

JAN 11 2002

**ADDITIONAL INVESTIGATION  
REPORT**

**Xtra Oil Company Service Station  
1701 Park Street  
Alameda, California**

**Alisto Project No. 10-210**

**December 2001**



**ADDITIONAL INVESTIGATION REPORT**

**Xtra Oil Company Service Station  
1701 Park Street  
Alameda, California**

**Project No. 10-210-17-003**

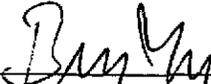
**Prepared for:**

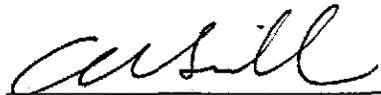
**Xtra Oil Company  
2307 Pacific Avenue  
Alameda, California**

**Prepared by:**

**Alisto Engineering Group  
3732 Mt. Diablo Boulevard, Suite 270  
Lafayette, California**

**December 19, 2001**

  
\_\_\_\_\_  
**Brady Nagle  
Project Manager**

  
\_\_\_\_\_  
**Al Sevilla, P.E.  
Principal**



## TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 Purpose and Scope of Work.....	1
1.2 Site Location and Description.....	1
1.3 Project Background .....	1
2.0 FIELD METHODS.....	3
3.0 ANALYTICAL METHODS .....	4
4.0 SITE GEOLOGY AND HYDROGEOLOGY.....	4
5.0 DISCUSSION OF RESULTS.....	5
6.0 FINDINGS AND CONCLUSIONS.....	5

### REFERENCES

### TABLES

- 1 Summary of Results of Soil Sampling
- 2 Summary of Results of Groundwater Sampling from Temporary Wells

### FIGURES

- 1 Site Vicinity Map
- 2 Site Plan

### APPENDICES

- A Permits
- B Field Procedures for Drilling, Soil Sampling, and Temporary Groundwater Monitoring Well Installation
- C Boring Logs and Temporary Well Construction Details
- D Temporary Well Sampling Field Survey Forms
- E Field Procedures for Chain of Custody Documentation, Laboratory Reports, and Chain of Custody Records



Jan 2002

## 1.0 INTRODUCTION

Alisto Engineering Group was retained by Xtra Oil Company to conduct additional investigation to assess the extent of petroleum hydrocarbons in the subsurface offsite of Xtra Oil Company Service Station at 1701 Park Street, Alameda, California. A site vicinity map is shown on Figure 1 and a site plan is shown on Figure 2.

### 1.1 Purpose and Scope of Work

The purpose of the additional site investigation is to address the concerns of the Alameda County Health Care Services Agency (ACHCSA), as set forth in the June 7, 2000 letter to Xtra Oil Company with respect to assessing the horizontal extent of petroleum hydrocarbons in the subsurface. As set forth in the work plan approved by ACHCSA, the scope of work included the following tasks:

- Obtain encroachment permits to perform work in the public right-of-way.
- Collect soil samples and shallow groundwater samples at three locations using a hand auger and sampler and temporary casing.
- Coordinate future groundwater monitoring and sampling with an adjacent petroleum release site (Exxon) at 1725 Park Street.
- Analyze soil and groundwater samples for specified hydrocarbon constituents.
- Evaluate the data and prepare a report.

### 1.2 Site Location and Description

The Xtra Oil Service Station is on the north corner of the intersection of Park Street and Buena Vista Avenue, Alameda, California. The site is at an elevation of approximately 20 feet above mean sea level and encompasses an area of approximately 0.5 acre. The operating retail fuel station has three (two 10,000-gallon and one 7,000-gallon) underground fuel storage tanks installed in 1994. The site layout and features and the locations of the underground storage tanks and existing groundwater monitoring wells are shown on Figure 2.

The Xtra Oil property is surrounded by residential and commercial properties. Adjacent to and northwest of the site is a residential property, and to the south, north and southeast are commercial properties.

### 1.3 Project Background

In April 1994, the Xtra Oil Service Station underwent a major renovation to expand into the adjoining property to the northwest. Three underground gasoline storage tanks and an underground diesel storage tank were removed and replaced with three double-walled storage tanks. One former underground storage tank (UST) used to store home heating oil was also removed from the adjoining property. Analysis of soil samples collected from the sidewalls of the fuel tank cavity and below the former dispenser islands detected petroleum hydrocarbons in



the vicinity of the tank area. No petroleum hydrocarbons, however, were detected above the reported detection limits in the soil samples collected from beneath the former fuel oil tank (Alisto, 1994).

To assess the nature and extent of petroleum hydrocarbons in soil and groundwater, a preliminary site assessment was conducted at the site in November 1994. The assessment involved drilling three onsite boreholes, B-1, B-2 and B-3, near the property line to the east, south, and west of the former underground fuel storage tanks and dispenser islands. These borings were subsequently converted into Monitoring Wells MW-1, MW-2 and MW-3. Results of the preliminary investigation revealed the presence of detectable concentrations of petroleum hydrocarbons in the soil samples collected from the borings for Wells MW-1 and MW-2 at 7.0 to 8.0 feet below grade, which is within the capillary fringe. Analysis of a soil sample collected from the boring for Well MW-3 did not detect petroleum hydrocarbons above the reported detection limits (Alisto 1995a).

At the request of the ACHCSA, an additional site investigation was performed in April 1997. The investigation involved drilling an exploratory soil boring (SB-1) and installing a monitoring well (MW-4) north of the former underground storage tanks and dispenser islands. Analysis of the soil samples collected during drilling of Well MW-4 detected petroleum hydrocarbons and total organic carbon (TOC) in Boring SB-1 (Alisto, 1997c).

A quarterly groundwater level measurement and sampling program was initiated at the site in November 1994. The groundwater gradient direction, as interpreted for each sampling event, has ranged from northeasterly to southeasterly. Since the beginning of the monitoring program, liquid-phase petroleum hydrocarbons have been observed in Well MW-2 at a thickness of up to 0.21 feet. Weekly product removal has reduced the hydrocarbon thickness to approximately 0.13 feet in March 1999. Dissolved-phase petroleum hydrocarbons have been detected consistently in Wells MW-1, MW-2 and MW-4 and periodically in MW-3 (Alisto 1995b, c, d; 1996a, b, c; 1997a,b; 1998a, b, c; 1999a, b, c; 2000a, b, c, d; and 2001a, b, c).

In February 1995, the files of the ACHCSA were reviewed to identify offsite properties with confirmed releases of petroleum hydrocarbons to the subsurface. The file review revealed seven sites within a ¼-mile radius of the site, each of which has on- and off-site groundwater monitoring wells associated with the reported release. Approximately 100 feet northeast of the Xtra Oil site is an Exxon service station with approximately 18 monitoring wells and an operating groundwater and soil vapor extraction system.

In June 1996, review of subsurface utility records at the City of Alameda Public Works Department revealed the presence of a 10-inch-diameter sanitary sewer along the centerline of Park Street at a depth of approximately 11 feet and a 6-inch-diameter sanitary sewer along the centerlines of Buena Vista Avenue and Eagle Avenue (Alisto, 1997c). Since the depth to groundwater at the site varies from 6 to 9 feet below grade, the trench and backfill material for the sanitary sewer pipe in Park Street may be influencing the lateral migration of petroleum hydrocarbons from the site towards Park Street.

A remedial feasibility study and corrective action plan dated October 14, 1999 was prepared to address the residual petroleum hydrocarbons in the soil and groundwater at the site. Based on detailed evaluation of technical feasibility, cost, ease of implementation, overall protection of



public health and the environment, and regulatory agency and community acceptance, air sparging and vapor extraction followed by thermal treatment of the extracted soil gas was determined to be the preferred remedial action for the site (Alisto, 1999).

On April 5, 2000, air sparging points, ASP-1 through ASP-7, were installed onsite at the locations shown on Figure 2. The air sparging points extend to depths of 26 to 30 feet, and consist of 3/4-inch-diameter PVC blank casing and pre-pack screened interval at the bottom two feet (Alisto, 2001d).

In October 2000, air sparging and vapor extraction tests were performed to collect site-specific data for use in evaluating the characteristics of the vadose zone and the technical feasibility and applicability of this technology at the site. Based on the results of this remedial pilot testing, the combination of air sparging and vapor extraction technologies was considered applicable at the site for the remediation of residual hydrocarbons in the subsurface (Alisto, 2001d).

## 2.0 FIELD METHODS

Before performing the field activities, a drilling permit was obtained from the Alameda County Public Works Agency and encroachment and right-of-way permits were obtained from the City of Alameda to drill within the public right-of-way. Copies of the permits are included in Appendix A.

