Woodward-Clyde

Engineering & Sciences applied to the earth & its environment

JOB NO. _____

Sept. 30 19 94

ALCO HAZMAT
94 SEP 23 PM 4:47

TO: Alameda County Env. Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Attention; Eva Chu

SUBJECT: Camp Parks
Bldg 109
Workplan

Transmitted herewith, please find workplan for monitoring well installation for your review. (I was just advised the Corps of Engineers did not forward this to you yet) Could you please approve work at your earliest convenience, as we would like to get started ASAP!
Thanks so much!

Very truly yours,

Woodward-Clyde Consultants

By JoBeth Dolger

Woodward-Clyde Consultants
500 12th Street, Suite 100 • Oakland, CA 94607-4014
(510) 893-3600 • Fax (510) 874-3268

SITE CHARACTERIZATION WORK PLAN BUILDING 109-UST PARKS RESERVE FORCES TRAINING AREA DUBLIN, CA

Prepared for

U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922

July 8, 1994

Woodward-Clyde

500 12th Street
Suite 100
Oakland, California 94607-4014

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CERTIFICATION

SITE CHARACTERIZATION WORK PLAN
BUILDING 109-UST
PARKS RESERVE FORCES TRAINING AREA
DUBLIN, CALIFORNIA

July 8, 1994
7112/9000

This work plan has been prepared by the staff of Woodward-Clyde and has been reviewed and approved by the professionals whose signatures appear below.

The findings, recommendations, specifications, or professional opinions are presented within the limits prescribed by the client, and prepared in accordance with generally accepted engineering practice in Northern California at the time this work plan was prepared. No other warranty is either expressed or implied.

WOODWARD-CLYDE

Michael Sartor, P.E.
Project Manager

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1.0
INTRODUCTION

1.1 SCOPE OF WORK

This workplan addresses the procedures involved with the proposed investigation and evaluation of an underground storage tank (UST) site located within the Parks Reserve Forces Training Area (PRFTA) in Dublin, CA, at the former Building 109. This work is proposed in order to investigate the extent and magnitude of petroleum hydrocarbons in the subsurface soil and groundwater at the site which reportedly leaked from the UST. Specific activities include the collection of soil samples during the drilling and construction of three proposed groundwater monitoring wells at the site, initial monitoring well groundwater sample collection, sample analysis, and waste disposal. This work plan has been prepared in accordance with the State of California, Regional Water Quality Control Board (RWQCB), Tri-Regional Board Staff Recommendations.

1.2 SITE CONTACTS

Woodward-Clyde is providing consulting engineering services for the project to the U.S. Army Corps of Engineers, Sacramento District. Table 1 presents the names and addresses of other important entities involved with the site investigation, including the regulatory agencies who will receive copies of report and correspondence regarding this site investigation.

1.3 SITE LOCATION AND DESCRIPTION

PRFTA 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 2800 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.

Building 109 was located in the southern portion of the facility (Figure 2).

1.4 SITE BACKGROUND

Prior to its demolition which is currently underway, Building 109 was a trash incinerator. During building demolition and removal activities in mid-March 1994, a previously unknown 2000-3000 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 the 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 was removed from the excavation and another estimated 1,077 gallons removed from the tank. The recovered product was disposed at a licensed disposal facility. Copies of the report of unauthorized release filed with the Alameda County Department of Health, Hazardous Materials Division is included in Appendix A. Manifests for the disposal of the fuel and additional water and fuel removed from the excavation pit on six subsequent dates from March 28 through April 25, 1994 are included in Appendix B. A product sheen was observed, however, on standing water in the excavation after the fuel oil and water removal activities were concluded on April 25, 1994.

Evidence of ash in an adjacent trench was reportedly observed according to Mr. Alley. Building 109 was identified on a 1945 facility drawing that identified a trash pit and scrap area to the south of the building. The 1945 drawing did not indicate the presence of a UST at Building 109. The ash will be the subject of a separate site characterization workplan currently being developed by the PRFTA.

There are no known monitoring wells at PRFTA.

1.5 HYDROGEOLOGIC SETTING

The PRFTA facility 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 continental gravel, sand, silt, and clay. PRFTA is dissected by the northwesterly-southeasterly 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. However, where the fault nears Highway 580, it apparently has some effect on the quality of groundwater.

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).

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

1.6 REGULATORY REQUIREMENTS

This Site Investigation Workplan 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). These regulations prescribe the activities required to investigate and mitigate soil and groundwater affected by the contents of USTs and their appurtenances. Guidance for conducting UST investigations in Dublin is provided by the RWQCB Tri-Regional Board Staff Recommendations dated 10 August 1990, and Appendix A of these recommendations, dated 30 August 1991, and Alameda County Health Care Agency requirements. Where these documents do not provide guidance, this investigation will proceed in accordance with the current Leaking Underground Fuel Tank (LUFT) guidelines prepared by the State Water Resources Control Board (SWRCB), dated October 1989.

Appendix A of the Tri-Regional Board Staff Recommendations contains an outline of the reporting requirements. In addition to this Site Characterization Workplan, the reporting requirements include:

1. The Preliminary Investigation and Evaluation Report (PIER), which presents whether the findings of the initial investigation indicate that only soil has been affected by the UST contents or if groundwater must also be investigated. Interim investigations are sometimes conducted in addition to the initial investigation until the lateral and vertical extent of affected soil and groundwater has been defined, prior to preparation of the next report.

This has not been done.

2. A Soil Remediation Plan (SRP), which is prepared and implemented if soil only is found to be impacted during the initial investigation which provides the basis of the PIER.

3. The Problem Assessment Report (PAR) is prepared if groundwater is also found to be impacted. The PAR describes the lateral and vertical extent of a problem, and proposes mitigative or remedial actions to cleanup a site.

4. The Final Remediation Plan (FRP) contains proposals to the regulatory agencies of activities to remediate the problem(s) identified in the PAR, based upon negotiations between the Regulatory Agencies and the tank owner and their consultants.

5. Quarterly Status Reports (QSRs) will be submitted following the submission of the first investigation report. QSRs will continue to be submitted concurrent with the activities involved with the previously discussed reports until investigation and cleanup of the site is deemed adequate by the RWQCB.

1.7 TECHNICAL APPROACH

1.7.1 Proposed Monitoring Well Locations

The objective of the proposed site investigation is to provide data to assess the extent of petroleum hydrocarbons in the soil and groundwater. The site investigation includes the following soil boring and monitoring well installation and sampling activities:

Need SBS around UST pit

(1) Drill 3 soil borings. Collect soil samples at depths of 5 feet and 10 feet and just above the water table, if possible. Analyze the soil samples for petroleum hydrocarbons.

(2) Construct monitoring wells (to be designated MW-1, MW-2 and MW-3) in the soil borings. Develop the wells, survey the wells for location and elevation, and measure depth to static groundwater. Examine the wells for free product.

(3) Collect and analyze groundwater samples from the monitoring wells for petroleum hydrocarbons.

(4) Use the water table elevation data to estimate a groundwater gradient and flow direction.

The proposed well locations are shown in Figure 3. Well MW-1 will be located south of Building 109 and outside the area of demolition debris. This well is expected to serve as a downgradient well. Well MW-2 will be located to the southwest, cross or downgradient within 10 feet of the UST. Well MW-3 will be located to the northeast, within the footprint of the former Building 109, and is expected to serve as an upgradient well. Note that there are no known monitoring wells at PRFTA, hence, the groundwater gradient direction is unknown. Assumptions in this workplan regarding gradient are based solely on regional data.

Standing water was observed by Woodward-Clyde personnel in the excavation at a depth of about 10 to 15 feet below grade. Because the excavation has been repeatedly pumped and continues to recharge, it is assumed this is the depth to groundwater.

any GW grab sample taken?

1.7.2 Preliminary Investigation and Evaluation Report (PIER)

Following completion of the initial field activities and the receipt of laboratory test results, a PIER will be prepared which will describe this phase of site investigation activities.

2.0
SOIL AND GROUNDWATER INVESTIGATION

2.1 SOIL INVESTIGATION

2.1.1 Boring Advancement and Sample Collection

Three soil borings will be advanced at the proposed locations shown in Figure 3. The vicinities of all borings will be surveyed by an underground utility locator. If underground utilities are discovered at the proposed boring locations, the boring will be relocated to a clear location nearby.

The borings for wells will be advanced to depths of approximately 20 feet. Borings will be advanced using 10-inch hollow-stem augers on a truck-mounted drill rig. Soil samples will be collected at 5-foot intervals beginning at 5 feet below grade. After the first boring has been advanced and the soil-water interface has been evaluated using a water interface probe, an attempt will be made to collect a soil sample from just above the water table in the borings. The soil types encountered during drilling will be logged according to the Unified Soil Classification System (USCS) and summarized on boring logs.

Sampling will be conducted using a 2.5-inch-diameter modified California split-spoon sampler lined with clean brass liners. The sampler will be decontaminated between uses. The sampler will be driven a maximum of 18 inches using a 140-pound hammer with a 30-inch drop. The number of blows required to drive the sampler each 6-inch interval ("blow count") will be recorded on the logs. The soil samples will be retained in brass liners within the sampler. A brass liner of soil will be retained for laboratory analysis. This liner will be sealed with Teflon sheeting, plastic end caps, labeled, placed in a plastic bag, and then stored in an ice chest cooled with ice. The cooler will be transported at the end of the day to the analytical laboratory, using chain-of-custody documentation, for analysis. The remaining soil in the brass liners will be examined by an experienced engineer or geologist working under the direct supervision of a State of California registered engineer or geologist to evaluate the soil types for descriptions consistent with the USCS.

2.1.2 Soil Sample Analyses

The soil samples will be submitted under chain of custody procedures to the analytical laboratory for chemical analysis. The analytical laboratory will be certified by the California Department of Toxic Substance Control for the analysis of hazardous materials. Soil sample analyses are summarized in Table 2. The soil samples will be analyzed for TPH extractable (diesel, kerosene and fuel oil) by modified EPA Method 8015 and BTEX by EPA Method 8020. These analyses were selected in accordance with RWQCB guidelines for investigating tanks which contained fuel/heating oil.

Ten percent of the soil samples will be analyzed as duplicates by submitting adjacent brass liner sections to the laboratory. If less than ten samples are collected, a minimum of one duplicate sample will be analyzed. Duplicate samples allow analysis of sampling precision, analytical precision and sample heterogeneity.

2.2 GROUNDWATER INVESTIGATION

Monitoring wells are to be installed because groundwater was impacted by the previously described fuel leak. Three wells are required to evaluate groundwater gradient direction.

2.2.1 Monitoring Well Construction

All three soil borings will be completed as groundwater monitoring wells. The groundwater monitoring wells will be constructed of 4-inch-diameter Schedule 40 polyvinyl chloride (PVC) piping with flush-threaded ends. The procedure for well installation is as follows:

- The drilling equipment will be decontaminated by steam cleaning before and after drilling to minimize the potential for cross-contamination.

