

# CLEARWATER

G R O U P, I N C.

*Environmental Services*

Mr. Barney Chan  
Alameda County Environmental Health Services  
Environmental Protection Division  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

April 30, 2001

**Re: Groundwater Monitoring Report, First Quarter 2001  
Eagle Gas, 4301 San Leandro Street, Oakland, California**

MAY 09 2001

Dear Mr. Chan,

Clearwater Group (Clearwater), on behalf of Ms. Farah Naz, is pleased to present this letter report of findings for groundwater monitoring activities for the above site. The activities reported here correspond with those proposed in the monitoring portion of the September 10, 1999, Artesian Environmental *Soil Remediation Pilot Study and Well Installation Workplan*.

## **SITE DESCRIPTION**

The subject site is located in the southern portion of Oakland, California at the south corner of San Leandro Street and High Street, approximately 1,000 feet east of Interstate Highway 880. The site is bounded by commercial property to the southeast, southwest, and northwest, and by the BART tracks to the northeast (Figure 1). Based on previous investigations, the site is predominantly underlain by clays with some clayey gravel and clayey sand in shallower depths to approximately 10 feet below ground surface (bgs), and silty sand below 20 feet in some areas.

## **BACKGROUND**

On April 21 and April 22, 1999, Artesian Environmental (now Clearwater) oversaw the removal of five underground storage tanks (USTs) at the subject site. The USTs included two 6,000 gallon gasoline USTs, two 4,000 gallon diesel USTs, and one 300 gallon used oil UST (Figure A). Field observations included strong petroleum odors from soils near the former USTs. A total of five confirmation soil samples and three groundwater samples were collected from the UST excavations. Laboratory analytical results confirmed an unauthorized release of petroleum (Table 2).

In a letter dated May 10, 1999, the Alameda County Department of Environmental Health recommended that soil be remediated by over-excavation / land disposal and that "as much groundwater as possible" be pumped from the excavation. Subsequently, approximately 800 tons of petroleum impacted soil were excavated and disposed of as Class II non-hazardous waste. Less than 1,000 gallons of petroleum impacted groundwater were pumped from the excavation. Groundwater did not recharge after pumping. Existing structures limited the amount of soil that could be safely excavated. Soil samples collected from the excavation walls and product piping trenches indicated some remaining petroleum and MTBE contamination.

On August 4 and August 5, 1999, approximately 100 linear feet of product piping was removed. Vent piping from between the former USTs and the south corner of the onsite building was also removed. All piping was cut and disposed of as scrap metal. On August 5, 1999, confirmation soil samples were collected along the piping trench. Six samples were collected from approximately three feet bgs. An additional four samples were collected, one for each of four

former fuel dispensers. Laboratory analytical results indicated the presence of hydrocarbon related contamination along piping trenches (Table 2).

On September 26, 2000, West Hazmat of Rancho Cordova, California, used a CME 75 drill rig to advance three borings to approximately 25 feet bgs (Figure 2), and collect soil samples (Table 2). Each of the three borings was converted to a groundwater monitoring well using clean, flush-threaded, two-inch diameter PVC well materials. On October 3rd and 10th, 2000, Clearwater surveyed the top of casings elevations for each well relative to an arbitrary benchmark, and developed the wells for monitoring. Initial ground samples collected from these wells contained 83,000 µg/L to 250,000 µg/L total petroleum hydrocarbons as gasoline (TPHg), and 33,000 µg/L to 400,000 µg/L methyl-tert butyl ether (MTBE).

### GROUNDWATER MONITORING FIELD ACTIVITIES

Date of field activities:	1/26/01
Wells gauged/sampled:	MW-1, MW-2 and MW-3
Analytes tested:	Total Petroleum Hydrocarbons as diesel (TPHd) and gasoline (TPHg), benzene, toluene, ethyl benzene and xylenes (BTEX), five fuel oxygenates, (MTBE, EDBE, DIBE, TAME, TBA), and lead scavengers (1,2-DCA and 1,2-DBA)
Analytical methods:	EPA Methods 8015 (modified), 8020, and 8260
Laboratory:	Entech Analytical Labs, Inc., of Sunnyvale, CA
Remarks:	None

### GROUNDWATER MONITORING RESULTS

Depth to water:	7.60 feet (MW-1) to 13.38 feet (MW-3) below ground surface (bgs)
Flow direction/gradient:	East-northeast, at 0.032 ft/ft
SPH - wells/thicknesses:	Not detected for any well
TPHd concentration range:	900 µg/L (MW-3) to 6,000 µg/L (MW-2)
TPHg concentration range:	51,000 µg/L (MW-1) to 740,000 µg/L (MW-2)
Benzene concentration range:	270 µg/L (MW-1) to 3,800 µg/L (MW-2)
MTBE concentration range:	77,000 µg/L (MW-1) to 1,000,000 µg/L (MW-2)
Remarks:	Laboratory indicated that diesel detected in all three wells was "within quantification range but atypical for fuel."

### SUMMARY AND CONCLUSIONS

Laboratory analytical results confirm petroleum related soil and groundwater contamination remain at this site. Soil contamination is greatest near the former UST excavation. Previous data indicate that some contaminated soil may remain underneath existing structures or near the former dispensers. ~~The groundwater contamination present has not yet been conclusively identified for further investigation.~~

Field observations during drilling activities indicated that first observed groundwater was is similar for all wells (17 feet bgs to 19 feet bgs). Static groundwater levels, however, varied considerably between the three wells. If measured static water levels are accurate, groundwater appears to flow towards the northeast, at a steep gradient ( $i = 0.032$  ft/ft). This groundwater flow directions is approximately opposite to the direction of San Francisco Bay.

Three operating USTs buried in artificial fill material currently occupy the former UST cavity, potentially acting as a groundwater sink interfering with normal groundwater flow patterns. Soil or other subsurface conditions may be influencing well recharge or groundwater gradient, producing anomalous groundwater elevation and gradient data.

## RECOMMENDATIONS

Clearwater recommends additional site investigative activities to more completely delineate the groundwater contaminant plume and to determine if residual secondary source material remains on site. Currently, Clearwater is seeking access to adjacent properties surrounding the site to install either temporary borings, or permanent monitoring wells. Once ~~access~~ possible access locations have been determined, Clearwater will submit a workplan for further investigation. We recommend the continuation of quarterly monitoring as planned, with well redevelopment as needed to accurately determine the magnitude and direction of hydraulic gradient.

## ATTACHMENTS

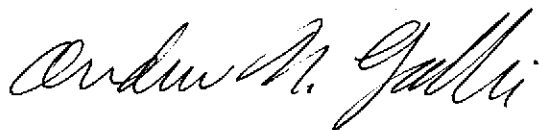
Figure 1	Vicinity Map, Eagle Gas
Figure 2	Site Map, Eagle Gas
Figure 3	Groundwater Elevation Map - 1/26/01, Eagle Gas
Figure 4	Hydrocarbon Concentration in Groundwater, Eagle Gas - January 26, 2001
Figure A	Historical Sample Locations, Eagle Gas
Table 1	Groundwater Elevations and Sample Analytical Results, Eagle Gas
Table 2	Soil Sample Analytical Results
Clearwater Field Procedures	
Well Gauging Data / Purge Calculations and Well Purging Data	
Laboratory Reports and Chain-of-Custody Forms	

**CERTIFICATION**

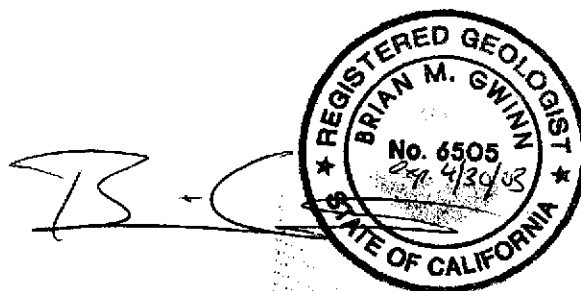
This report was prepared under the supervision of a professional Registered Geologist in the state of California. All statements, conclusions and recommendations are based solely upon published results from previous consultants, field observations by Clearwater Group and laboratory analysis performed by a California DOHS-certified laboratory related to the work performed by Clearwater Group. Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party. The service provided by Clearwater Group, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

**Clearwater Group,**

Prepared by:

