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Ms. Susan Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
Division of Hazardous Materials
80 Swan Way, Room 350
Oakland, California 94621

Subject: Workplan for Additional Site Investigation and Limited Soil Excavation
Celis Alliance Fuel Station at 4000 San Pablo Avenue
Emeryville, California

Dear Ms. Hugo:

On behalf of the City of Emeryville Redevelopment Agency, Woodward-Clyde Consultants (WCC) is pleased to submit the workplan for additional site investigation and limited soil excavation at the site of Celis' Alliance Fuel Station located at 4000 San Pablo Avenue, Emeryville, California. Your prompt review of this workplan is greatly appreciated. We will start the work after receiving your written approval of this workplan.

Please call the undersigned if you have any questions and comments.

Sincerely,

WOODWARD-CLYDE CONSULTANTS

Xinggang Tong, Ph.D.
Project Manager
(510) 874-3060

for Michael McGuire, P.E.
Senior Project Engineer
(510) 874-3288

cc: Kimberly Brandt, Catellus Development Corporation;
Ignacio Dayrit, City of Emeryville Redevelopment Agency;
RWQCB - San Francisco Bay Region.

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

WORKPLAN FOR ADDITIONAL SITE INVESTIGATION AND LIMITED SOIL EXCAVATION CELIS ALLIANCE FUEL STATION 4000 SAN PABLO AVENUE EMERYVILLE, CALIFORNIA

Prepared for

City of Emeryville Redevelopment Agency
2200 Powell Street, 12th Floor
Suite 1200
Emeryville, California 94608-4356

June 17, 1994

Prepared by

Woodward-Clyde Consultants
500 12th Street, Suite 100
Oakland, CA 94607-4014

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1.0
INTRODUCTION

1.1 PURPOSE

Woodward-Clyde Consultants (WCC) was retained by the City of Emeryville Redevelopment Agency (Agency) to prepare a workplan for additional site investigation and limited soil excavation at the site of Celis Alliance Fuel Station located at 4000 San Pablo Avenue in Emeryville, California. The preparation of this workplan follows the recent site investigation and the removal of six (6) underground storage tanks (USTs), which were performed by Levine-Fricke of Emeryville, California, in June 1993 through May 1994. The results of the investigation and tank removal revealed that soil and groundwater beneath the site have been impacted by petroleum hydrocarbons.

The purpose of this workplan is to describe the proposed criteria and procedures for additional site investigation and excavation of contaminated soil in the former UST areas.

1.2 SCOPE OF WORK

The activities to be performed for this additional site investigation and limited soil excavation include the following tasks:

- Development of criteria for additional site investigation;
- Installation of a groundwater monitoring well downgradient to assess the extent of petroleum-affected groundwater;
- Quarterly groundwater monitoring for one year;
- Development of soil excavation criteria;
- Excavation and off-site disposal of petroleum-affected soil near the former UST areas;
- Confirmation sampling at the excavation areas;
- Backfilling of the excavation with clean imported soil.

1.3 SITE CONTACTS

Woodward-Clyde is providing consulting engineering services for the project to the Agency. 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 investigation.

1.4 SITE LOCATION

The Celis Alliance Fuel Station (site) is located at 4000 San Pablo Avenue in Emeryville, California, within the 40th Street Right-of-Way extension (Figure 1). The site is approximately 100 feet by 100 feet and is bounded by San Pablo Avenue on west, a two-story concrete warehouse on east, and parking lots on both north and south (Figure 2).

Based on Levine-Fricke's research (see references), the site is underlain by Holocene alluvial deposits, primarily unconsolidated, fine sand, silt, and clayey silt with occasional thin beds of coarse sand. The site is located approximately one (1) mile east of the San Francisco Bay and is essentially level, with an approximate elevation of 40 feet above mean sea level.

2.0
SUMMARY OF RESULTS OF PREVIOUS SITE INVESTIGATIONS

2.1 INITIAL INVESTIGATIONS, JUNE THROUGH AUGUST 1993

In June 1993, Catellus Development Corporation (Catellus) of San Francisco, California, retained Levine-Fricke of Emeryville, California, to conduct a Phase I environmental site assessment for the 40th Street Right-of-Way of the section between San Pablo Avenue and Adeline Street (40th St. Right-of-Way). The Celis Alliance Fuel Station (site) is located within the section. The Phase I assessment revealed the existence of a fuel station on the Celis' site since at least 1936 and reported the following six (6) underground storage tanks (UST):

- One 7,000-gallon diesel UST;
- One 6,000-gallon regular gasoline UST;
- One 4,000-gallon unleaded gasoline UST;
- One 2,000-gallon unleaded gasoline UST;
- One 3,500-gallon super unleaded gasoline UST;
- One 550-gallon waste oil UST.

Heavy oil stains were observed in many areas of the Celis' site. Based on the Phase I findings, Levine-Fricke performed a Phase II investigation for the 40th St. Right-of-Way in August 1993, which included:

- Site inspection and geophysical survey;
- Drilling of 22 soil borings and collection of soil samples for lithologic description and chemical analysis. Of the 22 soil borings, 14 were from the Celis' site;
- Conversion of 3 soil borings to groundwater monitoring wells on the Celis' site;
- Collection of groundwater samples from the monitoring wells for chemical analysis.

The locations of soil borings and monitoring wells are shown on Figure 3. Selected soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg) using

EPA Method 8015/5030; benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020; TPH as diesel (TPHd) using EPA Method 8015/3510; TPH as motor oil (TPHmo) using EPA Method 8015/3510; total recoverable petroleum hydrocarbons as oil and grease (TRPHoil&grease) using Standard Method 5520EF; and polychlorinated biphenyls (PCBs) using EPA Method 8080.

The soil analytical results are summarized in Table 2. Soil samples were generally collected at depths of 7, 9.5, and 14.5 feet below ground surface (bgs). The analytical results indicate that soil at the Celis's site contains significant concentrations of petroleum hydrocarbons. TPHg was reported in 19 of the 32 soil samples analyzed, with concentrations ranging from 1 milligram per kilogram (mg/kg) to 2,800 mg/kg. Benzene was detected in all but four samples, at concentrations ranging from 0.005 to 22 mg/kg. The highest concentrations of petroleum hydrocarbons were generally reported for samples collected from 7 and 9.5 feet bgs. Four soil samples collected from soil borings SB-2 and SB-3, which were near the waste oil tank, were also analyzed for PCBs and were all shown below laboratory detection limits.

The soil encountered in the borings mainly consists of clayey silt (ML), silty clay (CL), and silty sand (SM). Some silty clay of low plasticity was also encountered.

The three groundwater monitoring wells installed on the Celis' site are all 2 inches in diameter, 20 feet bgs, screened from 5 to 20 feet bgs, and constructed with polyvinyl chloride. Shallow groundwater elevations varied from approximately 8 to 9.5 feet bgs during the month of August 1993. Groundwater flow direction beneath the site is generally toward the west under a hydraulic gradient of approximately 0.03 ft/ft.

Free-phase fuel product was measured in monitoring well LF-1 at a thickness of 6.24 inches on August 20, 1993. LF-1 is located downgradient from the pump island and the diesel tank. Free-phase product has not been detected in the other two monitoring wells.

The three monitoring wells were sampled on August 7, 1993 for the analysis of TPHg, TPHd, TPHmo, BTEX, and TRPHoil&grease. The results are summarized in Table 3. The results indicate that shallow groundwater beneath the Celis' site has been significantly affected by petroleum hydrocarbons.

2.2 ADDITIONAL INVESTIGATIONS, JANUARY 1994

At the request of Alameda County Health Care Services Agency (ACHA), Levine-Fricke conducted additional investigations to further assess the lateral extent of petroleum hydrocarbons in groundwater downgradient (west) from the Celis' site. Two soil borings were drilled, one of which was converted to a groundwater monitoring well (LF-4). Their locations are shown on Figure 3. This new monitoring well is also 2 inches in diameter, 20 feet bgs, and screened from 5 to 20 feet bgs.

Soil samples were analyzed for TPHg, TPHd, TPHmo, BTEX, and TRPHoil&grease. Their results are included in Table 2. Groundwater samples were analyzed for the same constituents as soil samples and their results are given in Table 3.

Monitoring well LF-4 is located approximately 160 feet west (downgradient) of well LF-1. The soil sample at 10 feet bgs from this well showed TPHg (220 mg/kg), TPHd (19 mg/kg), and BTEX. Groundwater samples from this well also reported TPHg, TPHd, TPHmo, and BTEX. Soil boring EB-1 is approximately 150 feet west of well LF-4 (310 feet downgradient of well LF-1). Soil samples from this boring reported below detection limits for TPHg, TPHd, TRPHoil&grease and BTEX, but had low levels of TPHmo (17 mg/kg at 5 ft bgs and 49 mg/kg at 10 ft bgs). A grab groundwater sample was also obtained from this boring and showed very low levels of TPHd (0.081 mg/l), Toluene (0.00057 mg/l) and xylenes (0.0026 mg/l). These low levels of petroleum hydrocarbons in boring EB-1 may not necessarily originate from the Celis' site because TPHg, which was reported at concentrations of approximately 10 times of the TPHd concentration in well LF-4, was not detected in boring EB-1. TPHg is more mobile than TPHd in groundwater and usually appears downgradient before TPHd.

2.3 UNDERGROUND TANK REMOVAL, MAY 1994

During several drive-by observations in May 1994, the gas station building, the surface payment, and the six USTs were seen to have been removed in the week of May 16, 1994. During a meeting of May 31, 1994, among representatives of ACHA, the City of Emeryville Redevelopment Agency, and WCC, we were informed that the two hydraulic lifts were also removed and soil samples beneath the USTs were obtained for chemical analyses. A report

documenting the UST removal and sampling results should be available from Levine-Fricke in the near future.

3.0
SOIL AND GROUNDWATER INVESTIGATION

3.1 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 Emeryville is provided by the RWQCB Tri-Regional Board Staff Recommendations dated August 10, 1990, and Appendix A of these recommendations dated August 30, 1991, and Alameda County Health Care Agency's (ACHA) requirements.

During a meeting of May 31, 1994, among the representatives of ACHA, the City of Emeryville Redevelopment Agency (Agency), and WCC, ACHA requested that the majority of petroleum-affected soil beneath the site be removed, soil confirmation samples be obtained in the excavation area, and the downgradient extent of petroleum-affected groundwater be assessed.

3.2 TECHNICAL APPROACH

3.2.1 Soil Excavation

Given the ACHA's requirements, the extensive soil contamination identified beneath the Celis' site (site), and the urgency to build the 40th Street Right-of-Way, the plan is to excavate and dispose off-site all unsaturated (vadose zone) soil beneath the site, subject to the safety and stability requirements of excavation. Excavation will stop above soil/water interface. The site is approximately 100 feet by 100 feet. Shallow groundwater level is approximately 9 feet bgs. The six USTs had a total volume of about 2,808 cubic feet. Therefore, the maximum volume of soil to be excavated would be 100 x 100 x 9 - 2,808 = 87,192 bank cubic feet or 3,230 bank cubic yards. Using a typical conversion factor of 1.3,

the "loose" volume of the excavated soil, i.e., when stockpiled for transport and disposal, would be 1.3 x 3,230 = 4,199 cubic yards.

The detailed excavation plan is presented in Appendix B.

3.2.2 Proposed Monitoring Well Location

The objective of the proposed installation of one additional groundwater monitoring well is to assess the downgradient extent of petroleum hydrocarbons in the soil and groundwater. Activities include:

(1) Drill one soil boring approximately 20 feet West of soil boring EB-1. Its location is shown on Figure 3. Collect soil samples at depths of 5 feet and 10 feet or just above the water table, if possible. Analyze the soil samples for petroleum hydrocarbons.