To assess the extent of petroleum hydrocarbons in the groundwater, ~~three borings, TW-1, TW-2 and TW-3, were drilled using a hand auger at the locations shown on Figure 2. During drilling, soil samples were collected from each boring at a depth of 7 feet, which is immediately above the encountered groundwater based on depth-to-water measurements from the onsite wells.~~ Soil sampling was performed in accordance with the procedures described in Appendix B. Soil samples were described in general accordance with the Unified Soils Classification System, including color, moisture, density and consistency. The soil boring logs prepared for TW-1, TW-2 and TW-3 are included in Appendix C.

Soil Borings TW-1, TW-2 and TW-3 were converted into Temporary Wells TW-1, TW-2 and TW-3 in accordance with the procedures described in Appendix B. Groundwater samples were collected from Temporary Wells TW-1, TW-2 and TW-3 to assess the lateral extent of petroleum hydrocarbons in groundwater. After collection of soil samples, the borings were extended to a depth of 10 feet. A 3/4-inch-diameter, flush-threaded, Schedule 40 PVC casing and 0.010-inch slotted screen was inserted into each boring to the total depth. Construction details for the temporary wells are included in the boring logs presented in Appendix C.

Before collecting water samples, each temporary well was purged of approximately 5 gallons of water while monitoring pH, specific conductivity, and temperature to demonstrate that the samples were representative of the water-bearing zone. The temporary wells were purged and groundwater samples were collected using a peristaltic pump with new sample tubing used for each sample collection. The samples were transported in an iced cooler to a state-certified laboratory following chain of custody procedures. After collection of groundwater samples, the borings were backfilled with neat cement as the casing was removed from the ground.



Field procedures for temporary well installation and sampling are presented in Appendix B. The groundwater sampling and field survey forms are included in Appendix D.

### 3.0 ANALYTICAL METHODS

Soil and groundwater samples collected during this investigation were analyzed by McCampbell Analytical, Inc., a state-certified laboratory, using standard test methods of the U.S. EPA and the California Department of Health Services for the following:

- Total petroleum hydrocarbons as gasoline (TPH-G) using EPA Methods 8015 and California LUFT Manual
- Total petroleum hydrocarbons as diesel (TPH-D) using EPA Methods 8015
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using Method Modified 8020
- Methyl tert-butyl ether (MTBE) using EPA Method Modified 8020

Additionally, groundwater samples collected from Temporary Wells TW-1, TW-2 and TW-3 were analyzed for the following aromatic hydrocarbons and fuel oxygenates using EPA Method 8260:

- Benzene
- Toluene
- Ethylbenzene
- Total xylenes
- t-butanol (TBA)
- MTBE
- Di-isopropyl ether (DIPE)
- Ethyl-t-butyl ether (ETBE)
- t-amyl methyl ether (TAME)
- 1,2-Dichloroethane

The laboratory results for the soil samples collected from Borings TW-1, TW-2 and TW-3 are summarized in Table 1 and the laboratory results for the grab groundwater samples from Temporary Wells TW-1, TW-2 and TW-3 are summarized in Table 2. The field procedures for chain of custody documentation, the laboratory reports, and chain of custody records are included in Appendix E.

### 4.0 SITE GEOLOGY AND HYDROGEOLOGY

The site, which is approximately 6000 feet east of San Francisco Bay and 1500 feet southwest of the Alameda Estuary in Alameda, California, lies in the Coastal Range geomorphic province



that is characterized by northwesterly trending mountains and valleys. San Francisco Bay occupies a Pliocene age structural depression and is underlain by Late Pliocene-Early Pleistocene alluvial sediment. The upper 500 feet of this coarse, poorly sorted sediment is derived mainly from the Sacramento-San Joaquin drainage system. The recent sediment load in this system has been greatly increased by hydraulic mining and farming. Bay mud, the youngest deposit in San Francisco Bay, is a soft, unconsolidated sediment generally consisting of 90 percent clay and silt-size detritus, and is prevalent in the area (Page, 1996). Soils types encountered while drilling during previous investigations consisted primarily of sand with some silt, probably of dune origin.

The shallow groundwater beneath the site, as measured on September 20, 2001, is at approximately 7 feet below ground surface. Review of groundwater elevations since groundwater monitoring began in 1994 revealed seasonal fluctuation of up to 2 feet. As interpreted from the previous monitoring data, groundwater flow has consistently been in a southeasterly direction with a gradient across the site ranging from 0.007 to 0.03.

## 5.0 DISCUSSION OF RESULTS

The results of this additional investigation, based on field observations and laboratory analysis, are discussed below.

- Analysis of soil samples collected from Soil Borings TW-1, TW-2 and TW-3 at depths immediately above the encountered groundwater did not detect TPH-G, TPH-D, BTEX or MTBE above the reported detection limits, as shown on Table 1.
- Analysis of groundwater samples collected from Temporary Wells TW-1, TW-2 and TW-3 using Method 8020 did not detect petroleum hydrocarbons or fuel oxygenates above the reported detection limits, with the exception of MTBE in grab water sample from TW-2 at a concentration of 7.8 micrograms per liter (ug/l).
- Using EPA Method 8260, only MTBE was detected in the groundwater samples collected from Temporary Wells TW-1 and TW-2 at concentrations of 3.3 and 6.5 ug/l, respectively.

## 6.0 FINDINGS AND CONCLUSIONS

Based on the results of the additional offsite assessment of the Xtra Oil service station, it is apparent that the extent of petroleum hydrocarbon release has essentially been defined, which is limited to within 80 feet of the property. Of the petroleum hydrocarbons and fuel oxygenates analyzed in the soil and groundwater samples collected from the temporary borings and wells, only MTBE was detected in two grab water samples at concentrations slightly above the proposed California Department of Health Services secondary Maximum Contaminant Level (MCL) of 5 ug/l and below the proposed primary MCL of 13 ug/l (CDHS, 2001a and b). Therefore, no additional offsite investigation or assessment of the extent of petroleum hydrocarbons related to the Xtra Oil hydrocarbon release are warranted or recommended at this time.



## REFERENCES

- Alisto Engineering Group, 1994. Tank Closure Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. July 5.
- Alisto Engineering Group, 1995a. Preliminary Site Assessment Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. January 13.
- Alisto Engineering Group, 1995b, c, and d. Groundwater Monitoring and Sampling Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. March 24, June 29, and December 11.
- Alisto Engineering Group, 1996a, b, and c. Groundwater Monitoring and Sampling Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. February 7, April 23, and October 29.
- Alisto Engineering Group, 1997a, and b. Groundwater Monitoring and Sampling Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. February 3, and November 24.
- Alisto Engineering Group, 1997c. Additional Site Investigation Report, Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. June 27.
- Alisto Engineering Group, 1998a, b, and c. Groundwater Monitoring and Sampling Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. February 11, May 27, and September 3.
- Alisto Engineering Group, 1999a, b, and c. Groundwater Monitoring and Sampling Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. February 10, April 27, and September 5.
- Alisto Engineering Group, 2000a, b, c, and d. Groundwater Monitoring and Sampling Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. January 21, May 22, September 17, and November 7.
- Alisto Engineering Group, 2001a and b. Groundwater Monitoring and Sampling Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. May 17 and July 24.
- Alisto Engineering Group, 2001d. Remedial Investigation Report. Xtra Oil Company Service Station, 1701 Park Street, Alameda, California. February 8.
- Page, Ben M., 1966. Geology of the Coastal Ranges of California. California Division of Mines and Geology, Bulletin 190, pp. 255-276.



REFERENCES  
(Continued)

- California Department of Health Services, 2001a. Final Statement of Reasons Primary Maximum Contaminant Level of Methyl tert-Butyl Ether, Title 22, California Code of Regulations. February 9.
- California Department of Health Services, 2001b. Final Statement of Reasons Secondary Maximum Contaminant Level of Methyl tert-Butyl Ether, Title 22, California Code of Regulations. February 9.
- United States Environmental Protection Agency (EPA), 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final. EPA Office of Emergency and Remedial Response, EPA/540/G-89/004. October, 1988.
- California Department of Health Services (DOHS), 1986. California Site Mitigation Decision Tree Manual.



