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SITE ASSESSMENT REPORT
ENGINEER'S HILL
SANTA RITA CORRECTIONAL FACILITY
DUBLIN, CALIFORNIA

ESE PROJECT #6-93-5073

PRESENTED TO:

ALAMEDA COUNTY GENERAL SERVICES AGENCY
4400 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA 94619

PREPARED BY:

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
4090 NELSON AVENUE, SUITE J
CONCORD, CALIFORNIA 94520
(510) 685-4053

FEBRUARY 1, 1994


This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of the Alameda County General Services Agency as it pertains to their site referred to as Engineer's Hill located at the Santa Rita Correctional Facility in Dublin, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, express or implied, is made as to professional advice in this report.

REPORT PREPARED BY:

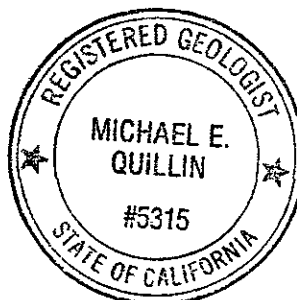

Bart S. Miller
Project Geologist

FEBRUARY 14, 1994
DATE

UNDER THE PROFESSIONAL SUPERVISION OF:


Michael E. Quillin
Senior Geologist
California Registered Geologist No. 5315

FEB. 14, 1994
DATE



PROJECT NO. 6-93-5073

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**SITE ASSESSMENT REPORT
ENGINEER'S HILL, SANTA RITA CORRECTIONAL FACILITY
DUBLIN, CALIFORNIA**

1.0 INTRODUCTION

This report presents the results of a site assessment conducted by Environmental Science & Engineering, Inc. (ESE) for the Alameda County General Services Agency (GSA) at the Engineer's Hill site on November 4 and 5, 1993. The objectives of the site assessment were to determine the vertical and lateral extent of petroleum hydrocarbons in soil beneath the site, to measure the depth to ground water and determine if petroleum hydrocarbons have migrated through the unsaturated zone to ground water beneath the site, and to identify potential product migration routes in the sedimentary stratigraphy of the unsaturated zone.

All activities described in this report were conducted in response to written authorization from the GSA. Site assessment procedures were conducted in accordance with Alameda County Health Care Services Agency (HCSA) guidelines, and follow California Regional Water Quality Control Board Tri-Regional Board recommendations (RWQCB, 1990).

1.1 SITE HISTORY

The Engineer's Hill site is located within the Santa Rita Correctional Facility property boundary approximately two miles northwest of the California Interstate 580 intersection with Tassajara Road at Dublin, California (Figure 1 - Location Map). The site is owned and managed by the GSA. At the site, the GSA formerly operated one 1,000-gallon-capacity underground storage tank (UST) containing diesel fuel (Figure 2 - Site Plan). The UST was constructed of single-walled carbon-steel and fueled a boiler formerly located adjacent to the UST location. The installation date of the UST is unknown.

Under permit from the HCSA and the Dougherty Regional Fire Authority (DRFA), ESE removed and disposed of the UST on May 18, 1992. Personnel from the HCSA and the DRFA witnessed UST removal activities and subsequent soil sampling. No fluids were found in the UST prior to removal.



Environmental
Science &
Engineering, Inc.

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TO: Alameda County
Health Care Services Agency
Department of Environmental Health
80 Swan Way, Rm. 350
Oakland, CA 94621

DATE: February 14, 1994

ATTN: Mr. Scott Seery

JOB NUMBER: 6-93-5073

SUBJECT: Engineer's Hill, Santa Rita Correctional Facility, Dublin, California

WE ARE TRANSMITTING THE FOLLOWING:

One copy of a Site Assessment Report for work performed at the subject location. The Alameda County General Services Agency has indicated an interest in proceeding with the recommended work upon receipt of your written approval.

Sincerely,

DIST:
LB
FILE
ORIGINATOR

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

BY 
Bart S. Miller
Project Geologist

ESE personnel collected one soil sample from the base of the UST excavation and submitted it to a California-certified laboratory where it was analyzed for total petroleum hydrocarbons as diesel (TPH-D); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and oil and grease (O&G). The sample was reported to contain TPH-D at a concentration of 190 milligrams per kilogram (mg/Kg). No detectable concentrations of BTEX or O&G were reported in the sample. ESE submitted a closure report for the UST site to the GSA and the HCSA on June 25, 1992 (ESE, 1992).

ESE supervised the overexcavation of impacted soil at the former UST site on November 8, 1992. At a depth of nine feet below grade, ESE personnel observed grey discoloration in a pebbly sand sediment and noted a petroleum hydrocarbon odor. The impacted soil was observed to extend to a depth of approximately 22 feet below grade, the limit of the excavation equipment's reach. One sample, collected by ESE from the impacted soil at a depth of 22 feet below grade, was submitted to a California-certified laboratory for analysis. The sample was reported to contain TPH-D at a concentration of 1,400 mg/Kg and detectable concentrations of BTEX constituents.

To determine the areal extent of impacted soil, three test pits were excavated to maximum depths of 22 feet below grade at locations approximately 10 to 25 feet east, west, and south of the former UST location. No soil discoloration or petroleum hydrocarbon odors were noted at these locations. Ground water was not found in these excavations, and it was not known whether ground water beneath the site had been impacted. Results of the excavation activities were documented in a report submitted to the GSA and the HCSA on January 7, 1993 (ESE, 1993a). Based on these findings, ESE recommended a site assessment be performed to determine the vertical and lateral extent of petroleum hydrocarbons in the unsaturated zone beneath the site and to determine whether ground water at the site had been impacted.

On June 29, 1993, ESE submitted a workplan for a site assessment to the HCSA on behalf of the GSA (ESE, 1993b). The proposed site assessment was comprised of drilling and sampling soil in four borings and collecting one ground water sample in one boring using a Hydropunch® sampler.

1.2 REGIONAL GEOLOGY

The site is located within the Coast Ranges geomorphic province (Norris and Webb, 1976) at the northern boundary of the Livermore Valley depression, located midway between the southern part of San Francisco Bay and the San Joaquin Valley. The Livermore Valley is approximately 13 miles long in an east-west direction and approximately 4 miles wide and is completely surrounded by hills of the Diablo Range.

The site is situated in the foothills demarcating the northern boundary of the Livermore Valley and the southern boundary of the Tassajara Upland. Unconsolidated fine-grained alluvial fan deposits of Quaternary age occur along the northern side of the Livermore Valley and consist of stratified beds of clay, silt, and sand formed by the deposition from streams draining upland areas composed of sandstone and shale of the Tassajara Formation (State of California Department of Water Resources, 1974).

These draping alluvial fan deposits comprise a portion of the Livermore Valley alluvial sediments, also referred to as valley fill materials, which are reported to be greater than 500 feet in thickness (State of California Department of Water Resources, 1974). The Livermore Valley fill materials are comprised mostly of younger alluvium overlying the fan deposits. The younger alluvium consists of unconsolidated deposits of interbedded clay, silt, fine sand, and lenses of clayey gravel.

The Livermore Valley is bisected by six major faults or fault groups and at least five other faults of a more local nature (State of California Department of Water Resources, 1974). The major faults are the Carnegie, Tesla, Mocho, Livermore, Pleasanton, and Calaveras

Faults. The minor faults include the Parks, Verona, and several unnamed faults. The site is located on a downdropped block of land bounded by the Mocho Fault to the north, the Parks Fault to the south, and the Pleasanton Fault to the east.

1.3 REGIONAL HYDROLOGY

The water-bearing sediments in the Livermore Valley can be described as multi-layered systems having an unconfined upper aquifer over a sequence of leaky or semiconfined aquifers (State of California Department of Water Resources, 1974). Ground water in the valley moves downslope to the longitudinal axis of the valley and then in a generally westerly direction. The central and western portions of the Livermore Valley contain the greatest amount of valley fill materials and produce the largest quantities of water.

The site is located at the northern boundary of the Camp Sub-basin which covers an area of approximately 2,850 acres (State of California Department of Water Resources, 1974). The sub-basin is drained by the Tassajara Creek and the Cottonwood Creek having source areas in the hills near the site and flow across the sub-basin along a southerly course. Unconfined to semiconfined ground water occurs in varying amounts throughout the sub-basin and have a potentiometric surface between 10 to 25 feet below grade. The potentiometric surface has been reported by the State of California Department of Water Resources (1974) to have a southerly gradient at approximately 70 feet per mile.

in the valley floor

Ground water in the Camp Sub-basin occurs in beds of alluvium consisting of sandy clay and sandy gravel which overlie the Tassajara Formation (State of California Department of Water Resources, 1974). These water-bearing zones dip gently to the south at an angle of approximately three degrees. Ground water in this sub-basin has been analyzed by the State of California Department of Water Resources (1974) and is classified as a sodium carbonate water of irrigation Class II quality.