(2) Construct a groundwater monitoring well (to be designated WCC-1) in the soil boring. Develop the well, survey the well for location and elevation, and measure depth to static groundwater. Figure 4 illustrates typical well construction details.

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

The proposed location for the new groundwater monitoring well is based on the results of Levine-Fricke's investigation that the groundwater flows westward beneath the Celis' site and that the petroleum-affected groundwater appeared to have passed monitoring well LF-4 and was approaching boring EB-1.

3.2.3 Monitoring Well Closure

Monitoring wells LF-1, LF-2, and LF-3 are all located on the Celis' site and within the area to be excavated. The three wells will be properly closed prior to the start of soil excavation.

The preferred method to close these wells is to pressure grout them. Neat cement will be tremie-pumped into each well. A cap will then be placed on top of the casing with an

opening for small-diameter tremie pipe. Sealing material will then be pumped under pressure with the casing sealed at the surface until refusal of sealing material. However, if a permit can not be obtained from Zone 7 of Alameda County Flood Control and Water Conservation District for the pressure-grout method, the wells will be drilled out to the full depth of each well, then cement grout placed in each well up to the surface by tremie method.

3.3 SOIL INVESTIGATION

3.3.1 Confirmation Soil Sampling and Analysis in Excavation Area

Soil samples will be collected on the side walls near the bottom of the excavation pit or soil/ groundwater interface before backfilling. Sampling frequency will be at one per 20 linear feet of the side walls. As illustrated on Figure 5, five soil samples are to be collected per side wall of the excavation pit.

Soil sample collection will be assisted by a backhoe. A backhoe bucket will take native soil from each sample location and bring the soil rapidly to the surface. Approximately three inches of top soil will be rapidly scraped away from the surface, then a clean brass tube (2.5-inch diameter by 6-inch length) will be driven into the soil with a wood mallet. The ends of the tube will be covered with aluminum foil or Teflon sheeting, then plastic end caps, and finally wrapped with duct tape. Samples will be labeled with identifying information, stored in an ice chest cooled with ice, 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.

Soil sample analyses are summarized in Table 4. Analyses include TPHg by EPA Method 8015/5030; BTEX by EPA Method 8020; TPHd by EPA Method 8015/3550; Oil&Grease by Standard Method 5520D&F; and metals (Cd, total Cr, Pb, Ni & Zn) by ICP method. Soil samples from the northern side of the excavation pit, where the waste oil tank was removed, will be analyzed for all the above constituents. Soil samples from the western side will also be analyzed for all the above constituents due to its downgradient position. Samples from the southern side and eastern side will all be analyzed for TPHg and BTEX, but only selectively for the other constituents because these samples are located upgradient and away from the diesel tank and the waste oil tank.

Soil samples from borings SB-2 and SB-3, which were drilled near the waste oil tank in August 1993, were analyzed for polychlorinated biphenyls (PCBs). Their concentrations were reported below laboratory detection limits. A soil sample was collected by Levine-Fricke at the bottom of the waste oil tank after its removal in May 18, 1994, and was analyzed for PCBs by EPA Method 8080, Creosote and polynuclear aromatics (PNAs) by EPA Method 8270, and chlorinated hydrocarbons by EPA Method 8010. All of the above chemicals were reported below laboratory detection limits. These results indicate that the site may have not been impacted by these chemicals. Therefore, further analyses of these chemicals for soil samples from the excavation pit is not planned.

3.3.2 Boring Advancement, Soil Sample Collection and Analysis

One soil boring (WCC-1) will be advanced at the proposed location shown on Figure 3. The boring vicinity will be surveyed by an underground utility locator. If any underground utilities or surface obstructions prevent soil boring at the proposed location, the boring will be relocated to a clear location nearby.

Boring will be advanced to a depth of approximately 20 feet. The boring 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. An attempt will be made to collect the second soil sample from just above the water table, which is approximately 9 feet below grade. The soil types encountered during drilling will be logged according to the Unified Soil Classification System (USCS) and summarized on the boring log.

Soil samples will be collected 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 log. The soil samples will be retained in brass liners within the sampler. A brass liner of soil will be retained for laboratory analysis. The liner will be sealed with aluminum foil or Teflon sheeting, plastic end caps, labeled, placed in a plastic bag, and stored in an ice chest cooled with ice. The remaining soil in the brass liners will be examined by a qualified engineer or geologist to determine the soil types for descriptions consistent with the USCS.

The soil samples will be submitted at the end of each day and 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 5. The soil samples will be analyzed for TPHg by EPA Method 8015/5030, BTEX by EPA Method 8020, TPHd and TPHmo by EPA Method 8015/3550.

3.4 GROUNDWATER INVESTIGATION

3.4.1 Monitoring Well Construction

The soil boring will be completed as a groundwater monitoring well. The groundwater monitoring well will be constructed of 2-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 as described in Section 4.1.

- The well will be drilled to approximately 20 feet below ground surface (bgs) using 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 3.3.1.

- The well will be screened from 5 feet to 20 feet bgs.

- Two-inch-diameter Schedule 40 PVC casing and 0.02-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 a tremie method as the augers are removed. A conservatively small 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.

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

Figure 4 shows typical well construction details.

3.4.2 Well Development

The well will be allowed to set 24 hours or more after construction prior to well development. It 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 evacuated from the well. Water quality parameters such as pH and specific conductance will be measured and recorded during development. Following development, the well will be allowed to stabilize for at least 72 hours prior to groundwater sampling.

3.4.3 Water Level Measurement and Groundwater Monitoring

The well will be surveyed by a licensed land surveyor for horizontal and top of casing elevation, relative to a referenced and established benchmark, to a precision of 0.01 foot. Depth 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 any 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.

3.4.4 Groundwater Sample Collection and Analysis

Prior to sampling, the well will be purged to allow groundwater representative of the saturated soil to enter the well. Three to five well casing volumes of groundwater will be purged from each well. 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 parameters suggests that the water within the well is representative of the groundwater in the saturated soil. Purge water will also be inspected in the field for the presence of odor or 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, stored in an ice chest cooled with ice, 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.

Groundwater and quality assurance sample analyses are summarized in Table 5. The groundwater samples will be analyzed for TPHg by EPA Method 8015/5030, BTEX by EPA Method 8020, TPHd and TPHmo by EPA Method 8015/3510.

3.4.5 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 and the travel blank will be analyzed for TPHg and BTEX only.

3.5 QUARTERLY GROUNDWATER MONITORING

Groundwater monitoring wells LF-4 and WCC-1 will be sampled and analyzed according to the schedule given in Table 6. Sampling procedures are given in Section 3.4.4. Water levels will be measured to the nearest 0.01 foot, prior to any purging activities to avoid disturbance of the static water table.

The analyses include TPHg by EPA Method 8015/5030, BTEX by EPA Method 8020, TPHd by EPA Method 8015/3510, and Oil&Grease by Standard Method 5520D&F.

A trip blank is included in each round of groundwater sampling for quality control and will be analyzed for TPHg and BTEX.

4.0
DECONTAMINATION PROCEDURES AND WASTE DISPOSAL

4.1 DECONTAMINATION PROCEDURES

Down-hole drilling equipment such as augers and well development equipment will be decontaminated using a pressure steam cleaner with potable water before beginning drilling, between each drilling/sampling location, and before leaving the site. Split-spoon samplers, brass tube liners, oil-water interface probe/water level indicators and bailers will be decontaminated before use by washing/scrubbing in an Alconox™ solution and rinsing with potable water followed by rinsing with deionized water. A decontamination pad will be constructed to contain the runoff water from steam cleaning. The decontamination water will be handled according to Section 4.2.

4.2 WASTE DISPOSAL

Purged groundwater, equipment decontamination water, and soil cuttings will be collected in separate DOT-approved drums and left on site pending characterization, acceptance and transportation to an appropriate recycling or disposal facility. To ensure proper handling, treatment and/or disposal, the drums will be properly 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
SCHEDULE

Soil excavation and well drilling will be scheduled pending approval of the well permit application and the approval of this workplan. Soil excavation will begin within one week after receipt of written approval of this workplan from ACHA and the Agency. We have estimated approximately 45 working days would be required to complete the excavation, disposal, and backfilling, if everything is on schedule. Possible causes for delay may include that part of the excavated soil could not be accepted by B&J landfill or Forward landfill, backfilling soil could not be supplied within 48-hour notice, or any unforeseen events.

Drilling work will be scheduled within one week after receipt of well construction permit and should be completed within one day. Well development will be conducted at least 24 hours following completion of the well 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 (2 weeks). A report on the findings will be submitted within six weeks of receipt of the final laboratory analytical reports and after the completion of field activities.

6.0
REPORTS

6.1 SITE INVESTIGATION REPORT

Following the completion of the soil excavation and well construction, a report will be prepared which will describe the investigation and soil excavation. The report will follow the Tri-Regional Guidelines and will include:

(1) A summary of field activities;
(2) Copies of boring logs with monitoring well construction details;
(3) A site plan, drawn to scale, showing boring locations;
(4) Field data sheets;
(5) Copies of laboratory analysis reports;
(6) A site geologic cross-section through the wells;
(7) Tables summarizing analytical data.

6.2 QUARTERLY REPORTS

Following each quarterly groundwater monitoring, a letter report will be prepared summarizing field activities, tabulated results of chemical analysis with copies of laboratory analysis reports, and a brief discussion of changes in groundwater elevations and chemical concentrations.

7.0
REFERENCES

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

Levine-Fricke, June 1993. Phase I Environmental Site Assessment, 40th Street Right-of-Way, Emeryville, California.

Levine-Fricke, September 1993. Phase II Investigation Results, Proposed 40th Street Right-of-Way, Emeryville, California.

Levine-Fricke, February 1994. Update of Approximate Costs for Remediating Petroleum Hydrocarbon-Affected Soil and Ground Water at the 40th Street Right-of-Way Site, Emeryville, California.

Levine-Fricke, March 1994. Further Soil and Ground-water Investigation, Fuel Station, 40th Street Right-of-Way, Emeryville, California.

