

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY
DAVID J. KEARS, Agency Director



ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

September 19, 2007

Mr. Harjit Sidhu
City of Livermore, Engineering Division
1052 S. Livermore Ave.
Livermore, CA 94550

Subject: Fuel Leak Case No. RO0002909 and Geotracker Global ID T06019786373, City of Livermore Airport, 636 Terminal Drive, Livermore, CA 94550

Dear Mr. Sidhu:

This letter transmits the enclosed underground storage tank (UST) case closure letter in accordance with Section 25296.10 of the Health and Safety Code. We are also transmitting to you the enclosed case closure summary. These documents confirm the completion of the investigation and cleanup of the reported release at the subject site. The subject fuel leak case is closed.

SITE INVESTIGATION AND CLEANUP SUMMARY

Please be advised that the following conditions exist at the site:

- Residual total petroleum hydrocarbons as diesel remain in groundwater at concentrations up to 110 ppb.
- Residual total petroleum hydrocarbons as jet fuel remain in groundwater at concentrations up to 94 ppb.

If you have any questions, please call Jerry Wickham at (510) 567-6791. Thank you.

Sincerely,

Donna L. Drogos, P.E.
LOP and Toxics Program Manager

Enclosures:

1. Remedial Action Completion Certificate
2. Case Closure Summary

cc:

Ms. Cherie McCaulou (w/enc)
SF- Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Mr. Toru Okamoto (w/enc)
State Water Resources Control Board
UST Cleanup Fund
P.O. Box 944212
Sacramento, CA 94244-2120

Ms. Danielle Stefani (w/enc)
Livermore-Pleasanton Fire Department
3560 Nevada Street
Pleasanton, CA 94566

Ms. Colleen Winey, QIC 80201 (w/enc)
Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551

City of Livermore Planning Department (w/enc)
1052 South Livermore Avenue
Livermore, CA 94550

Jerry Wickham (w/orig enc), D. Drogos (w/enc), File (w/enc)



REMEDIAL ACTION COMPLETION CERTIFICATION

September 19, 2007

Mr. Harjit Sidhu
City of Livermore, Engineering Division
1052 S. Livermore Ave.
Livermore, CA 94550

Subject: Fuel Leak Case No. RO0002909 and Geotracker Global ID T06019786373, City of Livermore Airport, 636 Terminal Drive, Livermore, CA 94550

Dear Mr. Sidhu:

This letter confirms the completion of a site investigation and remedial action for the underground storage tanks formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank(s) are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, this agency finds that the site investigation and corrective action carried out at your underground storage tank(s) site is in compliance with the requirements of subdivisions (a) and (b) of Section 25296.10 of the Health and Safety Code and with corrective action regulations adopted pursuant to Section 25299.3 of the Health and Safety Code and that no further action related to the petroleum release(s) at the site is required.

This notice is issued pursuant to subdivision (h) of Section 25296.10 of the Health and Safety Code. Please contact our office if you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ariu Levi', is written over the word 'Sincerely,'.

Ariu Levi
Director
Alameda County Environmental Health

**CASE CLOSURE SUMMARY
LEAKING UNDERGROUND FUEL STORAGE TANK - LOCAL OVERSIGHT PROGRAM**

I. AGENCY INFORMATION

Date: September 11, 2007

Agency Name: Alameda County Environmental Health	Address: 1131 Harbor Bay Parkway
City/State/Zip: Alameda, CA 94502-6577	Phone: (510) 567-6791
Responsible Staff Person: Jerry Wickham	Title: Hazardous Materials Specialist

II. CASE INFORMATION

Site Facility Name: City of Livermore Airport		
Site Facility Address: 636 Terminal Circle, Livermore, CA 94550		
RB Case No.: ---	Local Case No.: ---	LOP Case No.: RO0002909
URF Filing Date: 11/18/2005	Geotracker ID: T06019786373	APN: 904-4-6-0
Responsible Parties	Addresses	Phone Numbers
Harjit Sidhu, City of Livermore	1052 South Livermore, Livermore, CA 94550	925-960-4531

Tank I.D. No	Size in Gallons	Contents	Closed In Place/Removed?	Date
1	15,000 gallons	Jet Fuel A	Leak from piping; no action taken for USTs	---
2	15,000 gallons	Aviation Gas 1	Leak from piping; no action taken for USTs	---
3	15,000 gallons	Aviation Gas 2	Leak from piping; no action taken for USTs	---
Piping			Repaired/upgraded	11/2005

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and Type of Release: Piping leaks near remote fill.		
Site characterization complete? Yes	Date Approved By Oversight Agency: ---	
Monitoring wells installed? No	Number: 0	Proper screened interval? NA
Highest GW Depth Below Ground Surface: 15	Lowest Depth: 26	Flow Direction: West Southwest
Most Sensitive Current Use: Drinking water source.		

Summary of Production Wells in Vicinity: One City of Livermore municipal supply well (T3S R1E 1P3) is located immediately northeast (upgradient) from the site. The well is 12 inches in diameter and has a cemented conductor casing from ground surface to 110 feet bgs; total depth of the well is 480 feet. The current status of the well is reported as inactive. Based on the limited extent of groundwater contamination from the site, construction of the water supply well, and upgradient location, the well is not expected to be a receptor for the site. A second City of Livermore well (T3S R1E 1N1) is located approximately 1,000 feet west northwest (downgradient) of the site. The seal on the well is reported from ground surface to 220 feet bgs. Based on the limited extent of groundwater contamination from the site, distance from the site, and construction of the water supply well, the well is not expected to be a receptor for the site.

A 10-inch diameter irrigation well (T3S R1E 1P1) is located roughly 100 feet north of the site. The irrigation well is 297 feet deep with a screened interval from 212 to 240 feet bgs. The current status of the well is unknown. Based on the limited extent of groundwater contamination from the site, construction of the well, and upgradient location, the well is not expected to be a receptor for the site. An 18-inch diameter well (T3S R1E 1N2) with a stated use of "Recharge" is located approximately 1,500 feet west northwest of the site. The well has a surface seal from ground surface to 220 feet bgs and the total depth of the well is 440 feet. Based on the limited extent of groundwater contamination from the site, distance from the site, and construction of the well, the well is not expected to be a receptor for the site.

Are drinking water wells affected? No	Aquifer Name: Amador Subbasin of Livermore-Amador Groundwater Basin
Is surface water affected? No	Nearest SW Name: Las Positas Creek is approximately 500 feet north of the site.
Off-Site Beneficial Use Impacts (Addresses/Locations): None	
Reports on file? Yes	Where are reports filed? Alameda County Environmental Health and Livermore-Pleasanton Fire Department

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL			
Material	Amount (include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank	3 - 15,000 gallon tanks	No action taken for tanks	---
Piping	Not reported	Piping was repaired and upgraded. Disposal destination not reported.	11/2005
Free Product	None	---	---
Soil	850 cubic yards	Transported to Altamount Landfill in Livermore, CA for disposal	01/09/2006
Groundwater	None	---	---

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS BEFORE AND AFTER CLEANUP
 (Please see Attachments 1 through 6 for additional information on contaminant locations and concentrations)

Contaminant	Soil (ppm)		Water (ppb)	
	Before	After	Before	After
TPH (Gas)	970	<1	<50	<50
TPH (Diesel)	2,900	1	110	110
TPH (Jet Fuel)	NA	<1	94	94
Benzene	<0.005	<0.005	<0.5	<0.5
Toluene	3.9	<0.005	<0.5	<0.5
Ethylbenzene	<0.005	<0.005	<0.5	<0.5
Xylenes	0.21	<0.005	<0.5	<0.5
Lead	10(1)	4.4(1)	NA	NA
MTBE	<0.005(2)	<0.005(2)	0.5(3)	0.5(3)
Other (8240/8270)	NA(4)	NA(4)	NA(4)	NA(4)

(1) Arsenic = 5.5 ppm; Total Chromium = 55 ppm; Copper = 35 ppm; Nickel = 110 ppm; and Zinc = 72 ppm in soil.
 (2) ETBE, DIPE, TAME, and 1,2-DCA <0.005 ppm; TBA <0.05 ppm; ethanol <0.25 ppm; and methanol <2.5 ppm in soil.
 (3) ETBE, DIPE, TAME, and 1,2-DCA <0.5 ppb; TBA <5.0 ppb; ethanol <50 ppb; and methanol <500 ppb in groundwater.
 (4) No analysis for other VOCs or SVOCs.

Site History and Description of Corrective Actions:

The site is the remote fill area and fuel pipeline extending from the remote fill area to three underground storage tanks (USTs) in the northeastern corner of Livermore Municipal Airport. Trucks deliver fuel to the remote fill area, which is off Terminal Circle near the airport entrance, for aircraft fueling.