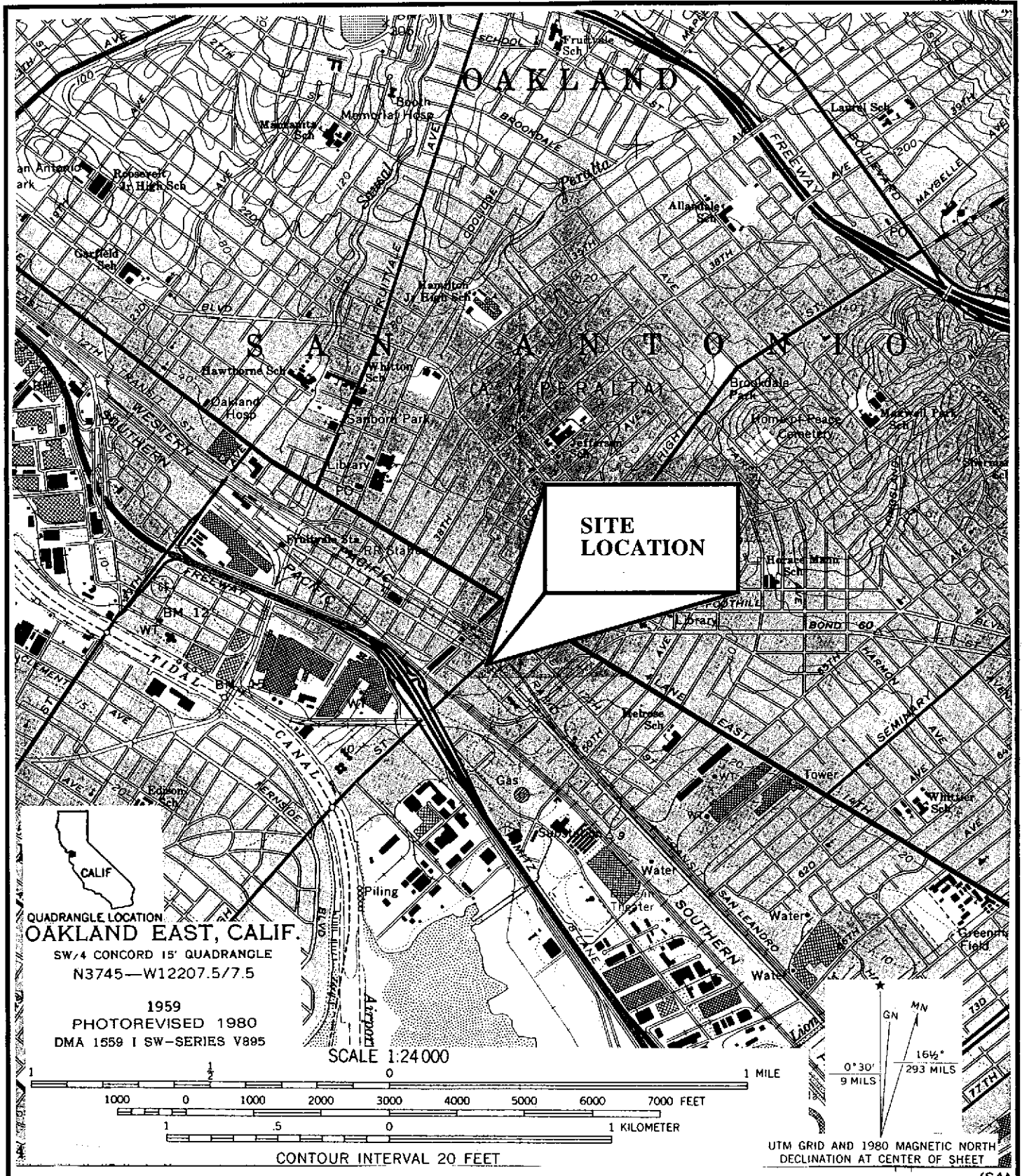


Andrew M. Galleni  
Project Geologist



Brian Gwinn, R.G.  
Senior Geologist

CC: Inspector Hernan Gomez, Oakland Fire Department  
Mr. Muhammad Jamil and Ms. Farah Naz, 40092 Davis Street, Fremont, CA 94538



Clearwater Group, Inc.  
 520 3rd. St. Suite 104  
 Oakland, California 94607  
 Phone (510) 307-9943 Fax (510) 232-2823

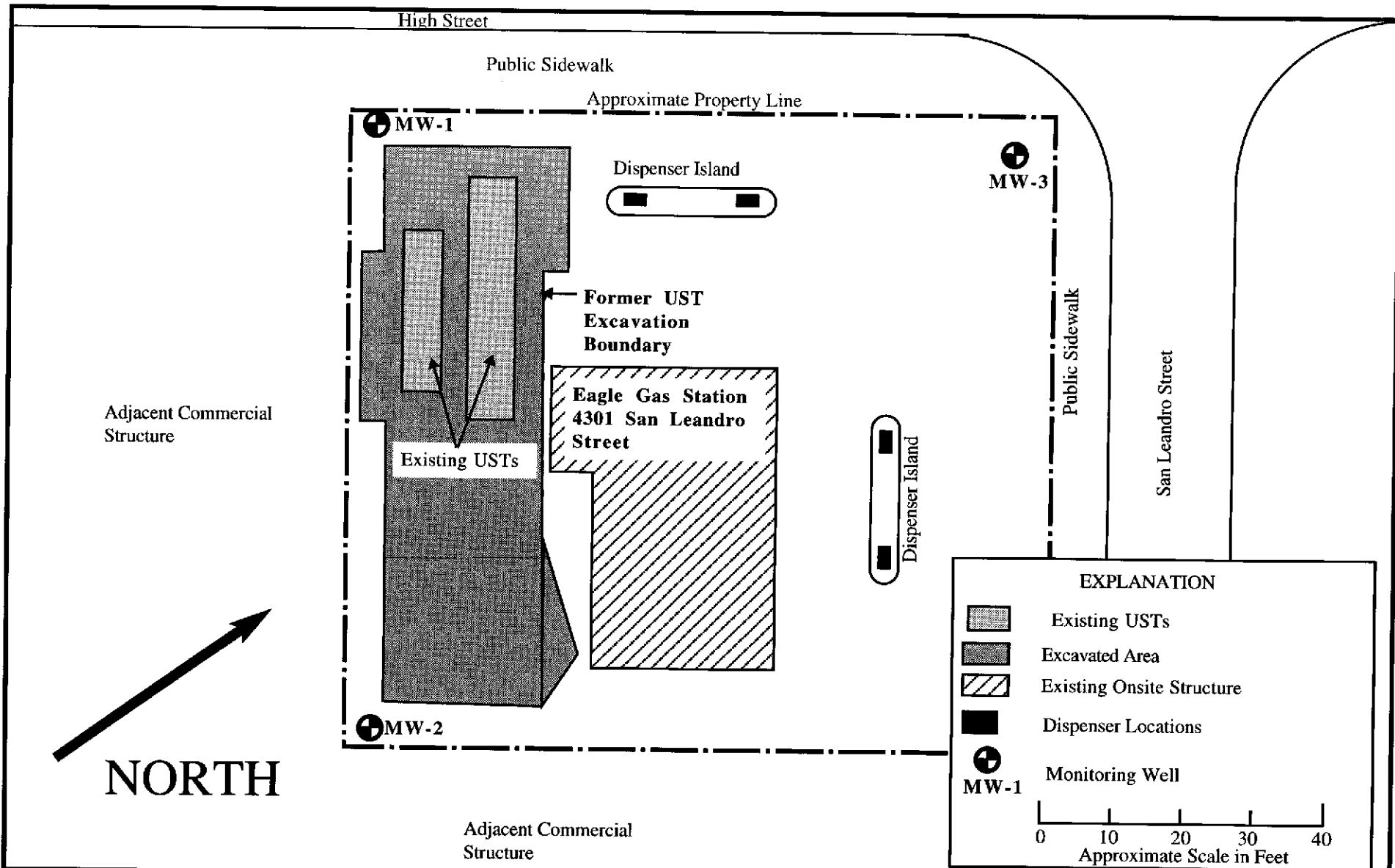
Vicinity Map  
 Eagle Gas  
 4301 San Leandro  
 Oakland, California