1.4 PRECIPITATION AND WATER USAGE

Alameda County exhibits a Mediterranean type of climate characterized by winter rains and summer dryness (Hickenbottom and Muir, 1988). Winter rains are caused by frontal storms generated in the northern Pacific Ocean and the majority of this rainfall occurs during the months of November through March. The Alameda County Flood Control and Water Conservation District (ACFCWCD) collects rainfall data from at least 67 stations within Alameda County (State of California Department of Water Resources, 1974). Two ACFCWCD stations, E50-2525 and E50-6991-06, are located at a distance of approximately three miles to the west and two miles to the southeast of the site, respectively. Based on precipitation data collected over a 100-year study period (1870 to 1970) and over a 9-year study period (1961-1970) the mean annual precipitation is reported to range between 14.27 to 14.58 inches.

All of the agriculture in the Livermore Valley is irrigated with ground water (State of California Department of Water Resources, 1974). As well, ground water is pumped for municipal and industrial uses. It is estimated that 80 percent of the average total volume of ground water utilized in the Livermore Valley is pumped from the valley fill alluvial sediments and the remaining 20 percent is pumped from the deeper Tassajara and Livermore Formations.

The State of California Department of Water Resources (1974) has reported that there are no data available concerning ground water production in the Camp sub-basin where the site is located.

2.0 FIELD METHODOLOGY

2.1 SOIL SAMPLING AND ANALYSIS

ESE supervised the drilling and sampling of five soil borings (EH1, EH2, EH3, EH4, and EH5; Figure 2) during this site assessment. All drilling activities were performed by Exploration Geoservices, Inc. (EGI) of San Jose, California using a mobile B-61 hollow-stem auger drill rig. Soil samples were collected from the first boring (EH1) at five-foot intervals, at distinct lithologic contacts, and at zones of obvious petroleum hydrocarbon impact. This soil boring and sampling was conducted in accordance with ESE Standard Operating Procedure No. 1 for soil borings and soil sampling with hollow-stem augers in unconsolidated formations (Appendix A - ESE Standard Operating Procedure No. 1). Soil samples were collected at ten-foot intervals from the subsequent borings (EH2, EH3, EH4, and EH5) after establishing control on the local geology and identifying geological units with petroleum hydrocarbon impact.

Boring EH1 was drilled to a total depth of 56 feet below grade and soil samples were collected at five-foot intervals. Boring EH2 was drilled to a total depth of 80 feet below grade and soil samples were collected at ten-foot intervals. Borings EH3, EH4, and EH5 were drilled to a depth of 61 feet below grade and were also sampled at ten-foot intervals. No ground water was encountered in the soil borings and each was backfilled with cement grout after sampling was completed.

A total of 35 soil samples were placed in a cooler with ice and transported under chain of custody documentation to McCampbell Analytical (a California-certified laboratory) of Pacheco, California. All samples were analyzed for TPH-D using EPA Method 8015 (modified per CA LUFT). Nine of the soil samples having noticeable petroleum hydrocarbon staining and odor were also analyzed for BTEX using EPA Method 8020.

2.2 WASTE MANAGEMENT

All decontamination rinseates were placed in appropriately labeled 55-gallon capacity Department of Transportation (DOT) - approved drums for temporary storage at the site. Each drum of rinseate was labeled according to source location. As requested by the GSA, all soil drill cuttings were stockpiled at the site on and under plastic sheeting.

3.0 RESULTS

3.1 SOIL

Subsurface investigation at the Engineer's Hill former UST site indicated soil comprised mostly of clay and sandy silts with interbeds of sand, pebbly sand, and gravel to a depth of 80 feet below grade. Geologic logs for borings EH1, EH2, EH3, EH4, and EH5 are presented in Appendix B.

Nine of the 35 soil samples collected at the Engineer's Hill site and submitted for analysis were reported to contain detectable concentrations of TPH-D (Table 1 - Analytical Results of Soil Samples Collected From Borings). Six of the nine soil samples containing detectable concentrations of TPH-D were also reported to contain detectable concentrations of BTEX constituents (Table 2). The largest proportion of soil samples impacted with petroleum hydrocarbons (EH1-5', EH1-10', EH1-15', EH1-20', EH1-25', EH1-30', EH1-35', and EH1-40') were collected from boring EH1 at ground surface to a depth of 40 feet below grade. The highest concentration of TPH-D was reported to be 17,000 mg/Kg in sample EH1-20', collected at a depth of 20 feet below grade.

One soil sample (EH3-50'), collected from boring EH3 at a depth of 50 feet below grade, was also reported to contain detectable concentrations of petroleum hydrocarbons. Analytical reports and chain of custody documents are presented in Appendix C.

5600 ppm
TPH-D

No ground water was found while drilling soil borings at the Engineer's Hill site. Schematic cross-sections utilizing boring log data for the site indicate that the plume of petroleum hydrocarbon impacted soil in the unsaturated zone extends from the UST excavation backfill vertically downward through interbeds of sandy silt, sand, and pebbly sand to a pebbly sand bed located at a depth of approximately 42 feet below grade (Figure 3 - East-West Oriented Schematic Cross-Section; Figure 4 - North-South Oriented Schematic Cross-Section). This impacted pebbly sand bed has an apparent dip toward the west and is underlain by more than ten feet of nonimpacted silty clay and sandy silt sediments.

The petroleum hydrocarbons appear to have migrated both laterally and vertically along the apparently dipping pebbly sand bed toward the west and were detected in a soil sample collected from boring EH3 at a depth of 50 feet (Figure 3). No petroleum hydrocarbon impact has been observed in samples of the pebbly sand collected from borings EH2, EH4, and EH5 located to the southwest, southeast, and north, respectively (Figures 3 and 4). The extent of petroleum hydrocarbon impact toward the west remains undefined (Figure 5 - Diesel Plume in Unsaturated Zone).

The deepest boring (EH2) was drilled to a depth of 80 feet and indicates that a "tight" clay layer having a minimum thickness of 15 feet underlies the impacted sediments (Boring Log EH2 - Appendix B). No evidence of water saturation was observed in any of the soil samples collected from this boring.

3.2 GROUND WATER

No ground water was found while drilling soil borings at the Engineer's Hill site and, subsequently, no ground water samples were collected.

4.0 DISCUSSION AND CONCLUSIONS

The UST excavation backfill material and formational sediments located beneath the backfill material to an approximate depth of 40 feet below grade are impacted with diesel fuel. The petroleum hydrocarbon plume appears to have migrated toward the west in an apparently dipping pebbly sand layer. The extent of petroleum hydrocarbon migration toward the west is undefined.

The lack of evidence of ground water saturation to a minimum depth 80 feet below grade at the site and the presence of a nonimpacted, "tight", clay layer of 15 feet minimum thickness beneath the impacted sediments suggests that the petroleum hydrocarbon plume has not migrated to ground water beneath the site.

5.0 RECOMMENDATIONS

Based upon the conclusions derived from this site assessment at Engineer's Hill, ESE recommends the following:

- Drill three additional soil borings to the west of boring EH3. The first boring should be drilled at a location approximately 20 to 30 feet west of boring EH3. The locations of the remaining two borings are to be considered tentative and should be modified based on findings from the first boring. If the pebbly sand lens is intersected in the first boring and is noted to be impacted with petroleum hydrocarbons, the remaining two borings will be drilled at locations further to the west. If the pebbly sand lens is intersected in the first boring and no petroleum hydrocarbon impact is detected, the remaining two borings will be drilled at locations further to the east toward boring EH3. Soil samples should be collected at ten-foot intervals over the complete depth of the borings and continuously through the impacted pebbly sand layer. All borings should be terminated in nonimpacted sediments beneath the bottom of the impacted pebbly sand layer. Soil samples with noticeable petroleum hydrocarbon staining and odor should be analyzed for TPH-D and BTEX.

6.0 REFERENCES

Environmental Science & Engineering Inc. (ESE), 1992. UST Closure Report, Engineer's Hill, Santa Rita Correctional Facility, Dublin, California; dated June 25, 1992.

Environmental Science & Engineering Inc. (ESE), 1993a. Letter Report to the Alameda County General Services Agency Concerning Overexcavation Activities at Engineer's Hill, Santa Rita Correctional Facility, Dublin, California; dated January 7, 1993.

Environmental Science & Engineering Inc. (ESE), 1993b. Workplan for Soil and Ground Water Investigation at Engineer's Hill, Santa Rita Correctional Facility, Dublin, California; dated June 29, 1993.

Hickenbottom, K., and Muir, K., 1988. Geohydrology and Ground Water Quality Overview of the East Bay Plain Area, Alameda County, California; Alameda County Flood Control and Water Conservation District Report 205 (J), 83 pp.

Norris, R.M., and Webb, R.W., 1976. Geology of California; John Wiley & Sons, Inc., New York. 365 pp.

State of California Department of Water Resources (DWR), 1974. Evaluation of Ground Water Resources: Livermore and Sunol Valleys; Bull. 118-2, pp. 153.

State of California Water Quality Control Board (RWQCB), 1990. Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites; dated August 10, 1990.

