



STID  
1082 ✓  
R02600  
HEATING OIL  
Sears & Roebuck  
6/14/02  
(AK)

March 11, 2002

Mr. Amir Gholami  
Hazardous Materials Specialist  
Alameda County Environmental Health Services  
1131 Harbor Bay Parkway, Number 250  
Alameda, California 94502

RE: 2001 Fourth Quarter Groundwater Monitoring  
Former Sears Retail Center #1058  
2633 Telegraph Avenue  
Oakland, California  
Case I.D. #STID 1082  
For Sears, Roebuck & Co.

Dear Mr. Gholami

Submitted with this letter is a URS report prepared on behalf of Sears, Roebuck & Co. Presented in the report are results of groundwater monitoring conducted at the above-referenced site during the Fourth Quarter 2001. Quarterly groundwater monitoring will continue within the current scope of work with the addition of two down-gradient monitoring wells installed during the first quarter of 2002. Please feel free to contact Taras Kruk or me at 714.835.6886 if you have questions or comments.

Respectfully Submitted,  
**URS CORPORATION**

  
J.S. Rowlands, R.G., C.H.G.  
Project Manager

cc: Mr. Scott DeMuth, Sears Roebuck and Co.  
Mr. Ryan Hartley, URS Corporation  
Mr. Tim Lester, Environmental Equalizers



**REPORT  
2001 FOURTH QUARTER  
GROUNDWATER MONITORING  
FORMER SEARS RETAIL CENTER #1058  
2633 TELEGRAPH AVENUE  
OAKLAND, CALIFORNIA  
CASE I.D. # STID 1082  
FOR SEARS, ROEBUCK & CO.**

**URS Job No. 22-00000139.02  
March 11, 2002**

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**REPORT  
2001 FOURTH QUARTER  
GROUNDWATER MONITORING  
HEATING OIL UST  
FORMER SEARS RETAIL CENTER #1058  
2633 TELEGRAPH AVENUE  
OAKLAND, CALIFORNIA  
CASE I.D. # STID 1082  
URS JOB NO. 22-00000139.02  
FOR SEARS, ROEBUCK & CO.**

## 1.0 INTRODUCTION

This report has been prepared by URS Corporation (URS; formerly as Dames & Moore) on behalf of Sears, Roebuck & Co. (Sears). It presents results of the 2001 Fourth Quarter Groundwater Monitoring conducted at the above-referenced Site (Figure 1). The former Sears retail center (Site) is located at 2633 Telegraph Avenue in Oakland, California. The groundwater monitoring event consisted of "post purge" groundwater sample collection from one of three monitoring wells (FOMW-1, FOMW-2, FOMW-3) installed on the Site during May 2000. Due to Site construction activities, monitoring wells FOMW-1 and FOMW-2 were not accessible for sampling during this quarterly event. The purpose of the groundwater monitoring was to assess groundwater conditions in the vicinity of a slurry-filled 10,000-gallon heating oil UST (Figure 2). The work is being performed under regulatory oversight of the Alameda County Environmental Health Service (ACEHS).

## 2.0 SITE DESCRIPTION

The Site is bounded by 27<sup>th</sup> Street to the north, Telegraph Avenue to the east, Sycamore Street to the south, and Northgate Avenue to the west (Figure 2). The property is occupied by a vacant Sears retail store (currently undergoing redevelopment) that was constructed in 1930, and an above-grade parking garage that was constructed in the 1960's. Prior to the construction of the store, single and multi-family residences dating to the turn of the century occupied the Site. The former Sears retail center is three stories tall (approximately 120,000 square feet) with a basement. Sears no longer owns the Site but maintains responsibility for environmental issues related to the slurry-filled 10,000 gallon heating oil UST. The Site elevation is approximately 30 feet above mean sea level (MSL), which slopes gently to the south towards San Francisco Bay.

The slurry-filled 10,000-gallon UST formerly used to store heating oil is located at the northern end of the retail center along 27<sup>th</sup> Street. It is constructed of single-walled steel with product piping that extends into a nearby basement (former boiler room) of the retail center. The top of the UST is located beneath the former loading dock of the store approximately 25 to 30 feet below ground surface (bgs). The loading dock was demolished during 2001, and the area has been repaved with asphalt. The UST is contained in a concrete vault estimated to be about 10 feet high and 30 feet long. The product piping was sealed and capped when the UST was taken out of commission sometime during the 1960's. The UST was filled with slurry in the fourth quarter of 1998 under regulatory oversight of the City of Oakland Fire Prevention Bureau.

## **2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY**

The Site is approximately 1.5 miles east of the San Francisco Bay and three miles west of the Diablo Range in Oakland, California. The Site is located on the eastern flank of The San Francisco Basin, a broad Franciscan depression. The basement rock of the basin is respectively overlain by the Santa Clara Formation, the Alameda Formation, and the Temescal Formation. These formations consist of unconsolidated sediments ranging in total thickness to approximately 1,000 feet. The Pleistocene Santa Clara Formation consists primarily of alluvial fan deposits that are interspersed with lake, swamp, river channel, and flood plain deposits. The overlying Alameda Formation was deposited in an estuary environment and consists of organic clays and alluvial fan deposits of sands, gravels and silts. The uppermost Holocene Temescal Formation is an alluvial deposit ranging in thickness from 1 to 50 feet and consists primarily of silts and clays with a basal gravel unit. (CRWQCB, San Francisco Bay Region, June 1999).

The Site is located within the Oakland sub-area of the East Bay Plain groundwater basin. The East Bay Plain groundwater basin encompasses approximately 115 square miles and is bounded by San Pablo Bay to the north, Alameda County to the south, the Hayward Fault to the east, and San Francisco Bay to the west. Groundwater flow direction in the basin typically follows surface topography. Historical high production wells in the Oakland sub-area were screened at depths greater than 200 feet bgs beneath the Yerba Buena Mud Member of the Alameda Formation. The Yerba Buena Mud is a black organic clay with an average thickness of 25 to 50 feet that forms an aquitard between upper and lower groundwater bearing units. From the 1860's until water importation programs were initiated in the 1930's, groundwater in the East Bay Plain was utilized as the primary municipal water source. Current beneficial uses of groundwater in the basin are minimal (CRWQCB, San Francisco Bay Region, June 1999).

### 3.0 BACKGROUND

Lowney Associates (Lowney) performed a "Phase I Environmental Site Assessment (ESA), a Soil and Groundwater Quality Evaluation" in April 1998, and a "Phase II Soil and Groundwater Evaluation," in July 1998. The first assessment included advancing five exploratory borings in three areas of recognized environmental concerns for collection of soil samples and groundwater grab samples (Figure 2). Borings EB-1, EB-2, and EB-3 were driven in an area between the boiler room and a suspect pipe in the 27th Street sidewalk. Two borings were drilled within 10-feet of an adjacent dry cleaners (EB-4) and in the vicinity of a possible former tire and oil shop at the southwest corner of the retail store (EB-5). Detectable concentrations of total petroleum hydrocarbons (TPH) ranging from 79 milligrams per kilogram (mg/kg) to 9,500 mg/kg were present in soil samples collected from borings EB-1, EB-2, EB-3 and EB-5. Benzene was not detected in any of the soil samples submitted for chemical analysis.

During the second assessment conducted by Lowney, seven additional borings were advanced down gradient of the anticipated groundwater flow direction to collect selected soil and groundwater grab samples (Figure 2). The investigation also confirmed the location and existence of the 10,000-gallon UST beneath the loading dock of the retail center and identified the piping beneath the sidewalk of 27th Street as the UST fill line. Soil samples collected from borings EB-6 through EB-12 contained non-detectable (ND) concentrations of TPH and benzene, toluene, ethylbenzene, total xylenes (BTEX).

Groundwater grab samples were collected by Lowney during the two assessments from borings EB-1 through EB-6, EB-10, EB-11, and EB-12. Groundwater grab samples collected from borings EB-1, EB-2, EB-3, and EB-5 contained detectable concentrations of TPH ranging from 38,000 micrograms per liter ( $\mu\text{g/L}$ ) to 480,000  $\mu\text{g/L}$ . Groundwater grab samples collected from borings EB-2 and EB-4 contained detectable concentrations of benzene at 4.8  $\mu\text{g/L}$  and 4.3  $\mu\text{g/L}$ , respectively. The remaining groundwater grab samples contained ND concentrations of TPH and BTEX.

SECOR International Incorporated (SECOR) subsequently performed an additional soil and groundwater investigation during November 1998 to further assess subsurface soils and groundwater near the southeastern corner of the property (Secor, Dec. 1998). The scope of work was approved by the ACEHS and included the advancement of nine soil borings (EB-13 through EB-21) for the collection of soil and groundwater grab samples (Figure 2). Soil samples collected from borings EB-19, EB-20, and EB-21 contained detectable concentrations of TPH ranging from 4 mg/kg to 160 mg/kg. All soil samples, excluding EB-20-7, analyzed during the investigation contained ND concentrations of BTEX. Soil sample EB-20-7 contained 0.044 mg/kg of ethylbenzene and ND concentrations of benzene, toluene and total xylenes.

