

**RECEIVED**

By loprojectop at 9:04 am, May 08, 2006

Mr. Jerry Wickham  
Hazardous Materials Specialist  
Alameda County Health Care Services Agency  
Environmental Health Services  
Environmental Protection  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

RE: Eagle Gas Station  
4301 San Leandro Street  
Oakland, California 94601  
LOP StID# 2118  
Fuel Leak Case No. R00000096  
USTCF Claim No. 014551  
Clearwater Group Project # ZP046

Dear Mr. Wickham,

As the legally authorized representative of the above-referenced project location I have reviewed the following lists of reports prepared by my consultant of record, Clearwater Group, Inc. I declare, under penalty of perjury, that the information and/or recommendations contained in each report listed below are true and correct to the best of my knowledge.

- *Recommendations for Interim Site Remediation* dated June 13, 2005.
- *Soil and Groundwater Investigation Work Plan* dated August 10, 2005.
- *3) Response to Comments (RTC)* dated October 6, 2005.
- *4) Notice for Interim Remediation Groundwater Treatment Pilot* dated November 1, 2005.
- *Workplan for Ozone Bench Test* dated December 19, 2005.
- *Request for Extension of the Interim Remediation Start-up Report* dated January 11, 2006.
- *Activity Status Report/Request for Extension of the Soil and Groundwater Investigation Report* on March 1, 2006.
- *Bench Test for Using Advanced Oxidation - A Summary Report* dated March 22, 2006.
- *Groundwater Monitoring Reports First Quarter through Fourth Quarter 2005.*

Sincerely,



Mr. Muhammad Jamil



**RECEIVED**

By lopprojectop at 9:05 am, May 08, 2006

**FILE COPY**

March 22, 2006

Mr. Jerry Wickham  
Hazardous Materials Specialist  
Alameda County Environmental Health Services  
Environmental Protection Division  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**Re: Bench Test for Using Advanced Oxidation – A Summary Report**  
Eagle Gas Station  
4301 San Leandro Street  
Oakland, California 94601  
LOP Site ID# 2118  
USTCF Claim No. 014551  
Clearwater Project No. ZP046D

Dear Mr. Wickham:

To evaluate the feasibility of using Ozone/Hydrogen Peroxide – an Advanced Oxidation (AO) technology - to treat the groundwater extracted from the subject site, Clearwater Group (Clearwater) conducted a bench test on December 21, 2005. Clearwater prepared this letter report to summarize the test results, findings, and recommendations.

#### **BACKGROUND**

For the design of a site interim remedial system requested in Alameda County Environmental Health Services' (ACEHS) May 26, 2005 letter (attached), a cost-efficient groundwater treatment technology has to be selected based on bench testing. Groundwater near the southeast boundary of the subject site, where the groundwater extraction wells EW-1 and EW-2 are located, has relatively high MTBE, TBA, and TPH-g concentrations (MTBE: 430 mg/L, TBA: 130 mg/L, and TPH-g greater than 70 mg/L in well MW-2 sampled on November 16, 2005). TBA and MTBE are the major concern for the site, while petroleum hydrocarbons are not a major concern.



If the extracted groundwater flow is greater than 10 gallons per minute (gpm), the cost of using activated carbon columns would be extremely high. Thus, Clearwater Group (Clearwater) recommended a pilot test for the Advanced Oxidation technology. ACEHS concurred with the Clearwater pilot test in the letter of November 1, 2005 and in various emails dated October 5, 2005, November 7, 2005 and November 23, 2005 (attached). Clearwater staff explained the pilot test process to be undertaken at the Subject Property in writing to the ACEHS. The pilot test was started on November 18, 2005 with the groundwater extraction process. Clearwater discovered several critical issues and limitations particular to the site. The first issue, a technical concern was the low groundwater yield and recharge of the aquifer. The second important constraint is the unsafe work environment for field personnel related to security problems during the day and the large amount of street traffic on the property. These issues prevented the completion of the pilot test as originally planned at the Subject Property location. Clearwater reported to the ACEHS the findings and issues regarding the pilot test, and also recommended to replace the pilot test by a bench scale test in an e-mail correspondence to ACEHS dated November 23, 2005 (attached).

