- Use a rack for lifting cylinders to and from upper elevations. Never lift a cylinder by the control valve or a valve cover.
- Always replace valve covers when gauges are removed. Valve covers must be placed on all cylinders before they are moved.
- Store oxygen cylinders 20 feet away from other cylinders, or separate by a solid approved divider. Do not store any cylinders inside a building.
- Keep oil and grease away from oxygen valves.
- Cylinders are to be kept at a safe distance or shielded from welding and cutting operations. They are not to be placed where they can contact an electric circuit.
- Acetylene cylinders must always be stored upright.
- Use only regulators specifically approved for the type of gas in the cylinder (read the front of the gauges for this information). Never modify regulators or use adapters.

### 10.2.14 Welding and Burning

- Electric
  - Keep leads out of walkways.
  - Shield arcs to protect others from direct arc rays.

- Remove rod from electrode holder before laying it down. Put rod butts in a container, not on the floor.
- Proper grounding from work to machine is a must.
- Turn off machine at end of shift.
- Gas
  - Keep hoses out of walkways.
  - Check area-sides and below for possible fire hazards.
  - Remove gauges at end of shift and replace cap on cylinder. Tool boxes used to store hose and gauges are to be ventilated.
  - Use soapy water when checking for leaks.
  - Before using fuel gas cylinders :
    - Always crack cylinder valve before connecting gauges to clean dirt.
    - Open cylinder valve slowly and leave wrench in position while cylinder is in use.
    - A regulator shall always be used on fuel gas cylinders.
    - The cylinder valve shall always be closed before removing regulator.
    - When fuel gas cylinders connected to gauges have a leak it will be repaired or removed from service and tray way from the work area.

#### **10.2.15 Electricity**

- No "live electrical" work is allowed without the authorization from your supervisor.
- Temporary lighting circuits require guards over the bulbs. Metal guards must be grounded.
- Keep extension cords out of water, and at least 7 feet above walkways.
- Disconnect switches must be labeled to show the equipment or service they feed. Check before operating.
- Always shut down electrical equipment before servicing, repairing, or investigating questionable function.

#### **10.2.16 Decontamination**

- Personnel
  - Do not walk through areas of obvious or known contamination.
  - Do not handle or touch contaminated materials directly.
  - Make sure all personal protective equipment has no cuts or tears prior to donning.
  - Fasten all closures on suits, covering with tape, if necessary.
  - Particular care should be taken to protect any skin injuries.
  - Do not carry cigarettes, gum, etc., into contaminated areas.

- Heavy Equipment
  - Take care to limit the amount of contamination that comes in contact with heavy equipment.
  - If contaminated tools are to be placed on non-contaminated equipment for transport to the decontamination pad, use plastic to keep the equipment clean.

### 10.3 ERGONOMIC CONSIDERATIONS

Routine activities at the project may involve tasks that, by their nature, may subject personnel to unexpected ergonomic stresses. Examples of ergonomic stresses include:

- Muscular sprains and strains.
- Musculo-skeletal trauma from impacts or vibrations.
- Fatigue due to extended work schedules.

Caution and work-load awareness should be exercised by all site personnel during project activities. Tasks which involve manual manipulation of sampling devices, chemical storage drums, shoveling, and/or prolonged exposure to vibrating mechanical equipment should be monitored by the individuals involved with them to preclude the adverse effects of ergonomic stress.

## 11.0 DISPOSAL PROCEDURES

The Waste Management Plan describes the handling of wastes from the project site and the management of all decontamination liquids and disposable clothing and supplies that have come in contact with contaminated materials. All disposable PPE will be treated as contaminated waste and disposed of properly. Contaminated clothing will be placed in a drum lined with a polyethylene bag. Wastewater generated on site will be stored until ready for testing and disposal. Temporary waste storage areas will be set up by each exclusion zone during the work day. This waste will then be moved to a main storage area until ready for disposal, if required by MCAS El Toro environmental personnel. All waste containers will be properly labeled and stored consistent with regulatory requirements. Contents of the containers will be sampled by trained sample technicians and sent to a laboratory to determine regulatory permitted disposal methods. Decontamination water will be contained and captured utilizing submersible pumps and/or vacuum units. Foster Wheeler Environmental will arrange for the proper disposal of all decontamination fluids, contaminated debris, soil and other waste per contract requirements. In no case will accumulation be allowed to exceed 90 days from the date that the accumulation started. Foster Wheeler Environmental has policies and procedures that require that all disposal is managed by firms that have been pre-approved by an internal review process and by the Navy.