- Wells will be drilled utilizing 10-inch inner diameter (ID) hollow-stem augers. Split spoon soil samples will be collected at approximately 5-foot intervals and will be used to prepare lithologic logs as discussed in Section 2.1.

- Wells will be screened from below the level where the water table is first encountered to approximately 1 to 2 feet above the anticipated static water table. The screen length shall be a minimum of 10 feet.

- Four-inch-diameter Schedule 40 PVC casing and 0.020-inch slot size PVC screen will be installed through the hollow-stem auger. The bottom of the well will be capped with a threaded end cap.

- Sand pack will be placed by the tremie method as the augers are removed. A conservatively small sand size such as Lone Star No. 2/12 will be placed to reduce the amount of sediment entering the well. The sand pack thickness will be measured continuously to ensure a solid pack with no bridging. The sand pack will extend approximately 1 to 2 feet above the top of the well screen.

- Approximately two feet of bentonite pellets will be placed into the borehole and hydrated with tap water to form a seal above the sand pack.

- Neat cement grout will be placed from the top of the bentonite seal to the ground surface. The grout will be allowed to set for 24 hours prior to well development.

- Wells will be completed at grade, with a watertight locking well cap and traffic-rated box.

Figure 4 shows typical well construction details.

2.2.2 Well Development

The wells will be allowed to set 24 hours or more after construction prior to well development. The wells will be developed by a combination of bailing, surging, and pumping until the discharge water is relatively free of settleable solids or a maximum of 10 well casing volumes has been excavated from each well. Water quality parameters such as pH and specific conductance will be measured and recorded during development. Following development, the wells will be allowed to stabilize for at least 72 hours prior to groundwater sampling.

2.2.3 Water Level Measurement and Groundwater Monitoring

The wells will be surveyed by a licensed land surveyor for horizontal location and top of casing elevation, relative to a referenced and established benchmark, to a precision of 0.01 foot. The surveyor will produce a scaled site plan showing the boring locations, buildings, paved and unpaved areas. If their locations are known, subsurface utility lines and conduits will also be shown on the site plan. Depths to groundwater will be measured from the surveyed reference point at the top of the well casing. Water levels will be measured to the nearest 0.01 foot, prior to any purging activities to avoid disturbance of the static water table. Water level data will be used to calculate groundwater elevations and estimate groundwater gradient and flow direction. 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.

2.2.4 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 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. Alternatively, if the size of the filter pack is unknown, five casing volumes will be purged. Water quality parameters including pH, temperature, and specific conductance will be recorded during well purging. Samples will be collected when these parameters have stabilized and the water level has returned to at least 80 percent of its static level Stabilization of these water quality parameters suggests that the water within the well is representative of the groundwater in the aquifer. Purge water will also be inspected in the field for the presence of odor and sheen. Groundwater samples will be collected using disposable bailers. 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. Samples will be labeled with identifying information and transported under standard chain of custody procedures to an analytical laboratory that is certified by the State of California Department of Toxic Substances Control for the analysis of hazardous materials.

2.2.5 Quality Assurance Water Samples

One duplicate groundwater sample will be collected. 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 parameters as the normal samples. The travel blank will be analyzed for volatile organic compounds only.

2.2.6 Groundwater Sample Analyses

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

3.0
DECONTAMINATION PROCEDURES

Down-hole drilling equipment such as augers and well development equipment will be steam-cleaned between wells. The California split-spoon sampler, brass tube liners, oil-water interface probe/water level indicators and bailers will be decontaminated before use by washing in an Alconox™ solution and rinsing in tap water followed by distilled water.

4.0
WASTE DISPOSAL

Purged groundwater, equipment decontamination water and drill cuttings will be collected in DOT-approved drums and left on site pending characterization, acceptance and transportation to an appropriate recycling or disposal facility. 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), and the name and phone number of a contact person to whom questions may be addressed.

5.0
SITE HEALTH AND SAFETY PLAN

The site health and safety plan is attached with this work plan as Appendix C. This health and safety plan outlines the measures that will be taken to ensure the health and safety of workers, regulators, and the public at the site.

6.0
SCHEDULE

Drilling will be scheduled pending approval of the well permit applications, approval of this work plan and contractor availability. Well development will be conducted at least 24 hours following completion of the wells in order to allow the seals to set. Water samples will be collected at least 72 hours following well development. Samples will be analyzed using standard laboratory turnaround time (3 weeks). A draft report on the findings will be submitted within six weeks of receipt of the final analytical laboratory reports.

7.0
REPORT

Following completion of the initial field activities and the receipt of laboratory analytical results, a Preliminary Investigation and Evaluation Report (PIER) will be prepared which will describe the investigation. The report will follow RWQCB guidelines and will include:

(1) a summary of field activities;
(2) photocopies of original field boring logs with monitoring well construction details;
(3) final boring logs;
(4) a site plan, drawn to scale, showing boring locations;
(5) a groundwater elevation contour map showing the local groundwater flow direction;
(6) petroleum hydrocarbon distribution maps, if appropriate; and
(7) field data sheets, including copy of field log of well purging and sampling.

The PIER will include discussions of site location, history and background information, site description, investigation methods and procedures, and analytical results. Data interpretation methods and results will be discussed and presented with conclusions and recommendations for the need for additional work, if appropriate. The report and boring logs will be prepared with oversight by a geologist or engineer registered in California.

8.0
REFERENCES

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

Regional Water Quality Control Board - North Coast, San Francisco Bay, and Central Valley Regions (RWQCB). 1990. Tri-Regional Board Staff Recommendation for Preliminary Evaluation and Investigation of Underground Tank Sites. August 10; and Appendix A - Reports, August 30, 1991.

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, CA 95814-2922
Attn: CESPK-ED-EC (Zimny)
Ray Zimny

Parks Reserve Forces Training Area (PRFTA)
Building 790
Camp Parks, CA 94568
Mervin Alley (510) 829-8780

I Corps and Fort Lewis
Ft. Lewis, WA 98433
Attn: AFZH-DEQ (Steucke)
Paul Steucke, Jr.

Environmental Consultants:

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

Lead Implementing Agency:

Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621
Eva Chu (510) 271-4530

Regional Water Quality Control Board:

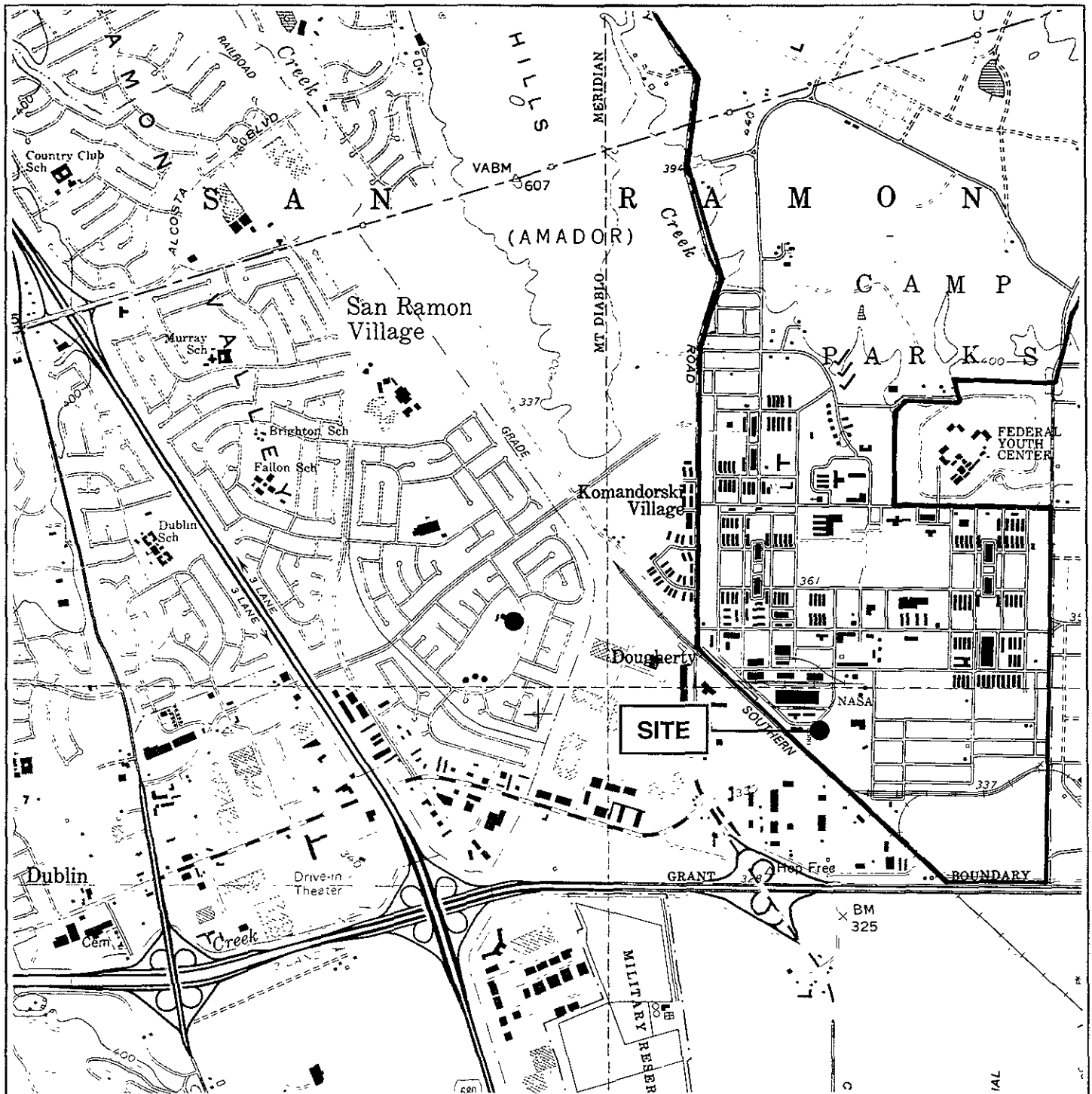
Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612
(510) 286-1255

