PORT OF OAKLAND

Alameda County

NOV 26 2002

Environmental Health

November 13, 2002

Mr. Barney Chan
Alameda County Health Care Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-9335

read a grahne of ITSI
Regs Pro Assumed

Subject: **UST Sites Located at 1395 Middle harbor Road**
Oakland, California
Fuel Leak Case RO-0000470

Dear Mr. Chan:

Please find enclosed a work plan prepared on the behalf of the Port of Oakland by Innovative Technical Solutions, Inc. (ITSI) that addresses underground storage tank sites located at 1395 Middle Harbor Road, Oakland, California The plan was prepared to answer your questions as noted in your September 10, 2002 letter. As you review the plan, please contact the undersigned at 627-1373 or Rachel Hess at 925-946-3105 regarding any questions or clarifications.

Sincerely,

John Prall, R.G.
Associate Environmental Scientist

Enclosure Noted:

ITSI, November 2002, Additional Limited Site Characterization Work Plan for Site Closure, Former APL Underground Storage Tank sites. 1395 Middle Harbor Road, Oakland, California.

CC: Rachel Hess, ITSI
Jeff Jones, Port of Oakland

ADDITIONAL LIMITED SITE CHARACTERIZATION WORK PLAN FOR SITE CLOSURE

Former APL Underground Storage Tank Sites
1395 Middle Harbor Road
Oakland, California

EHS NOV 7'02AM 9:36

Alameda County
NOV 26 2002
Environmental Health

Prepared for:

Port of Oakland
Environmental Health and Safety Compliance Department
530 Water Street
Oakland, California 94607

Prepared by:
Innovative Technical Solutions, Inc.
7700 Edgewater Drive, Suite 306
Oakland, California 94621
Project Number 00-152.19

November 2002

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FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

mg/kg	milligrams per kilogram
mg/L	milligrams per liter
ug/L	micrograms per liter
ACHCS	Alameda County Health Care Services
Alisto	Alisto Engineering Group
APL	American President Lines
Baseline	Baseline Environmental Consulting
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
1,2-DCE	1,2-Dichloroethene
DOT	Department of Transportation
Geomatrix	Geomatrix Consultants
HVOCs	halogenated volatile organic compounds
ITSI	Innovative Technical Solutions, Inc.
LOP	Local Oversight Program
M&R	Maintenance and Repair
MTBE	methyl tertiary-butyl ether
PID	photo-ionization detector
Port	Port of Oakland
PPE	personal protective equipment
RACC	Remedial Action Completion Certificate
RBSL	Risk-Based Screening Levels
RWQCB	Regional Water Quality Control Board
SMP	Site Management Plan
STID	Site Identification
SVOCs	semi-volatile organic compounds
TCE	trichloroethene
TOG	total oil and grease
TPHd	total petroleum hydrocarbons as diesel
TPHg	total petroleum hydrocarbons as gasoline
Uribe	Uribe and Associates
USA	Underground Service Alert
USCS	Unified Soil Classification System
USTs	underground storage tanks
VC	vinyl chloride
VOCs	volatile organic compounds

1.0 INTRODUCTION

The Port of Oakland (Port) is seeking closure for nine former underground storage tanks (USTs) (EF6 through EF14) located in four different locations at the current American President Lines Terminal at 1395 Middle Harbor Road (Figures 1 and 2). USTs [redacted] were clustered near one another, as [redacted] were located near the wharf, several hundred feet from other the USTs and from each other. All of these USTs are referenced as Local Oversight Program (LOP) Site Identification (STID) No. 2485, 1395 Middle Harbor Road by the Environmental Health Department of Alameda County Health Care Services (ACHCS).

One of the tanks (EF10) was granted a Remedial Action Completion Certificate (RACC) by Alameda County in 1996, but was reopened in 1997 when site information for EF6 through EF9 and EF11 through EF14 was transferred to this single case file (ACHCS, 1996 and 1997). Subsequent correspondence between the Port and County regarding site closure included requests for and submittal of land use site maps and a Site Management Plan (SMP) for EF6 through EF9 (Uribe and Associates [Uribe], 1997). In September of 2002, a request for site status was made to ACHCS by the Port. This request resulted in a letter from ACHCS requesting additional information prior to site closure consideration (ACHCS, 2002). Innovative Technical Solutions, Inc. (ITSI), has prepared this Additional Limited Site Characterization Work Plan for Site Closure (Work Plan) based on ACHCS' letter and on behalf of the Port.

This Work Plan presents a limited site investigation to address data gaps identified by ACHCS and to provide sufficient data to support site closure. Concerns identified by ACHCS included inconsistent soil and groundwater data for the contaminants of concern, the need for an assessment of site data against the San Francisco Bay Region Regional Water Quality Control Board (RWQCB) Risk-Based Screening Levels (RBSLs), and a utilities map and receptor survey of the site area. The proposed limited investigation excludes the area around EF10 since this UST has been closed. The limited investigation will focus on the installation and sampling of borings around the three other UST locations in question.

2.0 SITE BACKGROUND

Nine USTs were removed between 1990 and 1995 from the current American President Lines (APL) Terminal located at 1395 Middle Harbor Road, Oakland, California (Figure 1). These USTs, identified as EF6 through EF14, were removed from four different locations within the current APL Terminal area (Figure 2). Earlier investigations and administrative actions customarily grouped the tanks into three groupings: (1) EF6 through EF9, (2) EF10, and (3) EF11 through EF14. USTs EF6 through EF9 were all previously co-located in a single cavity near the current APL Terminal Building (Figure 3). EF10 was a single tank located approximately 150 yards south of the EF6 through EF9 cluster (Figure 2). USTs EF11 through EF13 were aligned along the southern side of the Maintenance and Repair (M&R) Building on the APL site, and EF14 (along with a related hose and reel pit) was located approximately 150 yards south of the M&R Building, near the wharf (Figure 4). A brief summary of previous site activities is presented below. Copies of selected data tables and figures from tank removal, investigation, and monitoring reports are presented in Appendix A.

2.1 UNDERGROUND STORAGE TANKS EF6 THROUGH EF9

EF6 (a 10,000-gallon diesel tank), EF7 (a 5,000-gallon diesel tank), EF8 (a 1,000-gallon gasoline tank), and EF9 (a 550-gallon waste oil tank) were installed in a single cavity immediately southeast of the APL Terminal Building (Figures 2 and 3). The STID Number for this tank site was initially STID 3777, with a reference address of 1579 Middle Harbor Road. This tank site was later transferred to STID 2485 in 1997 (ACHCS, 1997).

During the removal of the USTs in January 1992, the waste oil tank (EF9) reportedly had two visible holes with stained soil in their vicinity (Geomatrix Consultants [Geomatrix], 1993). Approximately 2,600 gallons of water and petroleum product was extracted from the waste oil tank pit and disposed of off-site. A grab groundwater samples was collected from the pit after groundwater had recharged and analyzed for volatile organic compounds (VOCs). Significant concentrations of vinyl chloride (VC) (300 micrograms per liter [ug/L]), xylenes (180 ug/L), 1,2-dichloroethene (1,2-DCE) (79 ug/L), benzene (41 ug/L), and trichloroethene (TCE) (15 ug/L)

were reported (Geomatrix, 1993). Perimeter excavation wall samples collected from the pit south and west of the location of EF9 (the larger diesel tank) contained a maximum concentration of 11,000 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as diesel (TPHd). Further excavation in the area was stopped due to physical obstructions (e.g., the APL Terminal Building) encountered at the site. Soil samples collected from a trench excavated north and south of the grouping of tanks EF7, EF8, and EF9 contained trace amounts of benzene, toluene, ethylbenzene, and xylenes (BTEX), and total oil and grease (TOG) to a maximum concentration of 180 mg/kg.

A soil and groundwater investigation was subsequently conducted to assess the extent of impacted soil and groundwater in the vicinity of former USTs EF6 through EF9 (Geomatrix, 1993). A total of eight borings was advanced to maximum depths of 15.5 feet below ground surface (bgs), and three of the borings were converted into monitoring wells MW-1, MW-2, and MW-3. Petroleum hydrocarbons were detected in soil west of the former excavation, and presumed to extend under the APL Terminal Building at concentrations greater than 100 mg/kg. Groundwater analytical results indicated the highest concentrations of TPH as gasoline (TPHg) (1,800 ug/L), TPHd (4,700 ug/L), TOG (5,000 ug/L), and BTEX (9.2, 1.6, 8.9, and 2.7 ug/L, respectively) in the upgradient well MW-1. There were no detections of VC, TCE, or 1,2-DCE (a.k.a. EDC) reported (Geomatrix, 1993). The three wells were monitored and sampled periodically as part of the ongoing assessment of the extent of petroleum hydrocarbons and VOCs (Alisto Engineering Group [Alisto], 1995a, and ITSI 1996a and 1996b). BTEX, TPHd, and TOG were detected in decreasing concentrations over the duration of the monitoring. No VC or TCE were detected in the down-gradient wells, MW-2 and MW-3. MW-1 had low detections of VC. The historical analytical results, as presented in Appendix A-1, show an overall decrease in concentrations of the contaminants of concern between 1993 and 1996.

An SMP was prepared in 1997 on behalf of the Port and at the request of ACHCS (ACHCS, 1997) to evaluate the potential health and safety risk associated with potential exposure to halogenated volatile organic compounds (HVOCs) remaining in the soil. The study concluded that based on the low levels of the HVOCs, the site does not present a threat to the environment or to human health or safety (Uribe, 1997). Human health and safety would be of concern if

exposure to groundwater occurred during construction activities. Potential conduits consisted of an underground electrical cable and a storm drain line passing near two monitoring wells (MW-2 and MW-3) where contaminants of concern have not been detected at significant levels to pose a threat. It was recommended that potential exposure risks could be managed adequately through proper notifications of site history and conditions in combination with appropriate work practices that are already required in Port construction contract specifications (Uribe, 1997). The SMP also indicated, in concurrence with ACHCS, that groundwater quality at the site need not meet drinking water standards to qualify for closure status.

2.2 UNDERGROUND STORAGE TANK EF10

EF10 was a 4,000-gallon steel diesel tank located near the wharf, approximately 435 feet south of the current APL Terminal Building (Figure 2). This tank site was assigned STID No. 2485, with the reference address of 1395 Middle Harbor Road. The UST and its associated appurtenances were removed in July 1995, with no holes or leaks detected during the visual inspection and leak test (Alisto, 1995b). Based on the results of samples collected from over excavation of the tank pit, ACHCS issued a RACC with no further action related to the UST in May of 1996 (ACHCS, 1996). The status of this UST was modified in 1997 when the site information for EF6 through EF9 and EF11 through EF14 was transferred to the STID 2485 case file (ACHCS, 1997). As a result, STID 2485 was reopened pending issuance of a RACC for USTs EF6, EF7, EF8, EF9, EF11, EF12, EF13, and EF14.

2.3 UNDERGROUND STORAGE TANKS EF11 THROUGH EF14

EF11 (a 2,000-gallon gasoline tank), EF12 (a 10,000-gallon diesel tank), and EF13 (a 550-gallon waste oil tank) were located near the Maintenance and Repair (M&R) Building at the APL Terminal (Figure 4). EF14 was a 10,000-gallon diesel UST located near the wharf, approximately 435 feet southwest of M&R Building. The STID Number for this tank site was initially STID 3777, with a reference address of 1579 Middle Harbor Road. This tank site was later transferred to STID 2485 in 1997 (ACHCS, 1997).

The USTs were installed in 1975, inactivated in 1987, and removed in 1990. During removal activities, USTs EF11 through EF13 were observed to be strapped to concrete pads, with no evidence of holes or corrosion in the tanks (Baseline Environmental Consulting [Baseline], 1990). Based on initial groundwater sampling results in the area of EF12, and soil results in the EF11 and EF13 excavations within the sandy fill, these locations were overexcavated to remove soils containing petroleum hydrocarbons. The vertical extent of overexcavation was limited to approximately 10 feet bgs for EF11, 12 feet bgs for EF12, and 8 feet bgs for EF13 by the concrete pads beneath the USTs. The results of samples collected from in situ soils at the location of EF11 indicated residual levels of TPHg ranging from 1.7 to 8.3 mg/kg in the ground; no residual levels of diesel were detected in the area of former EF12 (Baseline, 1990). One groundwater sample collected at 10 feet bgs in the former EF12 area revealed a TPHd concentration of 5.8 milligrams per liter (mg/L).

in vault or native ?

During removal of EF14, a number of cracks were observed along the seams of the fiberglass tank (Baseline, 1990). Four excavation soil samples collected at 10 feet bgs within the sandy fill material beneath the tank excavation revealed no detectable levels of diesel or BTEX. Due to insufficient groundwater accumulation in the excavation pit, groundwater was only tested for BTEX, and no detectable levels of BTEX were reported. The hose and reel pit associated with EF14 consisted of a concrete vault (7 feet long by 7 feet wide and 4 feet deep) that housed a pump and fuel dispensing equipment. Sidewall soil samples of the concrete vault excavation contained residual diesel hydrocarbon concentrations ranging from 2.1 to 200 mg/kg and trace amounts of xylenes. Benzene, ethylbenzene, and toluene were not detected in these samples.

The Report recommended no further action for the EF11 through EF14 site at the time of the tank removals because the site was proposed for inclusion in a regional monitoring program being developed by the Port.

3.0 PROPOSED ADDITIONAL LIMITED SITE INVESTIGATION

A limited geoprobe (direct-push drilling method) investigation is proposed to address the data gap concerns identified by ACHCS (ACHCS, 2002) and provide sufficient data for site closure consideration. The data generated from this limited investigation will also be used in preparation of the RBSL assessment for the site. The Site-Specific Health and Safety Plan for this project is attached in Appendix B.

Borings will be continuously logged and installed to the top of the Bay Mud or to a maximum of 20 feet bgs. Soil samples, when collected, will be collected above the soil/water interface. Grab groundwater samples will be collected from all locations.

Prior to drilling activities, the appropriate site clearances and drilling permits will be obtained. Proposed locations will be marked in the field using water-based marking paint, and an independent underground utility locating service will clear the proposed locations and immediately surrounding areas. Additionally, Underground Service Alert (USA) will be notified at least 48-hours prior to mobilization of the drilling crew. Tenant and Port personnel (including the Port's Site Wharfinger and personnel potentially familiar with underground utilities at the site) will also be notified of upcoming subsurface activities. Suspect locations will be hand-dug to a depth of approximately three feet to evaluate the potential presence of buried utilities or conduits prior to initiation of drilling activities. Based on conversation with the Port, it is anticipated that fieldwork will be conducted during the weekends to limit interruptions to ongoing active terminal activities. The former UST excavation areas that will be used to define boring locations for the current investigation are based on the locations presented in previous investigations.

3.1 SAMPLING RATIONALE AND ANALYSIS

ITSI proposes to install and sample a total of six primary borings and six possible step-out borings around the former EF6 through EF9 excavation area (Figure 3). Step-out borings will be

installed and sampled if field screening measurements or heavy visual soil staining is observed during drilling of the primary sample location. ACHSC has identified gaps in soil and groundwater data collected at the time of tank removal and a lack of plume definition north, east, and west of the tank excavation. To address the gaps in soil data, three borings will be installed within 10 to 20 feet of the former EF6 through EF9 excavation and sampled for both soil and groundwater. To provide better definition to the groundwater plume identified in previous investigations, three borings will be placed north, east, and west of the EF6 through EF9 excavation and sampled for groundwater only.

need to check w/: UST pit

A total of nine primary and nine possible step-out borings are proposed for the EF11 through EF14 UST areas (Figure 4). Step-out borings will be installed and sampled if field screening measurements or heavy visual soil staining is observed during drilling of the primary sample location. ACHCS has identified gaps in soil data, specifically samples collected from native soil, and in groundwater data collected at the time of tank removal. To address both concerns, four borings will be installed to a minimum depth of 15 feet bgs and within 10 to 20 feet of the former EF11 through EF13 excavation. Four borings will be installed to a minimum depth of 15 feet bgs and within in 10 to 20 feet of the lone UST EF14 excavation. All boring location s will be sampled for soil and groundwater.

Based on (1) the contaminants of concern for these USTs at the time of closure, (2) ACHCS' requirement for results for methyl tertiary-butyl ether (MTBE) and other oxygenates at the locations of former gasoline tanks, and (3) the need to supplement the existing data set for RBSL assessment, the following analyses are proposed for both soil and groundwater samples:

- For samples collected around the EF6 through EF9 UST cluster: VOCs by EPA Method SW8260, semi-volatile organic compounds (SVOCs) by EPA Method SW8270 with gel permeation cleanup, TPHd by Method 8015M with silica gel cleanup, BTEX and MTBE by EPA Method SW8021, other Fuel Oxygenates by EPA Method 8260M, total oil & grease by Standard Method 5520, and the metals Cadmium, Chromium, Lead, Nickel, and Zinc by EPA Method SW6010B.

- For samples collected around EF11 through EF13 UST cluster: VOCs by EPA Method SW8260, SVOCs by EPA Method SW8270, TPHd by Method 8015M with silica gel cleanup, BTEX and MTBE by EPA Method SW8021, other Fuel Oxygenates by EPA

Method 8260M, total oil & grease by Standard Method 5520, and the metals Cadmium, Chromium, Lead, Nickel, and Zinc by EPA Method SW6010B.

- For samples collected around EF14 (diesel only): TPHd by Method 8015M with silica gel cleanup, total oil & grease by Standard Method 5520, and the metals Cadmium, Chromium, Lead, Nickel, and Zinc by EPA Method SW6010B.

Groundwater samples collected for metals analyses will be filtered by the laboratory prior to analysis. Duplicate samples will be collected for approximately 10% of the soil and groundwater samples collected for quality control purposes. These samples will be designated as Dup-A, Dup-B, etc. on the chain of custody, and the sources of the duplicate samples will be recorded in the daily field notes.

3.2 SAMPLING METHODOLOGY AND HANDLING

The boreholes will be drilled using a direct-push method. Changes in lithology and evidence of odors or soil discoloration will be noted during sample collection and documented on the boring log. Soils will be logged in accordance with ASTM International Standards and the Unified Soil Classification System (USCS). Selected soil samples from each boring will be screened in the field using an organic vapor meter equipped with a photo-ionization detector (PID) by placing a small portion of the soil in a sealed container (i.e.plastic self-sealing bag). The concentration of organic vapor in the headspace of the container will be measured with the PID, and the concentration recorded on the boring log.

Soil samples will be collected in three- to four-foot long clear acetate liners. The desired sample depths will be selected and marked, and the acetate liners will be cut into 6-inch lengths. The ends of the liner sections for the selected sample intervals will be covered with Teflon tape, capped with plastic end caps, appropriately labeled, packaged, and documented under prescribed chain-of-custody procedures for transportation to the California-certified laboratory selected by and directly contracted with the Port. The laboratory will be contacted prior to sample collection

to assure a sufficient amount of soil is collected to meet the laboratory's procedural requirements for the requested analyses.

Grab groundwater samples will be collected from the boreholes using a peristaltic pump or disposable bailer, and transferred to clean sample containers provided by the laboratory. The samples will be sealed, labeled, placed in an iced cooler, and transported to the laboratory under prescribed chain-of-custody procedures. Groundwater parameters such as pH, conductivity, and temperature will be collected at the time of sample collection and recorded on a sample log with the time of sample collection and parameter measurement.

After completion of sampling activities, the boreholes will be backfilled with a bentonite-cement grout to the surface.

3.3 DECONTAMINATION AND INVESTIGATION DERIVED WASTES

Sampling equipment will be decontaminated before the start of work on site, between each boring location, and after completion of site work. Drill rods, samplers, and other non-disposable equipment will be cleaned using a mobile self-contained high-temperature pressure washer between sample locations and samples for chemical analysis.

Investigation-derived wastes (drill cuttings, decontamination liquid, and disposable personal protective equipment [PPE]) will be contained in 55-gallon Department of Transportation-(DOT) approved drums, labeled, inventoried, and staged on-site in the area selected by the Port. Disposal of the wastes will be provided under a separate contract with the Port's waste disposal contractor. The inventory of the wastes and the analytical results from the limited investigation will be provided to the Port for waste profiling. It is anticipated that data generated from this sampling event will be used to profile the wastes for disposal.

4.0 RISK-BASED SCREENING LEVEL ASSESSMENT

A Risk-Based Screening Level Assessment of existing site data and the data generated from this proposed limited additional site investigation will be conducted using RBSLs developed by the San Francisco Bay Region RWQCB (RWQCB, 2000a and 2000b). The RBSLs are presented in a series of four lookup tables that each have a specific combination of soil, groundwater, and land-use characteristics designed to identify the magnitude of risk at a given site. Site data will first be compared directly to the RBSLs that are appropriate for the site. In this case, the assessment will identify that groundwater at the site is not a current or potential drinking water source (due to high total dissolved solid content). Decisions made from this assessment may include no further action, additional site assessment, remedial action, or a more detailed assessment of the data. If a more detailed assessment is needed for selected component(s) [analytes], then those analytes that failed the first screening will be looked at in more detail with respect to site-specific pathways and compared to the appropriate pathway-specific RBSLs. If those analytes still fail, then a risk assessment for those failed analytes may be recommended. (Tier 2)

A utility map including a receptor survey consistent with the RBSL assessment will include nearby wells and other subsurface conduits. This map will be generated concurrently with the RBSL assessment. The survey will focus on the APL Terminal Area and immediately adjacent sites, as necessary.

