

April 29, 1996

Ms. Eva Chu
Alameda County Health
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Subject: Final Work Plan and Site Safety and Health Plan
for Quarterly Groundwater Monitoring at Building 109
Parks Reserve Forces Training Area (PRFTA) Dublin, California
Project No. 7112

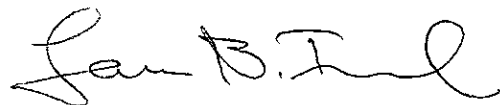
Dear Eva:

Woodward Clyde Federal Services (WCFS) is pleased to provide one copy of the Final Work Plan and Site Safety and Health Plan for Quarterly Groundwater Monitoring at Building 109 at Parks Reserve Forces Training Area (PRFTA) in Dublin, California.

WCFS is pleased to continue working with you on this project and we look forward to working with you throughout the quarterly monitoring program. If you have any questions regarding this work plan please call me at (916) 368-0988 or Michael Sartor at (510) 874-3173.

Very truly yours,

WOODWARD-CLYDE



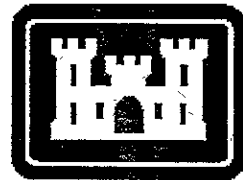
Laurie B. Israel, R.E.A.
Environmental Scientist

Attachment



WORK PLAN FOR
QUARTERLY
GROUNDWATER
MONITORING AT
BUILDING 109
PARKS RESERVE FORCES
TRAINING AREA
DUBLIN, CALIFORNIA

Prepared for



U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814

April 1996



10370 Old Placerville Road, Suite 104
Sacramento, California 95827
Project No. 7112 9700

ENVIRONMENTAL
PROTECTION
96 APR 30 PM 1:33



WORK PLAN FOR
QUARTERLY
GROUNDWATER
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PARKS RESERVE FORCES
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Prepared for



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April 1996

Woodward-Clyde



10370 Old Placerville Road, Suite 104
Sacramento, California 95827
Project No. 7112 9700

April 29, 1996

Mr. Rich Haavisto
U.S. Army Corps of Engineers
Sacramento District - CESP-K-ED-EC
1325 J Street
Sacramento, California 95814-2992

Subject: Final Work Plan and Site Safety and Health Plan
for Quarterly Groundwater Monitoring at Building 109
Parks Reserve Forces Training Area (PRFTA), Dublin, California
Project No. 7112

Dear Mr. Haavisto:

Woodward-Clyde is pleased to submit this Final Work Plan and Site Safety and Health Plan for Quarterly Groundwater Monitoring at Building 109. This Work Plan and Health and Safety Plan have been prepared by Woodward-Clyde for the U.S. Army Corps of Engineers Sacramento District (USACE) to provide engineering services at PRFTA, Dublin, California. These documents were prepared under Contract Number DACA05-92-D-0032, Modification 8 to Delivery Order No. 12.

This Work Plan and Site Safety and Health Plan describe the activities necessary to monitor the groundwater at Building 109. The Work Plan includes the following tasks: 1) water level measurement and groundwater monitoring, 2) groundwater sample collection, 3) quality assurance/quality control samples, and 4) groundwater sample analyses. The Site Safety and Health Plan is included as Appendix A in the Work Plan. The comments submitted by the USACE have been incorporated.

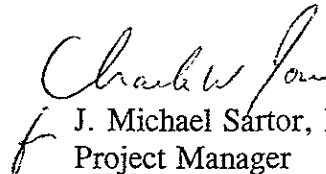
If you have any questions, please call Laurie Israel at (916) 368-0988 or Michael Sartor at (510) 874-3173.

Very truly yours,

WOODWARD-CLYDE



Laurie B. Israel, R.E.A.
Environmental Scientist



J. Michael Sartor, P.E.
Project Manager

Attachment

cc: Marshall Marik, PRFTA



April 29, 1996

Mr. Marshall Marik
Parks Reserve Forces Training Area
Building 791
Camp Parks, California 94568-5201

Subject: Final Work Plan and Site Safety and Health Plan
for Quarterly Groundwater Monitoring at Building 109
Parks Reserve Forces Training Area (PRFTA), Dublin, California
Project No. 7112

Dear Mr. Marik:

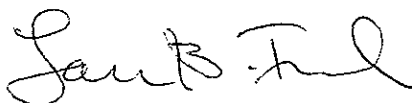
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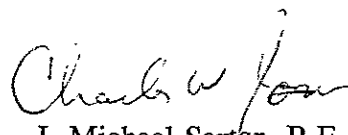
If you have any questions, please call Laurie Israel at (916) 368-0988 or Michael Sartor at (510) 874-3173.

Very truly yours,

WOODWARD-CLYDE



Laurie B. Israel, R.E.A.
Environmental Scientist


J. Michael Sartor, P.E.
Project Manager

Attachment

cc: Richard Haavisto, USACE



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1.1 SCOPE OF WORK

This Work Plan addresses the procedures involved with the quarterly groundwater monitoring program to be undertaken for four consecutive quarters (every three months) at three groundwater monitoring wells located at the former Building 109 underground storage tank (UST) site. Building 109 is located within the Parks Reserve Forces Training Area (PRFTA) in Dublin, California (Figure 1). This work is proposed in response to Alameda County Department of Environmental Health's request in their letter dated July 10, 1995 to further monitor the extent and magnitude of total petroleum hydrocarbons (TPH) in the groundwater at the site. Specific activities include the collection of groundwater samples from the three groundwater monitoring wells at the site, sample analysis, and waste disposal for four consecutive quarters. This Work Plan has been prepared in accordance with Alameda County Department of Environmental Health (ACDEH) requirements for quarterly groundwater monitoring.

1.2 SITE CONTACTS

Woodward-Clyde is providing consulting engineering services for the project to the U.S. Army Corps of Engineers, Sacramento District (USACE). Table 1 presents the names and addresses of other entities involved with the groundwater monitoring program, including the regulatory agencies who will receive copies of reports and correspondence regarding this project.

1.3 SITE LOCATION AND DESCRIPTION

PRFTA, also referred to as Camp Parks, is located in Townships 2 and 3 South, Range 1 East on the Dublin 7.5 minute topographic quadrangle in Alameda and Contra Costa Counties, California (Figure 1). PRFTA occupies approximately 2,800 acres and is bounded by multiple entities. PRFTA's neighbors include Federal Correctional Institutions, Santa Rita

Rehabilitation Center, Alameda County Santa Rita Jail, Tassajara Creek Regional Park, local businesses, and residential districts.

PRFTA is a multi-use installation that hosts a variety of tenants, both military and civilian. PRFTA organizations utilize the installation for activities which include: fire services, maintenance of buildings, range control, storage facilities, demolition activities, and administration of utilities. Tenant organizations who lease buildings or space at PRFTA include Federal entities (U.S. Army Reserve components and U.S. Border Patrol), private companies, and private and public organizations.

1.4 SITE BACKGROUND

Prior to its demolition, Building 109 was a trash incinerator. The Building 109 site is located in the southern portion of the facility (Figure 2). During building demolition and removal activities in mid-March 1994, a previously unknown 2,000 - 3,000-gallon UST was discovered under the building floor and damaged. It is suspected that the tank held fuel oil, possibly as a supplemental fuel for the incinerator. Mr. Mervin Alley of PRFTA reported that on March 22, 1994, the UST was punctured during the demolition of Building 109 resulting in fuel leakage into a 12-foot-deep excavation pit adjacent to the building foundations. Mr. Alley reported that approximately 442 gallons of product were removed from the excavation and another estimated 1,077 gallons removed from the tank. A product sheen was observed on standing water in the excavation after the fuel oil and water removal activities were concluded on April 25, 1994.

During December 1994 and January 1995, Woodward-Clyde conducted a site investigation at the former Building 109 site where the fuel leak occurred. Woodward-Clyde installed three groundwater monitoring wells as part of the site investigation (Figure 3). Well MW-1 is located south of the former Building 109 and outside the area of demolition debris. Well MW-1 is expected to serve as a downgradient well. Well MW-2 is located within 10 feet of the UST leak site to the southwest (downgradient). Well MW-3 is located to the northeast, within the footprint of the former Building 109, and is expected to serve as an upgradient well. The wells were screened approximately 12 to 22 feet below ground surface (bgs). Water was first encountered at depths ranging from 13.5 to 16 feet bgs. Figure 4 shows the groundwater elevations at the monitoring wells at Building 109 measured in January 1995.

The groundwater monitoring wells (MW-1, MW-2, and MW-3) were sampled on January 25, 1995 and each were analyzed for extractable total petroleum hydrocarbons (TPH-E) using modified EPA Method 8015 and for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8010/8020. Diesel was detected in all three monitoring wells at concentrations ranging from 62 to 1,200 µg/L. BTEX were also detected in MW-3 at the following concentrations: 2.5 µg/L benzene, 1.2 µg/L toluene, 2.5 µg/L ethylbenzene, 8.0 µg/L mixed xylenes. In addition, kerosene was detected in MW-3 at 820 µg/L. The groundwater sample from MW-1 was also analyzed for lead and for polychlorinated dioxins/furans (PCDD/ACDFs). Lead and PCDD/PCDFs were not detected in the sample from MW-1.

The Site Characterization Report for Building 109-UST (June 1995), prepared by Woodward-Clyde, provided the results of the groundwater investigation. The report was submitted to Ms. Eva Chu with ACDEH for review. Ms. Chu reviewed the document and in her letter dated July 10, 1995 requested that a quarterly monitoring program for the site be established for four consecutive quarters. Ms. Chu stated that her recommendation is based on the elevated concentrations of diesel and BTEX in the groundwater samples.

1.5 HYDROGEOLOGIC SETTING

PRFTA is located in the Livermore Valley. According to the State of California Department of Water Resources (Ford and Hills, 1974), the geologic units underlying PRFTA are Quaternary alluvium at the southern end and undifferentiated Pliocene formations at the northern end. The quaternary alluvium is classified as unconsolidated water bearing deposits consisting of stream and lake deposited sediments including various mixtures of gravel, sand, silt, and clay. PRFTA is dissected by the northwest-southeast trending Pleasanton fault. According to the State of California Department of Water Resources, "Livermore and Sunol Valleys, Evaluation of Groundwater Resources Appendix A: Geology" (1966), it is not known what effect the fault zone has on groundwater movement in the area.

PRFTA is located in the Dublin (southwestern PRFTA) and Camp (northeastern PRFTA) subbasins. The Dublin subbasin is bound to the east by the Pleasanton fault and to the west by non-water bearing marine sediments. In the vicinity of the site of interest, these sediments are approximately 150 feet thick. Groundwater in the Dublin subbasin is both unconfined and

confined. In the shallower, unconfined aquifers, groundwater is generally encountered at about 20 feet below ground surface (bgs) and slopes southward at about 20 feet per mile. In the deeper, confined aquifers, groundwater ranges from about 80 feet bgs in the north to about 50 feet bgs in the south. Groundwater slopes southward at about 30 feet per mile in the northern portion of the site to about 20 feet per mile in the southern portion (Ford and Hills, 1974).

The Camp subbasin is bound to the west by the Pleasanton fault and to the east by the Mocho fault. Groundwater in the Camp subbasin is unconfined to semiconfined. The combined potentiometric surface of the various water-producing zones lies at about 10 to 25 feet bgs. The potentiometric surface of the groundwater generally reflects the topography and slopes to the south at a gradient of about 70 feet per mile. Groundwater apparently moves southward as far as I-580 and then westward as far as Santa Rita Road (Ford and Hills, 1974).

PRFTA's topography varies from an elevation of 330 feet above mean sea level (MSL) in the south to 760 feet above MSL in the northern area (U.S. Geological Survey). Surface water drains primarily to the south via surface water discharge canals located throughout PRFTA.

1.6 REGULATORY REQUIREMENTS

This Work Plan was prepared under the direction of Ms. Eva Chu at the ACDEH. This Groundwater Monitoring Program Work Plan falls under the jurisdiction of Chapter 6.7, Division 20 of the Health and Safety Code and the California Underground Storage Tank Regulations (Subchapter 16 of Title 23 of the California Code of Regulations) and follows the Tri-Regional Board staff recommendations for Preliminary Evaluation and Investigation of Underground Storage Tanks. These regulations prescribe the activities required to investigate and mitigate soil and groundwater affected by the contents of USTs and their appurtenances.

1.7 TECHNICAL APPROACH

1.7.1 Quarterly Groundwater Monitoring Program

The objective of the proposed quarterly groundwater monitoring program is to provide data to monitor the extent of TPH-E and BTEX in the groundwater at Building 109. The quarterly groundwater monitoring program is comprised of four discreet groundwater sampling events to be completed every three months (consecutively) for the period of one year. The groundwater monitoring program includes the following activities:

- (1) Collect water table elevation data during each sampling event prior to purging to monitor groundwater gradient and flow direction fluctuations.
- (2) Purge each of the groundwater monitoring wells (MW-1, MW-2, and MW-3). Purge water will be placed in 55-gallon drums and left onsite for disposal by PRFTA personnel. During purging, general water quality parameters (pH, specific conductance, temperature) will be periodically measured and recorded.
- (3) Collect one groundwater sample from the each of the three monitoring wells using new disposable Teflon® bailers. One duplicate groundwater sample will be collected from one of the wells during each sampling event.
- (4) Analyze each groundwater sample for TPH-E using modified EPA Method 8015 and for BTEX using EPA Method 8020.

Following completion of each groundwater sampling event, a brief letter report documenting groundwater monitoring activities will be prepared. The report will include tables summarizing groundwater elevation data and the results of the analysis performed on the groundwater samples collected, a site map depicting the groundwater gradient, and copies of the laboratory analytical reports. Reports will be submitted to the ACDEH within 60 days following the completion of each sampling event. After four consecutive quarters of sampling, the ACDEH will review the case to determine the next phase of investigation and/or closure.

1.8 WORK PLAN ORGANIZATION

This Work Plan is organized into the following sections: Section 1.0 describes site location, site background, hydrogeologic setting, and the technical approach; Section 2.0 describes the groundwater sampling procedures; Section 3.0 discusses investigative derived waste disposal; Section 4.0 discusses the Site Safety and Health Plan; Section 5.0 discusses scheduling; Section 6.0 discusses the report format; and Section 7.0 provides references.

GROUNDWATER INVESTIGATION

2.1 GROUNDWATER SAMPLING

Each of the three groundwater monitoring wells will be sampled during the four quarterly sampling events to evaluate groundwater quality and gradient. If an immiscible layer, greater than a sheen, is present on the shallow groundwater, the groundwater sample will not be submitted for laboratory analysis.

2.1.1 Instrument Calibration

Electronic equipment to be used during sampling includes: a pH meter with temperature scale, a conductivity meter, and an electronic water level measurement probe. The pH and conductivity will be calibrated prior to use each day. The electronic water level measurement probe will be tested in a bucket full of water prior to each sampling event to ensure its proper operation. An oil-water interface probe will be used to measure the thickness of a floating immiscible layer, if present. The presence or absence of an immiscible layer on the shallow groundwater will be visually confirmed using a clear bailer.