## **TEST ACTIVITY**

A workplan (attached) was prepared to guide the test prior to the bench test. Approximately 30 gallons of groundwater extracted from monitoring wells MW-1 through MW-3 on November 18, 2005 during the pilot test was used for the bench test. The bench scale test was performed on December 21, 2005. A pilot scale ozone test system (PSOTS) developed by Ozotech, Inc. was rented for the testing. The unit includes an ozone generator, hydrogen peroxide pump and contact tank, and multiple UV light units. The PSOTS unit can produce 10.38 grams of ozone per hour (0.55 lb/day) and can handle an inflow of 11 gallons per minute.

The bench test included two scenarios: ozone only (Test T1) and ozone and hydrogen peroxide without pH adjustment (Test T2). Water was sampled before the test and at 5, 15, 20, and 30 minutes after treatment began. Samples obtained from the bench test data were sent to Kiff Analytical, LLC of Davis, California. The lab report dated December 30, 2005 is attached. Charts showing the decreases in MTBE and TBA concentrations for Test 1 and Test 2 are attached.

## TEST RESULTS

The bench test results are summarized below:

### Test 1 (T1; ozone only)

Time (minutes)	MTBE (µg/L)	Removal Efficiency (%)	TBA (µg/L)	Removal Efficiency (%)	TPH-g (µg/L)	Removal Efficiency (%)
0	2,200	---	71,000	---	<4,000	---
5	1,900	14	71,000	0	<4,000	0
15	1,500	32	68,000	4	<4,000	0
20	1,400	36	68,000	4	<4,000	0
30	1,200	45	64,000	10	<4,000	0

### Test 2 (T2; ozone and hydrogen peroxide)

Time (minutes)	MTBE (µg/L)	Removal Efficiency (%)	TBA (µg/L)	Removal Efficiency (%)	TPH-g (µg/L)	Removal Efficiency (%)
0	2,000	---	69,000	---	<4,000	---
5	2,000	0	71,000	0	<4,000	0
15	1,500	25	76,000	0	<3,000	0
20	1,500	25	70,000	0	<4,000	0
30	1,300	35	69,000	0	<4,000	0

## FINDINGS

- Only 45 % to 35% of MTBE was removed from the influent stream at 30 minutes after ozone sparging;
- TBA was ineffectively treated, and the TPH-g treatment efficiency could not be evaluated due to the associated Method Reporting Limit (The TPH-g analysis could be influenced by the MTBE and TBA concentrations);
- The treatment efficiency could be increased by including the UV lights and the adjustment of pH value to 3;
- The treatment efficiency could be increased if the treatment time or retention time is longer than 30 minutes;



- The use of retention time (treatment time) longer than 30 minutes may not be beneficial because the life-time of ozone is normally less than 20 minutes, and use of a longer retention will result in a larger treatment system; and
- Even after 30 minutes, the ozone generated by the pilot test unit was not sufficient to treat the high concentrations of MTBE and TBA encountered at the subject site.

## **DISCUSSION**

A preliminary cost evaluation of treatment using ozone, ozone with peroxide, ozone with ultraviolet (UV) and granular activated carbon was performed for above-ground treatment of the TBA and MTBE (see attached table). Clearwater evaluated various technologies to treat the TBA and MTBE impacted water. Given the low groundwater flow rates, the limited on-site space for ozone treatment units and the extra cost of the ozone units over the passive carbon canisters, it appears that the most economical method of treatment will be granular activated carbon.

## **RECOMMENDATIONS**

The major target compounds for AO technology are MTBE and TBA. Due to the low treatment efficiency determined from the bench test, the AO technology was either inefficient or impractical because a large treatment unit with retention time longer than 30 minutes is needed. Based on the low groundwater yield determined from the pilot test and the low treatment efficiency identified from the bench test, activated carbon will be more cost-effective.

The reasons of using Granular Activated Carbon (GAC) to replace the AO technology are listed below:

1. A large AO system will be needed to treat the current MTBE and TBA levels to an acceptable discharge level. As a result, the ground area required for a remedial compound will be larger than that allowed. A roof also will be required for the compound.
2. The capital cost for a full-scale AO system will be higher than the cost of a GAC system.
3. Due to the low groundwater yield, the inflow to the treatment system will not be continuous. The intermittent flow will make the control of the AO system more complicated. This implies more operation and maintenance problems and possibly higher cost.



4. GAC is very suitable to handle the intermittent flow. Due to the low groundwater yield identified during the pilot test, the anticipated costs for GAC and the associated change-out frequency will not be as high as originally calculated when the flow rate was estimated to be 10 gallons per minute.
5. A roof is not needed for the GAC, unless the security becomes a concern.
6. The AO system needs much more electric power than the GAC system.