TABLES

TABLE 1

ANALYTICAL RESULTS OF SOIL SAMPLES COLLECTED FROM BORINGS

Borehole No.	Depth (feet)	TPH-D (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)
EH1	5	50	-	-	-	-
	10	220	-	-	-	-
	15		ND	ND	0.60	4.0
	20		ND	ND	ND	0.53
	25		ND	ND	ND	0.24
	30	66	ND	ND	ND	0.017
	35	27	ND	ND	ND	ND
	40		ND	ND	0.016	0.11
	45	ND	ND	ND	ND	ND
	50	ND	-	-	-	-
	55	ND	-	-	-	-
EH2	10	ND	-	-	-	-
	20	ND	-	-	-	-
	30	ND	-	-	-	-
	40	ND	-	-	-	-
	50	ND	-	-	-	-
	60	ND	-	-	-	-
EH3	10	ND	-	-	-	-
	20	ND	-	-	-	-
	30	ND	-	-	-	-
	40	ND	-	-	-	-
	50		ND	0.022	0.043	0.30
	60	ND	ND	ND	ND	ND

TABLE 1 (CONTINUED)

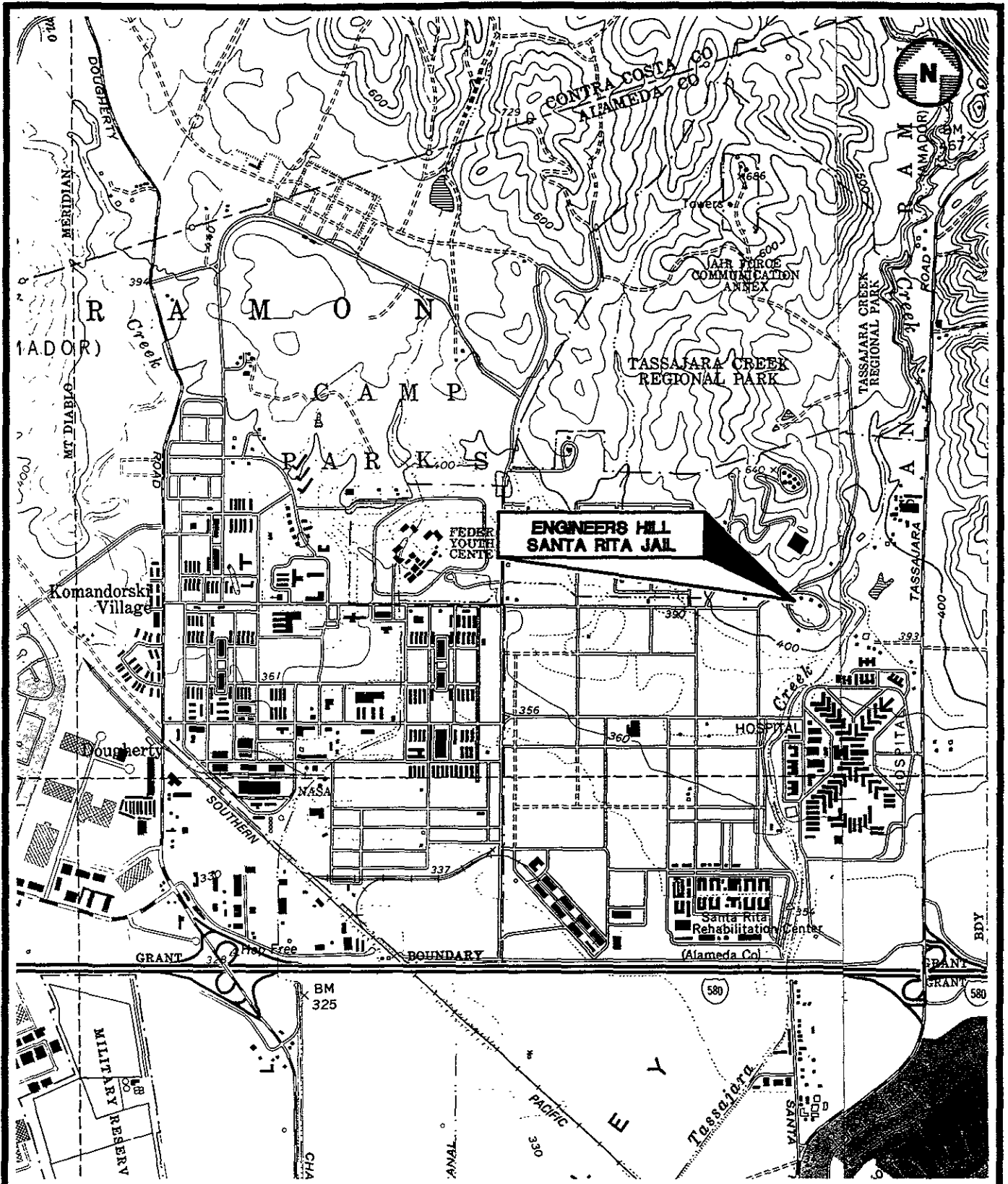
ANALYTICAL RESULTS OF SOIL SAMPLES COLLECTED FROM BORINGS

Borehole No.	Depth (feet)	TPH-D (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)
EH4	10	ND	-	-	-	-
	20	ND	-	-	-	-
	30	ND	-	-	-	-
	40	ND	-	-	-	-
	50	ND	-	-	-	-
	60	ND	-	-	-	-
EH5	10	ND	-	-	-	-
	20	ND	-	-	-	-
	30	ND	-	-	-	-
	40	ND	-	-	-	-
	50	ND	ND NA	0.022 NA	0.043 NA	0.30 NA
	60	ND	ND	ND	ND	ND


? same as
EH 3
samples

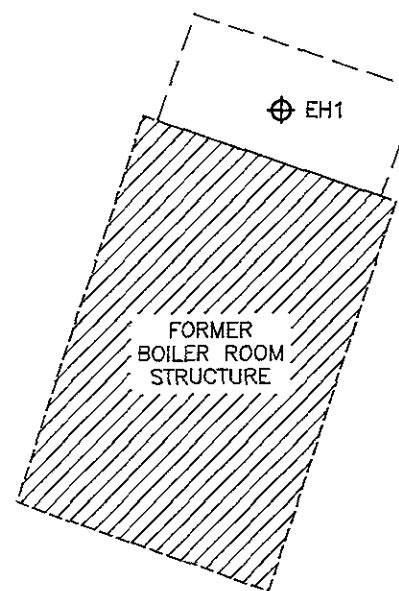
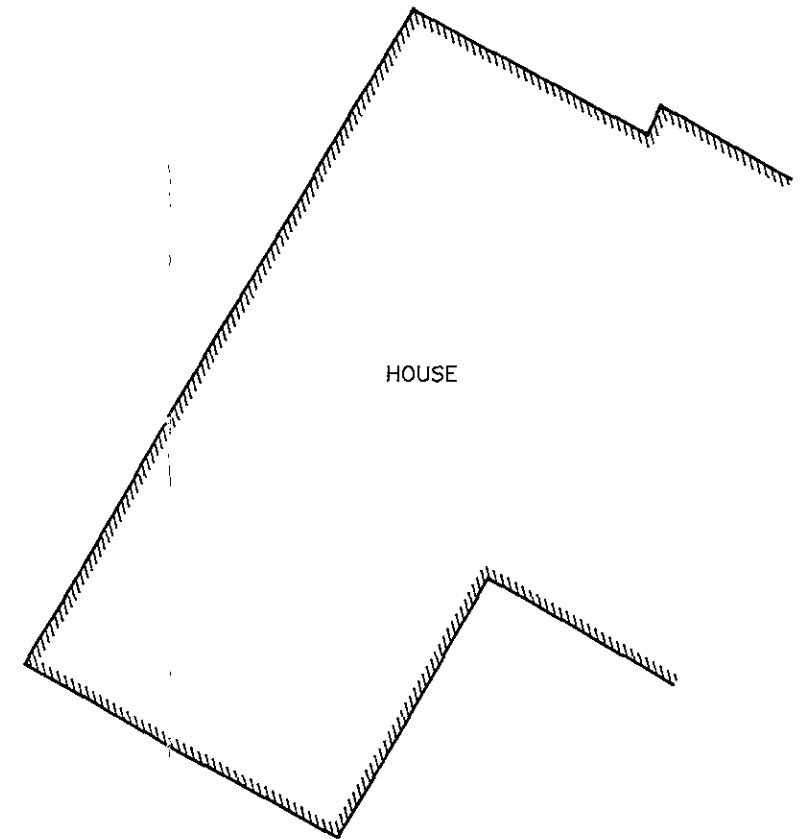
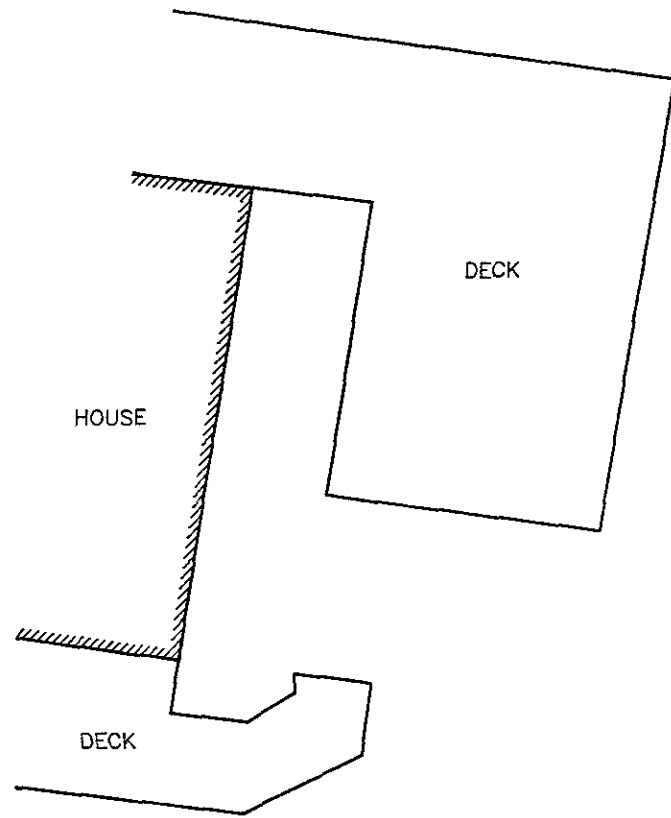
- NOTES:
- TPH-D refers to total petroleum hydrocarbons as diesel as analyzed using EPA Method 8015 (modified per CA LUFT)
 - ND refers to not detected at method lower detection limit
 - mg/Kg refers to concentration in milligrams per kilogram