5.0 SITE CLOSURE REPORT

The Site Closure Report will summarize the findings of the limited additional site investigation with previous investigation data and include the RBSL assessment and the utility map with receptor survey. In addition, the Report will also recommend destruction of monitoring wells MW-1, MW-2, and MW-3 as a part of site closure. It is anticipated that this Report will provide ACHCS with the information required to consider the pending site closure request.

6.0 REFERENCES

Alameda County Health Care Services (ACHCS), 2002. Letter to the Port of Oakland regarding the status of Fuel Leak Case RO0000470, 1395 Middle Harbor Road, Oakland, CA, dated September 10.

ACHCS, 1997. Letter to the Port of Oakland regarding the transfer of all site information for EF6 through EF9 and EF11 through EF14 from Site Identification No. 3777 to Site Identification No. 2485 at 1395 Middle Harbor Road and the reopening of EF10 as a result of the action, dated February 4.

ACHCS, 1996. Remedial Action Completion Certification Letter for EF10 (Site Identification No. 2485), American President Lines, 1395 Middle Harbor Road, Oakland, California, dated May 7.

Alisto Engineering Group (Alisto), 1995a. *Groundwater Monitoring and Sampling Report*, Port of Oakland, American President Lines Terminal, 1395 Middle Harbor Road, Oakland, California, May 16.

Alisto, 1995b. *Tank Closure Report: Port of Oakland Tank No. EF-10*, Berth 63, 1395 Middle Harbor Road, Oakland, California, October 20.

Baseline Environmental Consulting (Baseline), 1992. *Underground Storage Tank Operating Permit Application*, American President Lines, 1395 Middle Harbor Road, Oakland, California, April.

Baseline, 1991. *Disposition of Soil Removed from Former Underground Tank No. EF11, EF12, EF13, and EF14*, American President Line, 1395 Middle Harbor Road, Oakland, California, November 4.

Baseline, 1990. *Underground Tank Removal Activities APL Container Yard Earthquake Repair*, 1395 Middle Harbor Road, Oakland, California, November.

California Regional Water Quality Control Board (RWQCB), 2000a. *Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater, Volume 1: Summary Tier 1 Lookup Tables*, Interim Final, August.

RWQCB, 2000b. *Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater, Volume 2: Background Documentation for the Development of Tier 1 Soil and Groundwater Screening Levels*, Interim Final, August.

Geomatrix Consultants (Geomatrix), 1993. *Soil and Groundwater Investigation*, American President Lines Terminal, 1395 Middle Harbor Road, Oakland, California, April.

Geomatrix, 1992a. *Underground Storage Tank Removal Report*, American President Lines Terminal, 1395 Middle Harbor Road, Oakland, California, June.

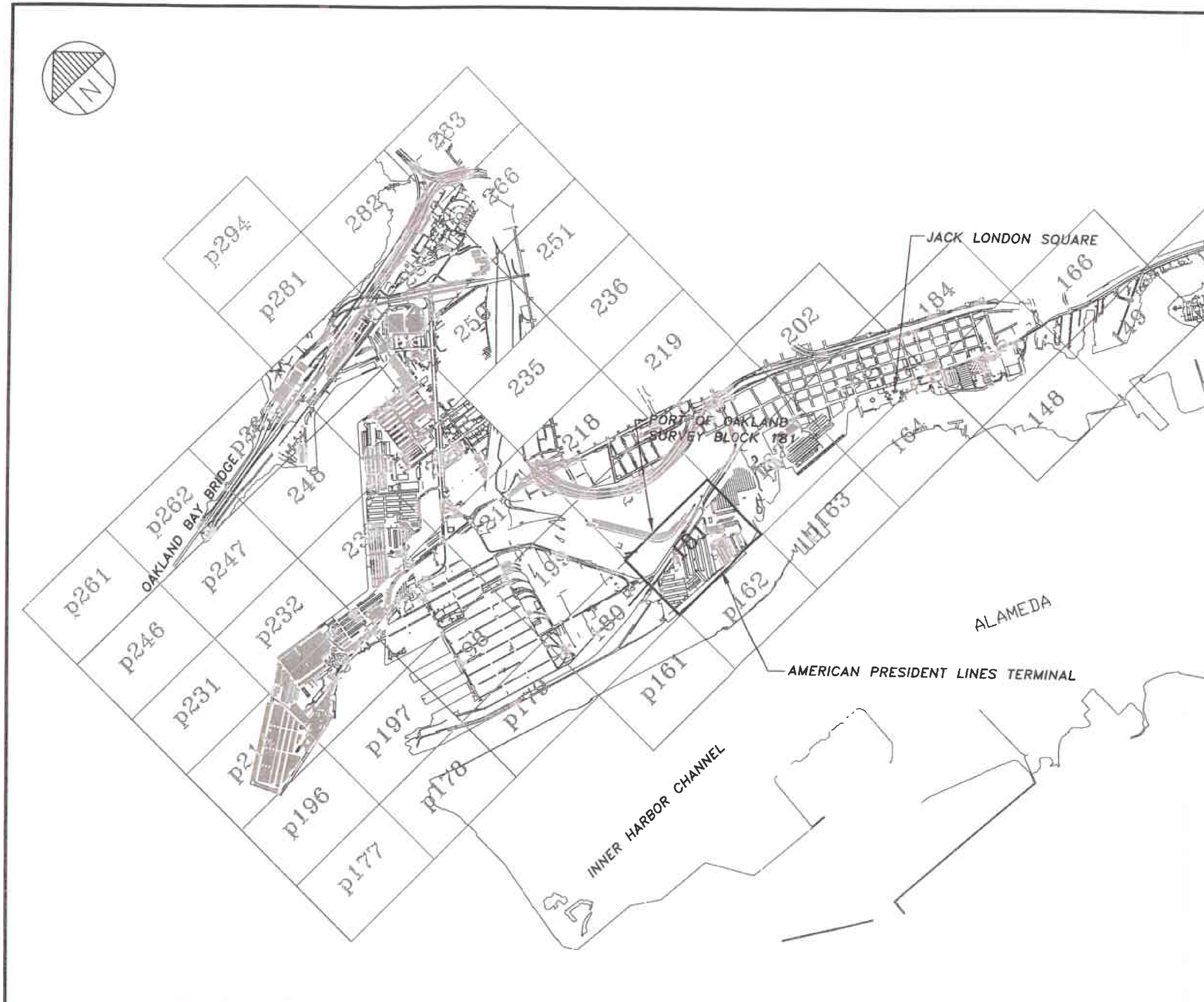
Geomatrix, 1992b. *Work Plan*, American President Lines Terminal, 1395 Middle Harbor Road, Oakland, California, October.

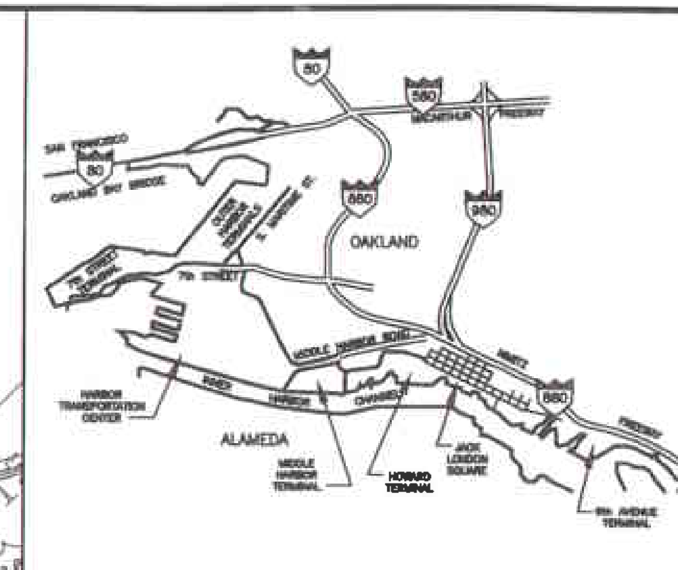
Innovative Technical Solutions, Inc. (ITSI), 1996a. *Groundwater Monitoring and Sampling Report – First Quarter*, American President Lines Terminal, 1395 Middle Harbor Road, Oakland, California, June 4.

ITSI, 1996b. *Groundwater Monitoring and Sampling Report – Second Quarter*, American President Lines Terminal, 1395 Middle Harbor Road, Oakland, California, July 24.

Tracer Research Corporation (Tracer), 1992. *Tracer Tight Test of 1 Underground Storage Tank*, American President Line, 1395 Middle Harbor Road, Oakland, California, October 19.

Uribe & Associates (Uribe), 1997. *Site Management Plan for Former USTs EF6, EF7, EF8 & EF9*, 1395 Middle Harbor Road, Oakland, California, August 4.





VICINITY MAP

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ITSI Innovative Technical Solutions, Inc.

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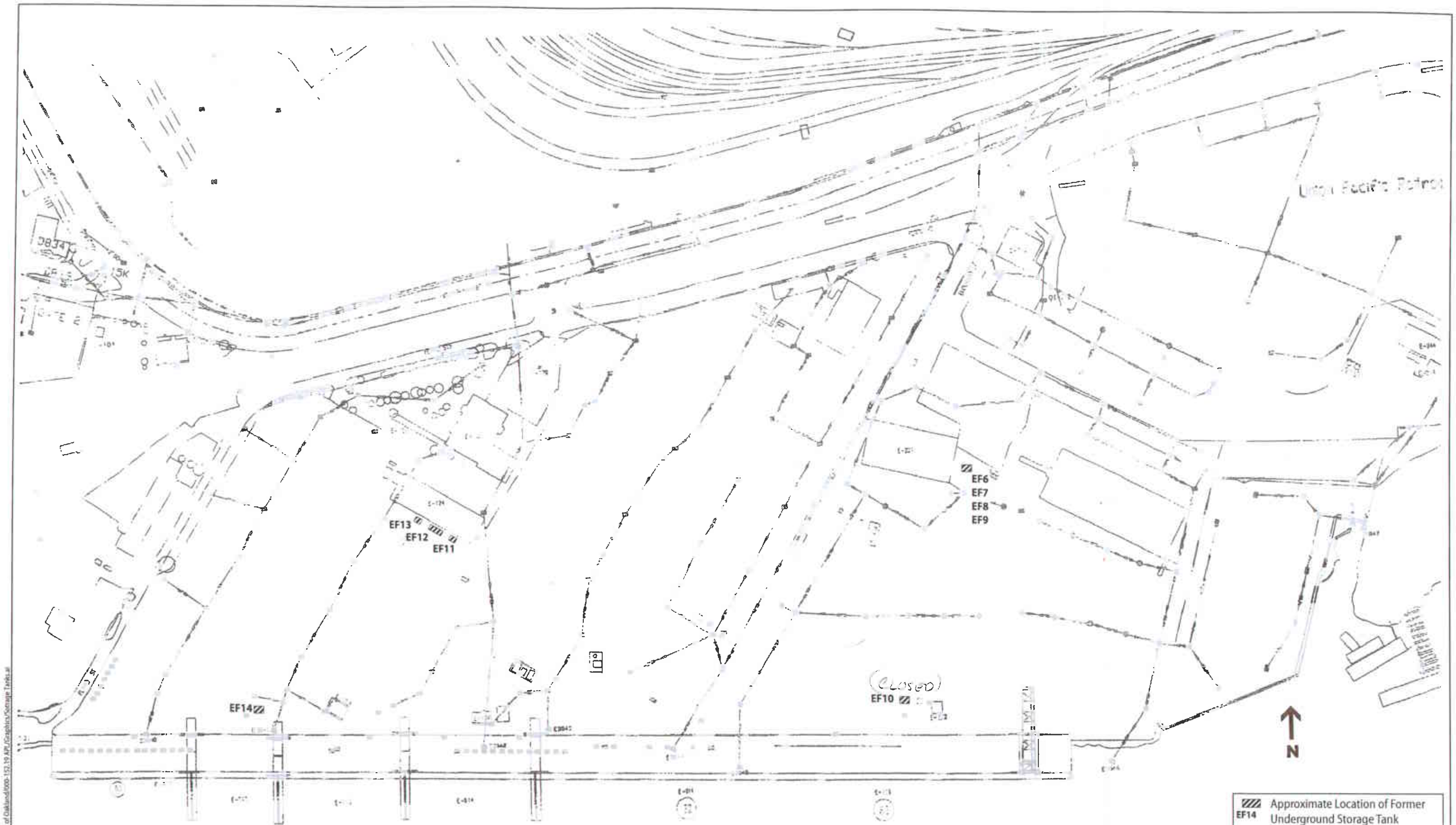
SCALE

FIGURE 1
LOCATION OF SURVEY BLOCK 181
AND VICINITY MAP OF
AMERICAN PRESIDENT LINES TERMINAL

CLIENT: PORT OF OAKLAND

LOCATION: 1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

DRAWN BY/DATE: EA 10/17/02	DRAWING NO.: 00-152.19-B1
CHECKED BY/DATE: EA/RH	APPROVED BY/DATE: RH 11/8/02



Source: Port of Oakland APL Terminal Land Records Management Sheet 21 of 56, dated 1/22/98

Innovative Technical Solutions, Inc.

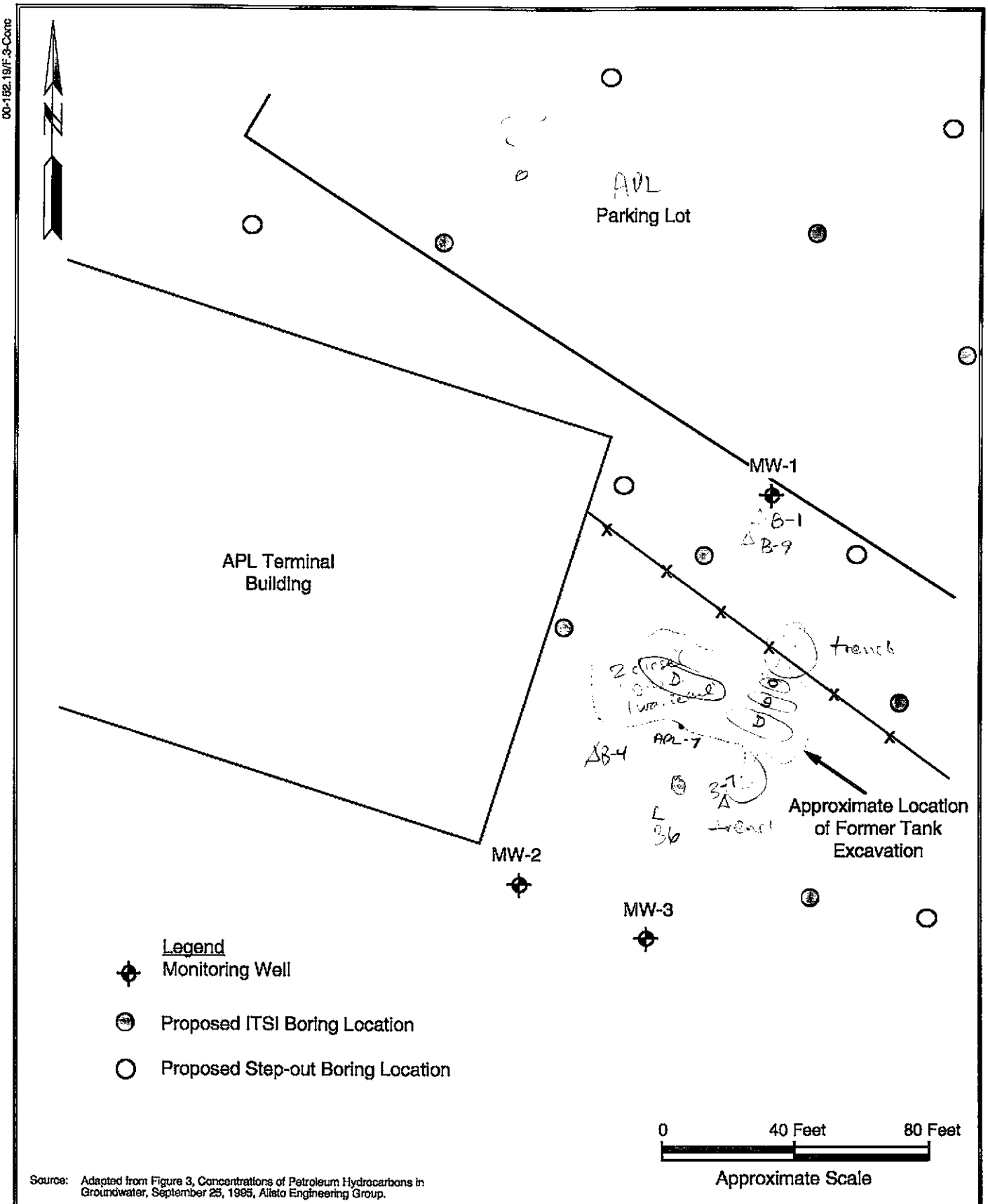
SCALE=?

Port of Oakland
1395 Middle Harbor Road
Oakland, California

FIGURE 2
Approximate Locations of
Former Underground Storage Tanks at
American President Lines Terminal

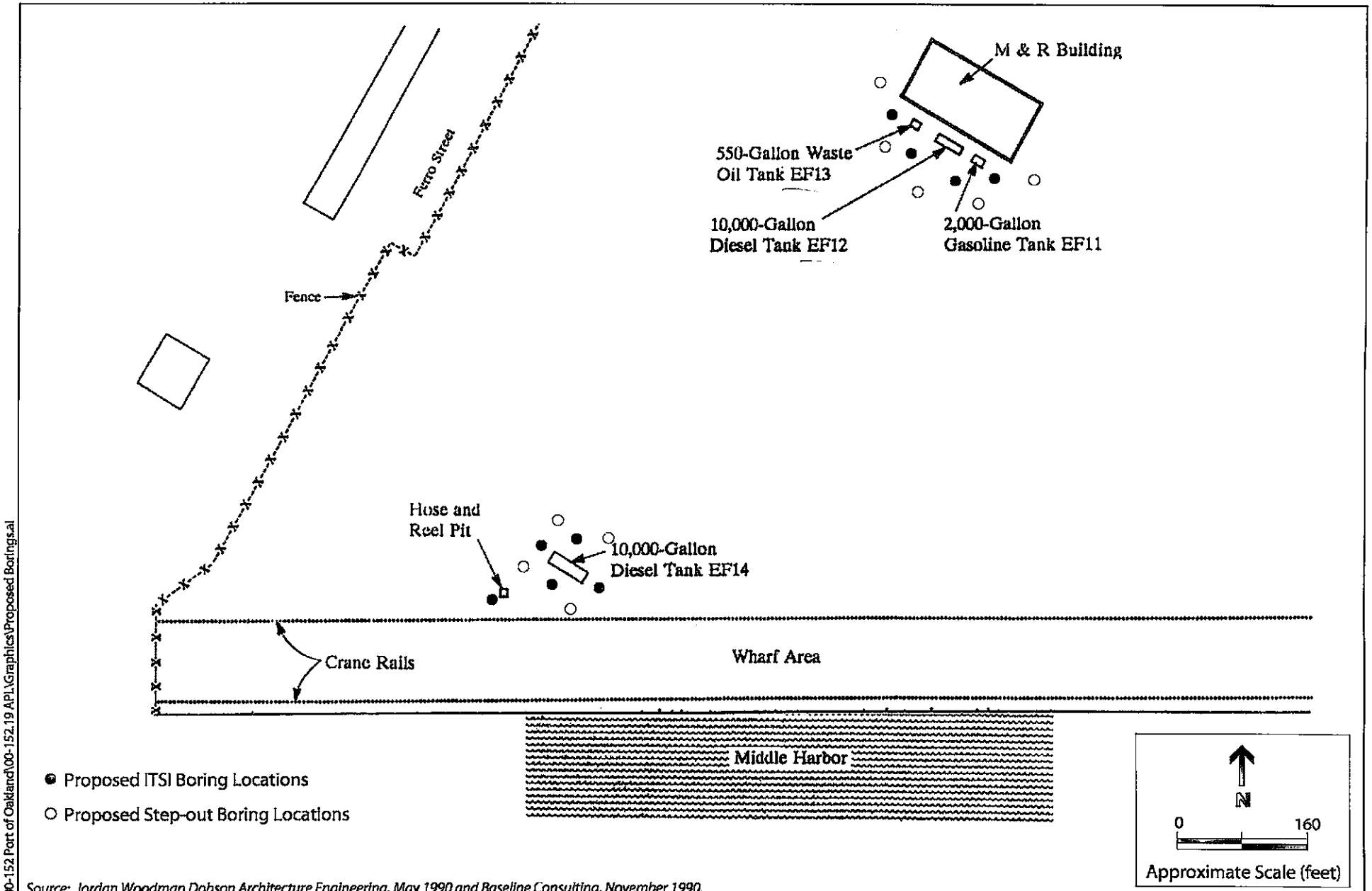
Public/Projects/2000/00-153 Port of Oakland/000-153.19 APL/Graphics/Storage Tanks.ai

00-192.19/F-3-Conc



Source: Adapted from Figure 3, Concentrations of Petroleum Hydrocarbons in Groundwater, September 25, 1995, Alisto Engineering Group.

Innovative Technical Solutions, Inc.	1395 Middle Harbor Road Oakland, California **Port of Oakland**	**Figure 3** **Proposed Boring Locations for EF6 through EF9**



Source: Jordan Woodman Dobson Architecture Engineering, May 1990 and Baseline Consulting, November 1990.

Innovative Technical Solutions, Inc.