TABLE 1 - SUMMARY OF RESULTS OF SOIL SAMPLING  
 XTRA OIL COMPANY SERVICE STATION  
 1701 PARK STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-210

BORING LOCATION	DEPTH OF SAMPLE (feet)	DATE OF SAMPLING	TPH-G (mg/kg)	TPH-D (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	LAB
TW-1	7-7.5	11/9/2001	ND<1.0	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.050	McC Campbell
TW-2	7-7.5	11/9/2001	ND<1.0	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.050	McC Campbell
TW-3	7-7.5	11/9/2001	ND<1.0	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.050	McC Campbell

ABBREVIATIONS:

TPH-G Total petroleum hydrocarbons as gasoline  
 TPH-D Total petroleum hydrocarbons as diesel  
 B Benzene  
 T Toluene  
 E Ethylbenzene  
 X Total xylenes  
 MTBE Methyl tert butyl ether  
 mg/kg Milligrams per kilogram  
 ND Not detected above reported detection limit

TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING FROM TEMPORARY WELLS  
 XTRA OIL COMPANY SERVICE STATION  
 1701 PARK STREET, ALAMEDA, CALIFORNIA

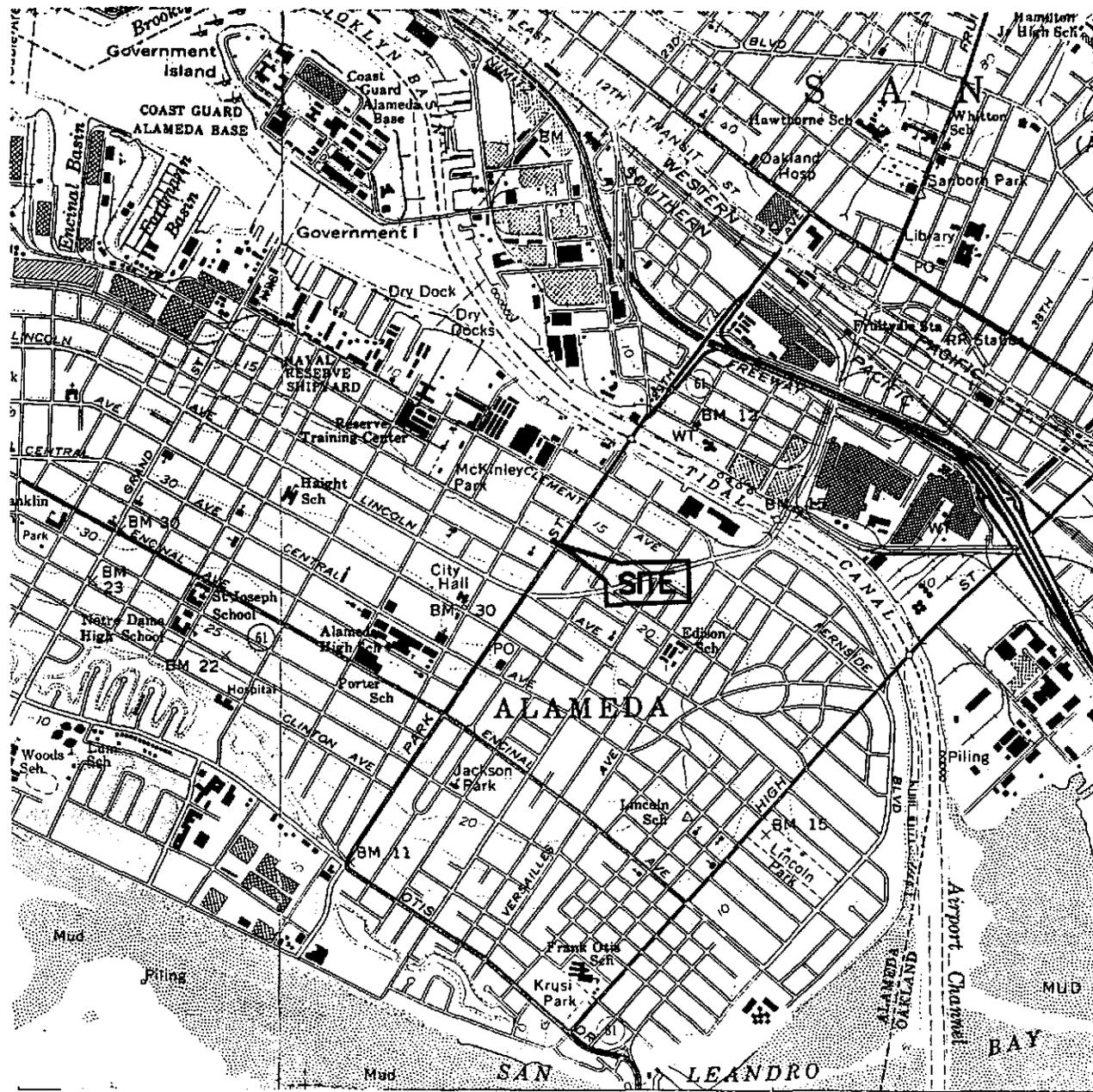
ALISTO PROJECT NO. 10-210

WELL ID	DATE OF SAMPLING/ MONITORING	DEPTH TO WATER (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (EPA 8020) (ug/l)	MTBE (EPA 8260) (ug/l)	DIPE (ug/l)	ETBE (ug/l)	TAME (ug/l)	TBA (ug/l)	1,2-DCA (ug/l)	DO (mg/l)	LAB
TW-1	11/09/01	7.5	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	3.3	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	6.67	McC
TW-2	11/09/01	7.5	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.8	6.5	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	8.61	McC
TW-3	11/09/01	7.5	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	6.4	McC

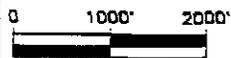
ABBREVIATIONS:

TPH-G Total petroleum hydrocarbons as gasoline  
 TPH-D Total petroleum hydrocarbons as diesel  
 B Benzene  
 T Toluene  
 E Ethylbenzene  
 X Total xylenes  
 DIPE Di-isopropyl ether  
 ETBE Ethyl tert-butyl ether  
 MTBE Methyl tert-butyl ether

TAME Tert-amyl methyl ether  
 TBA Tert-butanol  
 1,2-DCA 1,2-Dichloroethane (EDC)  
 DO Dissolved oxygen  
 ug/l Micrograms per liter  
 mg/l Milligrams per liter  
 --- Not measured/analyzed/applicable  
 ND Not detected above reported detection limit  
 McC McCampbell Analytical



SOURCE:  
 USGS MAP, OAKLAND WEST AND EAST QUADRANGLE,  
 7.5 MINUTE SERIES, 1959.  
 PHOTOREVISED 1980.

