Quarterly Groundwater Monitoring Report
Second Quarter 2005

City of Arcata Corporation Yard
Arcata, California
Case No. 1NHU767

Prepared for:

The City of Arcata

Consulting Engineers & Geologists, Inc.

812 W. Wabash Avenue
Eureka, CA 95501-2138
707/441-8855

September 2005
000108.100

CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W. Wabash • Eureka, CA 95501-2138 • 707-441-8855 • Fax 707-441-8877 • info@shn-eureka.com

Reference: 000108.100

September 28, 2005

Mr. Kim Watson, Superintendent of Public Works
City of Arcata
736 F Street
Arcata, CA 95521

Subject: **Quarterly Groundwater Monitoring Report, Second Quarter 2005, City of Arcata Corporation Yard, 600 South G Street, Arcata, California; Case No. 1NHU767**

Dear Mr. Watson:

This report presents the results of the quarterly groundwater-monitoring event, the operation of the groundwater extraction system, and biopile monitoring at the City of Arcata, Department of Public Works Corporation Yard for the second quarter of 2005. This work was performed by SHN Consulting Engineers & Geologists, Inc. (SHN) in accordance with our service agreement with the City of Arcata. City of Arcata employees conducted the second quarter monitoring activities on, April 20, 2005.

SHN is requesting a final round of confirmation sampling for the biopile and subsequent closure.

If you have any questions, please call me at 707/441-8855.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.

Roland M. Rueber FOR MKF

Mike Foget, P.E.
Project Engineer

MKF/ADM:lms
Attachment: Report
copy w/attach: Steve Tyler, City of Arcata
Ron Allen, RWQCB
Melissa Martel, HCDEH

Reference: 000108.100

Quarterly Groundwater Monitoring Report
Second Quarter 2005

City of Arcata Corporation Yard
600 South G Street
Arcata, California

Prepared for:

The City of Arcata

Prepared by:

Consulting Engineers & Geologists, Inc.
812 W. Wabash Avenue
Eureka, CA 95501-2138
707/441-8855

REGISTERED GEOLOGIST
ROLAND MICHAEL RUEBER
No. 7629
Exp. 6/30/06
STATE OF CALIFORNIA

September 2005

QA/QC:MKF___

Table of Contents

		Page
1.0	Introduction	1
2.0	Field Activities	1
2.1	Monitoring Well Sampling	1
2.2	Laboratory Analytical Methods	1
2.3	Equipment Decontamination Procedures	2
2.4	Investigation-Derived Wastewater Management	2
3.0	Groundwater Monitoring Results	2
3.1	Hydrogeology	2
3.2	Groundwater Analytical Results	2
3.3	Groundwater Extraction and Treatment System	4
3.4	Biopile Monitoring	4
4.0	Discussion and Recommendations	6
5.0	References Cited	6

Appendices

A. Field Notes
B. Historic Monitoring Data
C. Laboratory Analytical Report

List of Illustrations

Figures — **Follows Page**

1. Site Location Map 1
2. Site Plan 1
3. Groundwater Contours, April 20, 2005 2
4. Groundwater Contaminant Concentrations, April 20, 2005 3
5. Proposed Levee Construction 6

Tables — **Page**

1. Groundwater Elevations, April 20, 2005 2
2. Groundwater Analytical Results, April 20, 2005 3
3. Groundwater Extraction and Treatment System Monthly Operation Data 4
4. Stockpile/Biopile Petroleum Hydrocarbons Concentrations 5

Abbreviations and Acronyms

<	Denotes a value that is "less than" the method detection limit
ppm	parts per million
ug/g	micrograms per gram
ug/L	micrograms per Liter
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes
DIPE	Diisopropyl Ether
EPA	(U. S.) Environmental Protection Agency
ETBE	Ethyl Tertiary-Butyl Ether
MSL	Mean Sea Level
MTBE	Methyl Tertiary-Butyl Ether
MW-#	Monitoring Well-#
RAIR	Remedial Action Implementation Report
RWQCB	California Regional Water Quality Control Board, North Coat Region
SHN	SHN Consulting Engineers & Geologists, Inc.
SP-#	Stockpile sample-number
TAME	Tertiary-Amyl Butyl Ether
TBA	Tertiary-Butyl Alcohol
TPHD	Total Petroleum Hydrocarbons as Diesel
TPHG	Total Petroleum Hydrocarbons as Gasoline
TPHMO	Total Petroleum Hydrocarbons as Motor Oil
VOC	Volatile Organic Compound

1.0 Introduction

This report presents the results of groundwater monitoring activities, groundwater extraction, and monthly biopile monitoring for the second quarter 2005, conducted at the City of Arcata Corporation Yard. Under the direction of SHN Consulting Engineers & Geologists, Inc. (SHN), the City of Arcata (Arcata) conducted the quarterly monitoring of six groundwater wells located at their corporation yard. The site is located on South G Street adjacent to Butcher's Slough and Arcata Bay. The corporation yard houses the City of Arcata's wastewater treatment plant and the Department of Public Works' vehicle maintenance and equipment storage facilities. The site lies within Section 32 of Township 5 North, Range 1 East, Humboldt Base and Meridian (Figure 1).

Second quarter 2005, monitoring activities are presented in five sections. This section serves as an introduction for the report. Section 2.0 describes the field program for the work conducted during this monitoring event. Section 3.0 includes a discussion of the results of the monitoring activities. Section 4.0 presents our conclusions and site recommendations. Section 5.0 includes references cited in this report.

The objective of this work was to assess groundwater conditions beneath the site over time.

2.0 Field Activities

2.1 Monitoring Well Sampling

On April 20, 2005, City of Arcata personnel performed groundwater monitoring in wells MW-1 through MW-6, to aid in assessing current groundwater conditions beneath the site, including the direction of groundwater flow. A site map showing the locations of the existing monitoring wells is included as Figure 2. As part of the groundwater-monitoring program, each well was measured for depth to groundwater and sampled for water quality. During purging, each well was monitored for electrical conductivity and temperature using portable instrumentation, and pH was measured using portable pH test strips.