Groundwater grab samples collected by SECOR from borings EB-13, EB-14, EB-15 and EB-18 contained TPH concentrations ranging from ND to 2,300 µg/L. The groundwater grab samples collected from borings EB-13, EB-15 and EB-18 contained ND concentrations of BTEX. Groundwater grab sample EB-14 contained ND concentrations of benzene and toluene, 3.2 µg/L ethylbenzene, and 6.1 µg/L total xylenes.

From October 19 to December 2, 1998, URS and subcontractor, Foss Environmental, conducted in-place closure activities for the heating-oil UST in accordance with City of Oakland Fire Prevention Bureau, Closure Permit #94-98 (URS, Jan, 2001). The closure activities were conducted after obtaining a closure permit and preparing a site-specific health and safety plan. During the UST closure activities the UST was accessed, evacuated, cleaned and filled with concrete slurry. URS submitted a letter report to the City of Oakland Fire Prevention Bureau dated February 22, 1999 that documents the in-place closure activities. Approximately 2 ½ cubic yards of oily soil was removed from the access shaft, transported offsite, and disposed at an approved facility. Approximately 500 gallons of oily water pumped from the access shaft and vault, and 10,000 gallons of oily water pumped from the UST was transported offsite and disposed at an approved facility.

The City of Oakland Fire Prevention Bureau forwarded the UST closure report to the ACEHS. The ACEHS issued a letter on October 29, 1999 to Sears requesting a site assessment work plan and a list of responsible parties. In the letter, ACEHS requested the installation of three groundwater monitoring wells to assess subsurface conditions related to the former UST and dry cleaning facility. Resolution of property ownership issues resulted in Sears assuming the responsibility of assessing conditions solely related to the slurry-filled, heating oil UST.

URS installed three groundwater monitoring wells (FOMW-1, FOMW-2, FOMW-3) on the Site in May 2000 (URS, Jan. 2001). The monitoring wells were located adjacent to, and south of the slurry-filled UST (Figure 2). Soil samples collected from the borings contained concentrations of total extractable petroleum hydrocarbons (TEPH) as diesel fuel or bunker oil ranging from ND to 3,200 mg/kg. BTEX and methyl tertiary butyl ether (MTBE) were not detected in any of the soil samples analyzed. Groundwater samples have been collected from the wells on a quarterly basis since June 2000. Field parameter and chemical analytical results for previous quarterly sampling events are provided as appendices A and B.

## 4.0 HEALTH AND SAFETY PLAN

Prior to initiating the field activities, URS prepared a site-specific Health & Safety plan to:

- Identify and describe potentially hazardous substances which may be encountered during field operations;
- Specify protective equipment and clothing for on-site activities;
- Outline measures to be implemented in the event of an emergency.

URS field personnel reviewed the Health & Safety plan prior to commencing the field procedures. Field monitoring activities were recorded in the Health and Safety Plan and were maintained in the project files at URS's Santa Ana office. A copy of the Health and Safety Plan remained onsite during field operations.

## 5.0 QUARTERLY GROUNDWATER MONITORING

The 2001 Fourth Quarter Groundwater Monitoring was performed on December 7, 2001. The monitoring was performed on one of the three groundwater wells (FOMW-1, FOMW-2, and FOMW-3). Well FOMW-1 was covered with construction debris and was not accessible for sampling. Well FOMW- 2 was partially damaged during recent construction activities and was not accessible for sampling. The monitoring consisted of groundwater gauging, purging, and sampling well FOMW-3. A description of the monitoring procedures is presented below.

### 5.1 GROUNDWATER GAUGING

Prior to sampling, the accessible groundwater monitoring well was checked for the presence of separate phase product. Separate phase product was not observed in well FOMW- 3. The water level in well FOMW-3 was gauged using a Solinst™ water level indicator. Water level was measured relative to the surveyed top of the monitoring well casing. Groundwater depths and elevations are for the 2001 4<sup>th</sup> quarter are listed in Table 1.



## 5.2 PURGING AND SAMPLING METHODS

Prior to sample collection, well FOMW-3 was purged of approximately three well casing volumes using a Grundfos™ RediFlo 2 submersible well pump. Water purged from the well was monitored for field parameters, including temperature, pH, electrical conductivity, turbidity, dissolved oxygen (D.O.), and oxygen reduction potential (O.R.P.). The measured field parameters are listed on Table 1.

The purging of well FOMW-3 was terminated when temperature, pH, and conductivity measurements stabilized. Following the purging and well recovery to at least 80% of original static water levels (or after one hour of recovery), groundwater samples were collected for laboratory analysis from the discharge tubing of the well pump. The down-hole pump was cleaned prior to use, and between wells by washing in a solution of Alconox™, rinsing with tap water, final rinsing with deionized water, and air drying. The pre-cleaned, polyethylene tubing connected to the pump was changed prior to well purging.

Sample containers and handling procedures for groundwater samples conformed to the established protocols for each specific parameter as described in EPA SW-846. The sample bottles, once filled and preserved as required, were properly labeled and logged on a chain of custody form. The label included well identification number, sample number, date and time sampled, job number, site/client name and location, and sampling personnel's initials. The sealed and labeled samples were placed in ice chests maintained at a temperature of 4 to 7 degrees centigrade and transported to CDHS accredited laboratory for analysis. Chain-of-custody records were maintained throughout the sampling program.

## 5.3 LABORATORY ANALYSIS PROGRAM

Groundwater sampled from well FOMW-3 was submitted to the CDHS-accredited laboratory and analyzed for TPH as gasoline, diesel-fuel, Bunker-C, and motor oil by modified EPA 8015, and for volatile organic compounds (VOCs) as BTEX and methyl tertiary butyl ether (MTBE) by EPA method 8021B. As part of the attenuation monitoring program, the groundwater sample was also analyzed for total alkalinity by EPA method 310.1, nitrate and sulfate by EPA method 9056, hydrocarbon degraders by ASTM G-22, and heterotrophic plate count by SM 9215A.

## 5.4 WASTE MANAGEMENT

Liquid wastes (well purge water) were collected and stored in 55-gallon DOT-approved drums. Containers were numbered to identify the source of the wastes. The containers were stored onsite and properly disposed following review of the chemical analysis data.

## 6.0 MONITORING RESULTS

### 6.1 SHALLOW GROUNDWATER CONDITIONS

Historical groundwater measurements collected since June 2000 indicate that the potentiometric surface beneath the Site has fluctuated from approximately 9 to 11 feet bgs (15 to 18 feet MSL). The water bearing zones are moderately confined, as water levels ascended within drill rods after penetration of the coarser-grained water bearing units during well installation. Water level measurements collected during the previous groundwater monitoring events indicate groundwater flow is to the southeast with an approximate gradient of 0.015 foot per foot. Groundwater flow direction and gradient could not be accurately calculated for the 2001 4<sup>th</sup> quarter with data obtained from the one accessible monitoring well.

Current groundwater elevations beneath the Site at FOMW-3 have increased about 2.1 feet since the last monitoring event conducted in September 2001. Groundwater elevations are presented in Table 1 and appendix A. A Site map showing the estimated groundwater flow direction, based on previous quarterly data, is provided in Figure 2.

### 6.2 LABORATORY ANALYTICAL RESULTS

Chemical analyses results for the groundwater sample collected during this monitoring event are presented in Table 2. Historical chemical analyses results are provided in appendix B. The CDHS-accredited laboratory report and chain-of-custody form for the groundwater sample are provided in Appendix C.

The groundwater sample collected from monitoring well FOMW-3 contained 110 µg/L TPH as diesel fuel and 52 µg/L TPH as gasoline. The groundwater sample collected from well FOMW-3 did not contain detectable concentrations of TPH as motor oil or TPH as bunker-C. The groundwater

samples collected from well FOMW-3 did not contain detectable concentrations of VOCs, such as BTEX or MTBE per EPA analysis method 8021B.

URS conducted a check of data completeness for the analytical laboratory reports. Results indicate that "these data are usable, as qualified, for their intended purpose." URS's Data Validation Reports are included as Appendix D.

## 7.0 DISCUSSION

Results of the 2001 Fourth Quarter Groundwater Monitoring indicate that petroleum hydrocarbons within the diesel fuel range are present in shallow groundwater beneath the Site in the vicinity of the slurry-filled, heating oil UST. VOCs associated with petroleum fuel products such as ~~BTEX and MTBE~~ have not been positively identified in any groundwater samples collected since the quarterly groundwater sampling program was initiated in June 2000. The groundwater samples collected this quarter from well ~~FOMW-3~~ did not contain detectable concentrations of VOCs ~~as BTEX or MTBE~~ per EPA analysis method 8021B.