Project No. ZP 046A

Date Prepared: 10/00

Prepared by: Judi Fox

Figure 1



**NORTH**

**CLEARWATER GROUP**  
 520 Third Street, Suite 104  
 Oakland California

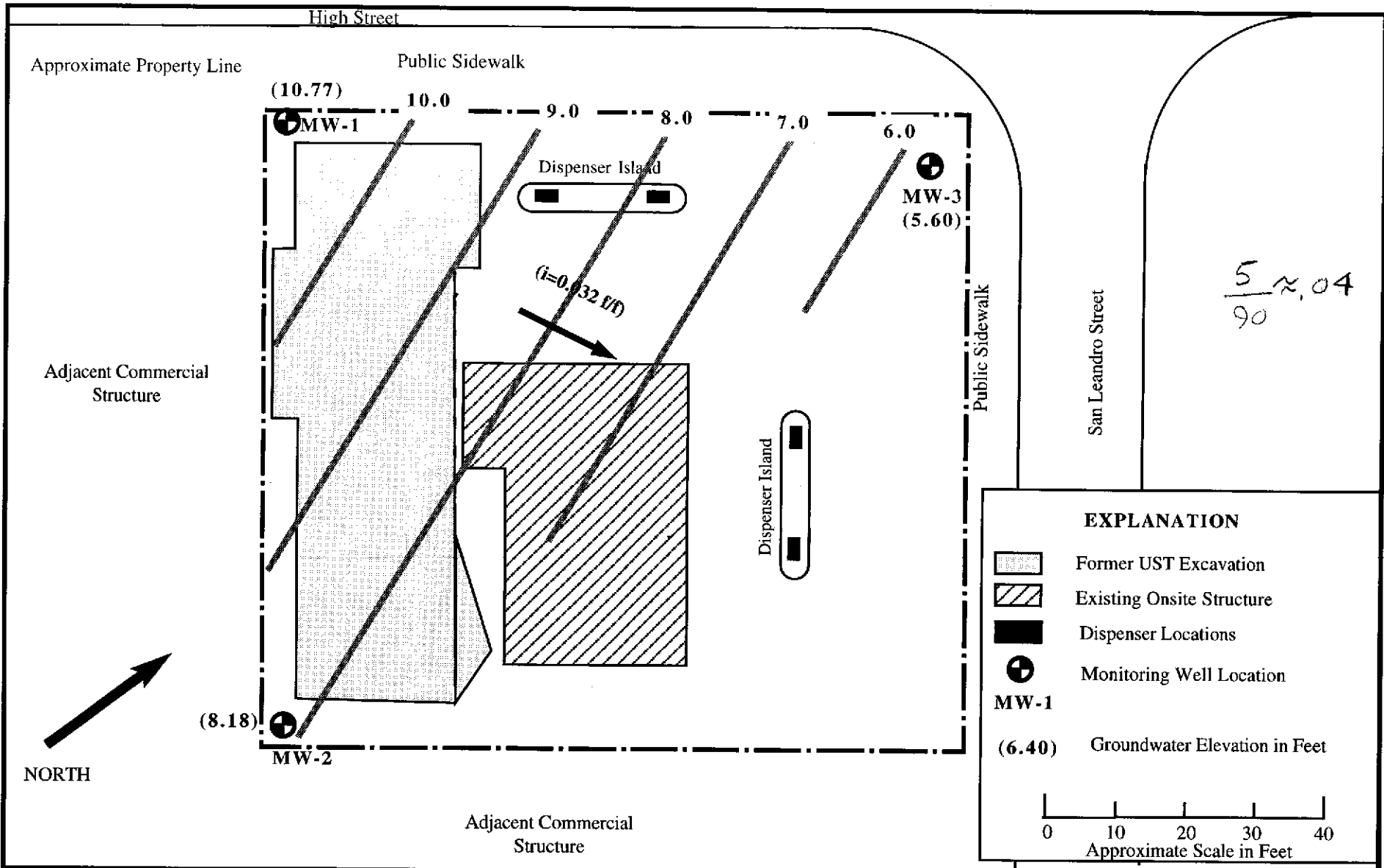
**Site Map - Eagle Gas**  
 4301 San Leandro Street  
 Oakland California

**Project No. ZP 046A**

**Date: 4/01**

**Prepared by:**  
**A.M. Galleni**

**Figure 2**



**CLEARWATER GROUP**  
 520 Third Street, Suite 104  
 Oakland, California

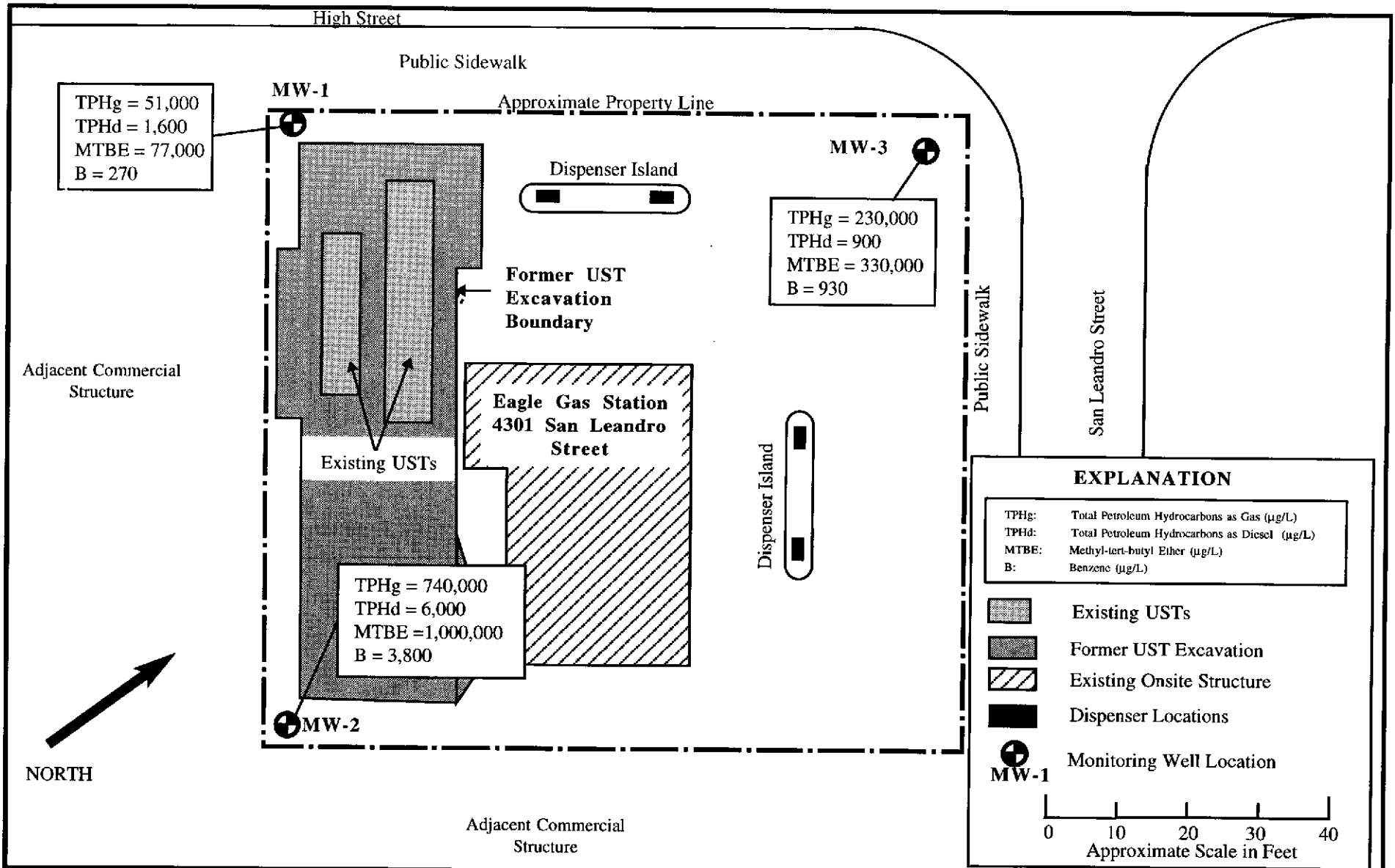
**Groundwater Elevation Map - 1/26/01**  
 Eagle Gas, 4301 San Leandro Street  
 Oakland, California