2.1.2 Water Level Measurement

Water level measurements at the site will be collected within a 24-hour period. Water levels will be measured to the nearest 0.01 foot, prior to any purging activities to avoid disturbance of the static water table. An electronic water level indicator will be used to measure the depth of the static water level and total depth of the well. The measuring point for all three wells will be the top of the PVC well casing. The measuring point will be marked by a notch in the casing.

The water level indicator will be decontaminated before use, between wells, and at the conclusion of measurements. Decontamination of the water level probe will be completed to prevent alteration and/or cross contamination of samples. Appropriate personal protective equipment will be donned in accordance with the Site Safety and Health Plan and the bottom

3 feet of the probe will be scrubbed in a solution of Alconox and potable water. The probe will then be rinsed using potable water, followed by a deionized water rinse. Sampling personnel will document decontamination activities in the field log book. Probe decontamination will be performed at the wells. Wash and rinse water will be collected, stored in drums, and labeled. A field data sheet for the water level measurements (Attachment 1) will be completed during each measuring event. Water level data will be used to calculate groundwater elevations and estimate groundwater gradient and flow direction.

2.1.3 Groundwater Sample Collection

Prior to sampling, the wells will be purged to allow groundwater representative of the aquifer to enter the wells. A volume of water equal to a minimum of three times the volume of water contained in the well casing plus three times the estimated volume of water in the well filter pack (assuming 30% porosity in the filter pack) will be purged from each well. Water quality parameters including pH, temperature, and specific conductance will be monitored and recorded during well purging. Stabilization of these water quality parameters suggests that the water within the well is representative of the groundwater in the aquifer. Samples will be collected when these parameters have stabilized and the water level has returned to at least 80 percent of its static level. Purging of the well will continue until either a maximum of five volumes of water contained in well casing have been purged or the groundwater parameters have stabilized. If, after purging five casing volumes, stabilization has not been reached, the groundwater sample will be collected as described below. Purge water will also be inspected in the field for the presence of odor and sheen. Water quality parameters are considered stabilized if they are measured to be within 10% of the previous reading (pH \pm 0.7; temperature \pm 5°F; specific conductance \pm 25 μ MHOS).

Groundwater samples will be collected using disposable bailers on the same day that the wells are purged. Water samples will be decanted into containers provided by the analytical laboratory specifically designed and prepared to prevent loss of volatile organic constituents from the sample (3-VOAs for BTEX, 1-Liter Amber for TPH-E). Volatile organic sample vials will be filled completely so that the water forms a convex meniscus at the top, then capped so that no air space (air bubbles) exists in the vial. Samples will be labeled with identifying information, placed on ice in a chilled cooler, and transported under standard chain of custody (COC) procedures to Curtis & Tompkins, Ltd., an analytical laboratory that

is certified by the State of California Department of Toxic Substances Control for the analyses required.

2.1.4 Quality Assurance Water Samples

One duplicate groundwater sample will be collected from one of the three wells during each sampling event. The duplicate sample will be collected at the same time as the initial sample. The duplicate sample will be handled in the same manner as the primary sample. A travel blank water sample will accompany the cooler in which the samples are stored during transportation from the laboratory, to the site, and back to the laboratory.

The duplicate sample will be analyzed for the same analytes as the groundwater samples. The travel blank will be analyzed for BTEX compounds only.

2.1.5 Groundwater Sample Analyses

Groundwater and quality assurance sample analyses are summarized in Table 2. The groundwater samples will be analyzed for TPH-E (diesel, kerosene, and fuel oil) using modified EPA Method 8015 and BTEX using EPA Method 8020.

2.2 SAMPLE DOCUMENTATION

Field parameters (pH, specific conductance, temperature), water level measurements, and sample data (time, other notes) will be recorded in a field log book during purging and sampling events. Sample labels will be filled out using waterproof ink. Sample labels will be securely affixed to the sample containers and contain the following information (1) unique sample identification number, (2) project/facility identification, (3) samplers initials, (4) date and time of sample collection, (5) analyses requested, and (6) preservatives (if any). All of the information on the sample label will be entered on the COC documenting the time of sample collection plus the following additional information: samplers signature and affiliation, sample type/matrix, analytes to be tested for, number and size of containers, method of shipment, and signatures of persons accepting and relinquishing custody (including dates and times). Since all samples will be submitted to the same laboratory, the duplicate sample for

each sampling event shall be labeled Monitoring Well #4. This labeling strategy will preserve the anonymity of the duplicate sample's true origin.

INVESTIGATIVE DERIVED WASTE DISPOSAL

Purged groundwater will be placed in 55-gallon DOT-approved drums and left on site pending disposal by PRFTA personnel. To help ensure proper handling, treatment and/or disposal, the drums will be labeled. The labels will include the date of collection, the site address, waste material, material origins (e.g., well number), potential contaminants of concern, and the name and phone number of a contact person to whom questions may be addressed.

SITE SAFETY AND HEALTH PLAN

The Site Safety and Health Plan (SSHP) is provided with this Work Plan as Appendix A. This SSHP outlines the measures that will be taken to ensure the health and safety of workers, regulators, and the public at the site during each sampling event.

5.0
SCHEDULE

Groundwater samples will be collected every three months for a period of one year (four consecutive sampling events). Samples will be analyzed using standard laboratory turnaround time (3 weeks). A brief letter report on the results of each quarterly sampling event will be submitted to the USACE Technical Manager five weeks after receipt of the analytical data.

6.0
REPORT

Following completion of the each quarterly groundwater sampling event and the receipt of laboratory analytical results, a brief letter report will be prepared which will describe the results of that quarter's groundwater monitoring. The report will include the following:

- (1) a summary of field activities including tables summarizing groundwater elevation and analytical data;
- (2) a groundwater elevation contour map showing the local groundwater flow direction and gradient;
- (3) TPH-E and/or BTEX distribution maps, if appropriate;
- (4) field data sheets, including copy of field log of well purging and sampling; and,
- (5) copies of the laboratory analytical reports.

The analytical data will be reviewed by a Woodward-Clyde project level chemist. The quarterly reports will be submitted to Mr. Richard Haavisto (USACE), Mr. Marshall Marik (PRFTA), and Ms. Eva Chu (ACDEH) for review.

REFERENCES

Ford, Robert S., Hills, Edward E. 1974. Department of Water Resources "Evaluation of Groundwater Resources: Livermore and Sunol Valleys". Bulletin No. 118-2.

U.S. Geological Survey; Dublin Quadrangle Topographic Base Map; 1961, photo revised 1980.

Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, 10 August 1990.

TABLE 1
LIST OF CONTACTS
BUILDING 109-UST, PRFTA, DUBLIN, CALIFORNIA

Owner's Representatives:

U.S Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922
Richard Haavisto (916) 557-7440
Technical Manager

Parks Reserve Forces Training Area (PRFTA)
Building 791
Camp Parks, California 94568-5201
Marshall Marik (510) 803-5638

Director of Public Works
Mr. Dennis Stone
Fort McCoy
Sparta, Wisconsin 54656-5000

Environmental Consultants:

Woodward-Clyde Federal Services
500-12th Street, Suite 100
Oakland, California 94607
Michael Sartor (510) 874-3173

Woodward-Clyde Federal Services
10370 Old Placerville Road, Suite 104
Sacramento, California 95827
Laurie Israel (916) 368-0988

Lead Implementing Agency:

Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502
Eva Chu (510) 567-6762

Regional Water Quality Control Board:

Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612
(510) 286-1255

TABLE 2

SUMMARY OF PROPOSED SAMPLES PER QUARTER

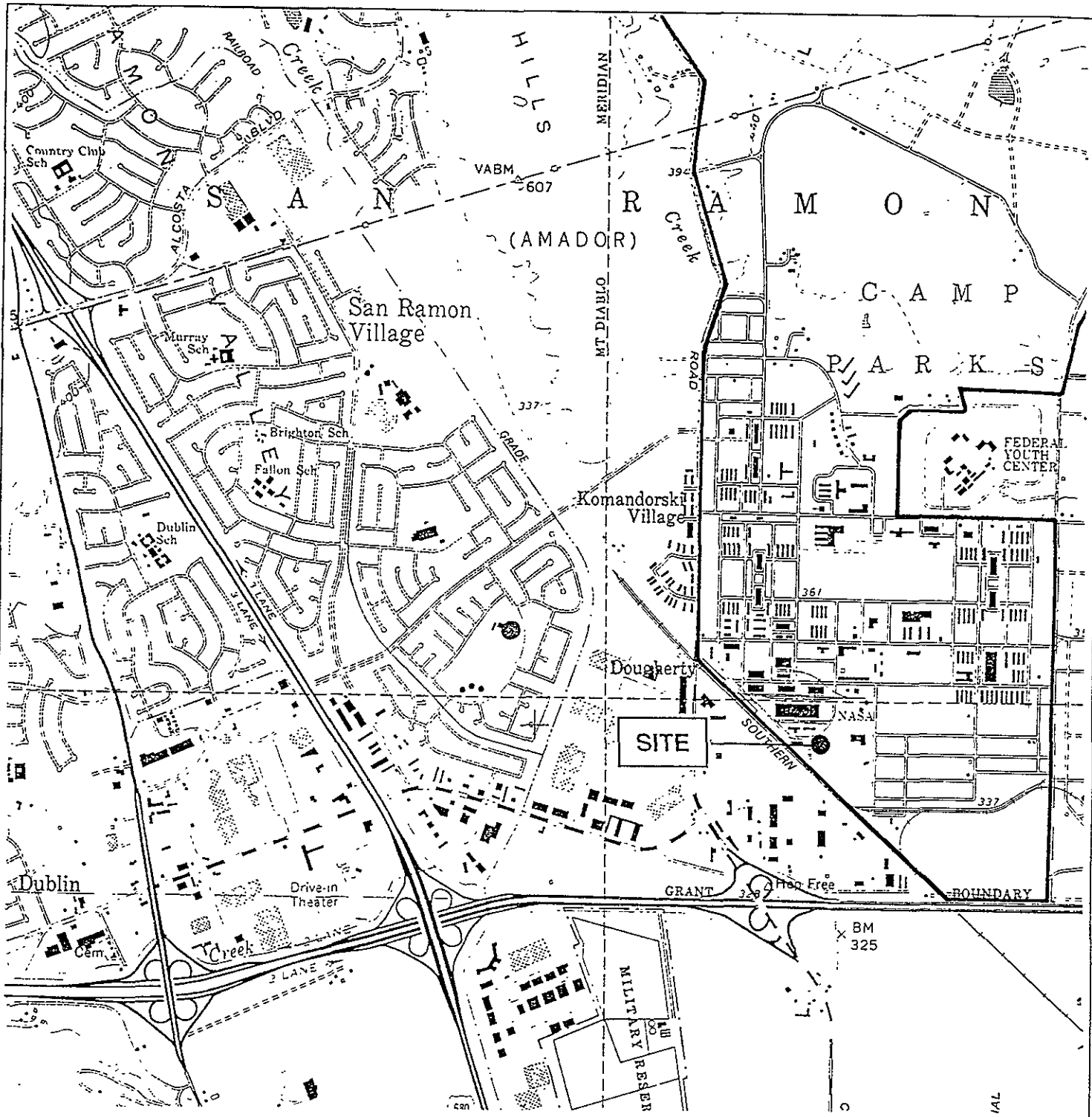
Sample Type	Number of Samples per Quarter	
	TPH as Diesel, Kerosene, Fuel Oil Mod. EPA Method 8015	BTEX EPA Method 8020
Groundwater	4	4
Trip Blank		1

TPH = total petroleum hydrocarbons.

BTEX = benzene, toluene, ethylbenzene, and xylenes.

TABLE 3
ANALYTICAL METHODS, SAMPLE CONTAINERS, PRESERVATION AND
HOLDING TIMES FOR WATER SAMPLES

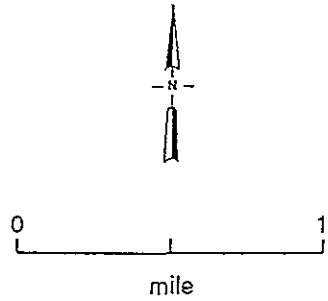
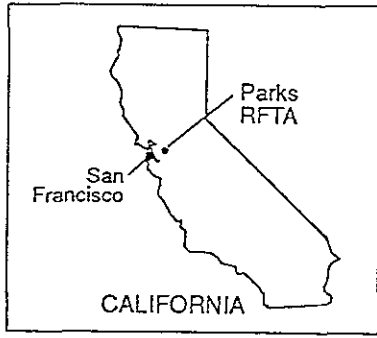
Method	Parameter	Number of Containers/Samples	Minimum Sample Size	Preservation	Maximum Holding Time
8015M	Diesel, Kerosene, Fuel Oil	1 Liter Amber glass bottle with Teflon-lined lid	1 Liter	4°C	14 days
8020	Volatile Organics (BTEX)	3-40 ml glass VOA vials with Teflon-lined septa Zero headspace	40 ml each VOA	4°C and 4 drops HCL	Analyze within 7 days (max 14-days with preservative)



LEGEND

— Facility Boundary

Note: Base Map From Dublin Quadrangle, Minute Series (Topographic) 1961, Photorevised 1980