FIGURES



ADAPTED FROM U.S.G.S. DUBLIN AND LIVERMORE 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAPS, 1980.

 <p>Environmental Science & Engineering, Inc.</p> <p>A CILCORP Company</p>	DATE 1/94	LOCATION MAP	FIGURE NO. 1
	REVISED		ALAMEDA COUNTY GENERAL SERVICES AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520		CAD FILE 50731001	



⊕ EH5

⊕ EH3

⊕ EH1

⊕ EH4


LIMITS OF FORMER 1,000 GALLON DIESEL UST EXCAVATION

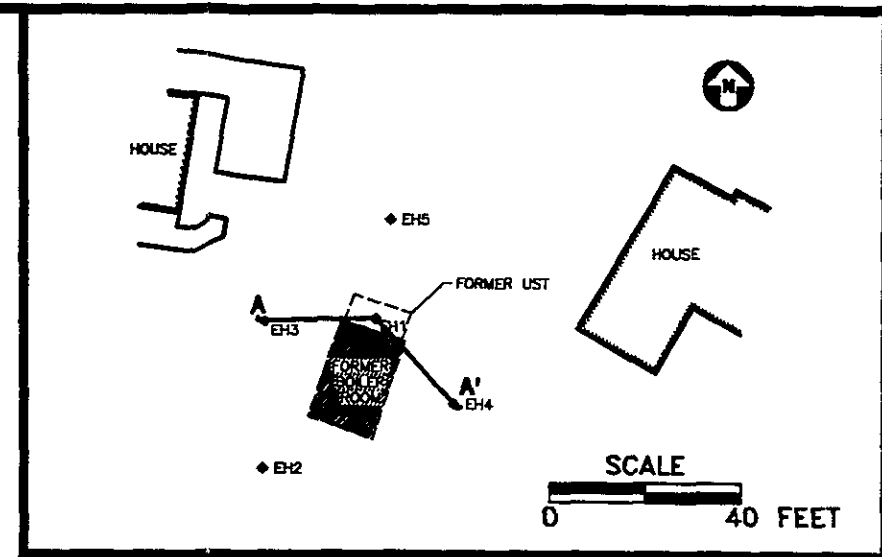
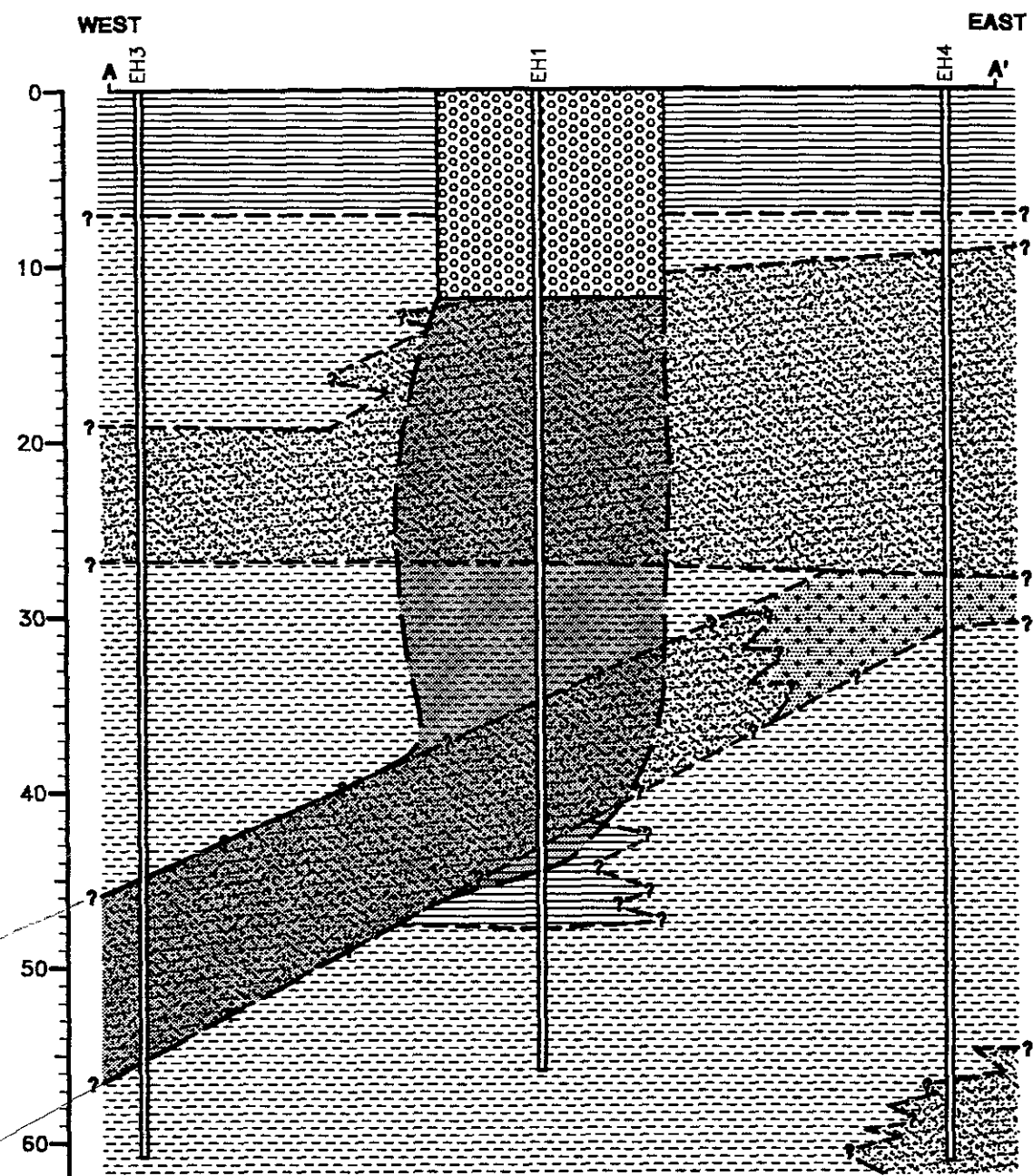
LEGEND

⊕ SOIL BORING LOCATION

⊕ EH2

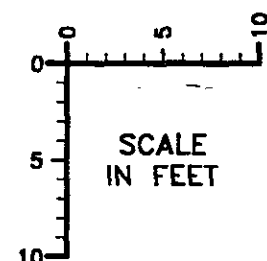


	DATE 1/94	SITE PLAN	FIGURE NO. 2
	REVISED		PROJ. NO. 6-93-5073
	CAD FILE 50731003		ALAMEDA COUNTY GENERAL SERVICES AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520			