TABLE 2

SUMMARY OF SAMPLE ANALYSES

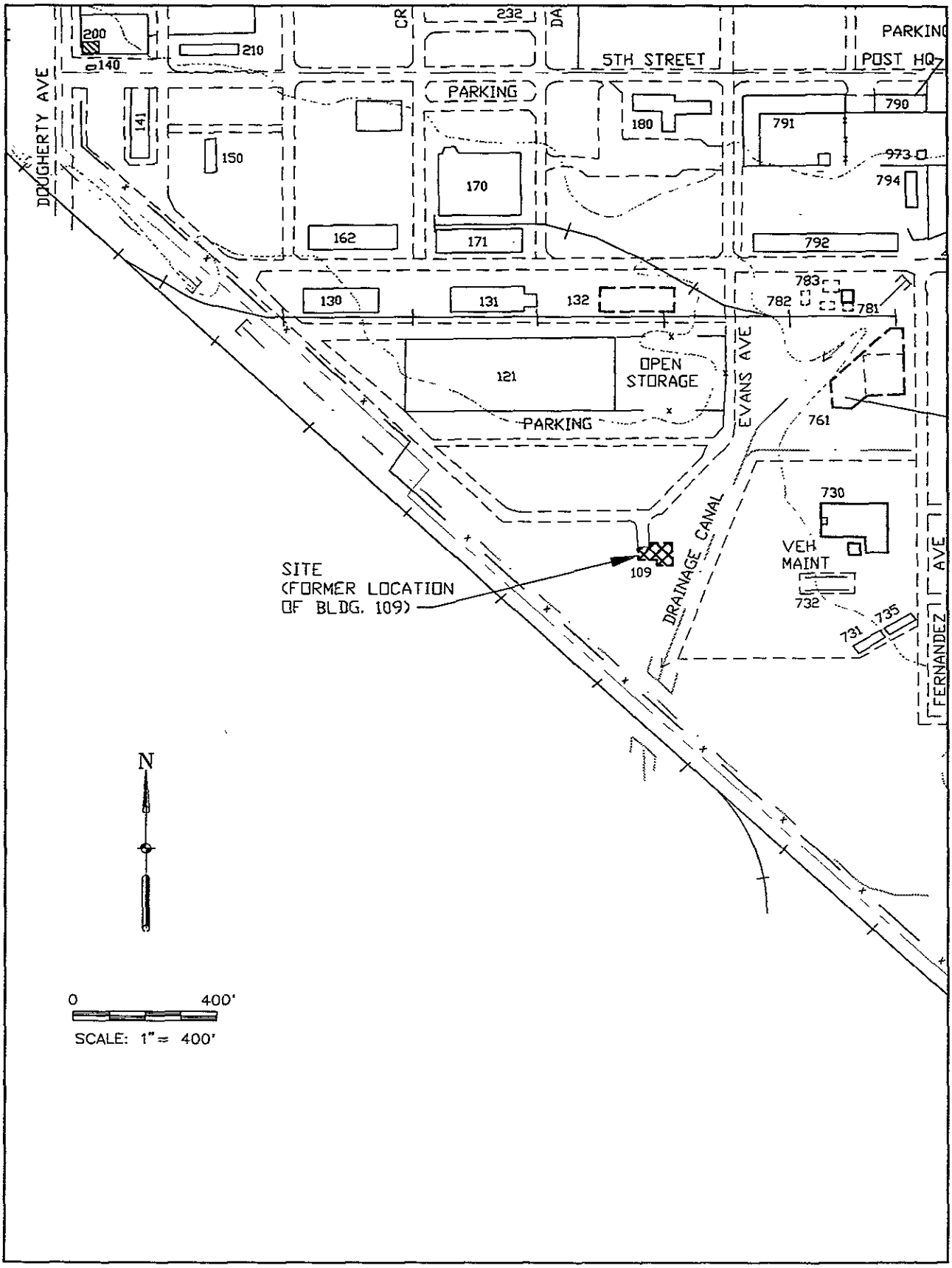
Sample Type	Analysis and Method	
	TPH as Diesel, Kerosene, Fuel Oil Mod. EPA Method 8015	BTEX EPA Method 8020
Soil	X	X
Groundwater	X	X
Trip Blank		X

TPH = total petroleum hydrocarbons.
BTEX = benzene, toluene, ethylbenzene and xylenes.



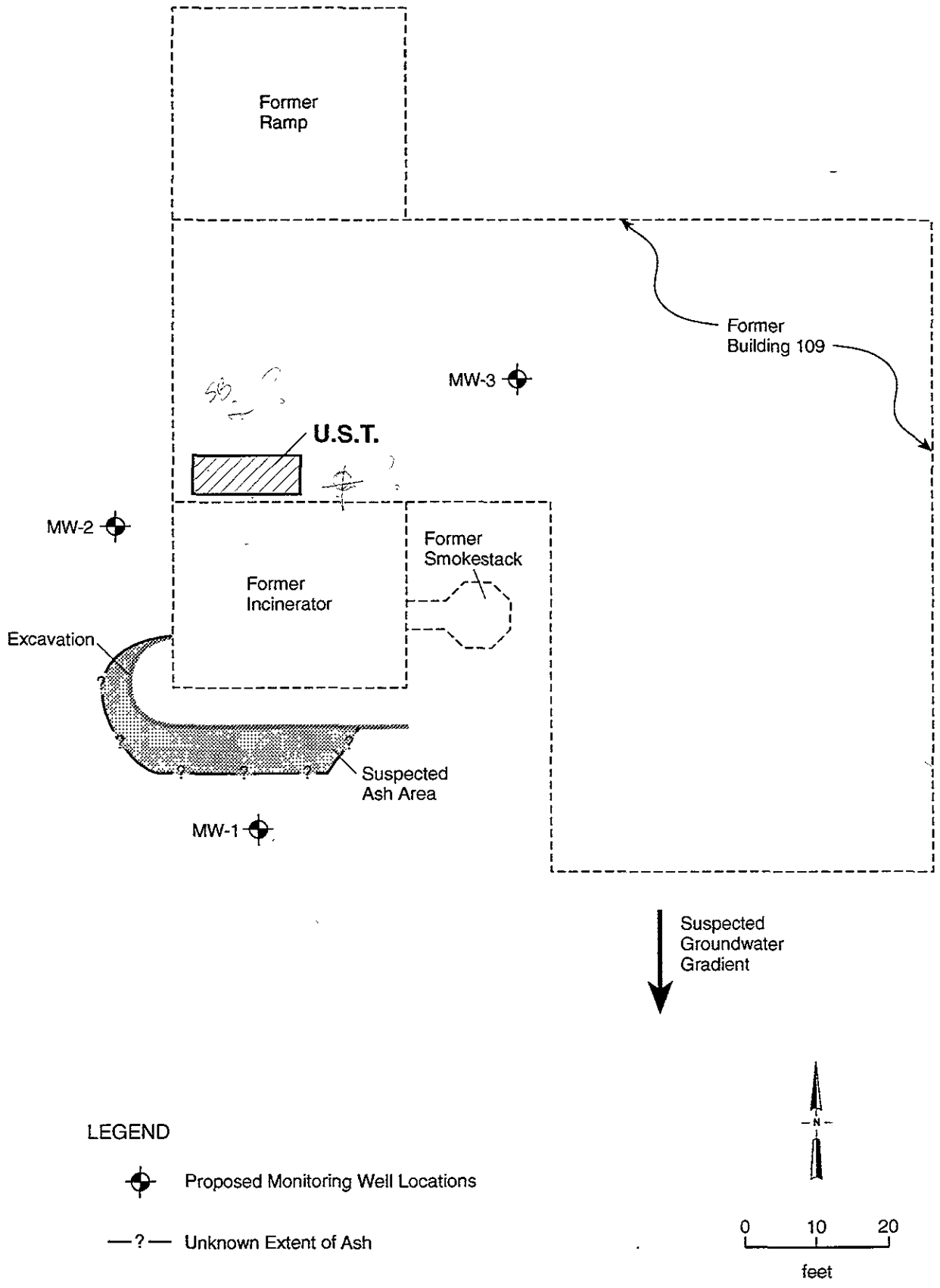
Project No. 7112	Parks Reserve Forces Training Area	FACILITY MAP LOCATION PARKS RESERVE FORCES TRAINING AREA DUBLIN, CALIFORNIA	Figure 1
Woodward-Clyde			

7112-9000/052594



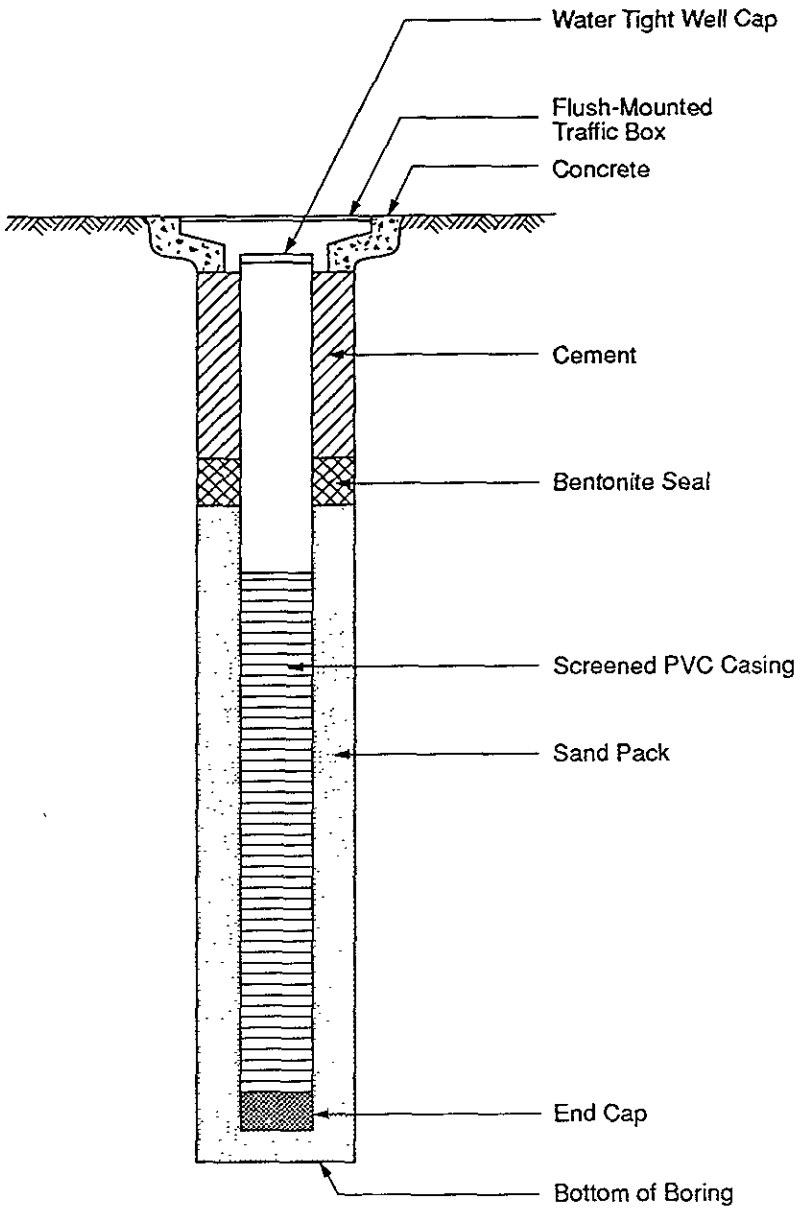
PARK-13 052094

Project No. 7112	PARKS RESERVE FORCES TRAINING AREA	SITE LOCATION BLDG. 109 INVESTIGATION	Figure 2
Woodward-Clyde Consultants			



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

7112-9000/052594



Woodward-Clyde Consultants		PROPOSED MONITORING WELL CONSTRUCTION	Figure 4

7112-9010/070794

APPENDIX A
UNAUTHORIZED RELEASE REPORT

DEPARTMENT OF THE ARMY
PARKS RESERVE FORCES TRAINING AREA
BUILDING 790
DUBLIN, CALIFORNIA 94568-5201

REPLY TO
ATTENTION OF:

March 24, 1994

Office of the Commander

SUBJECT: Spill Release Notification

Alameda County Department of Environment
Hazardous Materials Division, Room 200
Attention: Ms. Elaine Olson
80 Swan Street
Oakland, CA 94621

Dear Ms. Olson:

The following information is submitted:

Identity of Caller: Mervin Alley, (510) 829-8780.