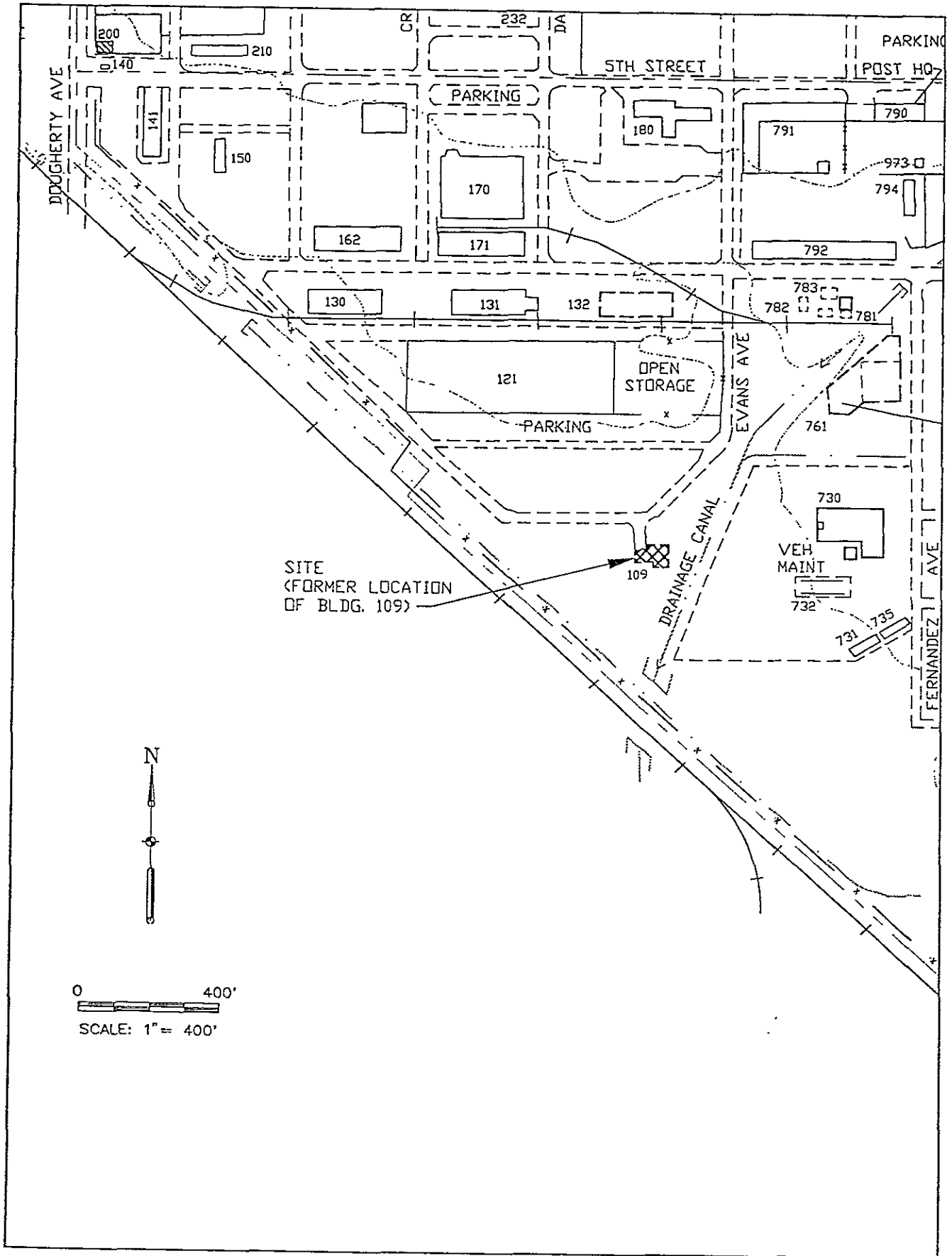
Project No.
7112

Parks Reserve Forces
Training Area

Woodward-Clyde

**SITE LOCATION MAP
PARKS RESERVE FORCES TRAINING AREA
DUBLIN, CALIFORNIA**

Figure
1

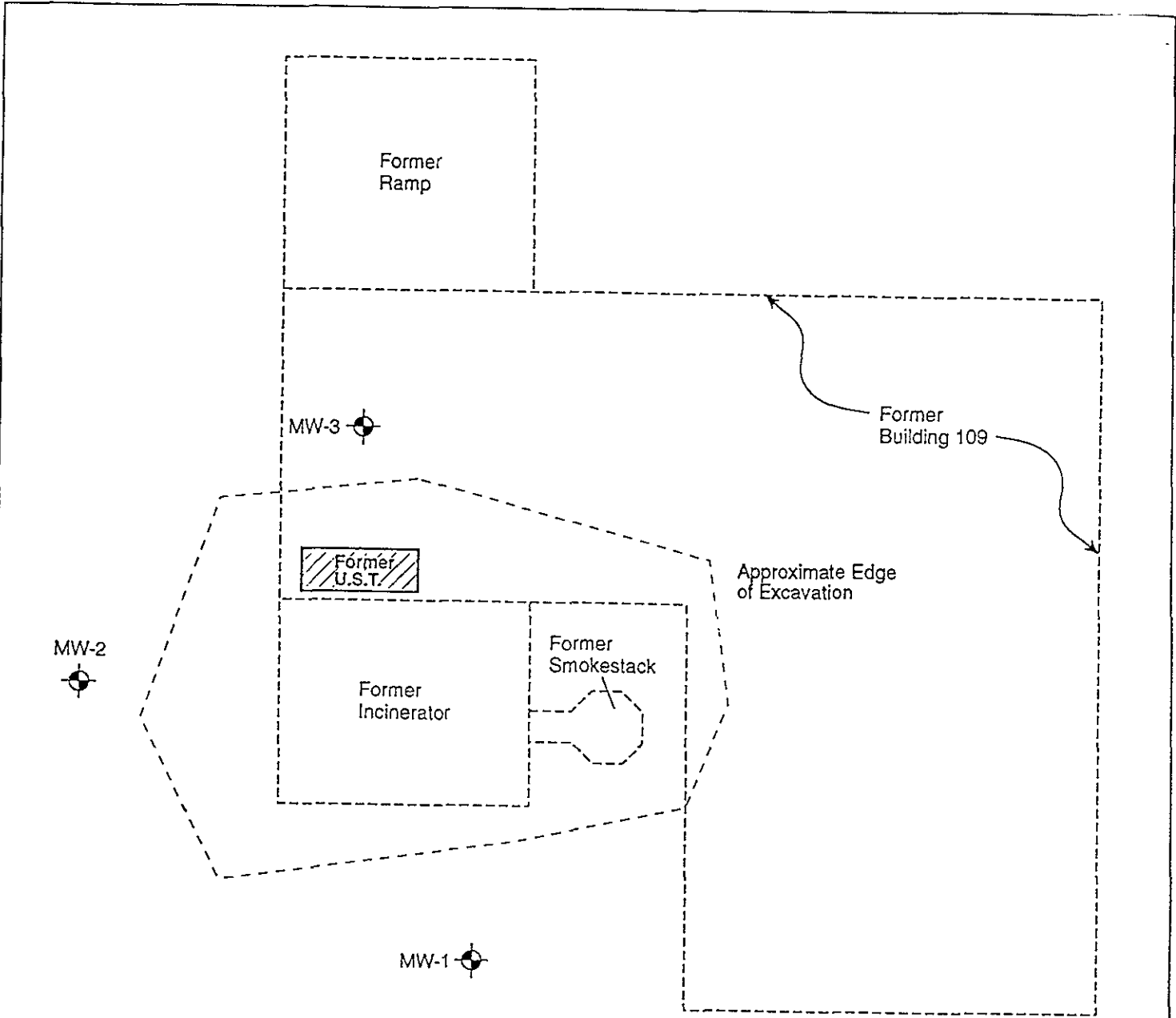


SITE
(FORMER LOCATION
OF BLDG. 109)




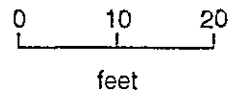
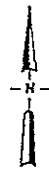
0 400'
SCALE: 1" = 400'

Project No. 7112	Parks Reserve Forces Training Area	SITE LOCATION BLDG. 109 GROUNDWATER INVESTIGATION	Figure 2
Woodward-Clyde			

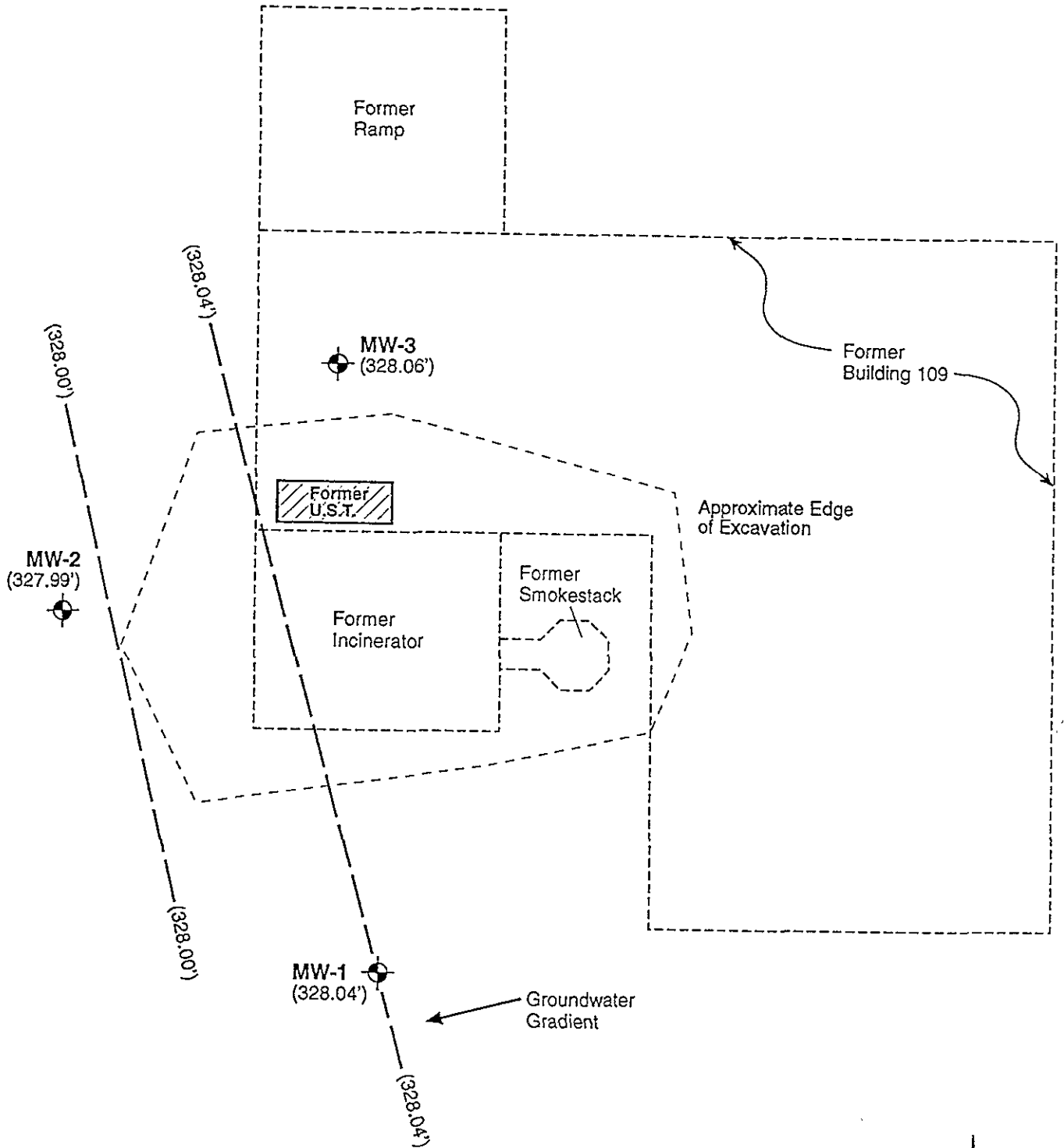


LEGEND


 MW-1 Monitoring Well Locations



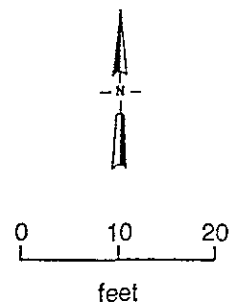
Project No. 7112	Parks Reserve Forces Training Area	MONITORING WELL LOCATIONS BLDG. 109 GROUNDWATER INVESTIGATION	Figure 3
Woodward-Clyde			



LEGEND

MW-1 (328.04')  Groundwater Elevation (feet above mean sea level) on January 25, 1995.

— (328.04') — Groundwater Elevation Contours



Project No. 7112	Parks Reserve Forces Training Area	GROUNDWATER ELEVATION JANUARY 1995 BUILDING 109 INVESTIGATION	Figure 4
Woodward-Clyde			

APPENDIX A
SITE SAFETY AND HEALTH PLAN

SITE SAFETY AND HEALTH PLAN



QUARTERLY

GROUNDWATER

MONITORING

BUILDING 109

PARKS RESERVE FORCES

TRAINING AREA

DUBLIN, CALIFORNIA

Prepared for



U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814

April 1996

Woodward-Clyde



10370 Old Placerville Road, Suite 104
Sacramento, California 95827
Project No. 7112 9700

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ADMINISTRATIVE INFORMATION

1.1 PROJECT IDENTIFICATION AND APPROVALS

Project Name: Quarterly Groundwater Monitoring - Parks Reserve Center
Project Number: 7112, 9700
Business Unit: Sacramento, California
Project Manager: J. Michael Sartor
Date of Issue: December 21, 1995
Effective Dates: January 2, 1996 through July 31, 1997

Approvals:



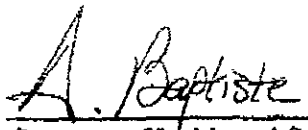
Project Manager
J. Michael Sartor, P.E.

4-25-96
Date



Health and Safety Officer
Jeff Mohn

4-18-96
Date



Corporate Health and Safety Officer
Anne Baptiste, CIH

4-16-96
Date

INTRODUCTION

This Site Safety and Health Plan (SSHP) establishes guidelines and requirements for the health and safety of field personnel during field activities associated with the quarterly monitoring of three (3) monitoring wells associated with the former Building 109 underground storage tank (UST). The specific activities addressed by this SSHP are defined in Section 6.0. All Woodward-Clyde on-site personnel and subcontractors are required to read this plan and agree to abide by the provisions of this plan by signing the attached Compliance Agreement. In addition, on-site personnel must comply with the Woodward-Clyde written Health and Safety Program.

The health and safety guidelines and requirements presented are based on a review of available information and an evaluation of potential hazards. This plan outlines the health and safety procedures and equipment required for activities at this site to minimize the potential for exposures of field personnel. This plan may be modified by the Project Manager, the business unit Health and Safety Officer (HSO), and the Corporate Health and Safety Officer (CHSO) in response to additional information obtained regarding the potential hazards to field investigative personnel.

RESPONSIBILITIES AND AUTHORITIES

EXECUTIVE VICE PRESIDENT - PRACTICE (EVPP): William Gardner

Responsibilities

- Direct and monitor the implementation of the Health and Safety Program.
- Advise CEO on health and safety matters.
- Issue directives, advisories, and information to CHSOs.

Authority

- Direct changes in the Health and Safety program.
- Determine and implement personnel disciplinary actions as required.

CORPORATE HEALTH AND SAFETY ADMINISTRATOR (CHSA): Phil Jones

Responsibilities

- Track health and safety regulations and implement improvements to the Woodward-Clyde health and safety program.
- Maintain records pertaining to medical surveillance, training, fit testing, chemical exposure, and incidents.
- Update health and safety manual.
- Manage medical surveillance program.

- Develop and implement the Health and Safety Training program.
- Provide industrial hygiene/chemical safety guidance to CHSO and HSO.
- Audit key aspects of Health and Safety Program and report effectiveness to EVPP.

Authority

- Approve the health and safety qualifications of employees to work at hazardous waste sites.
- Approve or disapprove Site Safety and Health Plans.
- Establish employee training and medical surveillance procedures.
- Suspend work on any project which jeopardizes the health and safety of personnel.