TABLE 1

LIST OF CONTACTS
40TH STREET RIGHT-OF-WAY AT 4000 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

Owner's Representatives:

Celis Alliance Gas Station
4000 San Pablo Avenue
Emeryville, California
Constantino and Remedios Celis
c/o City of Emeryville

City of Emeryville:

City of Emeryville Redevelopment Agency
2200 Powell Street, 12th Floor, Suite 1200
Emeryville, California 94608-4356
Ignacio Dayrit (510) 596-4356

Site Developer:

Catellus Development Corporation
201 Mission Street, Suite 250
San Francisco, California 94105
Kimberly Brandt (415) 974-3705

Environmental Consultant:

Woodward-Clyde Consultants
500 12th Street, Suite 100
Oakland, California 94607-4014
Xinggang Tong (510) 874-3060

Lead Implementing Agency:

Alameda County Health Care Services Agency
Department of Environmental Health
Division of Hazardous Materials
80 Swan Way, Room 350
Oakland, California 94621
Susan Hugo (510) 271-4530

Regional Water Quality Control Board:

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

TABLE 2
ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED FROM THE FUEL STATION
40TH STREET RIGHT-OF-WAY, EMERYVILLE, CALIFORNIA
(concentrations in milligrams per kilogram [mg/kg])

Sample Name	Depth (ft)	Sample Date	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TRPH	PCBs
LF-1-4.5	4.5	07-Aug-93	550	220	16	0.84	1.2	5.6	2.7	77	NA
LF-1-9.5	9.5	07-Aug-93	470	18	<10	0.97	<0.005	6.6	8.9	<30	NA
LF-1-14.5	14.5	07-Aug-93	8.4	16	<10	0.14	0.17	0.081	0.37	60	NA
LF-2-9.5	9.5	07-Aug-93	740	14	<10	4.7	35	13	68	30	NA
LF-2-14.5	14.5	07-Aug-93	<0.5	<10	<10	0.009	0.012	<0.005	0.015	<30	NA
LF-3-9.5	9.5	07-Aug-93	75	<10	<10	0.062	0.28	1.1	1.1	37	NA
LF-3-14.5	14.5	07-Aug-93	<0.5	<10	<10	0.014	<0.005	0.01	0.007	<30	NA
LF-4-5.0	5	28-Jan-94	0.8	<10	<10	0.083	<0.005	<0.005	0.034	NA	NA
LF-4-10.0	10	28-Jan-94	220	19	<10	1.7	6.7	4.5	24	NA	NA
SB-1-7	7	08-Aug-93	850	240	27	5.4	<0.005	25	42	290	NA
SB-1-9.5	9.5	08-Aug-93	180	220	<50	0.89	1.1	4.3	18	130	NA
SB-1-14.5	14.5	08-Aug-93	7.4	<10	<10	0.44	0.44	0.14	0.61	60	NA
SB-2-7	7	08-Aug-93	780	790	57	8	<0.005	31	140	160	ND
SB-2-9.5	9.5	08-Aug-93	720	200	<50	2.4	5.2	14	59	210	NA
SB-2-14.5	14.5	08-Aug-93	1	<10	12	0.2	0.21	0.021	0.12	43	ND
SB-3-9.5	9.5	07-Aug-93	580	11	<10	9.7	50	15	90	37	ND
SB-3-14.5	14.5	07-Aug-93	0.9	<10	<10	0.092	0.16	0.031	0.17	37	ND
SB-4-7	7	08-Aug-93	380	13	<10	3	5.2	8.2	18	70	NA
SB-4-14.5	14.5	08-Aug-93	<0.5	<10	<10	0.026	0.005	0.019	0.023	210	NA
SB-5-7	7	08-Aug-93	410	15	<10	2.4	0.6	16	6.3	37	NA
SB-5-14.5	14.5	08-Aug-93	<0.5	<10	<10	0.011	<0.005	0.008	0.008	93	NA
SB-6-9.5	9.5	08-Aug-93	490	51	<10	2.7	<0.005	15	15	67	NA
SB-6-14.5	14.5	08-Aug-93	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	<30	NA
SB-7-9.5	9.5	07-Aug-93	750	52	66	2.5	8.5	22	93	170	NA
SB-7-14.5	14.5	07-Aug-93	2.8	<10	<10	<0.005	<0.005	0.029	0.03	<30	NA
SB-8-9.5	9.5	08-Aug-93	2,800	110	<50	22	9.5	82	290	130	NA
SB-8-14.5	14.5	08-Aug-93	<0.5	<10	11	0.009	<0.005	<0.005	<0.005	37	NA
SB-9-7	7	07-Aug-93	210	14	<10	2.8	13	5.1	29	<30	NA
SB-9-9.5	9.5	07-Aug-93	1,200	NA	NA	14	81	26	140	NA	NA
SB-9-14.5	14.5	07-Aug-93	<0.5	<10	<10	0.079	0.059	0.011	0.041	77	NA
SB-10-7	7	07-Aug-93	73	NA	NA	2.6	4.5	1.6	7.7	NA	NA
SB-10-9.5	9.5	07-Aug-93	1,100	<10	<10	<0.005	7.8	<0.005	22	40	NA
SB-10-14.5	14.5	07-Aug-93	8.6	<10	<10	0.48	0.29	0.1	0.48	<30	NA
SB-11-14.5	14.5	09-Aug-93	<0.5	<10	11	<0.005	<0.005	<0.005	<0.005	40	NA
EB-1-5.0	5	28-Jan-94	<0.5	<10	17	<0.005	<0.005	<0.005	<0.005	NA	NA
EB-1-10.0	10	28-Jan-94	<0.5	<20	49	<0.005	<0.005	<0.005	<0.005	NA	NA

Data extracted from Levine-Fricke's Reports of September 1993 and March 1994 (References 3 and 5)
NA = not available; ND = not detected.
TPHg = total petroleum hydrocarbons as gasoline
TPHd = total petroleum hydrocarbons as diesel
TPHmo = total petroleum hydrocarbons as motor oil
TRPH = total recoverable petroleum hydrocarbons
PCBs = polychlorinated biphenyls

TABLE 3

ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES
40th Street Right-of-Way, Emeryville, California
(concentrations in milligrams per liter [mg/l])

Sample Name	Sample Date	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TRPH
LF-1AG	7-Aug-93	100	41	<2.5	13	9.4	3.1	14	11
LF-2AG	7-Aug-93	13	0.095	<0.50	2.4	2.9	0.5	2	<5
LF-3AG	7-Aug-93	11	0.78	<0.25	1.5	0.17	2.9	5.1	<5
GWEB1	28-Jan-94	<0.05	0.081	<0.05	<0.0005	0.00057	<0.0005	0.0026	NA
LF-4	28-Jan-94	18	1.4	0.16	1	1.9	0.88	4.7	NA
LF-4dup	28-Jan-94	21	2.2	0.21	1.1	2	0.80	4.2	NA

Data extracted from Levine-Fricke's Reports of September 1993 and March 1994 (References 3 and 5).
NA = not available; ND = not detected.
TPHg = total petroleum hydrocarbons as gasoline.
TPHd = total petroleum hydrocarbons as diesel.
TPHmo = total petroleum hydrocarbons as motor oil.
TRPH = total recoverable petroleum hydrocarbons

TABLE 4

SUMMARY OF ANALYSES FOR CONFIRMATION SOIL SAMPLES FROM EXCAVATION PIT

Side of Excav. pit	Sample ID	Analysis to be performed: TPHg mod. EPA 8015	BTEX EPA 8020	TPHd mod.EPA 8015	Oil&Grease 5520 D&F	Metals (Cd, Cr, Pb, Ni, & Zn) ICP method
North	N-1	X	X	X	X	X
	N-2	X	X	X	X	X
	N-3	X	X	X	X	X
	N-4	X	X	X	X	X
	N-5	X	X	X	X	X
South	S-1	X	X			
	S-2	X	X	X	X	X
	S-3	X	X			
	S-4	X	X	X	X	X
	S-5	X	X			
West	W-1	X	X	X	X	X
	W-2	X	X	X	X	X
	W-3	X	X	X	X	X
	W-4	X	X	X	X	X
	W-5	X	X	X	X	X
East	E-1	X	X			
	E-2	X	X	X	X	X
	E-3	X	X			
	E-4	X	X	X	X	X
	E-5	X	X			

Soil samples will be collected on each side near the bottom of excavation pit or soil/groundwater interface.
TPH = total petroleum hydrocarbons.
BTEX = benzene, toluene, ethylbenzene, and xylenes.

TABLE 5

SUMMARY OF SAMPLE ANALYSES FOR THE PROPOSED NEW WELL

		Analysis to be performed			
Sample Type	No. of Samples	TPHg	BTEX	TPHd	TPHmo
Soil	2	X	X	X	X
Groundwater	1	X	X	X	X
Groundwater dup	1	X	X		
Trip Blank	1	X	X		

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

TABLE 6

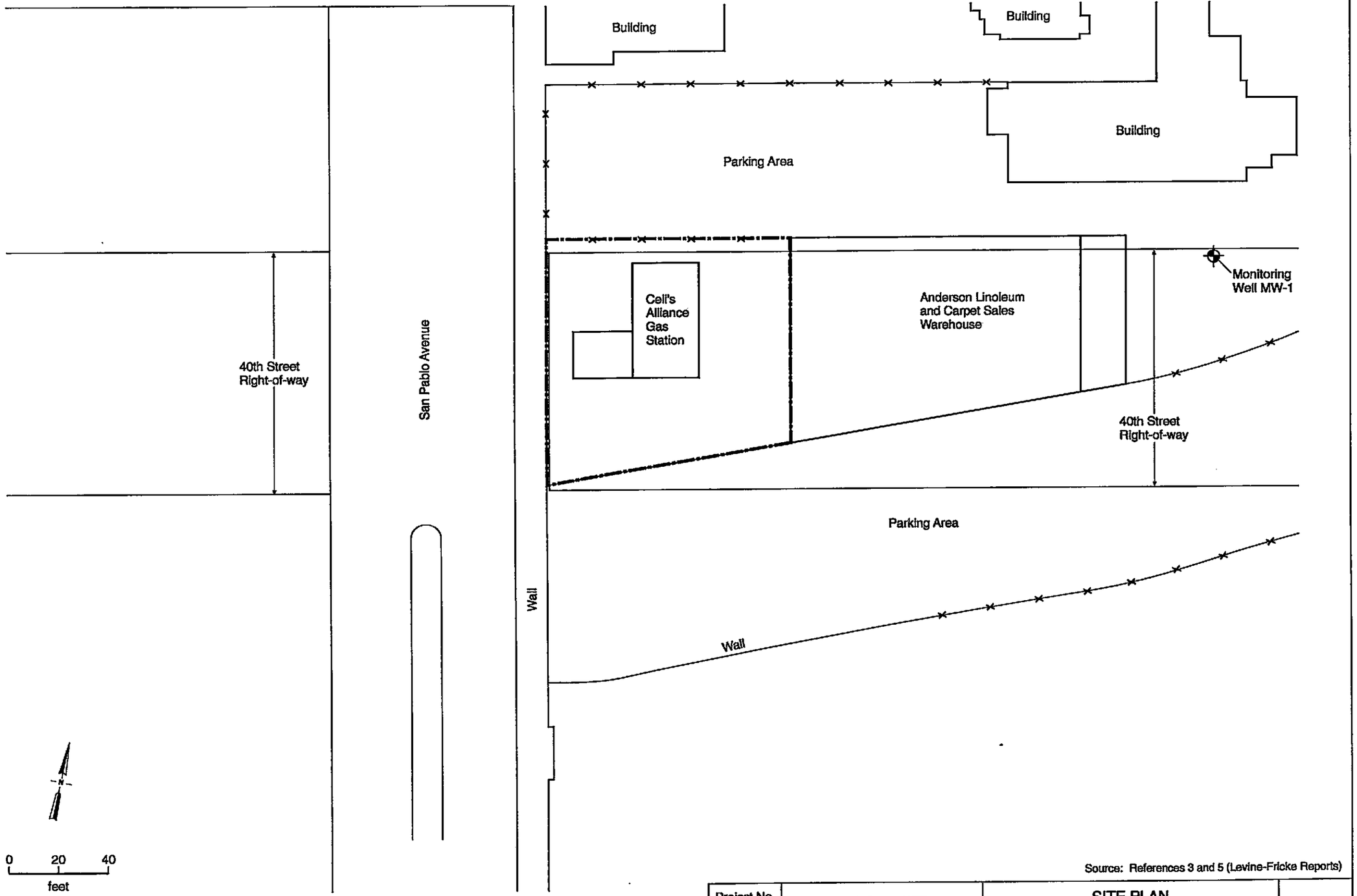
SUMMARY OF QUARTERLY GROUNDWATER SAMPLING AND ANALYSES

Well to be sampled	No. of samples	Analysis to be performed: TPHg mod.EPA8015	BTEX EPA8020	TPHd mod.EPA8015	Oil&Grease 5520D&F
LF-4	1	X	X	X	X
WCC-1	1	X	X	X	
Trip Blank	1	X	X		

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

Project No. 941114NA	40th Street UST	SITE LOCATION MAP CELI'S ALLIANCE GAS STATION SITE	Figure 1
Woodward-Clyde Consultants			