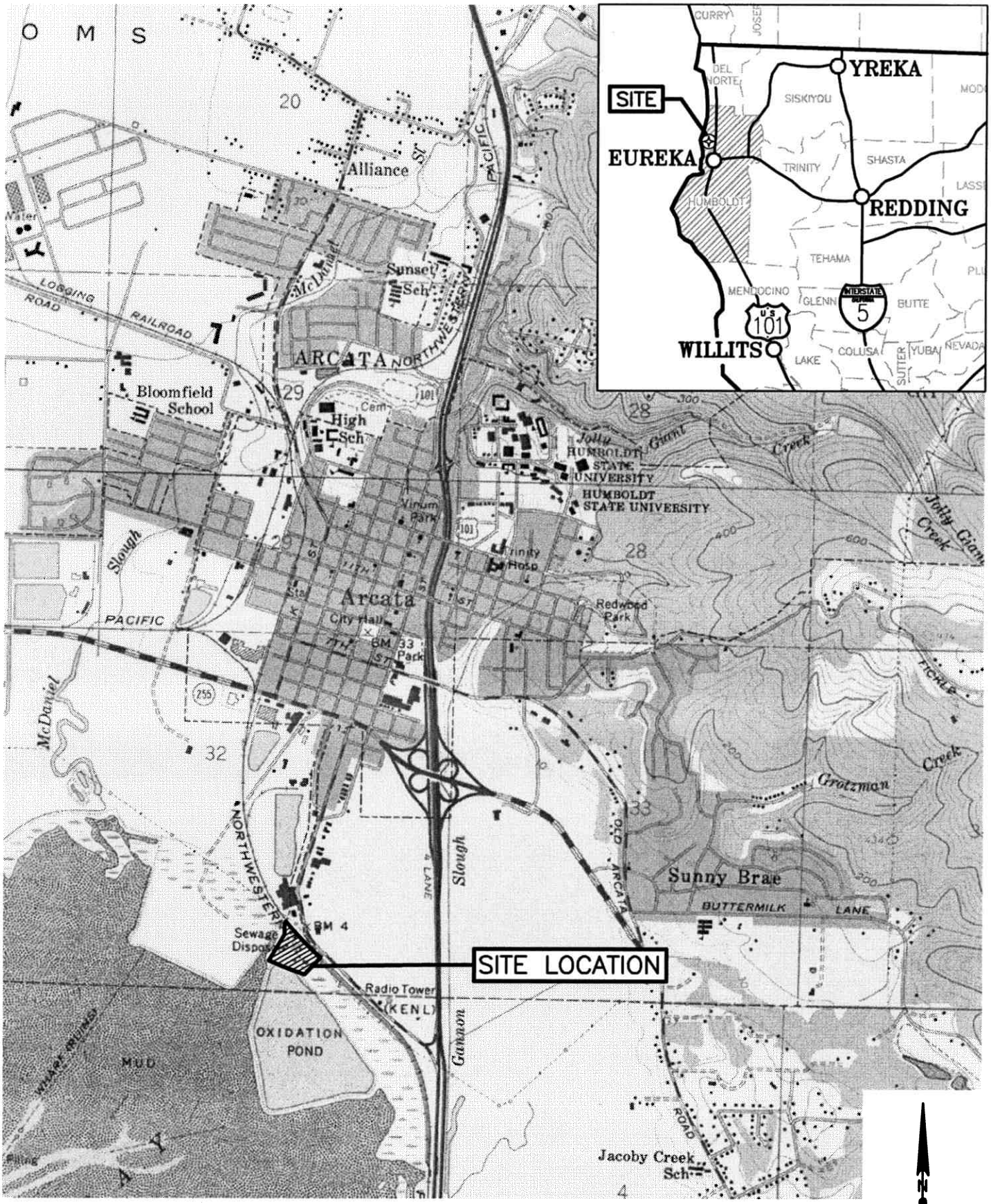
Upon completion of the well purging activities, a groundwater sample was collected from each well using a disposable polyethylene bailer, and transferred into laboratory-supplied containers. The water samples were then labeled, stored in an iced cooler, and transported to the laboratory under proper chain-of-custody documentation. Field notes from the April 20, 2005, groundwater-monitoring event are included in Appendix A.

2.2 Laboratory Analytical Methods

Each of the groundwater samples was analyzed for:

- Total Petroleum Hydrocarbons as Diesel (TPHD) with silica gel clean up in general accordance with U.S. Environmental Protection Agency (EPA) Method No. 3510 GCFID.
- Total Petroleum Hydrocarbons as Gasoline (TPHG) and Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX) in general accordance with EPA Method No. 8260B Modified.
- Fuel Oxygenates in general accordance with EPA Method No. 8260B Modified.