CORPORATE HEALTH AND SAFETY OFFICER (CHSO): Anne Baptiste

Responsibilities

- Direct the implementation of the Health and Safety Program of the operating group and provide recommendations for improvement of the program.
- Coordinate health and safety activities of the business unit offices in the operating group.
- Determine need for project Site Safety and Health Plans.
- Review and approve Site Safety and Health Plans.
- Monitor implementation of Site Safety and Health Plans.

- Investigate reports of incidents or accidents and report accidents or incidents to the CHSA and EVPP.
- Assist CHSA with employee health and safety training in the operating group.
- Determine whether an accidental exposure or injury merits a change in the affected individual's work assignments and whether changes in work practices are required.
- Coordinate business units with regard to health and safety equipment needs.

Authority

- Approve or disapprove Site Safety and Health Plans.
- Direct business unit HSO to prepare project Site Safety and Health Plans.
- Access project files.
- Direct changes in personnel work practices to improve health and safety of employees involved in hazardous waste management projects.
- Remove individuals from projects if their conduct jeopardizes their health and safety or that of co-workers.
- Suspend work on any project which jeopardizes the health and safety of personnel involved.

HEALTH AND SAFETY OFFICER (HSO): Jeff Mohn

Responsibilities

- Interface with project managers in matters of health and safety.

- Report to CHSO on health and safety matters.
- Develop or review and approve project Site Safety and Health Plans prior to submittal to the CHSO for review.
- Conduct staff training and orientation on health and safety related activities.
- Appoint or approve site safety officers.
- Monitor compliance with Site Safety and Health Plans and conduct site audits.
- Assist project managers to obtain required health and safety equipment.
- Approve personnel to work on hazardous waste management projects with regard to medical examinations and health and safety training.

Authority

- Suspend work or otherwise limit exposures to personnel if a Site Safety and Health Plan appears to be unsuitable or inadequate.
- Direct personnel to change work practices if existing practices are deemed to be hazardous to health and safety of personnel.
- Remove personnel from projects if their actions or condition endangers their health and safety or the health and safety of co-workers.

PROJECT MANAGER (PM): J. Michael Sartor

Responsibilities

- Ensure that the project is performed in a manner consistent with the Woodward-Clyde Health and Safety Program.
- Ensure that the project Site Safety and Health Plan is prepared, approved, and properly implemented.
- Provide the HSO with the information needed to develop Site Safety and Health Plans.
- Implement Site Safety and Health Plans.
- Ensure that adequate funds are allocated to fully implement project Site Safety and Health Plans.
- Assure compliance with Site Safety and Health Plans of contractor personnel.
- Coordinate with the HSO on health and safety matters.

Authority (Safety Related)

- Assign HSO-approved SSO to project and, if necessary, assign a suitably qualified replacement.
- Suspend field activities if health and safety of personnel are endangered, pending an evaluation by the HSO and/or CHSO.
- Suspend an individual from field activities for infractions of the Site Safety and Health Plan, pending an evaluation by the HSO, CHSO, and/or CHSA.

SITE SAFETY OFFICER (SSO): Laurie Israel

Responsibilities

- Direct health and safety activities on site.
- Report immediately all safety-related incidents or accidents to the HSO and PM.
- Assist project managers in all aspects of implementing Site Safety and Health Plans.
- Maintain health and safety equipment on site.
- Implement emergency procedures as required.

Authority

- Temporarily suspend field activities if health and safety of personnel are endangered, pending further consideration by the HSO and/or CHSO.
- Temporarily suspend an individual from field activities for infractions of the Site Safety and Health Plan, pending further consideration by the HSO and/or CHSO.

**SITE-SPECIFIC BACKGROUND, SCOPE OF WORK,
AND HAZARD ASSESSMENT**

4.1 SITE DESCRIPTION

The Parks Reserve Forces Training Area (PRFTA) is located in the City of Dublin, shown on Figure 1. PRFTA is a multi-use installation that hosts a variety of tenants, both military and civilian. PRFTA organizations utilize the installation for activities which include: fire services, maintenance of buildings, range control, storage facilities, demolition activities, and administration of utilities. Tenant organizations who lease buildings or space at PRFTA include Federal entities (U.S. Army Reserve components and U.S. Border Patrol), private companies, and public organizations.

4.2 SCOPE OF WORK

The scope of work will involve quarterly monitoring of three (3) groundwater monitoring wells located at the former Building 109 underground storage tank (UST) leak site. Specific activities include the collection of groundwater samples from the three groundwater monitoring wells at the site, sample analysis, and waste disposal for four consecutive quarters.

4.3 HAZARD ASSESSMENT

Hazard assessment analysis tables for the general activities are presented below:

Task 1: Groundwater and Liquid Sampling

Principal Steps	Potential Hazards	Recommended controls
Sample collection	Chemical exposure Back injury	Conduct air monitoring as specified in the Site Safety and Health Plan Utilize appropriate PPE Provide training for lifting and moving heavy equipment and provide adequate back support
Equipment to be used		Training Requirements
Pump, bailers, discreet samplers, and COLIWASA		OSHA 40-hour HAZWOPER/Refresher

Task 2: Decontamination of Sampling Equipment and PPE

Principal Steps	Potential Hazards	Recommended controls
Decontamination of Sampling Equipment and PPE	Chemical exposure	Follow decon procedures in Section 6.4. Utilize appropriate PPE
Equipment to be used		Training Requirements
LEL/Oxygen monitor		OSHA 40-hour HAZWOPER/Refresher

4.3.1 Chemical Hazards

The following chemicals may have been present and could pose a risk to human health or represent an exposure hazard at the site.

Benzene	Ethylbenzene	Toluene
Xylene(s)	Kerosene	Diesel fuel

Chemical information is summarized on Table 1-1 of this plan.

4.3.1.1 Aromatic and Fuel Hydrocarbons

Several aromatic constituents of petroleum distillates are also suspected to be potential soil and groundwater contaminants at the site. These hydrocarbons include:

- Benzene
- Toluene
- Xylene(s)
- Ethylbenzene
- Diesel
- Kerosene

The primary route of entry for aromatic hydrocarbons is through the lungs. Inhalation of aromatic hydrocarbons causes central nervous system (CNS) depression and can lead to other effects, such as damage to the liver, kidneys, and bone marrow. Vapors can also be absorbed through the skin. Prolonged exposure to the skin can cause defatting of the skin and dermatitis.

- Benzene. Benzene is a severe eye and moderate skin irritant. It can cause euphoria, nausea or vomiting, and fever when inhaled. Benzene is an

experimental carcinogen in animals and potential human carcinogen. The EPA has listed benzene as a type A carcinogen. It is also listed as a EPA priority pollutant and carcinogen by Proposition 65.

- Toluene. Toluene is a narcotic; acute symptoms from inhalation include euphoria, excitement, dizziness, headaches, and nausea. Extreme acute exposure can result in coma and death. Toluene is listed as a EPA priority pollutant.
- Xylene(s)/Ethylbenzene. Inhalation may lead to dizziness, excitement, drowsiness, and lack of coordination.
- Diesel: Diesel is a mixture of petroleum hydrocarbons in the 6-22 carbon atoms per molecule range. Diesel is moderately toxic to humans if ingested and mildly toxic if inhaled. Toxic affects are as follows: nausea, vomiting, fever, and hallucinations.
- Kerosene: Kerosene is a mixture of petroleum hydrocarbons in the 10-16 carbon atoms per molecule range. Kerosene is moderately toxic to humans if ingested and mildly toxic if inhaled. Toxic affects are a follows: nausea, vomiting, fever, and hallucinations.

4.3.2 Physical Hazards

The physical hazards to be encountered at the site are presented below.

Personal Protective Equipment. The personal protective equipment (PPE) which may be required for some activities places a physical strain on the wearer and may increase the risk of heat stress. In addition, PPE, such as gloves and protective clothing, limits manual dexterity. Specific PPE requirements are presented in Section 6.1.

Noise Exposure. At no time shall noise exceed 85 dBA for a period of 5 minutes or more without hearing protection as described in Section 6.1.1.

Slips, Trips, and Falls. Uneven ground will be encountered during the well sampling activities at the site. The risk of injury due to slips, trips, and falls will be increased in areas of uneven ground.

Insects. During field work at this site, personnel may encounter a wide variety of insects including bees, mosquitoes, ticks, and spiders. Field personnel are encouraged to use insect repellent when mosquitoes are present.

Stings of bees and wasps may cause serious allergic reactions in certain individuals. The SSO should identify all personnel with known insect allergies or sensitivities before field work begins.

Spider bites can be extremely serious, e.g., those of the black widow. Others are unpleasant or uncomfortable, resulting in rashes, itching, and possible infection. The possibility of allergies greatly increases the danger since people are not usually aware of such allergies until they have been bitten. Therefore, spiders should be regarded as potentially hazardous.

Ticks and other parasites that feed on the blood of an animal/human host and can carry several severe diseases, the least bringing several days of fever and pain and the worst causing brain damage.

Other Animals. Chipmunks, ground squirrels, rats, and other mammals have been known to harbor fleas carrying bubonic plague. Their bites can also transmit rabies and other infections. Chipmunk-like animals pose a special problem because people tend to try to feed them or pet them, the increased contact bringing greater possibility of danger. Avoid wildlife when possible.

Poisonous snakes may be encountered on site. Personnel should check for snakes before walking through grassy or debris-strewn areas. First aid for snake bites is included in Section 7.2.1.3.

Heat Stress

Summer and Fall in California can be very hot. Temperatures often reach 90 to 110 degrees Fahrenheit. Regular work/rest schedules must be observed in hot or humid weather. Workers must seek shade and drink fluids regularly during the work day. The heat stress operating procedure, contained in Attachment A, must be followed during this project.

GENERAL HEALTH AND SAFETY REQUIREMENTS

5.1 PERSONNEL CLEARANCE

Woodward-Clyde employees must obtain health and safety clearances before beginning field work at the PRFTA. Woodward-Clyde employees assigned to field operation must have (1) participated in the Woodward-Clyde medical surveillance program and have been certified by a Woodward-Clyde-approved physician as being physically fit and able to perform their assigned field work, (2) successfully completed a Woodward-Clyde 40-hour basic health and safety training course (Level C) for field personnel or the equivalent and subsequent 8-hour refresher courses, and (3) passed a respirator fit test with isoamyl acetate and/or irritant smoke as indicators. Site managers and supervisors must have successfully completed an 8-hour manager's health and safety course in addition to all other clearance requirements. The Site Safety Officer (SSO) must have current certification in CPR, First Aid, and OSHA Bloodborne Pathogen Standard (see Attachment B) in addition to requirements for field personnel.

Woodward-Clyde subcontractor employees must also have similar medical, training, and respirator fit clearances and will be required to provide proof of clearance before beginning work.

5.2 SAFETY BRIEFINGS

Before field work begins, all field personnel, including subcontractor employees, must be briefed on their work assignments and safety procedures contained in this document. Each person must be provided with and read a copy of this SSHP. At the end of the meeting, attendees should be informally quizzed to assess their understanding of the health and safety requirements, and must sign a safety compliance agreement form stating that they have read, understand, and agree to comply with the provisions of this plan. Individuals refusing to sign the agreement will be prohibited from conducting field work during this investigation.

The SSO will conduct this briefing. The documentation form for the briefing is attached in Attachment C. This form is to be completed and maintained in Woodward-Clyde records, including the Health and Safety file.

All personnel shall receive site specific training explaining the expected hazards and required PPE. All Woodward-Clyde staff entering the exclusion zone shall have received 40 hours HAZWOPER training, including respiratory protection.

5.3 VISITOR CLEARANCE

Visitors entering a contamination reduction zone or exclusion zone will be required to read and verify compliance with the provisions of this SSHP. In addition, visitors will be expected to comply with relevant OSHA requirements such as medical monitoring and training (Section 5.1). A minimum of four sets of PPE shall be available on-site at all times for Contracting Officer (CO)-approved visitors. All other visitors will be expected to provide their own protective equipment.

In the event that a visitor does not adhere to the provisions of the SSHP, he/she will be requested to leave the work area. All nonconformance incidents will be recorded in the site log.

5.4 DISTRIBUTION OF SSHP

Before field work begins, a copy of the final SSHP must be provided to each Woodward-Clyde and subcontractor employee assigned to field work on the project as well as to an authorized representative of each firm contracted by Woodward-Clyde to perform work on site. The SSO is responsible for ensuring that a copy of the final plan is available whenever work is in progress.

In addition to providing a SSHP, Woodward-Clyde ensures that all chemicals used, produced, or encountered on sites have been properly assessed, and that we have provided the necessary

information (labels, MSDS, and training) to employees. Our hazard communication program is presented as Attachment D. All persons shall have read the SSHP and understood the contents.

No person shall be allowed to enter the work area until they have signed a compliance agreement, Attachment E.

5.5 DAILY SAFETY INSPECTIONS

Daily safety and health inspections shall be conducted to determine if operations are being performed in accordance with the SSHP, USACE, and OSHA regulations. All self inspections should be recorded in the field log book.

5.6 ACCIDENT/INCIDENT REPORTING

In the event of an accident or incident, the SSO will immediately notify the Woodward-Clyde PM, HSO, and the CHSO. Types of accidents or incidents that are considered reportable are:

- Illness resulting from chemical exposure or unknown causes,
- Physical injury, including an injury that does not require medical attention,
- Fire, explosions, and flashes resulting from activities performed by Woodward-Clyde and its subcontractors,
- Infractions of safety rules and requirements, or
- Unexpected chemical exposures.

Work will be suspended to correct the cause of the accident/incident and to modify this plan as necessary.

A Woodward-Clyde accident/incident report form (Attachment F) must be submitted to the PM and the HSO within 24 hours of the occurrence.

In the event of an accident/incident, the SSO must also contact the USACE Technical Manager. Within two working days of any reportable accident, the contractor shall complete and submit an Accident Report on ENG 3394 in accordance with AR 385-40 and USACE Supplementals to that regulation.

5.7 SAFETY COMPLETION REPORT

The SSO will prepare a safety completion report at the end of field activities which includes a critical review of this plan, exposure monitoring data with monitoring dates, and any decisions made based on that data; a summary of incidence and action taken; and recommendations for improving health and safety at similar sites. (This report form is in Attachment G).

5.8 WORK ZONES

Work zones will be required for this project. Three work zones will be established around each sampling location: the exclusion zone, the contamination reduction zone (CRZ), and the support zone. An exclusion zone is an area where contamination could or does occur. The exclusion zone will be demarcated using orange cones and/or flagging. All Woodward-Clyde or subcontractor personnel who enter the exclusion zone must be cleared by the SSO, have signed a safety compliance agreement form, and wear the level of protective equipment specified in Section 6.0 of this plan.

The CRZ is located immediately outside the exclusion zone. This zone is designed to limit the migration of contaminants from potentially contaminated areas to uncontaminated areas. Decontamination facilities are located in this area.