In November 2005, signs of fuel leakage were observed in the area of a remote fill station adjacent to Terminal Circle. The City of Livermore and their pipeline contractor excavated soil around the remote fill station and fuel pipeline leading from the fill station to the USTs. A total of 15 soil samples were collected from the excavation on November 10, 2005. Total petroleum hydrocarbons (TPH) as gasoline and TPH as diesel were detected at concentrations of 8 and 200 ppm, respectively in the soil sample collected closest to the remote fill (sample 1-1). Benzene and MTBE were not detected in the soil sample. TPH as diesel was detected in one soil sample at a concentration of 1 ppm. TPH as gasoline and TPH as diesel were detected in soil samples collected from the stockpiled soil at concentrations ranging from 6 to 360 ppm.

The excavation was deepened in the area of sample 1-1 to a depth of approximately 16 feet bgs. Soil samples collected at depths of 9.5 feet bgs contained TPH as gasoline and TPH as diesel at concentrations of 970 and 2,900 ppm, respectively. Soil samples collected at a depth of 13 feet bgs contained TPH as gasoline and TPH as diesel at concentrations of 450 and 1,100 ppm, respectively. TPH as diesel was not detected in a soil sample collected 15 feet bgs; no analysis was performed for TPH as gasoline. The excavation was backfilled with a concrete slurry and pea gravel and the surface was covered.

Ten direct push borings were advanced at the site between April 2 and April 4, 2007. Three borings were advanced in the immediate area of the remote fill; two borings were advanced along the pipeline and near the sump; two borings were advanced near the pipeline and USTs, and four borings were advanced downgradient from the fill, pipeline, and USTs. TPH as gasoline, TPH as jet fuel, BTEX, fuel oxygenates, 1,2-dichloroethane, ethanol, and methanol were not detected in any of the 43 soil samples collected the direct push borings. TPH as diesel was detected in 1 of 43 soil samples at a concentration of 1 ppm.

TPH as diesel was detected in groundwater samples from 5 of the 10 soil borings at concentrations ranging from 55 to 110 ppb. TPH as jet fuel was detected in groundwater samples from 4 of the 10 soil borings at concentrations ranging from 53 to 94 ppb. TPH as gasoline, BTEX, fuel oxygenates, 1,2-dichloroethane, ethanol, and methanol were not detected in any of the 10 groundwater samples.

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Yes		
Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? Yes		
Does corrective action protect public health for current land use? Alameda County Environmental Health staff does not make specific determinations concerning public health risk. However, based upon the information available in our files to date, it does not appear that the release would present a risk to human health based upon current and projected future land use and conditions.		
Site Management Requirements: None		
Should corrective action be reviewed if land use changes? No		
Was a deed restriction or deed notification filed? No		Date Recorded: --
Monitoring Wells Decommissioned: NA	Number Decommissioned: 0	Number Retained: 0
List Enforcement Actions Taken: None		
List Enforcement Actions Rescinded: --		

V. ADDITIONAL COMMENTS, DATA, ETC.

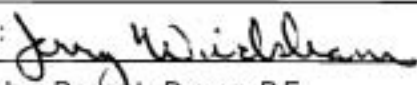
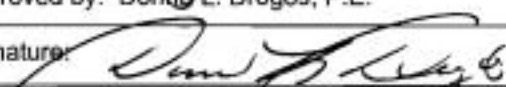
Considerations and/or Variances:

No soil borings were advanced north of the remote fill excavation. Based on the results from soil and groundwater sampling west and south (downgradient) of the remote fill area, a significant source of fuel contamination does not appear to be present in the area north of the remote fill.

Conclusion:

Alameda County Environmental Health staff believe that the levels of residual contamination do not pose a significant threat to water resources, public health and safety, and the environment based upon the information available in our files to date. No further investigation or cleanup is necessary. ACEH staff recommend case closure for this site.

VI. LOCAL AGENCY REPRESENTATIVE DATA

Prepared by: Jerry Wickham	Title: Hazardous Materials Specialist
Signature: 	Date: 09/11/07
Approved by: Donna L. Drogos, P.E.	Title: Supervising Hazardous Materials Specialist
Signature: 	Date: 09/11/07

This closure approval is based upon the available information and with the provision that the information provided to this agency was accurate and representative of site conditions.

VII. REGIONAL BOARD NOTIFICATION

Regional Board Staff Name: Cherie McCaulou	Title: Engineering Geologist
RB Response: Concur, based solely upon information contained in this case closure summary.	Date Submitted to RB:
Signature: <i>Cherie McCaulou</i>	Date: <i>9/18/07</i>

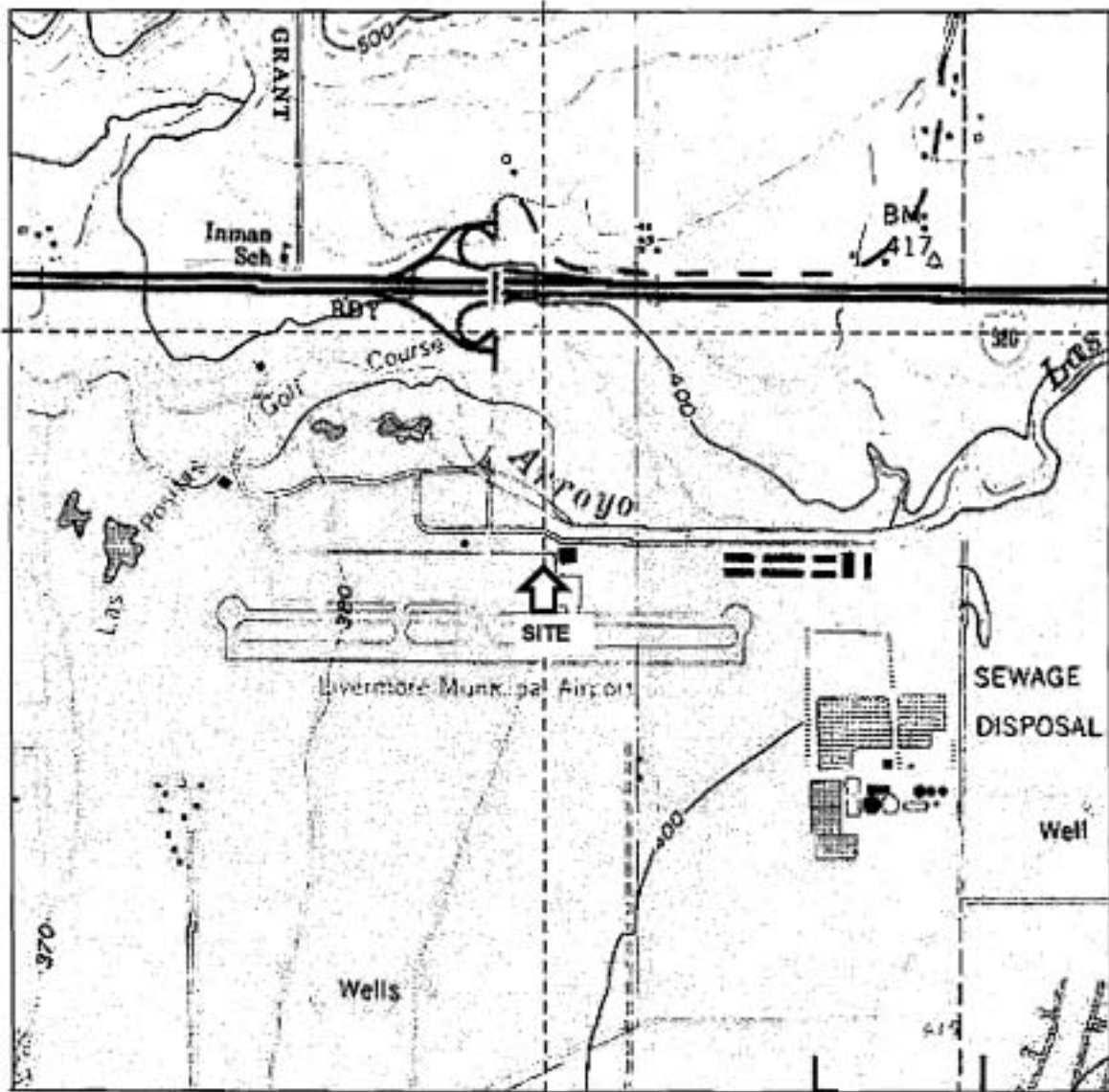
VIII. MONITORING WELL DECOMMISSIONING

Date Requested by ACEH: NA	Date of Well Decommissioning Report: NA	
All Monitoring Wells Decommissioned: NA	Number Decommissioned: 0	Number Retained: 0
Reason Wells Retained: NA		
Additional requirements for submittal of groundwater data from retained wells: NA		
ACEH Concurrence - Signature: <i>Jerry Wickham</i>	Date: <i>09/19/07</i>	

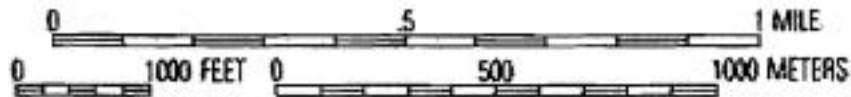
Attachments:

1. Site Location Map (1 page)
2. Boring Location Map and Soil Sample Locations November 2005 (2 pages)
3. Geologic Cross Sections and Dissolved Contaminants Map (3 pages)
4. Soil Analytical Data (14 pages)
5. Groundwater Analytical Data (1 page)
6. Boring Logs (10 pages)

This document and the related CASE CLOSURE LETTER & REMEDIAL ACTION COMPLETION CERTIFICATE shall be retained by the lead agency as part of the official site file.