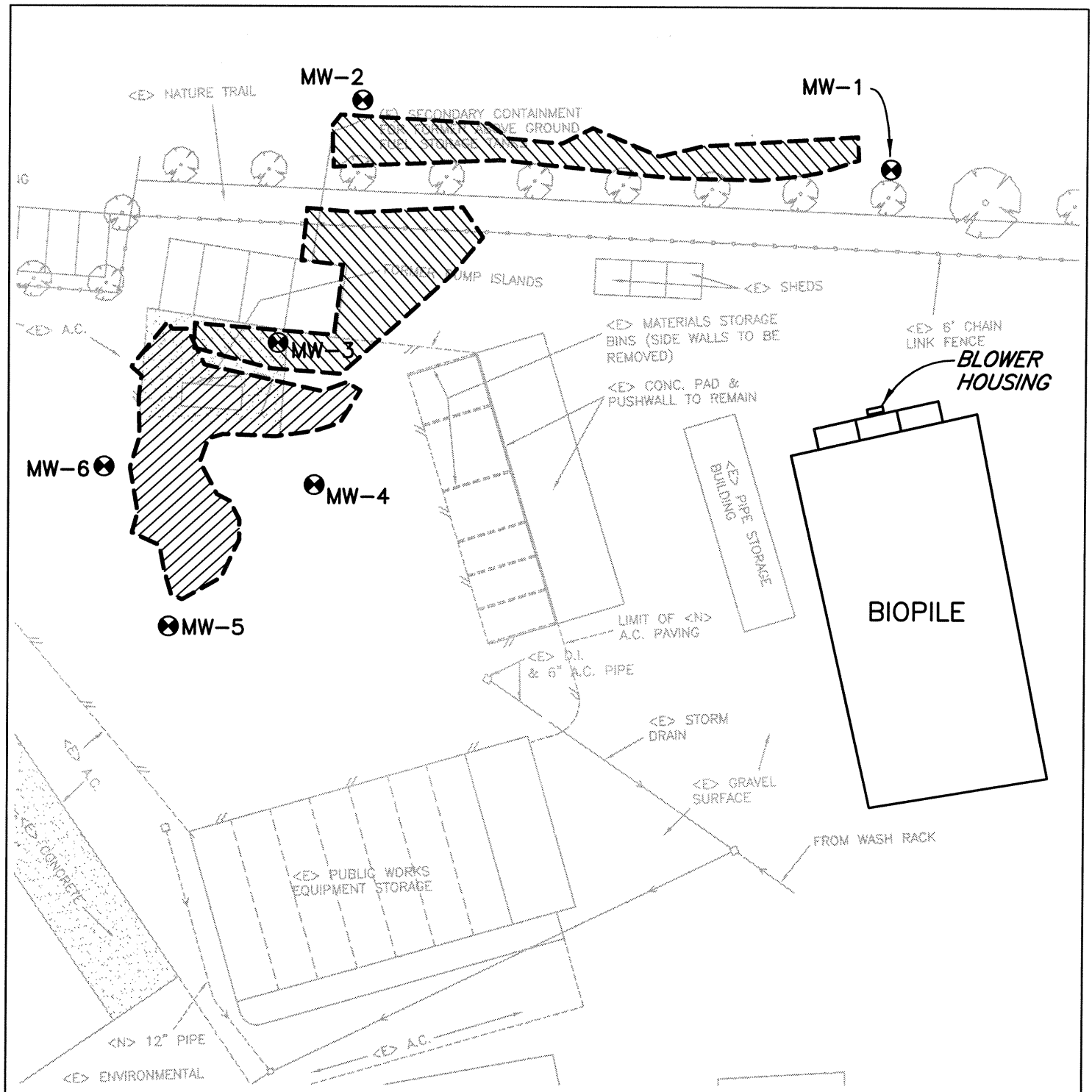
North Coast Laboratories Ltd., a state-certified analytical laboratory located in Arcata, California, performed all of the sample analyses.



SOURCE: ARCATA NORTH & SOUTH
USGS 7.5 MINUTE
QUADRANGLE

1"=2000'±

SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California		Site Location Map SHN 000108.100
	August, 2005	000108.100-VIC-MAP	Figure 1



EXPLANATION

MW-5 *MONITORING WELL LOCATION AND DESIGNATION*

LIMIT OF EXCAVATION NOVEMBER 2000

LIMIT OF EXCAVATION OCTOBER 2001

1"=40'±

SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California	Site Plan SHN 000108.100
	August, 2005	000108.100-SI1	Figure 2

2.3 Equipment Decontamination Procedures

All well purging and sampling equipment was cleaned prior to being transported to the corporation yard site. All small equipment that required on-site cleaning was decontaminated using the triple wash system. The equipment was first washed in a water solution containing Liquinox® cleaner, followed by a water rinse, then by a distilled water rinse. All of the groundwater samples were collected using pre-cleaned, disposable bailers, and transferred into laboratory-supplied containers.

2.4 Investigation-Derived Wastewater Management

Water used for decontaminating field equipment and all well purge water was placed into 5-gallon buckets, and subsequently transported to, and disposed of at the City of Arcata wastewater treatment facility.

3.0 Groundwater Monitoring Results

3.1 Hydrogeology

Depth-to-groundwater measurements were collected from each monitoring well prior to sampling, and are shown in Table 1. On April 20, 2005, the direction of groundwater flow beneath the site was inconsistent (Figure 3). Gradient calculations were not performed for the second quarter 2005, but historically, groundwater flows to the northeast. Historical groundwater elevation data are included in Appendix B, Table B-1.

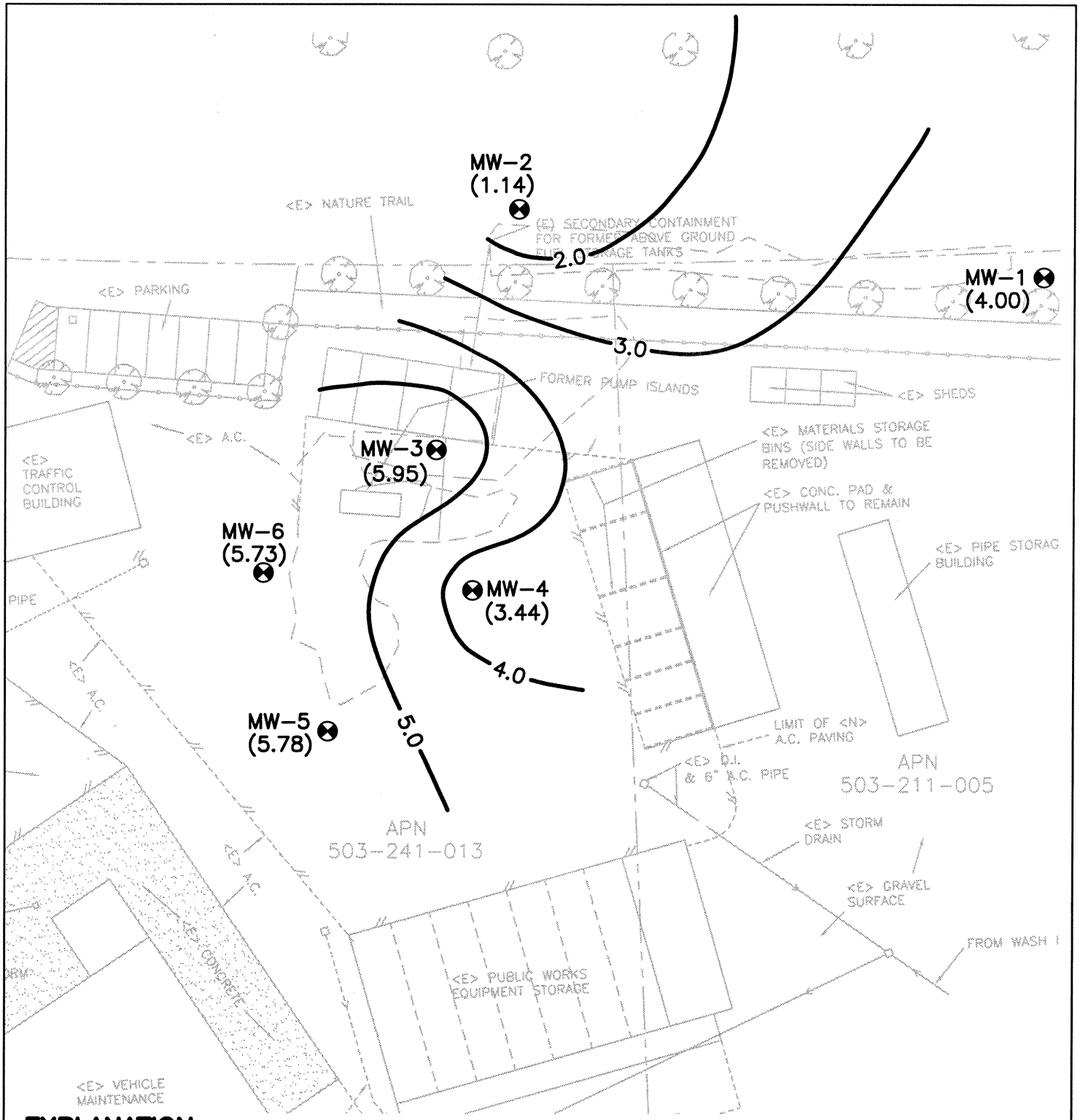
Table 1
Groundwater Elevations, April 20, 2005
City of Arcata Corporation Yard, Arcata, California