Location: Camp Parks; Date: 22 March 1994; 1300 hours.

Substance and quantity involved: Diesel fuel, 442 gallons.

Description of what happened: Contractor demolishing old incinerator building 109 unearthed a previously unknown 3000 gallon underground fuel tank on Friday, 18 March. On Tuesday, 22 March, oil was discovered leaking from puncture holes in the tank into an adjacent 12 foot deep pit. On the same day, Petroleum Recycling Company was called and pumped 442 gallons of oil from the pit and emptied the tank of another 1,077 gallons of oil. Arrangements were made with Navy Public Works Center, Oakland to remove the tank and clean up the site.

Mervin Alley
MERVIN ALLEY
Facilities Mgt Spec

APPENDIX B
WASTE DISPOSAL MANIFESTS

SUE FOR INVOICE ACCTG

BARBARA
RICHARD DOWNS ENVIRONMENTAL DEPT

PRC
13331 N. Hwy 33
Patterson, CA 95363
(209) 892-6742
(800) 874-4444

"California's Full Service Hazardous Waste Recycler"

MANIFEST
No. 93018013

RECEIVING TICKET

DATE 03-21-94

Generator: Dept of Army B/L No.: 3052
Transporter: PRC WT. Ticket No.: 57422
Material: Waste Liquid Net Wt.: 7920
Manifest: 93018013
Gravity: 30.7 @ 64.0
A.P.I. Gravity: ~~3~~ 30.4 B.S. & W. 1.0 %
Solids: 1.0 ~~% Drums of Solids~~ water N/C

Oil 99%

Washout ☐

Water Meter:
Begin ______ End ______

Tank No		Feet	Inches	Gross BBLS/GALS	Temp	60° F Bbls.

Signature For Volume Only:
Carrier: Tim Sass
Operator: [signature]

For Accounting Use Only:

#7.278
5.11

CALCULATIONS

Gross BBLS/GALS 1088 @ 60°F, Less 11 B.S. & W.

Net BBLS/GALS 1077 @ 60°F ← OIL

Distribution: White ____ Green ____ Canary ____ Pink ____ Goldenrod ____
RTMMP92

IN CAS...

FACILITY

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as ...

Printed/Typed Name: Ramsin Givargis
Signature: [signature]

DO NOT WRITE BELOW THIS LINE

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-94)
Please print or type. *Form designed for use on elite (12-pitch) typewriter.*

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: d A l l d d d l l l l 3 4 4 d 3 d 5 2 — Manifest Document No.
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address

DEPT. OF ARMY
BLDG 790 CAMPS PARKS, DUBLIN, CA. 94568-5201

4. Generator's Phone (510) 829-1201

5. Transporter 1 Company Name: PETROLEUM RECYCLING CORP.
6. US EPA ID Number: CAT 080 011 059

7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address

PETROLEUM RECYCLING CORP.
13331 NORTH HIGHWAY 33
PATTERSON, CA. 95363

10. US EPA ID Number: CAD 083 166 728

800-874-4444

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID (OIL WATER)	002	TT	01200	G
b.				
c.				
d.				

Stamp: Petroleum Recycling Corporation certifies that the above mentioned waste(s) more specifically identified by reference to the waste manifest set forth above, Was were recycled in accordance with the provisions of 40CFR261.6 and 23.4 pursuant to 40CFR261.3(c) All hazardous waste generated from the recycling efforts was also recycled in accordance with the provision of 40CFR266 Subpart D.
PETROLEUM RECYCLING CORPORATION
BY *Mary Ann Watson*

J. Additional Descriptions for Materials Listed Above — K. Handling Codes for Wastes Listed Above: a. 01

15. Special Handling Instructions and Additional Information

24 HR. EMERGENCY CONTACT: 1-800-874-4444
24 HR. EMERGENCY RESPONSE: CHEM TEL INC. 1-800-255-3924
APPROPRIATE PROTECTIVE CLOTHING & RESPIRATOR

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable federal, state and international laws.

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Printed/Typed Name	Signature	Month	Day	Year
MERVIN ALLEY	*Mervin Alley*	03	22	94

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
JAMES SASS	*James Sass*	03	22	94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

Actual Gallons per wt ticket 1088

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Ramsin Givargis	*Ramsin Ce...*	03	22	94

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (7/92)
EPA 8700—22

Yellow: TSDF SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS.
(Generators who submit hazardous waste for transport out-of-state, produce completed copy of this copy and send to DTSC within 30 days.)

"California's Full Service Hazardous Waste Recycler"

PRC
13331 N. Hwy 33
Patterson, CA 95363
(209) 892-6742
(800) 874-4444

MANIFEST No. 93018014

DATE 05-22-96

RECEIVING TICKET

Generator: Dept of Army B/L No.: N/A

Transporter: H+H Ship Serv WT. Ticket No.: 57477

Material: Waste Liquid Net Wt.: 3820

Manifest: 93018014

Gravity: 23.5 @ 65

A.P.I. Gravity: 23.7 B.S. & W. 16.0 %

Solids: 1.0 % Drums of Solids ~~WATER~~ 15.0

Washout ☐ Water Meter: Oil 84%

Begin _____ End _____

Tank No.		Feet	Inches	Gross BBLS/GALS	Temp.	60°F Bbls.

Signature For Volume Only:

Carrier: [signature]

Operator: [signature]

For Accounting Use Only:

#7.617

W 7.5

S 5

CALCULATIONS

Gross BBLS/GALS 502 @ 60°F, Less 80 B.S. & W.

Net BBLS/GALS 422 @ 60°F ← OIL

Distribution: White _____ Green _____ Canary _____ Pink _____ Goldenrod _____
RTM4P92

SHIPPER | TRANSPORTER | COMMO | DRIVER

IN CASE OF FACILITY

19 Discrepancy Indication Space

Actual Gallons 502

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as note

Printed/Typed Name: MATTHEW ANGLE Signature: [signature]

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (7/92)
EPA 8700-72

State of California—Environmental Protection Agency
Form Approved. OMB No. 2050-0039 (Expires 9-30-94)
Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law.
CA1000012136414	18014		

3. Generator's Name and Mailing Address
DEPT OF ARMY
BLDG 790 CAMP PARKS, DUBLIN, CA. 94568-5201

4. Generator's Phone (510 829-1201

5. Transporter 1 Company Name	6. US EPA ID Number
H & H SHIP SERVICE COMPANY	CAD000471116
7. Transporter 2 Company Name	8. US EPA ID Number

9. Designated Facility Name and Site Address	10. US EPA ID Number
PETROLEUM RECYCLING CORP. 13331 N. HWY 33 PATTERSON, CA. 95363	CAD083166728

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID (OIL, WATER)	001	TT	00800	G
b.				
c.				
d.				

Petroleum Recycling Corporation certifies that the above mentioned waste(s), more specifically identified by reference to the waste manifest set forth above, Was were recycled in accordance with the provisions of 40CFR261.6 and 23.4 pursuant to 40CFR261.3(c) (2). Hazardous waste generated from the recycling efforts was also recycled in accordance with the provision of 40CFR266 Subpart D.

PETROLEUM RECYCLING CORPORATION

12. Handling Codes for Wastes Listed Above	
a.	b.
c.	d.

15. Special Handling Instructions and Additional Information

24 HOUR EMERGENCY CONTACT: 1-800-874-4444
24 HOUR EMERGENCY RESPONSE: CHEM TEL INC. 1-800-255-3924
APPROPRIATE PROTECTIVE CLOTHING & RESPIRATOR

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Printed/Typed Name	Signature	Month	Day	Year
X MERVIN ALLEY	X Mervin Alley	03	22	94

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
ESTEBAN M. PENALVER		03	22	94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

Actual Gallons 502

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
MATTHEW ANGLES		03	22	94

DO NOT WRITE BELOW THIS LINE.

GENERATOR | TRANSPORTER | FACILITY

DTSC 8022A (7/92)
8700—22

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State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-94)
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See instructions on back of page 6.

BLDG #109
Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	12. Page	Information in the shaded areas is not required by Federal law.
CA D 0 0 0 1 7 8 5 6 2 6	7 7 7 7	of 1	

3. Generator's Name and Mailing Address
Dept OF ARMY
BLDG 790 Camp Parks Dublin, CA.

4. Generator's Phone (510 829-8780 94568-5201

5. Transporter 1 Company Name	6. US EPA ID Number
PETROLEUM RECYCLING CORP.	C A T 0 8 0 0 1 1 0 5 9
7. Transporter 2 Company Name	8. US EPA ID Number

9. Designated Facility Name and Site Address	10. US EPA ID Number
PRC PATTERSON, INC. 13331 N. HWY. 33 PATTERSON, CA. 95363	C A D 0 8 3 1 6 6 7 2 8

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID	0 0 1	T T	0 0 8 0 0	G
b. BLDG 770 350g BLDG 109 450g				

Petroleum Recycling Corporation certifies that the above mentioned waste(s), more specifically identified by reference to the waste manifest set forth above, Was were recycled in accordance with the provisions of 40CFR261.6 and 23.4 pursuant to 40CFR261.3(c)(2) hazardous waste generated from the recycling efforts was also recycled in accordance with the provision of 40CFR [illegible]

15. Special Handling Instructions and Additional Information

24 HR. EMERGENCY CONTACT: PRC #1-(800)-874-4444
24 HR. EMERGENCY RESPONSE: CHEM TEL INC. #1-(800)-255-3924
APPROPRIATE PROTECTIVE CLOTHING & RESPIRATOR.

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Printed/Typed Name	Signature	Month	Day	Year
MERVIN ALLEY	Mervin Alley	0 4	2 5	9 4

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Randy Skaggs	Randall D Skaggs	0 4	2 5	9 5

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
Actual gals. per wt. tag: 713

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Ramsil Giveggis	Ramsil Giveggis	0 4	2 5	9 4

DO NOT WRITE BELOW THIS LINE.