## 12.0 EMERGENCY RESPONSE PLAN

MCAS El Toro has some medical services located on the station. However, as the station closes many of these services will end. Due to the proximity to Irvine, there are numerous emergency services nearby in the civilian community. This plan describes response activities as they apply to the station. Site specific response procedures, if any different, will be discussed in the CTO SHSP. Certain information will always be repeated in every CTO SHSP to insure that the information is readily available and "on top". For example, every CTO SHSP will have a table that lists all the emergency contact numbers and the map to the nearest medical facilities.

### 12.1 RESPONSIBILITIES

The Project Superintendent or Project Manager, if there is no Project Superintendent, is the primary emergency coordinator for the project. In the absence of either or both the Project Superintendent and the Project Manager, the SHSS is the emergency coordinator. The emergency coordinator will take charge and determine, direct and delegate personnel and resources to manage the emergency. Key responsibilities of the emergency coordinator are to:

- Initiate evacuation, if needed.
- Initiate emergency response agency notification.
- Insure that response activities are commensurate with the level of the emergency and as discussed in this plan are implemented.
- Interface and coordinate with outside agencies responding to on-site emergencies.

### 12.2 COMMUNICATIONS

Personnel shall maintain verbal communication with each other. The following communications systems will be available during site activities:

- Cellular telephone or access to a land phone for emergency purposes.
- Hand held radios, as needed.
- Compressed air horn (signals emergency evacuation only) at the site.
- Hand signals, if used, will be diagrammed and posted.
- Posted location of evacuation assembly area(s).
- Posted route to the nearest hospital for the project site.
- Posted emergency phone numbers.

### 12.3 ACCIDENT/INCIDENT REPORT

After the emergency event is over or during the course of the emergency when possible, the SHSS will notify the PESM by telephone. Should an accident or incident occur, the Project Superintendent or Project Manager and the SHSS will immediately investigate the cause, notify the PESM, and promptly complete the following:

- ***Foster Wheeler Environmental Incident Report Form.*** Details of the incident shall be documented within twenty-four hours and copies of the report forwarded to the Navy RPM and the PESM. Reports of serious incidents will also be faxed to the Program Manager by the Project Superintendent or Project Manager.
- ***Incident Investigation Report.*** The Incident Report will have the same distribution as the Incident Report within 3 days of the incident.

Any recommended additional hazard control measures must be discussed with the Project Superintendent, the SHSS, and the PESM and meet their approval, prior to implementation. Any occupational injuries and illnesses will be recorded, if applicable, on an OSHA Form No. 200. The SHSS shall report immediately by telephone or telegraph to the nearest District Office of the Division of Occupational Safety and Health (Cal-OSHA) any serious injury or illness, or death, of an employee occurring in a place of employment or in connection with any employment. Immediately means as soon as practically possible but not longer than 8 hours. Records of all site accidents and first aid treatments will be maintained by the SHSS.

### 12.4 PRE-EMERGENCY PLANNING

Prior to performing any work the Project Superintendent or Project Manager and the SHSS will verify all emergency action plans by insuring that planned support facilities are available and that emergency contact numbers are valid. As work proceeds the SHSS will continue to insure that plans specified in this section can be implemented at all times. Furthermore, The SHSS will constantly insure that plans are modified as necessary to accommodate changes. The SHSS will coordinate all changes with the PESM. Upon arrival at the site, the project superintendent will ensure that all personnel know the system for communication of emergency situations and how to use a radio or nearby phone to summon emergency assistance. A vehicle must be available to transport personnel to safe locations or to hospitals. All personnel on this project will know how to use a portable fire extinguisher. All personnel will know the location of all emergency equipment and supplies.

### 12.5 EMERGENCY MEDICAL TREATMENT

The following procedures should be observed if an accident with injury occurs:

#### 12.5.1 First Aid

Only qualified personnel shall provide first aid and stabilize an individual needing assistance. Life support techniques such as CPR and treatment of life threatening problems such as airway

obstruction and shock will be given top priority. At least two persons certified in First Aid techniques and CPR will be on each work site at all times; Foster Wheeler Environmental EHS Procedure 4-1, Bloodborne Pathogens, will be followed when first aid/CPR are administered. The SHSS will be current in First Aid and CPR. Professional medical assistance shall be obtained at the earliest possible opportunity. The nearest clinic and hospital to the MCAS El Toro are shown on a map that is part of this plan and every CTO SHSP. (Figure 2)

#### **12.5.2 Minor Injury**

- Contact Task Foreman or "buddy".
- Have qualified first aid personnel treat injury,
- Record injury and include name of injured person, nature of injury, and treatment given.