Sample Location	Top of Casing Elevation [1] (feet MSL)[2]	Depth To Water (feet) [3]	Water Surface Elevation[1] (feet MSL)
MW-1	8.73	4.73	4.00
MW-2	9.86	8.72	1.14
MW-3	6.97	1.02	5.95
MW-4	6.96	3.52	3.44
MW-5	6.83	1.05	5.78
MW-6	6.73	1.00	5.73

1. Top of casing elevation referenced to City of Arcata Bench Mark #4, elevation.
2. Mean Sea Level (MSL).
3. Depth to water in feet below top of casing.

3.2 Groundwater Analytical Results

The laboratory analytical results from the April 20, 2005, groundwater-monitoring event are summarized in Table 2, and shown on Figure 4.



EXPLANATION

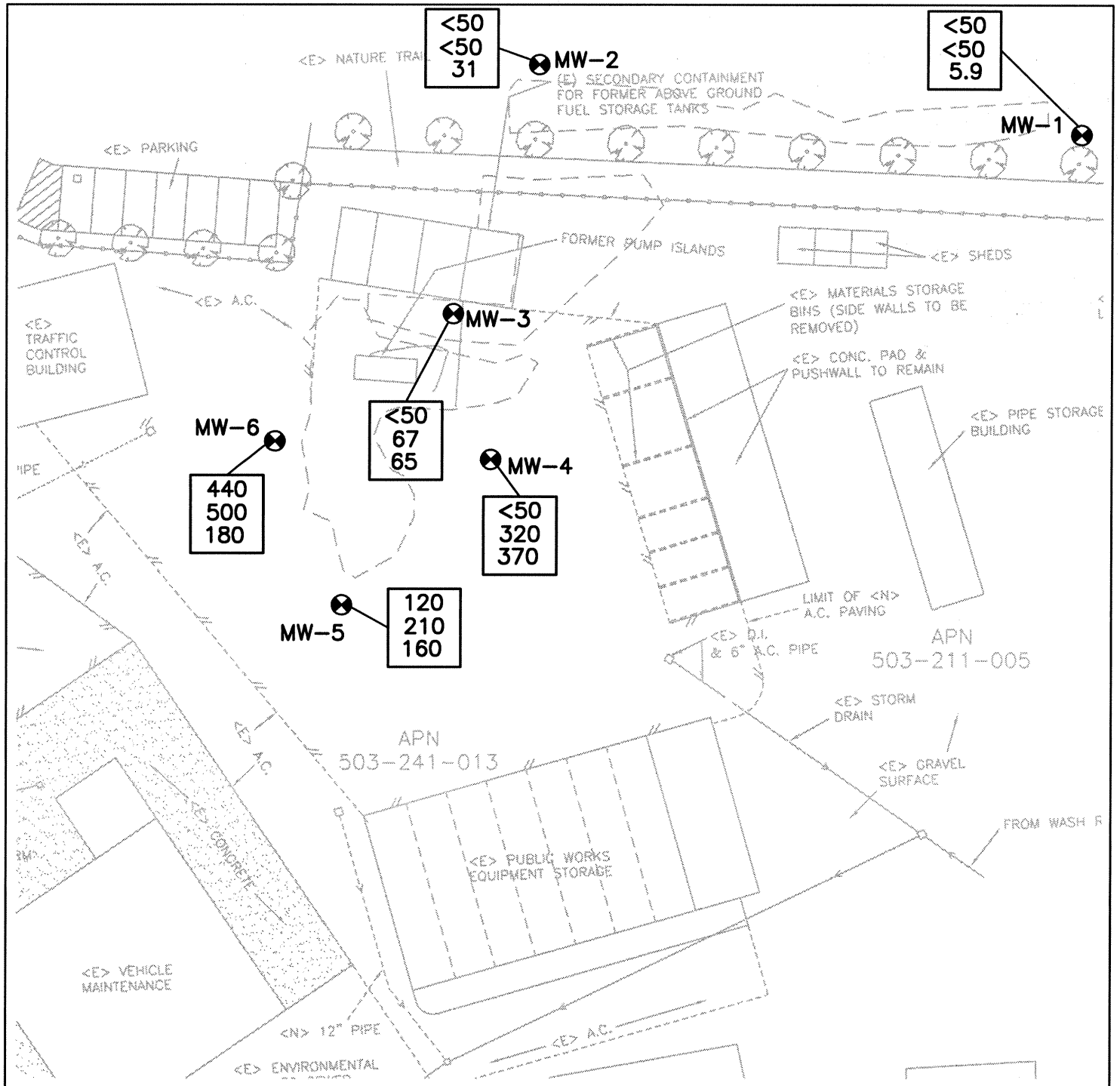
MW-5 *MONITORING WELL LOCATION AND DESIGNATION*

(5.78) *GROUNDWATER ELEVATION (FEET MSL)*

—3.0— *GROUNDWATER CONTOUR (FEET MSL)*

1"=40'±

SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California	Groundwater Contours April 20, 2005 SHN 000108.100
	SEPTEMBER 2005	000108.100-GWC-APR-05	Figure 3