GENERATOR — TRANSPORTER — FACILITY

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

DTSC 8022A (7/92)
EPA 8700—22

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Department of Toxic Substances Control
Sacramento, California

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UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. / Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law.
	CAA000178562 6177318		

[redacted]

3. Generator's Name and Mailing Address
Dept OF ARMY
BLDG #790 Camp PARKS Dublin CA

4. Generator's Phone (510) 829-8780

5. Transporter 1 Company Name: PETROLEUM RECYCLING CORP.
6. US EPA ID Number: CAT080011059

7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
PRC PATTERSON, INC.
13331 N. HWY. 33
PATTERSON, CA. 95363

10. US EPA ID Number: CAD083166728

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID	001	TT	003510	G
b.				
c.				
d.				

Petroleum Recycling Corporation certifies that the above mentioned waste(s), more specifically identified by reference to the waste manifest set forth above, Was were recycled in accordance with the provisions of 40CFR261.6 and 23.4 pursuant to 40CFR261.3(c)(2) hazardous waste generated from the recycling efforts was also recycled in accordance with the provision of 40CFR266 Subpart D.
PETROLEUM RECYCLING CORPORATION

15. Special Handling Instructions and Additional Information
24 HR. EMERGENCY CONTACT: PRC #1-(800)-874-4444
24 HR. EMERGENCY RESPONSE: CHEM TEL INC. #1-(800)-255-3924
APPROPRIATE PROTECTIVE CLOTHING & RESPIRATOR.

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Printed/Typed Name	Signature	Month	Day	Year
MERVIN ALLEY	Mervin Alley	04	18	94

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Randy Skaggs	Randy Skaggs	04	18	94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
1 Actual Gallons/Pr. Wt 313

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Ramsin Givergis	Ramsin Givergis	04	18	94

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DTSC 8022A (7/92)
EPA 8700—22

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Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

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CA1000123640	9 7 9 7 17		

3. Generator's Name and Mailing Address
Dept of Army
BLDG 790 Camp Parks Dublin, Ca
4. Generator's Phone (510 829-8780, 94568

5. Transporter 1 Company Name — 6. US EPA ID Number
PETROLEUM RECYCLING CORP. — CAT080011059

7. Transporter 2 Company Name — 8. US EPA ID Number

9. Designated Facility Name and Site Address — 10. US EPA ID Number
PRC PATTERSON, INC.
13331 N. HWY. 33
PATTERSON, CA. 95363
CAD083166728

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID	001	TT	00450	G
b.				
c.				
d.				

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PETROLEUM RECYCLING CORPORATION

15. Special Handling Instructions and Additional Information

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24 HR. EMERGENCY RESPONSE: CHEM TEL INC. #1-(800)-255-3924
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Printed/Typed Name	Signature	Month	Day	Year
MERVIN ALLEY	Mervin Alley	04	11	94

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Randy Skaggs	Randy Skaggs	04	11	94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

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Printed/Typed Name	Signature	Month	Day	Year
Ramsin Givegis	Ramsin Givegis	04	11	94

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GENERATOR

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DTSC 8022A (7/92)
EPA 8700—22

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Form Approved OMB No. 2050-0039 (Expires 9-30-
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See Instructions on [illegible] age 6.

BLDG # 109

Department of Toxic Substances Contr
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1	Information in the shaded areas
CA H 0 1 0 1 2 1 3 6 4	0 7 9 7 4	1 of 1	is not required by Federal law.

3. Generator's Name and Mailing Address
Dept OF Army
BLDG 790 Camp Parks Dublin CA. 94568

4. Generator's Phone (510) 892-8780

5. Transporter 1 Company Name	6. US EPA ID Number
PETROLEUM RECYCLING CORP.	C A T 0 8 0 0 1 1 0 5 9
7. Transporter 2 Company Name	8. US EPA ID Number

9. Designated Facility Name and Site Address	10. US EPA ID Number
PRC-PATTERSON, INC. 13331 N. HWY. 33 PATTERSON, CA. 95363	C A D 0 8 3 1 6 6 7 2 8

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID	0 0 1	T T	0 0 3 5 0	G
b.				
c.				
d.				

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PETROLEUM RECYCLING CORPORATION

15. Special Handling Instructions and Additional Information

24 HR. EMERGENCY CONTACT: PRC #1-(800)-874-4444
24 HR. EMERGENCY RESPONSE: CHEM TEL INC. #1-(800)-255-3924
APPROPRIATE PROTECTIVE CLOTHING & RESPIRATOR.

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Printed/Typed Name	Signature	Month	Day	Year
Robert C Cowan	Robert C Cowan	0 1	0 1	9 1 4

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Randy Skaggs	Randy Skaggs	0 1	0 1	9 1 4

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

actual Gallons on ticket 313

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Glenn Shipman	Glenn Shipman	0 1	0 1	9 1 4

DO NOT WRITE BELOW THIS LINE.

GENERATOR
TRANSPORTER
FACILITY

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EPA 8700—22

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BLDG #109

Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CA K 0 0 0 9 1 2 1 3 6 1
Manifest Document No.: 0 1 9 7 2
2. Page 1 of 1

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3. Generator's Name and Mailing Address
Dept of ARMY
BLDG #790 Camp Parks Dublin CA 94568-5201

4. Generator's Phone (510) 829-1201

5. Transporter 1 Company Name: PETROLEUM RECYCLING CORP.
6. US EPA ID Number: C A T 0 8 0 0 1 1 0 5 9

7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
PRC PATTERSON, INC.
13331 N. HWY. 33
PATTERSON, CA. 95363
10. US EPA ID Number: C A D 0 8 8 1 6 6 7 2 8

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID	0 0 1	T T	0 0 3 5 0	G
b.				
c.				
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Printed/Typed Name: MERVIN ALLEY
Signature: Mervin Alley
Month Day Year: 0 3 3 0 9 4

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Randy Skaggs
Signature: Randy Skaggs
Month Day Year: 0 3 3 0 9 4

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month Day Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Ramon Giverg[illegible]
Signature: [illegible]
Month Day Year: 0 3 3 0 9 4

GENERATOR / TRANSPORTER / FACILITY

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DTSC 8022A (7/92)
EPA 8700—22

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(Generators who submit hazardous waste for transport out-of-state, ...)

...ronmental Protection Agency
...No. 2050-0039 (Expires 9-30-94)
...pe. Form designed for use on elite (12-pitch) typewriter.

See Instructions on back of page 6.

Department of Toxic Substances
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CAL000112113	Manifest Document No. 179171	2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dept of Army
BLDG 790 Camp Parks Dublin CA 94568-5201

4. Generator's Phone (510) 829-1201

5. Transporter 1 Company Name: PETROLEUM RECYCLING CORP.
6. US EPA ID Number: CAT080011059

7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
PRC PATTERSON, INC.
13331 N. HWY. 33
PATTERSON, CA. 95363

10. US EPA ID Number: CAD083166728

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON RCRA HAZARDOUS WASTE LIQUID	001	TT	002500	G
b.				

Petroleum Recycling Corporation certifies that the above mentioned waste(s), more specifically identified by reference to the waste manifest set forth above, Was were recycled in accordance with the provisions of 40CFR261.6 and 23.4 pursuant to 40CFR261.3(c)(2) hazardous waste generated from the recycling efforts was also recycled in accordance with the provision of 40CFR266 Subpart D.
PETROLEUM RECYCLING CORPORATION

15. Special Handling Instructions and Additional Information
24 HR. EMERGENCY CONTACT: PRC #1-(800)-874-4444
24 HR. EMERGENCY RESPONSE: CHEM TEL INC. #1-(800)-255-3924
APPROPRIATE PROTECTIVE CLOTHING & RESPIRATOR.

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable federal, state and international laws.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
MERVIN ALLEY	Mervin Alley	03 28 94

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
Randy Skaggs	Randy Skaggs	03 28 94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space
actual Gallons per wt ticket 402

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
MATTHEW ANGUS	Matt G.	03 28 94

GENERATOR / TRANSPORTER / FACILITY

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

9319971

DO NOT WRITE BELOW THIS LINE

DTSC 8022A (7/92)
EPA 8700-22

Yellow: TSDF SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS.
(Generators who submit hazardous waste for transport out of st...

APPENDIX C
SITE HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

SITE CHARACTERIZATION
BUILDING 732-UST AND
BUILDING 109-UST AND ASH AREA
PARKS RESERVE FORCES
TRAINING AREA
DUBLIN, CA

Prepared for

U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922

July 1, 1994

Woodward-Clyde

500 12th Street
Suite 100
Oakland, California 94607-4014

TABLE OF CONTENTS

LIST OF ATTACHMENTS

Sent orig. to Anne B. 6/28 for sign. Will send back

1.0 ADMINISTRATIVE INFORMATION

1.1 PROJECT IDENTIFICATION AND APPROVALS

Project Name:	Camp Parks Reserve Forces
Project Number:	7112/9010
Business Unit:	Oakland
Project Manager:	Michael Sartor
Date of Issue:	June 7, 1994
Effective Dates:	June 9, 1994 through January 1, 1995

Approvals:

J. M. Sartor — Project Manager, Mike Sartor — Date: 6/17/94

J. K. Pawley — Oakland Health and Safety Officer, Tanya Pawley — Date: 6/27/94

Corporate Health and Safety Officer, Anne Baptiste, CIH — Date

2.0
INTRODUCTION

This Site Specific Safety and Health Plan (SSHP) establishes guidelines and requirements for the health and safety of field personnel during field activities associated with U.S. Army Corps of Engineers Contract Number DACA05-02-D-0032 at Camp Parks Army Reserve Facility in Dublin, California. The specific activities addressed by this plan are defined in Section 5.0. All Woodward-Clyde (WC) on-site personnel and WC 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 WC written Health and Safety Program and the U.S Army Corps of Engineers (COE), Safety and Health Requirements Manual EM 385-1-1. This plan is for use in conjunction with the Woodward-Clyde Health and Safety Manual which contains the Illness and Injury Prevention Program (IIPP) provisions for Woodward-Clyde employees.

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.

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 WC 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 health and safety 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 Health and Safety Plans.

- Review and approve Health and Safety Plans.

- Monitor implementation of Health and Safety 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 Health and Safety Plans.

- Direct business unit HSO to prepare project health and safety 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): Tanya Pawley

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 Health and Safety 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 Health and Safety 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 health and safety 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): Mike Sartor

Responsibilities

- Ensure that the project is performed in a manner consistent with the WC Health and Safety Program.

- Ensure that the project health and safety plan is prepared, approved, and properly implemented.