#### **12.5.3 Medical Emergency**

In the event of a medical emergency when actual or suspected serious injury occurs, the following procedures shall be implemented:

- Survey scene and evaluate whether the area is safe for entry.
- Remove the exposed or injured person(s) from immediate danger.
- Render first aid if necessary. Decontaminate affected personnel after critical first aid is given.
- Obtain paramedic services or ambulance transport to local hospital. This procedure shall be followed even if there is no visible injury.
- Call 911 (prefix not needed from cellular phone, prefix of 9 required for station phones).
- Identify location by number of nearest building, request medical assistance, provide name and telephone number.
- Request assistance from emergency medical service and/or additional assistance.
- Life-threatening emergencies will be routed to an on-base medical facility for treatment.
- Other personnel in the work area shall be evacuated to a safe distance until the Project Superintendent determines that it is safe for work to resume. If there is any doubt regarding the condition of the area, work shall not commence until all hazard control issues are resolved.
- Notify Navy Technical Representative (NTR) of incident and fill out accident reporting forms and associated documents.

#### **12.5.4 Fatal Injury**

If a fatal injury occurs, the following additional steps will be followed:

- Notify immediate Superintendent.
- Notify PESM who will initiate contact with Cal-OSHA and other appropriate agencies.
- Notify NTR.
- All work activities on the project must be stopped on the project for 24 hours.
- Assist Cal-OSHA as directed.

## **12.6 DECONTAMINATION DURING MEDICAL EMERGENCIES**

Any personnel requiring emergency medical attention shall be evacuated immediately from exclusion and contamination-reduction zones. Personnel shall not enter the area to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation is based on the type and severity of the illness or injury and the nature of the contaminant.

For some emergency victims, immediate decontamination may be an essential part of life saving first aid. For others, decontamination may aggravate the injury or delay life saving treatment. If decontamination does not interfere with essential treatment, it should be performed.

If decontamination can be performed:

- Wash external clothing and cut it away.
- Wrap victim in clean blanket or towel if necessary.

If decontamination cannot be performed:

- Wrap the victim in blankets or plastic to reduce contamination of other personnel.
- Alert emergency and off-site medical personnel to potential contamination; instruct them about specific decontamination procedures.
- Send along site personnel familiar with the incident.

## **12.7 EMERGENCY SITE EVACUATION PROCEDURES**

In the event of an emergency situation such as fire, explosion, etc., the SHSS or a supervisor will activate an air horn for approximately 15 seconds indicating the initiation of evacuation procedures. All personnel in both the restricted and non-restricted areas will evacuate and assemble near the Support Zone or other safe area as identified by the SHSS. Prior to start of work at any project site the SHSS will identify and mark the location of an evacuation assembly area for that project site. The location should be upwind of the site as determined by the wind direction. For efficient and safe site evacuation and assessment of the emergency situation, the project superintendent or SHSS will have authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SHSS must ensure that access for

emergency equipment is provided and that all equipment that may cause combustion has been shut down once the alarm has been sounded. As soon as possible, and while the safety of all personnel is confirmed emergency agency notification will commence. The SHSS will brief site personnel each day as to the location of the evacuation assembly area.

Prior to the start of each project work site the SHSS will establish safe egress routes from the site to the evacuation assembly area. The SHSS will prepare a drawing or map that diagrams these safe egress routes. The SHSS will use this same map to diagram egress from the evacuation assembly area to the station gate to be used as an exit. From this point, the map showing the route to the nearest clinic and the nearest hospital will be used should medical services be required.

## **12.8 FIRE PREVENTION AND PROTECTION**

Fire prevention and protection measures require pre-planning. At least one 20-lb dry chemical ABC fire extinguisher will be located at each project site. Employees will follow safe work practices to include proper storage of flammable and combustible liquids. Personnel will follow hot work procedures to insure that work is performed in a safe environment. In the event of a fire or explosion, summon the Fire Department immediately, take a head count and implement evacuation procedures.