Concentrations of dissolved petroleum hydrocarbons in well FOMW-3 have remained stable. Results of the physical and biological testing are typical of nonaggressive oxidizing conditions, indicating the potential for biodegradation of residual petroleum hydrocarbons in groundwater.

Based on beneficial uses of groundwater in the Site vicinity, and the constituent concentrations detected during this and previous investigations, there appears to be no significant risk of petroleum hydrocarbon exposure to any sensitive receptors in the area. As introduced in the 2000 Second Quarter report, URS plans to further evaluate Site conditions related to the petroleum hydrocarbon plume and establish closure conditions for the slurry-filled UST in accordance with the Urban Land Redevelopment (URL) Program.

In order to establish Site closure criteria and complete Site characterization, URS submitted a work plan to the ACEHS dated August 23, 2001 for review and approval. Following ACEHS comments to the workplan, URS submitted revisions dated December 18, 2001, for the proposed scope of work. In February 2002, URS installed two groundwater monitoring wells downgradient of FOMW-1 to further delineate the petroleum hydrocarbon impacted plume. URS also completed three additional soil borings on the perimeter of the UST vault (Figure 2).

URS will continue to remove separate phase product from well FOMW-1 on a monthly basis using a vacuum truck fitted with a PVC stinger. Separate phase product in FOMW-1 will also be gauged and recorded on a monthly basis.

## 8.0 SCHEDULE

This report represents the seventh submittal for quarterly groundwater monitoring at the Site. A subsequent groundwater sampling event was conducted during March 2002. Permanent closure of the UST vault, by filling with slurry, will be conducted following approval by the ACEHS. URS completed the additional Site characterization activities approved by the ACEHS during the first quarter of 2002.

The Site will be evaluated for closure in accordance with the URL Program guidance document following completion of the additional Site characterization and after additional quarterly monitoring is conducted. Given our current understanding of the petroleum hydrocarbon plume conditions, the Site will likely conform to the URL Program closure criteria. URS will continue to notify ACEHS personnel of upcoming field activities.

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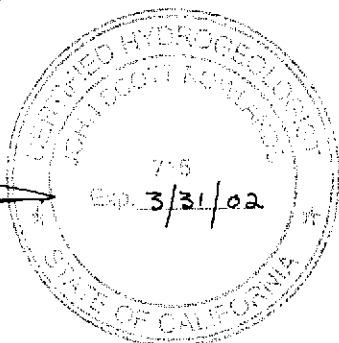
Should you have any questions or comments, please do not hesitate to contact us.

Respectfully Submitted,

URS CORPORATION



Taras B. Kruk, R.G., C.HG.  
Project Director

  
J.S. Rowlands, R.G., C.HG.  
Project Manager

## 9.0 REFERENCES

- California Regional Water Quality Control Board—San Francisco Bay Region Groundwater Committee (RWQCB), 1999. *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report*. June 1999, 106 p.
- Dames & Moore, 2000. *Site Assessment and Groundwater Monitoring Work Plan*, Former Sears Retail Center #1058, 2633 Telegraph Avenue, Oakland, California, February 24.
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- URS, 2001. *2000 Third Quarter Groundwater Monitoring*, Former Sears Retail Center #1058, 2633 Telegraph Avenue, Oakland, California, January 30.
- URS, 2001. *2000 Fourth Quarter Groundwater Monitoring*, Former Sears Retail Center #1058, 2633 Telegraph Avenue, Oakland, California, June 21.
- URS, 2001. *2001 First Quarter Groundwater Monitoring*, Former Sears Retail Center #1058, 2633 Telegraph Avenue, Oakland, California, July 6.

URS, 2001 *Workplan-Additional Site Assessment and Groundwater Monitoring Well Installation Heating Oil Underground Storage Tank*, Former Sears Retail Center #1058, 2633 Telegraph Avenue, Oakland, California, August 23.

URS, 2001. *2001 Second Quarter Groundwater Monitoring*, Former Sears Retail Center #1058, 2633 Telegraph Avenue, Oakland, California, December 4.

URS, 2002. *2001 Third Quarter Groundwater Monitoring*, Former Sears Retail Center # 1058, 2633 Telegraph Avenue, Oakland, California, March 1.

**Table 1**  
**2001 4th Quarter Groundwater Levels and Parameters**  
**Sears Retail Center Store No. 1058**  
**Oakland, California**

Monitoring Well No.	Date Collected	Notes	GROUNDWATER LEVELS				GROUNDWATER SAMPLING FIELD PARAMETERS					
			Product Thickness (ft)	Depth to Groundwater (feet bgs)	Casing Elevation (MSL)	Groundwater Elevation (MSL)	Temp. (Celcius)	pH	Cond (µS/cm)	O.R.P. (mV)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)
FOMW-1	12/7/2001	3	NA	NA	27.81	NA	NA	NA	NA	NA	NA	NA
FOMW-2	12/7/2001	4	NA	NA	26.65	NA	NA	NA	NA	NA	NA	NA
FOMW-3	12/7/2001	--	0.00	9.59	26.80	17.21	16.8	6.71	432	34.2	0.18	0.32

Notes:

<p>MSL - Mean Sea Level          BGS - Below ground surface          Groundwater Elevation reference to MSL          Groundwater Elevation = Top of casing elevation - Depth to Water          1 Sheen observed on water surface.          2 Petroleum odor in groundwater          3 Well covered by demolition debris. Could not be accessed          4 Well casing damaged          SP - Separate phase product in well          NA - Not analyzed/Not available.</p>	<p>µS/cm - microSiemens per centimete.          mV - millivolt          mg/L - milligrams per liter</p>
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**TABLE 2**  
**2001 4th QUARTER GROUNDWATER ANALYSES RESULTS**  
**SEARS RETAIL STORE NO. 1058**  
**OAKLAND, CALIFORNIA**

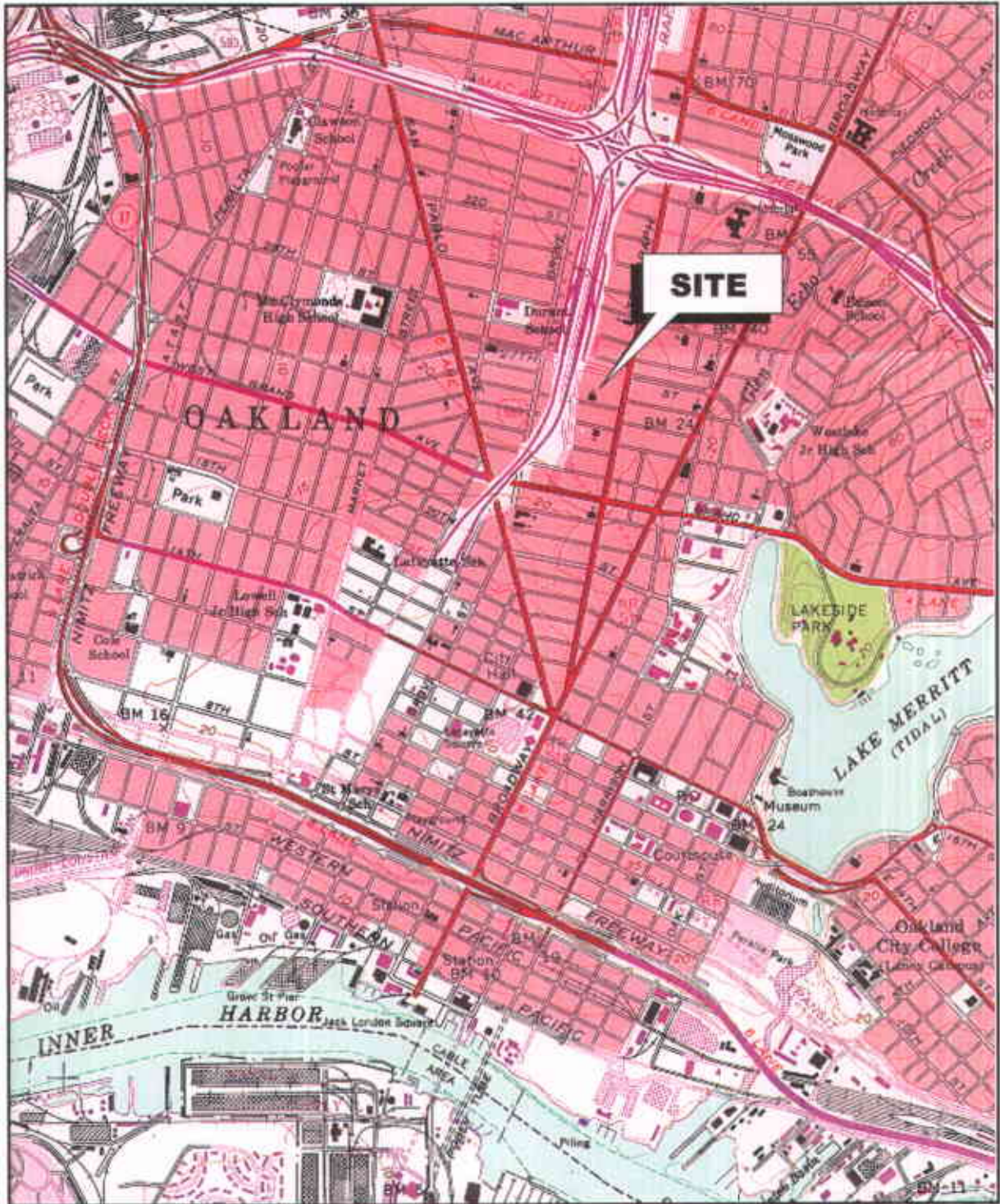
Monitoring Well No.	Sample Date	Notes	LABORATORY ANALYTICAL RESULTS									PHYSICAL PARAMETERS						
			Volatile Organics by GC/MS 8260A					TPH-Range				Nitrate (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Total Alkalinity (mg/L)	Dissolved Methane (µg/ML)	Hydrocarbon Degraders (CFU/ML)	Heterotrophic Plate Count (CFU/ML)
			B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	Gasoline (µg/L)	Diesel (µg/L)	Bunker Oil (µg/L)								
FOMW-1	12/7/2001	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
FOMW-2	12/7/2001	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
FOMW-3	12/7/2001	--	< 0.5	< 0.5	< 0.5	< 0.5	< 5	52	110	< 50	7.1	66	NA	130	NA	260	1000	