Should you have any questions regarding the test results and recommendations, please do not hesitate to call me at (510) 307-9943 ext. 231.

Sincerely,  
Clearwater Group

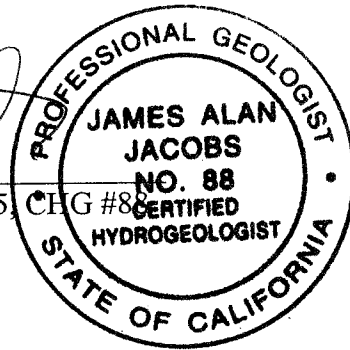
A handwritten signature in black ink, appearing to read "Jim Ho", written over a horizontal line.

Jim Ho, PhD, PE  
Principal Engineer

Reviewed by:

A handwritten signature in black ink, appearing to read "James A. Jacobs", written over a horizontal line.

James A. Jacobs, PG #4815, CHG #88  
Chief Hydrogeologist





**ATTACHMENT - COSTS OF TREATMENT OPTIONS**

<b>Treatment Technology</b>	<b>Summary</b>	<b>Description</b>	<b>Estimated Costs for 1 year</b>
Ozone alone; batch treatment <sup>1</sup>	126 lbs/day ozone unit	(2) 63 lbs/day units, (1) 5,000 gallon treatment tank	\$255,000
Ozone alone; batch treatment <sup>2</sup>	114 lbs/day ozone unit	(4) 28.5 lbs/day units, (1) 5,000 gallon treatment tank	\$426,000
Ozone alone; batch treatment <sup>3</sup>	131 lbs/day ozone unit	(15) 8.7 lb/day units, (1) 5,000 gallon treatment tank	\$680,970
Ozone with hydrogen peroxide, batch treatment <sup>1</sup>	56 lbs/day ozone unit with peroxide mixer	(2) 28 lbs/day units, (1) 5,000 gallon treatment tank	\$135,000
Ozone with hydrogen peroxide or ultraviolet batch treatment <sup>3</sup>	70 lbs/day ozone unit with peroxide mixer	(8) 8.7 lb/day units, (1) 5,000 gallon treatment tank	\$370,184
Granular Activated Carbon <sup>4</sup>	200 lbs of carbon used per day; 35 change outs per year	(35) change outs. (2) 2,000 lb GAC, (1) prefilter	\$111,500

**Assumptions:**

- Constant concentrations: 75 mg/L TBA; 5 mg/L MTBE, TPH-g: 5 mg/L
- Constant flow at 10-12 gpm for 1 year.
- Costs are estimated for purchase.
- Rental rates were not economic for the proposed 1-year treatment period.
- Given the high concentration of the TBA, ozone and advanced oxidation (ozone and hydrogen peroxide) would require a batch treatment using (1) 5,000 gallon tank to allow for adequate retention treatment time.





- Assume on-site operations for remediation: 1 visit per month to verify operations for 1 year (12 visits @ \$1,500/visit) = \$18,000 added to all estimated costs. Electrical costs for ozone systems would be added to the estimate.

Notes: For ozone treatment alone, units producing 114 to 131 lb/day were estimated. For ozone with hydrogen peroxide (or ultraviolet), the units producing between 56 to 70 lbs/day were estimated.