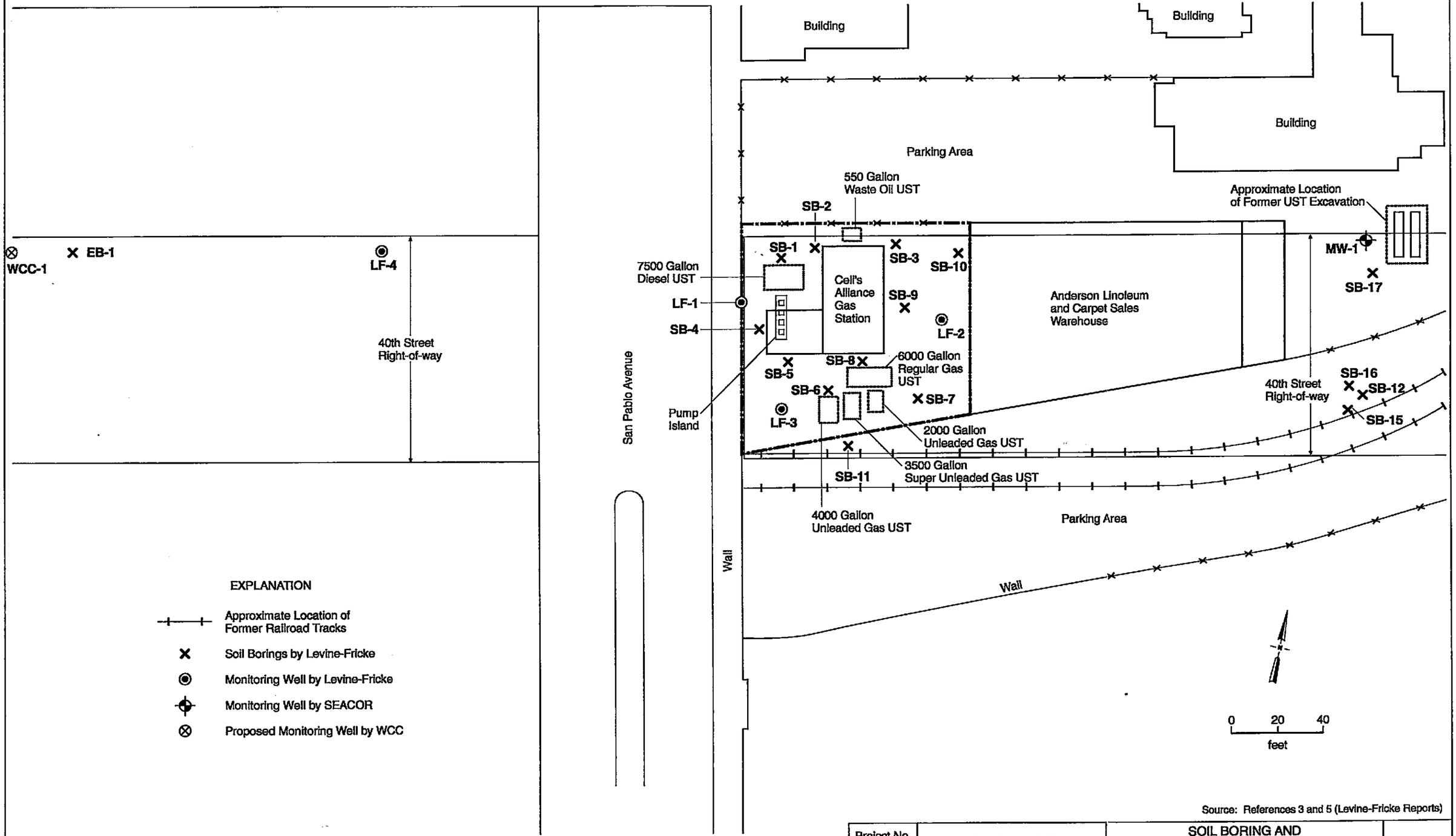
941114NA-1000/060994



Source: References 3 and 5 (Levine-Fricke Reports)

Project No. 941114NA	40th Street UST	SITE PLAN 40TH STREET RIGHT-OF-WAY EMERYVILLE, CALIFORNIA	Figure 2
Woodward-Clyde Consultants			

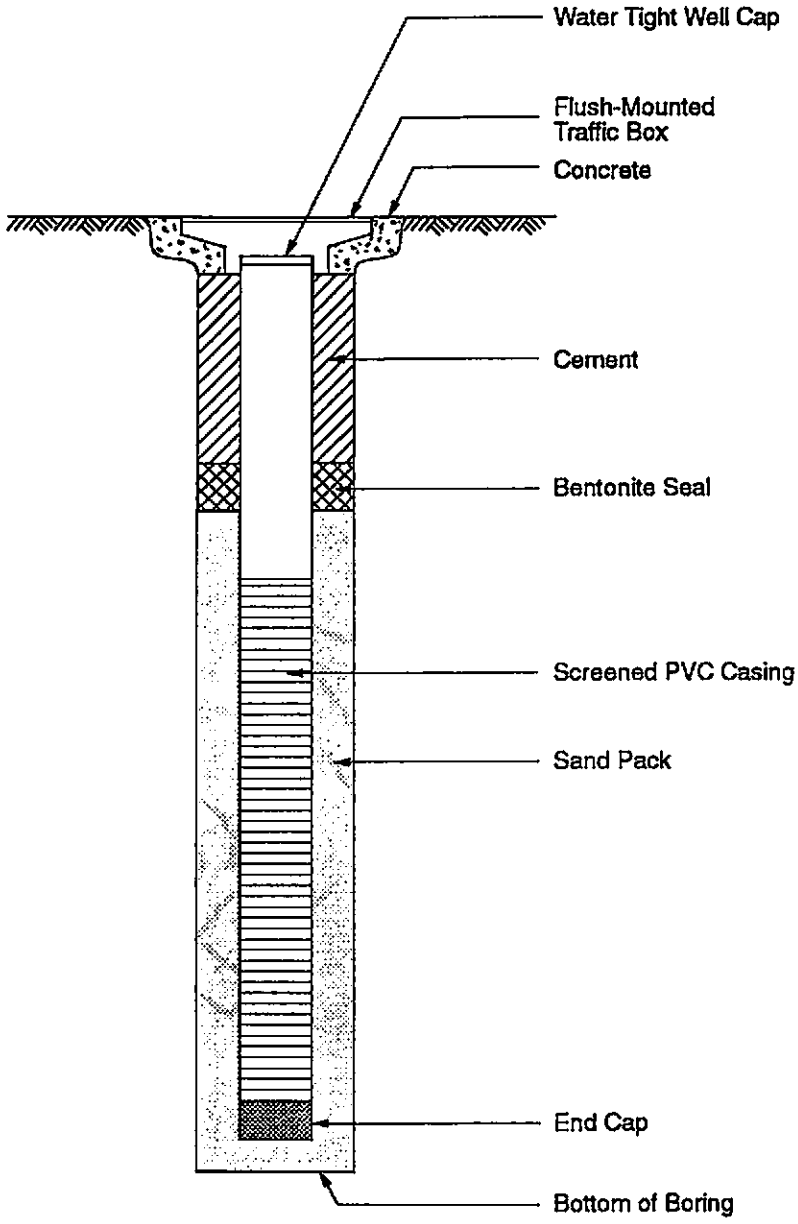
941114NA-1000/060994



Source: References 3 and 5 (Levine-Fricke Reports)

Project No. 941114NA	40th Street UST	SOIL BORING AND MONITORING WELL LOCATIONS 40TH STREET RIGHT-OF-WAY EMERYVILLE, CALIFORNIA	Figure 3
Woodward-Clyde Consultants			

941114NA-1000/060994



Woodward-Clyde Consultants		PROPOSED MONITORING WELL CONSTRUCTION	Figure 4

92C0644A-0200/050694

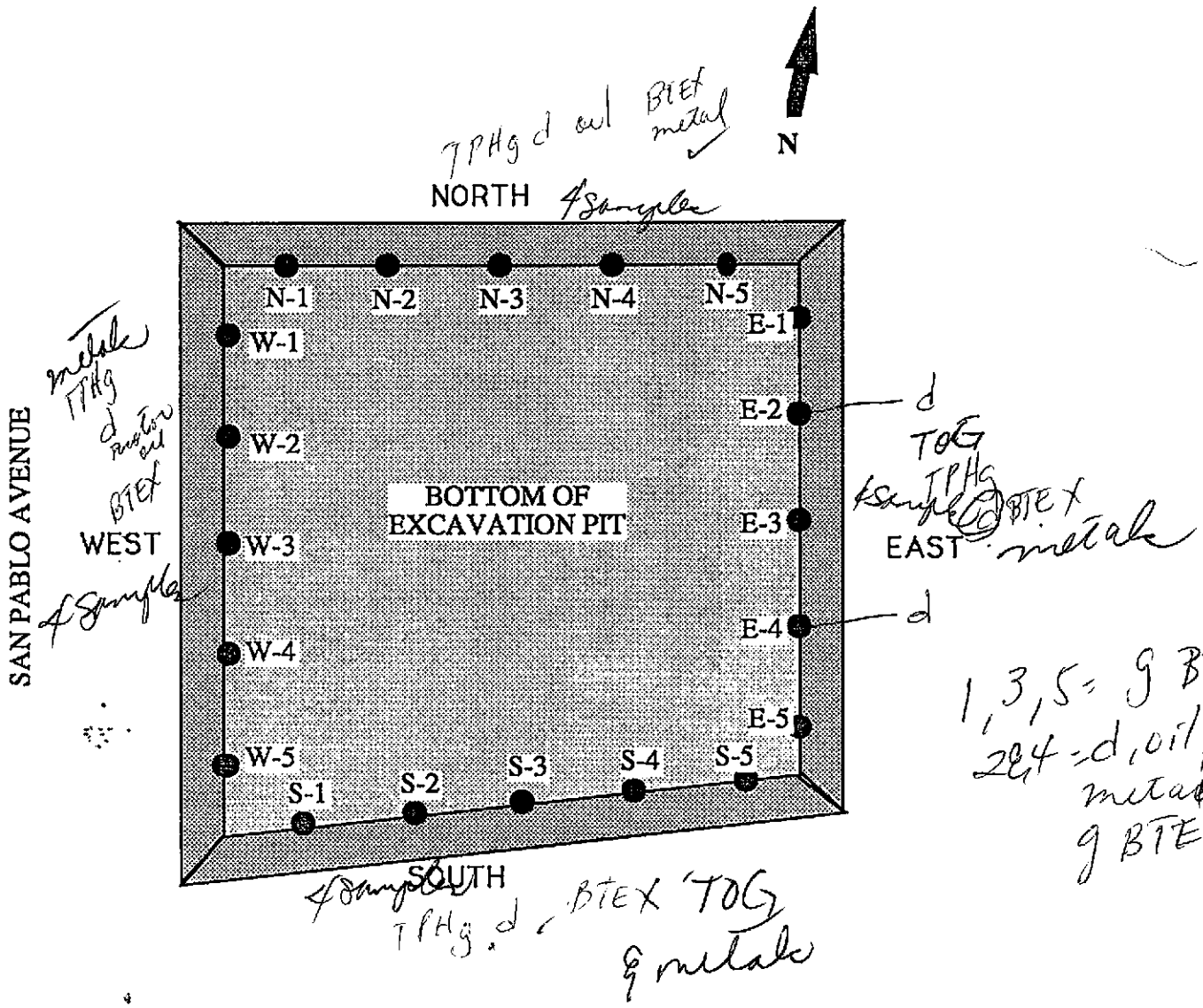


FIGURE 5

ILLUSTRATION OF SAMPLING LOCATIONS IN THE EXCAVATION PIT

(no scale)

APPENDIX A
SITE HEALTH AND SAFETY PLAN

FORM HS-507
SITE SAFETY PLAN
FIELD INVESTIGATION OF UNDERGROUND FUEL SPILLS

ADMINISTRATIVE INFORMATION

Project Number 941114NA-1000 **Project Name** 40th St. VST

Project Manager Xinggang Tong **Operating Unit** Oakland

Site Safety Officer Xinggang Tong **Health & Safety Officer** Tanya Pawley

Date of Issue 6/3/94 **Effective Dates** 6/6/94 - 10/94

SITE INFORMATION (attach map of site)

Location: 40th Street between San Pablo Ave and Adeline St., Emeryville, CA.