- Provide the HSO with the information needed to develop Health and Safety Plans.
- Implement Health and Safety Plans.
- Ensure that adequate funds are allocated to fully implement project Health and Safety Plans.
- Assure compliance with Health and Safety 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 Health and Safety Plan, pending an evaluation by the HSO, CHSO, and/or CHSA.

SITE SAFETY OFFICER (SSO): Sevin Bilir

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 Health and Safety 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 health and safety plan, pending further consideration by the HSO and/or CHSO.

4.0
SITE-SPECIFIC BACKGROUND, SCOPE OF WORK, AND HAZARD ASSESSMENT

4.1 OVERALL SITE

4.1.1 Site Location and Description

The investigative field work to be performed by WC is located within the Parks Reserve Forces Training Area (PRFTA) of the Camp Parks Reserve Forces in Dublin, California. The PRFTA occupies approximately 2800 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.

An over-all site map is presented in Figure 1 of the WC workplan.

4.1.2 Scope of Work

The scope of work for each location of the facility where field work will be performed is described below in location-specific sections (Section 4.2 and 4.3).

4.1.3 Hazard Assessment

4.1.3.1 Chemical Hazards

Chemical hazards specifically associated with each location are discussed in each location-specific Section. Chemical Information Sheets for the contaminants of concern are located in Attachment A. Additional chemical information on site constituents is available upon request.

4.1.3.2 Physical Hazards

The physical hazards that may be encountered at Camp Parks are presented below. A hazard assessment has been prepared for task-specific hazards for each work location. In addition, Activity Hazard Analysis have been prepared for task specific hazards and are located in Attachment B.

Drilling

Working with and around a drill rig can involve a high risk of serious injury or death. The hazards involved with the use of drill rigs are significant and include the hazards of pinch points; entrapment in machinery; impact from moving parts; fatigue; electrocution from lightning, overhead wires, or buried utilities; and improper operations. Use of hand tools, moving the rig, and conducting required repairs can increase physical risks. Excessive noise may be generated from drilling rigs. In order to reduce the risk, proper safety precautions must be observed at all times. Safe drilling procedures are included in Attachment C.

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 per work activity have been assessed and are described in Section 6.3.

Noise Exposure

Work at this site will be conducted near drill rigs and heavy equipment that may expose personnel to high noise levels. Ideally, personnel who do not need to be next to noisy equipment should stay as far away as possible to lower their risk to noise-induced hearing loss. Site personnel who must work next to this equipment will wear hearing protection such as ear plugs or muffs to reduce their exposure. Periodic noise monitoring may be conducted with the use of a sound level meter or a sound dosimeter. Equipment operators should be advised to wear hearing protection.

Slips, Trips, and Falls

The ground around the work area may become uneven over time and may be cluttered with pieces of equipment. These situations can result in workers falling or tripping and subsequently injuring themselves. To reduce this risk, the SSO will report trip hazards to the Drilling Site Manager, and have them immediately taken care of.

Heat Stress

Due to the California climate during the summer, heat stress could be of some concern. Bottled water will be available at the decontamination areas so that site personnel can conveniently consume fluids. A modified decontamination procedure will be in effect so that workers will not have to completely remove all contaminated garments prior to consuming water. Heat stress can result when protective clothing decreases natural body ventilation. If temperatures on-site exceed 75°F while protective coveralls are being worn, then heat stress monitoring should be employed. Monitoring may include watching the workers for visible signs of heat stress and taking the heart rate of workers. The heart rate should be taken twice daily and the results should be recorded. If no temperatures are elevated at the end of the first week of activity, temperature monitoring frequency may be decreased at the discretion of the Site Safety Officer (see WC H&S Manual Operation Procedure 102.0, Attachment D).

Buried Utilities

Intrusive investigations into soils involve the risk of encountering underground utilities. contact with underground utilities can be expensive, e.g. drilling through communications cable, or extremely dangerous, e.g. drilling through high pressure natural gas mains. Clearance shall be obtained in writing from the appropriate authorities, such as Blue Stake or similar utilities service, and if applicable, the facilities or engineering office of the client's facility before intrusive work commences at each location. The site manager shall discuss in advance with the facilities or engineering office or other responsible authority,emergency contacts and emergency procedures should underground utilities be encountered.

Traffic

When a work site encroaches upon public streets, the possibility of an individual being injured or struck by vehicular traffic must be considered. Therefore, personnel must always be alert when moving vehicles from a protected area. In addition, barricades and devices must be used to warn traffic. Individuals that are directing or controlling traffic should wear a bright reflector vest to become more visible to drivers.

Fire Hazard/Explosion

The site contains a number of flammable volatile compounds. By evaluating the current data, it seems unlikely that explosive levels of these compounds will be encountered during the drilling operations. However, pockets of these compounds may exist in the subsurface and therefore, there will not be any open flame within a radius of 25 feet from the drilling or excavating areas. Also, there will not be any smoking in or within 25 feet of the work area. A combustible gas meter will be used to monitor intrusive operations if excessive levels of volatile compounds are measured on the air monitoring instrument.

4.2 Former Building 109 - Delivery Order Number 0012

4.2.1 History and Description of Former Building 109

Building 109 was located at the southern portion of the facility (Workplan, Figure 2).

Prior to its demolition which is currently underway, Building 109 was a trash incinerator. During building demolition and removal activities in mid-March 1994, a previously unknown 2000-3000 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. It has been reported that 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. Approximately 442 gallons of product was removed from the excavation and another estimated 1,077 gallons removed from the tank.

Evidence of ash in an adjacent trench was reportedly observed. Building 109 was identified on a 1945 facility drawing that identified a trash pit and scrap area to the south of the building.

4.2.2 Scope of Work

The following field activities are anticipated to be performed in the location of the former building 109:

Task 1 — Hollow stem auger drilling to complete approximately 3 borings to a depth of 20 feet. Soil samples will be collected at 5-foot and 10-foot intervals. Each boring will be constructed into monitoring well and samples will be collected for analysis.

Task 2 — 1) An initial sample of the ash area will be collected for determining the chemical composition of the ash (specifically the presence of dioxin and/or polynuclear aromatic hydrocarbons (PAHs)).

2) After determination of the chemical composition of the ash area, hollow stem auger drilling will be conducted to complete borings in the location of the trench adjacent to building 109 where ash has been observed to be present. Soil samples will be collected for laboratory analysis.

Sampling location are presented in Figure 3 of the workplan.

4.2.3 Hazard Assessment

4.2.3.1 Chemical Hazards

Task 1 — Based on the history of the site location and previous analytical results, fuel from a punctured tank has seeped into the soil and possibly groundwater. Dermal exposure and inhalation of organic vapors generated from soil disruption are the primary routes of exposure. Air monitoring for organic compounds will be conducted during intrusive work activities as described in section 6.2.1. The chemical information sheet on toxicological effects and physical properties of fuels is presented in Attachment A.

Task 2 — Based on the history of the trench area adjacent to the former building 109, many compounds may be present. It is reasonable to prepare for the possible presents of various metals, semi-volatile organics (specifically PAHs), and possible dioxins. Air monitoring for organic compounds will be conducted during intrusive work activities as described in section 6.2.1. Because dioxin and various heavy metals may be present in unknown quantities in airborne dust, dust generation must be minimized during site activities as inhalation of contaminated particulate is a significant route of exposure. Chemical information sheets on the toxicological effects and physical properties of these compounds are presented in Attachment A.

4.2.3.2 Physical and Biological Hazards

Physical and biological hazards for the entire site are outlined in Sections 4.1.3.2 and 4.1.3.3. The hazards that will be of concern at this location are as follows:

- Drilling - See SOP-203, Attachment B and C
  Task 1 and 2

- Personal Protective Equipment - See Section 6.3
  Tasks 1 and 2

- Noise Exposure - See Section 4.1.3.2, Attachment B
  Task 1 and 2

- Slips, Trips, and Falls - See Section 4.1.3.2, Attachment B
  Task 1 and 2

- Heat Stress - See Section 4.1.3.2, Attachment B and D
  Task 1 and 2

- Buried Utilities - See Section 4.1.3.2
  Task 1 and 2

- Fire Hazard - See Section 4.1.3.2
  Task 1

4.3 Building 732 - Delivery Order Number 0028

4.3.1 History and Description of Building 732

Two underground storage tanks containing gasoline and waste oil were removed and excavated from this location in March, 1993. Soil under one tank revealed no contamination, however, possible fuel oil leaks have been indicated by petroleum odor and results of laboratory analysis from under the second tank (No. 732-2). Because there was no visible evidence of leaking from the tanks, the source of soil/water contamination appears to have been due to a past overfill.

4.3.2 Scope of Work

The following field activities are to be performed at the Building 732 location:

Task 1 Three boreholes will be drilled within 10 feet from the center of the former tank location. Collection of soil and groundwater samples from the boring will be sent to the laboratory for analysis.

4.3.3 Hazard Assessment

4.3.3.1 Chemical Hazards

Personnel conducting this work may be working with soils potentially containing petroleum hydrocarbons and possibly low levels of metals. Dermal exposure and inhalation of organic vapors generated from soil disruption are the primary routes of exposure. Air monitoring will be conducted during intrusive work activities as described in section 6.2.1. Chemical information sheets on the toxicological effects and physical properties of these compounds are presented in Attachment A.

4.3.3.2 Physical and Biological Hazards

Physical and biological hazards for the entire site are outlined in Sections 4.1.3.2 and 4.1.3.3. The hazards which will be of concern during field work conducted at this location are as follows:

- Drilling - See SOP-203, Attachment B and C
- Personal Protective Equipment - See Section 6.3
- Noise Exposure - See Section 4.1.3.2, Attachment B
- Slips, Trips, and Falls - See Section 4.1.3.2, Attachment B
- Heat Stress - See Section 4.1.3.2, Attachment B and D
- Buried Utilities - See Section 4.1.3.2
- Fire Hazard - See Section 4.1.3.2

5.0
GENERAL HEALTH AND SAFETY REQUIREMENTS

5.1 PERSONNEL CLEARANCE

WC employees must obtain health and safety clearances before beginning field work at the Camp Parks. WC employees assigned to field operation must have (1) participated in the WC medical surveillance program and have been certified by a WC-approved physician as being physically fit and able to perform their assigned field work, (2) successfully completed a OSHA required 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. 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 First Aid in addition to requirements for field personnel.

WC 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 Attachments E. This form is to be completed and maintained in WC records, including the Health and Safety file.

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). 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 HEALTH AND SAFETY PLAN

Before field work begins, a copy of the final SSHP must be provided to each WC and subcontractor employee assigned to field work on the project as well as to an authorized representative of each firm contracted by WC 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.

5.5 ACCIDENT/INCIDENT REPORTING

In the event of an accident or incident, the SSO will immediately notify the WC 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 WC 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 WC accident/incident report form (Attachments F) must be submitted to the PM and the HSO within 24 hours of the occurrence.

5.6 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).

5.7 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 WC 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 noncontaminated 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.