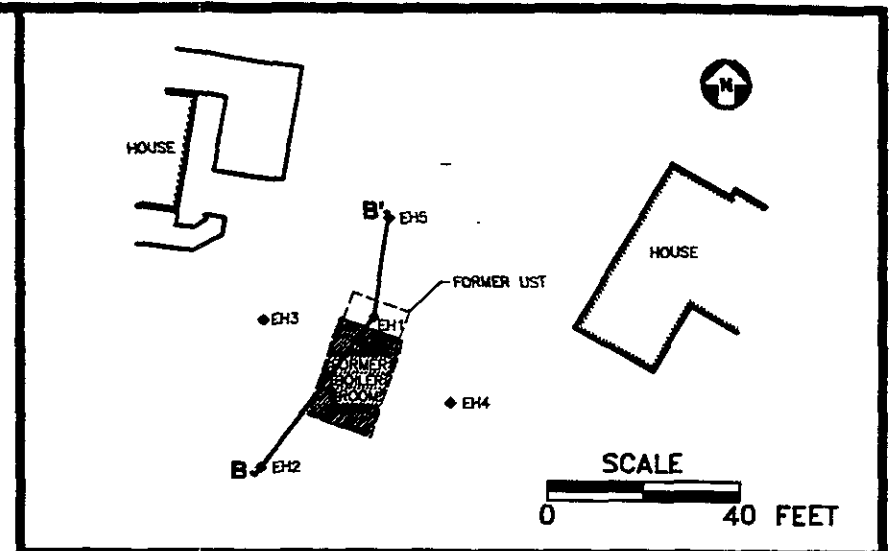
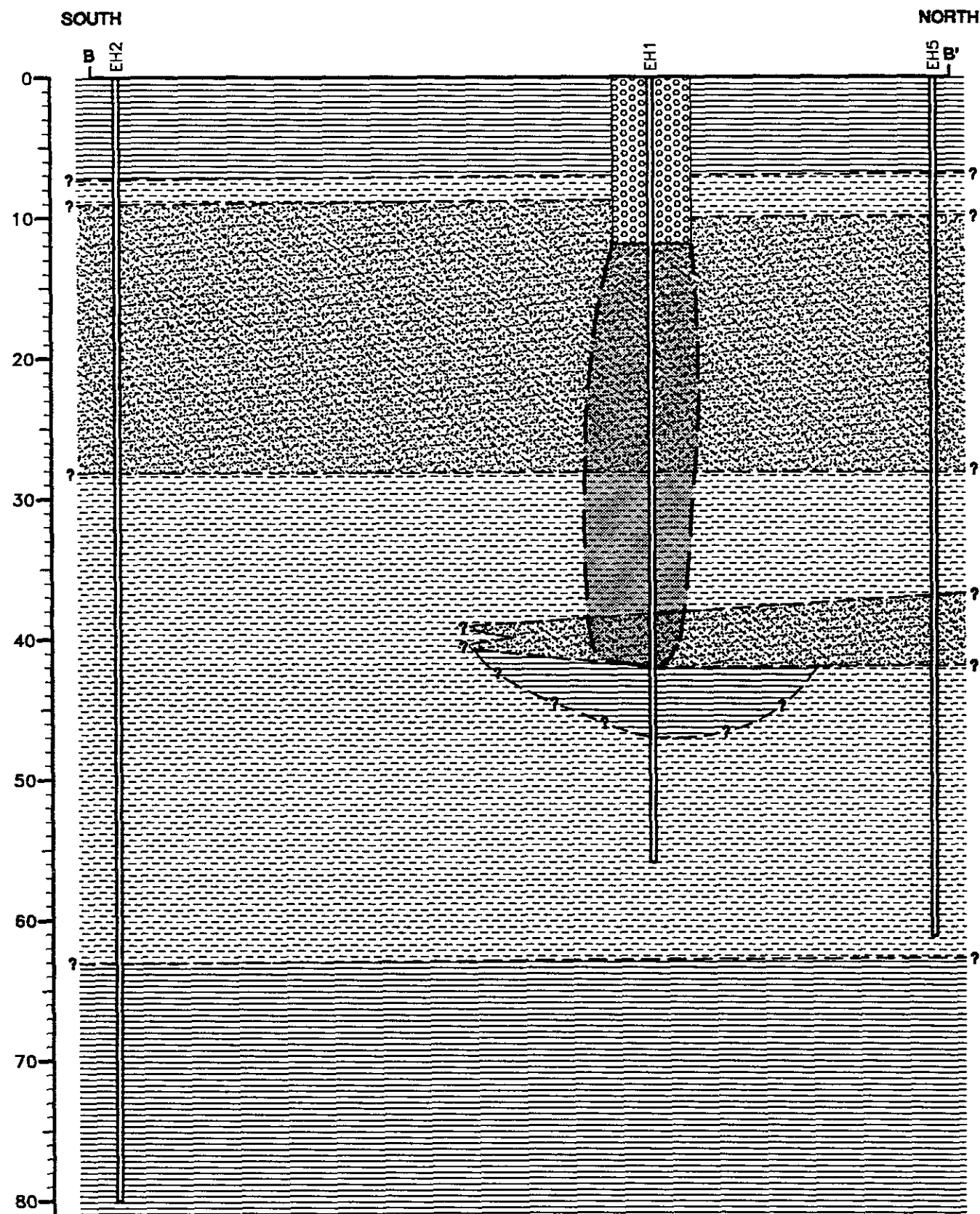


LEGEND

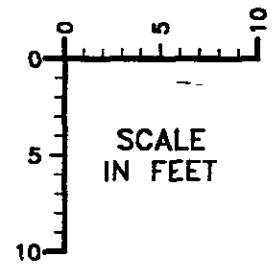
- UST EXCAVATION BACKFILL
- SAND, PEBBLY SAND, SILTY SAND
- SILT, SANDY SILT
- CLAY, SILTY CLAY
- GRAVEL
- ESTIMATED LIMITS OF PLUME OF DIESEL-IMPACTED SOIL IN UNSATURATED ZONE
- SOIL BORING LOCATION



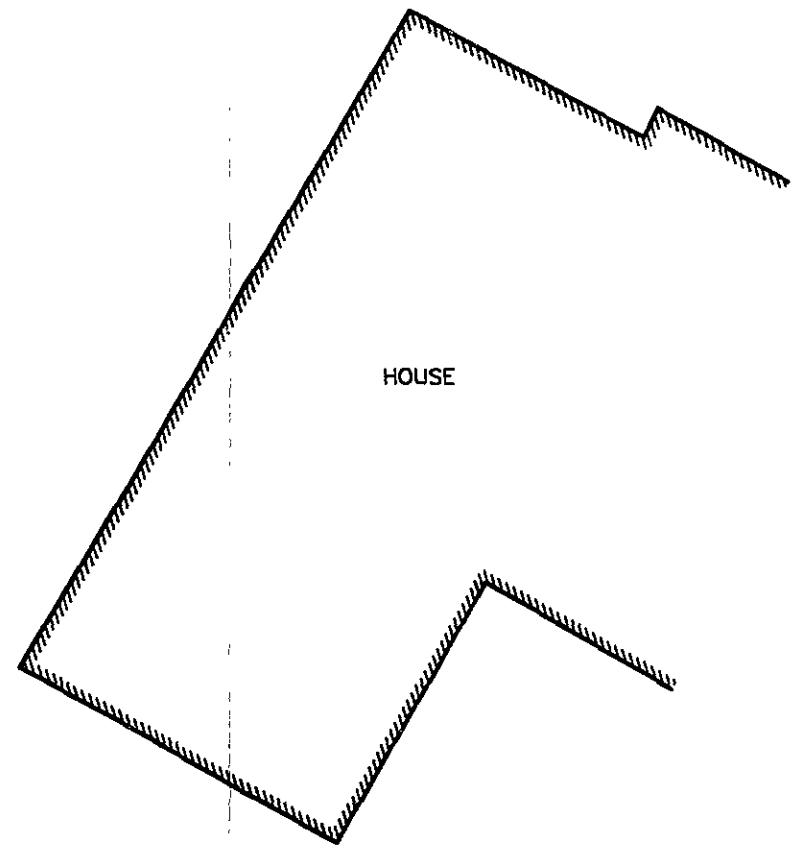
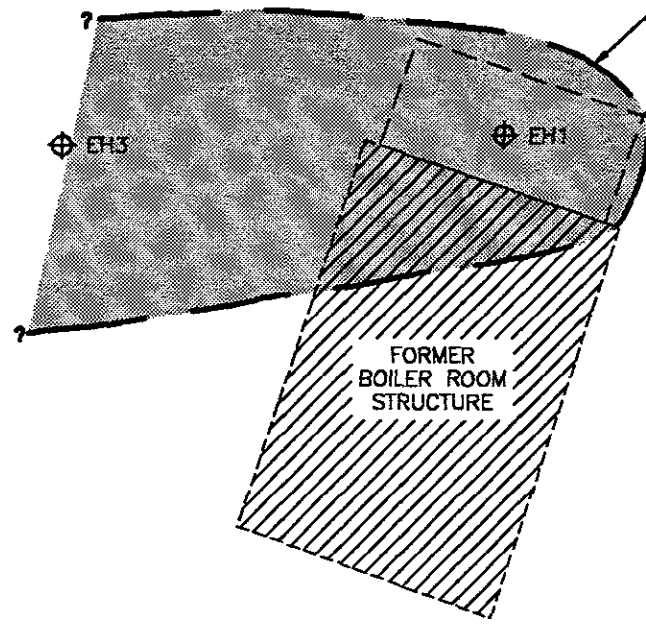
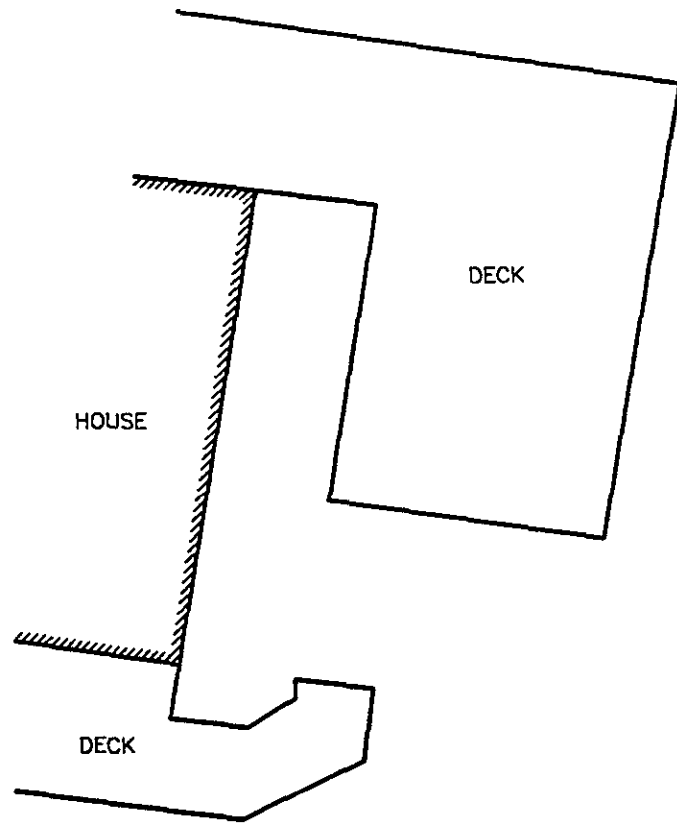
Environmental Science & Engineering, Inc. <small>A CILCORP Company</small>	DATE 2/94	EAST-WEST ORIENTED SCHEMATIC CROSS-SECTION	FIGURE NO. 3
	REVISED		ALAMEDA COUNTY GENERAL SERVICES AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	CAD FILE 50731004		