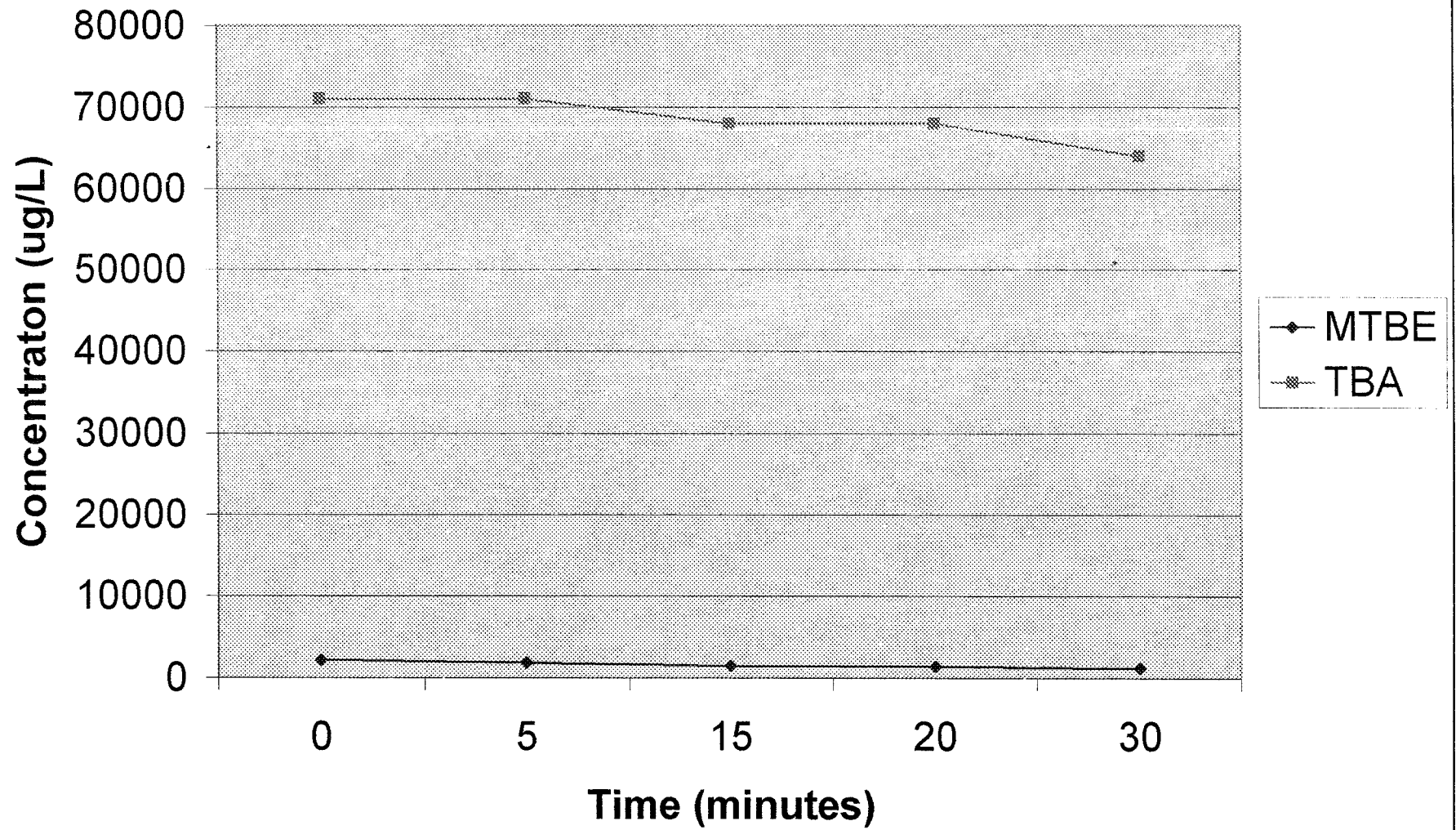
<sup>1</sup> Piper Environmental Group, [www.peg-inc.com](http://www.peg-inc.com); phone: 831-632-2700

<sup>2</sup> H<sub>2</sub>O Environmental Group, [www.h2oengineering.com](http://www.h2oengineering.com), phone: 805-547-0303