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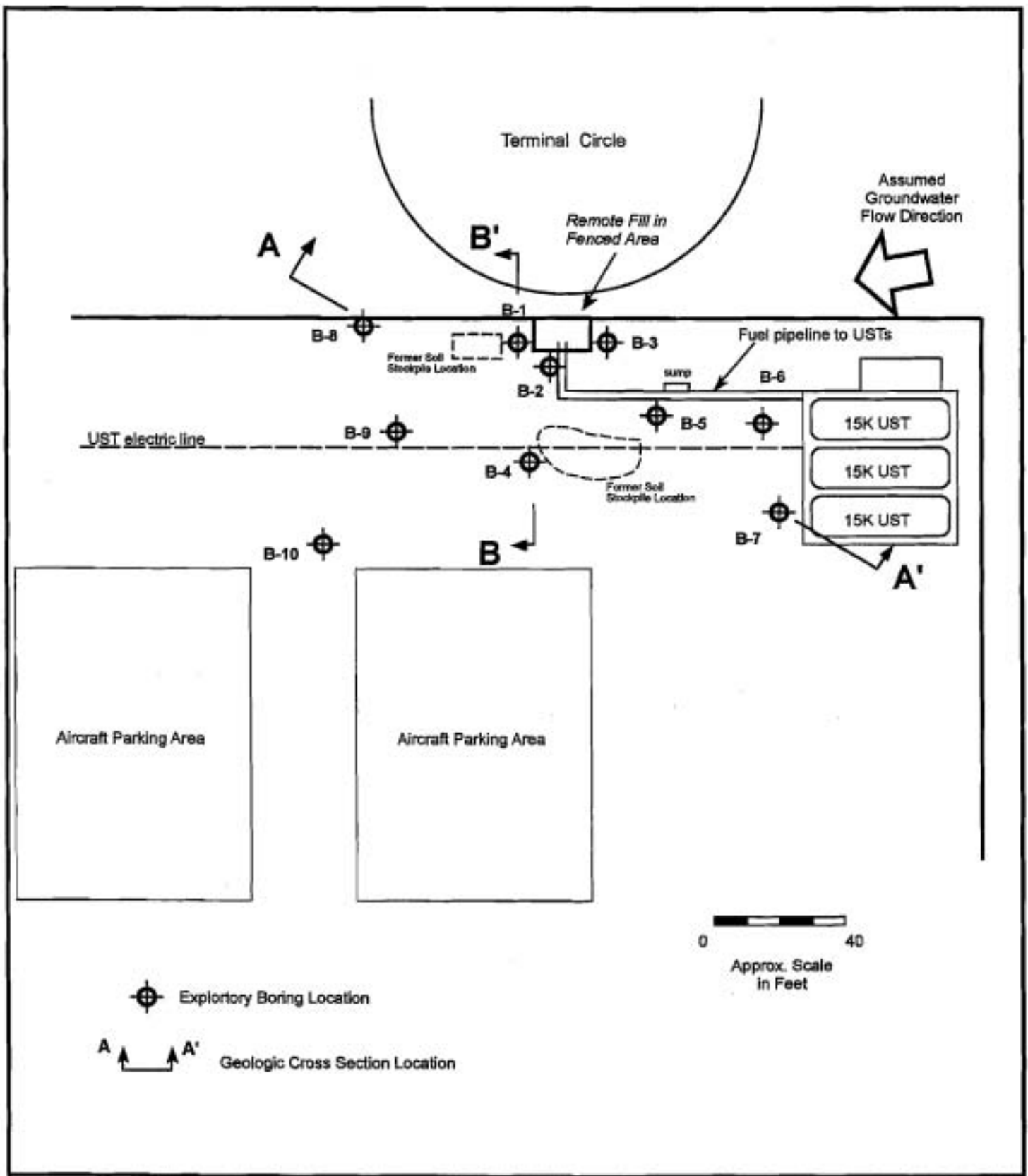
Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

Consolidated Engineering Laboratories, Inc.
San Ramon, CA

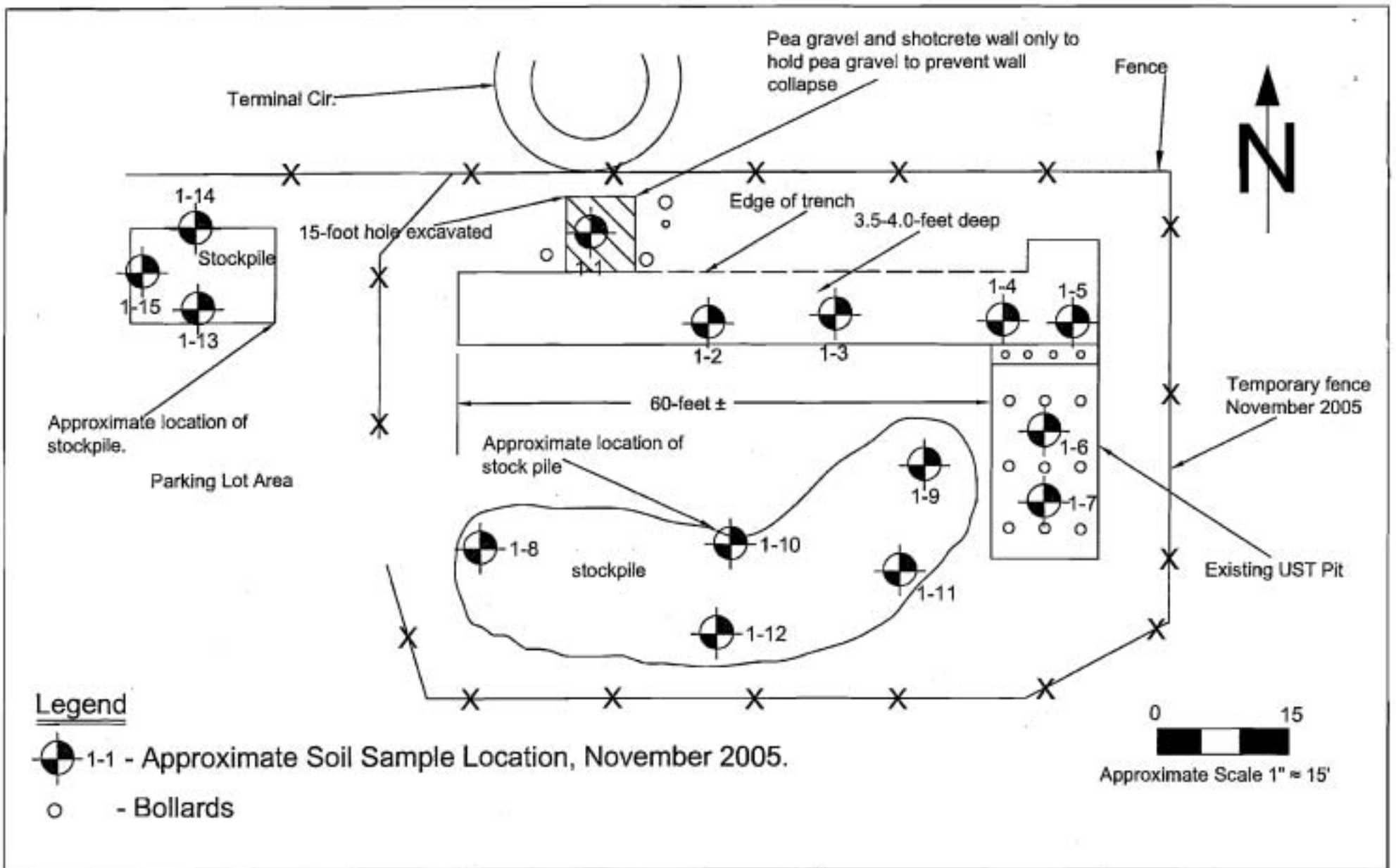
Location Map
Aircraft Fuel Fill and USTs
Livermore Airport
Livermore, CA