Port of Oakland
1395 Middle Harbor Road
Oakland, California

FIGURE 4
Proposed Boring Locations for
EF11 through EF14

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APPENDIX A

Selected Previous Investigation Figures and Data Tables

Appendix A-1	EF6 through EF9: Underground Storage Tank Removal, Soil and Groundwater Investigation, and Quarterly Monitoring Reports
Appendix A-2	EF10: Remedial Action Completion Certification and Tank Closure Report
Appendix A-3	EF11 through EF14: Underground Storage Tank Removal Activities

APPENDIX A-1

EF6 through EF9:

Underground Storage Tank Removal Report by Geomatrix Consultants, June 1992

Soil and Groundwater Investigation by Geomatrix Consultants, April 1993

First and Second Quarterly Monitoring Reports by ITSI, June and July 1996

EF6 through EF9:

Underground Storage Tank Removal Report by Geomatrix Consultants, June 1992

ITSI

EF-06, EF-07, EF-08, EF-09

GEOMATRIX

OE

UNDERGROUND STORAGE TANK REMOVAL REPORT

American President Lines Terminal
1395 Middle Harbor Road
Oakland, California 94607

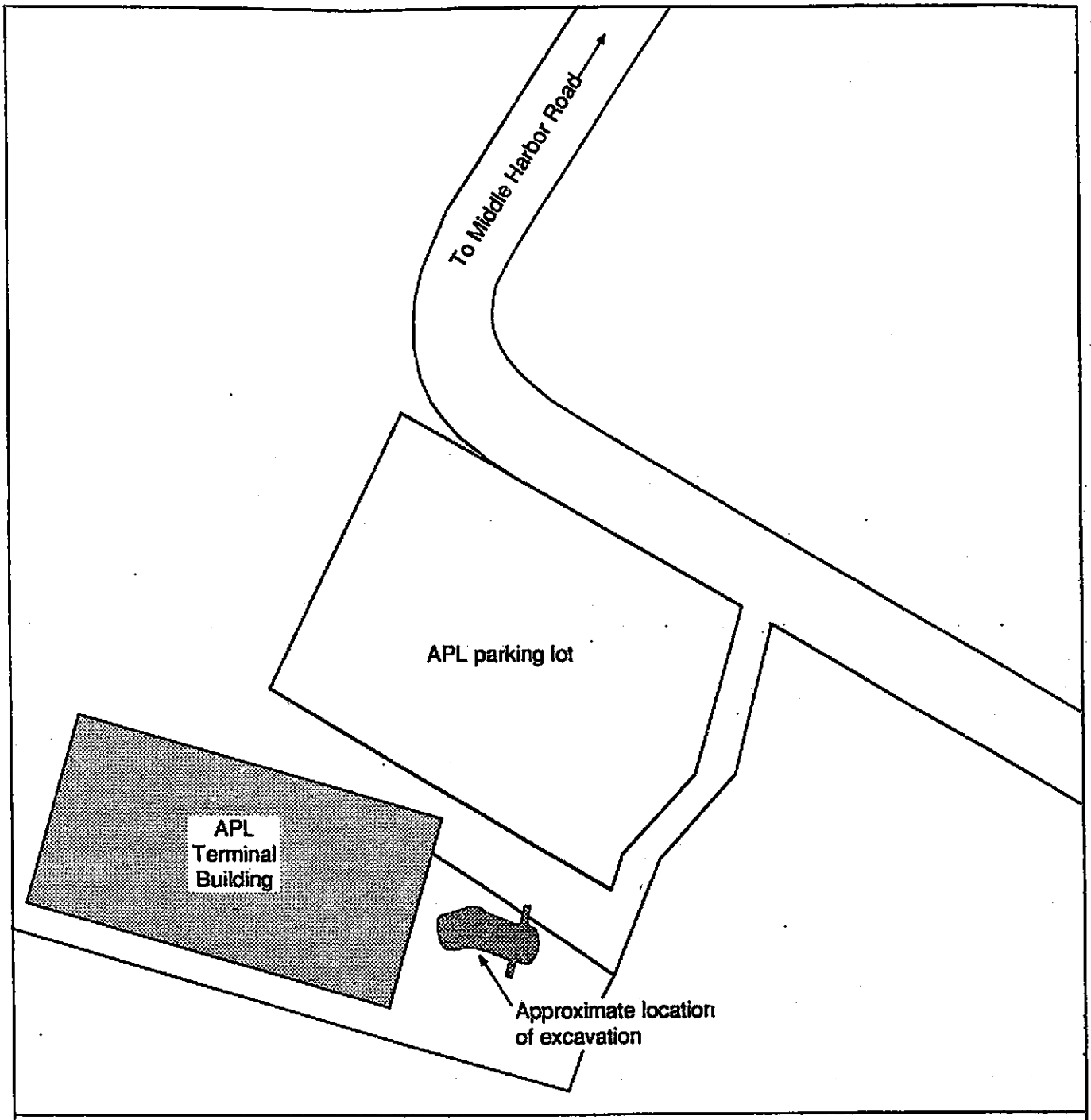
Prepared for

Port of Oakland
530 Water Street
Oakland, California

Prepared by

Geomatrix Consultants, Inc.
100 Pine Street, 10th Floor
San Francisco, California 94111

June 1992
Project No. 2026



N

0 100 Feet

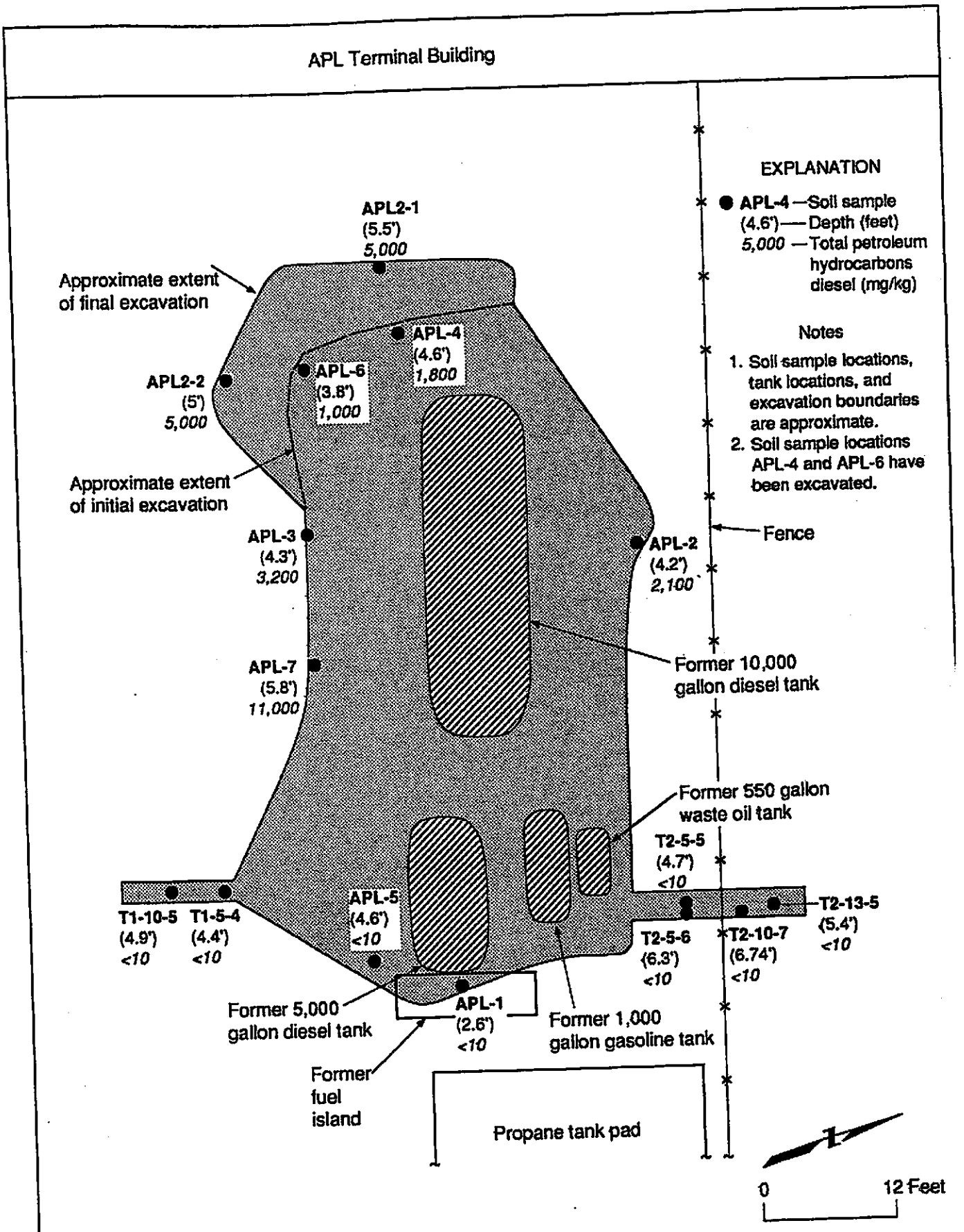
Based on figure provided by the Port of Oakland

GEOMATRIX

SITE PLAN
American President Lines Terminal
1395 Middle Harbor Road
Oakland, California

Figure
2

Project No.
2026



GEOMATRIX

EXCAVATION, TANK, AND SOIL SAMPLE LOCATIONS AND CONCENTRATIONS OF TOTAL PETROLEUM HYDROCARBONS AS DIESEL
American President Lines Terminal
1395 Middle Harbor Road
Oakland, California

Figure 3

Project No. 2026

GEOMATRIX

TABLE 1
SUMMARY OF EPA METHOD 8240 ANALYTICAL RESULTS[1]
GRAB GROUNDWATER SAMPLES
American President Lines Terminal
Oakland, California

concentrations in micrograms per liter (µg/l)

Analyte Detected[2]	WDA-1	WWO-1
Vinyl Chloride	300	130
Methylene Chloride	18	3900
Acetone	ND[3]	1300
1,1-DCA	ND	84
1,2-DCE	79	160
1,1,1-TCA	ND	90
TCE	15	2100
Benzene	41	1400
PCE	6.2	940
Toluene	71	2300
Ethylbenzene	32	320
Xylenes	180	1600
Trichlorofluoromethane	ND	50

[1] Samples collected by Geomatrix Consultants, Inc., and analyses performed by GTEL Environmental Laboratories, Inc. of Concord, California, using EPA Method 8240.

[2] DCA - dichloroethane
DCE - dichloroethene
TCA - trichlorothane
TCE - trichlorothene
PCE - tetrachloroethene

[3] ND - indicates analyte not detected.

TABLE 3
SUMMARY OF ANALYTICAL RESULTS[1]
EXCAVATION AND TRENCH SOIL SAMPLES
American President Lines Terminal
Oakland, California

concentrations in milligrams per kilogram (mg/kg)

	TPHg	TPHd	Benzene	Toluene	Ethyl benzene	Xylenes	EPA Method 8240	Oil & Grease	EPA Method 8010	Cd	Cr	Pb	Ni	Zn
Excavation														
APL-1	<1	<10	<0.005	0.005	<0.005	<0.015	NA[2]	NA	NA	NA	NA	NA	NA	NA
APL-2	500	2100	0.47	11	9.8	39	1.1[3]	NA	NA	NA	NA	NA	NA	NA
APL-3	290	3200	0.59	2	2.3	15	NA	NA	NA	NA	NA	NA	NA	NA
APL-4[4]	170	1800	0.13	0.65	1.5	8	NA	NA	NA	NA	NA	NA	NA	NA
APL-5	<1	<10	<0.005	<0.005	<0.005	<0.005	ND[5]	11	NA	<1	48	49	51	81
APL-6[4]	140	1000	<0.3	0.76	0.87	4.3	ND[5]	1200	NA	<1	9	<5	12	22
APL-7	210	11,000	0.17	1.62	4.7	20.4	NA	NA	NA	NA	NA	NA	NA	NA
APL2-1	NA	5000	<0.5	3.3	3.2	21	NA	NA	NA	NA	NA	NA	NA	NA
APL2-2	NA	5000	0.7	12	11	61	NA	NA	NA	NA	NA	NA	NA	NA
Trenches														
T1-5-4	<1	<10	<0.005	<0.005	<0.005	<0.015	NA	10	ND	<1	47	25	40	61
T1-10-5	<1	<10	<0.005	<0.005	<0.005	<0.015	NA	56	NA	<1	42	10	31	66
T2-5-6	35	<10	0.15	1.2	0.45	2.5	NA	180	ND	<1	19	<5	17	49
T2-5-5	<1	<10	<0.005	<0.005	<0.005	<0.015	NA	33	NA	<1	47	52	42	81
T2-10-7	5	<10	<0.005	<0.005	<0.005	0.02	NA	<5	NA	<1	26	<5	14	14
T2-13-5	<1	<10	0.006	0.008	<0.005	<0.015	NA	40	NA	<1	40	76	42	83

1 Analyses performed by GTEL Environmental Laboratories, Inc. of Concord, California with the exception of APL2-1 and APL2-2. Analyses were performed on these two samples by BC Analytical of Emeryville, California. Refer to Table 2 of this report for methods used.
2 Soil sample not analyzed by the test method or for the analyte indicated.
3 Sample APL-2 contains 1.1 milligram per kilogram 1,2-dichloroethene.
4 Soil samples APL-4 and APL-6 excavated during additional soil removal activities.
5 No analytes for the test method reported above laboratory detection limits.

GEOMATRIX

TABLE 4
SUMMARY OF ANALYTICAL RESULTS[1]
STOCKPILE SOIL SAMPLES
American President Lines Terminal
Oakland, California

concentrations in milligrams per kilogram (mg/kg)

Analyte[2]	SWO (1-4)	SWO (5-8)	SWO (9-12)	SDA (1-4)	SDA (5-8)	SDA2 (1-4)
TPH-gasoline	180	210	43	<10	270	610
TPH-diesel	650	570	300	1100	490	2600
Total Oil & Grease	2100	2400	1000	NA[3]	NA	NA
EPA Method 8270						
Naphthalene	NA	NA	1.1	1.8	2.9	4
2-Methylnaphthalene	NA	NA	1.7	5.4	4.1	6
Dibenzofuran	NA	NA	<0.3	0.43	<0.3	<3
Fluorene	NA	NA	<0.3	0.64	<0.3	<3
Phenanthrene	NA	NA	1.2	1.8	1.2	<5
Fluoranthene	NA	NA	1.3	0.7	0.34	<3
Pyrene	NA	NA	0.81	1.3	0.99	<3
Bis(2-ethylhexyl) phthalate	NA	NA	<0.3	0.65	0.99	<5
Benzo(k)fluoranthene	NA	NA	0.55	<0.3	<0.3	<8
Benzo(a)pyrene	NA	NA	0.36	<0.3	<0.3	<3
Indeno(1,2,3-c,d)pyrene	NA	NA	0.76	0.83	<0.3	<5
Benzo(g,h,i)perylene	NA	NA	0.92	0.89	0.66	<3
EPA Method 8240						
Methylene chloride	0.1	0.22	<.027	<0.006	0.075	<4
Acetone	0.172	0.25	<5.4	<0.1	<0.56	<20
1,1-Dichloroethane	0.022	0.043	<0.27	<0.006	<0.028	<0.8
1,2-Dichloroethene, total	0.058	0.078	<0.27	0.021	0.035	<0.8
1,1,1-Trichloroethane	0.065	0.12	<0.27	<0.006	0.1	<0.8
Trichloroethene	11	16	1.8	1.3	6.7	<0.8
Benzene	1.6	2.1	<0.27	0.07	0.75	<0.8
Tetrachloroethene	5.9	9.4	1.0	0.11	7.1	<0.8
Toluene	11	13	2.5	0.89	8	2.2
Ethylbenzene	4.2	4.2	1.7	0.51	0.83	1.7
Xylenes, total	25	26	10	4.5	32	12
Trichlorofluoromethane	0.061	0.12	<0.27	<0.006	<0.028	<0.8

TABLE 4
SUMMARY OF ANALYTICAL RESULTS[1]

concentrations in milligrams per kilogram (mg/kg)

Analyte[2]	SWO (1-4)	SWO (5-8)	SWO (9-12)	SDA (1-4)	SDA (5-8)	SDA2 (1-4)
Title 22 Metals						
Antimony	NA	NA	<5	<5	<5	<4
Arsenic	NA	NA	7	<5	<5	0.8
Barium	NA	NA	87	55	46	71
Beryllium	NA	NA	<1	<1	<1	0.3
Cadmium	<1	<1	<1	<1	<1	5
Chromium (total)	27	27	26	21	24	13
Cobalt	NA	NA	6	5	5	6
Copper	NA	NA	16	13	14	9
Lead	12	17	5	9	19	8
Mercury	NA	NA	0.09	NA	NA	0.05
Molybdenum	NA	NA	<1	<1	<1	<4
Nickel	28	32	29	25	28	14
Selenium	NA	NA	<5	<5	<5	<0.4
Silver	NA	NA	<2.5	<2.5	<2.5	<1
Thallium	NA	NA	18	<10	<10	<4
Vanadium	NA	NA	24	20	19	19
Zinc	93	110	42	41	190	29

Notes:

[1] Soil samples were collected by Geomatrix Consultants, Inc. and were composited by the analytical laboratory before analysis. Analyses performed on SWO (1-4), SWO (5-8), SWO (9-12), SDA (1-4), and SDA (5-8) by GTEL Laboratories, Inc. of Concord, California. Analyses on SDA2 (1-4) performed by BC Analytical of Emeryville, California. Refer to Table 2 of this report for methods used.

[2] TPH - total petroleum hydrocarbons.

[3] NA - indicates not analyzed for this compound.

EF6 through EF9:

Soil and Groundwater Investigation by Geomatrix Consultants, April 1993

EF-06 EF09, EF08, FF09

GEOMATRIX

OE

SOIL AND GROUNDWATER INVESTIGATION

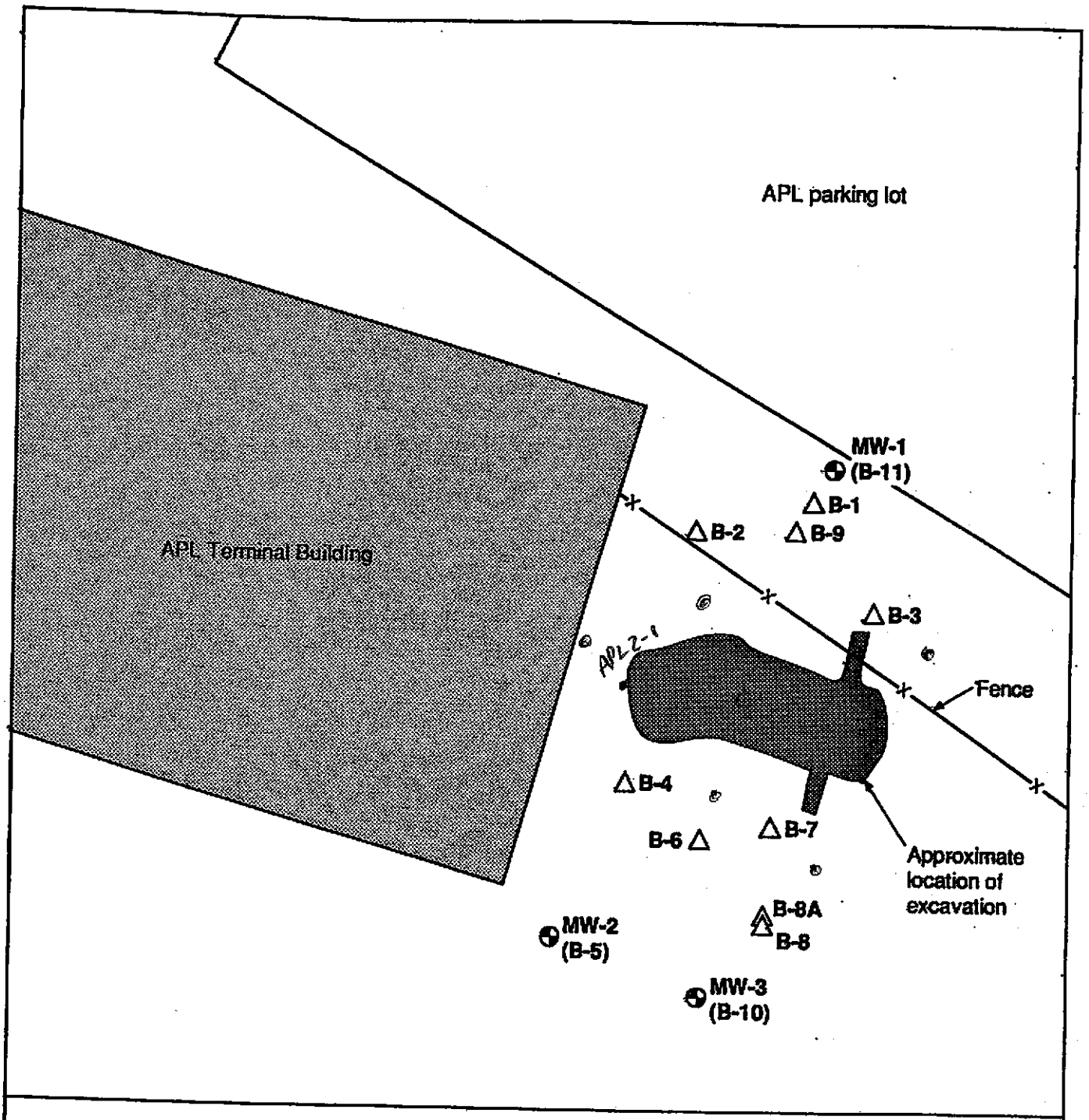
American President Lines Terminal
1395 Middle Harbor Road
Port of Oakland
Oakland, California

Prepared for

Port of Oakland
530 Water Street
Oakland, California

April 1993
Project No. 2026

Geomatrix Consultants



EXPLANATION

MW-2 ⊕ Monitoring well

B-1 △ Soil boring

Based on figure provided by the Port of Oakland

0 50 Feet

GEOMATRIX

LOCATION OF SOIL BORINGS AND MONITORING WELLS
American President Lines Terminal
1395 Middle Harbor Road
Oakland, California

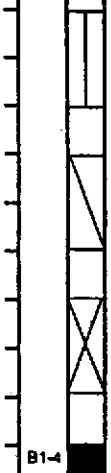
Figure 2

Project No. 2026

PROJECT: APL TERMINAL 1395 Middle Harbor Road Port of Oakland				**Boring Log Explanation Sheet**
BORING LOCATION:			ELEVATION AND DATUM:	
DRILLING CONTRACTOR:			DATE STARTED:	DATE FINISHED:
DRILLING METHOD:			TOTAL DEPTH:	MEASURING POINT:
DRILLING EQUIPMENT:			DEPTH TO WATER / FIRST	COMPL. / 24 HRS.
SAMPLING METHOD:			LOGGED BY:	
HAMMER WEIGHT:	DROP:		RESPONSIBLE PROFESSIONAL:	REG. NO.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	REMARKS

1. Soil descriptions are in accordance with the USCS as set forth by ASTM D2488-90 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)."
2. Soil color described according to Munsell Color Chart.
3. Dashed lines separating soil strata represent inferred boundaries between sampled intervals that may be abrupt or gradual transitions. Solid lines represent approximate boundaries observed within sampled intervals.
4. OVM = organic vapor meter, readings in parts per million.
5. Odor, if noted, is subjective and not necessarily indicative of specific compounds or concentrations.