The support zone is an uncontaminated area. Supporting equipment and facilities will be located in this area.

5.9 LABORATORY CONSIDERATIONS

Analysis of all samples collected from the site during the investigation will be handled by the contract laboratory. The laboratory director shall be informed that the samples may contain hazardous levels of contaminants that would require special handling procedures to prevent risks to the health and safety of laboratory personnel.

SITE-SPECIFIC HEALTH AND SAFETY REQUIREMENTS

6.1 PERSONAL PROTECTIVE EQUIPMENT

6.1.1 Hearing Protection

Regulations require that hearing protection be used when noise levels exceed 85 dBA averaged over an 8-hour day. Hearing protection is required during this investigation for exposures of greater than 85 dBA for any length of time. An initial noise survey will be conducted at the beginning of each task to determine appropriate hearing protection requirements. Woodward-Clyde personnel and their subcontractors shall have hearing protection on site for use by their employees.

6.1.2 Personal Protection Levels

Levels of personal protection are as follows:

Level D (all tasks)

- Hard Hat (when overhead hazards exist),
- Deconnable Steel Toe Boots (when working around heavy equipment),
- Boot Covers (to reduce decon water),
- Safety Glasses with side shields (around equipment), and
- Cotton gloves (over nitrile gloves, if required)
- Nitrile Gloves (when handling contaminated soils, sediments or groundwater).
- Hearing protection when required (minimum 30 dBA reduction)

6.2 AIR MONITORING REQUIREMENTS

6.2.1 Monitoring Guidelines

Vapor monitoring should be performed as often as necessary and wherever necessary to protect field personnel from hazardous vapors. Monitoring must be performed by individuals trained in the use and care of the required instruments. Because toxicity action levels are considerably lower than the explosivity action levels, monitoring efforts should focus initially on detection of toxic vapors. The presence of explosive levels of gases and vapors should be performed only when gas/vapor concentrations exceed the ppm range of the monitoring instruments and when explosive levels are expected (e.g., enclosed spaces, such as trenches).

During well developing/purging/sampling operations, vapor emissions may be measured continuously or periodically. If vapors are measured continuously and the instrument must be unattended, the sample intake orifice, or in the case of instruments that operate by diffusion, the detector, must be positioned in a safe place downwind of the well and an instrument alarm set to sound at the action level.

If the alarm sounds while monitoring continuously for toxic concentrations, the sample intake orifice/detector should be moved so that vapor concentrations in the breathing zone of individuals closest to the well are measured. Decisions regarding respirator use should be based on breathing zone vapor concentrations. If the alarm sounds while continuously monitoring for explosive concentrations, initiate shut-down procedures immediately. Since Level C is not a part of this Site Safety and Health Plan, personnel will evacuate if allowable levels are exceeded. If vapor emissions are measured periodically, they should be measured whenever the well is open. Measurements may be limited to breathing zone air.

6.2.2 Flammability/Oxygen Monitoring

The preferred instrument for air monitoring depends of the type of chemicals known or suspected to be present on site. All combustible gas monitoring shall be conducted using a combustible gas meter (CGM). Combustible gases can be created during the degradation of organic materials (petroleum hydrocarbons and plant debris). Explosion and oxygen monitoring shall be conducted using a CGM that is equipped with an oxygen sensor, such as the Gastech Model 1314S CGM.

If at any time readings greater than 20% LEL for methane are observed work shall be stopped.

In addition to the CGI, a photo ionizing detector (PID) or organic vapor analyzer (OVA) shall be used when opening any well.

6.2.3 Organic Vapor Monitoring

Vapor monitoring with an OVA flame ionization detector (FID) or photo ionizing detector (PID) shall be performed each time the wellhead is opened or every 20 minutes during all other activities which require monitoring. (The SSO may call for decreased or increased monitoring frequencies based on field conditions.) Monitoring must be continuous during well development and purging activities. Monitoring must be performed by individuals trained in the use and care of the OVA/PID.

Daily calibrations are to be completed according to manufacturer's specifications using methane as a calibration gas. A record of calibrations containing date, time, method of calibration, instrument read-out, and the name of the individual who conducted the calibration is to be maintained. A report summarizing calibration monitoring results must be written as part of the safety completion report at the end of this project. The main purpose of the air monitoring report is to document personnel exposures. Records of exposures will be maintained in the

Health and Safety file. The monitoring report is to be completed as part of the Safety Completion Report which is located in Attachment G.

6.2.4 Recordkeeping

A report summarizing monitoring results must be written as part of the safety completion report at the end of this project. The air monitoring form is contained in Attachment H.

6.3 ACTION LEVELS

INITIAL PROTECTIVE EQUIPMENT LEVEL:

Level D

- All Tasks

Stop Work:

Work shall be stopped and the area evacuated when:

- Benzene levels equal to or greater than 1 ppm as measured in the breathing zone using Draeger Tubes.
- There are sustained (more than 3 minutes) OVA/PID readings averaging 25 ppm above background in the breathing zone.
- LEL readings exceed 20% for 5 minutes or longer.
- Oxygen levels exceed 23.5% or are less than 19.5% at anytime.

- Symptoms of possible exposure occur in any individual while on the job (symptoms include eye, throat, or skin irritation; nausea, dizziness, light-headedness, blurred vision, muscular uncoordination, and vomiting).

Upon suspension of work, the SSO shall direct the field personnel to move to a safe place. The Woodward-Clyde PM and HSO will be contacted and health and safety procedures will be reassessed before work may resume. An addendum to this Site Safety and Health Plan may be required.

6.4 DECONTAMINATION

Decontamination equipment shall be present on site. A temporary decontamination line will be set up at the site. A decontamination solution of Alconox and water will be used at this site. An MSDS for Alconox is available on request. The temporary decontamination line will provide sufficient space to wash and rinse boots, gloves and all sampling equipment prior to placing equipment into a vehicle, as well as a place to discard of used disposable items such as gloves and tyvek. Personnel are advised to shower as soon as possible after leaving the site.

6.5 WORK PRACTICES

6.5.1 General

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the exclusion zone and the contamination reduction zone. The drinking of water, Gatorade, or equivalent fluids may occur in the CRZ if reasonable precautions are taken. At a minimum liquids must be dispensed into disposable cups which are discarded after a single use. In addition, personnel should remove the outer glove, unzip the front of the Tyvek, pull Tyvek away from the body, and wash their face and hands in clean water. The SSO may dispense with these additional requirements if field conditions warrant (based on minimal or no potential for exposure to hazardous substances).

- Smoking, carrying lighters and/or matches is prohibited in the exclusion zone and the contamination reduction zone.
- Dust generation will be kept to a minimum. If visible dust is generated for more than 15 minutes, engineering practices, such as wetting down the work area, shall be instituted.
- Medicine and alcohol can potentate the effects from exposure to toxic chemicals. PRESCRIBED DRUGS SHOULD NOT BE TAKEN BY PERSONNEL ON OPERATIONS WHERE THE POTENTIAL FOR ABSORPTION, INHALATION, OR INGESTION OF TOXIC SUBSTANCES EXISTS UNLESS SPECIFICALLY APPROVED BY A QUALIFIED PHYSICIAN. Alcoholic beverage intake will not be allowed during working hours or breaks.
- NO PERSON WILL ENTER AN EXCLUSION ZONE ALONE.
- No one will approach or enter areas or spaces where toxic or explosive concentrations (>20% LEL) of gases or dust may exist without proper equipment available to enable safety entry.
- Entry into trenches or confined spaces will not be permitted.

6.5.2 Buddy System

The "buddy system" will be used during all field work. At no time will an individual enter or leave an exclusion zone alone. Before entering an exclusion zone, each individual will identify his/her "buddy." "Buddies" will remain in visual contact with one another during field activities.

6.5.3 Excavation Safety

No personnel shall be allowed to enter a trench or excavation under this SSHP.

6.5.4 Material Handling Procedures

All purge water and decontamination water will be placed in 55-gallon drums and stored on site pending final determination of disposal criteria based on results of analytical sampling.

6.5.5 Communications

6.5.5.1 On-Site Communications

Due to the limited field work and number of personnel required for this project, on-site communications systems will not be utilized. The "buddy system" will be employed at this site and personnel will be in sight of the SSO during all field activities.

6.5.5.2 Off-Site Communications

The SSO will have access to a telephone at all times. A cellular phone will be available to the SSO during all on-site activities.

7.1 EMERGENCY SERVICES**7.1.1 Emergency Phone Numbers**

Ambulance: 911

Police Department: 911

Fire Department: 911

Woodward-Clyde Oakland Office: (510) 874-3000

Woodward-Clyde Sacramento Office: (916) 368-0988

Hospital: (510) 447-7000

7.1.2 Hospital Route

Valley Medical Center

5555 W. Las Positas Blvd.

Pleasanton, CA

Directions:

From site, take Arnold Road south to Dublin Blvd., turn left (east) on Dublin Blvd. to Hacienda Drive. Go south on Hacienda Drive, go over Hwy 580 to Owens Drive. Turn left (east) on Owens Drive to W. Las Positas Blvd. Turn left (east) on W. Las Positas Blvd. and the hospital is on the left side at 5555 W. Las Positas Blvd. The route to the hospital is included as Figure 1.

7.1.3 Woodward-Clyde Contacts

J. Michael Sartor

Project Manager

(510) 874-3173

Jeff Mohn
Health and Safety Officer
(408) 297-9585

Anne Baptiste
Corporate Health and Safety Officer
(619) 294-9400

7.2 EMERGENCY RESPONSE PROCEDURES

The Site Manager, with assistance from the SSO, has responsibility and authority for coordinating all emergency response activities until proper authorities arrive and assume control.

7.2.1 Emergency Medical Treatment

If an employee working in a contaminated area is physically injured, Red Cross first aid procedures will be followed. (As indicated in Section 5.1 the SSO must be trained in CPR and First Aid. However, other field personnel may also be certified and available to assist in emergency treatment.) Depending on the severity of the injury, emergency medical response may be sought. If the employee can be moved, they will be taken to the edge of the work area (on a stretcher, if needed) where contaminated clothing will be removed (if possible) and emergency first aid administered, and then they will be transported to the hospital.

7.2.1.1 Emergency Medical Procedures

For severe injuries, illnesses, or overexposures:

- Remove the injured or exposed person(s) from immediate danger.
- If possible, at least partial decontamination should be completed. Wash, rinse, and/or cut off protective clothing and equipment and redress the victim in clean coveralls.

- If decontamination cannot be done, wrap the victim in blankets or plastic sheeting to reduce contamination of other personnel.
- Render emergency first aid and call an ambulance for transport to local hospital immediately. Notify emergency personnel of contaminants on-site.
- Evacuate other personnel on site to a safe place until the SSO determines that it is safe to resume work.
- Report the accident to the PM and HSO immediately and complete an incident report.

For minor injuries or illnesses:

- Complete a full decontamination.
- Administer first aid. Minor injuries may be treated on site, but all injuries will be examined by trained medical personnel. Victims of serious bites or stings will be taken to a medical center.
- Notify the PM and HSO immediately.

7.2.1.2 First Aid - Chemical Injury

If the injury to the worker is chemical in nature (e.g., overexposure), the following first aid procedures are to be instituted as soon as possible:

- Eye Exposure: If contaminated solid or liquid gets into the eyes, wash eyes immediately with sterile saline solution lifting the lower and upper lids occasionally. Continue eye wash for 15 minutes. Cover the eye with a dry pad and obtain medical attention immediately. (Contact lenses are not permitted in the exclusion zone.)

- Skin Exposure: If contaminated solid or liquid gets on the skin, promptly wash contaminated skin for 15 minutes using soap or mild detergent and water. If solids or liquid penetrate through the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water. Obtain medical attention immediately if symptoms warrant.

7.2.1.3 First Aid - Physical Injury

- Animal Bites: Thoroughly wash the wound with soap and water. Flush the area with running water and apply a sterile dressing. Immobilize affected part until the victim has been attended by a physician. See that the animal is kept alive and in quarantine. Obtain name and address of the owner of the animal.
- Burns (minor): Do not apply vaseline or grease of any kind. Apply cold water applications until pain subsides. Cover with a wet sterile gauze dressing. Do not break blisters or remove tissue. Seek medical attention.
- Burns (severe): Do not remove adhered particles of clothing. Do not apply ice or immerse in cold water. Do not apply ointment, grease or vaseline. Cover burns with thick sterile dressings. Keep burned feet or legs elevated. Seek medical attention immediately.
- Cramps: Treat as heat exhaustion. See Attachment A.
- Cuts: Apply pressure with sterile gauze dressing, and elevate the area until bleeding stops. Apply a bandage and seek medical attention.
- Eyes: Keep the victim from rubbing the eye. Flush the eye with (foreign objects) water. If flushing fails to remove the object, apply a dry, protective dressing and consult a physician.
- Fainting: Keep the victim lying down with feet elevated. Loosen tight clothing. If victim vomits, roll him onto his side or turn his head to the side. If necessary wipe out his mouth.

Maintain an open airway. Bathe his face gently with cool water. Unless recovery is prompt, seek medical attention.

- Fracture: Deformity of an injured part usually means a fracture. If fracture is suspected, splint the part as it lies. Do not attempt to move the injured part of the person. Seek medical attention immediately.
- Heatstroke: See Attachment A.
- Snake Bites: Submerge the bite area in ice water or cover the bite area with ice. Keep the bite area as low as possible. Transport the victim immediately to a medical facility.
- Insect Bites: Remove "stinger" if present. Keep affected part down below the level of the heart. Apply ice bag. For minor bites and stings apply soothing lotions, such as calamine.
- Puncture Wounds: If puncture wound is deeper than skin surface, seek medical attention. Serious infection can arise unless proper treatment is received.
- Sprains: Elevate injured part and apply ice bag or cold packs. Do not soak in hot water. If pain and swelling persists, seek medical attention.
- Unconsciousness: Never attempt to give anything by mouth. Keep victim flat, maintain an open airway. If victim is not breathing, provide artificial respiration by mouth to mouth breathing and call for an ambulance immediately.

7.2.2 Injury Due to Heat Stress or Cold Stress

Environmental conditions may present additional health concerns due to temperature extremes. Effects and treatment of heat stress and cold stress can be found in Attachment A.

7.2.3 Fire/Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the PM or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on-site.

If it is safe to do so, site personnel may:

- Use fire fighting equipment available on site to control or extinguish the fire; and,
- Remove or isolate flammable or other hazardous materials which may contribute to the fire. Otherwise, immediate evacuation of the area is indicated. In the event of an explosion, all personnel shall be evacuated and the fire department notified. No one shall re-enter the area until it has been cleared by explosives safety personnel.

7.2.4 Natural Disasters

Natural disasters may occur at the site due to weather. These include lightning and high winds.

Lightning - Persons should not work in open areas, near trees or other equipment outside during lightning storms. Stop work until the storm passes. If possible, clear the site until the storm passes.