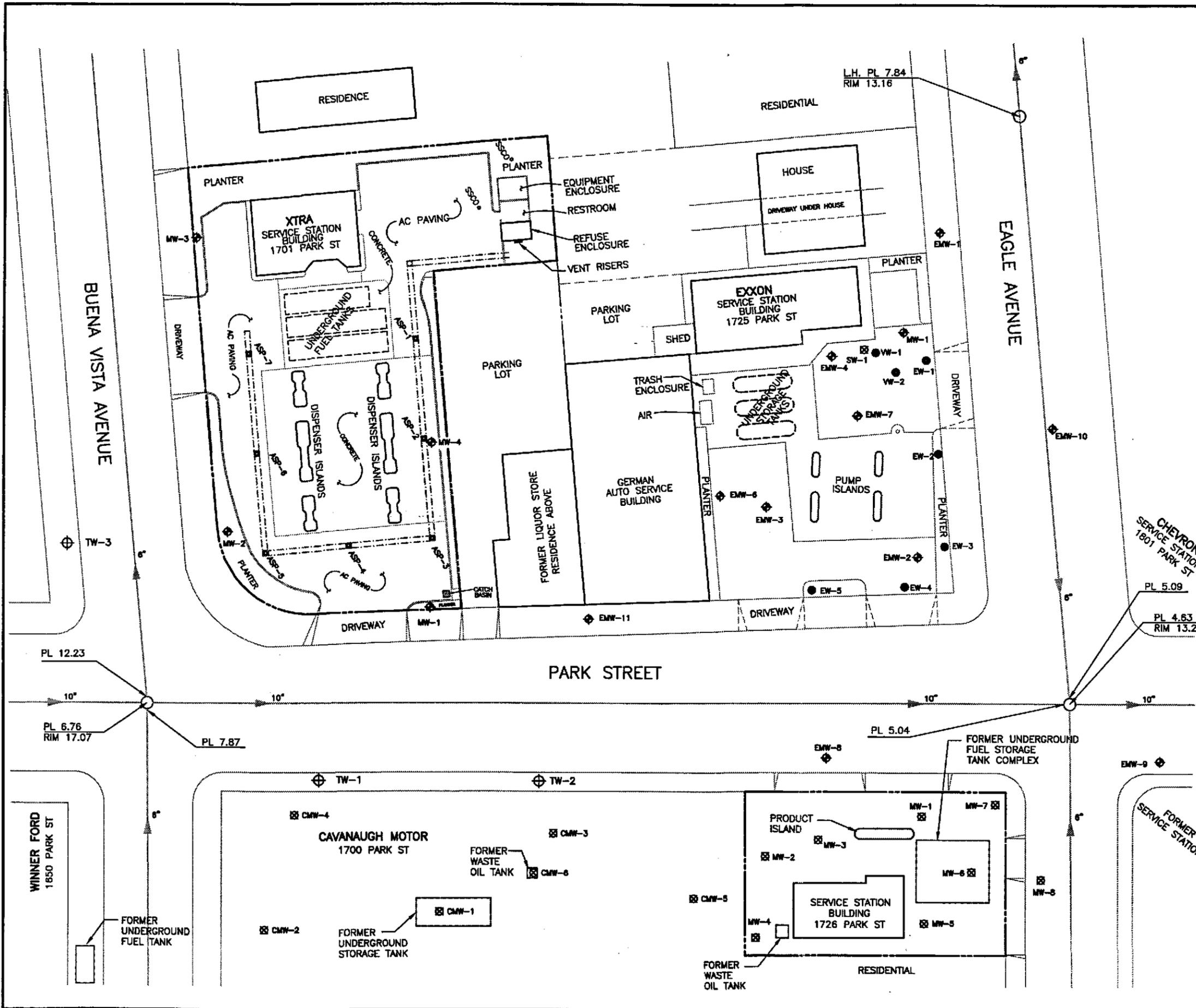


## FIGURE 1 SITE VICINITY MAP

XTRA OIL COMPANY SERVICE STATION  
 1701 PARK STREET  
 ALAMEDA, CALIFORNIA  
 PROJECT NO. 10-210

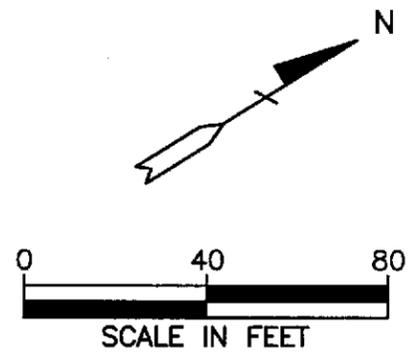


**ALISTO ENGINEERING GROUP**  
 WALNUT CREEK, CALIFORNIA



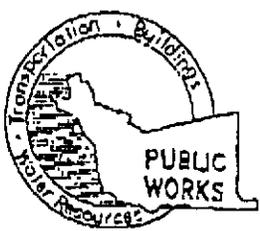
**LEGEND**

- ⊕ TEMPORARY WELL
- ◆ GROUNDWATER MONITORING WELL
- ⊠ DESTROYED WELL
- AIR SPARGING POINT WITH WELL VAULT
- PIPING VAULT
- SSCO S SEWER SERVICE CLEANOUT
- PROPERTY LINE
- - - EXISTING HORIZONTAL VAPOR EXTRACTION TRENCHING
- SEWER LINE



**FIGURE 2**  
**SITE PLAN**  
 XTRA OIL COMPANY SERVICE STATION  
 1701 PARK STREET  
 ALAMEDA, CALIFORNIA  
 PROJECT NO. 10-210

10210-C1LDWG 12-12-01 ONE 1=40



# ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION  
399 ELMHURST ST. HAYWARD CA. 94544-1395  
PHONE (510) 670-5554  
FAX (510) 782-1939

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 1701 Park St.  
Alameda

PERMIT NUMBER W01-1016  
WELL NUMBER \_\_\_\_\_  
APN \_\_\_\_\_

CLIENT  
Name Xtra Oil Company  
Address 7207 Pacific Ave Phone 510-865-9503  
City Alameda CA Zip 94501

PERMIT CONDITIONS  
Circled Permit Requirements Apply

APPLICANT  
Name Alisto Engineering  
Address 3232 Mt. Diablo Blvd Phone 925-962-6970  
City Lafayette CA Zip 94509

- A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
  2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources Well Completion Report.
  3. Permit is void if project not begun within 90 days of approval date.

TYPE OF PROJECT

Well Construction	<input type="checkbox"/>	Geotechnical Investigation	<input type="checkbox"/>
Cathodic Protection	<input type="checkbox"/>	General	<input type="checkbox"/>
Water Supply	<input type="checkbox"/>	Contamination	<input type="checkbox"/>
Monitoring	<input checked="" type="checkbox"/>	Well Destruction	<input type="checkbox"/>

- B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
  2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

PROPOSED WATER SUPPLY WELL USE

New Domestic	<input type="checkbox"/>	Replacement Domestic	<input type="checkbox"/>
Municipal	<input type="checkbox"/>	Irrigation	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	Other <u>n/a</u>	<input type="checkbox"/>

- C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
  2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

DRILLING METHOD:

Mud Rotary	<input type="checkbox"/>	Air Rotary	<input type="checkbox"/>	Auger	<input type="checkbox"/>
Cable	<input type="checkbox"/>	Other	<input type="checkbox"/>	<u>Hand auger Temp well *</u>	

- D. GEOTECHNICAL
- Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

DRILLER'S NAME Alisto Eng.

- E. CATHODIC
- Fill hole anode zone with concrete placed by tremie.

DRILLER'S LICENSE NO. N/A

- F. WELL DESTRUCTION
- Send a map of work site. A separate permit is required for wells deeper than 45 feet.

WELL PROJECTS

Drill Hole Diameter	<u>4"</u> in.	Maximum Depth	<u>17</u> ft.
Casing Diameter	<u>2 1/4"</u> in.	Owner's Well Number	_____
Surface Seal Depth	_____ ft.		

- G. SPECIAL CONDITIONS
- NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

GEOTECHNICAL PROJECTS

Number of Borings	_____	Maximum Depth	_____ ft.
Hole Diameter	_____ in.		

\* To be sealed after collecting grab sample.

APPROVED [Signature] DATE 10-5-01

ESTIMATED STARTING DATE 10/9/01  
ESTIMATED COMPLETION DATE 11/9/01

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [Signature] DATE 10/6/01

950 West Mall Square, #110

# CITY OF ALAMEDA

(510) 749-5840

Alameda Point

Alameda, CA 94501

Public Works Department

Fax (510) 749-5867

Printed: 10-23-2001

## Encroachment Permit

Permit #

**EN01-0050**

### Applicant

ALISTO ENGINEERING GROUP  
3732 MT DIABLO BLVD STE 270  
LAFAYETTE CA 94549 3805  
94598  
925 962 6970

### Contractor Information

ALISTO ENGINEERING GROUP  
3732 MT DIABLO BLVD STE 270  
LAFAYETTE CA 94549 3805  
94598

### Owner Information

SIMAS EDWARD T  
2307 PACIFIC AV  
ALAMEDA CA  
94501

### Project Information

ENCROACH - Encroachment Permit - **APPROVED**  
Sub-Type:

Applied: **09/26/2001**  
Finaled:

Issued: **10/23/2001**  
Expires: **10/23/2002**  
Valuation: **\$2,000.00**

Job Address: **1701 PARK ST**  
**071 019901802**

Parcel Number:

Suite / Unit:

Work Description: **HAND DIGGING & BORING TO ABOUT 10' ON THE PUBLIC RIGHT OF WAY**

Total Fees: \$150.50  
Total Payments: \$150.50  
BALANCE DUE \$0.00

Payments Made: 10/23/2001 09:24 AM  
Total Payment: **\$62.50**

## RECEIPT

Receipt #: R01-5314

Payee: ALISTO ENGINEERING GROUP

### Current Payment Made to the Following Items:

Account Code	Description	Amount
4225-33410 (1584)	Eng.-Encroachment Permit	62.50

### Payments Made for this Receipt:

Type	Method	Description	Amount
Payment	Check	2003	62.50

### Account Summary for Fees and Payments:

Item#	Description	Account Code	Tot Fee	Paid	Prev. Pmts	Cur. Pmts
250	Permit Filing Fees	4520-37450 (1050)	38.00	38.00	38.00	.00
836	Eng.-Encroachment Permit	4225-33410 (1584)	112.50	112.50	50.00	62.50

### INSPECTIONS

510-749-5840

Call for an inspection when work is complete.

This is to certify that the above work has been completed to my satisfaction and approval.