Notes:

TPH - Total Petroleum Hydrocarbons  
 B T E X - Benzene, Toluene, Ethylbenzene, Total Xylenes  
 MTBE - Methyl tertiary-butyl ether  
 TDS = Total Dissolved Solids  
 1: Duplicate sample  
 2: Well blocked by demolition debris. Could not be accessed.  
 3: Well casing is damaged  
 J - Bunker-C detections were quantitated against the diesel standard and flagged as estimated concentration:  
 < - Analyte not detected above indicated method detection limit  
 NA: Not analyzed/Not available.  
 SP: Separate Phase Product

µg/L - micrograms per liter  
 mg/L - milligrams per liter  
 (CFU/ML) - colony forming unit per milliliter





Source: USGS, Oakland West Quadrangle, California, 7.5 Minute Series Topographic, 1959 (photorevised, 1980)



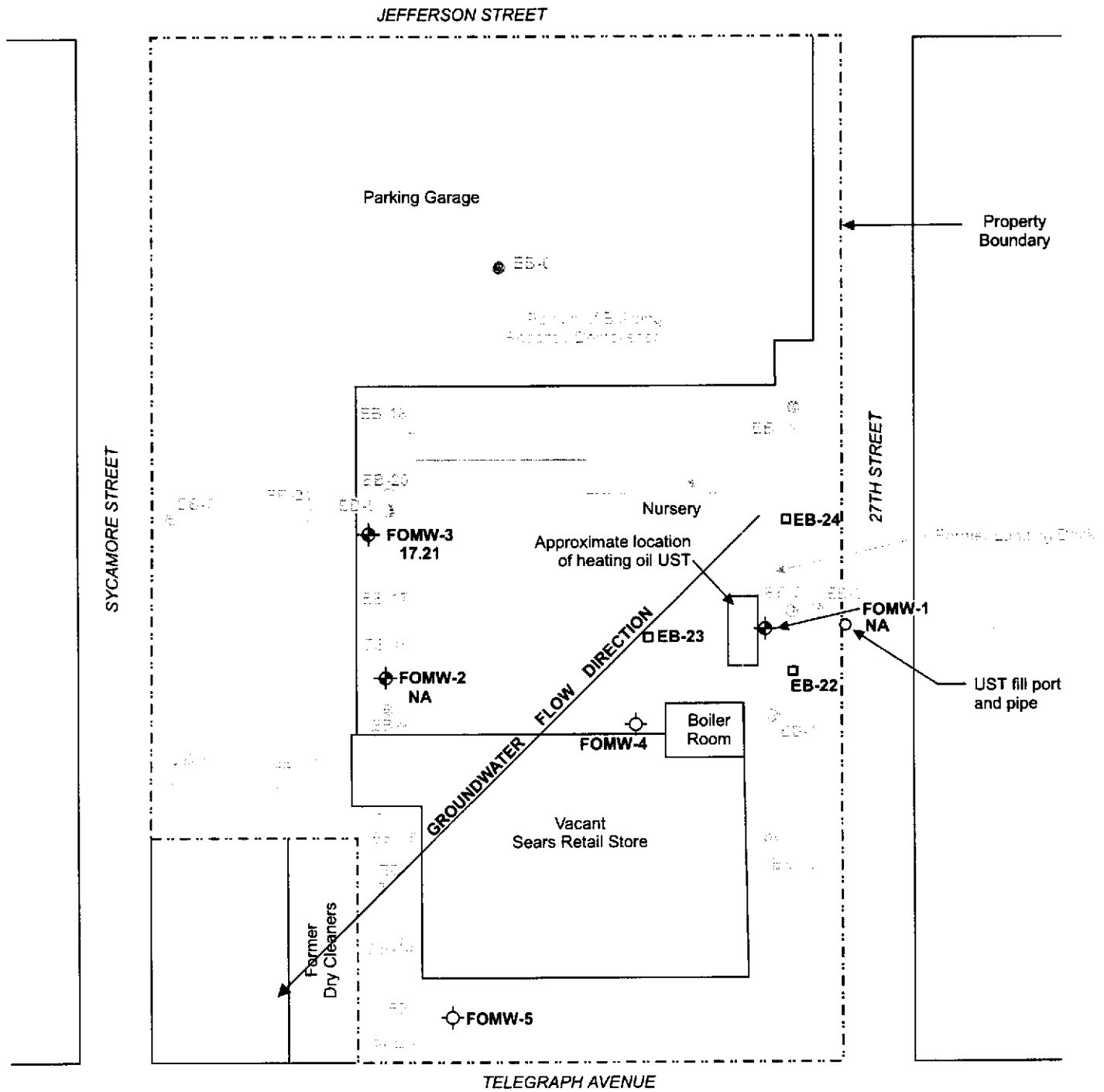
**SITE LOCATION MAP**

Sears Roebuck & Company  
 Site Assessment  
 Oakland, California

March 2002



FIGURE 1



**LEGEND**

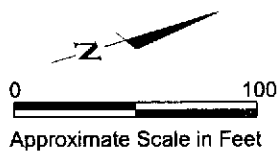
- (with dot) Approximate location of exploratory boring (Lowney, May 1998)
- (with dot) Approximate location of exploratory boring (Lowney, April 1998)
- (with dot) Approximate location of exploratory boring (SECOR, November 1998)
- ⊕ Groundwater monitoring well locations (URS/Dames & Moore)
- (with dot) Feb. 2002 monitoring well location (Approximate)
- Feb. 2002 soil boring location (Approximate)

**NOTES**

- (1) Groundwater elevations in feet above mean sea level (MSL).
- (2) NA = Not Accessible.
- (3) Groundwater elevations measured December 7, 2001.

Reference: Lowney Associates (1998)  
SECOR (1998)

L:/sears oakland/site plan 2001 4th Qtr.cdr



**SITE PLAN SHOWING 2001 4th QUARTER  
GROUNDWATER ELEVATIONS**

Sears Roebuck & Company  
Site Assessment  
Oakland, California

March 2002

**URS**

FIGURE 2

**APPENDIX A**

**HISTORICAL GROUNDWATER LEVELS AND FIELD PARAMETERS**

**Appendix A**  
**Historical Groundwater Levels and Parameters**  
**Sears Retail Center Store No. 1058**  
**Oakland, California**