Pertinent History: Gas Station. All underground storage tanks have been removed.

Material(s) Spilled: TPH - Gasoline & diesel & Waste Oil

FIELD ACTIVITIES

1) Monitoring Well Installation
2) Sampling
3) Oversite of Soil Excavation

EMERGENCY TELEPHONE NUMBERS

Fire Department	911
Ambulance	911
Hospital	510-204-4444
Project Manager	510-874-3060
Health & Safety Officer	510-874-3146

FORM HS-507
SITE SAFETY PLAN
FIELD INVESTIGATION OF UNDERGROUND FUEL SPILLS, CONCLUDED

HOSPITAL INFORMATION

Name: Alta Bates Hospital

Address: 2450 Ashby Ave

Route: From the site, take San Pablo Ave south to Ashby, turn left, hospital is on

AUTHORIZED FIELD PERSONNEL

Mike Sartor

Clifford Chan

Mike McGuire

NAME OF SUBCONTRACTORS (field work)

Name: _____ **Telephone Number:** _____

Address: Excavation subcontractors must provide own safety plan

Authorized Representatives: _____

Name: _____ **Telephone Number:** _____

Address: _____

Authorized Representative: _____

APPROVALS

_____ _____

Project Manager **Date**

J. K. Pe

_____ _____

Health & Safety Officer **Date**

_____ _____

Corporate Health & Safety Officer* **Date**

*Signature required only for modified plans.

March 1992

OPERATING PROCEDURE NO. HS-507

507.0 PROCEDURES FOR FIELD INVESTIGATIONS OF UNDERGROUND SPILLS OF GASOLINE AND OTHER PETROLEUM DISTILLATE FUELS

507.1 PURPOSE

The purpose of this procedure is to establish sound and uniform health and safety procedures and guidelines for field operations associated with investigations of leakage of petroleum hydrocarbon fuels from underground storage tanks and pipes.

507.2 SCOPE

This procedure identifies the types of fuels and field activities to which it applies, assesses the hazards of fuels, and describes risk control measures.

507.3 APPLICABILITY

This procedure applies to: (1) collection of samples of surface and subsurface soil, (2) construction, completion, testing, and abandonment of groundwater monitoring wells, (3) collection of water samples from new and existing wells, and observing removal of underground fuel pipes and storage tanks at facilities that currently dispense or store:

(1) leaded gasoline
(2) unleaded gasoline,
(3) gasohol,
(4) Numbers 1, 1D (diesel), 2, 2D (diesel), 4, 5, or 6 fuel oils,
(5) jet A, jet A-1, jet B, JP-1, JP-3, JP-4, and JP-5 jet fuels,
(6) crankcase oil,
(7) methanol (when used as a motor fuel), and/or
(8) stoddard solvent.

This procedure shall not be used for confined space entry or for installing or operating pilot and full-scale fuel recovery systems. This plan may be used for the installation of vapor extraction systems only by appropriate modification and proper health and safety approvals. This plan may not be used for the start-up or operation of vapor extraction systems. It is also not applicable to field work performed at refineries, sites where spills of chemicals other than the substances listed above have occurred, sites of unusual hazard, and any other site or activity for which the use of this plan is identified as inappropriate by the operating unit HSO.

This plan is applicable to work involving the removal of underground fuel pipes and storage tanks only when used with and attached to the American Petroleum Institute API Recommended Practice 1604, Second Ed. 1987 as revised March 6, 1989, Removal and Disposal of Used Underground Petroleum Storage Tanks.

This plan is applicable to work involving boring with power equipment only when used with and attached to Woodward-Clyde Operating Procedure HS-509, Safety Guidelines For Drilling Into Soil and Rocks.

This plan is applicable to work involving entry into excavations by Woodward-Clyde or Woodward-Clyde subcontractor personnel only when used with and attached to Woodward-Clyde Operating Procedure HS-510, Safety Procedures for Trench Construction and Other Excavating Operations.

507.4 RESPONSIBILITY AND AUTHORITY

The Project Manager has overall responsibility for safe conduct of all field work, including ensuring full implementation of this procedure by the site manager, project staff and subcontractors assisting with field work. The PM shall assign (with the concurrence of the operating unit HSO or HSC) a Site Safety Officer (SSO) to attend to day-to-day health and safety matters in the field. The PM may elect, if qualified, to serve as SSO. The SSO must be on-site whenever work by employees of WC or its subcontractors is being performed at the site.

Both the PM and SSO are authorized to suspend work when working conditions become too hazardous and are authorized to remove from the site any WC and subcontractor employee whose conduct endangers the health and safety of the employee or of others.

507.5 HAZARD EVALUATION

Petroleum distillate fuels are mixtures of aliphatic and aromatic hydrocarbons, the constituent concentrations of which can vary significantly dependent upon the crude feedstock, refining process, and seasonal variations. The predominant types of compounds in fuels are paraffins (e.g., pentane, hexane), naphthenes (e.g., cyclohexane) and aromatics (e.g., benzene, toluene, polynuclear aromatics). Gasoline contains about 80 percent paraffins, 6 percent naphthenes, and 14 percent aromatics. JP-1 and 4 contain up to 48 percent paraffin, 38 percent naphthenes, and 20 percent aromatics. Fuel oils and certain jet fuels (JP-3 and 5) contain about 10 percent paraffin, up to 23 percent naphthenes, and up to 78 percent non-volatile aromatic hydrocarbons. Gasohol is gasoline containing 10 to 40 percent ethyl alcohol. Methanol as it is used as a motor fuel typically contains up to 20% gasoline to improve cold starting characteristics as a safety factor to provide a visible flame. To improve their burning properties, compounds such as tetraethyl-lead, methyl tertbutyl ether (MTBE) and ethylene dibromide (EDB) are often added to automotive and aviation fuels.

Petroleum distillate fuels exhibit relatively low acute inhalation and dermal toxicity. Concentrations of 160 to 270 ppm gasoline vapor have been reported to cause eye, nose, and throat irritation in people after several hours of exposure. Levels of 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, kerosene, 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. Methanol can be toxic by either skin or inhalation exposure, and is unique in that it attacks the optic nerve. Methanol blindness can be irreversible.

Ingestion of 10 to 15 grams (2 to 3 teaspoons) of gasoline has caused death in children. In adults, ingestion of 20 to 50 grams may produce severe symptoms of poisoning. The most dangerous aspect of ingestion of these motor fuels is the development of chemical pneumonia from the aspiration of gasoline or other fuels are aspirated into the lungs.

Aspiration of very small quantities of these motor fuels into the lungs is often fatal. Some gasoline additives, such as ethylene dichloride, ethylene dibromide, and tetraethyl- and tetramethyl-lead are highly toxic materials; however, their concentrations in gasoline are so low that their contribution to the overall toxicity of gasoline is negligible in most instances.

Petroleum distillate fuels are flammable. Under certain conditions, this property presents a greater risk than toxicity. Six of the fuels covered by this procedure are classified by the Federal Department of Transportation as flammable liquids as all six typically have flash points of 100 degrees F or less. 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).

507.6 HEALTH AND SAFETY CLEARANCE

WC employees as well as subcontractor employees assigned to perform field activities covered by this procedure must be currently approved for hazardous waste field work, including:

Current medical clearance to conduct hazardous waste field work and to wear a respirator;

Successful completion of a respirator fit test within the last 12 months for the make and model of the respirator assigned to that individual for use at that site;

Completion of training as required by 29 CFR 1910.120(e), including either:

40 hours of hazardous waste worker basic instruction within the last 12 months, or,

8 hours of hazardous waste worker refresher training within the last 12 months, subsequent to completion of 40 hours of basic hazardous waste worker training.

507.7 HEALTH AND SAFETY BRIEFING

Before field work begins, all field personnel, including subcontractor employees, must be briefed on their work assignments and the provisions of this procedure, and each person briefed must be given a copy of this document and each must acknowledge receipt and willingness to comply by submitting a signed safety compliance agreement to the WC Project Manager. Individuals refusing to sign the agreement will be prohibited from working at the site.

507.8 PERSONAL PROTECTIVE EQUIPMENT

Equipment listed below must be available on-site in appropriate sizes for use when needed.

1. NIOSH approved full- or half-face respirator with organic vapor cartridges. Respirators must be worn when airborne hydrocarbon action levels are reached or exceeded.

2. Saranex or polyethylene coated Tyvek coveralls. Coated coveralls must be worn when product quantities of fuel are encountered and when fuel-saturated soil is handled.

3. Safety goggles or glasses. Must be worn when working within 10 feet of operating heavy equipment (e.g., drill rig, backhoe). Must be splash-proof when handling concentrated fuel product.

4. Nitrile or neoprene gloves for all fuels except methanol. Workers handling methanol must wear butyl gloves. Gloves must be worn when handling contaminated soil or water or drilling or digging into contaminated soil. Confirm with your HSO the applicability of model and brand of gloves!

5. Neoprene or butyl rubber safety boots, calf-length. Must be worn when walking on obviously contaminated soil and when working within 10 feet of operating heavy equipment.

6. Hardhat. Must be worn when working within 10 feet of operating heavy equipment.

507.9 ORGANIC VAPOR MONITORING

507.9.1 Monitoring Instruments

Two instruments are required for this work:

1) Combustible Gas/Oxygen indicator (CGI/O_2) with readout in %LEL and $\%O_2$.

2) Photoionization (PID) field survey instrument (HNU, ThermoEnvironmental 580A, Photovac Microtip, or equivalent)*, or, Flame-ionization (FID) field survey instrument (Foxboro OVA or equivalent).

*PID instruments cannot readily detect methanol, and therefore may NOT be used on sites where methanol is or may be encountered.

507.9.2 Toxicity Action Levels

The toxicity action levels given below are set to comply with OSHA Permissible Exposure Levels and ACGIH Threshold Limit Values. Some of the more volatile motor fuels also contain some concentration of benzene. Gasoline averages approximately 1% benzene. Therefore, for motor fuels which may contain benzene, the action levels specified below are also set to comply with the proposed TLV of 0.1 ppm. These action levels are also adjusted for the relative response of common PID or FID instruments to motor fuel vapors.

Respirators must be worn when meter readings averaged over 10 minutes equal or exceed the action level for upgrade to Level C PPE. Workers must be evacuated from the area when organic vapor concentrations exceeding respiratory protective equipment protection factors are encountered.

507.9.2.1 Toxicity Action Levels for Gasoline and Jet B

TOXICITY ACTION LEVELS
GASOLINE AND JET B
(in PPM indicated)

Instrument	Calibration Gas	Action Upgrade to Level C	Evacuate
Photoionization meter# (10.0 to 10.2 eV lamp)	H.Nu calibration gas* or Benzene	2	60** 300***
Photoionization meter (10.0 to 10.2 eV lamp)	Isobutylene	3.3	100** 500***
Flame-ionization meter (OVA-128)	Methane	10	300** 1500***

Photoionization instruments do not work and shall not be used for work in high (<90%) humidity or rainy weather, or sites where methanol is or may be present.

* Although the calibration gas purchased from HNU is isobutylene, the concentration identified on the cylinder for calibration of an HNU with 10.2 eV lamps is a benzene equivalent.