Interval of recovered soil core collected with split-barrel continuous sampler

Interval of recovered soil core collected with split-spoon drive sampler

Interval of no recovery

Sample collected for chemical analysis and sample identification

First water level

Final water level

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-1

BORING LOCATION: 45 feet north of former excavation	ELEVATION AND DATUM: 10.24 MLLW		
DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.	DATE STARTED: 1/19/93	DATE FINISHED: 1/19/93	
DRILLING METHOD: Hollow stem auger (8 1/4" diameter)	TOTAL DEPTH: 10.5'	MEASURING POINT: Ground surface	
DRILLING EQUIPMENT: Mobile B-53	DEPTH TO WATER	FIRST 4.0	COMPL. --- / 24 HRS. ---
SAMPLING METHOD: 5' CME continuous core	LOGGED BY: J. M. Abitz		
HAMMER WEIGHT: 140 lbs / DROP: 40 inches	RESPONSIBLE PROFESSIONAL: Sally E. Goodin	REG. NO. RG 3743	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	REMARKS
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Light olive brown (2.5Y5/6), moist, 60% fine to coarse sand, 30% fine gravel, 10% low plasticity fines [FILL]	
2						
3						
4	B-1-4				ATD ▽ Color change to greenish gray (5GY 5/1)	
5						
6					SAND (SP) Dark gray (7.5YR 4/0), wet, 95% fine sand, 5% low plasticity fines	Dark brown liquid observed
7					SILT (ML) Greenish gray (5GY 5/1), 100% fines, low plasticity, very stiff [BAY MUD]	
8						
9						
10						
11					Bottom of boring at 10.5 feet	
12						
13						
14						

B-1 (11/92)

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-2

BORING LOCATION: 30 feet north of former excavation

ELEVATION AND DATUM: 10.03 MLLW

DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.

DATE STARTED: 1/18/93 | DATE FINISHED: 1/18/93

DRILLING METHOD: Hollow stem auger (6 1/4" diameter)

TOTAL DEPTH: 15.5' | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: Mobile B-53

DEPTH TO WATER	FIRST	COMPL.	24 HRS.
	4.0	---	---

SAMPLING METHOD: 5' CME continuous core

LOGGED BY: J. M. Abitz

HAMMER WEIGHT: 140 lbs | DROP: 40 inches

RESPONSIBLE PROFESSIONAL: Sally E. Goodin | REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Dark reddish brown (5YR 3/3), moist, 60% fine sand, 30% fine gravel, 10% low plasticity fines [FILL]	
2						
3						
4	B-2-4			41	SAND with SILT and GRAVEL (SW - SM) Dark greenish gray (5GY 4/1), moist, 70% fine sand, 20% fine gravel, 10% low plasticity fines [FILL] ATD ▽	
5						
6						
7						
8					SILT (ML) Olive (5Y 4/4), wet, 100% fines, low plasticity, very soft [BAY MUD]	
9	B-2-9			1.8	Color change to black (5Y 2.5/1), with dark red (2.5YR 3/6) lenses, roots and wood pieces	
10					LEAN CLAY (CL) Dark greenish gray (5G 4/1), wet, 100% fines, low plasticity, firm [BAY MUD]	
11						
12						
13						
14						

B-1 (11/92)

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-2 cont'd

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15					LEAN CLAY (CL) (continued)	
					SAND with SILT (SW - SM) Black (10 YR 2/1), wet, 90% fine sand, 10% low plasticity fines	
16					Bottom of boring at 15.5 feet	
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-3

BORING LOCATION: Near former north-extending trench	ELEVATION AND DATUM: 10.51 MLLW
DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.	DATE STARTED: 1/18/93 / DATE FINISHED: 1/18/93
DRILLING METHOD: Hollow stem auger (6 1/4" diameter)	TOTAL DEPTH: 15.5' / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Mobile B-53	DEPTH TO WATER: FIRST 4.5 / COMPL. --- / 24 HRS. ---
SAMPLING METHOD: 5' CME continuous core	LOGGED BY: J. M. Abitz
HAMMER WEIGHT: --- / DROP: ---	RESPONSIBLE PROFESSIONAL: Sally E. Goodin / REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Brown (10YR 4/3), moist, 60% fine sand, 30% fine gravel, 10% low plasticity fines [FILL]	
2						
3						
4	B-3-4				Lean CLAY with SAND (CL) Dark gray (5Y 4/1), moist, 70% fines, 30% fine sand, high plasticity, firm ATD ▽	
				8.3		
5					SAND (SP) Dark greenish gray (5GY 4/1), wet, 95% fine sand, 5% low plasticity fines	
6						
7						
8						
9						
10	B-3-10.5					
				26.9		
11					Lean CLAY (CL) Dark greenish gray (5GY 4/1), wet, 100% fines, high plasticity, roots, firm [BAY MUD]	
12						
13					Change to no roots	
14						

B-1 (11/92)

Geomatrix Consultants | Project No. 2026J | Figure --

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-3 cont'd

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	PID (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15					LEAN CLAY (CL) (continued) CLAYEY SAND (SC) Dark gray (N 4/), wet, 70% firm sand, 30% high plasticity fines	
16					Bottom of boring at 15.5 feet	
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-4

BORING LOCATION: 10 feet southwest of former excavation

ELEVATION AND DATUM: 9.99 MLLW

DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.

DATE STARTED: 1/18/93 | DATE FINISHED: 1/18/93

DRILLING METHOD: Hollow stem auger (6 1/4" diameter)

TOTAL DEPTH: 15.5' | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: Mobile B-53

DEPTH TO WATER	FIRST	COMPL.	24 HRS.
	4.0	---	---

SAMPLING METHOD: 5' CME continuous core

LOGGED BY: J. M. Abitz

HAMMER WEIGHT: 140 lbs | DROP: 40 inches

RESPONSIBLE PROFESSIONAL: Sally E. Goodin | REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Dark greenish gray (5GY 4/1), moist, 60% fine to coarse sand, 30% fine to medium coarse gravel, 10% low plasticity fines [FILL]	
2						
3						
4	B-4-4			420	ATD ▽	
5				159	SAND (SP) Black (5Y 2.5/1), wet, 95% fine sand, 5% low plasticity fines	
6				340	SAND with SILT and GRAVEL (SP - SM) Dark gray (5Y 4/1), wet, 70% fine to medium sand, 20% fine gravel, 10% low plasticity fines	Sheen
7						
8						
9						
10	B-4-10.5					
11					LEAN CLAY (CL) Dark gray (5Y 4/1), wet, 100% fines, high plasticity, firm, some roots [BAY MUD]	
12						
13				42		
14						

B-1 (11/92)

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-4 cont'd

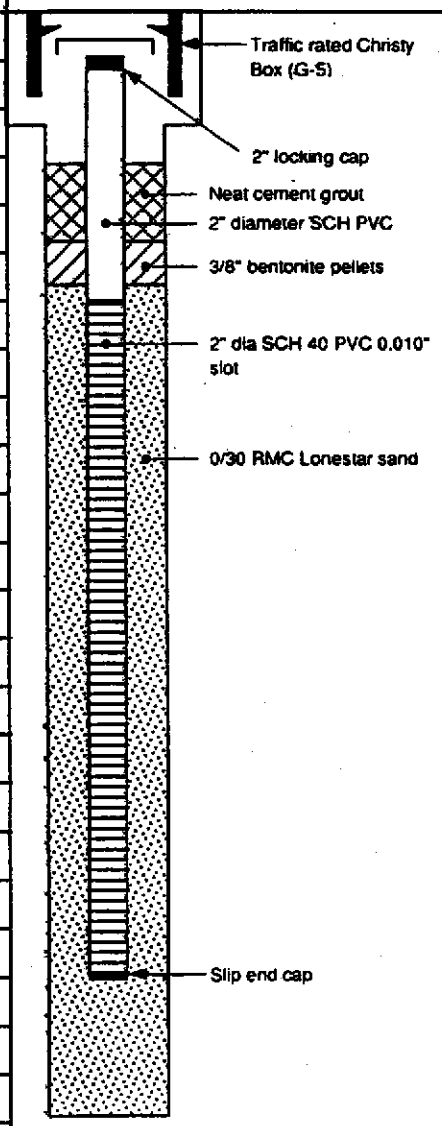
DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15					LEAN CLAY (CL) (continued)	
16					CLAYEY SAND (SM) Very dark gray (7.5YR N/3), wet, 70% firm sand, 30% low plasticity fines, roots Bottom of boring at 15.5 feet	
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL 1395 Middle Harbor Road - Port of Oakland	**Log of Well No. MW-2 (B-5)**
BORING LOCATION: 50 feet southwest of former excavation	ELEVATION AND DATUM: 10.03 MLLW
DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.	DATE STARTED: 1/20/93 / DATE FINISHED: 1/20/93
DRILLING METHOD: Hollow stem auger (8 1/4" and 10 1/4" OD)	TOTAL DEPTH: 10' / SCREEN INTERVAL: 3 - 10'
DRILLING EQUIPMENT: Mobile B-53	DEPTH TO WATER ATD: 5.5' / CASING: 2" dia SCH 40 PVC
SAMPLING METHOD: 5' CME continuous core and 18" x 2" split spoon	LOGGED BY: J. M. Abitz
HAMMER WEIGHT: 140 lbs / DROP: 40 inches	RESPONSIBLE PROFESSIONAL: Sally E. Goodin / REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:
0					Asphalt
1					SAND with SILT and GRAVEL (SW - SM) Light olive brown (2.5Y 5/6), moist, 60% fine sand, 30% fine gravel, 10% low plasticity fines [FILL]
2					
3					
4					
5					SAND with SILT and CLAY (SW - SC) Dark greenish gray (5GY 4/1), moist, 60% fine sand, 20% low plastic fines, 20% high plastic fines
6	B-5-6.5				
7					SAND (SP Dark greenish gray (5GY 4/1), wet, 100% firm sand
8					Lean CLAY (CL) Dark greenish gray (5GY 4/1), wet, 70% fines, 30% organics, high plasticity, firm [BAY MUD]
9					
10					Organic SOIL (OL/OH) Dark greenish gray (5GY 4/1), wet, 50% high plastic fines, 50% organics, very soft [BAY MUD]
11	B-5-11.5				
12					Bottom of boring at 11.5 feet
13					
14					

WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS



W-1 (11/92)

Geomatrix Consultants	Project No. 2067	Figure ---

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-6

BORING LOCATION: 20 feet south of former excavation	ELEVATION AND DATUM: 9.85 MLLW		
DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.	DATE STARTED: 1/18/93	DATE FINISHED: 1/18/93	
DRILLING METHOD: Hollow stem auger (6 1/4" diameter)	TOTAL DEPTH: 15.5'	MEASURING POINT: Ground surface	
DRILLING EQUIPMENT: Mobile B-53	DEPTH TO WATER	FIRST 4.0	COMPL. --- / 24 HRS. ---
SAMPLING METHOD: 5' CME continuous core	LOGGED BY: J. M. Abitz		
HAMMER WEIGHT: 140 lbs / DROP: 40 inches	RESPONSIBLE PROFESSIONAL: Sally E. Goodin	REG. NO. RG 3743	

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	PID (ppm)	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Olive (5Y 4/4), moist, 65% fine sand, 25% fine gravel, 10% low plasticity fines [FILL]	
2						
3				27.9		
4	B-6-4				ATD ▽	
				240	SAND with SILT and GRAVEL (SW - SM) Dark gray (5Y 4/1), wet, 50% fine to coarse sand, 40% fine to coarse gravel, 10% low plasticity fines	
5				371		
				173	Color change to black (5Y 2.5/1)	
6					SAND (SP) Black (5Y 2.5/1), wet, 95% fine sand, 5% low plasticity fines	
7						
8						
9						
10						
11						
12						
13						
14						

B-1 (11/92)

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-6 cont'd

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15		X			SAND (SP) (continued)	
16					Bottom of boring at 15.5 feet	
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-7

BORING LOCATION: Near former south-extending trench

ELEVATION AND DATUM: 9.97 MLLW

DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.

DATE STARTED: 1/18/93 | DATE FINISHED: 1/18/93

DRILLING METHOD: Hollow stem auger (6 1/4" diameter)

TOTAL DEPTH: 15.5' | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: Mobile B-53

DEPTH TO WATER: FIRST 3.5' | COMPL. --- | 24 HRS. ---

SAMPLING METHOD: 5' CME continuous core

LOGGED BY: J. M. Abitz

HAMMER WEIGHT: --- | DROP: ---

RESPONSIBLE PROFESSIONAL: Sally E. Goodin | REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Yellowish brown (10YR 5/8), moist, 65% fine to coarse sand, 25% fine gravel, 10% low plasticity fines [FILL]	
2					CLAYEY SAND (SC) Black (10YR 2/1), moist, 70% fine sand, 30% low plasticity fines, wood chunks [FILL]	
3	B-7-3.5			8.3	CLAYEY SAND (SC) ATD ▽ Dark greenish gray (5GY 4/1), wet, 70% fine sand, 30% medium plasticity fines, decreasing clay with depth	
4						
5						
6						
7						
8						
9						
10						
11						
12	B-7-12			1.7	Lean CLAY (CL) Dark gray (5Y 4/1), wet, 100% fines, high plasticity, firm [BAY MUD]	
13						
14						

B-1 (11/92)

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-7 cont'd

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	PID (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15		X			Lean CLAY (CL) (continued)	
16		X			CLAYEY SAND (SM) Very dark gray (7.5YR N/3), wet, 70% fine sand, 30% low plasticity fines	
17					Bottom of boring at 15.5 feet	
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-8

BORING LOCATION: 30 feet south of former excavation

ELEVATION AND DATUM: 9.86 MLLW

DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.

DATE STARTED: 1/19/93 | DATE FINISHED: 1/19/93

DRILLING METHOD: Hollow stem auger (8 1/4" diameter)

TOTAL DEPTH: 12' | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: Mobile B-53

DEPTH TO WATER	FIRST	COMPL.	24 HRS.
	6'	---	---

SAMPLING METHOD: 5' CME continuous core

LOGGED BY: J. M. Abitz

HAMMER WEIGHT: --- | DROP: ---

RESPONSIBLE PROFESSIONAL: Sally E. Goodin | REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Olive (5Y 4/4), moist, 60% fine sand, 30% fine gravel, 10% low plasticity fines [FILL]	
2						
3						
4						
5					Lean CLAY (CL) Dark greenish gray (5GY 4/1), moist, 100% fines, trace fine sand seams, high plasticity, firm, shell fragments [BAY MUD]	
6	B-8-6				ATD ▽	
7					SAND (SP) Dark greenish gray (5GY 4/1), wet, 85% fine sand, 10% fine gravel, 5% high plasticty fines	No recovery from 7 to 12 feet. See boring B-8A for lithology.
8						
9						
10						
11						
12					Bottom of boring at 12 feet	
13						
14						

B-1 (11/92)

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-8A

BORING LOCATION: 30 feet south of former excavation

ELEVATION AND DATUM: 9.84 MLLW

DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.

DATE STARTED: 1/19/93 | DATE FINISHED: 1/19/93

DRILLING METHOD: Hollow stem auger (8 1/4" diameter)

TOTAL DEPTH: 11.5' | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: Mobile B-53

DEPTH TO WATER	FIRST	COMPL.	24 HRS.
	---	---	---

SAMPLING METHOD: 18"x2" split spoon

LOGGED BY: J. M. Abitz

HAMMER WEIGHT: 140 lbs | DROP: 40 inches

RESPONSIBLE PROFESSIONAL: Sally E. Goodin | REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					Asphalt	Lithology from boring B-8 for 0' to 7'
1					SAND with SILT and GRAVEL (SW - SM) Olive (5Y 4/4), moist, 60% fine sand, 30% fine gravel, 10% low plasticity fines [FILL]	
2						
3						
4						
5					Lean CLAY (CL) Dark greenish gray (5GY 4/1), moist, 100% fines, fine sand seams, shell fragments, high plasticity, firm	
6						
7					SAND (SP) Dark greenish gray (5GY 4/1), wet, 85% fine sand, 10% fine gravel, 5% high plasticity fines	
8					Organic SOIL (OL/OH) Dark greenish gray (5GY 4/1), wet, 50% high plasticity fines, 50% organics, very soft [BAY MUD]	
9						
10						
11	B-8A -11				Lean CLAY (CL) Dark greenish gray (5GY 4/1), wet, 100% fines, fine sand seams, high plasticity, firm [BAY MUD]	
12					Bottom of boring at 11.5 feet	
13						
14						

B-1 (11/92)

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL
1395 Middle Harbor Road
Port of Oakland

Log of Boring No. B-9

BORING LOCATION: 35 feet north of former excavation

ELEVATION AND DATUM: 10.24 MLLW

DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.