Monitoring Well No.	Date Collected	Notes	GROUNDWATER LEVELS				GROUNDWATER SAMPLING FIELD PARAMETERS					
			Product Thickness (ft)	Depth to Groundwater (feet bgs)	Casing Elevation (MSL)	Groundwater Elevation (MSL)	Temp. (Celcius)	pH	Cond (µS/cm)	O.R.P. (mV)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)
FOMW-1	6/8/2000	1,2	0.00	9.59	27.81	18.22	18.3	6.72	659	13.00	0.28	NA
	10/10/2000	SP	0.01	9.91	27.81	17.90	NA	NA	NA	NA	NA	NA
	12/15/2000	SP	0.01	9.44	27.81	18.37	NA	NA	NA	NA	NA	NA
	3/27/2001	SP	0.01	9.00	27.81	18.81	NA	NA	NA	NA	NA	NA
	6/22/2001	SP	NA	NA	27.81	NA	NA	NA	NA	NA	NA	NA
	9/26/2001	SP	0.01	10.85	27.81	16.96	NA	NA	NA	NA	NA	NA
FOMW-2	12/7/2001	3	NA	NA	27.81	NA	NA	NA	NA	NA	NA	NA
	6/8/2000	--	0.00	11.14	26.65	15.51	14.7	7.00	673	10.00	2.92	NA
	10/10/2000	--	0.00	12.34	26.65	14.31	15.8	7.58	420	0.01	NA	NA
	12/15/2000	--	0.00	11.05	26.65	15.60	14.0	7.09	1210	NA	0.15	NA
	3/27/2001	--	0.00	10.91	26.65	15.74	15.4	7.62	305	92.00	0.61	NA
	6/22/2001	--	0.00	11.30	26.65	15.35	15.3	5.33	340	0.20	0.25	NA
FOMW-3	9/26/2001	3	NA	NA	26.65	NA	NA	NA	NA	NA	NA	NA
	12/7/2001	4	NA	NA	26.65	NA	NA	NA	NA	NA	NA	NA
	6/8/2000	2	0.00	10.48	26.80	16.32	15.0	6.87	689	23.00	0.22	NA
	10/10/2000	--	0.00	11.15	26.80	15.65	15.6	7.66	430	39.00	NA	NA
	12/15/2000	--	0.00	10.36	26.80	16.44	14.1	7.31	1400	45.00	0.15	NA
	3/27/2001	--	0.00	10.12	26.80	16.68	NA	NA	NA	NA	NA	NA
	6/22/2001	--	0.00	10.65	26.80	16.15	15.7	5.11	330	0.09	0.50	NA
	9/26/2001	--	0.00	11.74	26.80	15.06	17.5	6.81	528	23.80	0.78	NA
	12/7/2001	--	0.00	9.59	26.80	17.21	16.8	6.71	432	34.2	0.18	0.32

Notes: MSL - Mean Sea Level  
BGS - Below ground surface  
Groundwater Elevation reference to MSL  
Groundwater Elevation = Top of casing elevation - Depth to Water.  
1 Sheen observed on water surface.  
2 Petroleum odor in groundwater  
3 Well covered by demolition debris. Could not be accessed  
4 Well casing damaged  
SP - Separate phase product in well  
NA - Not analyzed/Not available

µS/cm - microSiemens per centimeter  
mV - millivolt  
mg/L - milligrams per liter

**APPENDIX B**

**HISTORICAL SUMMARY OF GROUNDWATER ANALYSES RESULTS**

Monitoring Well No.	Sample Date	Notes	PARAMETERS				
			Volatiles		Dissolved Methane (µg/ML)	Hydrocarbon Degraders (CFU/ML)	Heterotrophic Plate Count (CFU/ML)
			B (µg/L)	T (µg)			
FOMW-1	6/8/2000	--	< 0.5	<	< 0.01	390	4000
	10/10/2000	SP	NA		NA	NA	NA
	12/15/2000	SP	< 0.5	<	NA	NA	NA
	12/15/2000	1	< 0.5	<	NA	NA	NA
	3/27/2001	SP	NA		NA	NA	NA
	6/22/2001	SP	NA		NA	NA	NA
	9/26/2001	SP	NA		NA	NA	NA
	12/7/2001	2	NA		NA	NA	NA
FOMW-2	6/8/2000	--	< 0.5	<	< 0.01	1	110
	10/10/2000	--	< 0.5	<	< 0.01	170	1600
	12/15/2000	--	< 0.5	<	< 0.01	550	1000
	3/27/2001	--	< 0.5	<	< 0.01	30	170
	3/27/2001	1	< 0.5	<	< 0.01	40	70
	6/22/2001	--	< 1	<	< 0.01	4000	400000
	9/26/2001	2	NA		NA	NA	NA
	12/7/2001	3	NA		NA	NA	NA
FOMW-3	6/8/2000	--	< 0.5	<	< 0.01	440	110000
	6/8/2000	1	< 0.5	<	< 0.01	50	8000
	10/10/2000	--	< 0.5	<	< 0.01	800	4000
	12/15/2000	--	< 0.5	<	< 0.01	1200	1800
	3/27/2001	--	< 0.5	<	< 0.01	400	300
	6/22/2001	--	< 1	<	< 0.01	4000	350000
	9/26/2001	--	0.72		0.011	30	170
	12/7/2001	--	< 0.5	<	NA	260	1000

Notes:

TPH - Total Petroleum Hydrocarbons  
 BTEX - Benzene, Toluene, Ethylbenzene, Xylenes  
 MTBE - Methyl tertiary-butyl ether  
 TDS = Total Dissolved Solids  
 1: Duplicate sample  
 2: Well blocked by demolition debris  
 3: Well casing is damaged  
 J - Bunker-C detections were questionable  
 < - Analyte not detected above instrument detection limit  
 NA: Not analyzed/Not available.  
 SP: Separate Phase Product

**APPENDIX C**

**LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTS FOR  
GROUNDWATER**

**URS-Santa Ana**

2020 East 1st St Suite 400  
Santa Ana, CA 92705

Scott Rowlands

Project: 22-00000139.01  
Sears-Oakland

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com  
CA DHS ELAP#1094

Attached is our report for your samples received on Friday December 7, 2001  
This report has been reviewed and approved for release. Reproduction of this report  
is permitted only in its entirety.

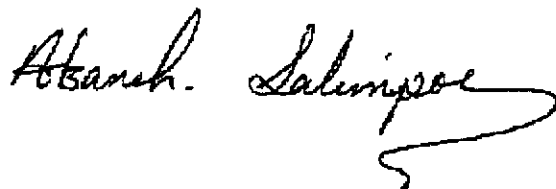
The report contains a Case Narrative detailing sample receipt and analysis.

Please note that any unused portion of the samples will be discarded after  
January 21, 2002 unless you have requested otherwise.

We appreciate the opportunity to be of service to you. If you have any questions,  
please call me at (925) 484-1919.

You can also contact me via email. My email address is: [asalimpour@chromalab.com](mailto:asalimpour@chromalab.com)

Sincerely,



Afsaneh Salimpour  
Project Manager



Gas/BTEX Compounds by 8015M/8021

URS-Santa Ana	☒ 2020 East 1st St Suite 400 Santa Ana, CA 92705
Attn: Scott Rowlands	Phone: (714) 648-2793 Fax: (714) 667-7147
22-00000139.01	Project: Sears-Oakland

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

**Samples Reported**

Sample ID	Matrix	Date Sampled	Lab #
FOMW-3	Water	12/07/2001	1

Gas/BTEX Compounds by 8015M/8021

URS-Santa Ana

Test Method: 8021B  
8015M

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Attn: Scott Rowlands

Prep Method: 5030

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

Sample ID: FOMW-3	Lab Sample ID: 2001-12-0142-001
Project: 22-00000139.01 Sears-Oakland	Received: 12/07/2001 12:15
Sampled: 12/07/2001	Extracted: 12/14/2001 20:03
Matrix: Water	QC-Batch: 2001/12/14-01.05

CA DHS ELAP#1094

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	52	50	ug/L	1.00	12/14/2001 20:03	g
Benzene	ND	0.50	ug/L	1.00	12/14/2001 20:03	
Toluene	ND	0.50	ug/L	1.00	12/14/2001 20:03	
Ethyl benzene	ND	0.50	ug/L	1.00	12/14/2001 20:03	
Xylene(s)	ND	0.50	ug/L	1.00	12/14/2001 20:03	
MTBE	ND	5.0	ug/L	1.00	12/14/2001 20:03	
<b>Surrogate(s)</b>						
Trifluorotoluene	72.9	58-124	%	1.00	12/14/2001 20:03	
4-Bromofluorobenzene-FID	89.4	50-150	%	1.00	12/14/2001 20:03	



Gas/BTEX Compounds by 8015M/8021

**Batch QC report**

Test Method: 8021B

Prep Method: 5030

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

<b>Laboratory Control Spike (LCS/LCSD)</b>	<b>Water</b>	<b>QC Batch # 2001/12/14-01.05</b>
LCS: 2001/12/14-01.05-004	Extracted: 12/14/2001 08:56	Analyzed: 12/14/2001 08:56
LCSD: 2001/12/14-01.05-005	Extracted: 12/14/2001 09:29	Analyzed: 12/14/2001 09:29