High Winds - If high winds are forecast, then the site should be cleared before the winds become hazardous. Workers should be instructed to go to an appropriate shelter.

If an evacuation is called, account for all persons before leaving the site.

Notify the PM of any work stoppage due to lightning and high winds.

7.3 EMERGENCY EQUIPMENT

This equipment will be stored at appropriate locations selected during site mobilization. Emergency response equipment may be moved from one location to another based on changing locations of construction activities.

- Fire Extinguishers: At least two 20-lb-type ABC fire extinguishers will be located at each entrance to each exclusion zone.
- Emergency Eye Wash: At least a 7 gallon portable eye wash will be located at the entrance to each exclusion zone.
- First Aid Kit: At least one industrial first aid kit will be provided and maintained fully stocked in the CRZ. First aid kit locations will be specially marked and provided with adequate water and other supplies necessary to cleanse and decontaminate burns, wounds, or lesions.
- Gatorade or the equivalent.
- Extra full set of PPE.

Table 1-1
Chemical Information Sheet

PETROLEUM DISTILLATE FUELS

CHEMICAL	OSHA PEL (ppm)	ACGIH TLV (ppm)	IDLH (ppm)	ODOR THRESHOLD (ppm)	CARC. CATEGORY	OVA RESPONSE % (METHANE)	IP (eV)	UEL/LEL %	Flash Point °F
*Benzene	1	.1	1000	34-119	A1 - Known Prop. 65 Listed	150	9.24	7.9/1.3	12
Toluene	100	100	2000	.16-37		110	8.82	7.1/1.2	40
Ethylbenzene	100	100	2000	0.092-0.60		100	8.76	6.7/1.0	55
Xylene	100	100	1000	20		114	8.44	7.0/1.1	63

* Note: These chemicals are known to the State of California to cause cancer or reproductive harm.

Petroleum distillate fuels are mixtures of aliphatic and aromatic hydrocarbons. The predominant types of compounds in fuels are paraffins, naphthenes, aromatics (benzene, ethylbenzene, toluene, xylene) and polycyclic aromatic hydrocarbons in the case of fuel oil 6. While benzene is the most toxic of the compounds, it is a minor component of petroleum distillate fuels with concentrations ranging from non-detectable to 5%, with gasoline typically at 1%. Benzene has been classified a known human carcinogen by the American Conference of Governmental Industrial Hygienists (ACGIH) based on the increased incidence of leukemia in certain oil refinery.

Petroleum distillate fuels exhibit relatively low acute inhalation and dermal toxicity unless excessive concentrations are reached. Concentrations of 160 to 270 ppm of gasoline vapor have been reported to cause eye, nose, throat and respiratory system irritation in people after several hours of exposure. Levels 500 to 900 ppm have been reported to cause irritation and dizziness in one hour and 2,000 ppm has been reported to cause mild anesthesia in 30 minutes. Gasoline and some jet fuels will cause severe eye irritation on contact with the eye and low to moderate skin irritation on contact with the skin. At extremely high concentrations, where oxygen displacement is a factor, asphyxiation may occur.

Gasoline is a very dangerous fire and explosion hazard when exposed to heat or flame. In addition it can react vigorously with oxidizing materials.

Petroleum distillate fuels are flammable. Under certain conditions, this property presents a greater risk than toxicity. Gasoline is classified by the Federal Department of Transportation as a flammable liquid. These fuels are gasoline, gasohol, Jet B, JP-1, JP-4, and No. 1 fuel oil. Lower explosive limits of the fuels range from 0.6 to 1.4 percent (6,000 to 14,000 ppm).

Diesel fuels are approximately similar to fuel oils used for heating (fuels oils no.1, no.2, and no.4). Diesel fuels contain predominantly a mixture of C10 through C19 hydrocarbons, which include approximately 64% aliphatic hydrocarbons, 1-2% olefinic hydrocarbons, and 35% aromatic hydrocarbons.

Table 1-1 (continued)
Chemical Information Sheet

LEAD COMPOUNDS

OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)	IDLH (mg/m ³)	ODOR THRESHOLD (mg/m ³)	CARC. CATEGORY	OVA RESPONSE % (METHANE)	IP (eV)	Flash Point
0.05	0.15	700	-	Prop. 65 Listed*	NA	NA	NA

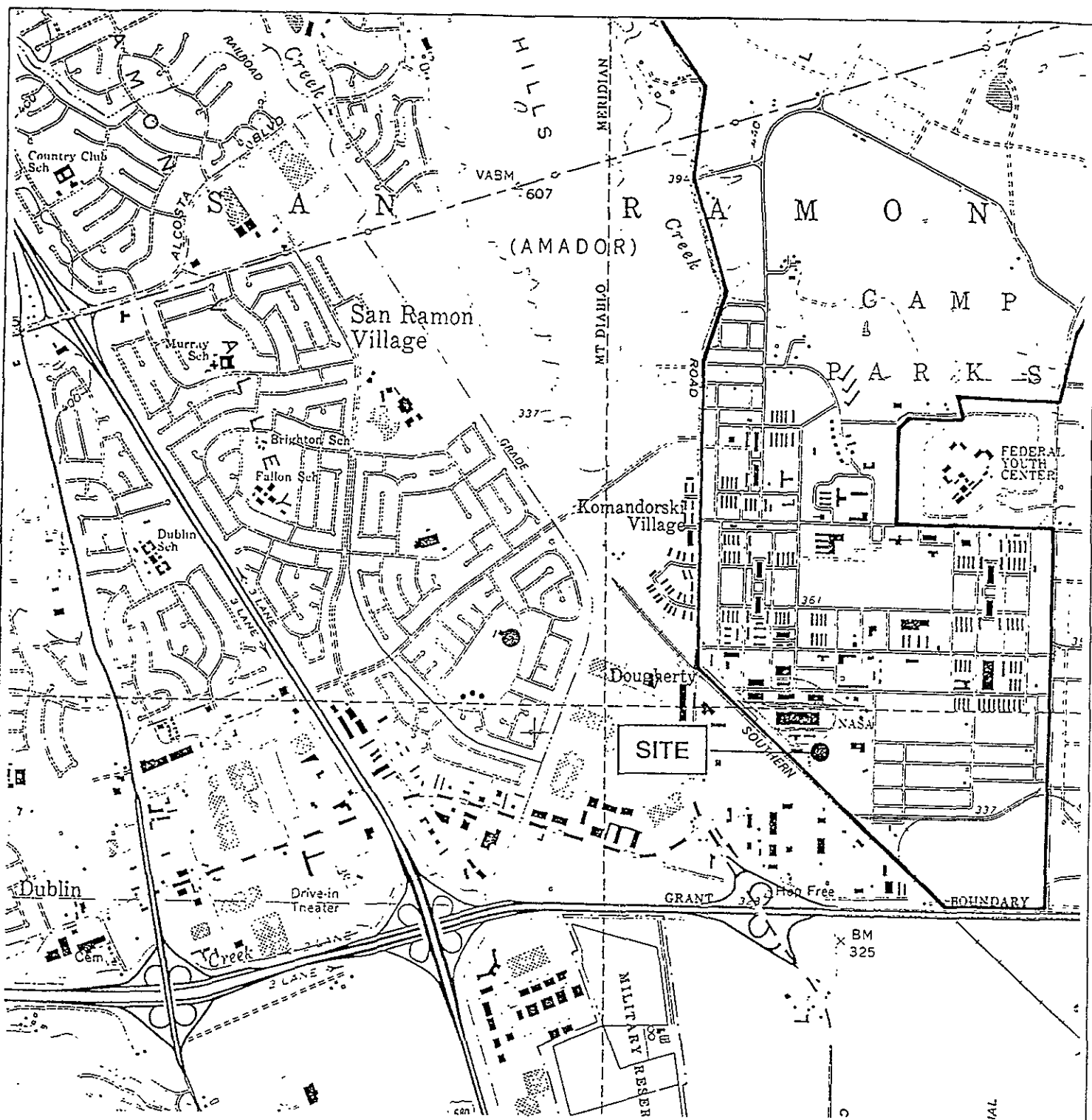
* Note: These chemicals are known to the State of California to cause cancer or reproductive harm.

Lead poisoning is one of the most common occupational diseases. The presence of lead bearing materials or lead compounds does not necessarily result in worker exposure but that the lead must be in such a form to distribute and gain entrance into the body or tissues of the worker in measurable quantities. Otherwise, exposure is said to not occur. Some lead compounds are carcinogenic of the lungs and kidneys and are on the Community Right to Know List.

Lead can enter the body by 1) inhalation of dust, fumes, mists or vapors, 2) ingestion of lead compounds trapped in the upper respiratory tract or introduced into the mouth on food, tobacco or fingers, 3) through the skin. Skin absorption is of special importance in the case of organic compounds of lead, as tetraethyl lead. Inorganic forms of lead have no dermal exposure significance. Significant quantities of lead can be ingested from water that has been sitting in pipes or water coolers with lead solder. When lead is ingested, much of it passes through the body unabsorbed, and is eliminated. Most of the lead that is absorbed is caught by the liver and excreted. For this reason, large amounts of lead are necessary to cause toxic effects by this route, and a long period of exposure is usually necessary to produce symptoms. Upon inhalation of dusts or mists, absorption takes place easily from the respiratory tract and symptoms develop more quickly.

Lead is a cumulative poison. Increasing amounts build up in the body and eventually reach a point where symptoms and disability occur. The major organs affected are the nervous system, blood system, and kidneys. Some of the human systemic effects by ingestion and inhalation are loss of appetite, anemia, insomnia, headache, irritability, muscle and joint pains, muscle weakness, and liver changes.

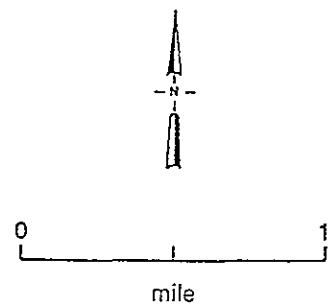
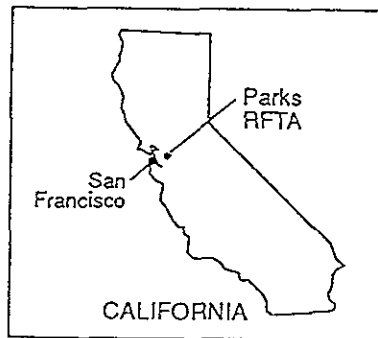
Use of proper personal protective equipment can illuminate worker exposure to lead during work activities. Engineering controls such as minimization of dust and high velocity fans can be utilized to keep lead levels under permissible exposure limits.



LEGEND

— Facility Boundary

Note: Base Map From Dublin Quadrangle, Minute Series (Topographic) 1961, Photorevised 1980



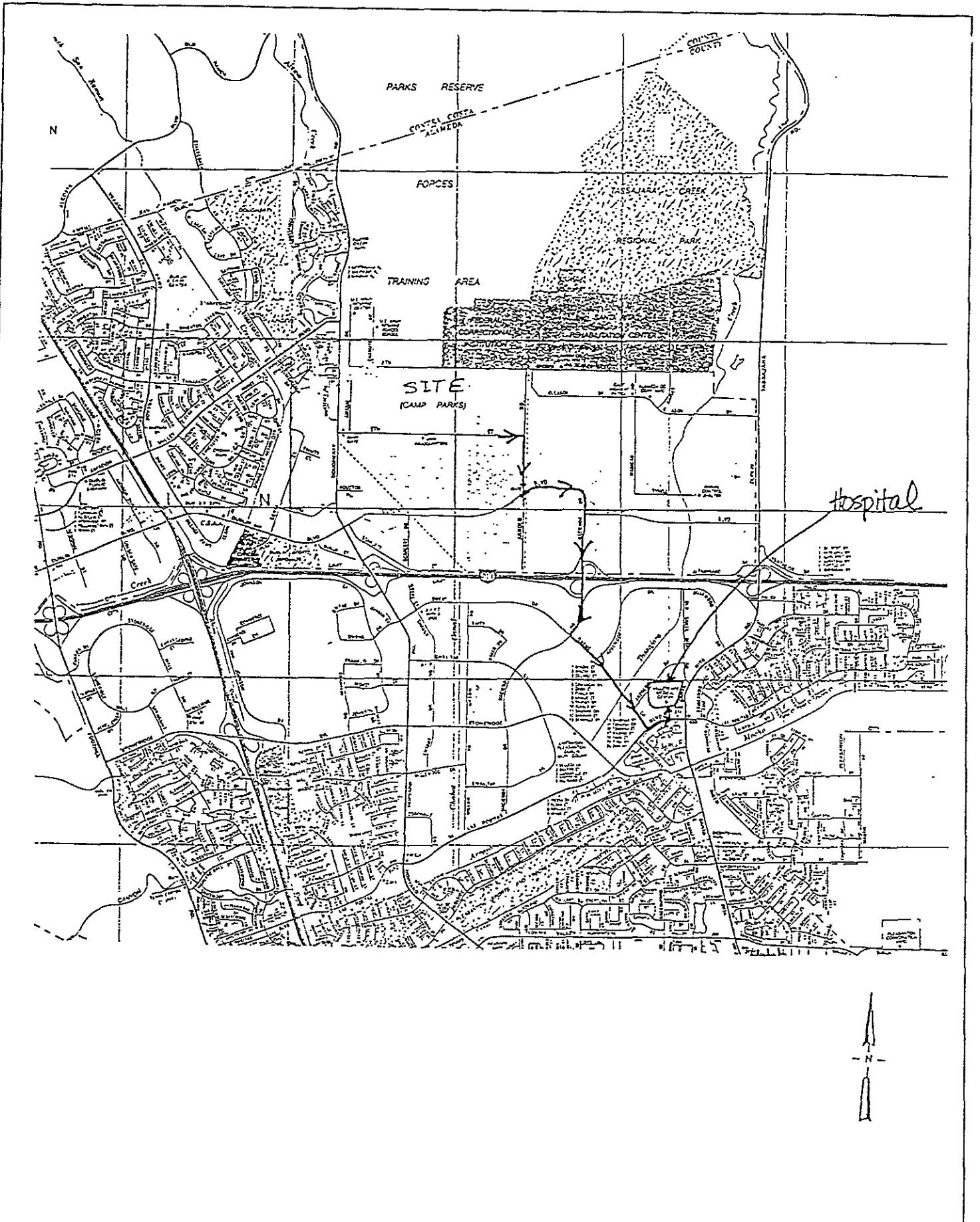
Project No.
7112

Parks Reserve Forces
Training Area

Woodward-Clyde

**SITE LOCATION MAP
PARKS RESERVE FORCES TRAINING AREA
DUBLIN, CALIFORNIA**

Figure
1



Project No. 7112	Parks Reserve Forces Training Area	ROUTE TO THE HOSPITAL VALLEY CARE MEDICAL CENTER	Figure 7-1
Woodward-Clyde			

ATTACHMENT A
HEAT STRESS

OPERATING PROCEDURES NO. HS-201

201.0 HEAT STRESS

201.1 PURPOSE

The purpose of this Operating Procedure is to provide general information on heat stress and the methods that can be utilized to prevent or minimize the occurrence of heat stress.