Proj. No. 81-01824-A
May 2007

FIGURE 1



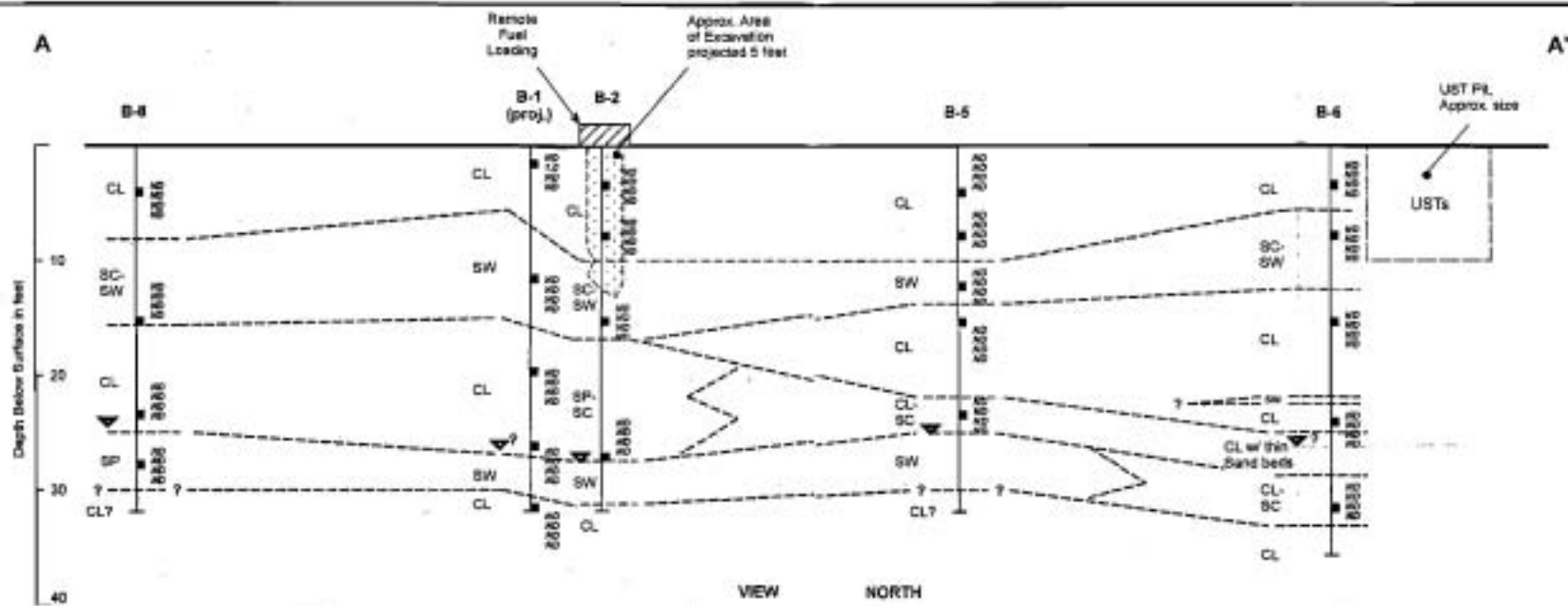
<p>Consolidated Engineering Laboratories, Inc. San Ramon, CA</p>	<p>Boring Location Map Aircraft Fuel Fill and USTs Livermore Airport Livermore, CA</p>	<p>Proj. No. 81-01824-A May 2007 FIGURE 2</p>
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Legend

- 1-1 - Approximate Soil Sample Location, November 2005.
- Bollards

 CONSOLIDATED ENGINEERING LABORATORIES	Soil Sample Locations November 2005 Airport Jet Fuel Line Replacement	81-01824-A	December 2006
		City of Livermore, Airport Livermore, CA	Figure 2 Location Map

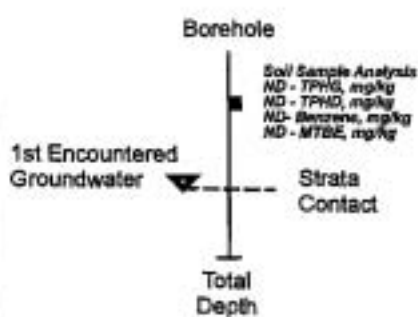
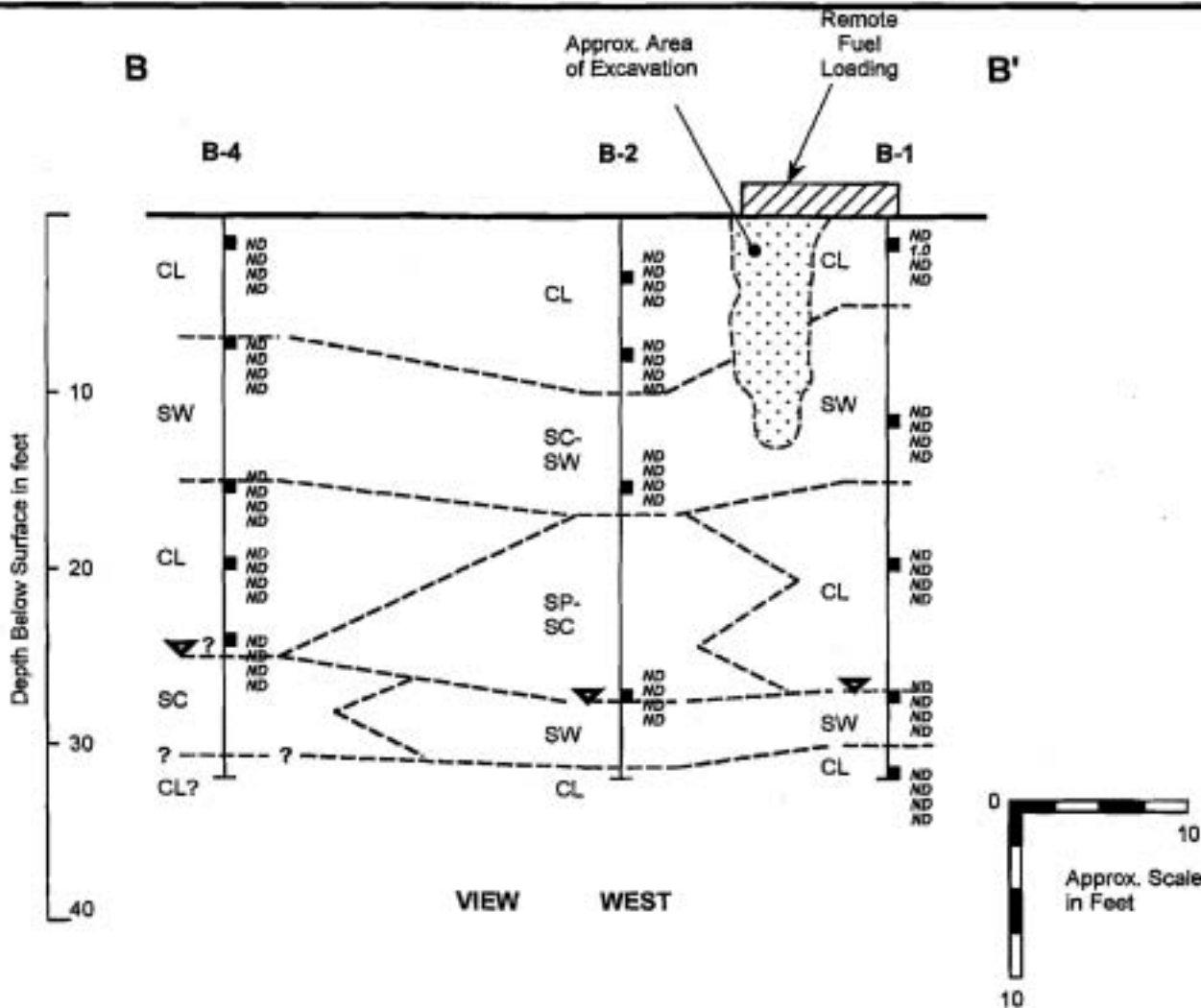


- SW SAND, well graded, may contain minor amounts of dispersed clay.
- SP SAND, poorly graded, may contain minor amounts of dispersed clay.
- SW-SC SAND and CLAYEY SAND, may occur as interbeds or mixtures.
- SC-CL CLAYEY SAND and CLAY, may occur as interbeds or mixtures, clay may contain variable amounts of silt.
- CL CLAY, may contain minor to moderate amounts of dispersed sand and silt, may contain thin sandy beds.



Generalized strata relationships and contacts interpreted locations are portrayed on the cross section, additional vertical and horizontal variations may occur.