Project No. ZP 046A

Date: 4/01

Prepared by:  
 Andrew M. Galleni

Figure 3



**CLEARWATER GROUP**  
 520 Third Street, Suite 104  
 Oakland, California

**Hydrocarbon Concentration in Groundwater**  
 Eagle Gas - January 26, 2001  
 4301 San Leandro Street  
 Oakland, California

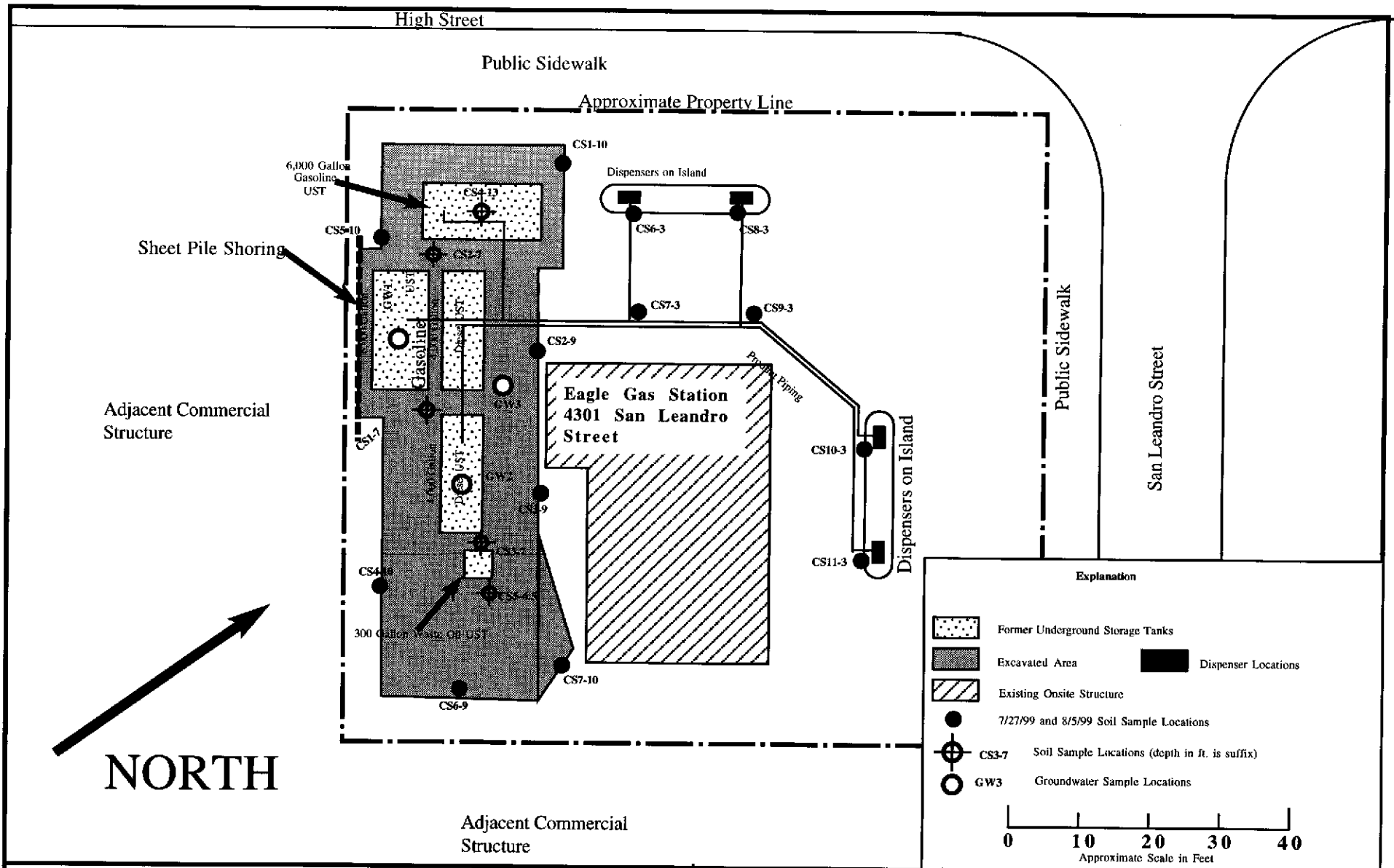
Project No. ZP 046A

Date: 4/01

Prepared by:  
 A.M. Galleni

Figure 4





**CLEARWATER GROUP**  
 520 Third Street, Suite 104  
 Oakland, California

**Historical Sample Locations**  
**Eagle Gas**  
 4301 San Leandro  
 Oakland, California

Project No. ZP 046A

Date Revised: 10/30/00

Drawn by: P.Jones  
 Revised By: J.Fox

Figure A

**TABLE 2**  
**SOIL SAMPLE ANALYTICAL RESULTS**  
**Eagle Gas**  
**4301 San Leandro Street**  
**Oakland, California**

Sample ID	Sampling Date	TPHg (mg/Kg)	TPHd (mg/Kg)	B (mg/Kg)	T (mg/Kg)	E (mg/Kg)	X (mg/Kg)	MTBE (mg/Kg)	DIPE (mg/Kg)	ETBE (mg/Kg)	TAME (mg/Kg)	TBA (mg/Kg)	Methanol (mg/Kg)	Ethanol (mg/Kg)	1,2-DCA (mg/Kg)	EDB (mg/Kg)
CS1-7	4/21/99	770	840	8.9	4.8	5.8	16	86	---	---	---	---	---	---	---	---
CS2-7	4/21/99	880	1,900	3.3	5.7	15	45	16	---	---	---	---	---	---	---	---
CS3-7	4/22/99	1,600	780	4.3	110	42	220	92	---	---	---	---	---	---	---	---
CS5-6.5	4/22/99	20	33	0.22	1.8	0.54	3	52	---	---	---	---	---	---	---	---
Stockpile 1	4/22/99	610	770	0.28	4.7	6.9	36	ND	---	---	---	---	---	---	---	---
Stockpile 2	4/22/99	480	670	0.23	2.3	3.9	18	ND	---	---	---	---	---	---	---	---
CS4-13	4/22/00	ND	ND	ND	ND	ND	ND	0.08	---	---	---	---	---	---	---	---
CS6-3	8/5/99	4,300	1,300	11	130	82	420	70	---	---	---	---	---	---	---	---
CS7-3	8/5/99	50	200	nd	2.4	0.85	4	14	---	---	---	---	---	---	---	---
CS8-3	8/5/99	250	3,400	0.32	0.72	0.81	1	3.8	---	---	---	---	---	---	---	---
CS9-3	8/5/99	380	1,900	ND	ND	ND	ND	9.5	---	---	---	---	---	---	---	---
CS10-3	8/5/99	930	350	ND	78	17	99	310	---	---	---	---	---	---	---	---
CS11-3	8/5/99	1,400	5,200	3.2	13	25	90	62	---	---	---	---	---	---	---	---
MW1-10' bgs	9/26/00	310	87	0.062	0.022	1.3	3.4	6.9	<0.0050	<0.0050	0.019	2.9	<5.0	<0.050	<0.0050	<0.0050
MW2-10' bgs	9/26/00	630	210	0.053	0.052	2.0	14	1.0	<0.050	<0.050	<0.050	3.5	<10	<1.0	<0.050	<0.050
MW3-10' bgs	9/26/00	32	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	4.5	<0.0050	<0.0050	0.043	0.58	<1.0	<0.050	<0.0050	<0.0050

**NOTES:**

- TPHd Total petroleum hydrocarbons as diesel by EPA Method 8015 (modified)
- TPHg Total petroleum hydrocarbons as gasoline by EPA Method 8015 (modified)
- BTEX Benzene, toluene, ethylbenzene and total xylenes by EPA Method 8260 (modified)
- MTBE Methyl tert-Butyl Ether by EPA Method 8260B
- ETBE Ethyl-tert-Butyl Ether by EPA 8260B
- TAME tert-Amyl Methyl Ether by EPA 8260B
- TBA tert-Butanol by EPA 8260B
- DIPE Diisopropyl Ether by EPA 8260B
- Not Tested / No Data Available
- ND not detected above laboratory detection limits

**TABLE 1**  
**GROUNDWATER ELEVATIONS AND SAMPLE ANALYTICAL RESULTS**  
**Eagle Gas**  
**4301 San Leandro Street**  
**Oakland, California**