5.8 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.

6.1 PERSONAL PROTECTIVE EQUIPMENT

6.1.1 Personal Protection Levels

Levels of personal protection are as follows:

Level D:

- Hard Hat (when overhead hazards exist),
- Deconnable Steel Toe Boots (when working around heavy equipment),
- Boot Covers (when working in soils saturated with contaminants),
- Safety Glasses with side shields (around equipment), and
- Nitrile Gloves (when handling contaminated soils, sediments or groundwater).
- Hearing protection (around drilling equipment)

Modified Level D:

- Tyvek coveralls (in dry conditions) taped at ankles and wrists,
- Coated Coveralls (groundwater sampling or free product) taped at ankles and wrists,
- Hard Hat (when overhead hazards exist),
- Deconnable Steel Toe Boots (when working around heavy equipment),

- Boot Covers,
- Safety Glasses with side shields (around equipment),
- Nitrile Gloves, and
- Latex or Nitrile Inner Gloves.
- Hearing protection (around drilling equipment)

Level C:

- Half-face or Full-face respirator with combination organic vapor/particulate filter (HEPA) cartridges,
- Tyvek coveralls (in dry conditions) taped at ankles and wrists,
- Coated Coveralls (groundwater sampling or free product) taped at ankles and wrists,
- Hard Hat (when overhead hazards exist),
- Deconnable Steel Toe Boots (when working around heavy equipment),
- Boot Covers,
- Safety Glasses with side shields (around equipment),
- Nitrile Gloves, and
- Latex or Nitrile Inner Gloves
- Hearing protection (around drilling equipment)

6.1.2 Initial Levels of Protection

- Building 109 - Task 1
  - Drilling: Modified Level D
  - Soil Sampling: Level D
  - Groundwater Sampling: Modified Level D
- Building 109 - Task 2
  - Drilling: Modified Level D
  - Soil Sampling: Level D
  - Ash area sampling: Level C (HEPA)
  - Groundwater Sampling: Modified Level D
- Building 732
  - Drilling: Modified Level D
  - Soil Sampling: Level D
  - Groundwater Sampling: Modified Level D

6.2 AIR MONITORING REQUIREMENTS

6.2.1 Organic Vapor Monitoring - Building 109-UST and Building 732-UST

Vapor monitoring with an OVA flame ionization detector shall be performed a periodically during all intrusive activities. During drilling operations, a reading must be taken at least one time every 5 feet drilled and recorded in the drilling log. (The SSO may call for increased monitoring frequencies based on field conditions.) If OVA readings exceed 10 ppm total hydrocarbons (assumes 0.1 ppm benzene will be approached) in the breathing zone, half face respirators with organic vapor cartridges shall be worn. If OVA readings exceed 100 ppm total hydrocarbons (assumes 10 ppm benzene will be present) in the breathing zone, work shall be temporarily suspended. If work is suspended, the SSO shall direct the field crew to a safe point upwind of the source of contamination, inform the PM that work has been

suspended, and return periodically to the evacuated area to remeasure vapor/gas concentrations. If the air concentrations fall below 100 ppm total hydrocarbons (or 10 ppm benzene) in the breathing zone, work may be resumed.

The Level C action level of 10 ppm total hydrocarbons (or 0.1 ppm benzene) and the evacuation level of 100 ppm hydrocarbons (or 10 ppm benzene), for instrument readings in the breathing zone, are conservative. Given a protection factor of 10 for a half-face respirator, the concentration inside the mask would be 0.1 ppm (at 10 ppm detection).

These toxicity action levels given are set to comply with OSHA Permissible Exposure Levels and ACGIH Threshold Limit Values. Some of the more volatile motor fuels contain some concentration of benzene. Gasoline averages approximately 1% benzene. Therefore, for motor fuels which may contain benzene, the action levels specified are also set to comply with the proposed TLV for benzene of 0.1 ppm. These action levels are also adjusted for the relative response of common PID or FID instruments to motor fuel vapors. The action level for particulates shall be the presence of any visible dust. The presence of visible dust in the breathing zone will require the wearing of respirators with HEPA and organic vapor cartridges.

Monitoring must be performed by individuals trained in the use and care of the OVA. 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 safety completion report (Appendix G) summarizing air monitoring results must be prepared 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.

6.2.2 Dust Suppression - Building 109 - Ash Area

Based on the uncertain presence and levels of dioxins, various heavy metals, and semi-volatile organic compounds near the ash area, minimizing dust during work activities is imperative in eliminating the inhalation exposure potential to highly toxic particulate. If

visual dust persists, personnel performing work in the ash area of building 109 must wear respirators utilizing high efficiency particulate filters.

6.3 ACTION LEVELS

Sampling Location	Monitoring Equipment	Sampling Result	Action
Building 109			
Task 1	OVA calibrated to methane	Breathing zone reading over 10 ppm above background	Upgrade to Level C PPE
		Breathing zone reading of 100 ppm above background (sustained for 1 minute)	Stop work and contact HSO
		Unusual Odors are detected	Stop work and contact HSO
	Observation	Symptoms of exposure (See chemical specific information, Attachment A)	Stop work and Contact HSO
		Visible Dust	Keep soil damp
Task 2			
Initial Sample	None	Not Applicable	Level C with HEPA cartridge
	OVA	To be assessed following the determination of the initial sample chemical composition.	
	Observation	Unusual Odors are detected	Stop work and contact HSO
		Symptoms of exposure (See chemical specific information, Attachment A)	Stop work and Contact HSO
		Visible dust	Keep soil damp -

Sampling Location	Monitoring Equipment	Sampling Result	Action
Building 732	OVA calibrated to methane	Breathing zone reading over 10 ppm above background	Upgrade to Level C PPE
		Breathing zone reading of 100 ppm above background (sustained for 1 minute)	Stop work and contact HSO
	Observation	Unusual Odors are detected	Stop work and contact HSO
		Symptoms of exposure (See chemical specific information, Attachment A)	Stop work and Contact HSO
		Visual Dust	Keep soil damp

6.3.1 Protective Measures for Work Activities at Building 732

Modified Level D:

- Soils saturated with contamination or free product is encountered
- A downgrade to Level D may be called at the discretion of the SSO

Level C:

Work shall be stopped and personnel shall upgrade to Level C utilizing organic vapor/HEPA cartridges PPE before continuing work:

- If there are sustained (for more than 3 minutes) OVA readings averaging 10 ppm above background in the breathing zone.
- If visible dust is generated in workers breathing zone and engineering controls are not feasible (such as keeping soil moist).

Stop Work:

Work shall be stopped and the area evacuated when:

- There are sustained (more than 3 minutes) OVA readings averaging 100 ppm above background in the breathing zone.

- 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 incoordination, and vomiting).

Upon suspension of work, the SSO shall direct the field personnel to move to a safe place. The WC PM and HSO will be contacted and health and safety procedures will be reassessed before work may resume. An addendum to this health and safety plan may be required.

6.4 DECONTAMINATION

Decontamination equipment shall be present on site. A temporary decontamination line will be set up at each site and decontamination conducted should personnel have contact with grossly contaminated material. 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 should 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 engineering practices such as wetting down the work area shall be instituted.

- No facial hair which interferes with a satisfactory fit of the mask-to-face seal is allowed on personnel required to wear respirators or self-contained breathing apparatus (SCBAs).

- 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 one will approach or enter areas or spaces where toxic of explosive concentrations 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 requiring the use of disposable coveralls and/or work around drill rigs or other heavy equipment. 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 Confined Space Entry Procedures

No confined space entry will be permitted during these field activities.

6.5.4 Spill Containment Program

Due to the nature of the work at this site, a spill containment program will not be required.

6.5.5 Excavation Safety

No excavations will be permitted under this SSHP.

6.5.6 Material Handling Procedures

All soils 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.

6.5.7 Fall Protection

Work at elevated locations is not anticipated for this project, with the possible exception of repair work on a piece of drilling equipment. Any personnel conducting work at an elevated location will use fall protection as provided in 29 CFR 1926.104, with a lifeline or lanyard to prevent the worker from falling more than six feet.

6.5.8 Illumination

No night work will be allowed during this investigation.

6.5.9 Sanitation

Shower facilities will not be required during this investigation. Potable water and toilet facilities which comply with 29 CFR 1910.120(n) must be available to on-site personnel.

6.5.10 Communications

6.5.10.1 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.

6.5.10.2 Off-Site Communications

The SSO will have access to a telephone at all times. A cellular phone or immediate phone access 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
Hospital:	(510) 847-3000
Emergency Room:	(510) 447-7000

7.1.2 Hospital Route

Valley Care Medical Center will handle emergency cases for this project.

Valley Care Medical Center
5555 W. Las Positas Blvd.
Pleasanton, CA

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 WC Contacts

Mike Sartor
Project Manager
(510) 874-3173

Tanya Pawley
Health and Safety Officer
(510) 874-3146

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. This information, which is included in Attachment A and Section 4.0, should be sent with the victim to the hospital.

- 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 D.

Cuts — Apply pressure with sterile gauze dressing, and elevate the area until bleeding stops. Apply a bandage and seek medical attention.

Eyes (foreign objects)	Keep the victim from rubbing the eye. Flush the eye with 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 D.
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 D. It is currently anticipated that field work for this project will be completed during the late fall and winter months.

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.

1. 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.

2. 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.

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

4. Notify the PM of any work stoppage due to lightening 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.

ATTACHMENT A

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
Fuel Oil 6	5 mg/m³	5 mg/m³	Petroleum Odor					3.9/20.1	>140
Gasoline		300		0.3				6.0/1.3	-50

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).