DATE STARTED: 1/21/93 | DATE FINISHED: 1/21/93

DRILLING METHOD: Hollow stem auger (8 1/4" diameter)

TOTAL DEPTH: 7' | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: Mobile B-53

DEPTH TO WATER	FIRST	COMPL.	24 HRS.
	4.5'	---	---

SAMPLING METHOD: 5' CME continuous core

LOGGED BY: J. M. Abitz

HAMMER WEIGHT: --- | DROP: ---

RESPONSIBLE PROFESSIONAL: Sally E. Goodin | REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	PID (ppm)	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
					Surface Elevation:	
0					Asphalt	
1					SAND with SILT and GRAVEL (SW - SM) Olive (5Y 5/3), moist, 60% fine sand, 30% fine gravel, 10% low plasticity fines [FILL]	
2						
3				304		
4				295		
4					ATD ▽	
5						
6						
7					Bottom of boring at 7 feet	
8						
9						
10						
11						
12						
13						
14						

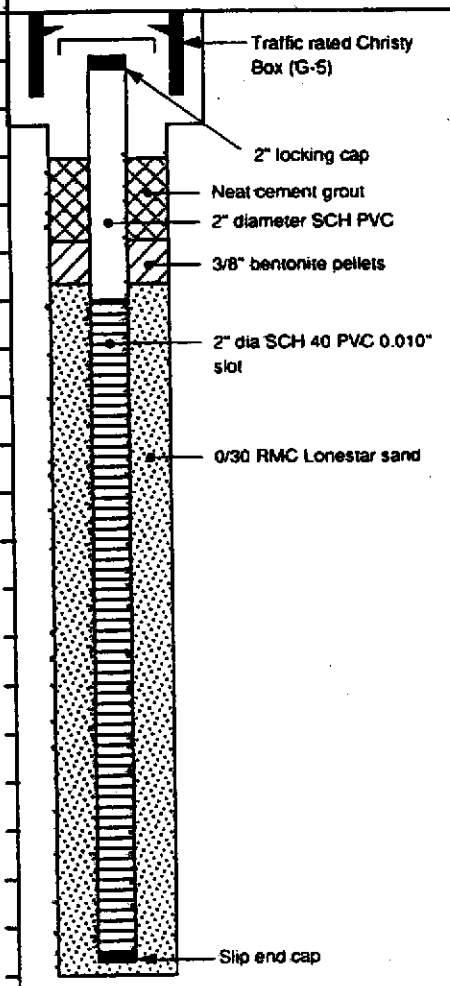
B-1 (11/92)

Geomatrix Consultants | Project No. 2026J | Figure ---

PROJECT: APL TERMINAL 1395 Middle Harbor Road - Port of Oakland	**Log of Well No. MW-3 (B-10)**
BORING LOCATION: 60 feet south of former excavation	ELEVATION AND DATUM: 9.84 MLLW
DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.	DATE STARTED: 1/20/93 / DATE FINISHED: 1/20/93
DRILLING METHOD: Hollow stem auger (8 1/4" and 10 1/4" OD)	TOTAL DEPTH: 10' / SCREEN INTERVAL: 3 - 10'
DRILLING EQUIPMENT: Mobile B-53	DEPTH TO WATER ATD: 6.5' / CASING: 2" dia SCH 40 PVC
SAMPLING METHOD: 5' CME continuous core and 18" x 2" split spoon	LOGGED BY: J. M. Abitz
HAMMER WEIGHT: 140 lbs / DROP: 40 inches	RESPONSIBLE PROFESSIONAL: Sally E. Goodin / REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:
0					Asphalt
1					SAND with SILT and GRAVEL (SW - SM) Reddish brown (5Y 5/3), moist, 60% fine sand, 30% fine gravel, 10% low plastic fines, increasing plasticity with depth [FILL]
2					
3					
4					
5	B-10 -5.5				ATD ▽
6					SAND (SP) Dark greenish gray (5GY 4/1), wet, 95% fine to medium sand, 5% low plasticity fines
7					Gravel
8					Lean CLAY (CL) Dark greenish gray (5GY 4/1), wet, 80% fines, 20% organics, trace gravel, high plasticity, decreasing organics with depth, firm [BAY MUD]
9					
10					Bottom of boring at 10 feet
11					
12					
13					
14					

WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS



W-1 (11/92)

Geomatrix Consultants	Project No. 2067	Figure ---

PROJECT: APL TERMINAL 1395 Middle Harbor Road - Port of Oakland	**Log of Well No. MW-1 (B-11)**
BORING LOCATION: 50 feet north of former excavation	ELEVATION AND DATUM: 10.37 MLLW
DRILLING CONTRACTOR: Gregg Drilling and Testing, Inc.	DATE STARTED: 1/21/93 / DATE FINISHED: 1/21/93
DRILLING METHOD: Hollow stem auger (8 1/4" and 10 1/4" OD)	TOTAL DEPTH: 10' / SCREEN INTERVAL: 3 - 10'
DRILLING EQUIPMENT: Mobile B-53	DEPTH TO WATER ATD: 6' / CASING: 2" dia SCH 40 PVC
SAMPLING METHOD: 5' CME continuous core and 18" x 2" split spoon	LOGGED BY: J. M. Abitz
HAMMER WEIGHT: 140 lbs / DROP: 40 inches	RESPONSIBLE PROFESSIONAL: Sally E. Goodin / REG. NO. RG 3743

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Surface Elevation:	
0					Asphalt	Traffic rated Christy Box (G-5)
1					SAND with SILT and GRAVEL (SW - SM) Light olive brown (2.5Y 5/4), moist, 60% fine to coarse sand, 30% fine gravel, 10% low plasticity fines [FILL]	2" locking cap
2						Neat cement grout
3						2" diameter SCH PVC
4						3/8" bentonite pellets
5						2" dia SCH 40 PVC 0.010" slot
6	B-11-6				ATD ▽	0/30 RMC Lonestar sand
7					SAND (SP) Dark greenish gray (5GY 4/1), wet, 95% fine to medium sand, 5% low plasticity fines	
8					Organic SOIL (OL/OH) Dark greenish gray (5GY 4/1), wet, 50% high plasticity fines, 50% organics, very soft [BAY MUD]	
9						
10					Lean CLAY (CL) Dark greenish gray (5GY 4/1), wet, 100% fines, high plasticity [BAY MUD]	Slip end cap
11					Bottom of boring at 10 feet	
12						
13						
14						

W-1 (11/92)

Geomatrix Consultants	Project No. 2067	Figure ---

GEOMATRIX

TABLE 1

SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES
American President Lines Terminal
1395 Middle Harbor Road
Port of Oakland
Oakland, California

Concentrations in parts per million (mg/kg)

Boring No.	Sample Depth (feet)	TPH as Gasoline	TPH as Diesel	Total Oil and Grease	Benzene	Toluene	Ethylbenzene	Total Xylenes	EPA Method 8010	EPA Method 8270
B-1	4	1.6(a)	ND	ND	ND	ND	0.011	0.013	ND	--
B-2	4	8(a)	7	310	ND	0.08	0.06	0.16	ND	--
B-2	9	ND	ND	ND	ND	ND	ND	ND	ND	--
B-3	4	1.4(a)	ND	ND	ND	0.007	ND	0.006	ND	ND
B-3	10.5	ND	ND	60	0.007	ND	ND	ND	ND	ND
B-4	4	480(a)	120	710	0.14	2.9	4.8	22	ND	--
B-4	10.5	0.5	12	110	ND	ND	ND	ND	ND	--
B-5	6.5	ND	ND	ND	ND	ND	ND	ND	ND	--
B-5	11.5	ND	ND	ND	ND	ND	ND	ND	ND	--
B-6	4	11(a)	10	ND	ND	0.011	0.035	0.11	ND	--
B-7	3.5	0.3	ND	ND	ND	0.007	ND	0.02	ND	--

GEOMATRIX

TABLE 1

SUMMARY OF COMPOUNDS DETECTED IN SOIL SAMPLES

Boring No.	Sample Depth (feet)	TPH as Gasoline	TPH as Diesel	Total Oil and Grease	Benzene	Toluene	Ethylbenzene	Total Xylenes	EPA Method 8010	EPA Method 8270
B-7	12	ND	ND	ND	ND	ND	ND	ND	ND	--
B-8	6	ND	25	ND	ND	ND	ND	ND	ND	--
B-8A	11	ND	ND	ND	ND	ND	ND	ND	ND	--
B-10	5.5	ND	ND	140	ND	ND	ND	ND	ND	--
B-11 (Mod)	6	3.9	ND	ND	ND	0.034	0.015	0.022	ND	--

Notes:

1. Samples collected by Geomatrix Consultants, Inc. and analyzed by Clayton Environmental Consultants of Pleasanton, California, for TPH as gasoline by modified EPA Method 8015; TPH as diesel by EPA Method 8015; total oil and grease by Standard Method 5520 E and F; and benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020. No soil samples from boring B-9 were collected for chemical analysis.

2. TPH = total petroleum hydrocarbons
   ND = not detected at or above detection limit
   -- = not analyzed
   (a) = Clayton Environmental Consultants noted that the petroleum hydrocarbon detected appears to be weathered gasoline

TABLE 2

SUMMARY OF COMPOUNDS DETECTED IN GROUNDWATER SAMPLES
American President Lines Terminal
1395 Middle Harbor Road
Port of Oakland
Oakland, California

Concentrations in parts per billion (µg/l)

Well No.	TPH as Gasoline	TPH as Diesel	Total Oil and Grease	Benzene	Toluene	Ethylbenzene	Total Xylenes	EPA Method 8010
MW-1	1,800	4,700	5,000	9.2	1.6	8.9	2.7	1,1-DCA 0.8
MW-2	ND	840	2,000	ND	ND	ND	ND	ND
MW-3	ND	3,400	2,000	2.1	0.9	1.7	3.1	Cis-1,2-DCE 0.4

Notes:

1. Samples collected by Geomatrix Consultants, Inc. and analyzed by Clayton Environmental Consultants of Pleasanton, California, for TPH as gasoline by modified EPA Method 8015; TPH as diesel by EPA Method 8015; total oil and grease by Standard Method 5520 C and F; benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020; and halogenated volatile organic compounds by EPA Method 8010. Samples also analyzed for total dissolved solids (TDS) by EPA Method 160.1; samples from monitoring wells MW-1, MW-2, and MW-3 contained 3,000, 23,000, and 1,600 milligrams per liter (ppm) TDS, respectively.

2. TPH = total petroleum hydrocarbons
   ND = not detected at or above detection limit

3. Total Dissolved Solids reported in parts per million (mg/l).

EF6 through EF9:

First and Second Quarterly Monitoring Reports by ITSI, June and July 1996

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

June 4, 1996

Project No.: 95-113.07

Mr. John Prall, R.G.
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Groundwater Monitoring and Sampling Report
American President Lines (APL) Terminal, Berths 60-63, Port of Oakland
1395 Middle Harbor Road
Oakland, California
(Work Order No. 201476)

Dear Mr. Prall:

This Groundwater Monitoring and Sampling Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI), on behalf of the Port of Oakland, for the first quarter 1996 groundwater monitoring and sampling performed on March 28, 1996, at the American President Lines (APL) Terminal, Berths 60-63, located at 1395 Middle Harbor Road in Oakland, California. A site location map is shown on Figure 1.

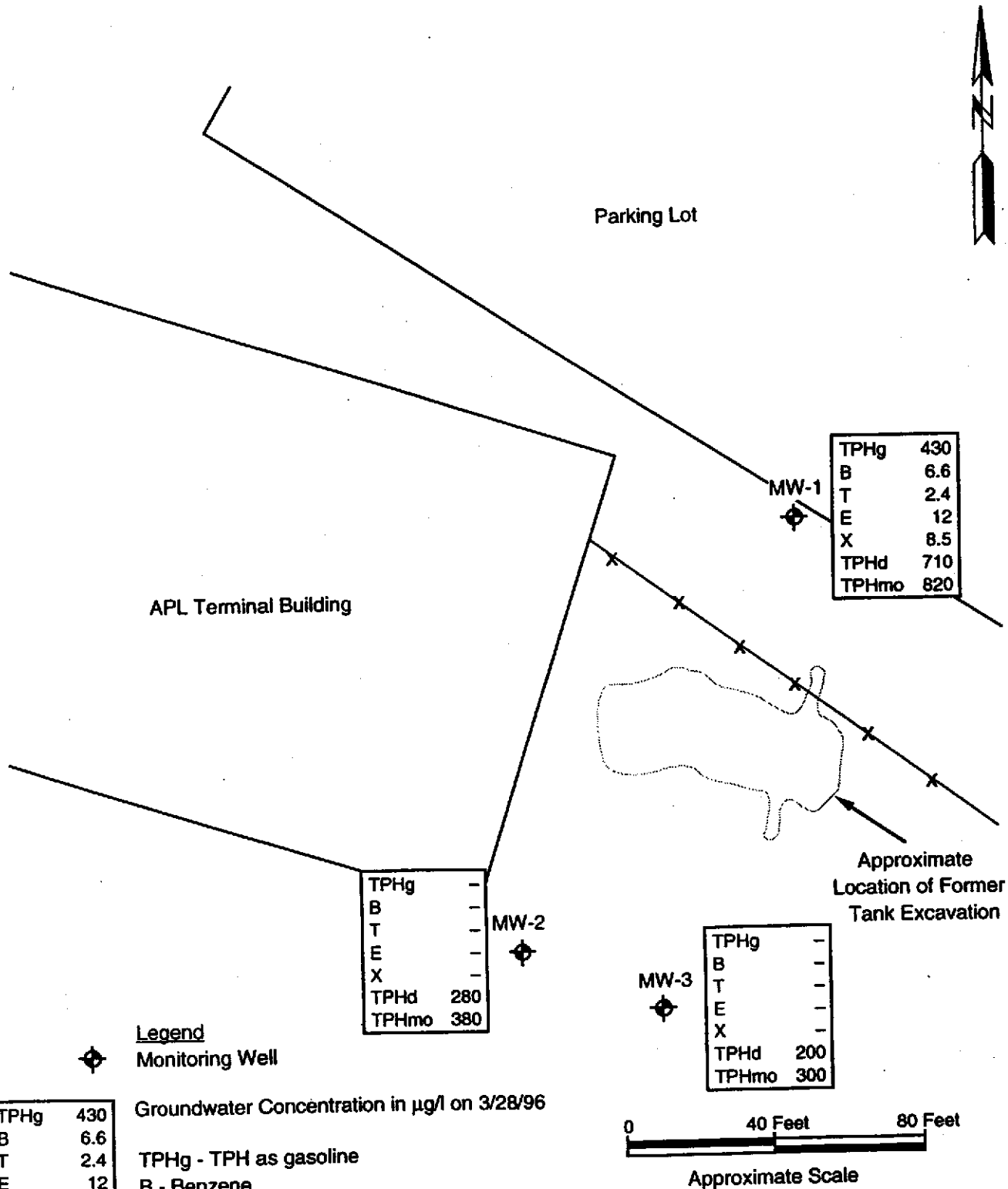
The scope of work included monitoring and sampling of three groundwater monitoring wells, MW-1, MW-2 and MW-3, installed in January 1993. The wells were installed in the vicinity of four former underground storage tanks: a 10,000-gallon diesel tank (EF-06), a 5,000-gallon diesel tank (EF-07), a 1,000-gallon gasoline tank (EF-08), and a 550-gallon waste oil tank (EF-09).

SAMPLING OF MONITORING WELLS

The groundwater monitoring and sampling was performed on March 28, 1996. The monitoring wells were initially gauged for depth to water and checked for the presence of separate phase hydrocarbons. No sparate phase hydrocarbons were observed in the monitoring wells. Depth to water measurements were recorded on Monitoring Well Purge and Sample Forms. Copies of the Monitoring Well Purge and Sample Forms are provided in Attachment A.

1330 Broadway, Suite 1625, Oakland, CA 94612 (510) 286-8888 (510) 286-8889 fax

95-113.07/F.3-Conc



Source: Adapted from Figure 3, Concentrations of Petroleum Hydrocarbons in Groundwater, September 25, 1995, Alisto Engineering Group.

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER ON MARCH 28, 1996

American President Lines Terminal, Berths 60-63
1395 Middle Harbor Road

PORT OF OAKLAND

ITSI
INNOVATIVE TECHNICAL SOLUTIONS, INC.

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

July 24, 1996

Project No.: 95-113.07

Mr. John Prall, R.G.
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Groundwater Monitoring and Sampling Report
American President Lines (APL) Terminal, Berths 60-63, Port of Oakland
1395 Middle Harbor Road
Oakland, California
(Work Order No. 201476)

Dear Mr. Prall:

This Groundwater Monitoring and Sampling Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI), on behalf of the Port of Oakland, for the second quarter 1996 groundwater monitoring and sampling performed on June 18, 1996, at the American President Lines (APL) Terminal, Berths 60-63, located at 1395 Middle Harbor Road in Oakland, California. A site location map is shown on Figure 1.

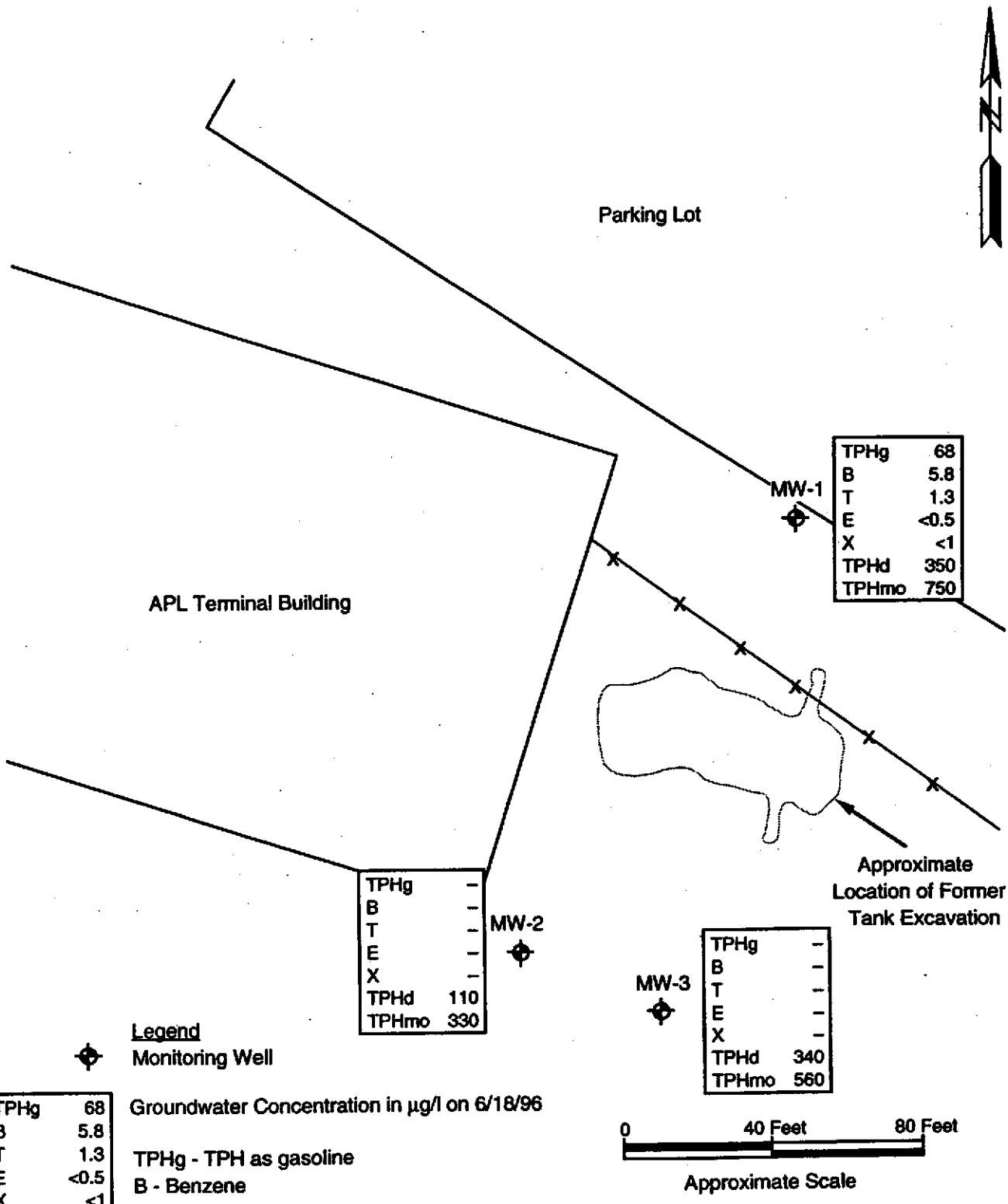
The scope of work included monitoring and sampling of three groundwater monitoring wells, MW-1, MW-2 and MW-3, installed in January 1993. The wells were installed in the vicinity of four former underground storage tanks: a 10,000-gallon diesel tank (EF-06), a 5,000-gallon diesel tank (EF-07), a 1,000-gallon gasoline tank (EF-08), and a 550-gallon waste oil tank (EF-09).

SAMPLING OF MONITORING WELLS

The groundwater monitoring and sampling was performed on June 18, 1996. The monitoring wells were initially gauged for depth to water and checked for the presence of separate phase hydrocarbons. No sparate phase hydrocarbons were observed in the monitoring wells. Depth to water measurements were recorded on Monitoring Well Purge and Sample Forms. Copies of the Monitoring Well Purge and Sample Forms are provided in Attachment A.

1330 Broadway, Suite 1625, Oakland, CA 94612 (510) 286-8888 (510) 286-8889 fax

95-113.07/F-3-Conc



Source: Adapted from Figure 3, Concentrations of Petroleum Hydrocarbons in Groundwater, September 25, 1995, Alisto Engineering Group.