## **12.9 SPILL CONTROL AND RESPONSE**

All spills, leaks, and fires involving oil or hazardous substances at MCAS El Toro must be reported to the ROICC, the RPM and the PESM. The person reporting the leak, spill, etc. is required to provide the following information:

- His/her name.
- Location of spill and facility number, if known.
- Number of injured personnel and nature of injuries, if known.
- Substance spilled.
- Amount spilled (estimate).
- Extent of spill.
- Rate that substance is currently being released (estimate).
- Time spill occurred (estimate).
- Any other pertinent information.

The ROICC and the RPM in coordination with the PjM will manage notifications to regulatory agencies. In addition, all spills will be reported to the Foster Wheeler Environmental Regional ESQ Manager. Project personnel will not report spills directly to any agency unless specifically requested by the RPM or Contracting Officer.

A minor spill would involve no immediate threat to human health or the environment, minimal property damage, and does not exceed the reportable quantity (RQ) for that material. In the event of a minor spill, the appropriate response action is for the responsible person to notify the ROICC, the RPM and the PjM and supply the responders with as much information as possible. In the case of a spill of contaminated or hazardous materials, the following procedures shall be followed:

- Notify the Project Superintendent.
- Identify protective clothing or equipment required to respond.
- Contain the spill.
- Neutralize and/or solidify any product.
- Transfer material into 55 gallon drums.
- Document incident.

### **12.9.1 Release Prevention and Minimization Measures**

In addition to training, the following procedures will be implemented to prevent and minimize releases of hazardous materials:

- Do not conduct hazardous materials operation when the weather could cause significant risk to surrounding area if a spill should occur.
- Transfer all materials in or over a bermed or "protected" area. A protected area is one which is covered with an impermeable material, such as polyethylene.
- Dike temporary storage tanks containing hazardous wastes or potentially hazardous wastes to contain potential releases.
- Maintain a supply of basic spill response materials and protective equipment on site to include:
  - Absorbent sheets, pillows, booms or absorbent material.
  - Open top 55-gallon drums or other containers with lids.
  - Booms, shovels and other tools, such as squeegees.

### **12.10 SIGNIFICANT VAPOR RELEASE**

Any project activity which releases significant amounts of vapor must be reported immediately as described in the spill release procedure. Every attempt to mitigate the release must be taken if it can be safely performed. For example, during excavations vapor releases may be controlled by simply replacing cover the excavation. Down wind evacuation procedures may be required. These will be initiated through coordination with station emergency coordinators.

### **12.11 EARTHQUAKE RESPONSE**

If an earthquake should occur during the course of site activities, take the following steps:

- Stop working. Remain calm and do not panic.
- Do not use or do anything that might be a source of ignition, i.e., smoking, cutting, or welding.
- Avoid power lines, power poles, and windows.
- If in a vehicle, stay in the vehicle until the earthquake is over.
- If in a building, take cover under a heavy piece of furniture.

After the earthquake is over:

- Prepare for after shocks. Stay out of severely damaged buildings.
- Meet for a head count at a location designated by the Superintendent.
- Check for injuries. Do not move seriously injured personnel unless remaining where they are would create danger of further injury.
- Check vehicles, equipment, and buildings for any obvious damage.
- Check utility lines for damage. Switch off power, water and gas until a utility official has inspected the buildings and operational area and determined it is safe.
- If driving, watch carefully for hazards created by the earthquake, i.e., undermined roads, weak bridges or overpasses, etc.

## 12.12 EMERGENCY EQUIPMENT

The following emergency equipment will be brought onto the site or will be stationed near each work area:

- Fire extinguisher, minimum one 20 lb dry chemical ABC type in the Contamination Reduction Corridor (CRC) at the edge of exclusion zone.
- Industrial first aid kit, in the CRC, at the edge of the Support Zone.
- Portable eye wash, capable of supplying 15 minutes of water and protected from direct sunlight in the support area, at the edge of the Support Zone.
- Air horn at the support area, at the edge of the Support Zone.
- Spill control material consisting of either absorbent pillows or absorbent material and shovels, in the Support Zone by the CRC entrance.

The following equipment will be available at the support trailer for use in an emergency situation:

- Industrial first aid kit.
- Blanket.

Each CTO SHSP may specify additional emergency equipment consistent with the hazards associated with the CTO. For example, some projects may require that SCBAs be available for work on projects where exposure to contaminants may require their use.

### **12.13 POSTINGS**

At every project site emergency contact names and phone numbers will be posted. A map showing egress routes, evacuation assembly areas, and the route to the clinic and the hospital will also be posted. At some remote locations, posting may not be practical. In this case the contact names, phone numbers and maps will be placed on the dashboard of every vehicle.