- LEGEND**
- UST EXCAVATION BACKFILL
 - SAND, PEBBLY SAND, SILTY SAND
 - SILT, SANDY SILT
 - CLAY, SILTY CLAY
 - GRAVEL
 - ESTIMATED LIMITS OF PLUME OF DIESEL-IMPACTED SOIL IN UNSATURATED ZONE
 - SOIL BORING LOCATION



Environmental Science & Engineering, Inc. 4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	DATE 2/94	NORTH-SOUTH ORIENTED SCHEMATIC CROSS-SECTION	FIGURE NO. 4
	REVISED		ALAMEDA COUNTY GENERAL SERVICES AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA
CAD FILE 50731006			




LEGEND

⊕ SOIL BORING LOCATION

⊕ EH2



 Environmental Science & Engineering, Inc. <small>A OILCORP Company</small>	DATE 2/94	DIESEL PLUME IN UNSATURATED ZONE	FIGURE NO. 5
	REVISED		ALAMEDA COUNTY GENERAL SERVICES AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	CAD FILE 50731008		

APPENDIX A
ESE STANDARD OPERATING PROCEDURE NO. 1

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE

STANDARD OPERATING PROCEDURE NO. 1
FOR SOIL BORINGS AND SOIL SAMPLING WITH HOLLOW-STEM AUGERS
IN UNCONSOLIDATED FORMATIONS

Environmental Science & Engineering, Inc. (ESE) typically drills soil borings using a truck-mounted, continuous-flight, hollow-stem auger drill rig. The drill rig is owned and operated by a drilling company possessing a valid State of California C-57 license. The soil borings are conducted under the direct supervision and guidance of an experienced ESE geologist. The ESE geologist logs each borehole during drilling in accordance with the Unified Soil Classification System (USCS). Additionally, the ESE geologist observes and notes the soil color, relative density or stiffness, moisture content, odor (if obvious) and organic content (if present). The ESE geologist will record all observations on geologic boring logs.

Soil samples are collected during drilling at a minimum of five-foot intervals by driving an 18-inch long Modified California Split-spoon sampler (sampler), lined with new, thin-wall brass sleeves, through the center of and ahead of the hollow stem augers, thus collecting a relatively undisturbed soil sample core. The brass sleeves are typically 2-inches in diameter and 6-inches in length. The sampler is driven by dropping a 140-pound hammer 30-inches onto rods attached to the top of the sampler. Soil sample depth intervals and the number of hammer blows required to advance the sampler each six-inch interval are recorded by the ESE geologist on geologic boring logs. The ends of one brass sleeve are covered with Teflon sheeting, then covered with plastic end caps. The end caps are sealed to the brass sleeve using duct tape. Each sample is then labeled and placed on ice in a cooler for transport under chain of custody documentation to the designated analytical laboratory. A portion of the remaining soil in the sampler is placed in either a new Ziploc® bag or a clean Mason Jar® and set in direct sunlight to enhance the volatilization of any Volatile Organic Compounds (VOCs) present in the soil. After approximately 15-minutes that sample is screened for VOCs using a photoionization detector (PID). The PID measurements will be noted on the geologic boring logs. The PID provides qualitative data for use in selecting samples for laboratory analysis. Soil samples from the saturated zone (beneath the ground-water table) are collected as described above, are not screened with the PID, and are not submitted to the analytical laboratory. The samples from the saturated zone are used for descriptive purposes. Soil samples from the saturated zone may be retained as described above for physical analyses (grain size, permeability and porosity testing).

If the soil boring is not going to be completed as a well, then the boring is typically terminated upon penetrating the saturated soil horizon or until a predetermined interval of soil containing no evidence of contamination is penetrated. This predetermined interval is typically based upon site specific regulatory or client guidelines. The boring is then backfilled using either neat cement, neat cement and bentonite powder mixture (not exceeding 5% bentonite), bentonite pellets, or a sand and cement mixture (not exceeding a 2:1 ratio of sand to cement). However, if the boring is to be completed as a monitoring well, then the boring is continued until either a competent, low estimated-permeability, lower confining soil layer is found or 10 to 15-feet of the saturated soil horizon is penetrated, whichever occurs first. If a low estimated-permeability soil layer is found, the soil boring will be advanced approximately five-feet into that layer to evaluate its competence as a lower confining layer, prior to the termination of that boring.

All soil sampling equipment is cleaned between each sample collection event using an Alconox® detergent and tap water solution followed by a tap water rinse. Additionally, all drilling equipment and soil sampling equipment is cleaned between borings, using a high pressure steam cleaner, to prevent cross-contamination. All wash and rinse water is collected and contained onsite in Department of Transportation approved containers (typically 55-gallon drums) pending laboratory analysis and proper disposal/recycling.

APPENDIX B
BORING LOGS



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

EH1

WELL COMPLETION

Completion Depth:
 Size/Type From To
 Casing:
 Screen:
 Filter:
 Seal:
 Well Cap or Box:

Project Name: Alameda County GSA Project No: 6-93-5073
 Location: Engineer's Hill
 Santa Rita Correctional Facility
 Dublin, California

Driller: Exploration Geoservices, Inc.
 Method: Mobile B-61 Hollow Stem Auger
 Hole Diameter: 6 Inches Total Depth: 56 Feet
 Ref. Elevations:
 Logged By: Bart Miller

Page 2 of 2

Dates:
 Start: 11/17/93
 Finish: 11/17/93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks Water, drilling/completion, summary, sample type
			Sample/Blows	Lithology	Well Installation		
35			8 23				
40	SAND, pebbly, blue, medium-grained, petroleum hydrocarbon odor, dry.	SP	19 28 32			62.3	SAMPLE @ 40 FEET 9:35
	SILTY CLAY, brown, no odor, moderate plasticity, dry.						
45		CL	12 18 28			0.3	SAMPLE @ 45 FEET 9:47
50	SILT, sandy, brown, no odor, low plasticity, dry.	ML	26 32 33			0	SAMPLE @ 50 FEET 10:03
55		ML	24 37 40			0	SAMPLE @ 55 FEET 10:25
60							
65							
70							

Boring drilled and sampled to a depth of 56 feet.
 No ground water detected. Petroleum hydrocarbon impacted soil detected over 13 to 42-foot interval.