Sample ID	Sampling Date	TOC (feet)	DTW (feet)	GWE (feet)	SPH (feet)	TPHd (µg/L)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	TBA (µg/L)
MW-1	10/3/00	18.37	8.96	9.41	0	460	93,000	<500	<500	<500	<500	130,000	<10,000	<10,000	<10,000	<10,000	<10,000	<2,000
	10/27/00	18.37	7.27	11.10	0	---	---	---	---	---	---	---	---	---	---	---	---	---
	1/26/01	18.37	7.60	10.77	0	1,600*	51,000	270	<100	<100	<100	77,000	<5,000	<5,000	<5,000	<5,000	<5,000	<20,000
MW-2	10/3/00	20.28	20.26	0.02	0	210	250,000	<1,250	<1,250	<1,250	<1,250	400,000	<25,000	<25,000	<25,000	<25,000	<25,000	<100,000
	10/27/00	20.28	13.88	6.40	0	---	---	---	---	---	---	---	---	---	---	---	---	---
	1/26/01	20.28	12.10	8.18	0	6,000*	740,000	3,800	<500	940	1,600	1,000,000	<50,000	<50,000	<50,000	<50,000	<50,000	<200,000
MW-3	10/10/00	18.98	---	---	0	120	83,000	<500	<500	<500	<500	33,000	<2,500	<2,500	<2,500	<2,500	<2,500	<10,000
	10/27/00	18.98	18.75	0.23	0	---	---	---	---	---	---	---	---	---	---	---	---	---
	1/26/01	18.98	13.38	5.60	0	900*	230,000	930	<500	<500	<500	330,000	<25,000	<25,000	<25,000	<25,000	<25,000	<100,000

**NOTES:**

- TOC Top of well casing referenced to mean sea level
- DTW Depth to water
- GWE Groundwater elevation
- SPH Separate phase hydrocarbons (floating product); no samples taken
- TPHd Total petroleum hydrocarbons as gasoline by EPA Method 8015 (modified)
- TPHg Total petroleum hydrocarbons as gasoline by EPA Method 8015 (modified)
- BTEX Benzene, toluene, ethylbenzene and total xylenes by EPA Method 8020 (modified)
- MTBE Methyl tert-Butyl Ether by EPA Method 8260B
- EDB 1,2-Dibromoethane by EPA Method 8260B
- 1,2-DCA 1,2-Dichloroethane by EPA Method 8260B
- DIPE Diisopropyl Ether by EPA Method 8260B
- ETBE Ethyl-t-butyl Ether by EPA Method 8260B
- TAME tert-Amyl Methyl Ether by EPA Method 8260B
- TBA tert-Butanol by EPA Method 8260B
- (µg/L) Micrograms per liter: approximately wqual to parts per billion
- <# Not detected in quantities greater than indicated method detection limit
- not tested / no data available
- \* Laboratory note: "Results within quantitation range; chromatographic pattern not typical of fuel."

## CLEARWATER GROUP, INC.

### Groundwater Monitoring and Sampling Field Procedures

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#### Groundwater Monitoring

Prior to beginning, a decontamination area is established. Decontamination procedures consist of scrubbing downhole equipment in an Alconox® solution wash (wash solution is pumped through any purging pumps used), and rinsing in a first rinse of potable water and a second rinse of potable water or deionized water if the latter is required. Any non-dedicated down hole equipment is decontaminated prior to use. When using a peristaltic pump, new or dedicated silicon head tube and polyethylene tubing is used.

Prior to purging and sampling a well, the static water level is measured to the nearest 0.01 feet with an electronic water sounder. Depth to bottom is typically measured once per year, at the request of the project manager, and during Clearwater's first visit to a site. If historical analytical data are not available, with which to establish a reliable order of increasing well contamination, the water sounder and tape will be decontaminated between each well. If floating separate-phase hydrocarbons (SPH) are suspected or observed, SPH is collected using a clear, open-ended product bailer, and the thickness is measured to the nearest 0.01 feet in the bailer. SPH may alternatively be measured with an electronic interface probe. Any monitoring well containing a measurable thickness of SPH before or during purging is not additionally purged and no sample is collected from that well. Wells containing a hydrocarbon sheen are sampled unless otherwise specified by the project manager. Field observations such as well integrity as well as water level measurements and floating product thicknesses are noted on the Gauging Data/Purge Calculations form.

#### Well Purging

Each monitoring well to be sampled is purged using either a PVC bailer, submersible pump or a peristaltic pump. Physical parameters (pH, temperature and conductivity) of the purge water are monitored during purging activities to assess if the water sample collected is representative of the aquifer. If required, parameters such as dissolved oxygen, turbidity, salinity etc. are also measured. Samples are considered representative if parameter stability is achieved. Stability is defined as a change of less than 0.25 pH units, less than 10% change in conductivity in micro mhos, and less than 1.0 degree centigrade (1.8 degrees Fahrenheit) change in temperature. Parameters are measured in a discreet sample decanted from the bailer separately from the rest of the purge water or in a in-line flowthrough cell. Parameters are measured at least four times during purging; initially, and at volume intervals of one well volume. Purging continues until three well casing volumes have been removed or until the well completely dewateres. Wells which dewater or demonstrate a slow recharge, may be sampled after fewer than three well volumes have been removed. Well purging information is recorded on the Purge Data sheet. All meters used to measure parameters are calibrated daily. Purge water is sealed, labeled, and stored on site in D.O.T.-approved 55-gallon drums. After being chemically profiled, the water is removed to an appropriate disposal facility by a licensed waste hauler.

#### Groundwater Sample Collection

Groundwater samples are collected immediately after purging or, if purging rate exceeds well recharge rate, when the well has recharged to at least 80% of its static water level. If recharge is extremely slow, the well is allowed to recharge for at least two hours, if practicable, or until sufficient volume has accumulated for sampling. The well is sampled within 24 hours of purging or repurged. Samples are collected using polyethylene bailers, either disposable or dedicated to the well. Samples may also be collected from the peristaltic pump tubing. Samples being analyzed for compounds most sensitive to volatilization are collected first. Water samples are placed in appropriate laboratory-supplied containers, labeled, documented on a chain of custody form and placed on ice in a cooler for transport to a state-certified analytical laboratory. Analytical detection limits match or surpass standards required by relevant local or regional guidelines.

#### Quality Assurance Procedures

To prevent contamination of the samples, CGI personnel adhere to the following procedures in the field:

- A new, clean pair of latex gloves are put on prior to sampling each well.
- Wells are gauged, purged and groundwater samples are collected in the expected order of increasing degree of contamination based on historical analytical results.
- All purging equipment will be thoroughly decontaminated between each well, using the procedures previously described at the beginning of this section.
- During sample collection for volatile organic analysis, the amount of air passing through the sample is minimized. This helps prevent the air from stripping the volatiles from the water. Sample bottles are filled by slowly running the sample down the side of the bottle until there is a convex meniscus over the mouth of the bottle. The lid is carefully screwed onto the bottle such that no air bubbles are present within the bottle. If a bubble is present, the cap is removed

and additional water is added to the sample container. After resealing the sample container, if bubbles still are present inside, the sample container is discarded and the procedure is repeated with a new container.

Laboratory and field handling procedures may be monitored, if required by the client or regulators, by including quality control (QC) samples for analysis with the groundwater samples. Examples of different types of QC samples are as follows:

- Trip blanks are prepared at the analytical laboratory by laboratory personnel to check field handling procedures. Trip blanks are transported to the project site in the same manner as the laboratory-supplied sample containers to be filled. They are not opened, and are returned to the laboratory with the samples collected. Trip blanks are analyzed for purgable organic compounds.
- Equipment blanks are prepared in the field to determine if decontamination of field sampling equipment has been effective. The sampling equipment used to collect the groundwater samples is rinsed with distilled water which is then decanted into laboratory-supplied containers. The equipment blanks are transported to the laboratory, and are analyzed for the same chemical constituents as the samples collected at the site.
- Duplicates are collected at the same time that the standard groundwater samples are being collected and are analyzed for the same compounds in order to check the reproducibility of laboratory data. They are typically only collected from one well per sampling event. The duplicate is assigned an identification number that will not associate it with the source well.