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER ON JUNE 18, 1996

American President Lines Terminal, Berths 60-63
1395 Middle Harbor Road

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

TABLE 2

SUMMARY OF LABORATORY RESULTS FOR PETROLEUM HYDROCARBONS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	TOG (µg/l)	TDS (mg/l)	Note
MW-1	2/5/93	1,800	9.2	1.6	8.9	2.7	4,700	-	5,000	3,000	1
	5/11/93	260	3.2	2.3	0.7	0.5	4,800	-	7,000	-	1
	8/19/93	60	9.0	ND	ND	ND	2,300	-	ND	-	1
	11/24/93	50	8.8	1.5	ND	3.0	280	-	ND	-	1
	2/24/94	360	12	ND	2	ND	2,000	-	-	-	1
	6/14/94	ND	9.4	ND	ND	0.7	ND	-	ND	-	1
	8/23/94	80	13	2.4	ND	9.0	3,000	-	ND	-	1
	11/4/94	ND	15	2.4	ND	11.2	1,600	-	ND	-	1
	3/7/95	<50	1.3	0.4	<0.3	<0.4	420	7,200	<5,000	9,000	1
	3/7/95	<50	0.9	0.3	<0.3	<0.4	-	-	-	-	1
	9/25/95	310	12	8.0	<0.3	22.5	<500	1,300	-	2,200	1
	3/28/96	430	6.6	2.4	12	8.5	710	820	-	453	
	6/18/96	68	5.8	1.3	<0.5	<1	350	750	-	953	
QC-1	6/18/96	<50	4.3	0.53	<0.5	<1	-	-	-	-	
MW-2	2/5/93	ND	ND	ND	ND	ND	840	-	2,000	23,000	1
	5/11/93	ND	ND	ND	ND	ND	3,700	-	ND	-	1
	8/19/93	ND	ND	ND	ND	ND	620	-	ND	-	1
	11/24/93	ND	ND	ND	ND	ND	80	-	ND	-	1
	2/24/94	ND	ND	ND	ND	ND	ND	-	-	-	1
	6/14/94	-	-	-	-	-	ND	-	ND	-	1
	8/23/94	-	-	-	-	-	620	-	ND	-	1
	11/4/94	-	-	-	-	-	1,400	-	ND	-	1
	3/7/95	<50	<0.4	<0.3	<0.3	<0.4	310	7,100	<5,000	20,000	1
	9/25/95	-	-	-	-	-	<300	880	-	11,000	1
	3/28/96	-	-	-	-	-	280	380	-	1,190	
	6/18/96	-	-	-	-	-	110	330	-	18,800	

1 Data from Table 1, Summary of Groundwater Monitoring and Petroleum Hydrocarbons in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

TABLE 2 (continued)

SUMMARY OF LABORATORY RESULTS FOR PETROLEUM HYDROCARBONS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	TOG (µg/l)	TDS (mg/l)	Note
MW-3	2/5/93	ND	2.1	0.9	1.7	3.1	3,400	-	2,000	1,600	1
	3/8/93	-	-	-	-	-	-	-	-	-	1
	5/11/93	ND	ND	ND	ND	ND	3,300	-	ND	-	1
	8/19/93	ND	ND	ND	ND	ND	840	-	ND	-	1
	11/24/93	ND	ND	ND	ND	ND	100	-	ND	-	1
	2/24/94	ND	ND	ND	ND	ND	890	-	-	-	1
	6/14/94	-	ND	ND	ND	ND	440	-	ND	-	1
	8/23/94	-	ND	ND	ND	ND	ND	-	ND	-	1
	11/4/94	-	ND	ND	ND	ND	630	-	ND	-	1
	3/7/95	<50	1.4	<0.3	<0.3	<0.4	330	3,200	<5,000	12,000	1
	9/25/95	-	-	-	-	-	200	1,300	-	19,000	1
	3/28/96	-	-	-	-	-	200	300	-	7,600	
	6/18/96	-	-	-	-	-	340	560	-	20,600	

1 Data from Table 1, Summary of Groundwater Monitoring and Petroleum Hydrocarbons in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

TABLE 3

SUMMARY OF LABORATORY RESULTS FOR HALOGENATED VOLATILE ORGANIC COMPOUNDS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	BDM (µg/l)	Chloroform (µg/l)	1,1-DCA (µg/l)	1,2-DCA (µg/l)	1,1-DCE (µg/l)	1,2-DCE (µg/l)	cis 1,2-DCE (µg/l)	1,2-DCB (µg/l)	1,4-DCB (µg/l)	VC (µg/l)	Note
MW-1	2/5/93	ND	ND	0.8	ND	ND	ND	ND	ND	ND	ND	1
	5/11/93	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	1
	8/19/93	ND	ND	2.0	ND	2.0	ND	ND	ND	ND	ND	1
	11/24/93	ND	ND	0.7	ND	ND	ND	ND	ND	ND	ND	1
	2/24/94	ND	ND	2.0	ND	ND	ND	ND	ND	ND	ND	1
	6/14/94	ND	ND	1.0	ND	ND	ND	ND	ND	ND	ND	1
	8/23/94	ND	ND	2.3	0.3	ND	0.4	ND	ND	ND	1.1	1
	11/4/94	ND	ND	2.2	0.8	ND	ND	ND	ND	ND	0.7	1
	3/7/95	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	1
	9/25/95	ND	ND	1.7	ND	ND	ND	0.6	ND	ND	1.8	1
	3/28/96	ND	ND	1.2	ND	ND	ND	ND	ND	ND	4	
	6/18/96	ND	ND	1.2	ND	ND	ND	ND	ND	ND	2.6	
QC-1	6/18/96	ND	ND	1.2	ND	ND	ND	ND	ND	ND	2.6	
MW-2	2/5/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	5/11/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	8/19/93	ND	ND	ND	ND	ND	ND	ND	1.0	3.0	ND	1
	11/24/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	2/24/94	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ND	1
	6/14/94	ND	ND	ND	ND	ND	ND	ND	ND	0.8	ND	1
	8/23/94	ND	ND	ND	ND	ND	0.4	ND	ND	1.3	ND	1
	11/4/94	ND	ND	ND	ND	ND	2.2	ND	ND	0.9	ND	1
	3/7/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	9/25/95	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	1
	3/28/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	6/18/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

1 Data from Table 2, Summary of Halogenated Volatile Organic Compounds in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

TABLE 3 (continued)

SUMMARY OF LABORATORY RESULTS FOR HALOGENATED VOLATILE ORGANIC COMPOUNDS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	BDM (µg/l)	Chloroform (µg/l)	1,1-DCA (µg/l)	1,2-DCA (µg/l)	1,1-DCE (µg/l)	1,2-DCE (µg/l)	cis 1,2-DCE (µg/l)	1,2-DCB (µg/l)	1,4-DCB (µg/l)	VC (µg/l)	Note
MW-3	2/5/93	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	1
	5/11/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	8/19/93	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ND	1
	11/24/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	2/24/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	6/14/94	ND	ND	ND	ND	ND	ND	ND	ND	0.6	ND	1
	8/23/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	11/4/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	3/7/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	9/25/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	3/28/96	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	
	6/18/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

1 Data from Table 2, Summary of Halogenated Volatile Organic Compounds in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

APPENDIX A-2

EF10:

Remedial Action Completion Certification dated May 7, 1996

Tank Closure Report by Alisto Engineering Group, October 1995

EF10:

Remedial Action Completion Certification dated May 7, 1996

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

Alameda County Environmental Health Div.
Mail Code: 430-4580
Environmental Protection Services
1131 Harbor Bay Parkway, Room 250
Alameda CA 94502-6577

May 7, 1996
LOP STID 2485

REMEDIAL ACTION COMPLETION CERTIFICATION

Attn: Jeff Rubin
Port of Oakland/Environmental Dept
530 Water St.
Oakland CA 94607

American President Lines
1395 Middle Harbor Rd.
Oakland CA 94607

RE: Port of Oakland/Berth 63/American President Lines site, 1395 Middle Harbor Rd., Oakland CA 94607

Dear Mr. Rubin and APL,

This letter confirms the completion of site investigation and remedial action for the 4,000-gallon diesel underground storage tank (Port of Oakland tank EF-10) at the above referenced site. Based on the available information and with the provision that the information provided to this agency was accurate and representative of site conditions, **no further action related to the underground tank release is required at this time.** Please be aware that this does not free present or future landowners or operators from cleanup responsibilities in the event that new information indicates a pollutant problem on the site or originating from the site.

This notice is issued pursuant to a regulation contained in Title 23, Division 3, Chapter 16, Section 2721(e) of the California Code of Regulations. If a change in land use is proposed, the owner must promptly notify this agency.

If you have any questions regarding this letter, please contact Jennifer Eberle at (510) 567-6700, ext. 6761. Attached is a copy of the Case Closure Summary, which was reviewed and approved by this agency and the RWQCB.

Very truly yours,

Mee Ling Tung, Director

PORT OF OAKLAND
ENVIRONMENTAL DIVISION
MAY 13 REC'D
RECEIVED
ENVIRONMENTAL DIVISION

cc: Acting Chief, Environmental Protection Division
Kevin Graves, RWQCB
Lori Casias, SWRCB (with attachment)
Brady Nagle, Alisto Engineering, 1575 Treat Blvd., Suite 201, Walnut Creek CA
Jennifer Eberle

LOP/Completion
je.2485clos.ltr
enclosure (clos sum)

EF10:

Tank Closure Report by Alisto Engineering Group, October 1995

TANK CLOSURE REPORT

Port of Oakland Tank EF-10
Berth 63 - American President Line Terminal
1395 Middle Harbor Road
Oakland, California

Project No. 10-256-02-004

Prepared for:

Port of Oakland
530 Water Street
Oakland, California

Prepared by:

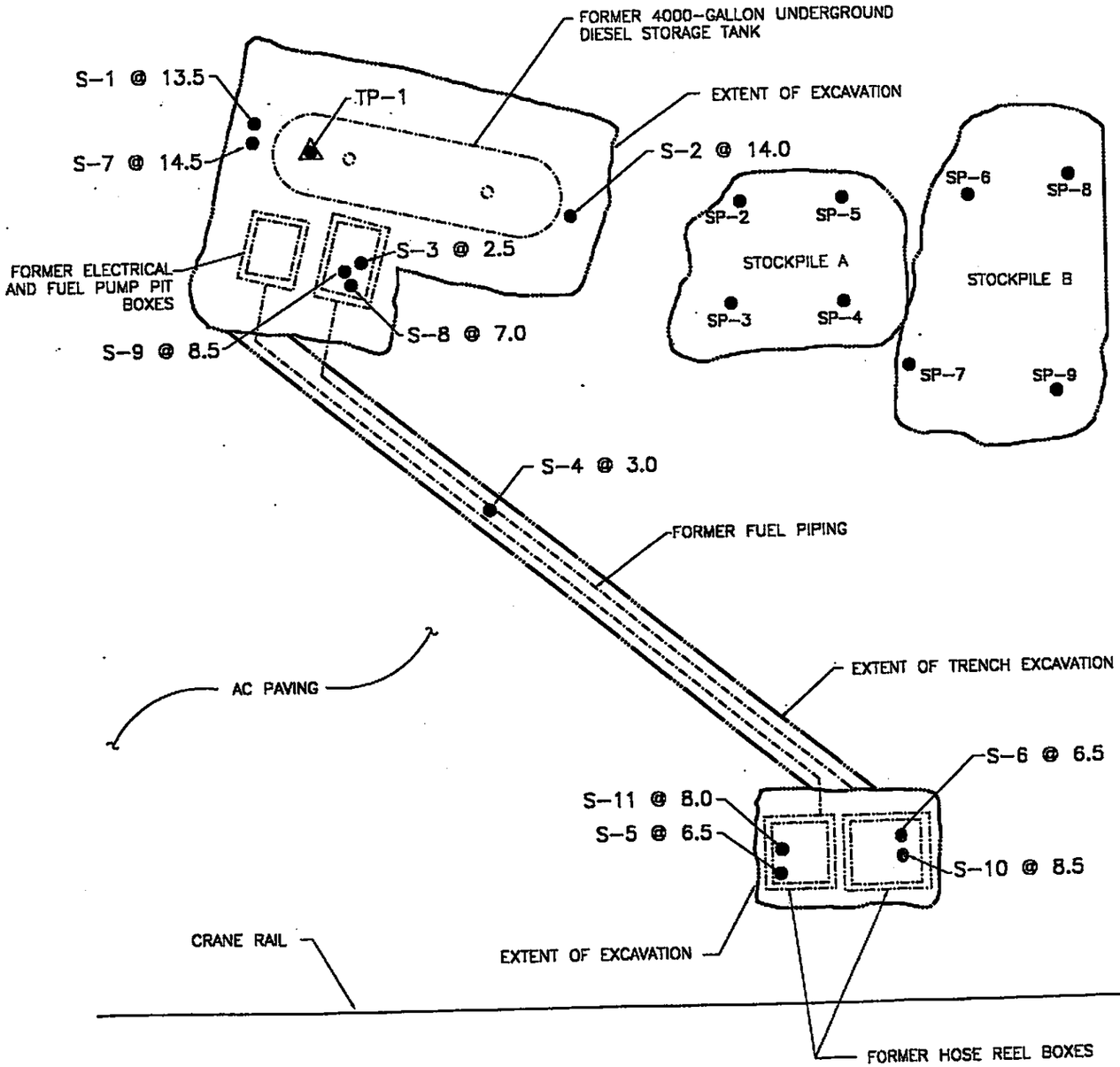
Alisto Engineering Group
1575 Treat Boulevard, Suite 201
Walnut Creek, California

October 31, 1995

Brady Nagle
Project Manager

Al Sevilla, P.E.
Principal

REGISTERED PROFESSIONAL ENGINEER
ALBERTO SANCHEZ SEVILLA
26392
Exp. Date 3/31/96
CIVIL
STATE OF CALIFORNIA



BUILDING E-222

N

0 10 20

SCALE IN FEET

LEGEND

S-2 @ 14 — SOIL SAMPLE LOCATION, DESIGNATION, AND DEPTH IN FEET BELOW GRADE

▲ GRAB WATER SAMPLE LOCATION

FIGURE 3

SITE PLAN

PORT OF OAKLAND
TANK EF-10, BERTH 63
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

PROJECT NO. 10-256

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

TABLE 1 - SUMMARY OF RESULTS OF SOIL SAMPLING
PORT OF OAKLAND, TANK EF-10, BERTH 63
1395 MIDDLE HARBOR ROAD, OAKLAND, CALIFORNIA

ALISTO PROJECT NUMBER 10-256

SAMPLE ID	SAMPLE DEPTH (fbg)	DATE OF SAMPLING	TPH-D (mg/kg)	B (ug/kg)	T (ug/kg)	E (ug/kg)	X (ug/kg)	LAB
S-1	13.5	07/25/95	2600	ND<500	ND<500	ND<500	ND<500	PACE
S-2	14.0	07/25/95	12	ND<1	ND<1	ND<1	ND<2	PACE
S-3	2.5	07/25/95	4600	11	8.1	ND<1	64	PACE
S-4	3.0	07/25/95	17	ND<1	1	ND<1	ND<2	PACE
S-5	6.5	08/07/95	580	ND<1	1.9	13	11	PACE
S-6	6.5	08/07/95	5800	ND<1	1.8	30	20	PACE
S-7	14.5	08/07/95	ND<10	ND<1	ND<1	ND<1	ND<2	PACE
S-8	7.0	08/07/95	1300	3.8	13	ND<1	16	PACE
S-9	8.5	08/14/95	25	ND<5	ND<5	ND<5	ND<5	CEC
S-10	8.5	08/14/95	50	ND<5	ND<5	ND<5	ND<5	CEC
S-11	8.0	08/14/95	ND<1	ND<5	ND<5	ND<5	ND<5	CEC

ABBREVIATIONS:

TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
fbg	Feet below grade
mg/kg	Milligrams per kilogram
ND	Not detected above reported detection limit
PACE	Pace, Inc.
CEC	Clayton Environmental Consultants

[illegible]

TABLE-2 SUMMARY OF GROUNDWATER SAMPLING AND ANALYSIS
PORT OF OAKLAND, TANK EF-10, BERTH 63
1395 MIDDLE HARBOR ROAD, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-256

SAMPLE ID	DATE OF SAMPLING	TPH-D (mg/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	LAB
TP-1	08/16/95	5.8	ND<0.5	ND<0.5	ND<0.5	ND<1	PACE
TB-1	08/16/95	—	ND<0.5	ND<0.5	ND<0.5	ND<1	PACE

ABBREVIATIONS:

TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
ug/l	Micrograms per liter
—	Not analyzed
ND	Not detected above reported detection limit
TP	Tank pit
TB	Trip blank
PACE	Pace, Inc.

E:\0\10-256\256-2-1\WQ.1

TABLE 3 - SUMMARY OF RESULTS OF STOCKPILED SOIL SAMPLING
PORT OF OAKLAND, TANK EF-10, BERTH 63
1395 MIDDLE HARBOR ROAD, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-256

SAMPLE ID	DATE OF SAMPLING	TPH-D (mg/kg)	B (ug/kg)	T (ug/kg)	E (ug/kg)	X (ug/kg)	Total Lead (mg/kg)	ph	Flash Point	Reactivity Cyanide (mg/kg)	Reactivity Sulfide (mg/kg)	LAB
SP-2, SP-3 SP-4, SP-5	08/07/95	430	ND<1	1.6	1.5	7.1	28.5	8.13	Negative	ND<0.495	19.9	PACE
SP-6, SP-7 SP-8, SP-9	08/07/95	4600	ND<1	1.4	ND<1	17	41.2	7.83	Negative	ND<0.5	31.9	PACE

ABBREVIATIONS:

TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
mg/kg	Milligrams per kilogram
ug/kg	Micrograms per kilogram
ND	Not detected above reported detection limit
PACE	Pace, Inc.

E:\0\10-256\STOCKPIL.WQ2

APPENDIX A-2

EF11 through EF14:

Underground Storage Tank Removal Report by Baseline Environmental Consulting, November 1990

Report on

UNDERGROUND TANK REMOVAL ACTIVITIES
APL CONTAINER YARD EARTHQUAKE REPAIR
1395 Middle Harbor Road
Oakland, California

Prepared for:

Port of Oakland
Oakland, California

November 1990

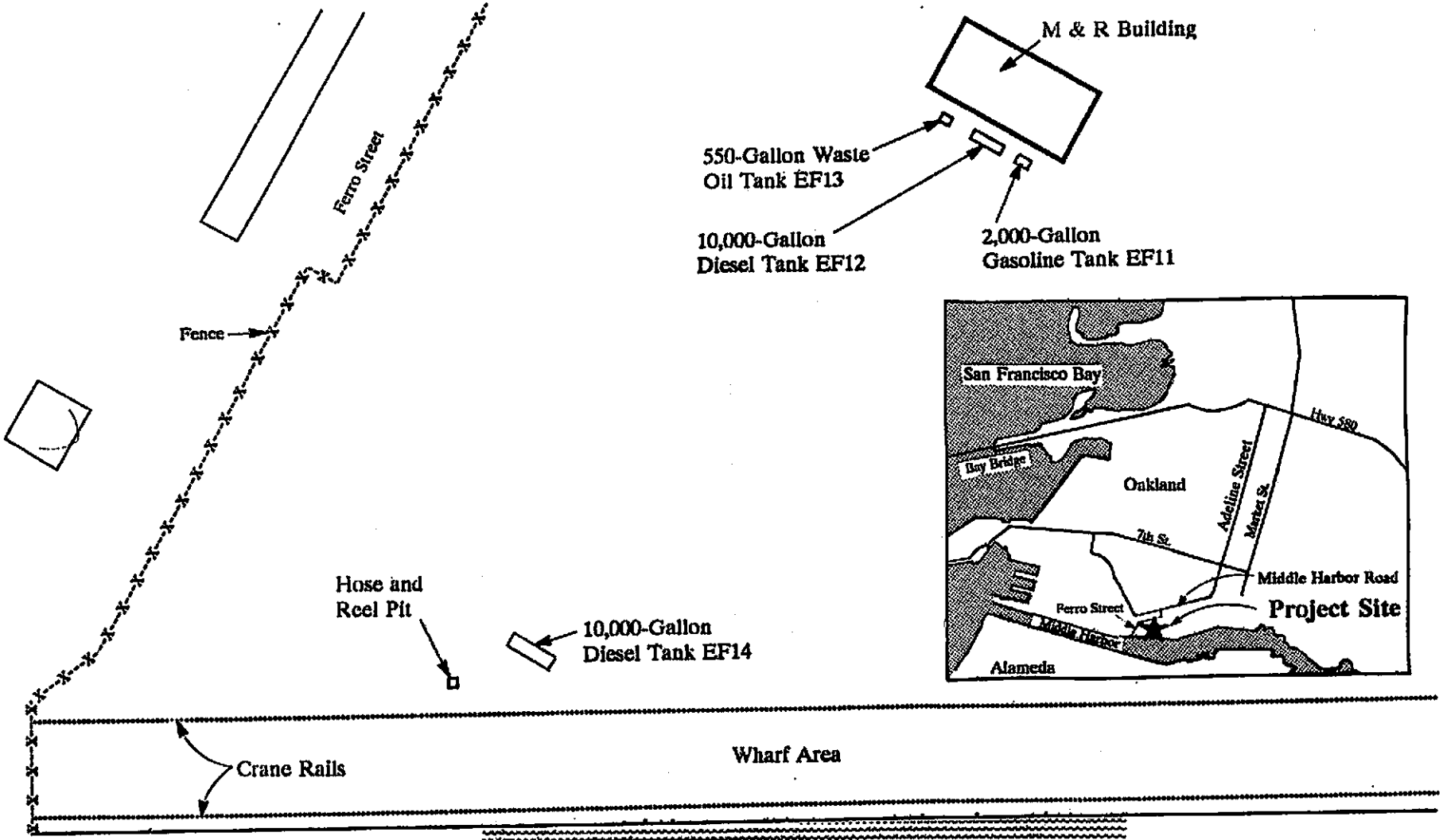
Prepared by:

BASELINE ENVIRONMENTAL CONSULTING
5900 Hollis Street, Suite D
Emeryville, California 94608
(415) 420-8686

S9-134.40

REGIONAL LOCATION AND SITE MAP
Underground Tank Removal
American President Companies ("APL")
Container Yard Earthquake Repair

Figure 1



1395 Middle Harbor Road
Oakland, California

Source: Jordan Woodman Dobson Architecture Engineering, May 1990.