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]			Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD		Recovery	RPD	LCS	LCSD	
Benzene	97.9	94.9	100.0	100.0	97.9	94.9	3.1	77-123	20			
Toluene	94.1	89.8	100.0	100.0	94.1	89.8	4.7	78-122	20			
Ethyl benzene	97.2	93.1	100.0	100.0	97.2	93.1	4.3	70-130	20			
Xylene(s)	283	272	300	300	94.3	90.7	3.9	75-125	20			
<b>Surrogate(s)</b>												
Trifluorotoluene	467	463	500	500	93.4	92.6		58-124				

Gas/BTEX Compounds by 8015M/8021

**Batch QC report**

Test Method: 8015M

Prep Method: 5030

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

<b>Laboratory Control Spike (LCS/LCSD)</b>	<b>Water</b>	<b>QC Batch # 2001/12/14-01.05</b>
LCS: 2001/12/14-01.05-006	Extracted: 12/14/2001 10:01	Analyzed: 12/14/2001 10:01
LCSD: 2001/12/14-01.05-007	Extracted: 12/14/2001 10:33	Analyzed: 12/14/2001 10:33

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	449	471	500	500	89.8	94.2	4.8	75-125	20		
<b>Surrogate(s)</b>											
4-Bromofluorobenzene-	529	541	500	500	105.8	108.2		50-150			

Gas/BTEX Compounds by 8015M/8021

**Batch QC Report**

Test Method: 8021B

Prep Method: 5030

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Matrix Spike ( MS / MSD )		Water	QC Batch # 2001/12/14-01.05	
Sample ID: FOMW-3 >> MS			Lab ID:	2001-12-0142-001
MS: 2001/12/14-01.05-025	Extracted: 12/14/2001 20:35	Analyzed: 12/14/2001 20:35	Dilution:	1
MSD: 2001/12/14-01.05-026	Extracted: 12/14/2001 21:07	Analyzed: 12/14/2001 21:07	Dilution:	1

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Compound	Conc. [ug/L]			Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD	[%]	Recovery	RPD	MS	MSD
Benzene	87.3	86.5	ND	100.0	100.0	87.3	86.5	0.9	65-135	20		
Toluene	79.5	79.5	ND	100.0	100.0	79.5	79.5	0.0	65-135	20		
Ethyl benzene	84.6	83.2	ND	100.0	100.0	84.6	83.2	1.7	65-135	20		
Xylene(s)	244	242	ND	300	300	81.3	80.7	0.7	65-135	20		
<b>Surrogate(s)</b>												
Trifluorotoluene	447	431		500	500	89.4	86.2		58-124			

Gas/BTEX Compounds by 8015M/8021

**Batch QC Report**

Test Method: 8015M

Prep Method: 5030

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Matrix Spike ( MS / MSD )	Water	QC Batch # 2001/12/14-01.05
Sample ID: FOMW-3 >> MS		Lab ID: 2001-12-0142-001
MS: 2001/12/14-01.05-027	Extracted: 12/14/2001 21:40	Analyzed: 12/14/2001 21:40
		Dilution: 1
MSD: 2001/12/14-01.05-028	Extracted: 12/14/2001 22:12	Analyzed: 12/14/2001 22:12
		Dilution: 1

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www.chromalab.com

CA DHS ELAP#1094

Compound	Conc. [ug/L]			Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD		Recovery	RPD	MS	MSD
Gasoline	435	428	52.3	500	500	76.5	75.1	1.8	65-135	20		
<b>Surrogate(s)</b>												
4-Bromofluorobenz	514	520		500	500	102.	104.0		50-150			

Gas/BTEX Compounds by 8015M/8021

**Legend & Notes**

Test Method: 8015M  
8021B

Prep Method: 5030

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Tel 925 484 1919  
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[www.chromalab.com](http://www.chromalab.com)

CA DHS ELAP#1094

**Analyte Flags**

9

Hydrocarbon reported in the gasoline range does not match our gasoline standard.





Total Extractable Petroleum Hydrocarbons (TEPH)

<b>URS-Santa Ana</b>	✉ 2020 East 1st St Suite 400 Santa Ana, CA 92705
Attn: Scott Rowlands 22-00000139.01	Phone: (714) 648-2793 Fax: (714) 667-7147 Project: Sears-Oakland

STL San Francisco  
1220 Quarry Lane  
Pleasanton, CA 94566

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
FOMW-3	Water	12/07/2001	1



Total Extractable Petroleum Hydrocarbons (TEPH)

Batch QC report

Test Method: 8015M

Prep Method: 3510/8015M

**Laboratory Control Spike (LCS/LCSD)      Water      QC Batch # 2001/12/12-02.10**  
 LCS: 2001/12/12-02.10-002    Extracted: 12/12/2001 11:56    Analyzed: 12/13/2001 09:59  
 LCSD: 2001/12/12-02.10-003    Extracted: 12/12/2001 11:56    Analyzed: 12/13/2001 10:46

STL San Francisco  
 1220 Quarry Lane  
 Pleasanton, CA 94566

Tel 925 484 1919  
 Fax 925 484 1096  
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 www.chromalab.com

CA DHS ELAP#1094

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Diesel	856	913	1250	1250	68.5	73.0	6.4	60-130	25		
<b>Surrogate(s)</b>											
o-Terphenyl	15.8	16.8	20.0	20.0	79.2	83.8		60-130	0		

Total Extractable Petroleum Hydrocarbons (TEPH)

**Legend & Notes**

Test Method: 8015M

Prep Method: 3510/8015M

**Analyte Flags**

ndp

Hydrocarbon reported does not match the pattern of our Diesel standard

STL San Francisco  
1220 Quarry Lane  
Pleasanton, CA 94566

Tel 925 484 1919  
Fax 925 484 1096  
[www.stl-inc.com](http://www.stl-inc.com)  
[www.chromalab.com](http://www.chromalab.com)

CA DHS ELAP#1094

Alkalinity (Total)

URS-Santa Ana	✉ 2020 East 1st St Suite 400 Santa Ana, CA 92705
Attn: Scott Rowlands	Phone: (714) 648-2793 Fax: (714) 667-7147
22-00000139.01	Project: Sears-Oakland

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

**Samples Reported**

Sample ID	Matrix	Date Sampled	Lab #
FOMW-3	Water	12/07/2001	1

Alkalinity (Total)

URS-Santa Ana  
Attn: Scott Rowlands

Test Method: 310.1  
Prep Method: 310.1

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Sample ID: FOMW-3	Lab Sample ID: 2001-12-0142-001
Project: 22-00000139.01 Sears-Oakland	Received: 12/07/2001 12:15
Sampled: 12/07/2001	Extracted: 12/12/2001 05:30
Matrix: Water	QC-Batch: 2001/12/12-01.58

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com  
CA DHS ELAP#1094

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Alkalinity (Total)	130	5.0	mg/L	1.00	12/12/2001 05:30	

Alkalinity (Total)

Batch QC report

Test Method: 310.1

Prep Method: 310.1

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

<b>Method Blank</b>	<b>Water</b>	<b>QC Batch # 2001/12/12-01.58</b>
MB: 2001/12/12-01.58-001		Date Extracted: 12/12/2001 05:30

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Alkalinity (Total)	ND	5.0	mg/L	12/12/2001 05:30	

Alkalinity (Total)

Batch QC report

Test Method: 310.1

Prep Method: 310.1

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Laboratory Control Spike (LCS/LCSD)		Water		QC Batch # 2001/12/12-01.58	
LCS:	2001/12/12-01.58-002	Extracted:	12/12/2001 05:30	Analyzed:	12/12/2001 05:30
LCSD:	2001/12/12-01.58-003	Extracted:	12/12/2001 05:30	Analyzed:	12/12/2001 05:30

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Compound	Conc. [mg/L]		Exp.Conc. [mg/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD		[%]	Recovery	RPD	LCS
Alkalinity (Total)	2330	2310	2500	2500	93.2	92.4	0.9	80-120	20		



Misc Anions by Ion Chromatograph

<b>URS-Santa Ana</b>	✉ 2020 East 1st St Suite 400 Santa Ana, CA 92705
Attn: Scott Rowlands	Phone: (714) 648-2793 Fax: (714) 667-7147
22-00000139.01	Project: Sears-Oakland

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

**Samples Reported**

Sample ID	Matrix	Date Sampled	Lab #
FOMW-3	Water	12/07/2001	1

Misc Anions by Ion Chromatograph

URS-Santa Ana

Test Method: 9056

Attn: Scott Rowlands

Prep Method: 9056

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Sample ID: FOMW-3	Lab Sample ID: 2001-12-0142-001
Project: 22-00000139.01 Sears-Oakland	Received: 12/07/2001 12:15
Sampled: 12/07/2001	Extracted: 12/07/2001
Matrix: Water	QC-Batch: 2001/12/07-02.41

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com  
CA DHS ELAP#1094

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Nitrate	7.1	1.0	mg/L	1.00	12/07/2001	
Sulfate	66	2.0	mg/L	2.00	12/07/2001	