## **13.0 TRAINING**

In accordance with Foster Wheeler Environmental corporate policy and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless excepted by the above reference. As a minimum, the training shall have consisted of instruction in the topics outlined in the above reference. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities that may expose them to chemical or physical hazards.

An employee's prior experience and/or training for equivalency may be considered to meet the training described above. The PESM will make the determination if previous experience and/or training meet the initial training requirements.

In addition to the required initial training, each employee shall have received 3 days of directly supervised on-the-job training at a hazardous waste site. This training shall have addressed the duties the employees are expected to perform and be properly documented. The Foster Wheeler Environmental project superintendent has the responsibility for ensuring that personnel assigned to field sites comply with these requirements. The project superintendent will provide the Navy Contracting Officer or designee with written certification of completion of the required training and maintain copies of required training records at the work site.

### **13.1 MANAGER/SUPERVISOR TRAINING**

In accordance with 29 CFR 1910.120, on-site managers and supervisors directly responsible for, or who supervise employees engaged in hazardous waste operations, shall receive training as required above and at least 8 additional hours of specialized training on managing such operations by the time of job assignment.

### **13.2 ANNUAL 8-HOUR REFRESHER TRAINING**

Annual 8-hour refresher training will be required of all hazardous waste site field personnel to maintain their qualifications for field work. The following topics will be reviewed: toxicology, respiratory protection—including air purifying devices and self-contained breathing apparatus (SCBA)—medical surveillance, decontamination procedures, and personal protective clothing. In addition, topics deemed necessary by the SHSS or PESM may be added to the above list.

### **13.3 SITE-SPECIFIC TRAINING**

Prior to commencement of field activities, the SHSS will provide site-specific training to all personnel assigned to the site; this training will specifically address the activities, procedures, monitoring, and equipment for the site operations. Training will include site and facility layout, hazards, and emergency services at the site, hazard communication, and will highlight all

provisions contained within the SHSP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and health for their particular activity. Additional training, if required for completion of field tasks during the site work, will be identified and provided for personnel as the work progresses.

#### **13.4 ON-SITE SAFETY BRIEFINGS**

Project personnel and visitors will be given daily on-site health and safety briefings by the SHSS, or designee, to assist site personnel in safely conducting their work activities. This training will be conducted prior to the start of new work activities using Activity Hazard Analyses. The briefings will include information on new operations to be conducted, changes in work practices, or changes in the site's environmental conditions. The briefings will also provide a forum to facilitate conformance with safety requirements, and identify performance deficiencies related to safety during daily activities or as a result of safety inspections.

#### **13.5 FIRST AID AND CPR**

The SHSS will identify those individuals requiring first aid and CPR training. At a minimum, the SHSS will have received first aid and CPR training. At least two persons trained and current in certification of first aid and CPR will be present at every work site. The training will be consistent with the requirements of the American Red Cross Association.

## **14.0 LOGS, REPORTS, AND RECORDKEEPING**

The following is a summary of required health and safety logs, reports, and recordkeeping for this contract.

### **14.1 SITE HEALTH AND SAFETY PLAN CHANGE APPROVAL FORM**

A Site Health and Safety Plan Change Approval Form is to be completed for all changes to the SHSP. This form requires the signatures of the Project Manager or Superintendent, the SHSS, and the PESM. The PESM sends a copy of this form to the Navy CIH within five workdays for review. Substantial changes to the SHSP may require a Field Change Request according to the Quality Control (QC) Plan in order to initiate a significant change to the SHSP. PESM approval of each Field Change Request (FCR) is required. Copies of the FCR affecting the SHSP are also sent to the Navy CIH.

### **14.2 MEDICAL AND TRAINING RECORDS**

Full medical and training records are normally kept by the employer. Proof of the most recent training and medical qualification must be provided to the SHSS by the employee. The SHSS will keep a file containing appropriate training and medical qualifications for site workers. Medical records will be maintained in accordance with 29 CFR 1910.20. The examining physician retains custody of the complete medical record. Employee records have only the physician statement of medical qualification for duty and the employee's fitness to wear a respirator.

### **14.3 ON-SITE LOG**

A log of personnel on-site each day (including job title, level of protection, and work location) will be kept by the SHSS or designee. A copy of these logs will be sent to the Foster Wheeler Environmental records coordinator for data entry. Originals will be kept in the contract task order project file.