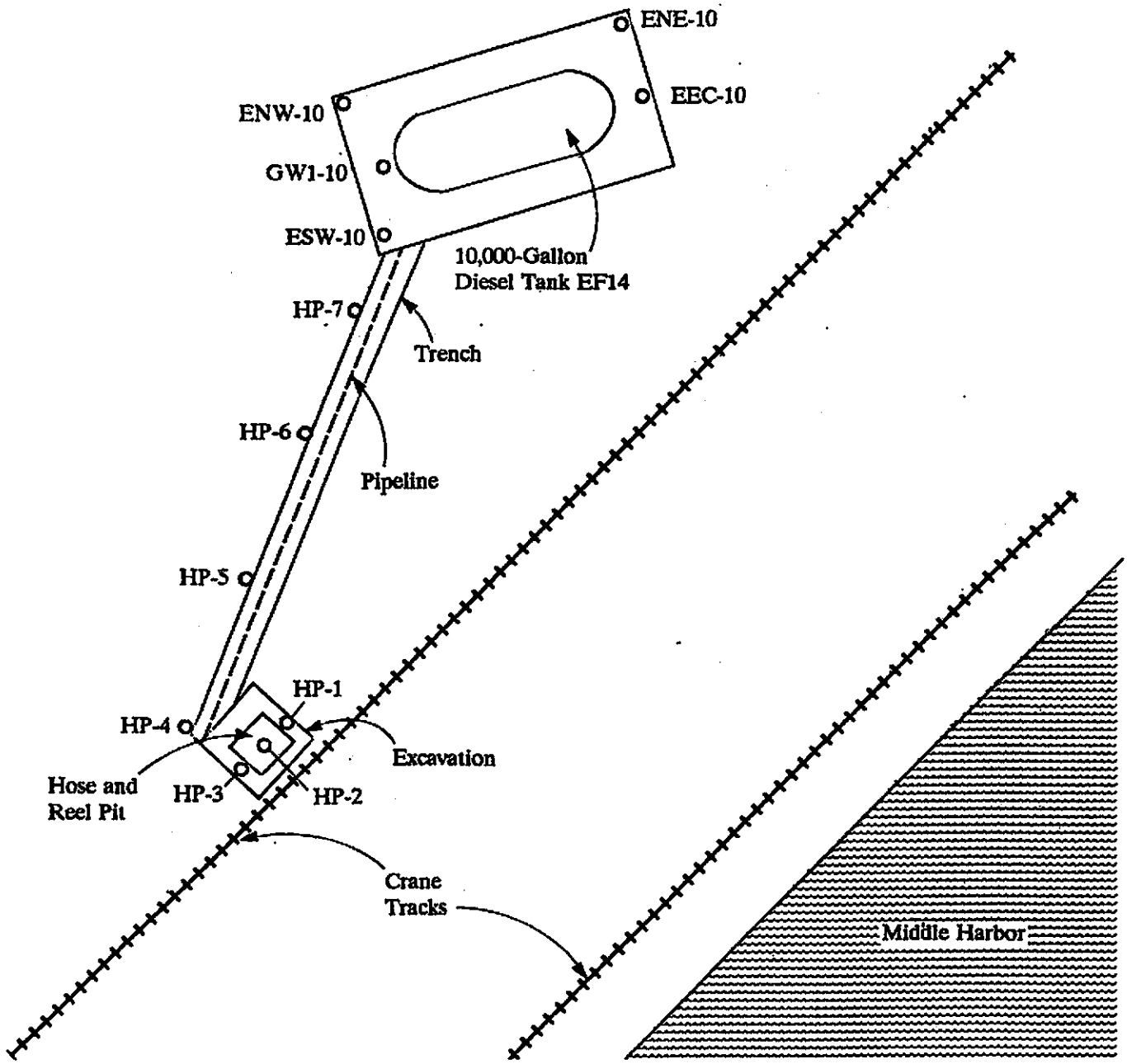
BASELINE

11/5/90

S9-134.40

SOIL SAMPLING LOCATIONS
Tank EF14 (Wharf Area)

Figure 2



American President Companies ("APL")
1395 Middle Harbor Road
Oakland, California

Approximate
0 20 Feet

BASELINE

TABLE 1

ANALYTICAL RESULTS, VERIFICATION SAMPLING, SOIL AND GROUNDWATER
APL Container Yard Earthquake Repair
1395 Middle Harbor Road, Oakland[1]
Tank EF14 (Wharf Area)
(mg/kg, except where noted)

Sample Location[2]	Date Sampled	Sample Depth (feet)	Diesel	Benzene	Toluene	Xylenes	Ethyl-benzene
Tank EF14 Excavation							
EEC-10	8/30/90	10.0	ND	ND	ND	ND	ND
ENE-10	8/30/90	10.0	ND	ND	ND	ND	ND
ENW-10	8/30/90	10.0	ND	ND	ND	ND	ND
ESW-10	8/30/90	10.0	ND	ND	ND	ND	ND
GW1-10 (mg/L)[3]	8/30/90	11.0	NA	ND	ND	ND	ND
Hose and Reel Pit							
P-1-4[4]	8/30/90	4.0	14,000	ND	ND	0.320	0.038
HP-1	9/11/90	5.0	2.1	ND	ND	0.010	ND
HP-2	9/11/90	5.0	200	ND	ND	0.0091	ND
HP-3	9/11/90	4.0	2.7	ND	ND	0.0073	ND
Trench							
HP-4	9/11/90	3.0	1.8	ND	ND	0.0061	ND
HP-5	9/11/90	2.75	5.3	ND	ND	0.0073	ND
HP-6	9/11/90	2.75	9.7	ND	ND	0.010	ND
HP-7	9/11/90	2.5	2.3	ND	ND	0.0052	ND
EPA Method:[5]			8015M	5030/8020	5030/8020	5030/8020	5030/8020
Detection Limit (mg/kg):			1.0	0.005	0.005	0.005	0.005

1 Tank EF14, a 10,000-gallon diesel tank, was located at the 1579 Middle Harbor Road address until APL assumed operational responsibility for the site. The tank is now considered part of 1395 Middle Harbor Road.

2 *In situ* samples collected after completion of overexcavation activities. Sampling locations are shown in Figure 2; laboratory reports are included as Appendix C. All samples, except for sample P-1-4, represent the quality of the soil remaining in the ground after excavation.

3 Groundwater sample; not analyzed for diesel in laboratory due to insufficient sample volume.

4 Sample P-1-4 was also analyzed for Title 26 metals, pH, acute aquatic toxicity, and volatile organics to determine whether the soils would be classified as hazardous waste according to CCR Title 26. The analytical results indicated that the soils would not be considered hazardous waste (laboratory report in Appendix C). The sample material was excavated and stockpiled on plastic.

5 Soils analytical method only.

Notes: ND = None detected.
NA = Not analyzed.

TABLE 2

ANALYTICAL RESULTS, SOILS AND GROUNDWATER
APL Container Yard Earthquake Repair
1395 Middle Harbor Road, Oakland[1]
Tanks EF11, EF12, EF13 (M & R Building[2])
(mg/kg, except where noted)

Sample Location[3]	Date Sampled	Sample Depth (feet)	Diesel	Gasoline	Oil and Grease	Benzene	Toluene	Xylenes	Ethyl-benzene	Organic Lead	Metals[4]	Volatile Organics	Semi-Volatile Organics
Tank EF11													
EF11-1	9/05/90	8.0	NA	8.3	NA	0.024	ND	0.130	0.096	ND	NA	NA	NA
EF11-2	9/05/90	8.0	NA	1.7	NA	0.036	ND	0.010	0.070	ND	NA	NA	NA
Tank EF12													
EF12-3	9/05/90	10.0	ND	NA	NA	ND	ND	ND	ND	NA	NA	NA	NA
EF12-4	9/05/90	10.0	ND	NA	NA	ND	ND	ND	ND	NA	NA	NA	NA
GW6/GW7[5]	9/05/90	11.5	5.8	NA	NA	ND	0.009	0.008	ND	NA	NA	NA	NA
Tank EF13													
EF13-5[6]	9/05/90	7.0	NA	NA	94	NA	NA	NA	NA	NA	Cd 0.6 Cr 15.0 Pb ND Zn 28.0	ND	ND
	EPA Method:[7]			8015M	8015M	503E[7]	5030/8020	5030/8020	5030/8020	5030/8020	7420	6010[9]	5030/8240/8270
	Detection Limit (mg/kg):10.0			10.0	0.005	0.005	0.005	0.005	0.005	0.5	Rept.	Rept.	Rept.

1 Tanks EF11, EF12, and EF13 were located at the 1579 Middle Harbor Road address until APL assumed operational responsibility for the site. The tanks are now considered part of 1395 Middle Harbor Road.
2 Referred to by APL as the Rigging Loft Building.
3 All samples were collected in place after completion of overexcavation activities (except for sample EF13-5). Sampling locations are shown in Figure 3; laboratory reports are included in Appendix C.
4 Cd = Cadmium, Cr = Chromium (total), Pb = Lead, and Zn = Zinc.
5 Groundwater sample; results reported as mg/L.
6 Sampled material subsequently excavated and stockpiled. Due to presence of oil and grease, excavated materials were transported to PORT site for bioremediation (see Soils Management).
7 Soils analytical methods only.
8 Source: Standard Methods for the Examination of Water and Wastewater.
9 EPA Method 7420 used for analysis of lead.

Notes: NA = Not analyzed.
ND = None detected.
Rept. = See laboratory report in Appendix C.

APPENDIX B

Site Specific Health and Safety Plan

HEALTH AND SAFETY PLAN

SOIL AND GROUNDWATER SAMPLING ACTIVITIES

1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Prepared for:

Port of Oakland Environmental Health and Safety Compliance Department
530 Water Street, Oakland, California

Prepared by:

Innovative Technical Solutions, Inc.

October 23, 2002

TABLE OF CONTENTS

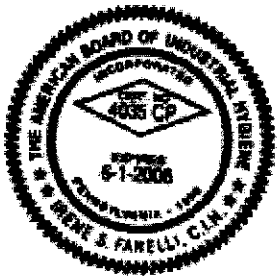
This Health and Safety Plan addresses the activities to be carried out during drilling and sampling of borings at 1395 Middle Harbor Road, Oakland, California, Alameda County, California. The plan has been prepared in accordance with 8 CCR 5192 and other applicable regulations, and good industrial hygiene practice.

This plan is intended to apply to the described project activities at the above listed site only, and must not be extrapolated to other substances, work activities or project locations without modification to address the specific hazards associated with those substances, activities and/or any other specific regulatory requirements.

CERTIFICATION OF HAZARD ASSESSMENT

A Hazard Assessment in accordance with 29 CFR 1910.132 has been made to determine the likelihood of excessive exposure to site chemical contaminants. All of the materials are present in low, part per billion, concentrations. Given the scope of work for the project, the concentrations, the degree of potential for exposure to the site materials and prior experience on other sites with similar conditions, there is no expectation that overexposure will occur. As such, exposure monitoring and real-time monitoring are not planned for this project. The exception to this conclusion, and primarily as a precaution, is the change-out of vapor-phase carbon in the treatment system, and handling of condensate in the system. These items are addressed in Section 5.0.

Irene S. Fanelli, CIH



October 24, 2002
Date

1.0 Introduction

This Health and Safety Plan addresses the activities to be carried out during drilling and sampling of borings at 1395 Middle Harbor Road, Oakland, California. The plan has been prepared in accordance with 8 CCR 5192 and other applicable regulations, and good industrial hygiene practice.

This plan is intended as a practical approach to the activities in light of the potential occupational and public health hazards. Based upon site history, anticipated chemicals of concern, and site activities, a "Level D" site will be maintained for site activities. As work activities progress, site conditions may change; this Health and Safety Plan outlines the procedures necessary to ensure a safe working environment under the actual conditions which may be encountered. This Plan may be upgraded/downgraded, as appropriate, in light of actual site conditions, after consultation with the consulting Certified Industrial Hygienist (CIH).

This Plan covers all contractors and subcontractors involved in site activities which may involve exposure to soil or groundwater. It serves as a minimum guideline for protective measures. Individual contractors may elect to implement more stringent measures for their own workers. Each contractor will provide health and safety equipment for its employees. All other employers are expected to provide equal or greater levels of protection for their employees.

All site workers directly involved in any contaminated soil disturbing operations will be appropriately trained and certified in accordance with the Cal-OSHA requirements for hazardous waste operations (8 CCR 5192). Soil cuttings and purged groundwater/decontamination water generated during field activities will be containerized in appropriately labeled containers and stored on-site until waste profiling is completed and the wastes are transported off-site for disposal.

All on-site personnel, regulatory agency personnel, and visitors are expected to be familiar with, and comply with the provisions of this Plan.

The site Health and Safety Plan is designed as part of an overall Health and Safety Program or Injury and Illness Prevention Program (IIPP) as specified in 8 CCR 5192 and 8 CCR 3203, respectively. It is specifically intended that this Plan function as the implementation of any Corporate policies and procedures set forth for the various employers involved at the site. If, in any instance, there is a conflict between this Plan and any employer's IIPP, the more stringent requirement shall apply to the work.

2.0 Site Background and Scope of Work

The project site is located at 1395 Middle Harbor Road, Oakland, in Alameda County, California (Figure 1). The site is an active container transport facility (marine terminal). Nine underground petroleum fuel storage tanks (UST) were removed from the site between 1990 and 1995. One of the USTs was granted closure by Alameda County in 1996. The client is currently seeking closure for

the remaining eight tanks and the site. The County has requested additional site characterization prior to site closure consideration. The soil and groundwater sampling activities for this project address the County's requirement.

Project activities covered by this plan include: drilling of borings and collection of soil and grab groundwater samples from the boreholes.

Drilling methodology will involve a direct-push method with soil samples collected in clear acetate liners. Lithology will be logged during sample collection including observations such as soil staining or odors. Grab groundwater samples will be collected from the borehole using a peristaltic pump or disposable bailer. Investigation derived wastes (drill cuttings and decontamination water) will be stored in Department of Transportation approved 55-gallon drums, labeled and staged in an area designated by the Client for future disposal by the Client's waste disposal contractor.

Innovative Technical Solutions, Inc. (ITSI) will perform overall project management, oversight of well installation and development activities, and sample collection. Subcontractors will be used for installation and development of the wells.

3.0 Key Personnel and Responsibilities

On-Site ITSI Project Supervisor/ Health and Safety Officer (HSO): Jim Anderson
The on-site ITSI Project Supervisor will function as the Health and Safety Officer for ITSI employees, and is responsible for oversight of the site activities of ITSI employees, including handling of any hazardous materials encountered. He or his designee is directly responsible for implementation of, and compliance of the company's personnel with, this health and safety plan, and will act as the company's competent person for excavation and as response coordinators in case of an emergency.

Each contractor or sub-consultant shall designate an HSO for their company's site activities. Each employer's HSO or their designee will be responsible for performing any required air monitoring on site for their company's employees, and will be responsible for decision making regarding upgrades in respiratory protection of their employees. They will also be responsible for performing daily inspections of their work sites in order to verify that the health and safety of their workers is protected through compliance with the provisions of this plan.

Consulting Certified Industrial Hygienist (CIH):
Irene S. Fanelli, CIH, Environmental Health Consultants, Inc.
The Consulting CIH will review and approve this Plan, will approve all changes to the Plan, and will provide support to the Site Supervisors for questions or problems relating to health and safety concerns at the site.

4.0 Job Hazard Analysis

The following section presents a discussion of the physical and chemical hazards for this project.

4.1 Physical Hazards

The primary physical hazards potentially associated with the site are expected to include:

a. Drilling equipment
b. Noise
c. Buried utilities/overhead power lines
d. Slips/falls
e. Heat Stress

Personnel working most directly with the well installation and development activities will have the greatest chance of encountering these hazards, however all personnel on site will have the possibility of encountering them at one time or another.

4.1.1 Drilling Equipment

Drilling equipment for this project will involve use of an direct-push rig for boring installation. On-site personnel will be made aware of the presence of this equipment and the hazards of working around such equipment. All personnel operating such equipment will be made aware of the presence of other site personnel. Communication between workers and operators will be by line-of-sight, utilizing standard construction hand signals. Backup alarms and rollover protection will be utilized, as appropriate. Only trained and qualified personnel will operate construction equipment. Groundwater samples, collected after hand development of the well, will be handled in accordance with the ITSI SOP for Sample Handling Procedures included in Attachment B.

4.1.2 Noise

Work around heavy equipment always entails the possibility of excessive noise. Based upon monitoring conducted previously at similar construction sites, noise levels typically range from 75 to 95 dBA. Excessive noise can be readily indicated to the workers on site by difficulty in hearing verbal communication at approximately an arm's length away. Drilling activities is expected to produce the greatest noise producing activity on site and may require hearing protection such as earplugs or earmuffs. Where other excessive noise may be encountered, employees will also be provided with hearing protection. If hearing protection is worn properly, it will provide protection sufficient to reduce actual noise exposures to well below the Cal-OSHA Exposure Limit of 90 dBA. ITSI employees participate in a Hearing Conservation Program that is included in the Corporate Health and Safety Program.

4.1.3 Buried Utilities/Overhead Power Lines

Drilling areas will be examined by site personnel or a locator, and utilities will be protected during any ground penetrating activities, if necessary. Underground Service Alert will be provided notice at least two days prior to the commencement of excavation activities. Protection from overhead power lines will be accomplished by maintenance of safe distances of at least 10 feet at all times. The work area contains conventional telephone and fiber optic phone lines.

4.1.4 Slips and Falls

Good housekeeping will be maintained on site at all times to minimize slip and fall hazards. Debris, supplies, or other materials or equipment that may present a tripping or slipping hazard must be removed or barricaded to prevent potential injury. Although not anticipated for site operations, any personnel who may be exposed to a fall of six feet or greater must have personal fall protection in place as required by OSHA 29 CFR 1926.

4.1.5 Heat Stress

Adverse climate conditions, particularly heat, are an important consideration in planing and conducting site operations. The following are identified as conditions of Heat Stress.

- Heat Cramps - cramping of muscles usually due to excessive sweating and loss of body salts - most often associated with moderate or strenuous physical exercise.
- Heat Rash - a rash produced when working and sweating in hot environments- greatly enhanced by excessive rubbing of clothing or items in direct contact with the skin.
- Heat Exhaustion - Excessive sweating, cool clammy skin, fatigue, weakness, headache, un-coordination nausea, fainting may occur.
- Heat Stroke - a response to heat characterized by extreme high body temperature and failure of the sweating mechanism. Heat Stroke symptoms include Hot Dry Skin, weak rapid pulse, and mental confusion. Unconsciousness may occur. Heat Stroke is considered an immediate, life-threatening emergency for which medical care is urgently needed - Call Emergency medical personnel immediately for assistance.

Preventive measures for Heat Stress include:

- Frequent Rest Periods in a shaded area when heat and/or humidity are high.
- Drinking of non-alcoholic fluids will be encouraged and done outside of exclusion zones. Drinking water and electrolyte replacement drinks (i.e. Gatorade) will be provided, as needed.
- Suitable acclimation periods will be provided for workers to gradually establish their resistance to heat stress.

The use of protective clothing greatly enhances the likelihood of heat stress. When site conditions exceed 70°F, the HSO will monitor the site conditions/work rates, and implement work/rest regimens, if necessary. Personal heat stress monitoring will be implemented as described below, as necessary. To monitor the workers, measurements will be made of their heart rate, with subsequent adjustments to work schedule:

- Count the wrist pulse during a 30-second period as early as possible in the rest period.
- If the heart rate exceeds 110 beats per minute (BPM) at the beginning of the rest period, shorten the next work cycle by one-third, and keep the rest period at 10 - 15 minutes.
- If the heart rate still exceeds 110 BPM at the next rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 BPM at the next rest period, shorten the following work cycle by one-third and keep the rest period the same.

4.2 Chemical Hazards

Chemicals detected in the work area groundwater include volatile organic compounds and total petroleum hydrocarbons. The table below lists toxicological information for the site contaminants:

Chemical	Maximum GW Concentration[1] (micrograms/liter)	Cal/OSHA PEL or TLV	Carcinogen (C) or Reproductive Toxin (R)	Absorbed through skin?
Benzene	41	1 ppm	Yes	Yes
Ethylbenzene	32	100 ppm	No	No
Toluene	71	50 ppm	Yes - R	Yes
Xylenes	180	100 ppm	No	Yes
Trichloroethene	15	25 ppm	Yes - C	Yes
Tetrachloroethene	6.2	25 ppm	Yes - C	Yes
Vinyl Chloride	300	1 ppm	Yes - C	Yes
1,1-Dichloroethane	2.3	100 ppm	Yes	Yes
1,1-Dichloroethene	2	1 ppm	Yes	Yes
1,2-Dichloroethene	79	200 ppm	Yes	Yes
TPH-gas	1,800	300 ppm	No	Yes
TPH-diesel	4,800	100 ppm	No	Yes
TPH-motor oil	7,200	100 ppm	No	Yes
Total Oil and Grease	7,000	None	No	Yes

Notes:

1. References: Geomatrix, 1992. *Underground Storge Tank Removd Report,* 1395 Middle Harbor Road, Oakland, CA, June. Innovative Technical Solutions, Inc, 1996. *Groundwater Monitoring and Sampling Report – Second Quarter,* 1395 Middle Harbor Road, Oakland, CA, June 4.
2. Data is taken from Title 8 CCR 5192, the NIOSH Pocket Guide to Chemical Hazards, 1997, and the ACGIH Threshold Limit Values, 2001.
3. The PEL/TLV is the lower of the two values.
4. ppm = parts of contaminant per million parts of air, by volume.
5. mg/m^3 = milligrams of constituent per cubic meter of air.

Note that the maximum concentrations reported for the VOCs were from either grab groundwater samples collected directly from the excavation pit or from quarterly monitoring of groundwater. A second grab water sample was collected from a drum which contained free product and groundwater removed from the excavation (Geomatrix, 1992) and was orders of magnitude higher than

concentrations detected in the excavation pit.

Routes of exposure to these site chemicals generally occur through inhalation of vapors or contaminated airborne particulate or through ingestion due to poor work practices and/or poor personal hygiene practices. Other potential routes of exposure include injection and absorption. Chemicals identified on site are listed under California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) as chemicals known to the State of California to cause cancer or reproductive harm. These chemicals are identified in the table above.

Any exposures to the site contaminants are expected to be minimized through proper work practices, personal protective equipment in accordance with ambient air monitoring, and proper personal hygiene. The potential for exposure to the public is considered to be minimal, and the control measures taken will serve to further minimize any exposure. All site personnel will be instructed to report any visual or odor indications of the presence of contamination so that the conditions may be evaluated and appropriate protective measures for the employees may be taken.