Date

Inspector

950 West Mall Square, #110

# CITY OF ALAMEDA

(510) 749-5840

Alameda Point  
Alameda, CA 94501

Public Works Department

Fax (510) 749-5867

Printed: 10-23-2001

## Right-of-Way Permit

Permit #  
**EX01-0128**

### Applicant

ALISTO ENGINEERING GROUP  
CAVANAUGH LEE R TR & DAVID & JOAN C TRS  
3732 MT DIABLO BLVD STE 270  
LAFAYETTE CA 94549 3805  
94598  
925 962 6970

### Contractor Information

ALISTO ENGINEERING GROUP  
3732 MT DIABLO BLVD STE 270  
LAFAYETTE CA 94549 3805  
94598

### Owner Information

PO BOX 2418  
ALAMEDA CA  
94501

### Project Information

RTOFWAY - Right-of-Way Permit - **APPROVED**  
Sub-Type:

Applied: **09/26/2001**  
Finaled:

Issued: **10/23/2001**  
Expires: **10/23/2002**  
Valuation: **\$2,000.00**

Job Address: **1700 PARK ST**

Parcel Number:

**070 019202101**

Suite / Unit:

Work Description: **TEMPORARY SOIL BORING**

Total Fees: \$88.00  
Total Payments: \$88.00  
**BALANCE DUE \$0.00**

Payments Made:

### RECEIPT ,

Receipt #:

Total Payment: **\$0.00**

Payee:

### Current Payment Made to the Following Items:

### Payments Made for this Receipt:

Type	Method	Description	Amount
-----	-----	-----	-----

### Account Summary for Fees and Payments:

Item#	Description	Account Code	Tot Fee	Paid	Prev. Pmts	Cur. Pmts
250	Permit Filing Fees	4520-37450 (1050)	38.00	38.00	38.00	.00
833	Eng.-Right of Way Permit	4225-37190 (6321)	50.00	50.00	50.00	.00

**\*\* See application for additional requirements \*\***

### INSPECTIONS

**510-749-5840**

NOTE: All construction within the public right of way must have barricades with flashers for night time protection.

This is to certify that the above work has been completed to my satisfaction and approval.

Date

Inspector

**APPENDIX B**

**FIELD PROCEDURES FOR DRILLING, SOIL SAMPLING,  
AND TEMPORARY GROUNDWATER MONITORING WELL INSTALLATION**

**FIELD PROCEDURES  
FOR  
DRILLING, SOIL SAMPLING,  
AND TEMPORARY GROUNDWATER MONITORING WELL INSTALLATION**

Drilling

The shallow soil borings used for lateral groundwater assessment were drilled using 4-inch-diameter hand augers. To avoid cross-contamination, drilling equipment in contact with potentially contaminated material was washed using a phosphate-free detergent followed by tap water and deionized water rinses between each use. Decontamination fluids were placed into a tank truck for disposal at an appropriate recycling facility.

Soil Sampling

During drilling, samples were collected at varying intervals. Before and after each use, the sampler was washed using a phosphate-free detergent followed by tap water and deionized water rinses. Soil was sampled using a hand sampler with stainless steel tubes. A slide hammer was used to advance the sampler approximately 6 inches into undisturbed soil.

After retrieval from the boring, the sampler was opened, the sample tubes were removed, and a soil sample was selected for possible chemical analysis. The sample was retained within the stainless steel tube, and both ends were immediately covered with Teflon sheeting and polyurethane caps. The caps were sealed with tape and labeled with the following information: Alisto's project number, boring number, sample depth interval, sampler's initials, and date of collection. The sample was immediately placed in a waterproof plastic bag and stored in a cooler containing blue ice. Possession of the samples was documented from the field to a state-certified analytical laboratory by using a chain of custody form.

Soil samples and, when representative, drill cuttings were described by Alisto's personnel using the Unified Soils Classification System; and field estimates of soil type, color, moisture, density, and consistency were noted on the boring logs. The logs were reviewed by a civil engineer registered in the State of California.

Temporary Monitoring Well Installation and Sampling

Construction of the temporary monitoring wells used for lateral groundwater assessment was based on the stratigraphy encountered in the soil borings and the depth to water in the boring. Prior to inserting the temporary well casing into the boring, the depth to water was measured so that the screened interval of the temporary well casing was within one foot of the stabilized water level.

The 3/4-inch-diameter PVC well casing consisted of 0.010-inch slotted casing from the ground surface to approximately 10 feet below grade.

**FIELD PROCEDURES  
FOR  
DRILLING, SOIL SAMPLING,  
AND TEMPORARY GROUNDWATER MONITORING WELL INSTALLATION  
(Continued)**

To ensure that the groundwater samples were representative of the aquifer, the temporary wells were purged of up to 5 gallons of groundwater using a peristaltic pump, while monitoring stabilization of pH, electrical conductivity, and temperature.

Groundwater samples were collected from the temporary wells using the peristaltic pump, with new sample and flexible tubing used for each sample, and transferred into laboratory-supplied containers. The samples were labeled with the well number, site identification, date of collection and sampler's initials, and transported in an iced cooler to a state-certified laboratory following preservation and chain of custody protocol. The sampling technician wore nitrile gloves during purging and well sampling.

**APPENDIX C**

**BORING LOGS AND TEMPORARY WELL CONSTRUCTION DETAILS**



**SEE SITE PLAN**

ALISTO PROJECT NO: 10-210

DATE DRILLED: 11/19/01

CLIENT: Xtra Oil Company

LOCATION: 1701 Park St. Alameda (Offsite), California

DRILLING METHOD: Hand Auger

DRILLING COMPANY: Alisto Engineering

CASING ELEVATION: N/A

LOGGED BY: David Radabaugh

APPROVED BY: Al Sevilla

PID VALUES	BORING DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0		2 4 6 8 10 12				<p>Soil surface in tree space in sidewalk of Park St.</p> <p>Silty SAND, light brown, damp; very fine-grained sand.</p> <p>Moist at 7 feet.</p> <p>Wet at 8'.</p> <hr/> <p>Boring terminated at 12 feet. Groundwater sample collected at 1320. Boring grouted with neat cement after remaining temporary casing.</p>



**SEE SITE PLAN**

ALISTO PROJECT NO: 10-210

DATE DRILLED: 11/19/01

CLIENT: Xtra Oil Company

LOCATION: 1701 Park St. Alameda (Offsite), California

DRILLING METHOD: Hand Auger

DRILLING COMPANY: Alisto Engineering

CASING ELEVATION: N/A

LOGGED BY: David Radabaugh

APPROVED BY: Al Sevilla

PID VALUES	BORING DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0	<p>4 inch diameter Boring</p> <p>3/4 inch diameter PVC casing with 0.010</p>	<p>2</p> <p>4</p> <p>6</p> <p>8</p> <p>10</p> <p>12</p>				<p>Soil surface in tree space in sidewalk of Park St.</p> <p>Silty SAND, light brown, damp; very fine-grained sand.</p> <p>Moist at 7 feet.</p> <p>Wet at 8'.</p> <p>Boring terminated at 12 feet. Groundwater sample collected at 1300. Boring grouted with neat cement after remaining temporary casing.</p>



SEE SITE PLAN

ALISTO PROJECT NO: 10-210

DATE DRILLED: 11/19/01

CLIENT: Xtra Oil Company

LOCATION: 1701 Park St. Alameda (Offsite), California

DRILLING METHOD: Hand Auger

DRILLING COMPANY: Alisto Engineering

CASING ELEVATION: N/A

LOGGED BY: David Radabaugh

APPROVED BY: Al Sevilla

PID VALUES	BORING DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0	<p>4 inch diameter Boring</p> <p>3/4 inch diameter PVC casing with 0.010</p>	<p>2</p> <p>4</p> <p>6</p> <p>8</p> <p>10</p> <p>12</p>				<p>Soil surface in tree space in sidewalk of Buena Vista Avenue.</p> <p>Silty SAND, light brown, damp; very fine-grained sand.</p> <p>Moist at 7 feet.</p> <p>Wet at 8'.</p> <p>Boring terminated at 12 feet. Groundwater sample collected at 1340. Boring grouted with neat cement after removing casing.</p>

**APPENDIX D**

**TEMPORARY WELL SAMPLING FIELD SURVEY FORMS**

# ALISTO

ENGINEERING GROUP

## Field Report / Sampling Data Sheet

3732 MT. DIABLO BOULEVARD, SUITE 270  
LAFAYETTE CA 94598 (925) 962-6970 FAX 962-6971

Project No. 10-210-17-002 Date: 11/9/01  
Address 1701 Park Street Day: MTWTF  
Contract No. n/a City: Alameda  
Station No. XTRA Sampler: Dave Radabaugh