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

EH2

WELL COMPLETION

Completion Depth:

Size/Type	From	To
-----------	------	----

Casing:
Screen:
Filter:
Seal:

Well Cap or Box:

Project Name: Alameda County GSA Project No: 6-93-5073

Location: Engineer's Hill
Santa Rita Correctional Facility
Dublin, California

Driller: Exploration Geoservices, Inc.
Method: Mobile B-61 Hollow Stem Auger
Hole Diameter: 6 Inches Total Depth: 80 Feet
Ref. Elevations:
Logged By: Bart Miller

Page 1 of 3

Dates:
Start: 11/17/93
Finish: 11/17/93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks
			Sample/Blows	Lithology	Well Installation		
0	FORMATIONAL SEDIMENTS CLAY, dark brown, no odor, moderate plasticity, dry	CL					Start 12:05
5	SANDY SILT, light brown, no odor, low plasticity, dry	ML					
10	SAND, light brown, no odor, dry.	SP	5 8 9			0	SAMPLE @ 10 FEET 12:13
15	SAND, pebbly, brown, medium-grained, no odor, dry.						
20	SAND, as above.	SP	6 8 12			0	SAMPLE @ 20 FEET 12:30
25							
30	SANDY SILT, brown, no odor, low plasticity, dry.	ML	8 13 25			0	SAMPLE @ 30 FEET 12:45
35							



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

EH2

WELL COMPLETION

Completion Depth:
Size/Type From To

Casing:
 Screen:
 Filter:
 Seal:

Well Cap or Box:

Project Name: Alameda County GSA Project No: 6-93-5073
 Location: Engineer's Hill
 Santa Rita Correctional Facility
 Dublin, California

Driller: Exploration Geoservices, Inc.
 Method: Mobile B-61 Hollow Stem Auger
 Hole Diameter: 6 Inches Total Depth: 80 Feet
 Ref. Elevations:
 Logged By: Bart Miller

Page 2 of 3

Dates:
 Start: 11/17/93
 Finish: 11/17/93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks <small>Water, drilling/completion, summary, sample type</small>
			Sample/Blows	Lithology	Well Installation		
35							
40	SANDY SILT, brown, no odor, low plasticity, dry.	ML	8 12 20			0	SAMPLE @ 40 FEET 13:13
45							
50	SANDY SILT, as above.	ML	8 12 16			0	SAMPLE @ 50 FEET 13:36
55							
60	SANDY SILT, as above.	ML	16 18 24			0	SAMPLE @ 60 FEET 13:55
65	CLAY, light brown, no odor, moderate plasticity, dry.	CL					
70							



Environmental
Science &
Engineering, Inc.

BORING LOG AND WELL COMPLETION SUMMARY

EH3

WELL COMPLETION

Completion Depth:

Size/Type From To

Casing:
Screen:
Filter:
Seal:

Well Cap or Box:

Project Name: Alameda County GSA Project No: 6-93-5073

Location: Engineer's Hill
Santa Rita Correctional Facility
Dublin, California

Driller: Exploration Geoservices, Inc.
Method: Mobile B-61 Hollow Stem Auger
Hole Diameter: 6 Inches Total Depth: 61 Feet
Ref. Elevations:
Logged By: Bart Miller

Page 1 of 2

Dates:
Start: 11/18/93
Finish: 11/18/93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks Water, drilling/completion, summary, sample type
			Sampler Blows	Lithology	Well Installation		
0	FORMATIONAL SEDIMENTS CLAY, dark brown, no odor, moderate plasticity, dry.	OL					Start 8:12
5	SANDY SILT, light brown, no odor, low plasticity, dry	ML					
10			8 9 10				0 SAMPLE @ 10 FEET 8:19
15							
20	SAND, pebbly, brown, medium-grained, no odor, dry.	SP	22 24 17				0 SAMPLE @ 20 FEET 8:34
25	SILT, sandy, light brown, no odor, moderate plasticity, dry.	ML					
30			18 22 33				0 SAMPLE @ 30 FEET 8:50
35							



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

EH3

WELL COMPLETION

Completion Depth:
Size/Type From To

Casing:
Screen:
Filter:
Seal:

Well Cap or Box:

Project Name: Alameda County GSA Project No: 6-93-5073

Location: Engineer's Hill
Santa Rita Correctional Facility
Dublin, California

Driller: Exploration Geoservices, Inc.
Method: Mobile B-61 Hollow Stem Auger
Hole Diameter: 6 Inches Total Depth: 61 Feet
Ref. Elevations:
Logged By: Bart Miller

Page 2 of 2

Dates:
Start: 11/18/93
Finish: 11/18/93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks
			Sample/Blows	Lithology	Well Installation		
35	SANDY SILT, light brown, no odor, low plasticity, dry.	ML					
40			14 21 27			0	SAMPLE @ 40 FEET 9.11
45							
50	SILTY SAND, blue, fine-grained, no pebbles, strong petroleum hydrocarbon odor, dry.	SP	18 24 37			114	SAMPLE @ 50 FEET 9.30
55							
60	SILT, brown, no odor, low plasticity, dry.	ML	21 32 40			1.1	SAMPLE @ 60 FEET 9.50
65							
70							

Boring drilled and sampled to a depth of 61 feet.
No ground water detected. Petroleum hydrocarbon impacted soil detected over 45 to 55-foot interval.



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

EH5

WELL COMPLETION

Completion Depth:

Size/Type From To

Casing:
Screen:
Filter:
Seal:

Well Cap or Box:

Project Name: Alameda County GSA Project No: 6-93-5073
Location: Engineer's Hill
Santa Rita Correctional Facility
Dublin, California

Driller: Exploration Geoservices, Inc.
Method: Mobile B-61 Hollow Stem Auger
Hole Diameter: 6 Inches Total Depth: 61 Feet
Ref. Elevations:
Logged By: Bart Miller

Page 1 of 2

Dates:
Start: 11/18/93
Finish: 11/18/93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks Water, drilling/completion, summary, sample type
			Sample/Blows	Lithology	Well Installation		
0	FORMATIONAL SEDIMENTS CLAY, dark brown, no odor, moderate plasticity, dry.	OL					Start 13:39
5	SANDY SILT, light brown, no odor, low plasticity, dry.	ML					
10	SAND, pebbly, brown, medium-grained, no odor, dry.	SP	8 9 10			0	SAMPLE @ 10 FEET 13:45
20	SAND, as above.		14 16 25			0	SAMPLE @ 20 FEET 13:54
30	SANDY SILT, light brown, no odor, low plasticity, dry.	ML	7 14 25			0	SAMPLE @ 30 FEET 14:05
35							



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

EH5

WELL COMPLETION

Completion Depth:
Size/Type From To

Casing:
 Screen:
 Filter:
 Seat:

Well Cap or Box:

Project Name: Alameda County GSA Project No: 6-93-5073

Location: Engineer's Hill
 Santa Rita Correctional Facility
 Dublin, California

Driller: Exploration Geoservices, Inc.
 Method: Mobile 8-61 Hollow Stem Auger
 Hole Diameter: 6 Inches Total Depth: 61 Feet
 Ref. Elevations:
 Logged By: Bart Miller

Page 2 of 2

Dates:
 Start: 11/18/93
 Finish: 11/18/93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks
			Sample/Blows	Lithology	Well Installation		
35		ML					
40	SAND, pebbly, medium-grained, no odor, dry.	SP	28 50			0	SAMPLE @ 40 FEET 14:26
45		ML					
50	SANDY SILT, brown, low plasticity, no odor, dry.	ML	27 50			0	SAMPLE @ 50 FEET 15:01
55		ML					
60	SILT, as above.	ML	16 18 24			0	SAMPLE @ 60 FEET 15:18
65		ML					
70		ML					

Boring drilled and sampled to a depth of 61 feet.
 No ground water detected No petroleum
 hydrocarbon impacted soil detected.

APPENDIX C
LABORATORY RESULTS WITH CHAIN OF CUSTODY DOCUMENTATION

McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553

Tele: 510-798-1620 Fax: 510-798-1622

Environmental Science & Eng. 4090 Nelson Avenue, Suite J Concord, CA 94520	Client Project ID: # 6-93-5073; Engineer's Hill, Santa Rita Correctional Facility	Date Sampled: 11/17-11/18/93
	Client Contact: Bart Miller	Date Received: 11/19/93
	SMSA-C-021; # 111993	Date Extracted: 11/19/93
		Date Analyzed: 11/20-11/23/93

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d) ⁺	% Recovery Surrogate
33178	EH1-5'	S	50,e	99
33179	EH1-10'	S	220,e	100
33180	EH1-15'	S	3100,a	106
33181	EH1-20'	S	17,000,a	113 [#]
33182	EH1-25'	S	3900,a	109
33183	EH1-30'	S	66,a	99
33184	EH1-35'	S	27,a	98
33185	EH1-40'	S	1800,a	100
33186	EH1-45'	S	ND	99
33187	EH1-50'	S	ND	100
33188	EH1-55'	S	ND	98
33189	EH2-10'	S	ND	96
33190	EH2-20'	S	ND	98
33191	EH2-30'	S	ND	99
33192	EH2-40'	S	ND	98
Detection Limit unless other- wise stated; ND means Not Detected	W		50 ug/L	
	S		10 mg/kg	

*water samples are reported in ug/L, soil samples in mg/kg, and all TCLP extracts in mg/L

[#] cluttered chromatogram; surrogate and sample peaks co-elute or surrogate peak is on elevated baseline

⁺ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) modified diesel?; light (CL) or heavy (CH) diesel compounds are significant; d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (aged diesel?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible phase is present.