** for workers wearing 1/2 face respirators.

*** for workers wearing full face respirators.

507.9.2.2 Toxicity Action Levels for Fuels other than Gasoline and Jet B

TOXICITY ACTION LEVELS
FUELS OTHER THAN GASOLINE, METHANOL AND JET B
(in PPM indicated)

Instrument	Calibration Gas	Action Upgrade to Level C	Evacuate
Photoionization meter# (10.0 to 10.2 eV lamp)	H.Nu calibration gas* or Benzene	20	60** 300***
Photoionization meter (10.0 to 10.2 eV lamp)	Isobutylene	33	100** 500***
Flame-ionization meter (OVA-128)	Methane	99	300** 1500***

Photoionization instruments do not work and shall not be used for work in high (<90%) humidity or rainy weather.

* Although the calibration gas purchased from H.Nu is isobutylene, the concentration identified on the cylinder for calibration of H.Nu's with 10.2 eV lamps is a benzene equivalent.

** for workers wearing 1/2 face respirators.

*** for workers wearing full face respirators.

All instruments shall be calibrated both immediately prior to commencing the day's field work and after work ceases for the day. Calibration and monitoring records shall be kept in the project file and provided to the operating unit HSO. Records shall include:

Worker's name,
Date,
Time,
Location,
Temperature and humidity, and
Calibration gas identity and concentration.
Exposure data (time, location, and concentration)

507.9.3 Explosion Hazard Action Levels

The explosivity action levels below are set to prevent the creation of flammable or explosive atmospheres. Measurements should be taken at all locations where personnel are present or power/hand tools are in use.

EXPLOSIVITY ACTION LEVELS
(% of the LEL)

Instrument	Calibration Gas	Action Level (Evacuate)
Combustible Gas Indicator	hexane	20%
Combustible Gas Indicator	methane	20%

The CGI alarm must be set to sound at the action level. For this work it is highly recommended that hexane be used as the calibration gas.

When measurements with a combustible gas indicator (CGI) indicate the presence of combustible gas levels equal to or exceeding the explosivity action level in the work area, the following action must be taken:

1. Extinguish all possible ignition sources in the work area and shut down all powered equipment.

2. Move personnel at least 100 feet away from work area.

3. Contact Health and Safety Officer (HSO).

4. At the instruction of the HSO and after waiting 5 minutes for organic vapors to dissipate, the SSO or PM may use the CGI to cautiously and with prudence approach the worksite to determine the extent and concentration of organic emissions. The SSO or PM shall not enter any area where CGI readings exceed the explosivity action level, nor shall the SSO or PM make any approach if there is possibility of fire or explosion.

5. Personnel may reenter the work area only by clearance of the HSO after the cause of the emission has been determined and the source abated.

6. Prepare incident report and submit to HSO.

507.9.4 Monitoring Guidelines

Personnel exposure monitoring should be performed as often as necessary and wherever necessary to protect field personnel from hazardous concentrations of organic vapors. Monitoring must be performed by individuals trained in the calibration, use and care of the required instruments.

Toxicity action levels are considerably lower then explosivity action levels. Therefore initial and periodic monitoring should be conducted with the PID or FID. Monitoring shall be conducted in the worker's breathing zone, which is a 1 foot diameter sphere surrounding the worker's head. The alarm on this instrument should be set to sound at the action level. If vapors are measured continuously and the instrument must be unattended, the detector inlet should be located as close to the worker's breathing zone as possible. Decisions regarding respirator use should be based on breathing zone vapor concentrations of personnel expected to have the greatest exposures. Particular effort should be made to monitor personnel exposures while trenching, boring or tank inerting is progressing.

Explosivity monitoring should be continuous, with the detector set at a location near and downwind of the source of emission. Additional monitoring with the CGI should be

performed when organic vapor concentrations exceed the ppm range of the PID or FID instrument. If the alarm sounds while continuously monitoring with a CGI, initiate shut-down and evacuation procedures immediately.

507.10 AREA CONTROL

Access to hazardous and potentially hazardous areas of spill sites must be controlled to reduce the probability of occurrence of physical injury and chemical exposure of field personnel, visitors, and the public. A hazardous or potentially hazardous area includes any area where (1) field personnel are required to wear respirators, (2) borings are being drilled with powered augers, or (3) excavating operations with heavy equipment are being performed.

The boundaries of hazardous and potentially hazardous areas must be identified by cordons, barricades, or emergency traffic cones or posts, depending on conditions. If such areas are left unattended, signs warning of the danger and forbidding entry must be placed around the perimeter if the areas are accessible to the public. Trenches and other large holes must be guarded with wooden or metal barricades spaced no further than 20 feet apart and connected with yellow or yellow and black nylon tape not less than 3/4-inches wide. The barricades must be placed no less than two feet from the edge of the excavation or hole.

Entry of hazardous areas shall be limited to individuals who must work in those areas. Unofficial visitors must not be permitted to enter hazardous areas while work in those areas is in progress. Official visitors should be discouraged from entering hazardous areas, but may be allowed to enter only if they agree to abide by the provisions of this document, follow orders issued by the site safety officer, and are informed of the potential dangers that could be encountered in the areas.

507.11 DECONTAMINATION

Field decontamination of personnel and equipment is not required except when contamination is obvious (visually or by odor). Recommended decontamination procedures follow.

507.11.1 Personnel Decontamination

Gasoline, kerosene, jet fuel, and gasohol should be removed from skin using a mild detergent and water. Hot water is more effective than cold. Liquid dishwashing detergent is more effective than hand soap.

507.11.2 Equipment Decontamination

Gloves, respirators, hardhats, boots and goggles should be cleaned as described under personnel; however, if boots do not become clean after washing with detergent and water, wash them with a strong solution of trisodium phosphate and hot water.

Sampling equipment, augers, vehicle undercarriages, and tires should be steam or high pressure washer cleaned. The steam cleaner is a convenient source of hot water for personnel and protective equipment cleaning.

507.12 SMOKING

Smoking and open flames are strictly prohibited at sites under investigation.

507.13 INERTING OF TANKS

Whenever WC personnel must be present during removal or transport of fuel storage tanks, the SSO or designee must determine whether or not the procedures to be used by the firm responsible for tank removal/transport agree with API Recommended Practice 1604, Second Ed. 1987 as revised March 6, 1989, Removal and Disposal of Used Underground Petroleum Storage Tanks. If the firm's procedures, especially those addressing removal/inactivation of flammable vapors, disagree substantially with API's procedures, the PM and HSO must be notified immediately (by telephone, if possible). In turn, the PM shall inform the client that WC personnel will not report to the site during tank/removal operations unless proper procedures are used. If the firm responsible for tank removal/transport is under subcontract to WC, the WC project manager shall require the subcontractor to follow API procedures.

OPERATING PROCEDURE NO. HS-203

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.

OPERATING PROCEDURE NO. HS-204

204.0 SAFETY PROCEDURES FOR TRENCH CONSTRUCTION AND OTHER EXCAVATING OPERATIONS

204.1 PURPOSE

This procedure contains an overview of the safety requirements for excavating and trenching operations. The requirements are consistent with standards established by the Occupational Safety and Health Administration (OSHA) and described in Title 29 Code of Federal Regulations (CFR) 1926.650. The detailed OSHA standard was effective in January 1990 and should be consulted before design of a shoring system, with questions regarding sloping options, or before working as a "competent person" on an excavation site.

204.2 RESPONSIBILITY

The responsibility and authority for excavating and trenching safety must be well defined prior to project start-up. In general, the contractor will assume responsibility for excavation safety and Woodward-Clyde (W-C) will maintain safety responsibility and authority only for W-C and W-C subcontractor employees. W-C employees will not serve in the OSHA defined role of "competent person" unless specifically defined in the project scope of work and approved by the Project Manager (PM) and Management Oversight Reviewer (MOR). The PM shall ensure that the W-C field staff clearly understands the limitation of their excavation safety responsibilities and authorities.

W-C employees are responsible for understanding the general excavation safety requirements and for not entering improper trenches or excavations.

204.3 APPLICABILITY

This procedure is applicable to all W-C projects in which trenching or other excavating operations, exclusive of borings, are entered by W-C personnel or personnel employed by firms under contract to W-C. It is also applicable to W-C projects requiring W-C personnel

or personnel of firms under contract to W-C to enter trenches and other types of excavations.

The best approach for avoiding the detailed trenching requirements is to perform sampling and other procedures without entry into excavations. Use of a backhoe to bring up samples, use of long-handled sampling devices, and similar techniques are recommended.

204.4 REQUIREMENTS

204.4.1 Preliminary Requirements

Certain government agencies (e.g. California) require a permit to perform excavation operations.

Before digging, determine or have the client determine if underground installations, such as sewer, water, fuel, or electrical lines are to be encountered, and if so, determine the exact locations of the lines. Information can be obtained by contacting Underground Service Alert (consult local telephone directory for toll-free number), local utility companies, and the owner of the property on which excavating operations are planned.

Trees, boulders, and other surface encumbrances, located so as to pose a potential hazard to employees must be removed or made safe before the operation begins.

204.4.2 Placement of Excavated Materials

Excavated materials must be placed at least two feet back from the edge of the excavation and precautions must be taken to prevent the materials from falling into the excavation.

204.4.3 Working in Excavations

Shoring and Sloping

Except for solid rock, trenches in which personnel are required to work must be shored or sloped if the depth of the excavation is five (5) feet or more. When a shoring system is used, it shall consist of hydraulic shores or the equivalent, with sheathing or sheet piling as needed. Trench boxes are also permitted. OSHA uses a soil classification system to determine the allowable slopes for trenches. The shoring system must be properly designed and installed to sustain all existing and expected loads. For details on shoring and sloping requirements, consult Title 29 CFR, Subpart P, Sections 1926.650 to 1926.653 (attached).

Access

When work is to be performed in any excavation, safe access to the excavation must be provided by means of ladders, stairs, or ramps. Trenches four or more feet deep must have ladders spaced no less than 25 feet apart, and the ladders must extend at least three feet above grade.

Hazardous Atmospheres

At sites where oxygen deficiency or hazardous concentrations of flammable or toxic vapors or gases may be encountered in excavations, the atmosphere in the excavations must be tested by the site safety officer or other qualified person before work in an excavation begins and at appropriate intervals afterward. Trenches may be classified as confined spaces and require an entry permit as covered in HS-205, Confined Space Entry.

204.4.4 Inspection of Excavation

Excavations must be observed daily by the "competent person". If evidence for potential cave-ins or slides is apparent, all work in the excavation must be suspended until necessary steps have been taken to safeguard employees.

204.4.5 Operations of Vehicles Near Excavations

When vehicles or heavy equipment must operate near an excavation, the sides of the excavation must be shored or braced as necessary to withstand forces exerted by the superimposed load and the earth pressure. Stop logs or other types of secure barriers must be installed at the edges of the excavations.

204.4.6 Bell-Bottom Pier Holes

Employees entering drilled pier holes must be protected by a casing proportioned to sustain the maximum stresses imposed by earth and water or slurry that extends the full depth of the shaft and to the bottom of the bell. A safety cage or a shoulder harness secured to a full-time tended lifeline shall be required for entry and exit. Air monitoring and related requirements of HS-205, Confined Space entry, shall be followed.

204.4.7 Bridges and Walkways

Walkways or bridges with standard guardrails must be provided where employees or equipment are required or permitted to cross over excavations. Pedestrian walkways shall be of sufficient strength to permit a vertical deflection of no more than 0.5 inch when a 250-pound weight is applied to the center of the walkway. All bridges intended for vehicular traffic must be constructed to withstand twice the load of the heaviest vehicle expected.

204.4.8 Barricades and Fences

Excavated areas must be completely guarded on all sides with barricades or fences, as appropriate. If barricades are used, they must be spaced no more than 20 feet apart and

shall not be less than 35 inches high when erected. A yellow or yellow and black tape, at least 0.75 inches wide, shall be stretched between the barricades.