Geologic Cross Sections Pipeline and Underground Fuel Tanks Livermore Airport, Livermore, CA	Proj. No. 01-01824-A Scales: as shown. May, 2007
CONSOLIDATED ENGINEERING LABORATORIES, INC.	FIGURE 3A



- SW** SAND, well graded, may contain minor amounts of dispersed clay.
- SP** SAND, poorly graded, may contain minor amounts of dispersed clay.
- SW-SC** SAND and CLAYEY SAND, may occur as interbeds or mixtures.
- SC-CL** CLAYEY SAND and CLAY, may occur as interbeds or mixtures, clay may contain variable amounts of silt
- CL** CLAY, may contain minor to moderate amounts of dispersed sand and silt, may contain thin sandy beds.

Generalized strata relationships and contacts interpreted locations are portrayed on the cross section, additional vertical and horizontal variations may occur.

Geologic Cross Sections Pipeline and Underground Fuel Tanks Livermore Airport, Livermore, CA	Proj. No. 81-01824-A Scales: as shown. May, 2007
CONSOLIDATED ENGINEERING LABORATORIES, INC.	FIGURE 3B

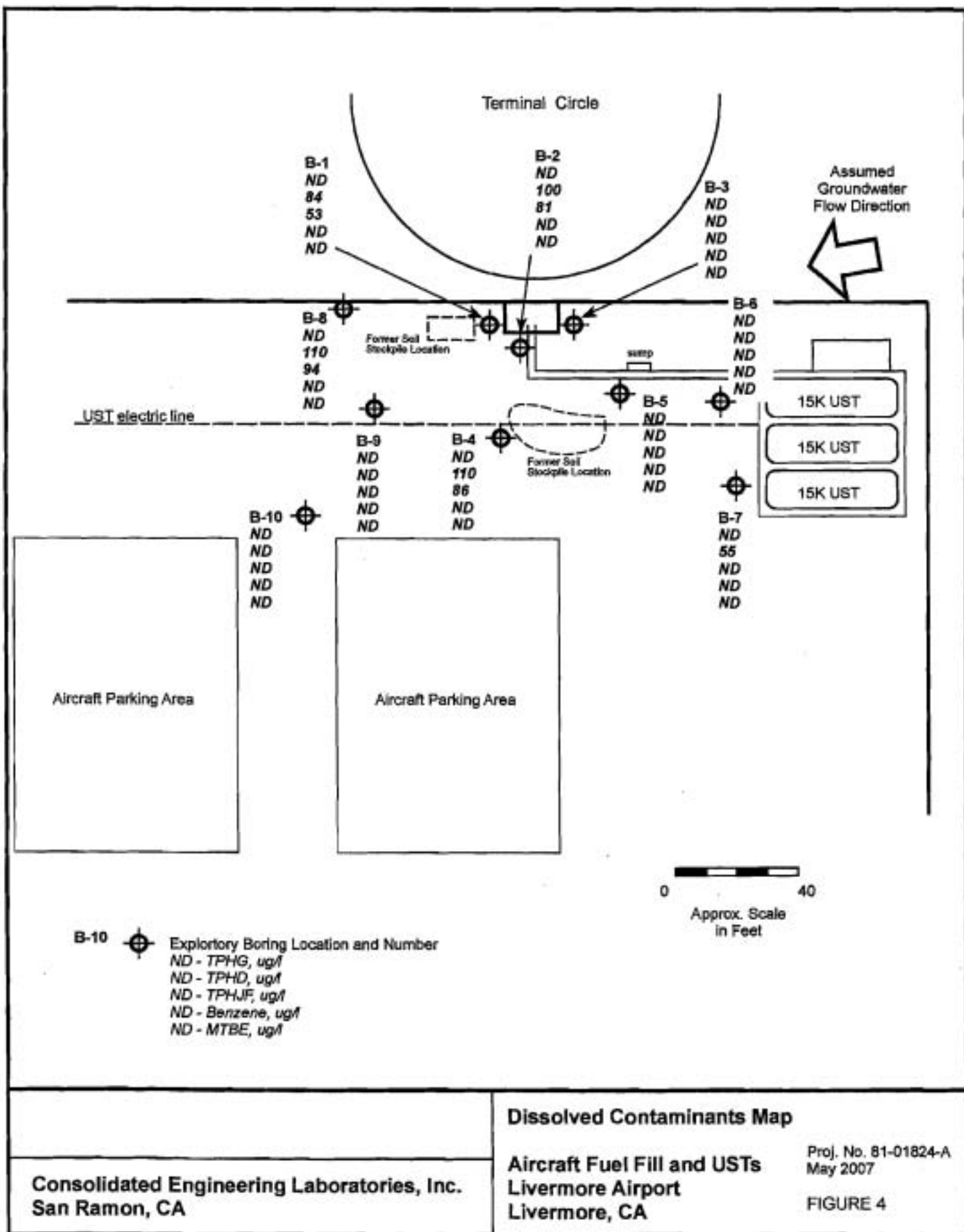




Table 1. Soil Chemical Data Boring B-1

	B-1 @2-2.5'	B-1-3 @11.5-12'	B-1-5 @19.5-20'	B-1-7 @27.5-28'	B-1-8 @31.5-32'
TPHG (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
TPHD (mg/kg)	1.0	<1.0	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Ethanol (mg/kg)	<0.25	<0.25	<0.25	<0.25	<0.25
Methanol (mg/kg)	<2.5	<2.5	<2.5	<2.5	<2.5

None Detected at detection limit shown, see laboratory reports. Mg/kg - Milligrams per kilogram.

Table 1 con't. Soil Chemical Data Boring B-2

	B-2-1 @3.5-4.0'	B-2-2 @7.5-8.0'	B-2-4 @15.5-16.0'	B-2-7 @27.5-28'
TPHG (mg/kg)	<1.0	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg - Milligrams per kilogram.



Table 1, con't. Soil Chemical Data Boring B-3

	B-3-1 @2.5-3.0'	B-3-2 @7.5-8.0'	B-3-3 @11.5-12.0'	B-3-4 @15.5-16.0'	B-3-5 @19.5-20.0'	B-3-6 @23.5-24.0'
TPHG (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg – Milligrams per kilogram.

Table 1, con't. Soil Chemical Data Boring B-4

	B-4-1 @2.0-2.5'	B-4-2 @7.5-8.0'	B-4-4 @15.5-16.0'	B-4-5 @19.5-20.0'	B-4-6 @23.5-24.0'
TPHG (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg – Milligrams per kilogram.



CONSOLIDATED ENGINEERING
LABORATORIES

Table 1, con't. Soil Chemical Data Boring B-5

	B-5-1 @3.5-4.0'	B-5-2 @7.5-8.0'	B-5-3 @11.5-12.0'	B-5-4 @15.5-16.0'	B-5-6 @23.5-24.0'
TPHG (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg - Milligrams per kilogram.

Table 1, con't. Soil Chemical Data Boring B-6

	B-6-1 @3.5-4.0'	B-6-2 @7.5-8.0'	B-6-4 @15.5-16.0'	B-6-6 @23.5-24.0'	B-6-8 @31.5-32'
TPHG (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg - Milligrams per kilogram.



Table 1, con't. Soil Chemical Data Boring B-7

	B-7-3 @11.5-12.0'	B-7-4 @15.5-16.0'	B-7-5 @19.5-20.0'	B-7-6 @23.5-24.0'
TPHG (mg/kg)	<1.0	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg – Milligrams per kilogram.

Table 1, con't. Soil Chemical Data Boring B-8

	B-8-1 @3.5-4.0	B-8-4 @15.5-16.0'	B-8-6 @23.5-24.0'
TPHG (mg/kg)	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005
DIPE (mg/kg)	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg – Milligrams per kilogram.



Table 1, con't. Soil Chemical Data Boring B-9

	B-9-1 @3.5-4.0'	B-9-4 @15.5-16.0'	B-3-6 @23.5-24.0'
TPHG (mg/kg)	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005
DiPE (mg/kg)	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg - Milligrams per kilogram.

Table 1, con't. Soil Chemical Data Boring B-10

	B-10-1 @2.5-3.0'	B-10-4 @15.5-16.0'	B-10-6 @23.5-24.0'
TPHG (mg/kg)	<1.0	<1.0	<1.0
TPHD (mg/kg)	<1.0	<1.0	<1.0
TPHJF (mg/kg)	<1.0	<1.0	<1.0
Benzene (mg/kg)	<0.005	<0.005	<0.005
Toluene (mg/kg)	<0.005	<0.005	<0.005
Ethylbenzene (mg/kg)	<0.005	<0.005	<0.005
Xylenes (mg/kg)	<0.005	<0.005	<0.005
MTBE (mg/kg)	<0.005	<0.005	<0.005
ETBE (mg/kg)	<0.005	<0.005	<0.005
DiPE (mg/kg)	<0.005	<0.005	<0.005
TAME (mg/kg)	<0.005	<0.005	<0.005
TBA (mg/kg)	<0.05	<0.05	<0.05
1,2-Dichloroethane (mg/kg)	<0.05	<0.05	<0.05
Ethanol (mg/kg)	<0.005	<0.005	<0.005
Methanol (mg/kg)	<0.25	<0.25	<0.25

None Detected at detection limit shown, see laboratory reports. Mg/kg - Milligrams per kilogram.