### **14.4 EXPOSURE RECORDS**

Any personal monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.20. For Foster Wheeler Environmental employees, the originals will be sent to the records coordinator. For subcontractor employees, the originals will be sent to the subcontractor employer and a copy kept in the contract task order project file.

## **14.5 ACCIDENT/INCIDENT REPORTS**

A Foster Wheeler Environmental accident/incident report must be completed following any event involving emergency first aid, lost time, or property damage. The originals will be sent to the Foster Wheeler Environmental records coordinator for maintenance and distribution by Foster Wheeler Environmental. Copies will be distributed to the PESM, Project Superintendent, subcontractor employees, if appropriate, and the Navy Contracting Officer. A copy of the completed forms will be kept in the contract task order project file.

## **14.6 OSHA FORM 200**

An OSHA Form 200 (Log of Occupational Injuries and Illnesses) will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Foster Wheeler Environmental records coordinator for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 200 form. The Foster Wheeler Environmental accident/incident report meets the requirements of the OSHA Form 101 (Supplemental Record) and must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

## **14.7 HEALTH AND SAFETY FIELD LOG BOOKS**

The SHSS will complete and maintain the daily log book at the site. Log books will be used to document important events as they occur. Some general procedures will pertain to the use of all log books. The following information will be recorded on each page of all log books:

- Initials of persons making entry.
- Date.
- Time of each entry (military time).
- Location.

The log will be signed at the end of each day or work shift. All entries will be made in black ink. No pages will be removed from the log book and each page will be numbered. Any corrections will be made with a single line through the entry, and initialed.

The log book will be used to record daily site conditions and activities within the exclusion zones. The log book will contain the following items:

- Names and job titles of all personnel in the work group.
- Level of protection.
- Health and safety monitoring equipment used.
- Weather conditions.
- Work/rest schedule (if appropriate).

- A description of the activities as they are occurring.
- Any pertinent health and safety observations.
- Sample number (if appropriate).

Copies of the log books will be submitted to the project superintendent as necessary. The original log books will become part of the exposure records file and will be maintained by the Foster Wheeler Environmental records coordinator.

#### **14.8 MATERIAL SAFETY DATA SHEETS**

Material Safety Data Sheets (MSDS) will be obtained and kept on file at the project site for each hazardous chemical brought to, used, or stored at the site. An MSDS for each contaminant will also be maintained. The MSDS will be kept on file by the SHSS at the project site.

#### **14.9 CLOSEOUT SAFETY REPORT**

A final safety report will be provided to the PESM summarizing the safety performance achieved during the site work. Specific elements of the report will include the following:

- A description of significant events, exposures, accidents, illnesses, and actions taken to prevent their occurrence.
- A summary of monitoring results including air, noise, radiation, and heat stress samples.
- A description of any state or federal inspections involving the health and safety of site workers.

## **15.0 FIELD PERSONNEL REVIEW**

All personnel are required to be trained in this site wide SHSP and the CTO SHSP. Upon completion of this training and review all project personnel will acknowledge this training by signing SHSP review form.

## 16.0 REFERENCES

Specific reference unique to a project will either be listed as an attachment to the SHSP or they will be incorporated as a separate section to the SHSP. For example, a specific procedure for personal air sampling may be included as a reference within the SHSP.