Misc Anions by Ion Chromatograph

Batch QC report

Test Method: 9056

Prep Method: 9056

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

<b>Method Blank</b>	<b>Water</b>	<b>QC Batch # 2001/12/07-02.41</b>
MB: 2001/12/07-02.41-001		Date Extracted: 12/07/2001

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Nitrate	ND	1.0	mg/L	12/07/2001	
Sulfate	ND	1.0	mg/L	12/07/2001	

Misc Anions by Ion Chromatograph

Batch QC report

Test Method: 9056

Prep Method: 9056

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

<b>Laboratory Control Spike (LCS/LCSD)</b>		<b>Water</b>	<b>QC Batch # 2001/12/07-02.41</b>
LCS: 2001/12/07-02.41-002	Extracted: 12/07/2001	Analyzed: 12/07/2001	
LCSD: 2001/12/07-02.41-003	Extracted: 12/07/2001	Analyzed: 12/07/2001	

Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Compound	Conc. [mg/L]		Exp.Conc. [mg/L]		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD		Recovery	RPD	LCS	LCSD
Nitrate	20.5	20.5	20.0	20.0	102.5	102.5	0.0	80-120	20		
Sulfate	20.1	20.0	20.0	20.0	100.5	100.0	0.5	80-120	20		

Misc Anions by Ion Chromatograph

Batch QC Report

Test Method: 9056

Prep Method: 9056

STL Chromalab  
1220 Quarry Lane  
Pleasanton, CA 94566

Matrix Spike ( MS / MSD )	Water	QC Batch # 2001/12/07-02.41
Sample ID: FOMW-3 >> MS		Lab ID: 2001-12-0142-001
MS: 2001/12/07-02.41-004	Extracted: 12/07/2001	Analyzed: 12/07/2001
		Dilution: 1
MSD: 2001/12/07-02.41-005	Extracted: 12/07/2001	Analyzed: 12/07/2001
		Dilution: 1

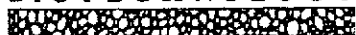
Tel 925 484 1919  
Fax 925 484 1096  
www.stl-inc.com  
www.chromalab.com

CA DHS ELAP#1094

Compound	Conc. [mg/L]			Exp.Conc. [mg/L] Recovery [%]				RPD	Ctrl.Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD		[%]	Recovery	RPD	MS
Nitrate	47.9	48.9	7.10	40.0	40.0	102.	104.5	2.4	80-120	20		
Sulfate	112	112	65.8	40.0	40.0	115.	115.5	0.0	80-120	20		

# Cyto Culture

ENVIRONMENTAL  
BIOTECHNOLOGY



CytoCulture International Inc.

249 Tewksbury Avenue

Pt. Richmond, CA 94801 USA

**Chromalab Inc.**

**CL Subm. No. 2001-12-0126**

**Project Manager: Afsaneh Salimpour**

1220 Quarry Lane, Pleasanton, CA 94566-4756

**Reporting Date: December 14, 2001**

**CytoCulture Lab Login: 01-86**

**Project Description: Sears- Hayward**

Tel. 925/484-1919 Fax. 925/484-1096

**SAMPLES:** Six water samples on ice were received on 12/7/01. The samples were assayed the following business day and stored at 4°C for any future testing. See the attached chain of custody form.

## **Aerobic Hydrocarbon-Degrading and Total Heterotrophic Bacteria Enumeration Assays**

**ANALYSIS REQUEST:** Bacterial enumeration for aerobic petroleum hydrocarbon-degraders (broad range petroleum hydrocarbons derived from diesel and gasoline) and total heterotrophic plate counts by methods 9215A (HPC) / Standard Methods 9215B modified.

**CARBON SOURCE:** Sterilized Chevron No. 2 diesel and gasoline were dissolved into agar plates as the sole carbon and energy sources for the growth of hydrocarbon-degrading aerobic bacteria. Heterotrophic plates were made up with standard methods total plate count agar (Difco) containing a wide range of carbon sources derived from yeast extract, tryptone, pancreatic digest of casein and glucose.

### **PROTOCOLS:**

**Hydrocarbon Degraders:** Sterile agar plates (100 x 15 mm) were prepared with minimal salts medium at pH 6.8 with noble agar and hydrocarbons, without any other carbon sources or nutrients added. Triplicate plates were inoculated with 1.0 ml of each sample, or log dilutions of the sample, at  $10^0$ ,  $10^{-1}$ ,  $10^{-2}$  and  $10^{-3}$ . Hydrocarbon plates were counted 12 days after incubation at 30 Deg C. The plate count data are reported as colony forming units (cfu) per milliliter (ml). Each bacteria population value represents a statistical average of the plate count data obtained with inoculations for two of the four log dilutions tested.

**Heterotrophs:** Sterile agar plates (100 x 15 mm) were prepared with minimal salts medium and 2.35% heterotrophic plate count agar at pH 6.8 without any other carbon sources or nutrients added. Plates were inoculated with 1.0 ml of water sample, or log dilutions of the sample, in triplicate at sample dilutions of  $10^0$ ,  $10^{-1}$ ,  $10^{-2}$ , and  $10^{-3}$ . The heterotroph plates were counted after 4 days of incubation at 30 Deg. C. The plate count data are reported as colony forming units (cfu) per milliliter (ml) of sample. Each enumeration value represents a statistical average of two of the four log dilutions inoculated in plates.

Request corrected Lab Report. Hayward Lab Results Included


**Aerobic Hydrocarbon-Degrading and Heterotrophic Bacteria Enumeration Results**

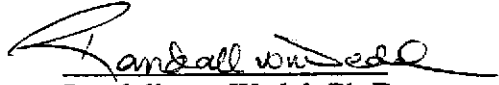
CLIENT SAMPLE NUMBER	SAMPLE DATE	HYDROCARBON DEGRADERS (CFU/ML)	TARGET HYDROCARBONS TESTED	TOTAL HETEROTROPHS (CFU/ML)
<del>MW-4</del>	12/7/01	$1.5 \times 10^2$	Gasoline + diesel	$9 \times 10^3$
<del>MW-2</del>	12/7/01	$1.7 \times 10^1$	Gasoline + diesel	$2.5 \times 10^{2*}$
<del>MW-11</del>	12/7/01	$1.4 \times 10^3$	Gasoline + diesel	$2.2 \times 10^3$
<del>MW-16</del>	12/7/01	$1.5 \times 10^2$	Gasoline + diesel	$3.6 \times 10^{3*}$
<del>Dup 1</del>	12/7/01	$1.4 \times 10^3$	Gasoline + diesel	$2.8 \times 10^3$
FOMW-3	12/7/01	$2.6 \times 10^2$	Gasoline + diesel	$1 \times 10^3$
Sterile water	12/10/01	zero	Gasoline + diesel	zero
Air control	12/10/01	zero	Gasoline + diesel	zero
Positive control	12/10/01	$1.7 \times 10^8$	Gasoline + diesel	$4.5 \times 10^9$

\* Motile bacterial film growth may have partially occluded counting of colonies on these plates.

A hydrocarbon-degrading bacteria positive control sample was run concurrently with these samples using a mixed flask culture of bacteria from Northern California contaminated groundwater sites.

CytoCulture is available on a consulting basis to assist in the interpretation of these data and their application to field bioremediation protocols.

  
 Wendy Fulkerson, B.S.  
 Laboratory Technician

  
 Randall von Wedel, Ph.D.  
 Principal Biochemist

C:\cytolab\lab reports\chromalab wtr01-86

From:  
**STL ChromaLab (CL)**  
 1220 Quarry Lane  
 Pleasanton, CA 94566-4756

To:  
 Cyto Culture  
 249 Tewksbury Avenue  
 Point Richmond, CA 94801

Project Manager: Afsaneh Salimpour  
 Phone: (925) 484-1919 Ext: 107  
 Fax: (925) 484-1096  
 Email: asalimpour@chromalab.com

Phone: (510) 233-0102  
 Fax: ( ) -  
 Contact: NO CONTACT  
 Phone: (510) 233-0102

#01-86  
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CL Submission #: **2001-12-0126**

Project #: 22-00000140.01

CL PO #:

Project Name: Sears-Hayward

Client Sample ID	CL#	Sampled	Matrix	Due
Analysis			Method	
MW-4 (2)	001	12/06/2001 14:05	Water	
Subcontract tests that are not listed.				12/13/2001 17:00
MW-2 (5)	002	12/06/2001 13:10	Water	
Subcontract tests that are not listed.				12/13/2001 17:00
MW-11 (2)	003	12/06/2001 11:25	Water	
Subcontract tests that are not listed.				12/13/2001 17:00
MW-16 (2)	004	12/06/2001 07:40	Water	
Subcontract tests that are not listed.				12/13/2001 17:00
DUP 1 (2)	006	12/06/2001 12:00	Water	
Subcontract tests that are not listed.				12/13/2001 17:00