204.4.9 Backfilling

Excavated areas must be backfilled in accordance with the work plan as soon as practical after work is completed, and all associated equipment must be removed from the area.

204.5 EXCAVATIONS NEXT TO EXISTING STRUCTURES

A registered engineer will review all plans for excavations next to existing structures to avoid undermining the structures and possible collapse.

SAFETY AND HEALTH PROTECTION ON THE JOB

CAL OSHA

State of California
Department of Industrial Relations

The California Occupational Safety and Health Act of 1973 provides job safety and health protection for workers. The Department of Industrial Relations has primary responsibility for administering the Cal/OSHA program. Job safety and health standards are promulgated by the Occupational Safety and Health Standards Board. Employers and employees are required to comply with these standards. Enforcement is carried out by the Division of Occupational Safety and Health within the Department of Industrial Relations.

EMPLOYERS AND EMPLOYEES

California law requires every employer to provide employment and a place of employment which are safe and healthful for the employees therein. Employers and employees are required to comply with the occupational safety and health standards contained in Title 8 of the California Code of Regulations and all rules, regulations and orders pursuant to Division 5 of the California Labor Code which are applicable to their employment and actions on the job.

COMPLIANCE WITH JOB SAFETY AND HEALTH REQUIREMENTS

To ensure compliance with State job safety and health requirements, the Division of Occupational Safety and Health conducts periodic jobsite inspections. The inspections are made by trained safety engineers and industrial hygienists.

The law provides that an authorized representative of the employer and a representative of the employees be given an opportunity to accompany the safety engineer/industrial hygienist for the purpose of aiding the inspection. Where there is no authorized employee representative, the safety engineer/industrial hygienist talks with a reasonable number of employees about the safety and health conditions in the workplace.

Every employee has the right to bring unsafe or unhealthful conditions to the attention of the safety engineer/industrial hygienist making the inspection. In addition, any employee who believes unsafe or unhealthful conditions exist at the worksite has the right to notify the Division of Occupational Safety and Health. The Division upon request will withhold the names of employees who submit or make statements during an inspection or investigation.

If the Division of Occupational Safety and Health believes that an employer has violated a safety and health standard or order, it issues a citation to the employer. Each citation specifies a date by which the alleged violation must be corrected. The law provides for mandatory penalties against employers of up to $2,000 for each serious violation and for optional penalties of up to $1,000 for each general violation. Penalties of up to $2,000 per day may be proposed for failure to correct serious violations and up to $1,000 per day may be proposed for failure to correct general violations by the abatement date. Also any employer who willfully or repeatedly violates any occupational safety and health standard or order may be assessed civil penalties of not more than $20,000 for serious violations and $10,000 for general violations.

A willful violation that causes death or permanent impairment of the body of any employee results, upon conviction, in a fine of not more than $10,000 or imprisonment of not more than six months, or both. A second conviction, after a first conviction, doubles these maximum penalties.

While governmental entities may be cited on the same basis as other employers, and abatement dates set, civil penalties will not be assessed.

An employer who receives a citation, Order to Take Special Action or Special Order must post it prominently at or near the place of the violation for three working days, or until the unsafe condition is corrected, whichever is longer, to warn employees of danger that may exist there. Any employee may protest the time allowed for correction of the violation.

COMPLAINTS

Employees or their representatives who believe unsafe or unhealthful conditions exist in their workplace have the right to file a complaint with any office of the Division of Occupational Safety and Health and thereby to request an inspection. The Division keeps confidential the names of complainants unless they request otherwise.

An employee may not be fired or punished in any way for filing a complaint about unsafe or unhealthful working conditions or using any other right given to employees by the Cal/OSHA law. An employee of a private employer who believes that he/she has been fired or punished for exercising such rights may file a complaint about this discrimination with the nearest office of the Department of Industrial Relations - Division of Labor Standards Enforcement (State Labor Commissioner) or with the San Francisco office of the U.S. Department of Labor, Occupational Safety and Health Administration. Employees of state or local government agencies may file discrimination complaints only with the State Labor Commissioner. Consult your local telephone directory for the office nearest you.

OTHER EMPLOYEE RIGHTS

Any employee has the right to refuse to perform work which would violate the Cal/OSHA Act or any occupational safety or health standard or order where such violation would create a real and apparent hazard to the employee or other employees.

Employers who use any substance listed as a hazardous substance in Section 339 of Title 8 of the California Code of Regulations or subject to the Federal Hazard Communication Standard (29 CFRS 1910.1200) must provide employees with information on the contents of material safety data sheets (MSDS) or equivalent information about the substance which trains employees to use the substance safely.

Employers shall make available on a timely and reasonable basis a material safety data sheet on each hazardous substance in the workplace upon request of an employee collective bargaining representative, or an employee's physician.

Employees have the right to see and copy their medical records and accurate records of employee exposure to potentially toxic materials or harmful physical agents.

Any employee has the right to observe monitoring or measuring of employee exposure to hazards conducted pursuant to Cal/OSHA standards. Employers must tell their employees when they are being, or have been, exposed to concentrations of harmful substances higher than the exposure limits allowed by Cal/OSHA standards, and the corrective action being taken.

For information and assistance, contact the nearest office of the Division of Occupational Safety and Health. See addresses below.

The law requires each employer in California to post this poster conspicuously in each workplace.

CONSULTATION SERVICE

In order to encourage voluntary compliance, Cal/OSHA provides free, upon request, a full range of occupational safety and health consulting services. The Cal/OSHA Consultation Service is separate from Cal/OSHA enforcement activities.

OFFICES OF THE DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

HEADQUARTERS: 395 Oyster Point Blvd. So. San Francisco 94080

Regional Offices

Anaheim	2100 E. Katella Ave., Room 125, 92806	(714) 939-8611
Los Angeles*	6150 Van Nuys Blvd., Ste. 310, Van Nuys, 91401	(818) 901-5421
Sacramento*	2422 Arden Way, Suite B-53, 95825	(916) 920-6127
San Francisco	455 Golden Gate Ave., Room 1171, 94102	(415) 557-8640
Van Nuys	6150 Van Nuys Blvd., Suite 405, 91401	(818) 901-5403
Ventura	1655 Mesa Verde, 93003	(805) 654-4581
Vernon*	11980 Telegraph Rd., Ste. 102,Santa Fe Spgs. 90670	(213) 944-7676

District Offices

Anaheim	2100 E. Katella Ave., Room 140, 92806	(714) 939-0145
Bakersfield	4800 Stockdale Highway, Suite 212, 93309	(805) 395-2718
Concord	1465 Enea Circle, Bldg. E, Suite 900, 94520	(415) 676-5333
Covina	1123 So. Parkview, Suite 100, 91724	(818) 966-1166
Fresno	2550 Mariposa St., Room 4000, 93721	(209) 445-5302
Long Beach	401 E. Ocean Blvd., Room, 400, 90802	(213) 590-5035
Los Angeles	3550 West Sixth St., Room 431, 90020	(213) 736-3041
Modesto	1209 Woodrow Ave., Suite C-4, 95350	(209) 576-6260
Oakland	7700 Edgewater Dr., Suite 125, 94621	(415) 568-8602
Redding	381 Hemsted Drive, 96002	(916) 224-4743
Sacramento*	2422 Arden Way, Suite B-55, 95825	(916) 920-6123
San Bernardino	303 West Third St., Room 640, 92401	(714) 383-4321
San Diego	7807 Convoy Court, Suite 140, 92111	(619) 237-7325
San Francisco	455 Golden Gate Ave., Room 1193, 94102	(415) 557-1677
San Jose*	100 Paseo De San Antonio, Suite 101, 95113	(408) 277-1260
San Mateo	1900 So. Norfolk St., Suite 215, 94403	(415) 573-3812
Santa Fe Spgs*	11980 Telegraph Rd., Suite 102, 90670	(213) 944-7676
Santa Rosa	50 "D" St., Suite 430, 95404	(707) 576-2388

Field Offices

Chico	555 Rio Lindo, Suite A, 95926	(916) 895-4761
Eureka	619 Second St., Room 109, 95501	(707) 445-6611
Salinas	1164 Monroe St., Suite 1, 93906	(408) 443-3050
Stockton	31 E. Channel St., Room 418, 95202	(209) 948-7762
Ukiah	620 Kings Court, Suite 5, 95482	(707) 463-4783

* Denotes temporary location.

CAL/OSHA CONSULTATION SERVICE

Headquarters: 395 Oyster Pt. Blvd., 3rd Fl., So.San Francisco, 94080 (415) 737-2843

Area Offices

Downey	8535 E. Florence Ave., Suite 200, 90240	(213) 861-9993
Fresno	1901 N. Gateway, Suite 102, 93727	(209) 454-1295
Sacramento*	2424 Arden Way, Suite D-90, 95825	(916) 920-6131
San Diego*	7807 Convoy Court, Suite 140, 92111	(619) 279-3771
San Mateo	3 Waters Park Drive, Suite 230, 94403	(415) 557-1715

Persons wishing to register a complaint alleging inadequacy in the administration of the California Occupational Safety and Health Plan may do so by contacting the San Francisco Regional Office of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor (Tel. 415/744-6670). OSHA monitors the operation of State plans to assure that continued approval is merited.

TO ALL EMPLOYERS OF CALIFORNIA EMPLOYEES: Section 6408(a) of the California Labor Code requires that information shall be posted regarding protections and obligations of employers under the occupational safety and health laws. This poster meets that requirement and must be prominently posted in all places of employment in the state of California. Section 6431 of the California Labor Code provides that any employer who violates any of the posting requirements of Section 6408 of the California Labor Code shall be assessed a civil penalty of up to one thousand dollars ($1,000) for each violation.

DECEMBER 1989

JOB SAFETY & HEALTH PROTECTION

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

Employers

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

Employees

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

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

Inspection

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

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

Complaint

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

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

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

Citation

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

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

Proposed Penalty

The Act provides for mandatory penalties against employers of up to $1,000 for each serious violation and for optional penalties of up to $1,000 for each nonserious violation. Penalties of up to $1,000 per day may be proposed for failure to correct violations within the proposed time period. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to $10,000 for each such violation.

Criminal penalties are also provided for in the Act. Any willful violation resulting in death of an employee, upon conviction, is punishable by a fine of not more than $10,000, or by imprisonment for not more than six months, or by both. Conviction of an employer after a first conviction doubles these maximum penalties.

Voluntary Activity

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

Such voluntary action should initially focus on the identification and elimination of hazards that could cause death, injury, or illness to employees and supervisors. There are many public and private organizations that can provide information and assistance in this effort, if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free consultative assistance, without citation or penalty, is available to employers, on request, through OSHA supported programs in most State departments of labor or health.

More Information

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

Atlanta, Georgia
Boston, Massachusetts
Chicago, Illinois
Dallas, Texas
Denver, Colorado
Kansas City, Missouri
New York, New York
Philadelphia, Pennsylvania
San Francisco, California
Seattle, Washington

Telephone numbers for these offices, and additional area office locations, are listed in the telephone directory under the United States Department of Labor in the United States Government listing.

Washington, D.C.
1985
OSHA 2203

William E. Brock, Secretary of Labor

U.S. Department of Labor
Occupational Safety and Health Administration

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

WARNING

THE CALIFORNIA STATE SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) REQUIRES PUBLIC NOTIFICATION OF THE PRESENCE OF CHEMICALS KNOWN BY THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY. COMPOUNDS LISTED BY THE GOVERNOR MAY BE PRESENT DURING THIS OPERATION.