1"=40'±

EXPLANATION

MW-5 — *MONITORING WELL LOCATION AND DESIGNATION*

440 / 530 / 240 — *TPHD / TPHG / MTBE* — *RESULTS IN ug/l*

SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California	Groundwater Contaminant Concentrations, April 20, 2005 SHN 000108.100
	August, 2005	000108.100-CONTAM-CONC-APR-05 — Figure 4

Table 2
Groundwater Analytical Results, April 20, 2005
City of Arcata Corporation Yard, Arcata, California
(in ug/L)[1]

Sample Location	TPHD[2]	TPHG[3]	B[3]	T[3]	E[3]	X[3]	MTBE[3]	TBA[3]	DIPE[3]	ETBE[3]	TAME[3]
MW-1	<50[4]	<50	<0.50	<0.50	<0.50	<1.0	**5.9**	<10	<1.0	<1.0	<1.0
MW-2	<50	<50	<0.50	<0.50	<0.50	<1.0	**31**	<10	<1.0	<1.0	**1.8**
MW-3	<50	**67[5]**	**0.59**	<0.50	<0.50	<1.0	**65**	<15[6]	<1.0	<1.0	**2.0**
MW-4	<50	**320[7]**	<0.50	<0.50	<0.50	<1.0	**370**	<100[6]	<1.0	<1.0	**12**
MW-5	**120[8]**	**210[9]**	<0.50	<0.50	<0.50	<1.0	**160**	<30[6]	<1.0	<1.0	**5.3**
MW-6	**440[8]**	**500[9]**	<0.50	<0.50	<0.50	<1.0	**180**	<50[6]	<1.0	<1.0	**5.5**

1. ug/L: micrograms per liter.
2. TPHD: Total Petroleum Hydrocarbons as Diesel analyzed in general accordance with EPA Method 3510/GCFID.
3. TPHG: Total Petroleum Hydrocarbons as Gasoline; Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX); Methyl Tertiary-Butyl Ether (MTBE), Tertiary-Butyl Alcohol (TBA), Diisopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), and Tertiary-Amyl Butyl Ether (TAME), analyzed in general accordance with EPA Method 8260B.
4. <: Denotes a value that is " less than" the method detection limit.
5. The sample includes the reported gasoline components and additives in addition to other peaks in the gasoline range.
6. Reporting limits were raised due to matrix interference.
7. The gasoline values are primarily from the reported additives.
8. Sample contains material similar to degraded or weathered diesel oil
9. Sample includes the reported gasoline additives in addition to other peaks in the gasoline range.

TPHD was detected in the groundwater samples collected from wells MW-5 and MW-6 at concentrations of 120 micrograms per liter (ug/L) and 440 ug/L, respectively. TPHG was detected in the groundwater samples collected from four of the monitoring wells, at concentrations ranging from 67 ug/L in well MW-3, to 500 ug/L in well MW-6. TPHG was not detected in the groundwater samples collected from MW-1 and MW-2. TPHG values observed in MW-4 are primarily from gasoline additives. Benzene was detected in the groundwater sample collected from MW-3. No detectable concentrations of benzene, toluene, ethylbenzene, or total xylenes were present in any other samples collected during the April 2005 sampling event.

Methyl Tertiary-Butyl Ether (MTBE) was detected in all of the groundwater samples that were collected during the April 20, 2005, monitoring event. Historical groundwater analytical results are presented in Appendix B, Table B-2. The complete laboratory analytical report and corresponding chain-of-custody documentation are included in Appendix C.

3.3 Groundwater Extraction and Treatment System

The groundwater extraction and treatment system was activated May 17, 2004. The system was taken off line during April 2005 due to low recovery of groundwater from extraction well SW-1. To date, 12,793 cubic feet (approximately 95,698 gallons) of groundwater have been extracted and treated by the system. Groundwater extraction and treatment system monthly operation data are shown in Table 3.

Table 3
Groundwater Extraction and Treatment System Monthly Operation Data
City of Arcata Corporation Yard, Arcata, California

Date	Meter Readings		Total Water Extracted	
	Start (cubic feet)	Finish (cubic feet)	(cubic feet)[1]	(gallons)
May 2004	9	1,045	1,036	7,750
June 2004	1,045	1,244	199	1,489
July 2004	1,244	1,429	185	1,384
August 2004	1,429	1,611	182	1,361
September 2004[2]	1,611	1,611	0	0
October 2004	1,611	3,208	1,597	11,946
November 2004	3,208	4,217	1,009	7,548
December 2004	4,217	6,760	2,543	19,023
January 2005	6,760	10,569	3,808	28,486
February 2005	10,569	11,638	1,069	7,997
March 2005	11,638	12,709	1,071	8,012
April 2005	12,709	12,803	94	703
		Total	**12,793**	**95,698**

1. 1 cubic foot = 7.48 gallons
2. The extraction and treatment system did not operate September 2004.

3.4 Biopile Monitoring

The biopile was constructed in September 2003 and is monitored monthly for blower manifold readings, soil temperature readings, and general condition observations. The biopile is monitored quarterly for Volatile Organic Compounds (VOCs), percent oxygen, percent carbon dioxide, and temperature. Soil samples are collected semi-annually from the biopile. During the March 10, 2005, quarterly biopile-monitoring event, VOCs were detected in all sample ports with concentrations ranging from 40 parts per million (ppm) in Ports #1, 2, and 4 to 100 ppm in Port #5. Field notes from the March 10, 2005, quarterly biopile monitoring event are included in Appendix A.

Table 4 summarizes the pre-treatment (stockpile) and the post-treatment (biopile) soil sample analyses. In comparing the geometric and arithmetic means of the sample results from the stockpile to those from the March 2005 sampling event, TPHG concentrations have been substantially reduced and TPHD concentrations have been slightly reduced. The mean concentrations of Total Petroleum

Hydrocarbons as Motor Oil (TPHMO) were greater in March 2005 than the mean results from the initial stockpile sampling. BTEX and MTBE were not detected in the soil samples from the March 2005 sampling event.