PLEASE INCLUDE QC WITH FAXED AND HARD-COPY RESULTS  
 \*\*\*\*HYDRO DEGRADERS & HETEROTROPHIC PLATE COUNT

RELINQUISHED BY: 1. <i>Crowley</i> Signature <i>Crowley</i> 12/07/01 Printed Name Date STL CL Company	RELINQUISHED BY: 2. Signature Printed Name Company	RELINQUISHED BY: 3. Signature Printed Name Company
RECEIVED BY: 1. <i>Dorcas Kelly</i> 1/5 Signature Time <i>Dec 9 '01</i> Printed Name Date Company	RECEIVED BY: 2. Signature Printed Name Company	RECEIVED BY: 3. Signature Printed Name Company



# CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

Lab: cytochrome  
 1220 Quarry Lane • Pleasanton, California 94566-4756  
 510/484-1919 • Facsimile 510/484-1096

282  
 Sub-Contract

## Chain of Custody

DATE 12/7/01 PAGE 1 OF 1

PROJ MGR Afsaneh Salimpour  
 COMPANY STL-CC  
 ADDRESS \_\_\_\_\_  
 \_\_\_\_\_  
 SAMPLERS (SIGNATURE) \_\_\_\_\_ (PHONE NO) \_\_\_\_\_  
 \_\_\_\_\_ (FAX NO) \_\_\_\_\_

### ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	H-Degraders (ASTM 6-77)	HPA (SM 9215A)														NUMBER OF CONTAINERS	
FDMW-3	12/2/01	-	H <sub>2</sub> O	-	X	X															2
<del>2001-12-142</del>																					

PROJECT INFORMATION		SAMPLE RECEIPT			
PROJECT NAME:	TOTAL NO. OF CONTAINERS	2			
PROJECT NUMBER 63549	HEAD SPACE				
P.O. #	REC'D GOOD CONDITION/COLD				
TAT	STANDARD 5-DAY	24	48	72	OTHER
SPECIAL INSTRUCTIONS/COMMENTS.					

RELINQUISHED BY 1		RELINQUISHED BY 2		RELINQUISHED BY 3	
<u>D. Harrington</u> (SIGNATURE)	(TIME)		(TIME)		(TIME)
<u>D. Harrington</u> (PRINTED NAME)	(DATE)		(DATE)		(DATE)
<u>STL-CC</u> (COMPANY)					
<u>12/7/01</u> (DATE)					
RECEIVED BY 1		RECEIVED BY 2		RECEIVED BY (LABORATORY) 3	
<u>Douglas Johnson</u> (SIGNATURE)	1:15 (TIME)		(TIME)		(TIME)
<u>Douglas Johnson</u> (PRINTED NAME)	12/7/01 (DATE)		(DATE)		(DATE)

2001-12-12

URS Greiner Woodward-Clyde

SHIPMENT NO.: \_\_\_\_\_

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

PROJECT NAME: SEWER - CANTON

DATE 12/17/01

PROJECT NO.: 22-00000139.01

63549

Sample Number	Location	Type of Sample		Type of Container	Type of Preservation		Analysis Required*
		Material	Method		Temp	Chemical	
FOMW-3	CANTON	GN	PURGE	100, 16 AMP, 500ML VIAL	1 (COT)	NO, SUPPLY THE RESERVE	(1)
EACH OF SEVEN							
3.0°C							

Total Number of Samples Shipped: \_\_\_\_\_ Sampler's Signature: \_\_\_\_\_

Relinquished By:  
 Signature: \_\_\_\_\_  
 Printed Name: STAN GONSKI  
 Company: URS  
 Reason: ANALYSIS

Received By:  
 Signature: \_\_\_\_\_  
 Printed Name: VAN SPALL  
 Company: WORLD COURT 5016

Date: 12/7/01  
 Time: 11:15

Relinquished By:  
 Signature: \_\_\_\_\_  
 Printed Name: VAN SPALL  
 Company: WORLD COURT  
 Reason: \_\_\_\_\_

Received By:  
 Signature: \_\_\_\_\_  
 Printed Name: D. Harrington  
 Company: STL-CL

Date: 12/07/01  
 Time: 12:15

Relinquished By:  
 Signature: \_\_\_\_\_  
 Printed Name: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Reason: \_\_\_\_\_

Received By:  
 Signature: \_\_\_\_\_  
 Printed Name: \_\_\_\_\_  
 Company: \_\_\_\_\_

Date: 1/1  
 Time: \_\_\_\_\_

Relinquished By:  
 Signature: \_\_\_\_\_  
 Printed Name: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Reason: \_\_\_\_\_

Received By:  
 Signature: \_\_\_\_\_  
 Printed Name: \_\_\_\_\_  
 Company: \_\_\_\_\_

Date: 1/1  
 Time: \_\_\_\_\_

Special Shipment / Handling / Storage Requirements:  
 (1) TPK, TPA-d, TPA-o (EQUIS); BTEX, MTBE (EQUIS) WITH B260B CONFIRMATION, NITRATE & SULFATE (G016); ALKALINITY (310.1); H. DEGRADERS (ASTM-G-22), HPC (SM9215A)

\* Note - This does not constitute authorization to proceed with analysis

**APPENDIX D**

**URS DATA VALIDATION REPORTS**

## Level III Data Validation Summary

**PROJECT:** Sears Oakland  
**LABORATORY:** Severn Trent Laboratories, Inc. (STL) - ChromaLab  
**MATRIX:** Groundwater  
**LAB PROJECT #:** 2001-12-0142  
**SAMPLES:** See table below

Field ID	QC Designations	Lab ID	Gasoline, BTEX, and MTBE	Diesel and Motor Oil	H-Degrader and HPC	Alkalinity	Nitrate and Sulfate
FOMW-3		2001-12-0142-001	X	X	X	X	X

Gasoline range quantitated is C<sub>5</sub>-C<sub>13</sub>.  
 Diesel range quantitated is C<sub>9</sub>-C<sub>24</sub>.  
 Motor Oil range quantitated is C<sub>24</sub>-C<sub>36</sub>.  
 BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes.  
 MTBE = Methyl tertiary butyl ether.  
 H-Degrader = Hydrogen degrader.  
 HPC = Heterotrophic plate count.  
 STL is certified by California Department of Health Services (Certificate Number 1094)

### DATA REVIEW MATRIX

QC Parameter	Gasoline, BTEX, and MTBE EPA 5030/ 8015M/8021B(1)	Diesel and Motor Oil EPA 3510/ 8015M	H-Degrader and HPC ASTM G-22/ SM9215A/ SM9215B(3)	Alkalinity EPA 310.1	Nitrate and Sulfate EPA 9056
Chain-of-custody (COC)	✓(2)	✓	✓	✓	✓
Sample Receipt	✓	✓	✓	✓	✓
Holding Times	✓	✓	✓	✓	✓
Method Blank	✓	✓	✓	✓	✓
Surrogate Recovery	✓	✓	NA	NA	NA
Laboratory Control Sample	✓	✓	NA	✓	✓
Matrix Spike	✓	✓	NA	NA	✓
Duplicate or Spike Duplicate	✓	✓	NA	NA	✓
Field Duplicate	NC	NC	NC	NC	NC
Trip Blank/Equipment Blank	NC/NC	NC/NC	NC/NC	NC/NC	NC/NC

✓ = Quality control evaluation criteria met.  
 Laboratory control samples were prepared in duplicate.  
 NA = Not Applicable or Not Analyzed      NC = None Collected

**Notes:**

- The case narrative indicated that the hydrocarbons reported in the sample did not match the diesel or gasoline standards.
- According to the COC documentation, the analyses of BTEX and MTBE by method 8020B was requested for sample FOMW-3. However, the laboratory performed method 8021B on this sample, which is the intended method.
- Analysis subcontracted to Cyto Culture International, Inc.

**Summary:** Based on this Level III validation covering the QC parameters listed in the table above, these data are considered to be useable for meeting project objectives. However, the data user must evaluate the ultimate usability of the data obtained based on the reporting limits obtained. The table below lists the detection limits obtained for undiluted samples. Some samples were diluted due to the presence of target

analytes. In such cases, the reporting limits are elevated. However, usability is not affected when the target analyte is reported as present.

<b>Analyte</b>	<b>Detection Limits Obtained</b>
Gasoline	50
Diesel	50
Motor Oil	500
Benzene (8021B/8015M)	0.5
Toluene (8021B/8015M)	0.5
Ethylbenzene (8021B/8015M)	0.5
Xylenes (8021B/8015M)	0.5
MTBE (8021B/8015M)	5
Alkalinity	5000
Nitrate	1000
Sulfate	1000

Aqueous units are micrograms per liter (ug/l).