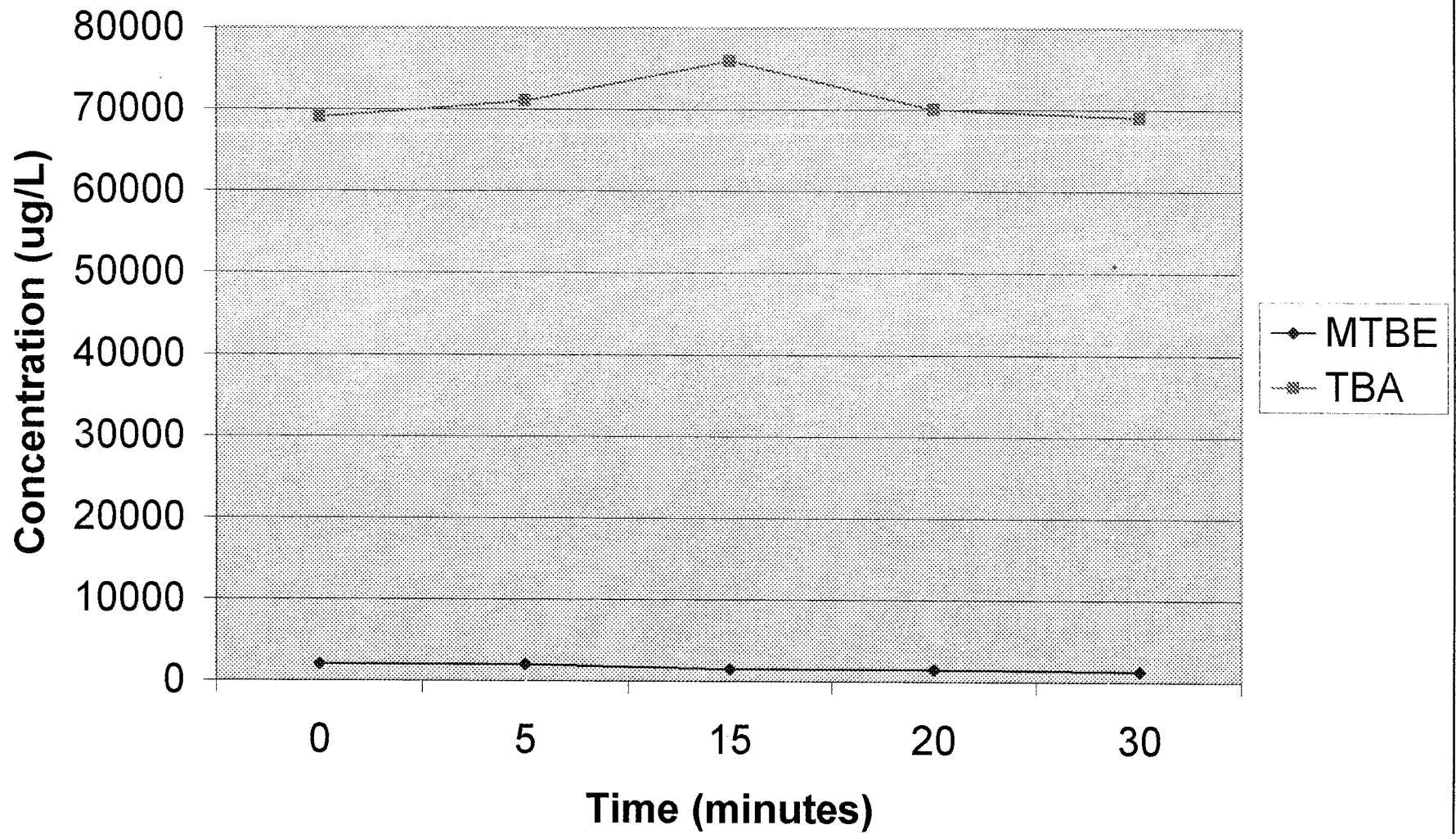
<sup>3</sup> Ozotech, [www.ozotech.com](http://www.ozotech.com), phone: 530-842-4189

<sup>4</sup> US Filter, [www.usfilter.com](http://www.usfilter.com), phone: 800-659-1718

# Test 1



## Test 2





Report Number : 47616

Date : 12/30/2005

Jim Ho  
Clearwater Group, Inc.  
229 Tewksbury Avenue  
Point Richmond, CA 94801

Subject : 10 Water Samples  
Project Name : Naz-EAGLE GAS  
Project Number : ZP046D

Dear Mr. Ho,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,



Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : **T1-0**

Matrix : Water

Lab Number : 47616-01

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	<b>2200</b>	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	<b>71000</b>	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< <b>4000</b>	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	97.6		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	93.4		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : Naz-EAGLE GAS

Project Number : ZP046D

Sample : T1-5

Matrix : Water

Lab Number : 47616-02

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 40	40	ug/L	EPA 8260B	12/28/2005
Toluene	< 40	40	ug/L	EPA 8260B	12/28/2005
Ethylbenzene	< 40	40	ug/L	EPA 8260B	12/28/2005
Total Xylenes	< 40	40	ug/L	EPA 8260B	12/28/2005
Methyl-t-butyl ether (MTBE)	1900	40	ug/L	EPA 8260B	12/28/2005
Tert-Butanol	71000	200	ug/L	EPA 8260B	12/28/2005
TPH as Gasoline	< 4000	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	98.1		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	94.5		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : Naz-EAGLE GAS

Project Number : ZP046D

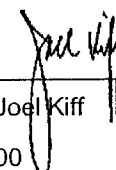
Sample : T1-15

Matrix : Water

Lab Number : 47616-03

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	1500	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	68000	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< 4000	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	96.8		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/28/2005

Approved By:  \_\_\_\_\_  
 Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : **T1-20**