## FIGURES

DRAWING NO:  
00100901.DWG

DCN: FWSD-RAC-00-1009  
CTO #022

APPROVED BY: HH

CHECKED BY: HH  
REV: REVISION 0

DRAWN BY: MD  
DATE: 07/21/00

I:\1990-RAC\CTO-0022\DWG\001009\00100901.DWG  
PLOT/UPDATE: JUL 11 2000 15:08:04

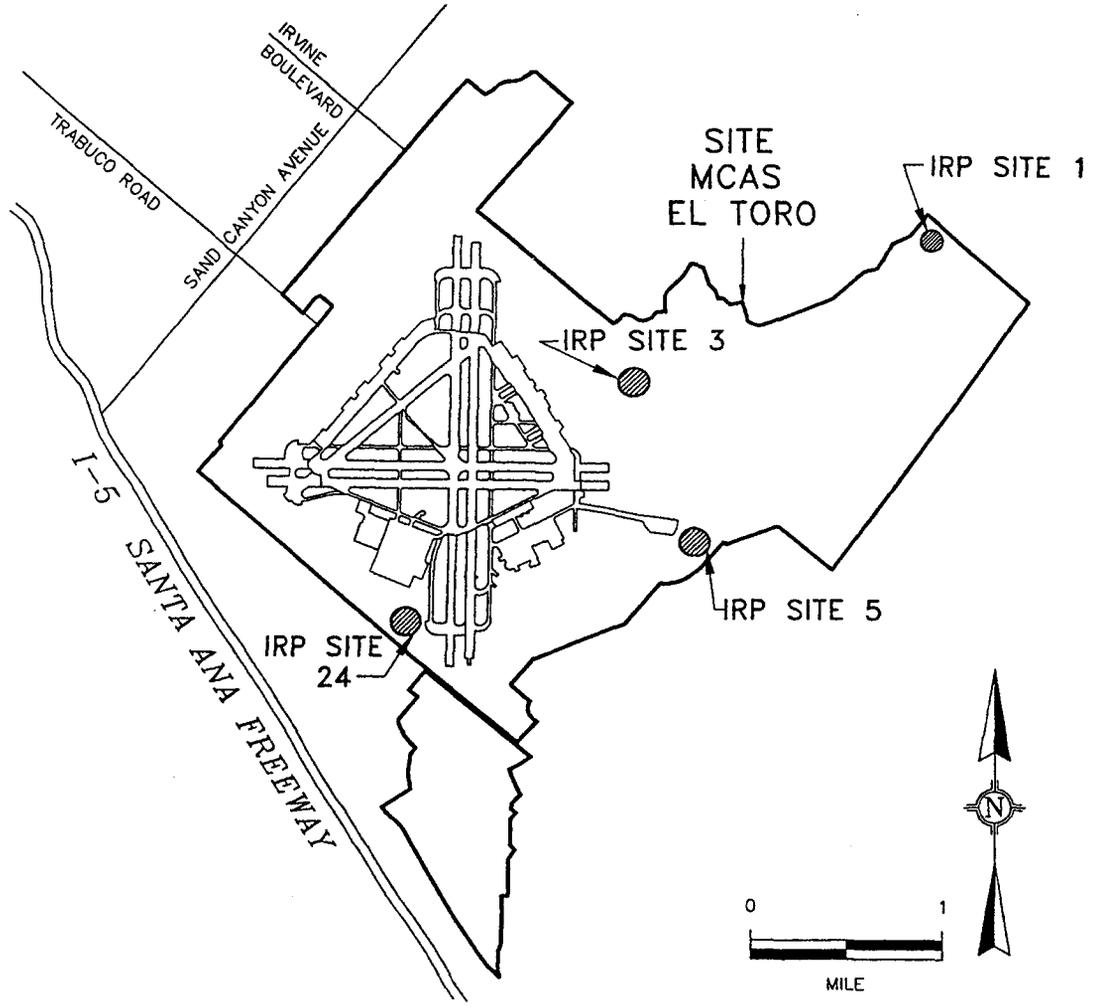
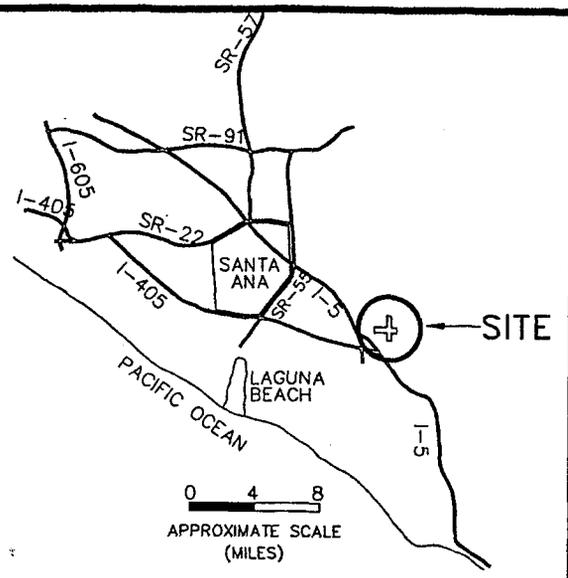