CONSOLIDATED ENGINEERING
LABORATORIES

TABLE 1 (Samples 1-1 through 1-15)
SUMMARY OF ANALYTICAL DATA

Constituent	Reported Concentration (ppm) (ppb)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Gasoline Range Organic		NA	400	NA	NA
1-1 (2)	8,000				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8 (2)	260,000				
1-9 (2)	6,000				
1-10 (2)	310,000				
1-11 (2)	360,000				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Benzene		NA	0.38	NA	NA
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Toluene		NA	9.3	NA	NA
1-1 (2)	59				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9 (2)	12				
1-10	ND				
1-11 (2)	3,900				
1-12	ND				
1-13	8.3				
1-14	5.6				
1-15	ND				



CONSOLIDATED ENGINEERING
LABORATORIES

Constituent	Reported Concentration (ppm) (ppb)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels-ESLs (ppm)	California Title 22 TTLc (ppm)	US EPA Residential PRG (ppm)
Ethyl Benzene		NA	32	NA	NA
1-1	17				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Total Xylenes		NA	2.3	NA	NA
1-1 (2)	210				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Diesel Range Organics		NA	500	NA	NA
1-1	200				
1-2	ND				
1-3	ND				
1-4	6.1				
1-5	61				
1-6	ND				
1-7	ND				
1-8 (2)	1,100				
1-9 (2)	710				
1-10 (2)	750				
1-11 (2)	800				
1-12	16				
1-13	15				
1-14	7.5				
1-15	3				



**CONSOLIDATED ENGINEERING
LABORATORIES**

Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Motor Oil Range Organics		NA	1,000	NA	NA
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	65				
1-13	68				
1-14	ND				
1-15	ND				
MTBE		NA	5.6	NA	620
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	NA				
1-9	ND				
1-10	NA				
1-11	NA				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Antimony		15	40	500	31
1-1	3.8				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



**CONSOLIDATED ENGINEERING
LABORATORIES**

Constituent	Reported Concentration (ppm)	California Title 22 STL (ppm)	SFBRWQCB Environmental Screening Levels - ESLs (ppm)	California Title 22 TTL (ppm)	US EPA Residential PRG (ppm)
Arsenic		5	5.5	500	39
1-1	5.5				
1-2	3.9				
1-3	4.1				
1-4	2.1				
1-5	3.1				
1-6	2.7				
1-7	1.6				
1-8	ND				
1-9	1.2				
1-10	1.4				
1-11	1.3				
1-12	1.7				
1-13	4.2				
1-14	4.1				
1-15	4.1				
Barium		100	1,500	10,000	5,400
1-1	170				
1-2	190				
1-3	180				
1-4	35				
1-5	140				
1-6	45				
1-7	26				
1-8	35				
1-9	27				
1-10	46				
1-11	46				
1-12	49				
1-13	160				
1-14	170				
1-15	150				
Beryllium		0.75	8.0	75	150
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



**CONSOLIDATED ENGINEERING
LABORATORIES**

Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels - ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Cadmium		1	7.4	100	3.7
1-1	1.6				
1-2	1.5				
1-3	1.5				
1-4	1.0				
1-5	1.3				
1-6	1.2				
1-7	0.8				
1-8	0.5				
1-9	0.5				
1-10	0.8				
1-11	1.2				
1-12	0.9				
1-13	1.5				
1-14	1.5				
1-15	1.4				
Chromium - Total		5	58	NA	210
1-1 (1)	54				
1-1 WET	0.12				
1-2	50				
1-2 WET	0.89				
1-3	48				
1-4	15				
1-5	41				
1-6	15				
1-7	14				
1-8	11				
1-9	11				
1-10	19				
1-11	41				
1-12	18				
1-13	48				
1-14 (1)	55				
1-14 WET	0.17				
1-15	50				
Cobalt		80	10	8,000	4,700
1-1 (2)	14				
1-2 (2)	14				
1-3 (2)	14				
1-4	4.7				
1-5 (2)	11				
1-6	7.8				
1-7	3.4				
1-8	3.9				
1-9	3.5				
1-10	5.9				
1-11	8.2				
1-12	9.7				
1-13 (2)	13				
1-14 (2)	14				
1-15 (2)	13				



**CONSOLIDATED ENGINEERING
LABORATORIES**

Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Copper		25	230	2,500	2,900
1-1	35				
1-2	30				
1-3	31				
1-4	11				
1-5	26				
1-6	15				
1-7	8.3				
1-8	9.1				
1-9	7.5				
1-10	13				
1-11	17				
1-12	19				
1-13	27				
1-14	29				
1-15	27				
Lead - Total		5	750	1,000	400
1-1	7.5				
1-2	6.8				
1-3	6.9				
1-4	4.0				
1-5	6.1				
1-6	4.4				
1-7	3.0				
1-8	10				
1-9	8.7				
1-10	10				
1-11	5.2				
1-12	2.6				
1-13	7.3				
1-14	7.4				
1-15	7.8				
Molybdenum		350	40	3,500	390
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



**CONSOLIDATED ENGINEERING
LABORATORIES**

Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Nickel		20	150	2,000	1,600
1-1	100				
1-2	93				
1-3	92				
1-4	28				
1-5	73				
1-6	28				
1-7	19				
1-8	16				
1-9	22				
1-10	32				
1-11	28				
1-12	40				
1-13	100				
1-14	110				
1-15	98				
Selenium		1	10	100	390
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Silver		5	40	500	390
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



**CONSOLIDATED ENGINEERING
LABORATORIES**

Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels - ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Thallium		7	13	700	5.2
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Vanadium		24	200	2,400	550
1-1	25				
1-2	25				
1-3	25				
1-4	12				
1-5	22				
1-6	28				
1-7	11				
1-8	11				
1-9	6.7				
1-10	12				
1-11	28				
1-12	13				
1-13	22				
1-14	22				
1-15	23				
Zinc		250	600	5,000	23,000
1-1	47				
1-2	42				
1-3	45				
1-4	72				
1-5	39				
1-6	31				
1-7	20				
1-8	17				
1-9	22				
1-10	24				
1-11	26				
1-12	30				
1-13	43				
1-14	44				
1-15	41				



**CONSOLIDATED ENGINEERING
LABORATORIES**

Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels - ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Mercury		0.2	10	20	2.3
1-1	0.06				
1-2	0.06				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	0.06				
1-14	0.05				
1-15	0.05				

ND Non Detectable

NA Not Applicable/Available

- (1) More than 10 times the California STLC. However, the test results are below the California TTLC, San Francisco Bay Regional Water Quality Board ESLs, and the US EPA PRG.
- (2) More than the San Francisco Bay Regional Water Quality Board ESLs. However, the test results are below the California TTLC, STLC and US EPA PRG.



Table 2. Groundwater Chemical Data Borings B-1 through B-10

	B-1*	B-2	B-3	B-4*	B-5	B-6	B-7	B-8#	B-9	B-10
TPHG (ug/l)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPHD (ug/l)	84	100	<50	110	<50	<50	55	110	<50	<50
TPHJF (ug/l)	53	81	<50	88	<50	<50	<50	94	<50	<50
Benzene (ug/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (ug/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene (ug/l)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
Xylenes (ug/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MTBE (ug/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ETBE (ug/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DIPE (ug/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TAME (ug/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TBA (ug/l)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane (ug/l)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
Ethanol (ug/l)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Methanol (ug/l)	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500

None Detected at detection limit shown, see laboratory reports. Ug/l – Micrograms per liter.

* - Laboratory reports that diesel range compounds are significant but no recognizable pattern and oil range compounds are significant.

- A Laboratory report that diesel range compounds are significant and about one percent of the sample was sediment.