Generally, trip blanks and field blanks check field handling and transportation procedures. Duplicates check laboratory procedures. The configuration of QC samples is determined by CGI depending on site conditions and regulatory requirements.



# WELL PURGING DATA

SHEET 1 OF

Job No.: 2846A      Location: San Leandro Street, Oakland      Date: 1-26-01      Tech: SR

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: <u>1515</u> Sample for: (circle)
MW-2	<del>1406</del>	1.5	61.9	12.7	7	<input checked="" type="checkbox"/> TPHg <input checked="" type="checkbox"/> TPHd    TPHmo <input checked="" type="checkbox"/> BTEX    MTBE    8010 Other: <u>S fuel oxys, Lead Scavenger</u>
Calc. purge	1409	3	61.2	8.52	6.77	
volume	1413	4.5	60.8	7.5	6.80	
6	1417	6	61.4	7.57	6.99	

COMMENTS: color, turbidity, recharge, etc.  
brown, low, 1 PCB

Sampling Method: Dedicated / Disposable bailer  
 Purging Method: PVC bailer / Pump

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: <u>1540</u> Sample for: (circle)
MW-1	1425	2	59.3	6.24	5.62	<input checked="" type="checkbox"/> TPHg <input checked="" type="checkbox"/> TPHd    TPHmo <input checked="" type="checkbox"/> BTEX    MTBE    8010 Other: <u>S fuel oxys, Lead Scavs</u>
Calc. purge	1429	4	61.0	6.25	5.89	
volume	1433	6	61.0	6.68	5.96	
8.13	1438	8.13	61.3	6.5	5.33	

COMMENTS: color, turbidity, recharge, etc.  
Sheen dark gray, High good

Sampling Method: Dedicated / Disposable bailer  
 Purging Method: PVC bailer / Pump

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: <u>1525</u> Sample for: (circle)
MW-3	1449	1	61.1	6.37	5.87	<input checked="" type="checkbox"/> TPHg <input checked="" type="checkbox"/> TPHd    TPHmo <input checked="" type="checkbox"/> BTEX    MTBE    8010 Other: <u>S fuel oxys, Lead Scavs</u>
Calc. purge	1452	2	62.3	5.37	5.91	
volume	1455	3	62.7	6.18	6.18	
4.6	1460	4.6	64.2	5.91	6.23	

COMMENTS: color, turbidity, recharge, etc.  
brown, moderate, fair

Sampling Method: Dedicated / Disposable bailer  
 Purging Method: PVC bailer / Pump





# Entech Analytical Labs, Inc.

3334 Victor Court • Santa Clara, CA 95054 • (408) 588-0200 • Fax (408) 588-0201

February 02, 2001

Andrew M. Galleni  
Clearwater Group, Inc.  
520 Third Street, Suite 104  
Oakland, CA 94607

**Order:** 24175  
**Project Name:** Eagle Gas  
**Project Number:** ZP046A  
**Project Notes:**

**Date Collected:** 1/26/01  
**Date Received:** 1/26/01  
**P.O. Number:**


On January 26, 2001, samples were received under documented chain of custody. Results for the following analyses are attached:

<u>Matrix</u>	<u>Test</u>	<u>Method</u>
Liquid	Gas/BTEX	EPA 8015 MOD. (Purgeable)
	Oxygenates+1,2DCA+EDB	EPA 8020
	TPH as Diesel	EPA 8260B
		EPA 8015 MOD. (Extractable)

Chemical analysis of these samples has been completed. Summaries of the data are contained on the following pages. USEPA protocols for sample storage and preservation were followed.

Entech Analytical Labs, Inc. is certified by the State of California (#2346). If you have any questions regarding procedures or results, please call me at 408-588-0200.

Sincerely,



Michelle L. Anderson  
Lab Director

# Entech Analytical Labs, Inc.

3334 Victor Court • Santa Clara, CA 95054 • (408) 588-0200 • Fax (408) 588-0201

Clearwater Group, Inc.  
520 Third Street, Suite 104  
Oakland, CA 94607  
Attn: Andrew M. Galleni

Date: 2/2/01  
Date Received: 1/26/01  
Project Name: Eagle Gas  
Project Number: ZP046A  
P.O. Number:  
Sampled By: Client

## Certified Analytical Report

<b>Order ID:</b> 24175	<b>Lab Sample ID:</b> 24175-001	<b>Client Sample ID:</b> MW-1								
<b>Sample Time:</b> 3:40 PM	<b>Sample Date:</b> 1/26/01	<b>Matrix:</b> Liquid								
<b>Parameter</b>	<b>Result</b>	<b>Flag</b>	<b>DF</b>	<b>PQL</b>	<b>DLR</b>	<b>Units</b>	<b>Extraction Date</b>	<b>Analysis Date</b>	<b>QC Batch ID</b>	<b>Method</b>
TPH as Diesel	1600	x	2	50	100	µg/L	1/29/01	1/31/01	DW010107	EPA 8015 MOD. (Extractable)
						<b>Surrogate</b> o-Terphenyl		<b>Surrogate Recovery</b> 81		<b>Control Limits (%)</b> 45 - 105

<b>Order ID:</b> 24175	<b>Lab Sample ID:</b> 24175-002	<b>Client Sample ID:</b> MW-2								
<b>Sample Time:</b> 3:15 PM	<b>Sample Date:</b> 1/26/01	<b>Matrix:</b> Liquid								
<b>Parameter</b>	<b>Result</b>	<b>Flag</b>	<b>DF</b>	<b>PQL</b>	<b>DLR</b>	<b>Units</b>	<b>Extraction Date</b>	<b>Analysis Date</b>	<b>QC Batch ID</b>	<b>Method</b>
TPH as Diesel	6000	x	5	50	250	µg/L	1/29/01	2/1/01	DW010107	EPA 8015 MOD. (Extractable)
						<b>Surrogate</b> o-Terphenyl		<b>Surrogate Recovery</b> 82		<b>Control Limits (%)</b> 45 - 105

<b>Order ID:</b> 24175	<b>Lab Sample ID:</b> 24175-003	<b>Client Sample ID:</b> MW-3								
<b>Sample Time:</b> 3:25 PM	<b>Sample Date:</b> 1/26/01	<b>Matrix:</b> Liquid								
<b>Parameter</b>	<b>Result</b>	<b>Flag</b>	<b>DF</b>	<b>PQL</b>	<b>DLR</b>	<b>Units</b>	<b>Extraction Date</b>	<b>Analysis Date</b>	<b>QC Batch ID</b>	<b>Method</b>
TPH as Diesel	900	x	1	50	50	µg/L	1/29/01	1/31/01	DW010107	EPA 8015 MOD. (Extractable)
						<b>Surrogate</b> o-Terphenyl		<b>Surrogate Recovery</b> 91		<b>Control Limits (%)</b> 45 - 105

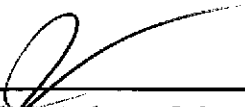
DF = Dilution Factor

ND = Not Detected

DLR = Detection Limit Reported

PQL = Practical Quantitation Limit

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #2346)

  
Michelle L. Anderson, Laboratory Director

Environmental Analysis Since 1983

# Entech Analytical Labs, Inc.

3334 Victor Court • Santa Clara, CA 95054 • (408) 588-0200 • Fax (408) 588-0201

Clearwater Group, Inc.  
520 Third Street, Suite 104  
Oakland, CA 94607  
Attn: Andrew M. Galleni

Date: 2/2/01  
Date Received: 1/26/01  
Project Name: Eagle Gas  
Project Number: ZP046A  
P.O. Number:  
Sampled By: Client

## Certified Analytical Report

Order ID: 24175      Lab Sample ID: 24175-001      Client Sample ID: MW-1  
Sample Time: 3:40 PM      Sample Date: 1/26/01      Matrix: Liquid

Parameter	Result	Flag	DF	PQL	DLR	Units	Extraction Date	Analysis Date	QC Batch ID	Method
Benzene	270		200	0.5	100	µg/L	N/A	1/31/01	WGC2010130	EPA 8020
Toluene	ND		200	0.5	100	µg/L	N/A	1/31/01	WGC2010130	EPA 8020
Ethyl Benzene	ND		200	0.5	100	µg/L	N/A	1/31/01	WGC2010130	EPA 8020
Xylenes, Total	ND		200	0.5	100	µg/L	N/A	1/31/01	WGC2010130	EPA 8020
			<b>Surrogate</b>			<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>	
			aaa-Trifluorotoluene			93			65 - 135	