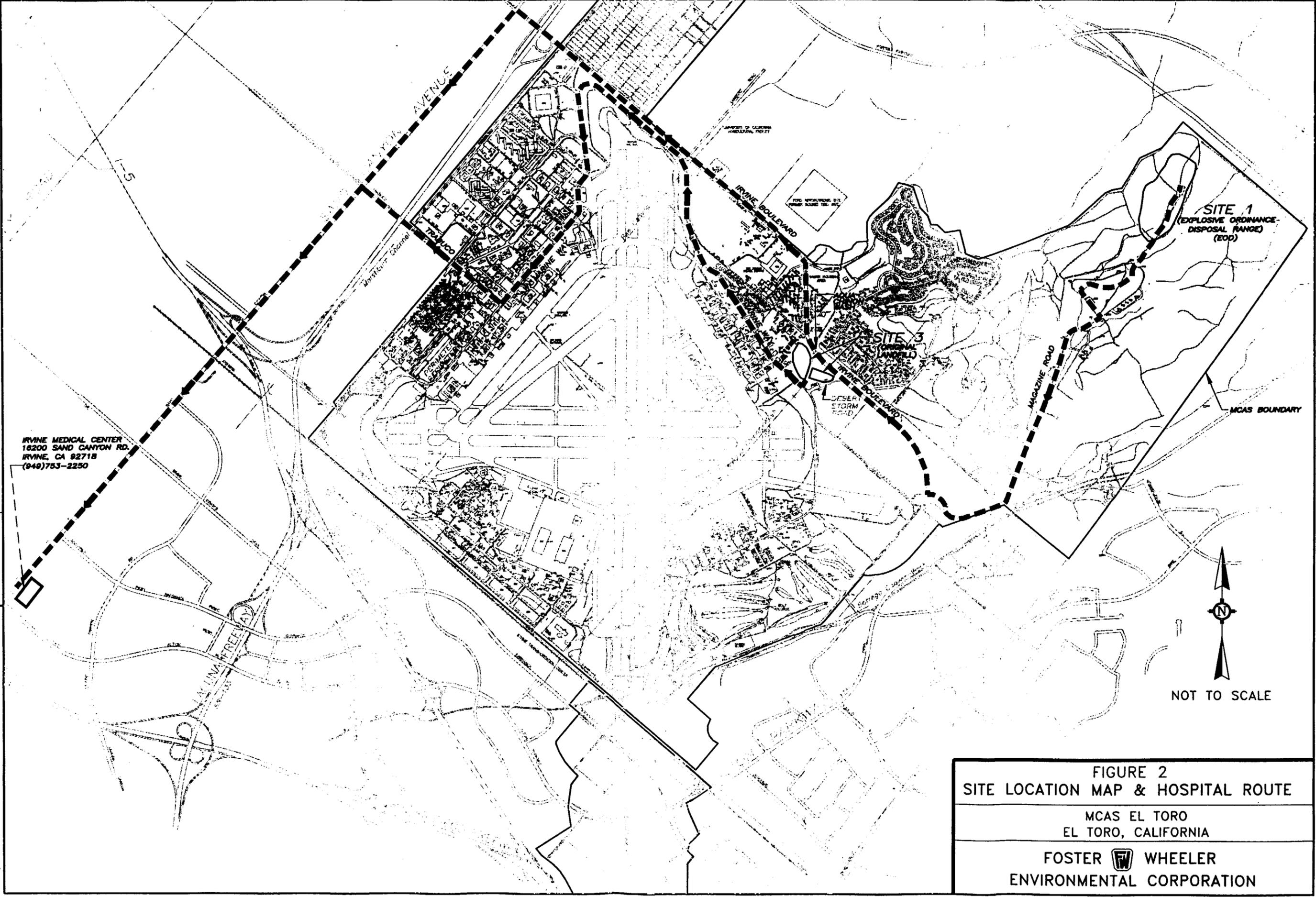
Figure 1  
MCAS EL TORO VICINITY MAP  
MCAS, EL TORO, CA

Southwest Division  
Naval Facilities Engineering Command

FOSTER WHEELER  
ENVIRONMENTAL CORPORATION

DRAWING NO: 01006602.dwg  
 DCN: FWS-D-RAC-01-0066  
 APPROVED BY: HH  
 CTO #022  
 CHECKED BY: HH  
 REV: REVISION 0  
 DRAWN BY: MD  
 DATE: 10/27/00

I:\1990-RAC\CTO-0022\DWG\010066\01006602.DWG  
 PLOT/UPDATE: OCT 23 2000 12:42:21



**FIGURE 2**  
**SITE LOCATION MAP & HOSPITAL ROUTE**  
 MCAS EL TORO  
 EL TORO, CALIFORNIA  
 FOSTER  WHEELER  
 ENVIRONMENTAL CORPORATION