Table 4
Stockpile/Biopile Petroleum Hydrocarbons Concentrations
City of Arcata Corporation Yard
(in ug/g)[1]

Sample Location	Date	TPHG[2]	TPHD[3]	TPHMO[3]	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Total Xylenes[4]	MTBE[4]
Stockpile Samples									
SP1A	9/5/2002	**2.9**	**95**	**160**	**0.019**	**0.013**	**0.015**	**0.048**	<0.050[5]
SP1B	9/5/2002	**2.5**	**22**	**60**	**0.017**	**0.0096**	**0.0095**	**0.0286**	<0.050
SP2A	9/5/2002	**7.9**	**120**	**110**	**0.0054**	<0.040	**0.011**	**0.032**	<0.050
SP2B	9/5/2002	**190**	**740**	**260**	<0.0050	<0.015	<0.040	<0.10	**0.11**
SP3A	9/5/2002	**4.7**	**73**	**85**	**0.19**	**0.017**	**0.0099**	**0.052**	<0.050
SP3B	9/5/2002	**29**	**150**	**130**	**0.028**	<0.050	**0.039**	**0.12**	<0.050
SP4A	9/5/2002	**2.0**	**1.2**	**10**	<0.0050	<0.020	**0.0057**	**0.039**	<0.050
SP4B	9/5/2002	**2.0**	**21**	**63**	<0.0050	<0.030	<0.0050	**0.034**	<0.050
Geometric Mean		7.0	52	81	--	--	--	--	--
Arithmetic Mean		30.1	152.8	109.8					
Biopile Samples									
SP-1A,B,C,D	9/12/2003	**3.1**	**53**	**85**	<0.005	<0.005	<0.005	**0.019**	<0.05
SP-1E,F,G,H	9/12/2003	**3.3**	**70**	**73**	<0.005	<0.005	<0.005	**0.008**	<0.05
Geometric Mean		3.2	61	79	--	--	--	--	--
SP-1A,B,C,D	3/5/2004	**1.6**	**87**	**120**	<0.005	<0.005	<0.005	**0.0085**	<0.05
SP-1E,F,G,H	3/5/2004	**1.5**	**73**	**160**	<0.005	<0.005	<0.005	**0.0144**	<0.05
Geometric Mean		1.5	80	139	--	--	--	--	--
SP-1A,B,C,D	9/21/2004	**2.2**	**34**	**74**	<0.0058	<0.012	<0.0058	**0.011**	<0.058
SP-1E,F,G,H	9/21/2004	**2.1**	**58**	**86**	<0.0056	<0.011	<0.0056	**0.021**	<0.056
Geometric Mean		2.1	44	80	--	--	--	--	--
SP-1A,B,C,D	3/10/2005	<1.1[6]	**36**	**120**	<0.0057	<0.0057	<0.0057	<0.0057	<0.057
SP-1E,F,G,H	3/10/2005	**6.3**	**66**	**140**	<0.0058	<0.0058	<0.0058	<0.0058	<0.058
Geometric Mean[7]		2.6	49	130	--	--	--	--	--
Arithmetic Mean[7]		3.7	51	130	--	--	--	--	--
% Reduction (GM)		63%	6%	-59%	--	--	--	--	--
% Reduction (AM)		88%	67%	-18%	--	--	--	--	--

1. ug/g: micrograms per gram.
2. TPHG: Total Petroleum Hydrocarbons as Gasoline, analyzed in general accordance with EPA Method 5035/GCFID(LUFT)/EPA8015B.
3. Total Petroleum Hydrocarbons as Diesel (TPHD) and as Motor Oil (TPHMO) analyzed in general accordance with EPA Method No. 3550/GCFID (LUFT)/EPA 8015B.
4. Benzene (B), Toluene (T), Ethylbenzene (E), and total Xylenes (X), and Methyl Tertiary-Butyl Ether (MTBE) analyzed using EPA Method No. 5035/8021B.
5. <: Denotes a value that is "less than" the method detection limit.
6. Used a value of 1.1 for calculating the geometric and arithmetic mean
7. March 2005 samples

Pending approval from the California Regional Water Quality Control Board, North Coat Region (RWQCB), the biopile stockpile will be used to construct a levee as part of the McDaniel Slough Marsh Enhancement Project. The levee construction details are shown in Figure 5. The low permeability of the soil to be used to encapsulate the treated biopile-stockpile soils (SHN, Nov 2005) will prevent migration of residual contaminates into the surrounding environment.

4.0 Discussion and Recommendations

The results of this quarterly monitoring program indicate that groundwater at the corporation yard site has been impacted by petroleum hydrocarbons and fuel oxygenates. The groundwater extraction and treatment system was activated May 17, 2004. Because of seasonal low levels of groundwater the system has not been operating continuously. SHN is recommending that the system be shut down and replaced with an air sparging system. SHN conducted an air sparge pilot test on April 29, 2005, using the existing groundwater extraction piping located at the base of the October 2001 excavation pit. Results of the pilot test are presented in a report of findings (SHN, May 2005).

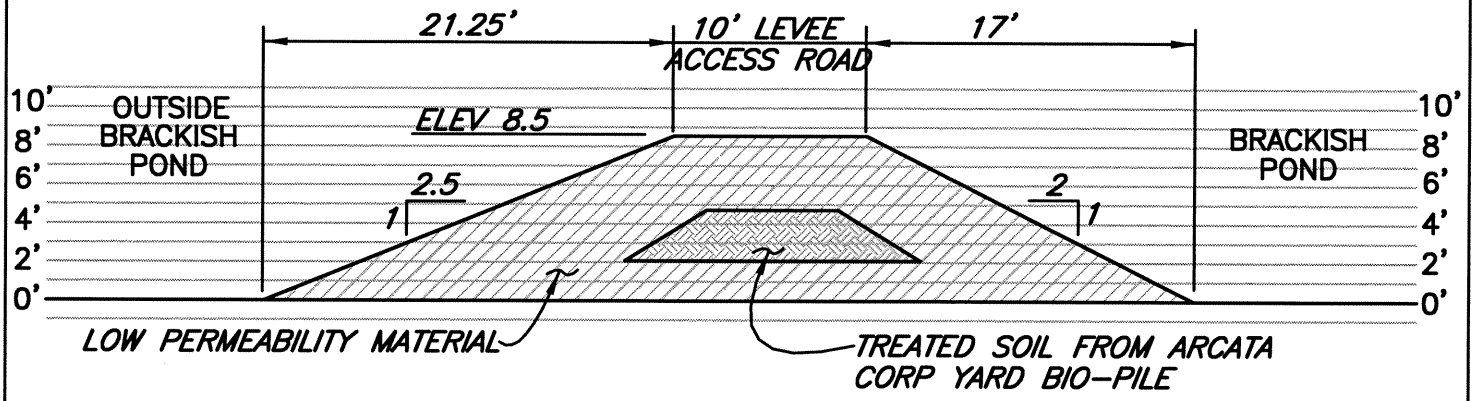
Based on the reduction of TPHG and TPHD concentrations in the biopile soil, SHN is recommending closure for the biopile. The City of Arcata would like to use the treated soil in the construction of dikes for the proposed McDaniel Slough Marsh Enhancement Project. The treated soil would be placed in the center of a dike, and encapsulated with bay mud that will be excavated to deepen channels at the site. Prior to closure, SHN will collect 4 samples for every 100 cubic yards of soil and the analytical laboratory will composite each set of four samples into one for analysis. Using the approximate 1,000 cubic yard volume of the biopile, 10-four point composite samples will be analyzed. Soil samples will be analyzed for TPHMO, TPHD, TPHG, BTEX, and MTBE.