Parameter	Result	Flag	DF	PQL	DLR	Units	Extraction Date	Analysis Date	QC Batch ID	Method
TPH as Gasoline	51000	x	200	50	10000	µg/L	N/A	1/31/01	WGC2010130	EPA 8015 MOD. (Purgeable)
			<b>Surrogate</b>			<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>	
			aaa-Trifluorotoluene			105			65 - 135	

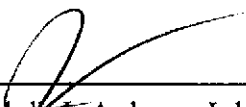
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Clearwater Group, Inc.  
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Attn: Andrew M. Galleni

Date: 2/2/01  
Date Received: 1/26/01  
Project Name: Eagle Gas  
Project Number: ZP046A  
P.O. Number:  
Sampled By: Client

## Certified Analytical Report


Order ID: 24175      Lab Sample ID: 24175-002      Client Sample ID: MW-2  
Sample Time: 3:15 PM      Sample Date: 1/26/01      Matrix: Liquid

Parameter	Result	Flag	DF	PQL	DLR	Units	Extraction Date	Analysis Date	QC Batch ID	Method
Benzene	3800		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
Toluene	ND		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
Ethyl Benzene	940		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
Xylenes, Total	1600		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
			Surrogate			Surrogate Recovery			Control Limits (%)	
			aaa-Trifluorotoluene			91			65 - 135	

Parameter	Result	Flag	DF	PQL	DLR	Units	Extraction Date	Analysis Date	QC Batch ID	Method
TPH as Gasoline	740000	x	1000	50	50000	µg/L	N/A	1/30/01	WGC2010129	EPA 8015 MOD. (Purgeable)
			Surrogate			Surrogate Recovery			Control Limits (%)	
			aaa-Trifluorotoluene			104			65 - 135	

DF = Dilution Factor      ND = Not Detected      DLR = Detection Limit Reported      PQL = Practical Quantitation Limit

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Attn: Andrew M. Galleni

Date: 2/2/01  
Date Received: 1/26/01  
Project Name: Eagle Gas  
Project Number: ZP046A  
P.O. Number:  
Sampled By: Client

## Certified Analytical Report

Order ID: 24175      Lab Sample ID: 24175-003      Client Sample ID: MW-3  
Sample Time: 3:25 PM      Sample Date: 1/26/01      Matrix: Liquid

Parameter	Result	Flag	DF	PQL	DLR	Units	Extraction Date	Analysis Date	QC Batch ID	Method
Benzene	930		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
Toluene	ND		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
Ethyl Benzene	ND		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
Xylenes, Total	ND		1000	0.5	500	µg/L	N/A	1/30/01	WGC2010129	EPA 8020
			<b>Surrogate</b>		<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>		
			aaa-Trifluorotoluene		88			65 - 135		

Parameter	Result	Flag	DF	PQL	DLR	Units	Extraction Date	Analysis Date	QC Batch ID	Method
TPH as Gasoline	230000	x	1000	50	50000	µg/L	N/A	1/30/01	WGC2010129	EPA 8015 MOD. (Purgeable)
			<b>Surrogate</b>		<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>		
			aaa-Trifluorotoluene		102			65 - 135		


DF = Dilution Factor

ND = Not Detected

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Attn: Andrew M. Galleni

Date: 2/2/01  
Date Received: 1/26/01  
Project Name: Eagle Gas  
Project Number: ZP046A  
P.O. Number:  
Sampled By: Client

## Certified Analytical Report

<b>Order ID:</b> 24175	<b>Lab Sample ID:</b> 24175-001	<b>Client Sample ID:</b> MW-1							
<b>Sample Time:</b> 3:40 PM	<b>Sample Date:</b> 1/26/01	<b>Matrix:</b> Liquid							
Parameter	Result	Flag	DF	PQL	DLR	Units	Analysis Date	QC Batch ID	Method
1,2-Dibromoethane (EDB)	ND		1000	5	5000	µg/L	1/31/01	WMS2010130	EPA 8260B
1,2-Dichloroethane	ND		1000	5	5000	µg/L	1/31/01	WMS2010130	EPA 8260B
Diisopropyl Ether	ND		1000	5	5000	µg/L	1/31/01	WMS2010130	EPA 8260B
Ethyl-t-butyl Ether	ND		1000	5	5000	µg/L	1/31/01	WMS2010130	EPA 8260B
Methyl-t-butyl Ether	77000		1000	5	5000	µg/L	1/31/01	WMS2010130	EPA 8260B
tert-Amyl Methyl Ether	ND		1000	5	5000	µg/L	1/31/01	WMS2010130	EPA 8260B
tert-Butanol	ND		1000	20	20000	µg/L	1/31/01	WMS2010130	EPA 8260B
	<b>Surrogate</b>			<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>		
	4-Bromofluorobenzene			100			65 - 135		
	Dibromofluoromethane			106			65 - 135		
	Toluene-d8			99			65 - 135		


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Date: 2/2/01  
Date Received: 1/26/01  
Project Name: Eagle Gas  
Project Number: ZP046A  
P.O. Number:  
Sampled By: Client

## Certified Analytical Report

Order ID: 24175

Lab Sample ID: 24175-002

Client Sample ID: MW-2

Sample Time: 3:15 PM

Sample Date: 1/26/01

Matrix: Liquid

Parameter	Result	Flag	DF	PQL	DLR	Units	Analysis Date	QC Batch ID	Method
1,2-Dibromoethane (EDB)	ND		10000	5	50000	µg/L	1/31/01	WMS2010130	EPA 8260B
1,2-Dichloroethane	ND		10000	5	50000	µg/L	1/31/01	WMS2010130	EPA 8260B
Diisopropyl Ether	ND		10000	5	50000	µg/L	1/31/01	WMS2010130	EPA 8260B
Ethyl-t-butyl Ether	ND		10000	5	50000	µg/L	1/31/01	WMS2010130	EPA 8260B
Methyl-t-butyl Ether	1000000		10000	5	50000	µg/L	1/31/01	WMS2010130	EPA 8260B
tert-Amyl Methyl Ether	ND		10000	5	50000	µg/L	1/31/01	WMS2010130	EPA 8260B
tert-Butanol	ND		10000	20	200000	µg/L	1/31/01	WMS2010130	EPA 8260B

### Surrogate

### Surrogate Recovery

### Control Limits (%)

4-Bromofluorobenzene  
Dibromofluoromethane  
Toluene-d8

99  
108  
100

65 - 135  
65 - 135  
65 - 135

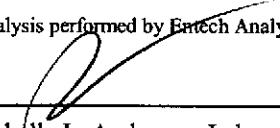
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Date: 2/2/01  
Date Received: 1/26/01  
Project Name: Eagle Gas  
Project Number: ZP046A  
P.O. Number:  
Sampled By: Client

## Certified Analytical Report

Order ID: 24175

Lab Sample ID: 24175-003

Client Sample ID: MW-3

Sample Time: 3:25 PM

Sample Date: 1/26/01

Matrix: Liquid

Parameter	Result	Flag	DF	PQL	DLR	Units	Analysis Date	QC Batch ID	Method
1,2-Dibromoethane (EDB)	ND		5000	5	25000	µg/L	1/31/01	WMS2010130	EPA 8260B
1,2-Dichloroethane	ND		5000	5	25000	µg/L	1/31/01	WMS2010130	EPA 8260B
Diisopropyl Ether	ND		5000	5	25000	µg/L	1/31/01	WMS2010130	EPA 8260B
Ethyl-t-butyl Ether	ND		5000	5	25000	µg/L	1/31/01	WMS2010130	EPA 8260B
Methyl-t-butyl Ether	330000		5000	5	25000	µg/L	1/31/01	WMS2010130	EPA 8260B
tert-Amyl Methyl Ether	ND		5000	5	25000	µg/L	1/31/01	WMS2010130	EPA 8260B
tert-Butanol	ND		5000	20	100000	µg/L	1/31/01	WMS2010130	EPA 8260B

### Surrogate

### Surrogate Recovery

### Control Limits (%)

4-Bromofluorobenzene  
Dibromofluoromethane  
Toluene-d8

101  
107  
99

65 - 135  
65 - 135  
65 - 135


DF = Dilution Factor

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## STANDARD LAB QUALIFIERS (FLAGS)