Adverse climatic conditions are important considerations in planning and conducting site operations. Ambient temperature effects can include physical discomfort, reduced efficiency, personal injury, and increased accident probability. Heat stress is of particular concern while wearing impermeable protective garments, since these garments inhibit evaporative body cooling.

201.2 TYPES OF HEAT STRESS

Heat stress is the combination of environmental and physical work factors that constitute the total heat load imposed on the body. The environmental factors of heat stress are the air temperature, radiant heat exchange, air movement, and water vapor pressure. Physical work contributes to the total heat stress of the job by producing metabolic heat in the body in proportion to the intensity of the work. The amount and type of clothing also affects heat stress.

Heat strain is the series of physiological responses to heat stress. When the strain is excessive for the exposed individual, a feeling of discomfort or distress may result, and, finally, a heat disorder may ensue. The severity of strain will depend not only on the magnitude of the prevailing stress, but also on the age, physical fitness, degree of acclimatization, and dehydration of the worker.

Heat disorder is a general term used to describe one or more of the heat-related disabilities or illnesses shown in Table 201-1.

201.3 METHODS OF CONTROLLING HEAT STRESS

As many of the following control measures, as appropriate, should be utilized to aid in controlling heat stress:

- Provide for adequate liquids to replace lost body fluids. Encourage personnel to drink more than the amount required to satisfy thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.
- Replace body fluids primarily with water, with commercial mixes such as Gatorade or Quick Kick used only as a portion of the replacement fluids. Avoid excessive use of caffeine drinks such as coffee, colas or tea.
- Establish a work regimen that will provide adequate rest periods for cooling down. The heat exposure Threshold Limit Values (TLV) may be used for guidelines.
- Provide shaded work areas, if possible.
- Wear cooling devices such as vortex tubes or cooling vests.
- Consider adjusting work hours to avoid the worst heat of the day.
- Take breaks in a cool rest area.
- Remove any impermeable protective garments during rest periods.
- Do not assign other tasks to personnel during rest periods.
- Inform personnel of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress.

201.6 MONITORING

201.6.1 Temperature

The environmental heat stress of an area can be monitored by the Wet Bulb Globe Temperature Index (WBGT) technique. When heat stress is a possibility, a heat stress monitoring device, such as the Wibget Heat Stress Monitor (Reuter Stokes) can be utilized.

The WBGT shall be compared to the TLV outlined by the American Conference of Governmental Industrial Hygienists (ACGIH) TLV guides, and a work-rest regimen can be established in accordance with the WBGT. Note that approximately 5°C must be subtracted from the TLVs listed for heat stress to compensate for the wearing of impermeable protective clothing.

201.6.2 Medical

In addition to the provisions of the Woodward-Clyde (W-C) medical surveillance program, on-site medical monitoring of personnel should be performed for projects where heat stress is a significant concern. Blood pressure, pulse, body temperature (oral), and body weight loss may be utilized.

Heart Rate: Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third. If the heart rate still exceeds 110 beats per minute at the next rest cycle, shorten the following work cycle by one-third.

Oral Temperature: Use a clinical thermometer or similar device to measure the oral temperature at the end of the work period (before drinking liquids). If the oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period. If the oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.

Do not permit a worker to wear a semipermeable or impermeable garment if his/her oral temperature exceeds 100.6°F (38.1°C).

Body Water Loss: Measure body weight on a scale accurate to ± 0.25 pounds at the beginning and end of each work day (also at lunch break, if possible) to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, nude. The body water loss should not exceed 1.5 percent total body weight loss in a work day.

Physiological Monitoring: Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and the level of physical work. The length of the work cycle will be governed by the frequency of the required physiological monitoring.

201.7 REFERENCES

American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents, 1992-1993.

EPA, Standard Operating Safety Guides, 1992, Pages 91-93.

National Institute for occupational Safety and Health, Criteria for a Recommended Standard: Occupational Exposure to Hot Environments, 1986.

Category and Clinical Features	Predisposing Factors	Underlying Physiological Disturbances	Treatment	Prevention
<p>Temperature Regulation Heatstroke</p> <p>Heatstroke: (1) Hot, dry skin; usually red, mottled, or cyanotic; (2) rectal temperature 40.5°C (104°F) and over; (3) confusion, loss of consciousness, convulsions, rectal temperature continues to rise; fatal if treatment is delayed</p>	<p>(1) Sustained exertion in heat by unacclimatized workers; (2) lack of physical fitness and obesity; (3) recent alcohol intake; (4) dehydration; (5) individual susceptibility; and (6) chronic cardiovascular disease</p>	<p>Failure of the central drive for sweating (cause unknown) leading to loss of evaporative cooling and an uncontrolled accelerating rise in t_{re}; there may be partial rather than complete failure of sweating</p>	<p>Immediate and rapid cooling by immersion in chilled water with massage or by wrapping in wet sheet with vigorous fanning with cool dry air; avoid overcooling; treat shock if present</p>	<p>Medical screening of workers, selection based on health and physical fitness; acclimatization for 5-7 days by graded work and heat exposure; monitoring workers during sustained work in severe heat</p>
<p>Circulatory Hypostasis Heat Syncope</p> <p>Fainting while standing erect and immobile in heat</p>	<p>Lack of acclimatization</p>	<p>Pooling of blood in dilated vessels of skin and lower parts of body</p>	<p>Remove to cooler area; rest in recumbent position; recovery prompt and complete</p>	<p>Acclimatization; intermittent activity to assist venous return to heat</p>
<p>Water and or Salt Depletion</p> <p>(a) <u>Heat Exhaustion</u></p> <p>(1) Fatigue, nausea, headache, giddiness; (2) skin clammy and moist; complexion pale, muddy, or hectic flush; (3) may faint on standing with rapid thready pulse and low blood pressure; (4) oral temperature normal or low, but rectal temperature usually elevated (37.5-38.5°C or 99.5-101.3°F); water restriction type: urine volume small, highly concentrated; salt restriction type; urine less concentrated chlorides less than 3 g/L</p> <p>(b) <u>Heat Cramps</u></p> <p>Painful spasms of muscles used during work (arms, legs, or abdominal); onset during or after work hours</p>	<p>(1) Sustained exertion in heat; (2) lack of acclimatization; and (3) failure to replace water lost in sweat</p> <p>(1) Heavy sweating during hot work; (2) drinking large volumes of water without replacing salt loss</p>	<p>(1) Dehydration from deficiency of water; (2) depletion of circulating blood volume; (3) circulatory strain from competing demands for blood flow to skin and to active muscles</p> <p>Loss of body salt in sweat, water intake dilutes electrolytes; water enters muscles, causing spasm</p>	<p>Remove to cooler environment; rest in recumbent position; administer fluids by mouth; keep at rest until urine volume indicates that water balances have been restored</p> <p>Salted liquids by mouth or more prompt relief by IV infusion</p>	<p>Acclimatize workers using a breaking-in schedule for 5-7 days; supplement dietary salt only during acclimatization; ample drinking water to be available at all times and to be taken frequently during work day</p> <p>Adequate salt intake with meals; for unacclimatized workers, supplement salt intake at meals.</p>

Category and Clinical Features	Predisposing Factors	Underlying Physiological Disturbances	Treatment	Prevention
<p>Skin Eruptions</p> <p>(a) <u>Heat Rash</u> (miliaria rubra, or "prickly heat")</p> <p>Profuse tiny raised red vesicles (blisterlike) on affected areas; prickling sensations during heat exposure</p> <p>(b) <u>Anhidrotic Heat Exhaustion</u> (miliaria profunda)</p> <p>Extensive areas of skin which do not sweat on heat exposure, but present gooseflesh appearance, which subsides with cool environments; associated with incapacitation in heat</p>	<p>Unrelieved exposure to humid heat with skin continuously wet from unevaporated sweat</p> <p>Weeks or months of constant exposure to climatic heat with previous history of extensive heat rash and sunburn</p>	<p>Plugging of sweat gland ducts with sweat retention and inflammatory reaction</p> <p>Skin trauma (heat rash; sunburn) causes sweat retention deep in skin; reduced evaporative cooling causes heat intolerance</p>	<p>Mild drying lotions; skin cleanliness to prevent infection</p> <p>No effective treatment available for anhidrotic areas of skin; recovery of sweating occurs gradually on return to cooler climate</p>	<p>Cool sleeping quarters to allow skin to dry between heat exposures</p> <p>Treat heat rash and avoid further skin trauma by sunburn; provide periodic relief from sustained heat</p>
<p>Behavioral Disorders</p> <p>(a) <u>Heat Fatigue - Transient</u></p> <p>Impaired performance of skilled sensorimotor, mental, or vigilance tasks, in heat</p> <p>(b) <u>Heat Fatigue - Chronic</u></p> <p>Reduced performance capacity; lowering of self-imposed standards of social behavior (e.g., alcoholic over-indulgence); inability to concentrate, etc.</p>	<p>Performance decrement greater in unacclimatized and unskilled worker</p> <p>Workers at risk come from temperature climates for long residence in tropical latitudes</p>	<p>Discomfort and physiologic strain</p> <p>Psychosocial stresses probably as important as heat stress; may involve hormonal imbalance but no positive evidence</p>	<p>Not indicated unless accompanied by other heat illness</p> <p>Medical treatment for serious causes; speedy relief of symptoms on returning home</p>	<p>Acclimatization and training for work in the heat</p> <p>Orientation on life in hot regions (customs, climate, living conditions, etc.)</p>

ATTACHMENT B
BLOODBORNE PATHOGEN STANDARD

OPERATING PROCEDURE NO. HS-211

211.0 BLOODBORNE PATHOGENS

211.1 BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN

The following Exposure Control Plan has been developed in accordance with the Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard, Title 29 Code of Federal Regulations (CFR) 1910.1030. The goal is to reduce the risk of disease in employees potentially exposed to bloodborne pathogens.

211.2 EXPOSURE ROUTES

The transmission of infectious agents such as bacteria and virus's may occur through direct contact, airborne, and vector routes of exposure. Direct contact is an important route of exposure for bloodborne pathogens due to needlestick injuries, puncture injuries, contact with abraded skin, or contact with areas such as the eyes, without skin protection. While very few organisms can enter the body through normal intact skin, direct contact with blood is to be avoided.

The airborne route of exposure is significant for common viral diseases including colds, flu, mumps, and chicken pox, but is not typically an exposure route for pathogens such as Human Immunodeficiency Virus (HIV) or Hepatitis B Virus (HBV) infections.

Vector borne diseases are those transferred to humans by insects or animals and include lyme disease, malaria, plague, and rabies. (Further information on tick-borne diseases may be seen in HS-213.) Vectors are not considered a significant route of exposure for HIV or HBV.

Woodward-Clyde (W-C) employees that may have potential exposure to blood or to biohazard waste include Site Safety Officers (SSO) during first aid procedures and field staff on projects involving medical or other infectious waste. The W-C job classification and associated tasks for these categories are as follows:

Woodward-Clyde

Revised: 10/93

<u>Job Classification</u>	<u>Task Procedures/Description</u>
Site Health and Safety Officer (SSO)	Enforcement of the Site Health and Safety Plan during field activities and First Aid
Field Staff	Field projects involving potential exposure to medical or other infectious waste as defined by the Site Health and Safety Plan

211.3 IMPLEMENTATION SCHEDULE AND METHODOLOGY

W-C will incorporate this Operating Procedure when first-aid capability is provided by W-C or when field work involves medical or infectious waste. More detailed procedures, if needed, will be incorporated into a site specific safety and health plan.

211.4 COMPLIANCE METHODS

Universal precautions will be observed at all work site locations in order to prevent contact with blood or other potentially infectious materials. All blood or other potentially infectious material will be considered infectious regardless of the perceived status of the source individual.

Engineering and work practice controls will be utilized to eliminate or minimize exposure to employees at all work site locations. Where occupational exposure remains after institution of these controls, personal protective equipment shall also be utilized. At all work site locations the following procedures will be utilized:

- Separate containers for used first aid equipment
- Flush skin areas where cuts or abrasions have occurred before adding band aids or clean wrappings
- Gloves to be worn by those administering first aid

- Handwashing after administering first aid
- Removal of blood contaminated clothing
- Clean-up of blood on tools or equipment

The controls will be checked and maintained on a regular schedule. The schedule for reviewing the effectiveness of the controls is as follows:

- Controls and procedures will be checked daily before start of any field activities.
- Maintaining and enforcing these controls will be the responsibility of the Site Health and Safety Officer.

Handwashing facilities must be readily accessible after incurring exposure. If handwashing facilities are not feasible, the SSO is required to provide either an antiseptic cleanser in conjunction with a clean cloth/paper towels or antiseptic towelettes. If these alternatives are used, then the hands are to be washed with soap and running water as soon as feasible.

If employees incur exposure to their skin or mucous membranes then those areas shall be washed or flushed with water, as appropriate, as soon as feasible following contact.

211.5 CONTAINERS

Contaminated cutting materials, (i.e., knife, scissors) that are re-usable are to be placed immediately, or as soon as possible after use, into a separate container. These containers must be puncture resistant, labeled with a biohazard label, and be leakproof.

Containers for biohazard waste (used bandages, used gloves, etc.) will be located in the same area as the first aid equipment, and will be the responsibility of the SSO for proper disposal. Disposal will be

arranged as soon as possible after use. These containers must be labeled with a biohazard label, and be leakproof

211.6 WORK AREA RESTRICTIONS

Workers are not to eat, drink, or smoke in areas with potential exposure to infectious materials.

All procedures will be conducted in a manner which will minimize splashing, spraying, splattering, and generation of droplets of blood or other potentially infectious materials. To help accomplish this, first aid personnel will not apply their unprotected hands to any patient body areas where blood is present.

211.7 SPECIMENS

Certain W-C worksites require the collection of blood or urine specimens for worker monitoring. Specimens will be placed in a container which prevents leakage during the collection, handling, processing, storage, and transport of the specimens. The container used for this purpose will be labeled or color coded with correct information.

If outside contamination of the primary container occurs, the primary container shall be placed within a secondary container which prevents leakage during the handling, processing, storage, transport, or shipping.

211.8 CONTAMINATED EQUIPMENT

Equipment which has become contaminated with blood or other potentially infectious materials shall be decontaminated as necessary unless the decontamination of the equipment is not feasible. This decontamination will be kept separate from any other on-site decontamination. Items contaminated with blood and also possible chemical contamination shall be placed in a container and labeled with its suspected contaminants, including the blood. Further instructions for disposal will be obtained from the Health and Safety Officer (HSO).