ATTACHMENT B

HAZARD ANALYSIS

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Site layout of survey points and sampling locations, walk-through, site inspection	- Slips, trips and falls	- Be aware of steep slopes, potholes, uneven ground where footing may be insecure.
		- Wear ANSI-Z-41 footwear in good condition
	- Biological hazards	- Be cautious of wildlife and avoid when possible
EQUIPMENT TO BE USED		TRAINING REQUIREMENTS
		- OSHA Initial 40-hour

HAZARD ANALYSIS

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Hand augering and sample collection	- Striking overhead power lines.	- Assure clearance from powerlines is adequate based on Section E-15 of EM-385-1-1.
	- Underground utilities.	- Have all underground utilities located and documented to their location prior to the start-up of drilling.
	- Slips, trips, and falls.	- Wear proper footwear and anticipate footing hazards.
	- Being struck by falling objects.	- Wear hardhats, per Section 7 A-C, EM-385-1-1.
	- Hazards presented by moving, impacting machinery.	- Assure all machine guards are in place and working properly.
	- Noise exposure.	- Wear hearing protection whenever the noise levels are such that conversation is impaired without raising the voice level.
	- Exposure to hazardous chemicals	- Perform air monitoring as described in SSHP. Upgrade PPE in accordance with action levels listed in SSHP.
	- Back injuries	- Provide training for lifting and moving heavy equipment and provide adequate back support.
EQUIPMENT TO BE USED		TRAINING REQUIREMENTS
		- OSHA Initial 40-hour and current refresher course - Fully trained equipment operators on respective machinery - Site personnel trained on standard field procedures and signals

HAZARD ANALYSIS

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Sampling of groundwater monitoring wells	- Injury by tool handling	- Use proper PPE as described in Section 6.2.1.
	- Back injury	- Train sampler on proper lifting techniques. - Provide back support.
	- Chemical exposure	- Conduct Air monitoring as specified in Section 6.3 and institute action levels.
EQUIPMENT TO BE USED		TRAINING REQUIREMENTS
		- OSHA Initial 40-hour and current refresher course - Fully trained equipment operators on respective machinery - Site personnel trained on standard field procedures and signals

HAZARD ANALYSIS

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Personnel and equipment decontamination	- Burns, lacerations caused by high pressure hot water steam. - Migration of contamination - Exposure to potentially contaminated soil/ water	- Keep high pressure hose in front of operator, not allowing body parts to come in contact with the steam. - Delineate three specific work zones where clear decontamination is contained prior to exiting the site. - Wear PPE as specified in Section 8.3 until proper decontamination procedures are completed
EQUIPMENT TO BE USED		TRAINING REQUIREMENTS
- High pressure water		- OSHA Initial 40-hour and current refresher course - Fully trained equipment operators on respective machinery - Site personnel trained on standard field procedures and signals

HAZARD ANALYSIS

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Drilling and sampling of soil borings	- Striking overhead powerlines.	- Assure clearance from powerlines is adequate based on Section #-15 of EM-385-1-1.
	- Underground utilities.	- Have all underground utilities located and documented to their location prior to the start-up of drilling.
	- Slips, trips, and falls.	- Wear proper footwear and anticipate footing hazards.
	- Being struck by falling objects.	- Wear hardhats, per Section 7 A-C, EM-385-1-1
	- Hazards presented by moving, impacting machinery.	- Assure all machine guards are in place and working properly.
	- Noise exposure.	- Wear hearing protection whenever the noise levels are such that conversation is impaired without raising the voice level.
	- Exposure to hazardous chemicals	- Perform air monitoring as described in Section 6.2.1. Upgrade PPE in accordance with action levels listed in Section 6.3.
	- Back injuries	- Providing training for lifting and moving heavy equipment and provide adequate back support.

EQUIPMENT TO BE USED	TRAINING REQUIREMENTS
- Drill rig - Soil sampling equipment	- OSHA Initial 40-hour and current refresher course - Fully trained equipment operators on respective machinery - Site personnel trained on standard field procedures and signals

ATTACHMENT C

203.0 SAFETY GUIDELINES FOR DRILLING INTO SOIL AND ROCKS

203.1 PURPOSE

The purpose of this Operating Procedure (OP) is to provide an overview for working safely around drilling operations with truck-mounted and other engine-powered drill rigs. The procedure addresses off-road movement of drill rigs, overhead and buried utilities, use of augers, rotary and core drilling, and other drilling operations and activities.

203.2 APPLICATION

The guidelines shall be applied in Woodward-Clyde (W-C) projects in which truck-mounted, or other engine-powered, drill rigs are used. The guidelines are applicable to W-C employees and W-C owned rigs. For drill rigs operated by contractors, the primary responsibility for drilling safety is with the drilling contractor.

203.3 RESPONSIBILITY AND AUTHORITY

Drill rig safety and maintenance is the responsibility of the drill rig operator. W-C employees are responsible for their own safety including recognizing and avoiding drill rig hazards. W-C employees that observe a drill rig condition believed to be unsafe, shall advise the drill rig operator of the unsafe condition.

203.4 SAFETY GUIDELINES

203.4.1 Movement of Drill Rigs

Before moving a rig, the operator must do the following:

1. To the extent practical, walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles.

2. Check the brakes of the truck/carrier, especially if the terrain along the route of travel is rough or sloped.

3. Discharge all passengers before moving on rough or steep terrain.

4. Engage the front axle (on 4x4, 6x6, etc. vehicles) before traversing rough or steep terrain.

Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel becomes necessary, the operator must conservatively evaluate the ability of the rig to remain upright while on the hill or embankment. The possibility must be considered that the presence of drilling tools on the rig may reduce the ability of the rig to remain upright (raises the center of mass of the rig).

Logs, ditches, road curbs, and other long and horizontal obstacles should be normally approached and driven over squarely, not at an angle.

When close lateral or overhead clearance is encountered, the driver of the rig should be guided by another person on the ground.

Loads on the drill rig and truck must be properly stored while the truck is moving, and the mast must be in the fully lowered position.

After the rig has been positioned to begin drilling, all brakes and/or locks must be set before drilling begins. If the rig is positioned on a steep grade and leveling of the ground is impossible or impractical, the wheel of the transport vehicle should be blocked and other means of preventing the rig from moving or topping over employed.

203.5 BURIED AND OVERHEAD UTILITIES

The location of overhead and buried utility lines must be determined before drilling begins, and the locations should be noted on boring plans or assignment sheets.

When overhead power lines are close by, the drill rig mast should not be raised unless the distance between the rig and the nearest power line is at least 20 feet or other distance as required by local ordinances, whichever is greater. The drill rig operator or assistant should walk completely around the rig to make sure that proper distance exists.

When the drill rig is positioned near an overhead line, the rig operator should be aware that hoist lines and power lines can be moved towards each other by wind. When necessary and approved by the Project Manager (PM) and the utility and/or powerlines may be shielded, shut down, or moved by the appropriate personnel.

203.6 CLEARING THE WORK AREA

Before a drill rig is positioned to drill, the area on which the rig is to be positioned should be cleared of removable obstacles and the rig should be leveled if sloped. The cleared/leveled area should be large enough to accommodate the rig and supplies.

203.7 SAFE USE OF AUGERS

Never place hands or fingers under the bottom of an auger flight or drill rods when hoisting the augers or rods over the top of another auger or rod in the ground or other hard surfaces, such as the drill rig platform.

Never allow feet to get under the auger or drill rod while they are being hoisted.

When the drill is rotating, stay clear of the drill string and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.

Move auger cuttings away from the auger with a long-handled shovel or spade; never use hands or feet.

Never clean an auger attached to the drill rig unless the transmission is in neutral or the engine is off, and the auger has stopped rotating.

203.8 SAFE USE OF HAND TOOLS

OSHA regulations regarding hand tools should be observed in addition to the guidelines provided below:

1. Each tool should be used only to perform tasks for which it was originally designed.

2. Damaged tools should be repaired before use or discarded.

3. Safety goggles or glasses should be worn when using a hammer or chisel. Nearby co-workers and by-standers should be required to wear safety goggles or glasses also, or move away.

4. Tools should be kept cleaned and stored in an orderly manner when not in use.

203.9 SAFE USE OF WIRE LINE HOISTS, WIRE ROPE, AND HOISTING HARDWARE

Safety rules described in Title 29 Code of Federal Regulations (CFR) 1926.552 and guidelines contained in the Wire RPE User's Manual published by the American Iron and Steel Institute shall be used whenever wire line hoists, wire rope, or hoisting hardware are used.

203.10 PROTECTIVE GEAR

203.10.1 Minimum Protective Gear

Items listed below should be worn by all members of the drilling team while engaged in drilling activities.

- Hard Hat;
- Safety Shoes (shoes or boots with steel toes and shanks); and
- Gloves.

203.10.2 Other Gear

Items listed below should be worn when conditions warrant their use. Some of the conditions are listed after each item.

1. Safety Goggles or Glasses: Use when working within 25 feet of a drill rig or when using hand tools or chemicals that may create eye hazards.

2. Safety Belts and Lifelines: Safety belts and lifelines should be worn by all persons working on top of an elevated derrick beam. The lifeline should be secured at a position that will allow a person to fall no more than eight feet.

3. Life Vests: Use for work over water.

203.11 TRAFFIC SAFETY

Drilling in streets, parking lots or other areas of vehicular traffic requires definition of the work zones with cones, warning tape, etc. and compliance with local police requirements.

203.12 FIRE SAFETY

1. Fire extinguishers shall be kept on or near drill rigs for fighting small fires.

2. If methane is suspected in the area, a combustible gas instrument (CGI) shall be used to monitor the air near the borehole with all work to stop at 20 percent of the Lower Explosive Limit.

3. Work shall stop during lighting storms.

ATTACHMENT D

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 regiment 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 $\pm$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.

TABLE 201-1
Classification, Medical Aspects, and Prevention of Heat Illness

Category and Clinical Features	Predisposing Factors	Underlying Physiological Disturbances	Treatment	Prevention
Temperature Regulation Heatstroke				
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	(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	Failure of the central drive for sweating (cause unknown) leading to loss of evaporative cooling and an uncontrolled accelerating rise in t_{cr}; there may be partial rather then complete failure of sweating	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	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
Circulatory Hypostasis Heat Syncope				
Fainting while standing erect and immobile in heat	Lack of acclimatization	Pooling of blood in dilated vessels of skin and lower parts of body	Remove to cooler area; rest in recumbent position; recovery prompt and complete	Acclimatization; intermittent activity to assist venous return to heat
Water and or Salt Depletion				
(a) Heat Exhaustion	(1) Sustained exertion in heat; (2) lack of acclimatization; and (3) failure to replace water lost in sweat	(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	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	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
(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				
(b) Heat Cramps	(1) Heavy sweating during hot work; (2) drinking large volumes of water without replacing salt loss	Loss of body salt in sweat, water intake dilutes electrolytes; water enters muscles, causing spasm	Salted liquids by mouth or more prompt relief by IV infusion	Adequate salt intake with meals; for unacclimatized workers, supplement salt intake at meals.
Painful spasms of muscles used during work (arms, legs, or abdominal); onset during or after work hours				

TABLE 201-1 (continued)
Classification, Medical Aspects, and Prevention of Heat Illness

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

ATTACHMENT E

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

FORM HS-102

W-C HEALTH AND SAFETY INCIDENT REPORT

Project Name: _____

Project Number: _____

Date of Incident: _____

Time of Incident: _____

Location: _____

_____

TYPE OF INCIDENT (Check all applicable items)

☐ Illness ☐ Fire, explosion, flash

☐ Injury ☐ Unexpected exposure

☐ Property Damage ☐ Vehicular Accident

☐ 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:

- WCGI Corporate Health and Safety Manager
- Corporate Health and Safety Officer
- Project Manager
- Personnel Office (medical treatment cases only)

ATTACHMENT G

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: _____

1.0 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

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

FIGURE

Project No. 7112	Parks Reserve Forces Training Area
Woodward-Clyde	

Route to Hospital

7112-9000/052594