5.0 References Cited

SHN Consulting Engineers & Geologists, Inc. (November 2003). *Geotechnical Evaluation of McDaniel Slough Marsh Enhancement Project, Arcata, California.* Eureka: SHN

---. (March 2004). *Remedial Action Implementation Report (RAIR), Biopile Soil Remediation, City of Arcata Corporation Yard, 600 South G Street, Arcata, California.* Eureka: SHN

---. (May 2005). *Remedial Action Pilot Study, Report of Findings, City of Arcata Corporation Yard, 600 South G Street, Arcata, California.* Eureka: SHN



POND PERIMETER LEVEE SECTION
1"=10' HORIZ AND VERT

SHN Consulting Engineers & Geologists, Inc.	Arcata Corp Yard Arcata, California	Proposed Levee Construction Shn 000108.100
	July, 2005	000108-100-bermsect	Figure 5

Appendix A

Field Notes

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

DAILY FIELD REPORT

Job No. 000108.100

Page of

Project Name: Arcata Corp Yard	Client/Owner: City of Arcata	Daily Field Report Sequence No
General Location Of Work	Owner/Client Representative	Date: 4/22/05 — Day Of Week: Fri.
General Contractor	Grading Contractor	Project Engineer: Mike Foget
Type Of Work	Grading Contractor, Superintendent, Or Foreman	Supervisor
Source & Description Of Fill Material	Weather: Overcast	Technician: Dustin Tibbets
	Key Persons Contacted (Civil Engr, Architect, Developer, Etc)	

Describe Equipment Used For Hauling, Spreading, Watering, Conditioning, & Compacting

~~1100 On site. open up well M-9D, taking water level.~~

1234 On site taking reading on the pump + treat system.
Meter reading = 12803.79 cubic feet
1240 Taking reading on the Bio-Pile system.
1300 Off site.

Copy given to:

Reported By: Dustin Tibbets

G:\FORMS\DAILY FIELD REPORT.doc

Monthly Monitoring
City of Arcata, Corp Yard
000108.100

Technician:	Date:	Time:
Dustin Tibbets	4/22/05	1240

Weather Conditions: Over Cast

Ambient Air Temperature: 66°

Time Settings Before Adjustments:

Blower "A": ON from 8 Am to 4 pm

Blower "B": ON from 8 Am to 4 pm

Time Settings After Adjustments:

Blower "A": ON from — to —

Blower "B": ON from — to —

Blower "A" Manifold Readings:		Blower "B" Manifold Readings:	
Line Temperature: 64° °F		Line Temperature: 64° °F	
Line Pressure: 5 in-H_2O		Line Pressure: N/A in-H_2O	
Air Velocity (Line 1) 1350 ft/min	Air Velocity (Line 2) 2030 ft/min	Air Velocity (Line 3) 2450 ft/min	Air Velocity (Line 4) 2325 ft/min

Soil Vapor Readings:	Gas Meter Used:	Gas Meter Calibration:

Sample Port	VOC's (ppm)	O_2 (%)	CO_2 (%)
#1			
#2			
#3			
#4			
#5			

Soil Temperature Readings:

#1	#2	#3	#4
60° °F	60° °F	58° °F	72° °F

Condition of Bio-Pile Cover: Good

Condition of Cover Hold-Downs: Good

Additional Observations:

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

DAILY FIELD REPORT

Job No. 000108.100

Page of

Project Name: Arcata Corp Yard	Client/Owner: City of Arcata	Daily Field Report Sequence No
General Location Of Work	Owner/Client Representative	Date: 5/27/05 — Day Of Week: Fri.
General Contractor	Grading Contractor	Project Engineer: Mike Foget
Type Of Work	Grading Contractor, Superintendent, Or Foreman	Supervisor
Source & Description Of Fill Material	Weather: Over Cast	Technician: Dustin Tibbets
	Key Persons Contacted (Civil Engr, Architect, Developer, Etc)	

Describe Equipment Used For Hauling, Spreading, Watering, Conditioning, & Compacting

1050 On site.
1055 Taking readings.
1130 Pump and treat meter reading, 12803.79 cubic feet.
1135 loaded up.
1140 off site.

Copy given to:

Reported By: Dustin Tibbets

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Monthly Monitoring
City of Arcata, Corp Yard
000108.100

Technician:	Date:	Time:
Dustin Tibbets	5/27/05	1055

Weather Conditions:	Ambient Air Temperature:
Over Cast	62° F

Time Settings Before Adjustments:	Time Settings After Adjustments:
Blower "A": ON from 8am to 4pm	Blower "A": ON from_____ to_____
Blower "B": ON from 8Am to 4 pm	Blower "B": ON from_____ to_____

Blower "A" Manifold Readings:	Blower "B" Manifold Readings:
Line Temperature: 63 °F	Line Temperature: 63 °F
Line Pressure: 5 in-H_2O	Line Pressure: Needs to be replaced in-H_2O

Air Velocity (Line 1)	Air Velocity (Line 2)	Air Velocity (Line 3)	Air Velocity (Line 4)
1200 ft/min	1990 ft/min	2045 ft/min	2180 ft/min

Soil Vapor Readings:	Gas Meter Used:	Gas Meter Calibration:

Sample Port	VOC's (ppm)	O_2 (%)	CO_2 (%)
#1			
#2			
#3			
#4			
#5			

Soil Temperature Readings:

#1	#2	#3	#4
59° °F	Missing °F	Missing °F	72 ? °F

Condition of Bio-Pile Cover:
Fair to Good

Condition of Cover Hold-Downs:
Redid Hold-Downs on the North end.