5.0 Air Monitoring Plan and Action Levels

Based upon existing site chemicals, continuous direct reading air monitoring is not anticipated during site activities. Organic vapors are not expected to be present from site chemicals of concern. Air monitoring requirements may be changed at the direction of the Project Supervisor/HSO or designee. All site personnel will be advised to be aware of and report any visible or odor indications of the presence of contamination.

If site conditions are found to differ from those described in this plan, the HSO, in conjunction with the consulting CIH, will determine the extent of personal exposure monitoring necessary during site operations. Subcontractors will be required to perform personal exposure monitoring for their own personnel on site when necessary. Site personnel will be advised to use respiratory protection at their own discretion based upon odor, irritation, or other subjective indications.

6.0 Personnel Protection

The following section presents requirements for personnel protection.

6.1 Protective Equipment

The minimum level of protection for personnel working on site includes:

Hardhat	Work gloves
Steel-toed boots	Workclothes
Safety glasses	

During sampling and other activities where skin contact is a potential exposure mechanism, nitrile,

gloves will be utilized.

Chemical goggles/safety glasses will be worn to prevent eye contact via splash or dust, as necessary.

Hearing protection, when required, will consist of the worker's choice of earplugs or earmuffs. In addition, workers will be instructed to utilize hearing protection whenever normal conversation at approximately three feet or arm's length becomes difficult due to work area noise levels.

The use of respiratory protection is not anticipated during site activities. Respiratory protection may be used upon request of on-site personnel. If the HSO determines that site conditions have changed to warrant respiratory protection as described in Section 5.0, site operations will discontinue and the operations/situation will be evaluated.

7.0 Work Zones and Site Security

The following section presents work zone designations and site security.

7.1 Exclusion Zone

The active work area during drilling will be considered the Exclusion Zone. The Exclusion Zone will be modified, as necessary, as subsurface work is started and/or completed. Traffic cones and/or warning tape will demarcate the area. Access to these zones will be limited to authorized personnel with the appropriate protective equipment, who have met the training and medical requirements appropriate for their level of work effort and protection. All drilling will stop if unauthorized personnel enter the area and not resume until those individuals have left.

7.2 Decontamination and Support Area

Due to the size and short duration of this project, the decontamination and support areas will be combined and located adjacent to the exclusion zone and out of the way of site traffic.

7.3 Site Security

The site is an active container transport/trucking facility and general site security is provided by the on-site tenant. Project specific security around the immediate work area will be conducted as described above in Section 7.1.

8.0 Decontamination Procedures

The following section describes decontamination procedures for the project.

8.1 Personal Decontamination

All disposable clothing, if used, will be deposited in containers on-site for off-site disposal. Wash tubs with soap and water and rinse tubs may be provided for decontamination of gloves if reused. Soap and water or other means will be available for personnel to wash up after work or if any skin contact occurs during the workday.

8.2 Equipment Decontamination

Any equipment that comes in contact with contaminated materials will be properly cleaned before leaving the site. Augers will be steam cleaned using a self-contained steam-cleaning unit. Attachment C presents the standard operating procedures for steam cleaning as well as general decontamination procedures. Smaller pieces of equipment may be washed in the same manner as contaminated personal protective equipment, i.e., with a brush and soapy water and rinse water.

8.3 Decontamination Materials

All decontamination water will be collected for disposal to a proper disposal site. Contaminated gloves and other contaminated disposable equipment will be collected and disposed of at an appropriate site.

9.0 General Site Safety Provisions

The following section presents general site safety work rules.

9.1 General Site Health and Safety and Work Rules

1. No consumption of alcoholic beverages or illegal drugs will be allowed on-site. Anyone reporting to work under the influence of alcohol and/or illegal drugs will be subject to disciplinary action. Any employee under a physician's care and/or taking prescribed narcotics must notify the Project Supervisor.

2. Personal protective equipment is required in designated areas. Such equipment may include, but is not limited to, respiratory protection, earplugs/earmuffs, hardhat, Tyvek coveralls, boots, gloves, chemical goggles, safety glasses, and protective faceshields.

3. Eating, drinking, smoking, and chewing gum or tobacco is allowed only in designated areas

in the Support Zone.

4. Changes in work practices or work rules will be implemented only after approval by the project supervisor.

5. Construction equipment always has the right-of-way over regular vehicles.

6. All employees entering the Exclusion Zone must complete the required decontamination procedure before leaving the site.

7. All protective clothing to be worn inside the Exclusion Zone will be supplied. None of this clothing will be permitted to leave the site with any employee for personal use. Also, any equipment to be used elsewhere for another project will be fully decontaminated before leaving the site.

8. Employees shall listen for warning signals on construction equipment and shall yield to construction equipment.

9. All equipment operators shall pay deliberate attention to watching for workers on the ground who may be in their path and provide these people with warning before moving.

10. All workers shall follow emergency procedures explicitly.

11. Kneeling and/or sitting directly on the ground in the Exclusion Area is prohibited.

3. All employees will utilize a buddy system while working on site.

9.2 Conditions of Site Access to the Exclusion Zone

1. All personnel must meet the medical monitoring requirements of 29 CFR 1910.120/8 CCR 5192 and 8 CCR 5144 and described in Section 12.0. Failure to submit to, or pass, any exam will be grounds for excluding the employee from the site.

2. All employees must participate in the air quality exposure-monitoring program by wearing the personal monitors or sampling devices designated by the HSO. Any employee refusing to participate in the program, or tampering with a sample, will be subject to disciplinary action.

3. No beards or long sideburns will be allowed by personnel utilizing respiratory protection since they interfere with the seal of the respirator to the face. Trimmed sideburns and mustaches are acceptable. All employees potentially using respirators must report to work clean-.

4. All employees must complete the required training programs prior to starting work at the site.

5. All on-site personnel must wear the prescribed health and safety equipment, and go through the decontamination procedures prior to exiting the site.

10.0 Emergency Procedures

Potential on-site emergencies are expected to be restricted to minor injuries to site personnel. On-site conditions are expected to be within the limits of measures that can be taken by on-site personnel. During any on-site emergency, work activities will cease until the emergency is brought under control.

Directions for the emergency route to the medical center are included in Table 1 and Figure HSP-1. This Table and Figure will be kept on site in site vehicles. A list of the emergency telephone numbers is also included in Table 1, and will also be kept on site near the site telephone. All personnel working on site will be informed of the emergency numbers, emergency routes and activity hazards, and will also be informed of evacuation routes, meeting places, and evacuation warning signals in case of the need for an evacuation. Any spill of contaminated soil/groundwater will be immediately contained and cleaned-up at the time of the spill.

Personnel designated to provide first aid to injured workers will receive training and information as required for bloodborne pathogens. These individuals will be advised of the hazards and modes of transmission of bloodborne pathogens and offered the option to receive the Hepatitis B vaccination series. The site first-aid kits will be outfitted with universal precaution protective gear for prevention of exposure to bloodborne pathogens during treatment of injured workers. Any items which come in contact with blood or other body fluids will be "red bagged" and disposed of as medical waste. Each employer having designed first aid responders on site must maintain their own Bloodborne Pathogens Exposure Control Plan.

11.0 Training

All on-site personnel working in the Exclusion Zone will have the appropriate prior experience and training, in compliance with 29 CFR 1910.120 and 8 CCR 5192. Such training includes the 40-hour basic training, three days of supervised field experience, 8-hour update training, 8-hour supervisory training, as appropriate.

A project-specific training session will be provided prior to startup of on-site activities. This training will include:

a. Site health and safety plan
b. Decontamination
c. Personal protection levels
d. Potential chemical hazards
e. Physical hazards
f. Medical monitoring

g. Air monitoring
h. Use and maintenance of personal protective equipment
i. Work zones
j. Site safety rules and conditions of employment
k. Emergency provisions
l. Buddy system

On-site tailgate meetings will be held before each workday to reinforce pertinent topics from the above list and to anticipate problems that may arise during the day. The Project Supervisor will conduct these meetings for their respective crews. These meetings may be combined into a single meeting in order to aid coordination between the contractors. This training will be documented as part of the daily documentation for the site.

12.0 Medical Monitoring

All on-site personnel who will have potential exposure to the site contaminants will participate in a medical monitoring program. Any site personnel and visitors who have not received medical clearance must be excluded from the active work areas.

For those employees regularly working in the Exclusion Zone, the monitoring program will consist of either a corporate annual physical examination or a pre-employment physical (if the employee was hired specifically for this job which includes:

a. Medical history
b. Physical exam
c. Pulmonary function test
d. Audiogram
e. Blood chemistry
f. CBC with differential and platelets
g. Urinalysis with dipstick and microscopic morphology

For those employees who work infrequently in the Exclusion Zone (i.e. site visitors and those needing only occasional access) and/or who may be expected to use respirators, the medical exam will be that which the examining physician determines is sufficient for clearance to use respiratory protection.

Employees not directly involved with the excavation and sampling activities are not subject to the medical monitoring requirements.

13.0 Documentation

Documentation of each employee's compliance with the training and medical monitoring requirements, and their signature indicating they have reviewed and will comply with this Health and Safety Plan, will be maintained at the Corporate Office. In addition, any required permits, copies of tailgate meeting minutes, air monitoring data, and accident reports will be maintained on site.

Table 1
Emergency Route and Emergency Telephone Numbers

Route to Hospital

To: Summit Medical Center
350 Hawthorne Ave Oakland, CA 94609-3108
(510) 869-6600

Total Distance: 2.91 miles
1: Start out going East on 1395 MIDDLE HARBOR RD by turning right for 0.39 miles
2: Turn RIGHT onto 3RD ST for 0.35 miles
3: Turn LEFT onto BRUSH ST for 0.11 miles
4: Turn RIGHT onto 5TH ST for 0.07 miles
5: Turn LEFT onto CASTRO ST for 0.91 miles
6: Turn LEFT onto MARTIN LUTHER KING JR WAY for 0.06 miles
7: Turn RIGHT onto W GRAND AVE for 0.08 miles
8: Turn LEFT onto NORTHGATE AVE for 0.11 miles
9: Turn RIGHT onto 24TH ST for 0.11 miles
10: Turn LEFT onto TELEGRAPH AVE for 0.55 miles
11: Turn RIGHT onto 350 HAWTHORNE AVE for 0.19 miles
See Figure HSP-1 for Hospital Route.

Contact		Phone Number
Police Department		911
Fire Department		911
Hospital: Summit Medical Center, 350 Hawthorne Ave, Oakland, CA		(510) 869-6600
Ambulance:		911
Innovative Technical Solutions, Inc.:	Corporate Office	(925) 946-3100
Jim Anderson, Site Superintendent	Cell Phone	(530) 249-2998
Rachel Hess, Project Manager	Office Phone	(925) 946-3105
	Cell Phone	(510) 715-7842
Environmental Health Consultants, Inc.: Irene S. Fanelli	Office	(650) 347-9205
	Cellular	(650) 906-7397
	Pager	(888) 881-5128
Port of Oakland Environmental Health & Safety Compliance Department contact: Mr. John Prall		(510) 627-1373

ATTACHMENT A

HOSPITAL ROUTE MAP
AND
SAFETY FIELD FORM

00-152.19/F 3-Conc

Route to Hospital

To: Summit Medical Center
350 Hawthorne Ave
Oakland, CA 94609-3108
(510) 869-6600

Total Distance: 2.91 miles

1: Start out going East on 1395 MIDDLE HARBOR RD by turning right for 0.39 miles
2: Turn RIGHT onto 3RD ST for 0.35 miles
3: Turn LEFT onto BRUSH ST for 0.11 miles
4: Turn RIGHT onto 5TH ST for 0.07 miles
5: Turn LEFT onto CASTRO ST for 0.91 miles
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9: Turn RIGHT onto 24TH ST for 0.11 miles
10: Turn LEFT onto TELEGRAPH AVE for 0.55 miles
11: Turn RIGHT onto 350 HAWTHORNE AVE for 0.19 miles

ITSI Innovative Technical Solutions, Inc.	1395 Middle Harbor Road Oakland, California **Port of Oakland**	**Figure HSP-1** **Route to Hospital**

Innovative Technical Solutions, Inc.

Worker/Visitor Review and Acknowledgement of the Site Safety and Health Plan

Project Name/Job No.: _____
Project Location: _____
Client/Contract No.: _____

I HAVE REVIEWED AND UNDERSTAND THE SITE SAFETY AND HEALTH PLAN FOR THE ABOVE SITE. BY SIGNING BELOW, I ACKNOWLEDGE AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS PROJECT.

Date	Name (Printed)	Company	Signature

ATTACHMENT B

STANDARD OPERATING PROCEDURES FOR SAMPLE HANDLING

SAMPLE HANDLING
STANDARD OPERATING PROCEDURE

1.0 PURPOSE

This procedure defines minimum requirements for safe handling of groundwater, soil and waste samples by all field employees.

2.0 SCOPE

This procedure applies to all samples of contaminated groundwater, soil and waste.

3.0 DEFINITIONS

Sample: Material collected for the sole purpose of analytical testing to determine its composition or hazardous characteristics. Regardless of the hazardous nature of a sample, it **is not** considered a hazardous waste during collection, shipping and analysis. See 40 CFR 261.4(d). However, samples **are** subject to the Department of Transportation (DOT) shipping regulations found in 49 CFR.

4.0 REQUIREMENTS

All samples shall be packaged and shipped in accordance with DOT regulations in 49 CFR 106-180.

Sample preparation and packaging for shipment shall be done at the job site whenever possible. These activities should not occur in office buildings unless each sample is maintained in a sealed container at all times. Sample and hazardous material storage is not permitted in office buildings.

Samples shall not be transported in passenger vehicles unless packaged in appropriate DOT containers. Samples must not be transported in the passenger compartment of the vehicle. Samples should be shipped using methods such as private courier, Federal Express or UPS. Samples that may be hazardous may not be shipped via passenger carriers such as aircraft, trains or buses.

Analytical laboratory contracts and service agreements shall include the requirement for the lab to properly dispose of unused and residual samples without returning these materials to ITSI, unless specifically required by the project contract.

Personnel collecting samples must be adequately trained in proper sampling methods, Chain-of-Custody Documentation, personnel protective equipment, respirators, the hazards of the material to be sampled (if known), DOT shipping requirements and appropriate Quality Assurance/Quality Control (QA/QC) procedures.

ATTACHMENT C

STANDARD OPERATING PROCEDURES FOR DECONTAMINATION MEASURES

DECONTAMINATION MEASURES
STANDARD OPERATING PROCEDURES

1.0 PURPOSE

This procedure describes minimum requirements for preventing the transfer of chemical contamination to uncontaminated materials and personnel. Specific decontamination methods and site work zones will be specified in site health and safety plans.

2.0 SCOPE

This procedure applies to all work sites where employees may come in contact with chemical contaminants. It does not address asbestos abatement, lead abatement or radiological materials. Decontamination requirements for these materials will be covered in separate policies.

3.0 DEFINITIONS

Decontamination: The process of removing or neutralizing contaminants that have accumulated on personnel and equipment. Decontamination methods physically remove contaminants and/or inactivate them by chemical breakdown, neutralization or disinfection/sterilization.

Exclusion Zone: Areas of a field work site that are potentially contaminated with hazardous substances. Access to these zones is restricted to properly trained personnel with appropriate protective clothing, respirators and safety equipment.

Decontamination Zone: Areas of a field work site bordering exclusion zones, where personnel, tools and equipment are cleaned to prevent the spread of contamination into clean work locations. These areas can also be used to store respirators, protective clothing and other safety supplies, as well as first aid kits, fire extinguishers and other emergency equipment. Shower and locker room facilities are located in decontamination zones.

Support Zone: Clean areas of a field work site where no contamination exists. Clean break areas are located in the support zone, as well as necessary office trailers, toilets and drinking water supplies. Access to the support zone is generally unrestricted.

ITSI

4.0 CONTAMINATION CONTROL

Employees will use the following work practices to prevent or minimize chemical contamination.

- Avoid direct contact with potentially contaminated surfaces whenever possible;
- Limit access to exclusion zone to essential personnel only;
- Lay out traffic patterns and work areas on-site to minimize travel between clean and contaminated areas;
- Enter and exit exclusion zones through the decontamination zone;
- Use tools and heavy equipment to avoid hand and body contact with contaminated materials;
- Use disposable personnel protective equipment (PPE) to minimize the need to clean reusable items;
- Cover potentially-exposed instruments and tools with polyethylene or other protective materials whenever possible.

Field work sites will establish clean, decon and exclusion zones appropriate to the site-specific work operations. Zones will be clearly marked with stakes and caution tape or other appropriate means. Site personnel will be informed of the zone locations and marking system at their initial site safety orientation.

4.2 PERSONAL HYGIENE

As a minimum, personnel decontamination facilities at field work sites must include supplies for hand and face washing upon leaving contaminated work areas.

Employees will wash hands and face prior to eating, chewing, drinking or smoking. Smoking, drinking, eating, chewing tobacco and gum are permitted in designated clean break areas only.

Shower trailers and clean and dirty locker rooms are required for field work sites lasting six months or longer, or where standard field decontamination measures are not sufficient to remove contamination. Potentially contaminated tools and clothing are prohibited in clean locker rooms.

Only potable water will be used for showers and hand or face washing.

5.0 DECONTAMINATION METHODS

Personnel, clothing, equipment, and samples leaving the contaminated areas of a site must be decontaminated to remove any harmful chemicals and biological waste that may have adhered to them.

5.1 PHYSICAL CLEANING

Gross contamination can be removed by physically brushing, scraping, water rinsing, or wiping off surfaces. Cleaning tools, rags and rinse water must be properly containerized for disposal as contaminated waste unless laboratory or field analyses are used to classify these materials in other waste categories.

5.2 CHEMICAL CLEANING AND DISINFECTION

Detergent washing is a more aggressive cleaning method for removal of liquids and solids that stick to contaminated surfaces. Cleaning detergents used for PPE, respirators, hard hats and tools could include, but is not limited to, household laundry or dish soap, trisodium phosphate (TSP), or Alconox™. TSP is caustic and can cause severe skin irritation. Rubber or nitrile gloves and liquid-resistant aprons or coveralls are required to prevent skin contact while cleaning with TSP solutions.

In some instances, diesel oil may be used to remove stubborn petroleum and heating oil contamination. This must be followed by detergent washing to remove the diesel oil.

Solvent rinsing can be used to decontaminate sampling equipment such as split spoon samplers, soil triers and bailers. Solvent rinsing will only be performed in work locations that are at least 75 feet from any potential ignition source. PPE and respirators are required to prevent human exposure to solvent vapors and liquids during this type of decontamination.

Solvent rinsing will not be used for personnel decontamination.

All solvent, diesel, and detergent cleaning wastes and rinse water will be containerized for proper disposal. These wastes will be considered contaminated unless laboratory or field analysis classify them in other waste categories.

5.3 PRESSURE WASHING AND STEAM CLEANING

High-pressure washers and steam cleaners can be used to remove stuck-on materials from vehicles and heavy equipment. These methods are also used in tank cleaning.

Pressure washing and steam cleaning will only be performed by personnel adequately trained in the safe use and maintenance of these devices. These devices can peel paint off surfaces during cleaning and can cause serious injuries if aimed at humans or animals.

Pressure washers and steam cleaners shall not be used for personnel decontamination.

Steam cleaning can build up static charges on surfaces that conduct electricity. Steam cleaning is prohibited with flammable liquids and solids and in any flammable atmosphere.

Pressure washing and steam cleaning activities must be confined to a limited area separate from other vehicle and foot traffic. Screens may be required to prevent overspray and windblown spray during cleaning.

All pressure washing and steam cleaning wastes will be properly containerized for disposal as contaminated wastes unless laboratory or field analysis classify them in other waste categories.

6.0 MEDICAL EMERGENCIES

Whenever possible, contaminated clothing and safety equipment will be removed from injured or ill personnel prior to transporting them to off-site medical facilities. Protective clothing and exposed skin may be decontaminated prior to transport, if time permits and decontamination can be performed without aggravating the victim's injuries.

In the event of eye contact with contaminated materials, clean drinking water or sterile eyewash solutions will be used to flush the exposed eyes for at least 15 minutes. Clean drinking water will also be used to flush skin exposed to contaminated materials.

Employees are prohibited from applying solvents or chemical neutralizing agents to contaminated skin or eyes unless specifically instructed to do so by a National Poison Control Center, paramedic, emergency medical technician, physician or other licensed medical personnel.

7.0 SITE SAFETY AND HEALTH PLANS

Site-specific health and safety plans will include written procedures to prevent the spread of chemical contamination. These procedures must include at least the following:

- Housekeeping requirements for job sites;
- Means of separating clean, decon and exclusion zones at job sites;
- Means of controlling access to decon and exclusion zones;
- Methods for decontaminating personnel, vehicles and equipment when leaving the exclusion zones;
- Handling procedures for contaminated disposable clothing and tools;
- Work practices that minimize the spread of contamination;
- Emergency decon procedures; and
- Provisions for updating decon procedures.

8.0 TRAINING

General decontamination requirements and site zoning are covered in initial 40-hour training for new employees assigned to field work. HSOs and site supervisors are responsible for informing employees, visitors and contractors of project-specific decontamination requirements and verifying compliance with those requirements. HSOs will also inspect decontamination activities periodically to verify the effectiveness of specific cleaning methods. Alternative cleaning methods will be implemented, if necessary. Affected personnel will be informed of changes in specific decontamination procedures prior to their implementation.