### DEPTH TO GROUNDWATER SUMMARY

WELL ID	SAMPLE ID	WELL DIAM	TOTAL DEPTH	DEPTH TO WATER	PRODUCT THICKNESS	TIME MONITORED	COMMENTS:
TW-1	TW-1	3/4"	11.20	7.31		1315	
TW-2	TW-2	3/4"	10.50	6.70		1230	
TW-3	TW-3	3/4"	11.20	7.70		1340	
QC-1		3/4"					

**FIELD INSTRUMENT CALIBRATION DATA**  
 pH METER HORIBA 4.00 AUTO-CAL SOLN 7.00 10.00 TEMPERATURE COMPENSATED Y N TIME \_\_\_\_\_ WEATHER \_\_\_\_\_  
 D.O. METER \_\_\_\_\_ ZERO d.O. SOLUTION \_\_\_\_\_ BAROMETRIC PRESSURE \_\_\_\_\_ TEMP \_\_\_\_\_  
 CONDUCTIVITY METER \_\_\_\_\_ 10,000 \_\_\_\_\_ TURBIDITY METER \_\_\_\_\_ 5.0 NTU \_\_\_\_\_ OTHER \_\_\_\_\_  
 LEAK DETECTOR : \_\_\_\_\_ ALARM MODE \_\_\_\_\_ NON ALARM MODE

Well ID	epth to Wat	Diam	Cap/Loc	Product Dr	Iridescend	Gal.	Time	Temp *F	pH	E.C.	D.O.	
TW-2	6.70	3/4"			Y N	1/2	1235	20.9	7.41	0.438	8.73	<input type="radio"/> EPA 601 _____
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge= PurgeVol.												<input type="radio"/> TPH-G/BTEX _____
						1	1255	20.8	7.08	0.423	8.62	<input type="radio"/> TPH Diesel _____
						1 1/2	1300	20.6	7.11	0.431	8.61	<input type="radio"/> TOG 5520 _____
Purge Method: <input type="radio"/> Surface Pump <input type="radio"/> Disp. Tube <input type="radio"/> Winch <input type="radio"/> Disp. Bailer(s) <input type="radio"/> Sys Port												<b>TIME/SAMPLE ID</b>
Comments: <u>TURB 600, 501,</u>												<u>TW-2 / 1300</u>

# ALISTO

## Field Report / Sampling Data Sheet

ENGINEERING GROUP

3732 MT. DIABLO BOULEVARD, SUITE 270  
LAFAYETTE CA 94598 (925) 962-6970 FAX 962-6971

Project No. 10-210-17-002

Address 1701 Park Street

Contract No.

Station No.

XTRA

Sampler:

Date: 11/9/01

Day: M T W T F

City: Alameda

*Dave Radabaugh*

Well ID	epth to Wat	Diam	Cap/Loc	Product Dr	Iridescend	Gal.	Time	Temp *F	pH	E.C.	D.O.
TW-1	7.31	3/4"	11.20	<del>11.20</del>	Y N	1/2	1305	22.6	7.00	.393	4.32
Total Depth - Water Level=						1	1310	22.7	6.84	.502	5.34
x Well Vol. Factor=						1 1/2	1315	22.8	6.74	.376	6.67
x#vol. to Purge=											
Purge Vol.											

Purge Method:  Surface Pump  Disp. Tube  Winch  Disp. Bailer(s)  Sys Port

Comments:

TIME/SAMPLE ID  
1315 / TW-2

Well ID	epth to Wat	Diam	Cap/Loc	Product Dr	Iridescend	Gal.	Time	Temp *F	pH	E.C.	D.O.
TW-3	7.70	3/4"	11.20	<del>11.20</del>	Y N	1/2	1330	23.1	7.03	.288	5.40
Total Depth - Water Level=						1	1333	23.1	6.72	.239	6.38
x Well Vol. Factor=						1 1/2	1337	23.1	6.60	.238	6.40
x#vol. to Purge=											
Purge Vol.											

Purge Method:  Surface Pump  Disp. Tube  Winch  Disp. Bailer(s)  Sys Port

Comments:

TIME/SAMPLE ID  
1340 / TW-3

Well ID	epth to Wat	Diam	Cap/Loc	Product Dr	Iridescend	Gal.	Time	Temp *F	pH	E.C.	D.O.
					Y N						
Total Depth - Water Level=											
x Well Vol. Factor=											
x#vol. to Purge=											
Purge Vol.											

Purge Method:  Surface Pump  Disp. Tube  Winch  Disp. Bailer(s)  Sys Port

Comments:

TIME/SAMPLE ID

**APPENDIX E**

**FIELD PROCEDURES FOR CHAIN OF CUSTODY DOCUMENTATION,  
LABORATORY REPORTS, AND CHAIN OF CUSTODY RECORDS**

**FIELD PROCEDURES  
FOR  
CHAIN OF CUSTODY DOCUMENTATION**

Samples were handled in accordance with the California Department of Health Services' guidelines. Each sample was labeled in the field and immediately stored in an iced cooler for transport to a state-certified laboratory for analysis.

A chain of custody record accompanied the samples and included the site and sample identification, date of collection, analysis requested, and the name and signature of the sampling technician. When transferring possession of the samples, the transferee signed and dated the chain of custody record.



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
		Date Received: 11/12/01
	Client Contact: Brady Nagle	Date Extracted: 11/12/01
	Client P.O:	Date Analyzed: 11/12/01

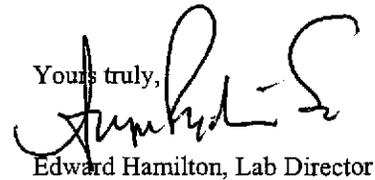
11/19/01

Dear Brady:

Enclosed are:

- 1). the results of 3 samples from your #10-210-17; **Groundwater Sampling** project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,  
  
Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
	Client Contact: Brady Nagle	Date Received: 11/12/01
	Client P.O:	Date Extracted: 11/12/01
		Date Analyzed: 11/12-11/13/01

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline\*, with Methyl tert-Butyl Ether\* & BTEX\***

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) <sup>+</sup>	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
83390	TW-1S	S	ND	ND	ND	ND	ND	ND	109
83391	TW-2S	S	ND	ND	ND	ND	ND	ND	109
83392	TW-3S	S	ND	ND	ND	ND	ND	ND	113
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

\* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

\* cluttered chromatogram; sample peak coelutes with surrogate peak

\*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

 Edward Hamilton, Lab Director





McCAMPBELL ANALYTICAL INC.

110 2nd Ave. South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

# QC REPORT

## EPA 8015m + 8020

Date: 11/13/01

Extraction: TTLC

Matrix: Soil

Compound	Concentration: mg/kg			%Recovery		RPD	
	Sample	MS	MSD	Amount Spiked	MS		MSD
SampleID: 111201				Instrument: GC-2 A			
Surrogate1	ND	104.000	101.000	100.00	104	101	2.9
TPH (diesel)	ND	138.000	140.000	150.00	92	93	1.4

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation



McCAMPBELL ANALYTICAL INC.

110 2nd Ave. South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

## QC REPORT

### EPA 8015m + 8020

Date: 11/12/01

Extraction: TTLC

Matrix: Soil

Compound	Concentration: mg/kg			%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	

SampleID: 111201

Instrument: GC-7

Surrogate1	ND	112.000	114.000	100.00	112	114	1.8
Xylenes	ND	0.310	0.311	0.30	103	104	0.3
Ethylbenzene	ND	0.105	0.105	0.10	105	105	0.0
Toluene	ND	0.105	0.106	0.10	105	106	0.9
Benzene	ND	0.100	0.101	0.10	100	101	1.0
MTBE	ND	0.092	0.088	0.10	92	88	4.4
TPH (gas)	ND	0.970	0.945	1.00	97	94	2.6

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2.100$$

RPD means Relative Percent Deviation



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
		Date Received: 11/12/01
	Client Contact: Brady Nagle	Date Extracted: 11/12/01
	Client P.O:	Date Analyzed: 11/12/01

11/19/01

Dear Brady:

Enclosed are:

- 1). the results of 3 samples from your #10-210-17; Groundwater Sampling project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
	Client Contact: Brady Nagle	Date Received: 11/12/01
	Client P.O:	Date Extracted: 11/14-11/15/01
		Date Analyzed: 11/14-11/15/01