Matrix : Water

Lab Number : 47616-04

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	<b>1400</b>	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	<b>68000</b>	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< <b>4000</b>	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff





Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : **T1-30**

Matrix : Water

Lab Number : 47616-05

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	1200	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	64000	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< 4000	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	98.4		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	99.7		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : T2-0

Matrix : Water

Lab Number : 47616-06

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	<b>2000</b>	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	<b>69000</b>	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< 4000	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : **T2-5** Matrix : Water Lab Number : 47616-07

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	2000	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	71000	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< 4000	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	98.1		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	95.8		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : **T2-15**

Matrix : Water

Lab Number : 47616-08

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 30	30	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 30	30	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 30	30	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 30	30	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	1500	30	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	76000	150	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< 3000	3000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	99.2		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	115		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : **T2-20**

Matrix : Water

Lab Number : 47616-09

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	1500	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	70000	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< 4000	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	99.1		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	93.4		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff



Report Number : 47616

Date : 12/30/2005

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Sample : **T2-30**

Matrix : Water

Lab Number : 47616-10

Sample Date :12/21/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Toluene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Ethylbenzene</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Total Xylenes</b>	< 40	40	ug/L	EPA 8260B	12/28/2005
<b>Methyl-t-butyl ether (MTBE)</b>	<b>1300</b>	40	ug/L	EPA 8260B	12/28/2005
<b>Tert-Butanol</b>	<b>69000</b>	200	ug/L	EPA 8260B	12/28/2005
<b>TPH as Gasoline</b>	< 4000	4000	ug/L	EPA 8260B	12/28/2005
Toluene - d8 (Surr)	97.6		% Recovery	EPA 8260B	12/28/2005
4-Bromofluorobenzene (Surr)	95.2		% Recovery	EPA 8260B	12/28/2005

Approved By:

Joel Kiff

Report Number : 47616

Date : 12/30/2005

**QC Report : Method Blank Data**

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2005
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/27/2005
Toluene - d8 (Surr)	94.2		%	EPA 8260B	12/27/2005
4-Bromofluorobenzene (Surr)	118		%	EPA 8260B	12/27/2005
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/27/2005
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	12/27/2005
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/27/2005
Toluene - d8 (Surr)	99.2		%	EPA 8260B	12/27/2005
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	12/27/2005

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
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Approved By:  Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 47616


Date : 12/30/2005

**QC Report : Matrix Spike/ Matrix Spike Duplicate**

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	47627-01	<0.50	39.8	39.9	38.3	39.3	ug/L	EPA 8260B	12/27/05	96.2	98.5	2.38	70-130	25
Toluene	47627-01	0.68	39.8	39.9	35.5	36.2	ug/L	EPA 8260B	12/27/05	87.5	88.9	1.59	70-130	25
Tert-Butanol	47627-01	<5.0	199	200	183	185	ug/L	EPA 8260B	12/27/05	92.0	92.8	0.873	70-130	25
Methyl-t-Butyl Ether	47627-01	<0.50	39.8	39.9	38.1	40.9	ug/L	EPA 8260B	12/27/05	95.6	102	6.94	70-130	25
Benzene	47572-01	<0.50	40.0	39.3	39.5	39.2	ug/L	EPA 8260B	12/28/05	98.8	99.7	0.948	70-130	25
Toluene	47572-01	<0.50	40.0	39.3	37.4	36.6	ug/L	EPA 8260B	12/28/05	93.4	93.3	0.122	70-130	25
Tert-Butanol	47572-01	<5.0	200	196	194	188	ug/L	EPA 8260B	12/28/05	96.9	95.6	1.32	70-130	25
Methyl-t-Butyl Ether	47572-01	7.6	40.0	39.3	45.9	45.2	ug/L	EPA 8260B	12/28/05	95.7	95.7	0.0113	70-130	25

Approved By:  \_\_\_\_\_  
 Joel Kiff



Report Number : 47616

Date : 12/30/2005

**QC Report : Laboratory Control Sample (LCS)**

Project Name : **Naz-EAGLE GAS**

Project Number : **ZP046D**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	12/27/05	97.0	70-130
Toluene	40.0	ug/L	EPA 8260B	12/27/05	88.3	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/27/05	92.5	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/27/05	97.4	70-130
Benzene	40.0	ug/L	EPA 8260B	12/27/05	99.1	70-130
Toluene	40.0	ug/L	EPA 8260B	12/27/05	94.4	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/27/05	98.0	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/27/05	92.9	70-130

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