Woodward-Clyde Consultants

AIR MONITORING DATA SHEET

Site or Project Name _____ Project No. _____ Date: _____

Person(s) Collecting Data _____

General Operation and Location at Site _____

Instrument Type, Make, Model _____

Instrument Serial or ID No. _____ Battery Check Results _____

Date of Last Calibration or Check _____ Date of Last Service _____

Contaminant(s) Suspected _____

	Specific Location	Specific Operation or Work Phase	Employee Name If Breathing Zone Monitored	Time	Reading	Comments (e.g., duration, causation of reading)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

General Comments: _____

Signature of Person Responsible for Data: _____ Date Signed _____

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

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)

APPENDIX B
SOIL EXCAVATION AND BACKFILLING PLAN

B.1.0 INTRODUCTION

Woodward-Clyde Consultants (WCC) has been contracted by the City of Emeryville Redevelopment Agency (Agency) to perform excavation and disposal of petroleum hydrocarbon-affected soil and backfilling with imported clean soil at the site of Celis Alliance Fuel Station (Site) located at 4000 San Pablo Avenue in Emeryville, California. The Site is within the planned extension of 40th Street Right-of-Way of the section between San Pablo Avenue and Adeline Street. This plan has been prepared to guide field operation activities and for the approval of Alameda County Health Care Services Agency (ACHA), and the Regional Water Quality Control Board (RWQCB) — San Francisco Bay Region.

The following information has been presented previously in the main text of the Workplan and therefore will not be repeated here:

- Site description (Sections 1.4 and 2.0);
- Summary of results of previous site investigation (Section 2.0);
- Confirmation soil sampling and analysis in excavation area (Section 3.3.1);
- Decontamination procedures (Section 4.1);
- Report (Section 6.1);
- Site health and safety plan (Appendix A).

B.1.1 SCOPE OF WORK

The activities to be performed include the following tasks:

- Excavate and stockpile on-site petroleum hydrocarbon-affected soil from the Site. The Site occupies an area of approximately 100 feet by 100 feet. The excavation will stop above the soil/water interface, which is presently about 9 feet below ground surface (bgs);

- Collect soil samples and chemically analyze them according to the requirements of waste management facilities where the soil is to be disposed;

- Haul and dispose the stockpiled soil in a state licensed waste management facility;

- Import and place approximately 2,500 bank cubic yards of fill soil and compact the fill to a minimum of 90 percent relative compaction. The fill soil will be supplied by Catellus Development Corporation (Catellus).

B.1.2 SCHEDULE

Field operations will start within one week after receiving approval of this plan from ACHA and will be completed within 40 days after the beginning of the field work.

B.2.0 PRE-EXCAVATION ACTIVITIES

B.2.1 SUB-CONTRACTORS

Remedial Solutions Inc. (RSI) of Fremont, California, has been contracted by WCC to conduct soil excavation, disposal, and backfilling field activities. RSI's address is:

Remedial Solutions Inc.
43353 Osgood Road
Suite B
Fremont, California 94539
Phone: (510) 651-7725
Contact person: Mr. Jay Alman
California Contractor License No.: A634555

B.2.2 SITE SECURITY

The entire area of the Celis' site is the work area and will be controlled with 6-foot high chain-linked fence with one gate facing the San Pablo Avenue. Access to the work area will

be controlled and limited to those personnel required to effectively perform the various field activities.

No visitors will be allowed in the work area without the approval of the Agency and the Site Safety Officer.

B.2.3 UTILITY CLEARANCE

Underground Services Alert (USA) will be contacted at least 48 hours, but no more than 14 days, prior to the field excavation activities. In addition, a private locator will also be retained to provide underground utility clearance.

Levine-Fricke has identified the following five (5) underground utility lines beneath the Site during the tank removal process: one sanitary sewer line, one electrical line, one water line, and two unknown lines. These utility lines were hand-drawn on a site plan map. The Agency gave WCC a copy of the map for review. As recorded on the map, the electrical line has been mostly removed during the tank removal process. The Agency believes that all the five underground utility lines are solely for the Celis' site and recommended closure of these lines during the excavation. No official utility maps were available for WCC's review. Based on the Agency's recommendation, all the five identified underground lines will be properly closed. The Agency will take the responsibility if the closure of any of these utility lines would affect users of any other sites.

The identified sewer line will be properly plugged according to the City of Emeryville's specification. The East Bay Municipal Utility District (EBMUD) water line and the Pacific Gas and Electric Co. (PG&E) electrical line will be capped by the respective utilities prior to the excavation. The two unknown underground lines will be simply removed if they cannot be identified by the City of Emeryville Public Works Department, the USA subscribers, and the private utility locator.

If underground utilities other than the water, sewer, or electrical lines, are identified by the utility locator or discovered during excavation, the Agency will be notified immediately. Prior to initiating any work on the utility, appropriate utility agencies will be contacted for authorization.

B.2.4 PERMITS

The following regulatory agencies will be contacted for appropriate permit(s) prior to field activities:

- Alameda County Health Agency (ACHA) Department of Environmental Health, Division of Hazardous Materials.

  Written approval of this excavation and backfilling plan will be obtained prior to the field operations.

- State of California Department of Industrial Relations, Division of Occupational Safety and Health.

  A permit application and job notification for the excavation will be filed with the agency.

- Bay Area Air Quality Management District (BAAQMD)

  BAAQMD will be notified for the excavation, stockpiling, and backfilling activities. We believe that the BAAQMD will not require permits for the operations because soil piles will be properly lined and covered with plastic sheet. Dust will be controlled by frequently applying water to the excavation area.

- City of Emeryville

  A grading permit application will be filed with the City of Emeryville Building Department covering the excavation and backfilling operations.

- California Department of Transportation (CalTrans)

  An encroachment permit application will be filed with CalTrans District 4 for traffic coordination on the San Pablo Avenue. One north-bound lane of the San

Pablo Avenue may need to be temporarily closed during soil loading and unloading operations.

B.2.5 SOIL DISPOSAL FACILITIES

Preliminary arrangements have been made with the following waste management facilities to receive the soil to be excavated from the Site. However, both facilities have indicated that additional analyses will be required before they can accept the soil. WCC is currently negotiating specific requirements with the facilities based on the Levine-Fricke's Phase II site investigation results and the additional analytical results of soil samples collected after the tank removal.

Alta/B&J Landfill
831 Davis Street
Vacaville, California 95687
Phone (800) 794-2768

Forward Landfill
1145 West Charter Way
Stockton, California 95206
Phone (209) 466-4482

Alta/B&J landfill is a class III landfill and Forward landfill is a class II landfill. Soil will be disposed of at Alta/B&J if it is accepted by the landfill. If part of the excavated soil has contamination exceeded B&J's acceptance criteria, but within Forward's criteria, it will be disposed of at Forward landfill. In the event that some part of the soil would not be accepted by either of the landfills, other disposal alternatives would be evaluated.

B.2.6 IMPORTED FILL SOIL

Catellus will provide clean soil for backfilling. Either Catellus or the Agency will certify that the provided soil is clean (free of contamination) and is suitable as fill material for the 40th Street Right-of-Way. WCC will not perform any chemical analyses on the supplied fill material.

One hundred (100) lb of representative sample of each fill material will be supplied to WCC for determination of the maximum dry density of each fill material by ASTM test method D1557.

B.3.0 SOIL EXCAVATION AND DISPOSAL

B.3.1 AREA OF EXCAVATION

The plan is to excavate and dispose of all unsaturated (vadose zone) soil beneath the Site, subject to the safety and stability requirements of excavation. The Site is approximately 100 feet by 100 feet. Shallow groundwater level is approximately 9 feet below ground surface (bgs). Excavation will stop above the soil/water interface.

A two-story concrete warehouse building exists next to the Celis' site. We understand that this building will be demolished in the near future as part of the 40th Street Right-of-Way extension. Therefore, no specific efforts will be made during excavation to protect the building's integrity. WCC will not be responsible for any damages to the building.

The perimeter of the excavation area will be staked off prior to excavation.

B.3.2 SHORING

RSI will design and install sheet piling along the San Pablo Avenue side of the Site prior to excavation.

B.3.3 SLOPE REQUIREMENTS

For the sides that are not shored, slope will be maintained in a safe condition at all times during and after the excavation. No slopes will be steeper than one (1) horizontal to one (1) vertical. If the warehouse building next to the Site has not yet been demolished at the time the excavation starts, the excavation will stop 2 feet from the building footing on the surface and slope at no steeper than one horizontal to one vertical away from the building.

B.3.4 EXCAVATION AND DISPOSAL

When overhead power lines are close by, earth-moving equipment will not be raised unless the distance between the equipment and the nearest power line is at least 20 feet or other distance as required by local ordinances. The equipment operator or assistant will walk completely around the equipment to make sure that the proper distance exists.

Dust will be controlled by frequently applying water to the excavation area, assuming water is available on site.

The excavation will proceed in the following steps:

- Excavate half of the site first, and stockpile the excavated soil on the other half of non-excavation area;
- Collect soil samples from the soil pile for profiling according to B&J's requirements;
- Haul and dispose of the stockpiled soil to appropriate landfills;
- The excavated portion of the site will be backfilled to the specified depth;
- The backfilled area will then be covered with 10 mil visqueen plastic sheet;
- Excavate the other half of the site, and stockpile the soil on the backfilled area;
- Collect soil samples from the soil pile for profiling according to B&J's requirements;
- Haul and dispose of the stockpiled soil to appropriate landfills;
- Backfill the second half of the Site to the specified depth.

B.3.5 VOLUME ESTIMATION

The loose volume of soil excavated and disposed of will be calculated by counting the number of truck loads and the yardage of each truck load. The loose volume will then be divided by 1.3 to obtain bank volume. The calculated bank volume will be verified by measuring the actual area and depth of the excavation pit before backfilling.

B.4.0 BACKFILLING

B.4.1 PLACING AND COMPACTING FILL MATERIAL

If the base of the excavation is too wet for the type of fill material to be compacted to the specification, the base of the excavation will be lined with woven geotextile fabric prior to placing fill. WCC engineer will make on-site decision for the placement of the geotextile fabric.

Imported clean soil will be placed in uniform lifts not exceeding 8 inches in uncompacted thickness. All imported fill material will have to meet the following requirements:

- Does not contain organic material, debris, or other deleterious materials;
- Does not contain rock lumps larger than 6 inches in greatest dimension and not more than 15 percent (by weight) larger than 2-1/2 inches.
- Its plasticity index, as determined by ASTM Test Method 4318, will not exceed 20.

Before compaction begins, the fill soil will be brought to a uniform water content 1 to 3 percent over the optimum water content by either: 1) aerating the soil if it is too wet; or 2) spraying the soil with water if it is too dry. Each lift will be thoroughly mixed to ensure a uniform distribution of water content.

The fill soil will be compacted to a minimum of 90 percent relative compaction. The degree of relative compaction is defined as the ratio, expressed as a percentage, of the dry density of the fill material as compacted in the field to the maximum dry density of the same material as determined by ASTM test method D1557 in the laboratory. Each compacted lift will be field tested for compaction verification by field-nuclear probe method (ASTM D2922).

The Agency has requested approximately 2,500 bank cubic yards of backfill. This amount of fill will bring the bottom of the excavation pit to approximately 3 feet below ground surface. The Agency will be responsible for the remaining of the backfilling requirements.

B.4.2 GRADING

Since only approximately two thirds of the excavated volume will be backfilled with fill soil, the Site will be left as a 3-foot deep pit. No grading will be necessary, except that the fill soil will be spread uniformly at the bottom of the excavation pit and be compacted as specified in Section B.4.1

B.5.0 SITE CLEAN-UP

Upon completion of the project, all equipment and construction materials will be removed from the site, except that the fence and shoring will remain in place until the excavation pit is properly backfilled to surface. The Agency will be responsible for the site safety and security after WCC completes its contracted work.