211.9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment will be chosen based on the anticipated exposure to blood or other potentially infectious materials. The protective equipment will be considered appropriate only if it does not permit blood or other potentially infectious materials to pass through or reach the employees' clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used. This PPE will be stored or placed with all first aid equipment or kits.

All personal protective equipment will be cleaned, laundered, and disposed of by the employer at no cost to employees.

Any clothing which is penetrated by blood shall be removed immediately or as soon as feasible. PPE will be removed prior to leaving the work area.

Gloves shall be worn where it is reasonably anticipated that employees will have had contact with blood or other potentially infectious materials. Gloves will be available from the first aid kit.

Disposable gloves used during first aid and/or emergency procedures are not to be washed or decontaminated for re-use and are to be replaced as soon as practical when they become contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised. Utility gloves may be decontaminated for re-use provided that the integrity of the glove is not compromised. Utility gloves will be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

Respirators in combination with eye protection devices, such as goggles or glasses with solid side shield, or chin length face shields, are required to be worn whenever splashes, spray, splatter, or droplets of blood or other potentially infectious materials may be generated.

Tyvek coverall (coated or uncoated), should be worn if the potential exists for blood to splash onto the first aid responders clothing.

Any PPE, soil, or small equipment that has blood on it shall be placed in a lined container and labeled. The SSO shall contact the HSO for further disposal information.

211.10 LAUNDRY PROCEDURES

Laundry contaminated with blood or other potentially infectious materials will be handled as little as possible. Such laundry will be placed in appropriately marked bags at the location where it was used. The HSO will then be notified for further instructions.

All employees who handle contaminated laundry will utilize personal protective equipment to prevent contact with blood or other potentially infectious materials.

If the laundry is being sent off-site, then the laundry service accepting the laundry is to be notified.

211.11 HEPATITIS B VACCINE

All employees who have been identified as having exposure to blood or other potentially infectious materials, or are involved with any on-site first aid case, will be offered the Hepatitis B vaccine, at no cost to the employee. The vaccine is not necessary if the employee has previously had the vaccine. The employee can request antibody testing which will show if the employee has sufficient immunity.

Employees who decline the Hepatitis B vaccine will sign a waiver which uses the wording in Form HS 211-1

Employees who initially decline the vaccine but who later wish to be immunized may do so at no cost. The HSO of each office has the responsibility for assuring that the vaccine is offered, the waivers are signed, and the policy is enforced.

211.12 POST-EXPOSURE EVALUATION AND FOLLOW-UP

When the employee incurs an exposure incident, it should be reported to the HSO using W-C incident report HS-102.

All employees who incur an exposure incident will be offered post-exposure evaluation and follow-up.

This follow-up will include the following:

- Documentation of the route of exposure and the circumstances related to the incident.
- If possible, the identification of the source individual and, if possible, the status of the source individual. The blood of the source individual will be tested (after consent is obtained) for HIV/HBV infectivity.
- Results of testing of the source individual will be made available to the exposed employee with the exposed employee informed about the applicable laws and regulations concerning disclosure of the identity and infectivity of the source individual.
- The employee will be offered the option of having their blood collected for testing of the employee's HIV/HBV serological status. The blood sample will be preserved for up to 90 days to allow the employee to decide if the blood should be tested for HIV serological status. However, if the employee decides prior to that time that testing will or will not be conducted then the appropriate action can be taken and the blood sample discarded.
- The employee will be offered post-exposure prophylaxis in accordance with the current recommendations of the U.S. Public Health Service.
- The employee will be given appropriate counseling concerning precautions to take during the period after the exposure incident. The employee will also be given information on what potential illnesses to be alert for and to report any related experiences to appropriate personnel.
- The HSO has been designated to assure that the policy outlined here is effectively carried out as well as to maintain records related to this policy.

211.13 INTERACTION WITH HEALTH CARE PROFESSIONALS

A written opinion shall be obtained from the health care professional who evaluates employees for each W-C office. Written opinions will be obtained in the following instances:

- 1) When the employee is sent to obtain the Hepatitis B vaccine.
- 2) Whenever the employee is sent to a health care professional following an exposure incident.

Health care professionals shall be asked:

- 1) Whether the Hepatitis B vaccine is indicated and if the employee has received the vaccine, or for evaluation following an incident.
- 2) That the employee has been informed of the results of the evaluation
- 3) That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials.

211.14 TRAINING

Training for all employees will be conducted prior to initial assignment to tasks where occupational exposure may occur. Training for employees will include the following:

- 1) The OSHA standard for Bloodborne Pathogens
- 2) Epidemiology and symptomatology of bloodborne diseases
- 3) Modes of transmission of bloodborne pathogens
- 4) The exposure Control Plan, i.e., points of the plan, lines of responsibility, how the Plan will be implemented, etc.

- 5) Procedures which might cause exposure to blood or other potentially infectious materials while performing first aid.
- 6) Control methods which will be used at the facility to control exposure to blood or other potentially infectious materials
- 7) Personal protective equipment available on-sites
- 8) Post-exposure evaluation and follow-up
- 9) Signs and labels used on-site
- 10) Hepatitis B vaccine program for W-C

The HSO is responsible for providing the training for their office.

211.15 RECORDKEEPING

All records required by the OSHA standard will be maintained by the HSO.

All employees will receive refresher training every 12 months. (Note that this training is to be conducted within one year of the employee's previous training.)

The outline for the training material is located in each office and also with the WCGI Health and Safety Office in Philadelphia, Pennsylvania.

FORM HS 211-1

TO SECTION 1910.1030
HEPATITIS B VACCINE DECLINATION (MANDATORY)

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Name: _____
Employee Signature Date

Print: _____
Employee Name

Name: _____
Health and Safety Officer Signature Date

Print: _____
Health and Safety Officer Name

**ATTACHMENT C
SAFETY BRIEFING FORM**

SAFETY BRIEFING FORM

Project Name: _____

Date: _____

Project No.: _____

Task No.: _____

General: Tailgate meetings shall be performed at least every ten days or whenever the scope of work has changed.

Describe any new work or tasks: _____

Describe any anticipated hazards for each task: _____

Describe new safety procedures for tasks: _____

Briefing Attendees:

Name

Signature

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Site Safety Officer: _____

**ATTACHMENT D
HAZARD COMMUNICATIONS PROGRAM**

OPERATING PROCEDURE NO. HS-101

101.0 HAZARD COMMUNICATION PROGRAM

101.1 PURPOSE

Woodward-Clyde (W-C) is committed to informing employees of hazardous substances present in their places of work in accordance with the Occupational Health and Safety Administration (OSHA) Hazard Communication (HAZCOM) requirements, Title 29 Code of Federal Regulations (CFR) 1910.120 and 1926.59. This program applies to W-C work operations where employees may be exposed to hazardous substances.

Under the HAZCOM program, employees will be informed of the contents of the HAZCOM regulations, the hazardous properties of chemicals with which they work, safe handling procedures, and measures to take to protect themselves from these chemicals.

101.2 MATERIAL SAFETY DATA SHEETS (MSDS)/CHEMICAL HAZARD INFORMATION

MSDS provide specific information on the chemicals to which workers may be exposed. The MSDS should be a fully completed OSHA Form 174 or equivalent. Every effort will be made to obtain all pertinent MSDS or similar chemical hazard information whenever chemical exposure of W-C employees is possible.

The Health and Safety Officer is responsible for acquiring and updating MSDS for chemicals stored in buildings/offices. On field sites, MSDS for chemicals used by other firms will be available for examination. For hazardous waste site activities, chemical hazard information on the site contaminants will be provided in the Health and Safety Plan, while any chemicals brought on to the site need MSDS.

101.3 LABELS AND OTHER FORMS OF WARNING

Hazardous chemicals used will be properly labeled. Original labels will list the chemical identity,

appropriate hazard warnings, and the name and address of the manufacturer. Referral will be made to the corresponding MSDS to assist in verifying label information. Original labels will not be defaced or removed.

If chemicals are transferred from a labeled container to a portable container that is intended only for immediate use, no labels are required on the portable container. However, no hazardous materials or chemicals should be permanently used or stored in unlabeled containers.

101.4 TRAINING

Everyone who works with, or is potentially exposed to hazardous chemicals, will receive initial training on the Hazard Communication Standard requirements and the safe use of those chemicals. Those individuals involved in the Hazardous Waste Practice have chemical hazard training included in their 40-hour course (W-C Basic Health and Safety), in the 8-hour refresher course, and in site specific briefings.

Employees not in the hazardous waste practice, who are potentially exposed to hazardous chemicals, will be trained in:

1. The basic requirements of HAZCOM and employees' right to information on chemical hazards.
2. W-C's program to comply with HAZCOM, and procedures to follow the standard, the company program, and MSDS recordkeeping/availability.
3. How to interpret and use the labels on containers of hazardous materials.
4. The potential physical hazards and health effects of the hazardous substances and how to use MSDS for more information.
5. Methods and observations that may be used to detect the presence or release of chemicals.

6. The measures that employees can take to protect themselves from chemicals.

All HAZCOM training will be documented by a sign-in sheet recording each employee's attendance, the date, and the training topics covered. This sign-in sheet will be retained in the Project File. Such training can be performed by any of the following individuals:

- Health and Safety Coordinator
- Site Safety Officer
- Health and Safety Officer
- Corporate Health and Safety Officer

The implementation of the Hazard Communication Program will be under the general direction of a Certified Industrial Hygienist.

101.5 PROTECTIVE MEASURES

The use of chemical splash goggles, gloves, protective clothing, boots, and possibly respiratory protection may be required. If respiratory protection is used, it must be in full compliance with the OSHA standards under Title 29 CFR 1910.134 and Title 29 CFR 1926.103. All personal protective equipment used will be in accordance with Subpart I of Title 29 CFR 1910 and Subpart E of Title 29 CFR 1926. Any emergencies or problems involving hazardous chemicals will be reported to the Project Manager, the Health and Safety Officer and a Corporate Health and Safety Officer.

ATTACHMENT E
COMPLIANCE AGREEMENT

HEALTH AND SAFETY COMPLIANCE AGREEMENT

I, the undersigned, have received a copy of the health and safety plan for the project identified below. I have read the plan, understand it, and agree to comply with all of the health and safety requirements therein. I understand that I may be prohibited from continuing work on the project for failing to comply.

I have ___ have not ___ (check one) been briefed by a project safety authority on the health and safety requirements of the project.

Project No. _____

Project Title _____

Date of Plan _____

Print Name

Signature

Firm

Date

**ATTACHMENT F
ACCIDENT/INCIDENT REPORT FORM**

1.0 INCIDENT REPORTS

1.1 PURPOSE

All health and safety incidents shall be reported to site manager and health and safety staff. The prompt investigation and reporting of incidents will reduce the risk of future incidents, better protect employees, and reduce liability.

1.2 DEFINITIONS

A health and safety incident is any event listed below:

- Illness resulting from chemical exposure or suspected chemical exposure.
- Physical injury, including both those that do and do not require medical attention to employees or subcontractors.
- Fire, explosions, and flashes resulting from activities performed by a contractor and its subcontractors.
- Property damage resulting from activities performed by contractors and its subcontractors.
- Vehicular accidents occurring on-site, while travelling to and from client locations, or with any company-owned vehicle.
- Infractions of safety rules and requirements.
- Unexpected chemical exposures.
- Complaints from the public regarding field operations.

1.3 REPORTING PROCEDURES

1.3.1 Reporting Format

Incident reports shall be prepared by completing Form HS-102. This form may be obtained from the Health and Safety Officer (HSO) and is attached to this operating procedure.

1.3.2 Responsible Party

Reports of incidents occurring in the field shall be prepared by the Site Safety Officer or, in the absence of the site safety officer, the supervising field engineer, witness, or injured/exposed individual.

1.3.3 Filing

A report must be submitted to the Health and Safety Officer of the Operating Unit to which the Project Manager belongs within 24 hours of each incident involving medical treatment. In turn, the Health and Safety Officer must distribute copies of the report to the Corporate Health and Safety Manager and the Corporate Health and Safety Officer. When an injury or illness is reported, the Health and Safety Officer must deliver a copy of the report to the individual in charge of Human Resources so that a Worker's Compensation Insurance Report can be filed if necessary. Reports must be received by Human Resources within 48 hours of each qualifying incident.

1.3.4 Major Incidents

Incidents that include fatalities, hospitalization of employees or subcontractors, or involve injury/illness of the public shall be reported to the HSO and Project Manager as soon as possible. Any contact with the media should be referred to the Project Manager and Operating Unit Manager.

FORM HS-102
HEALTH AND SAFETY INCIDENT REPORT

Project Name: _____

TYPE OF INCIDENT (Check all applicable items)

Project Number: _____

Illness Fire, explosion, flash

Date of Incident: _____

Injury Unexpected exposure

Time of Incident: _____

Property Damage Vehicular Accident

Location: _____

Health & Safety Infraction

Other (describe) _____

DESCRIPTION OF INCIDENT (Describe what happened and possible cause. Identify individual involved, witnesses, and their affiliations; and describe emergency or corrective action taken. Attach additional sheets, drawings, or photographs as needed.)

Reporter: _____
Print Name

Signature

Date

Reporter must deliver this report to the Operating Unit Health & Safety Officer within 24 hours of the reported incident for medical treatment cases and within five days for other incidents.

Reviewed by: _____
Operating Unit Health & Safety Officer

Date

- Distribution by HSO:
- Corporate Health and Safety Manager
 - Corporate Health and Safety Officer
 - Project Manager
 - Personnel Office (medical treatment cases only)

ATTACHMENT G
SAFETY COMPLETION REPORT

SAFETY COMPLETION REPORT

This report must be submitted to the Operating Unit Health and Safety Officer upon completion of the project.

PROJECT NAME: _____

PROJECT NUMBER: _____

1. EVALUATION OF HEALTH AND SAFETY PLAN

- a. Was the plan adequate?

- b. Did the plan adequately anticipate chemical and physical hazards actually present at the site?

- c. What situations were discovered that were not anticipated in the health and safety plan?

- d. How were these situations handled?

- e. Was the recommended PPE (such as gloves, respirators, eye, face, and skin protection) adequate to protect employees from chemical exposures?

- f. Comments

SAFETY COMPLETION REPORT (Concluded)

2.0 HEALTH AND SAFETY ACTIVITIES

- a. Was air monitoring performed? Yes No
- b. What type of air monitoring was conducted? Personal Area
- c. What instrument was used? _____
- d. Was medical monitoring conducted? Yes No
- e. What changes were made due to air monitoring results?

3.0 NAMES OF PERSONNEL ON-SITE

Name	Company
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4.0 PLEASE ATTACH THE FOLLOWING INFORMATION

- Air Monitoring Data Sheet
- Medical Monitoring Records
- Compliance Agreements

FORM COMPLETED BY: _____
Signature Date

Print Name

ATTACHMENT H
AIR MONITORING FORM