All Entech lab reports now reference standard lab qualifiers. These qualifiers are noted in the adjacent column to the analytical result and are adapted from the U.S. EPA CLP program. The current qualifier list is as follows:

Qualifier (Flag)	Description
U	Compound was analyzed for but not detected
J	Estimated value for tentatively identified compounds or if result is below PQL but above MDL
N	Presumptive evidence of a compound (for Tentatively Identified Compounds)
B	Analyte is found in the associated Method Blank
E	Compounds whose concentrations exceed the upper level of the calibration range
D	Multiple dilutions reported for analysis; discrepancies between analytes may be due to dilution
X	Results within quantitation range; chromatographic pattern not typical of fuel

# Entech Analytical Labs, Inc.

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## Quality Control Results Summary

QC Batch #: WGC2010130  
Matrix: Liquid

Units:  $\mu\text{g/L}$   
Date Analyzed: 1/30/01

Parameter	Method	Blank Result	Spike Sample ID	Spike Amount	Sample Result	Spike Result	QC Type	% Recovery	RPD	RPD Limits	Recovery Limits
<b>Test: TPH as Gasoline</b>											
TPH as Gasoline	EPA 8015 M	ND		561		529.8	LCS	94.4			65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>					
	aaa-Trifluorotoluene			102		65 - 135					
<b>Test: BTEX</b>											
Benzene	EPA 8020	ND		6.2		6.08	LCS	98.1			65.0 - 135.0
Ethyl Benzene	EPA 8020	ND		7.8		6.61	LCS	84.7			65.0 - 135.0
Toluene	EPA 8020	ND		35.8		29.7	LCS	83.0			65.0 - 135.0
Xylenes, total	EPA 8020	ND		43		36.2	LCS	84.2			65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>					
	aaa-Trifluorotoluene			96		65 - 135					
<b>Test: TPH as Gasoline</b>											
TPH as Gasoline	EPA 8015 M	ND		561		549.6	LCSD	98.0	3.67	25.00	65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>					
	aaa-Trifluorotoluene			102		65 - 135					
<b>Test: BTEX</b>											
Benzene	EPA 8020	ND		6.2		6.49	LCSD	104.7	6.52	25.00	65.0 - 135.0
Ethyl Benzene	EPA 8020	ND		7.8		6.83	LCSD	87.6	3.27	25.00	65.0 - 135.0
Toluene	EPA 8020	ND		35.8		31.1	LCSD	86.9	4.61	25.00	65.0 - 135.0
Xylenes, total	EPA 8020	ND		43		37.3	LCSD	86.7	2.99	25.00	65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>			<b>Control Limits (%)</b>					
	aaa-Trifluorotoluene			97		65 - 135					

# Entech Analytical Labs, Inc.

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## Quality Control Results Summary

QC Batch #: DW010107

Units: µg/L

Matrix: Liquid

Date Analyzed: 1/30/01

Parameter	Method	Blank Result	Spike Sample ID	Spike Amount	Sample Result	Spike Result	QC Type	% Recovery	RPD	RPD Limits	Recovery Limits
<b>Test:</b> TPH as Diesel											
TPH as Diesel	EPA 8015 M	ND		1000		708.12	LCS	70.8			50.0 - 135.0
	<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>					
	o-Terphenyl			70		45 - 105					
<b>Test:</b> TPH as Diesel											
TPH as Diesel	EPA 8015 M	ND		1000		753.94	LCSD	75.4	6.27		50.0 - 135.0
	<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>					
	o-Terphenyl			75		45 - 105					

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## Quality Control Results Summary

QC Batch #: WMS2010130

Units: µg/L

Matrix: Liquid

Date Analyzed: 1/30/01

Parameter	Method	Blank Result	Spike Sample ID	Spike Amount	Sample Result	Spike Result	QC Type	% Recovery	RPD	RPD Limits	Recovery Limits
<b>Test: EPA 8260B</b>											
1,1-Dichloroethene	EPA 8260B	ND		40		35.6	LCS	89.0			65.0 - 135.0
Benzene	EPA 8260B	ND		40		39.9	LCS	99.8			65.0 - 135.0
Chlorobenzene	EPA 8260B	ND		40		37.5	LCS	93.8			65.0 - 135.0
Methyl-t-butyl Ether	EPA 8260B	ND		40		38.8	LCS	97.0			65.0 - 135.0
Toluene	EPA 8260B	ND		40		37.3	LCS	93.2			65.0 - 135.0
Trichloroethene	EPA 8260B	ND		40		36.8	LCS	92.0			65.0 - 135.0

Surrogate	Surrogate Recovery	Control Limits (%)
4-Bromofluorobenzene	103	65 - 135
Dibromofluoromethane	98	57 - 139
Toluene-d8	101	65 - 135

<b>Test: EPA 8260B</b>											
1,1-Dichloroethene	EPA 8260B	ND		40		34.8	LCSD	87.0	2.27	25.00	65.0 - 135.0
Benzene	EPA 8260B	ND		40		40.3	LCSD	100.7	1.00	25.00	65.0 - 135.0
Chlorobenzene	EPA 8260B	ND		40		37.7	LCSD	94.3	0.53	25.00	65.0 - 135.0
Methyl-t-butyl Ether	EPA 8260B	ND		40		38.8	LCSD	97.0	0.00	25.00	65.0 - 135.0
Toluene	EPA 8260B	ND		40		37.5	LCSD	93.8	0.53	25.00	65.0 - 135.0
Trichloroethene	EPA 8260B	ND		40		36.7	LCSD	91.8	0.27	25.00	65.0 - 135.0

Surrogate	Surrogate Recovery	Control Limits (%)
4-Bromofluorobenzene	103	65 - 135
Dibromofluoromethane	101	57 - 139
Toluene-d8	102	65 - 135

# Entech Analytical Labs, Inc.

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## Quality Control Results Summary

QC Batch #: WGC2010129

Units: µg/L

Matrix: Liquid

Date Analyzed: 1/29/01

Parameter	Method	Blank Result	Spike Sample ID	Spike Amount	Sample Result	Spike Result	QC Type	% Recovery	RPD	RPD Limits	Recovery Limits
<b>Test: TPH as Gasoline</b>											
TPH as Gasoline	EPA 8015 M	ND		561		568.7	LCS	101.4			65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>						
	aaa-Trifluorotoluene			104				65 - 135			
<b>Test: BTEX</b>											
Benzene	EPA 8020	ND		6.2		6.21	LCS	100.2			65.0 - 135.0
Ethyl Benzene	EPA 8020	ND		7.8		6.57	LCS	84.2			65.0 - 135.0
Toluene	EPA 8020	ND		35.8		29.7	LCS	83.0			65.0 - 135.0
Xylenes, total	EPA 8020	ND		43		35.6	LCS	82.8			65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>						
	aaa-Trifluorotoluene			97				65 - 135			
<b>Test: MTBE by EPA 8020</b>											
Methyl-t-butyl Ether	EPA 8020	ND		52.8		51.1	LCS	96.8			65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>						
	aaa-Trifluorotoluene			97				65 - 135			
<b>Test: TPH as Gasoline</b>											
TPH as Gasoline	EPA 8015 M	ND		561		537.1	LCSD	95.7	5.72	25.00	65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>						
	aaa-Trifluorotoluene			103				65 - 135			
<b>Test: BTEX</b>											
Benzene	EPA 8020	ND		6.2		6.18	LCSD	99.7	0.48	25.00	65.0 - 135.0
Ethyl Benzene	EPA 8020	ND		7.8		6.48	LCSD	83.1	1.38	25.00	65.0 - 135.0
Toluene	EPA 8020	ND		35.8		30.2	LCSD	84.4	1.67	25.00	65.0 - 135.0
Xylenes, total	EPA 8020	ND		43		36.0	LCSD	83.7	1.12	25.00	65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>						
	aaa-Trifluorotoluene			97				65 - 135			
<b>Test: MTBE by EPA 8020</b>											
Methyl-t-butyl Ether	EPA 8020	ND		52.8		51.4	LCSD	97.3	0.59	25.00	65.0 - 135.0
<b>Surrogate</b>			<b>Surrogate Recovery</b>		<b>Control Limits (%)</b>						
	aaa-Trifluorotoluene			97				65 - 135			