Environmental Science & Eng. 4090 Nelson Avenue, Suite J Concord, CA 94520	Client Project ID: # 6-93-5073; Engineer's Hill, Santa Rita Correctional Facility	Date Sampled: 11/17-11/18/93
		Date Received: 11/19/93
	Client Contact: Bart Miller	Date Extracted: 11/19/93
	SMSA-C-021; # 111993	Date Analyzed: 11/20-11/23/93

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d) ⁺	% Recovery Surrogate
33193	EH2-50'	S	ND	99
33194	EH2-60'	S	ND	99
33195	EH3-10'	S	ND	91
33196	EH3-20'	S	ND	99
33197	EH3-30'	S	ND	96
33198	EH3-40'	S	ND	99
33199	EH3-50'	S	5600,a	111 [#]
33200	EH3-60'	S	ND	100
33201	EH4-10'	S	ND	100
33202	EH4-20'	S	ND	100
33203	EH4-30'	S	ND	100
33204	EH4-40'	S	ND	99
33205	EH4-50'	S	ND	100
33206	EH4-60'	S	ND	98
33207	EH5-10'	S	ND	99
Detection Limit unless otherwise stated; ND means Not Detected	W		50 ug/L	
	S		10 mg/kg	

*water samples are reported in ug/L, soil samples in mg/kg, and all TCLP extracts in mg/L

[#] cluttered chromatogram; surrogate and sample peaks co-elute or surrogate peak is on elevated baseline

⁺ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) modified diesel?; light (CL) or heavy (CH) diesel compounds are significant; d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel(?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible phase is present.

QC REPORT FOR HYDROCARBON ANALYSES

Date: 11/20/93

Matrix: Soil

Analyte	Concentration (mg/kg)			Amount Spiked	% Recovery		
	Sample	MS	MSD		MS	MSD	RPD
TPH (gas)	0.000	1.640	1.666	2.03	81	82	1.5
Benzene	0.000	0.188	0.186	0.2	94	93	1.1
Toluene	0.000	0.184	0.180	0.2	92	90	2.2
Ethylbenzene	0.000	0.184	0.178	0.2	92	89	3.3
Xylenes	0.000	0.564	0.548	0.6	94	91	2.9
TPH (diesel)	60	413	400	300	118	114	3.0
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

RESIST - PM #12 NT

CHAIN OF CUSTODY RECORD

DATE NOVEMBER 17, 1993 PAGE 1 OF 2

PROJECT NAME ALAMEDA COUNTY GSA

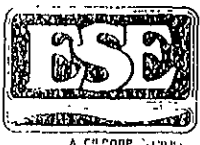
ADDRESS ENGINEER'S HILL
SANTA RITA CORRECTIONAL FACILITY
DUBLIN, CALIFORNIA

PROJECT NO. 6-93-5073

SAMPLED BY [Signature] BART MILLER

LAB NAME McCAMPBELL ANALYTICAL

ANALYSES TO BE PERFORMED										MATRIX	CONTAINERS
TPH-Diesel (8015m)	BTEX (8020)									MATRIX	
✓										Soil	1
✓										"	1
✓	✓									"	1
✓	✓									"	1
✓	✓									"	1
✓	✓									"	1
✓	✓									"	1
✓	✓									"	1
✓	✓									"	1
✓	✓									"	1
✓	✓									"	1
✓										"	1
✓										"	1
✓										"	1
✓										"	1
✓										"	1
✓										"	1
✓										"	1
✓										"	1
✓										"	1



Environmental Science & Engineering, Inc.
 1000 Leach Avenue
 Suite 100
 Dublin, CA 94568
 Phone (510) 685-4053
 Fax (510) 685-4322

REMARKS (CONTAINER SIZE, ETC.)
33178
33179
33180
33181
33182
33183
33184
33185
33186
33187
33188
33189

RELINQUISHED BY: (signature) 1. <u>[Signature]</u>	RECEIVED BY: (signature) <u>[Signature]</u>	date time <u>11-14-93 10:20</u>	12
2.			
3.			
4.			
5.			

TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO:
BART MILLER
ESE

SPECIAL SHIPMENT REQUIREMENTS
COLD TRANSPORT

SAMPLE RECEIPT

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
NORMAL T.A.T. INVOICE TO ESE

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	✓
CONFORMS TO RECORD	✓

Case # 180

DATE NOVEMBER 17, 1993 PAGE 2 OF 2

CHAIN OF CUSTODY RECORD

PROJECT NAME ALAMEDA COUNTY GSA

ADDRESS ENGINEER'S HILL
SANTA RITA CORRECTIONAL FACILITY
DUBLIN, CALIFORNIA

PROJECT NO. 6-93-5073

SAMPLED BY [Signature] BART MILLER

LAB NAME McCAMPBELL ANALYTICAL

ANALYSES TO BE PERFORMED										MATRIX	NUMBER OF CONTAINERS
										MATRIX	
✓										Soil	1
✓										"	1
✓										"	1
✓										"	1
✓										"	1



Environmental Science & Engineering, Inc

1902 Nelson Avenue
 Santa Clara, CA 95050
 Phone (510) 685-4053
 Fax (510) 685-5123

REMARKS (CONTAINER, SIZE, ETC.)

33190

33191

33192

33193

33194

RELINQUISHED BY: (signature) [Signature]

RECEIVED BY: (signature) [Signature]

date time 11-19-93 10:20

5

TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO:
BART MILLER
ESE

SPECIAL SHIPMENT REQUIREMENTS
COLD TRANSPORT

SAMPLE RECEIPT

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):

NORMAL T.A.T. INVOICE TO ESE

CHAIN OF CUSTODY SEALS

REC'D GOOD CONDTN/COLD

CONFORMS TO RECORD

EXHIBIT 21 25 NOV 1993

CHAIN OF CUSTODY RECORD

DATE NOVEMBER 18, 1993 PAGE 1 OF 2

PROJECT NAME ALAMEDA COUNTY USA

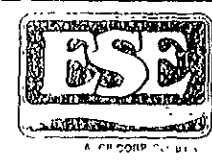
ADDRESS ENGINEER'S HILL
SANTA RITA CORRECTIONAL FACILITY
DUBLIN, CALIFORNIA

PROJECT NO. 6-93-5073

SAMPLED BY BART MILLER

LAB NAME MCCAMPBELL ANALYTICAL

ANALYSES TO BE PERFORMED				MATRIX				NUMBER OF CONTAINERS
TPH (Det 8015 m)	BTEX (3020)			MATRIX				
✓				SOIL			1	
✓				"			1	
✓				"			1	
✓				"			1	
✓	✓			"			1	
✓	✓			"			1	
✓				"			1	
✓				"			1	
✓				"			1	
✓				"			1	
✓				"			1	
✓				"			1	
✓				"			1	



Environmental Science & Engineering, Inc

2000 Leona Avenue
 Suite 1
 Dublin, CA 94568
 Phone (510) 685-1053
 Fax (510) 685-5331

REMARKS (CONTAINER, SIZE, ETC.)

- 33195
- 33196
- 33197
- 33198
- 33199
- 33200
- 33201
- 33202
- 33203
- 33204

33205
 33206

RELINQUISHED BY: (signature) 1. <u>Bart Miller</u>	RECEIVED BY: (signature) <u>Bart Miller</u>	date <u>11-18-93</u>	time <u>10:28</u>	12
2.				
3.				
4.				
5.				

REPORT RESULTS TO:
Bart Miller
ESE

SPECIAL SHIPMENT REQUIREMENTS
COLD TRANSPORT

SAMPLE RECEIPT

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):

NORMAL TAT. INVOICE TO ESE

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDITN/COLD	✓
CONFORMS TO RECORD	✓

ESE 39

CHAIN OF CUSTODY RECORD

DATE NOVEMBER 18, 1993 PAGE 2 OF 2

PROJECT NAME ALAMEDA COUNTY GSA

ADDRESS ENGINEER'S HILL
SANTA RITA CORRECTIONAL FACILITY
DUVALL, CALIFORNIA

PROJECT NO. 6-93-5013

SAMPLED BY [Signature] BART MILLER

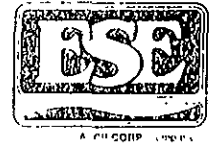
LAB NAME MCCAMPBELL ANALYTICAL

ANALYSES TO BE PERFORMED

MATRIX

MATRIX

NUMBER OF CONTAINERS



Environmental Science & Engineering, Inc

1000 Sibley Avenue Phone (510) 685-1053
 Suite 100
 Concord, CA 94520 Fax (510) 685-1100

REMARKS (CONTAINER, SIZE, ETC.)

SAMPLE #	DATE	TIME	LOCATION
E15-10'	11/18/93	13:45	
E15-20'	"	13:54	
E15-30'	"	14:05	
E15-40'	"	14:26	
E15-50'	"	15:01	
E15-60'	"	15:18	

TAP-Diesel (3015)

MATRIX

6

33207

33208

33209

33210

33211

33212

RELINQUISHED BY: (signature)

RECEIVED BY: (signature)

date time

TOTAL NUMBER OF CONTAINERS

1. [Signature]
2. [Signature]
- 3.
- 4.
- 5.

[Signature]
 11-18-93 11:20

REPORT RESULTS TO:
 Bart Miller
 ESE

SPECIAL SHIPMENT REQUIREMENTS
 COLD TRANSPORT

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):

NORMAL T.A.T. INVOICE TO ESE.

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	<input checked="" type="checkbox"/>
CONFORMS TO RECORD	<input checked="" type="checkbox"/>