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-1
 Logged by: CMP Date: April 2, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 26' Static: 22'

Grout Seal: 32' to Surface

Sample No.	PID /OV	Contin. Push/ Core	Sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-1 to 4'	0			CL - Sandy CLAY, dark brown 10YR3/3, f.-med. sand 30-40%, low plasticity, stiff, damp.	
B-1 to 8'	0		5	Same as above, increasing sand.	
B-1 to 12'	0		10	SW - SAND with Clay, brownish yellow 10YR6/6, clay up to 20%, low plasticity, f.-crs. sand 80%, rare fine gravel, med. dense, damp.	
B-1 to 16'	0		15	Same as above, f.-crs. sand, clay decreases occurs as matrix, color change to light yellowish brown 10YR6/4, dense, damp.	
B-1 to 20'	0		20	CL - Sandy CLAY, dark yellowish brown 10YR4/4, f. -med. sand 30-40%, clay lean, low plasticity, 60-70%, med. stiff, damp.	
B-1 to 24'	0			CL - Sandy CLAY, grayish brown 2.5YR5/2, f. sand 5-15%, clay low plasticity, 75%+, med. stiff, damp.	
B-1 to 28'	0		25	Increase in f.-med. sand to 45%, med. stiff, moist. Becomes very moist to saturated at about 26 feet.	
B-1 to 32'	0		30	SW - SAND, grayish brown 2.5YR4/2, f.-crs. sand 90%, fines 10% and slightly plastic, dense, saturated. CL - Sandy CLAY, dark grayish brown 2.5YR4/2, f.-med. sand 15-25%, clay low plasticity, stiff, damp.	
			35	Bottom of Boring = 32 feet Water enters borehole slowly	

Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-2
 Logged by: CMP Date: April 2, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
 BOREHOLE COMPLETION:
 Well installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 26.5' Static: NM

Grout Seal: 32' to Surface

Sample No.	PID /OV	Contin. Push/ Core	Sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-2 to 4'	0			CL - CLAY, dark yellowish brown 10YR3/4, f. sand 20%, low plasticity, lean, stiff, damp.	
B-2 to 8'	0		5	CL - Sandy CLAY, dark yellowish brown 10YR3/4, f.-crs. sand 40%, rare gravel clay 60% lean low plasticity, stiff, damp. Sand content varies from about 45-65% at 8 feet, stiff, damp.	
B-2 to 12'	0		10	SC-SW - Clayey SAND to SAND interbedded, brown 10YR5/2, f.-crs. sand 70-90%, clay varies 10-30%, lean low plasticity, rare gravel, dense, damp.	
B-2 to 16'	0		15	Same as above, less med. crs. sand, lens of sand 2-4 inches thick, dense, damp. Pushes hard 16-20 feet.	
B-2 to 20'	0		20	SP - SAND, grayish brown 10YR5/2, f. sand 80-90%, fines 10-20%, nonplastic to slightly plastic, dense, damp.	
B-2 to 24'	0		25	SP-SC - SAND and Clayey SAND, grayish brown 10YR5/2, f. sand 70-90%, clay/fines low plasticity lean, dense, damp to very moist.	
B-2 to 28'	0		28	CL - CLAY, yellowish brown 10YR5/6, v. f. sand <5%, stiff, damp. Sand interbed about 26 to 28 feet, saturated, low core recovery.	
B-2 to 32'	0		30	Sand interbed fines 10-15%, sand 85%, dense saturated at 31.5-31.8, then clay as above, not saturated 31.8-32, stiff, damp.	
			35	Bottom of Boring = 32 feet Water enters borehole slowly, some collapse or swell 28-32 feet, sampled with Hydropunch	
Reviewed by PG					

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01B24-A BORING NO. B-3
 Logged by: CMP Date: April 2, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 28'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 25' Static: 25'

Grout Seal: 28' to Surface

Sample No.	PID /OV	Contin. Push/ Core	sample Depth	Lithology Log	Well Detail/ Backfill
				Concrete	
B-3 to 4'	0			CL - Sandy CLAY, dark yellowish brown 10YR3/4, f. sand 15-20%, low plasticity lean clay, med. stiff, damp.	
B-3 to 8'	0		5	Same as above, thin sand beds 2-4 inches thick with crs. sand, o/w med. stiff, damp. increase in sand at 8 feet, pushes hard 8-12 feet, stiff, damp.	
B-3 to 12'	0		10	SW - SAND, light yellowish gray 10YR6/2, f. -crs. sand 90%, fines slightly plastic, may contain very thin clay beds 1-2 inches thick, very dense, damp.	
B-3 to 16'	0		15	SC - Clayey SAND, brown 10YR5/2, f. sand 75%, lean low plasticity clay 25%, faint bedding, very dense, damp.	
B-3 to 20'	0		20	Same as above, less sand, clay inc. to 40%, possible caliche, very dense, damp.	
B-3 to 24'	0			Same as above, inc. in sand to 75%, then transition to underlying stratum, dense, damp.	
B-3 to 28'	0		25	CL - Silty CLAY, brown 10YR5/2, lean, no sand, stiff, damp.	
				SW-SC - SAND and Clayey SAND, brown 10YR4/3, f.-med. sand 70-80%, clay lean low plasticity 20-30%, dense, saturated.	
				CL - CLAY, brown 10YR4/3, f. sand <5%, clay lean low plasticity, stiff, damp.	
			30		
			35		
				Bottom of Boring = 28 feet Water enters borehole slowly	
					Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-4
 Logged by: CMP Date: April 3, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 25' Static: NM

Grout Seal: 32' to Surface

Sample No.	PID /OV	Contin. Push/ Core	Sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-4 to 4'	0			CL - Silty CLAY, brown 10YR5/6, v.f. sand <5%, clay lean low plasticity, med. stiff, damp.	
B-4 to 8'	0		5		
B-4 to 12'	0		10	SW - SAND, pale brown 10YR6/4, f.-crs. sand 90%, fines 10% and nonplastic, rare gravel, massive, dense damp.	
B-4 to 16'	0		15	Same as above, crude crs. sand grain-sized defined bedding, nonplastic fines, very dense, damp.	
B-4 to 20'	0		20	CL - Silty CLAY, brown 10YR4/3, clay low plasticity lean 90%, v.f. sand 10%, caliche(?), hard, damp.	
B-4 to 24'	0		25	Same as above, massive clay, v.f. sand inc. to 10-15%, pushes hard 20-24 feet.	
B-4 to 28'	0		30	Sandy Clay to Clayey Sand interbed 8 inches thick at 22.5-23 feet, o/w same clay below 23 feet, stiff to hard, damp.	
B-4 to 32' Hydropunch	0		35	SC - Clayey SAND, gray 10YR5/1, f. -med sand 70%, clay 30%, low plasticity, very dense, very moist to saturated.	
				Borehole collapses to 17 feet after recovery of 25 foot sample. Use Hydropunch for water sample, push tool to 32 feet, then pull back to 27 for water entry.	
				Bottom of Boring = 32 feet Water enters borehole slowly	

Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-5
 Logged by: CMP Date: April 3, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
 BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 24.5' Static: NM

Grout Seal: 32' to Surface

Sample No.	PID /OV	Contin. Push/ Core	Sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-5 to 4'	0			CL - Sandy CLAY, dark yellowish brown 10YR3/4, lean low plasticity, v.f. sand <5%, med. stiff, damp.	
B-5 to 8'	0		5	CL - Sandy CLAY, brown, 10YR4/3, f. crs. sand 20%, gravel 1%, clay lean low plasticity 80%, massive to crudely bedded, stiff, damp.	
B-5 to 12'	0		10	SW - SAND, grayish brown 10YR5/2, f. crs. sand 85%, f. gravel 5%, fines 10% nonplastic to slightly plastic, very dense, damp.	
B-5 to 16'	0		15	CL - Silty CLAY, yellowish brown 10YR5/4, low-mod. plasticity, v.f. sand <5%, dissem. in clay, minor caliche, hard, damp.	
B-5 to 20'	0		20	Same as above, pushes hard, no caliche, hard, damp.	
B-5 to 24'	0		25	CL-SC - Sandy CLAY to Clayey SAND, dark grayish brown 10YR4/2, f.-med. sand 40-70%, fines 40-70% varies, low plasticity, locally contains 2-4 inch thick sand beds at 23-24 feet, hard to dense, damp, moist at 24 feet	
B-5 to 28'	0			SP - SAND, dark grayish brown 10Yr4/3, sand 95%, nonplastic fines 5%, massive to faint bedding, very dense saturated.	
B-5 to 32' Hydropunch			30	Borehole collapses at 8 feet, use Hydropunch to collect water sample, push to 32 feet, pull back to 27 feet to collect sample.	
			35	Bottom of Boring = 32 feet Water enters borehole slowly	

Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-6
 Logged by: CMP Date: April 3, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 36'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 27' Static: 24'