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline\*, with Methyl tert-Butyl Ether\* & BTEX\***

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) <sup>+</sup>	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
83393	TW-1	W	ND,i	ND	ND	ND	ND	ND	101
83394	TW-2	W	ND,i	7.8	ND	ND	ND	ND	104
83395	TW-3	W	ND,i	ND	ND	ND	ND	ND	104
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

\* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

\* cluttered chromatogram; sample peak coelutes with surrogate peak

\*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

 Edward Hamilton, Lab Director





McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
	Client Contact: Brady Nagle	Date Received: 11/12/01
	Client P.O.:	Date Extracted: 11/15/01
		Date Analyzed: 11/15/01

**Oxygenated Volatile Organics By GC/MS**

EPA method 8260 modified

Lab ID	83393	83394	83395		Reporting Limit	
Client ID	TW-1	TW-2	TW-3		S	W
Matrix	W	W	W			
Compound	Concentration*				ug/kg	ug/L
Di-isopropyl Ether (DIPE)	ND	ND	ND		5.0	1.0
Ethyl tert-Butyl Ether (ETBE)	ND	ND	ND		5.0	1.0
Methyl-tert Butyl Ether (MTBE)	3.3	6.5	ND		5.0	1.0
tert-Amyl Methyl Ether (TAME)	ND	ND	ND		5.0	1.0
tert-Butanol	ND	ND	ND		25	5.0

**Surrogate Recoveries (%)**

Dibromofluoromethane	103	102	103		
Comments:	i	i	i		

\* water samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / STLC / SPLP extracts in ug/L  
 ND means not detected above the reporting limit; N/A means surrogate not applicable to this analysis  
 (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content

DHS Certification No. 1644

 Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
	Client Contact: Brady Nagle	Date Received: 11/12/01
	Client P.O:	Date Extracted: 11/15/01
		Date Analyzed: 11/15/01

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	83393
Client ID	TW-1
Matrix	W

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	---	5.0	25	trans-1,3-Dichloropropene	---	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	---	1.0	5.0	Ethylbenzene	---	1.0	5.0
Bromochloromethane	---	1.0	5.0	Hexachlorobutadiene	---	5.0	25
Bromodichloromethane	---	1.0	5.0	Iodomethane	---	1.0	5.0
Bromoform	---	1.0	5.0	Isopropylbenzene	---	1.0	5.0
Bromomethane	---	1.0	5.0	p-Isopropyl toluene	---	1.0	5.0
n-Butyl benzene	---	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	---	1.0	5.0
sec-Butyl benzene	---	1.0	5.0	Methylene Chloride <sup>(e)</sup>	---	1.0	5.0
tert-Butyl benzene	---	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	---	2.0	10
Carbon Disulfide	---	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	---	1.0	5.0
Carbon Tetrachloride	---	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	---	1.0	5.0	Naphthalene	---	5.0	25
Chloroethane	---	1.0	5.0	n-Propyl benzene	---	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	---	1.0	5.0	Styrene <sup>(h)</sup>	---	1.0	5.0
Chloroform	---	1.0	5.0	1,1,1,2-Tetrachloroethane	---	1.0	5.0
Chloromethane	---	1.0	5.0	1,1,2,2-Tetrachloroethane	---	1.0	5.0
2-Chlorotoluene	---	1.0	5.0	Tetrachloroethene	---	1.0	5.0
4-Chlorotoluene	---	1.0	5.0	Toluene <sup>(i)</sup>	ND	1.0	5.0
Dibromochloromethane	---	1.0	5.0	1,2,3-Trichlorobenzene	---	5.0	25
1,2-Dibromo-3-chloropropane	---	2.0	10	1,2,4-Trichlorobenzene	---	5.0	25
Dibromomethane	---	1.0	5.0	1,1,1-Trichloroethane	---	1.0	5.0
1,2-Dichlorobenzene	---	1.0	5.0	1,1,2-Trichloroethane	---	1.0	5.0
1,3-Dichlorobenzene	---	1.0	5.0	Trichloroethene	---	1.0	5.0
1,4-Dichlorobenzene	---	1.0	5.0	Trichlorofluoromethane	---	1.0	5.0
Dichlorodifluoromethane	---	1.0	5.0	1,2,3-Trichloropropane	---	1.0	5.0
1,1-Dichloroethane	---	1.0	5.0	1,2,4-Trimethylbenzene	---	1.0	5.0
1,2-Dichloroethane	---	1.0	5.0	1,3,5-Trimethylbenzene	---	1.0	5.0
1,1-Dichloroethene	---	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	---	5.0	25
cis-1,2-Dichloroethene	---	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	---	1.0	5.0
trans-1,2-Dichloroethene	---	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	---	1.0	5.0	<b>Comments: i</b>			
1,3-Dichloropropane	---	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	---	1.0	5.0	Dibromofluoromethane		122	
1,1-Dichloropropene	---	1.0	5.0	Toluene-d8		103	
cis-1,3-Dichloropropene	---	1.0	5.0	4-Bromofluorobenzene		101	

\* water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPL extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
	Client Contact: Brady Nagle	Date Received: 11/12/01
	Client P.O.:	Date Extracted: 11/15/01
		Date Analyzed: 11/15/01

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	83394
Client ID	TW-2
Matrix	W

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	---	5.0	25	trans-1,3-Dichloropropene	---	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	ND	1.0	5.0
Bromobenzene	---	1.0	5.0	Ethylbenzene	---	1.0	5.0
Bromochloromethane	---	1.0	5.0	Hexachlorobutadiene	---	5.0	25
Bromodichloromethane	---	1.0	5.0	Iodomethane	---	1.0	5.0
Bromoform	---	1.0	5.0	Isopropylbenzene	---	1.0	5.0
Bromomethane	---	1.0	5.0	p-Isopropyl toluene	---	1.0	5.0
n-Butyl benzene	---	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	---	1.0	5.0
sec-Butyl benzene	---	1.0	5.0	Methylene Chloride <sup>(e)</sup>	---	1.0	5.0
tert-Butyl benzene	---	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	---	2.0	10
Carbon Disulfide	---	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	---	1.0	5.0
Carbon Tetrachloride	---	1.0	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	---	1.0	5.0	Naphthalene	---	5.0	25
Chloroethane	---	1.0	5.0	n-Propyl benzene	---	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(c)</sup>	---	1.0	5.0	Styrene <sup>(h)</sup>	---	1.0	5.0
Chloroform	---	1.0	5.0	1,1,1,2-Tetrachloroethane	---	1.0	5.0
Chloromethane	---	1.0	5.0	1,1,2,2-Tetrachloroethane	---	1.0	5.0
2-Chlorotoluene	---	1.0	5.0	Tetrachloroethene	---	1.0	5.0
4-Chlorotoluene	---	1.0	5.0	Toluene <sup>(i)</sup>	ND	1.0	5.0
Dibromochloromethane	---	1.0	5.0	1,2,3-Trichlorobenzene	---	5.0	25
1,2-Dibromo-3-chloropropane	---	2.0	10	1,2,4-Trichlorobenzene	---	5.0	25
Dibromomethane	---	1.0	5.0	1,1,1-Trichloroethane	---	1.0	5.0
1,2-Dichlorobenzene	---	1.0	5.0	1,1,2-Trichloroethane	---	1.0	5.0
1,3-Dichlorobenzene	---	1.0	5.0	Trichloroethene	---	1.0	5.0
1,4-Dichlorobenzene	---	1.0	5.0	Trichlorofluoromethane	---	1.0	5.0
Dichlorodifluoromethane	---	1.0	5.0	1,2,3-Trichloropropane	---	1.0	5.0
1,1-Dichloroethane	---	1.0	5.0	1,2,4-Trimethylbenzene	---	1.0	5.0
1,2-Dichloroethane	---	1.0	5.0	1,3,5-Trimethylbenzene	---	1.0	5.0
1,1-Dichloroethene	---	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	---	5.0	25
cis-1,2-Dichloroethene	---	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	---	1.0	5.0
trans-1,2-Dichloroethene	---	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	---	1.0	5.0				
1,3-Dichloropropane	---	1.0	5.0				
2,2-Dichloropropane	---	1.0	5.0				
1,1-Dichloropropene	---	1.0	5.0				
cis-1,3-Dichloropropene	---	1.0	5.0				
Comments: i							
Surrogate Recoveries (%)							
Dibromofluoromethane						121	
Toluene-d8						102	
4-Bromofluorobenzene						101	

\* water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
	Client Contact: Brady Nagle	Date Received: 11/12/01
	Client P.O.:	Date Extracted: 11/15/01
		Date Analyzed: 11/15/01

**Volatile Organics By GC/MS**

EPA method 8260

Lab ID	83395
Client ID	TW-3
Matrix	W

Compound	Concentration*	Reporting Limit		Compound	Concentration*	Reporting Limit	
		W	S			W	S
Acetone <sup>(b)</sup>	---	5.0	25	trans-1,3-Dichloropropene	---	1.0	5.0
Benzene	ND	1.0	5.0	Ethylene dibromide	---	1.0	5.0
Bromobenzene	---	1.0	5.0	Ethylbenzene	ND	1.0	5.0
Bromochloromethane	---	1.0	5.0	Hexachlorobutadiene	---	5.0	25
Bromodichloromethane	---	1.0	5.0	Iodomethane	---	1.0	5.0
Bromoform	---	1.0	5.0	Isopropylbenzene	---	1.0	5.0
Bromomethane	---	1.0	5.0	p-Isopropyl toluene	---	1.0	5.0
n-Butyl benzene	---	1.0	5.0	Methyl butyl ketone <sup>(d)</sup>	---	1.0	5.0
sec-Butyl benzene	---	1.0	5.0	Methylene Chloride <sup>(e)</sup>	---	1.0	5.0
tert-Butyl benzene	---	1.0	5.0	Methyl ethyl ketone <sup>(f)</sup>	---	2.0	10
Carbon Disulfide	---	1.0	5.0	Methyl isobutyl ketone <sup>(g)</sup>	---	1.0	5.0
Carbon Tetrachloride	---	---	5.0	Methyl tert-Butyl Ether (MTBE)	---	1.0	5.0
Chlorobenzene	---	1.0	5.0	Naphthalene	---	5.0	25
Chloroethane	---	1.0	5.0	n-Propyl benzene	---	1.0	5.0
2-Chloroethyl Vinyl Ether <sup>(h)</sup>	---	1.0	5.0	Styrene <sup>(i)</sup>	---	1.0	5.0
Chloroform	---	1.0	5.0	1,1,1,2-Tetrachloroethane	---	1.0	5.0
Chloromethane	---	1.0	5.0	1,1,2,2-Tetrachloroethane	---	1.0	5.0
2-Chlorotoluene	---	1.0	5.0	Tetrachloroethene	---	1.0	5.0
4-Chlorotoluene	---	1.0	5.0	Toluene <sup>(j)</sup>	ND	1.0	5.0
Dibromochloromethane	---	1.0	5.0	1,2,3-Trichlorobenzene	---	5.0	25
1,2-Dibromo-3-chloropropane	---	2.0	10	1,2,4-Trichlorobenzene	---	5.0	25
Dibromomethane	---	1.0	5.0	1,1,1-Trichloroethane	---	1.0	5.0
1,2-Dichlorobenzene	---	1.0	5.0	1,1,2-Trichloroethane	---	1.0	5.0
1,3-Dichlorobenzene	---	1.0	5.0	Trichloroethene	---	1.0	5.0
1,4-Dichlorobenzene	---	1.0	5.0	Trichlorofluoromethane	---	1.0	5.0
Dichlorodifluoromethane	---	1.0	5.0	1,2,3-Trichloropropane	---	1.0	5.0
1,1-Dichloroethane	---	1.0	5.0	1,2,4-Trimethylbenzene	---	1.0	5.0
1,2-Dichloroethane	---	1.0	5.0	1,3,5-Trimethylbenzene	---	1.0	5.0
1,1-Dichloroethene	---	1.0	5.0	Vinyl Acetate <sup>(m)</sup>	---	5.0	25
cis-1,2-Dichloroethene	---	1.0	5.0	Vinyl Chloride <sup>(n)</sup>	---	1.0	5.0
trans-1,2-Dichloroethene	---	1.0	5.0	Xylenes, total <sup>(o)</sup>	ND	1.0	5.0
1,2-Dichloropropane	---	1.0	5.0	<b>Comments: i</b>			
1,3-Dichloropropane	---	1.0	5.0	<b>Surrogate Recoveries (%)</b>			
2,2-Dichloropropane	---	1.0	5.0	Dibromofluoromethane		124	
1,1-Dichloropropene	---	1.0	5.0	Toluene-d8		103	
cis-1,3-Dichloropropene	---	1.0	5.0	4-Bromofluorobenzene		100	

\* water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPL extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

*Edward Hamilton*  
 Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Ave. South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

# QC REPORT

## EPA 8015m + 8020

Date: 11/14/01

Extraction: EPA 5030

Matrix: Water

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 111401				Instrument: GC-3			
Surrogate1	ND	103.0	104.0	100.00	103	104	1.0
Xylenes	ND	33.5	34.0	30.00	112	113	1.5
Ethylbenzene	ND	11.1	11.2	10.00	111	112	0.9
Toluene	ND	10.9	11.3	10.00	109	113	3.6
Benzene	ND	10.4	10.7	10.00	104	107	2.8
MTBE	ND	10.2	10.6	10.00	102	106	3.8
TPH (gas)	ND	86.4	84.8	100.00	86	85	1.9

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 100$$

RPD means Relative Percent Deviation



McCAMPBELL ANALYTICAL INC.

110 2nd Ave. South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

# QC REPORT

## EPA 8015m + 8020

Date: 11/13/01

Extraction: EPA 5030

Matrix: Water

Compound	Concentration: ug/L			%Recovery		RPD	
	Sample	MS	MSD	Amount Spiked	MS		MSD
SampleID: 111201			Instrument: GC-11 B				
Surrogate1	ND	103.0	102.0	100.00	103	102	1.0
TPH (diesel)	ND	7025.0	7075.0	7500.00	94	94	0.7

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{AmountSpiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 100$$

RPD means Relative Percent Deviation



McCAMPBELL ANALYTICAL INC.

110 2nd Ave. South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: main@mccampbell.com

## QC REPORT

### VOCs (EPA 8240/8260)

Date: 11/15/01

Extraction: EPA 5030

Matrix: Water

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 111501				Instrument: GC-10			
Surrogate	ND	102.0	101.0	100.00	102	101	1.0
tert-Amyl Methyl Ether	ND	9.4	9.2	10.00	94	92	2.2
Methyl tert-Butyl Ether	ND	8.9	8.7	10.00	89	87	2.3
Ethyl tert-Butyl Ether	ND	10.7	10.0	10.00	107	100	6.8
Di-isopropyl Ether	ND	9.8	9.6	10.00	98	96	2.1
Surrogate	ND	102.0	101.0	100.00	102	101	1.0
Toluene	ND	9.7	9.9	10.00	97	99	2.0
Benzene	ND	10.3	10.5	10.00	103	105	1.9
Chlorobenzene	ND	10.2	10.2	10.00	102	102	0.0
Trichloroethene	ND	9.0	9.0	10.00	90	90	0.0
1,1-Dichloroethene	ND	11.5	11.2	10.00	115	112	2.6

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 100$$

RPD means Relative Percent Deviation

 <b>McCAMPBELL ANALYTICAL INC.</b>	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone : 925-798-1620 Fax : 925-798-1622 <a href="http://www.mccampbell.com">http://www.mccampbell.com</a> E-mail: <a href="mailto:main@mccampbell.com">main@mccampbell.com</a>
	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone : 925-798-1620 Fax : 925-798-1622 <a href="http://www.mccampbell.com">http://www.mccampbell.com</a> E-mail: <a href="mailto:main@mccampbell.com">main@mccampbell.com</a>

Alisto Engineering Group 3732 Mt. Diablo Blvd. Ste 270 Lafayette, CA 94549	Client Project ID: #10-210-17; Groundwater Sampling	Date Sampled: 11/09/01
	Client Contact: Brady Nagle	Date Received: 11/12/01
	Client P.O:	Date Analyzed: 11/15/01
	Date Extracted: 11/15/01	Date Analyzed: 11/15/01

**1,2-Dichloroethane (1,2-DCA)**

EPA method 8260

Lab ID	Client ID	Matrix	1,2-DCA	% Recovery Surrogate
83393	TW-1	W	ND	103
83394	TW-2	W	ND	102
83395	TW-3	W	ND	103
Reporting Limit unless otherwise stated: ND means not detected above the reporting limit	W	1.0 ug/L		
	S	5.0 ug/kg		

\* water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L  
 h) lighter than water immiscible shoen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) sample diluted due to high organic content.

DHS Certification No. 1644

 Edward Hamilton, Lab Director