Grout Seal: 36' to Surface

Sample No.	PID /OV	Contin. Push/ Core	sample Depth	Lithology Log	Well Detail/ Backfill
B-6 to 4'	0			Asphalt	
B-6 to 8'	0		5	CL - Silty CLAY, brown 10YR4/3, f. crs. sand 5%, clay lean low plasticity, seff, damp.	
B-6 to 12'	0		10	SW-SC - SAND and Clayey SAND, dark grayish brown 10YR4/2, f.crs. sand 60-75% fines 25-40% slight to low plasticity, dense, damp.	
B-6 to 16'	0		15	CL - Silty CLAY, dark yellowish brown 10YR4/6, low-mod. plasticity, v.f. sand 5%, some caliche. hard, damp. Same as above, light tan mottles and caliche(?), f. sand to 10%, hard, damp.	
B-6 to 20'	0		20	Same as above, v.f. sand 5%, some very thin sandy zones 18-24 feet, very slow push at 20 feet	
B-6 to 24'	0		23-23.3	3 inch thick f. med. sand bed at 23-23.3 feet, hard, damp, becomes damp to moist at 24 feet.	
B-6 to 28'	0		25	CL - Sandy CLAY, yellowish brown 10YR5/4, f. sand 30%, clay 70% low plasticity lean, massive, hard, damp to moist; pushes very hard to 27 feet.	
B-6 to 32'	0		30	SC-CL - Clayey SAND to Sandy CLAY, yellowish brown 10YR5/4, v.f. f. sand 50-75%, fines/clay 25-50% low plasticity lean, local thin sand beds, hard to dense, damp to slightly moist.	
B-6 to 36'	0		35	CL - Sandy CLAY, brown 10YR4/3, f. sand 10-30%, dissem. in clay, clay 70% low plasticity, hard, damp.	
			40	Bottom of Boring = 36 feet Water enters borehole slowly	

Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-7
 Logged by: CMP Date: April 3, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
 BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 25.5' Static: 23.5'

Grout Seal: 32' to Surface

Sample No.	PID /OV	Contin. Push/ Core	sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-7 to 4'	0			CL - Silty CLAY, brown 10YR4/3, f. crs. sand 5%, clay lean low plasticity, stiff, damp.	
B-7 to 8'	0		5	SW-SC - SAND and Clayey SAND, dark grayish brown 10YR4/2, f. crs. sand varies 60-80%, clay 20-40% low plasticity, dense, damp.	
B-7 to 12'	0		10	Same as above, locally crs. gravel 10%, f. crs. sand 80-85%, fines <5-10%, very dense, damp.	
B-7 to 16'	0		15	CL - Silty CLAY, yellowish brown 10YR5/6, low-mod. plasticity, f. sand 10-20% dissem. in clay, hard, damp. Same as above, minor tan mottles, caliche infilled fractures, hard, damp.	
B-7 to 20'	0		20	Sand interbed 4-6 inch thick at 23.5 feet, inc. sand from 25-30%, hard, damp.	
B-7 to 24'	0			CL - Sandy CLAY, brown 10YR4/3, f. sand 30-40%, dissem. in clay, clay low plasticity, hard, damp. Sandy interbed damp to moist.	
B-7 to 28'	0		25	CL - CLAY, brown 10YR4/3, sandy beds from 25-26 feet, clay low plasticity lean, hard, damp.	
B-7 to 32'	0		30	Same as above, sandy interbed sturated at 28.5-29 feet, then clay damp.	
			35	Bottom of Boring = 32 feet Water enters borehole slowly	

Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-8
 Logged by: CMP Date: April 4, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
 BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 24' Static: 24?

Grout Seal: 32' to Surface

Sample No.	PID /OV	Contin. Push/ Core	Sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-8 to 4'	0			CI - Sandy CLAY, brown 10YR4/3, f. sand 20%, clay 80%, low plasticity, massive, hard, damp.	
B-8 to 8'	0		5	Same as above, med. sand 15-20%, color change to dark yellowish brown 10YR3/4, lean, sandy interbed at 6 feet, hard, damp.	
B-8 to 12'	0		10	SC-SW - Clayey SAND to SAND, brown 10YR5/3, f. crs. sand 90%, fines 10% slightly plastic, crs. sand beds 0.2-1.0 inches thick from 11-14 feet, dense, damp.	
B-8 to 16'	0		15	Same as above, faint bedding, rare fine gravel, sand 80-90%, fines 10-20% are slightly plastic, dense damp.	
B-8 to 20'	0		20	CL - Silty CLAY, yellowish brown 10YR5/4, lean low plasticity, v.f. sand 10%, caliche, stiff to hard, damp.	
B-8 to 24'	0			Same as above, v.f. sand 5%, massive, stiff, damp to moist at about 24 feet.	
B-8 to 28'	0		25	SP - SAND, yellow brown 10YR5/4, f. sand 90%, fines 10% slightly plastic, thin clay beds at 24-28 feet interbedded with sand, med. dense, saturated.	
B-8 to 32' Hydropunch	0		30	Insufficient yield of water, push Hydropunch to 32 feet collect water sample.	
			35	Bottom of Boring = 32 feet Water enters borehole slowly	

Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-9
 Logged by: CMP Date: April 4, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
BOREHOLE COMPLETION:
 Well Installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 25' Static: 22'

Grout Seal: 32' to Surface

Sample No.	PID IOV	Contin. Push/ Core	Sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-9 to 4'	0			CL - Sandy CLAY, dark yellowish brown 10YR3/4, f. med. sand 30-40%, massive, stiff, damp. Sand inc. to near 50% at 5 feet.	
B-9 to 8'	0		5	SC-SW - Clayey SAND to SAND, varigated to gray 10YR5/1, f. -crs. sand 70-90%, fines 10-30% and slightly plastic, dense, damp.	
B-9 to 12'	0		10	Same as above, local fine gravel beds, crudely bedded crs. sand strata, very dense, damp.	
B-9 to 16'	0		15	Same as above, massive f.-crs sand beds, very little fines, then sharp contact.	
B-9 to 20'	0		20	CL - Sandy CLAY, dark yellowish brown 10YR4/4, low plasticity lean, v.f. sand 10-20%, very faint bedding at 16 feet, stiff, damp; pushes hard 16 19 feet. Same as above, stiff, damp.	
B-9 to 24'	0			SC-SP - Clayey SAND to SAND, dark yellowish brown 10YR4/4, f. sand 75-90%, fines 10-25% clay low plasticity, massive, dense, damp.	
B-9 to 28'	0		25	Same as above, interbeds of SP sand very moist to saturated, SC clayey SAND damp to moist.	
B-9 to 32'	0		30	CL - Sandy CLAY, yellow brown 10YR4/6, low to mod. plasticity, v.f. sand 10-20%, stiff, damp.	
			35	Bottom of Boring = 32 feet Water enters borehole slowly	

Reviewed by PG

Consolidated Engineering Laboratories, Inc.

Exploratory Boring Log

Project No. 81-01824-A BORING NO. B-10
 Logged by: CMP Date: April 4, 2007
 Client: City of Livermore Airport
 Location: Fuel Pipeline and USTs

Drilling Method: GeoProbe Page 1 of 1
 BOREHOLE COMPLETION:
 Well installed: No
 Total Depth: 32'

Permit: Zone 7 #27059
 Water Levels: 1st Enc: 25' Static: NM

Grout Seal: 32' to Surface

Sample No.	PID IOV	Contin. Push/ Core	Sample Depth	Lithology Log	Well Detail/ Backfill
				Asphalt	
B-10 to 4'	0			CL - Sandy CLAY, brown 10YR4/3, f. sand 20-30%, clay 70-80% lean low plasticity, massive, stiff, damp.	
			5	color change to very dark brown 10YR2/2, v.f. sand 15%, massive, stiff, damp.	
B-10 to 8'	0				
			10	Same as above, crs. sand interbed 3 inches thick at 1 feet, inc. in sand overall, stiff, damp.	
B-10 to 12'	0				
			15	SC - Clayey SAND, yellowish brown 10YR5/8, f. med. sand 70-80%, clay/fines 20-30%, low plasticity, dense damp.	
B-10 to 16'	0				
			20	CL - Silty CLAY, dark yellowish brown 10YR4/6, low-mod. plasticity, some caliche, f. sand 10%, stiff to hard, damp.	
B-10 to 20'	0				
			25	Same as above, v.f. sand 20-25% dissem. in clay, stiff to hard, damp.	
B-10 to 24'	0				
			30	Increasing sand to nearly 50%, stiff, damp.	
B-10 to 28'	0				
			35	SC-SP - Clayey SAND to SAND, yellowish brown 10YR5/6, f. sand 60-90%, clay 10-40% low plasticity, dense, damp to moist.	
B-10 to 32' Hydropunch	0			thin clay interbeds and saturated sand beds, clay decreases to 10%, v.f. f. sand 90%, water entry into borehole very slow.	
				Hydropunch to 32 feet to collect sufficient yield for samples.	
				Bottom of Boring = 32 feet Water enters borehole slowly	
				Reviewed by PG	