Additional Observations: Reset timer's to current time.

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

DAILY FIELD REPORT

Job No. 000108.100

Page of

Project Name: Arcata Corp Yard	Client/Owner: City of Arcata	Daily Field Report Sequence No
General Location Of Work	Owner/Client Representative	Date: 6/24/05 — Day Of Week: Fri.
General Contractor	Grading Contractor	Project Engineer: Mike Foget
Type Of Work	Grading Contractor, Superintendent, Or Foreman	Supervisor
Source & Description Of Fill Material	Weather: Over Cast	Technician: Dustin Tibbets
	Key Persons Contacted (Civil Engr, Architect, Developer, Etc)	

Describe Equipment Used For Hauling, Spreading, Watering, Conditioning, & Compacting

1338 On site.
1342 Taking reading on Biopile system
1355 Pump and Treat flow meter reading. = 12803.79 cubic feet
1358 loaded up.
1403 Off site.

Copy given to:

Reported By: Dustin Tibbets

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Monthly Monitoring
City of Arcata, Corp Yard
000108.100

Technician:	Date:	Time:
Dustin Tibbets	6/24/05	1342

Weather Conditions:	Ambient Air Temperature:
Over Cast	68°

Time Settings Before Adjustments:	Time Settings After Adjustments:
Blower "A": ON from 8 am to 4 pm	Blower "A": ON from_____ to_____
Blower "B": ON from 8 am to 4 pm	Blower "B": ON from_____ to_____

Blower "A" Manifold Readings:	Blower "B" Manifold Readings:
Line Temperature: 78° °F	Line Temperature: 70 °F
Line Pressure: 5 in-H_2O	Line Pressure: N/A in-H_2O

Air Velocity (Line 1)	Air Velocity (Line 2)	Air Velocity (Line 3)	Air Velocity (Line 4)
1030 ft/min	2100 ft/min	2090 ft/min	2240 ft/min

Soil Vapor Readings:	Gas Meter Used:	Gas Meter Calibration:

Sample Port	VOC's (ppm)	O_2 (%)	CO_2 (%)
#1			
#2			
#3			
#4			
#5			

Soil Temperature Readings:

#1	#2	#3	#4
	found reinstalled		
59° °F	missing °F	missing °F	54° °F

Condition of Bio-Pile Cover:
Needs to be retiten.

Condition of Cover Hold-Downs:
Good

Additional Observations:

REC'D AUG 2 9 2005

4/20/05

WELL NO. MW-1

TOTAL DEPTH 17.80

DEPTH TO WATER 4.73

ELEVATION

WATER ELEVATION

HT OF WATER COLUMN 13.07 X(0.16) CASING VOL 2.09x3 = 6gal

DEPTH	TIME	TIME	WATER REMOVED	EC	TEMP	pH
		9:30	0			
		10:25	2	682 ppm	16.9 c	6.25
		10:30	4	779	16.1 c	6.38
		10:35	6	882	16.4 c	6.33

TOTAL INITIAL WATER VOLUME

SAMPLING EQUIPMENT Disposable Bailer

SAMPLE TIME

SAMPLE ANALYSIS 8260 List 1; TPHD

LABORATORY N.C.L.

REMARKS

4/20/05

WELL NO. MW-2
TOTAL DEPTH 18.35
DEPTH TO WATER 8.72

ELEVATION WATER ELEVATION

HT OF WATER COLUMN 9.63 X(0.16) CASING VOL 1.54x3=4.5gal

DEPTH	TIME	TIME	WATER REMOVED	EC	TEMP	pH
		9:35	0	2000+ ppm	18.3 c	6.5
		10:45	1.5	2000+ ppm	16.9 c	6.58
			3.0		16.1 c	6.60
			4.5	2000+ ppm		

TOTAL INITIAL WATER VOLUME

SAMPLING EQUIPMENT DISPOSABLE BAILER
SAMPLE TIME
SAMPLE ANALYSIS 8260 LIST 2, TPHD
LABORATORY N.C.L.
REMARKS

4/20/05

WELL NO. MW-3
TOTAL DEPTH 14.70
DEPTH TO WATER 1.02

ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 13.68 X(0.16) CASING VOL 2.18 x 3 = 6.5 gal

DEPTH	TIME	TIME	WATER REMOVED	EC	TEMP	pH
		9:55	0			
		1:00	2	665 ppm	15.9 c	6.7
		1:05	4	684	16.6 c	6.5
		1:10	6.5	673	15.3	6.7

TOTAL INITIAL WATER VOLUME

SAMPLING EQUIPMENT DISPOSABLE BAILER
SAMPLE TIME
SAMPLE ANALYSIS 8260 LIST 1 ; TPHD
LABORATORY N.C.L.
REMARKS

04/20/05
4/20/05

WELL NO. MW-4
TOTAL DEPTH 14.70
DEPTH TO WATER 3.52

ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 11.18 X(0.16) CASING VOL 1.79X3=5.25 gal

DEPTH	TIME	TIME	WATER REMOVED	EC	TEMP	pH
		9:45	0			
		11:05	1.75	2000+ ppm	17.4 C	6.20
		11:10	3.50	2000+ ppm	16.1 C	6.47
			5.25	2000+ ppm	15.4 C	6.25

TOTAL INITIAL WATER VOLUME

SAMPLING EQUIPMENT DISPOSABLE BAILER
SAMPLE TIME
SAMPLE ANALYSIS 8260 LIST 1; TPHD
LABORATORY
REMARKS N.C.L.

CITY OF ARCATA

FIELD SAMPLING LOG

PROJECT #
CLIENT
WELL NO. MW-5
TOTAL DEPTH 14.85
DEPTH TO WATER 1.05

DATE 04/20/05
SAMPLER TW + SA
ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 13.80 X(0.16) CASING VOL 2.2 x 3 = 6.5 gal

DEPTH	TIME	TIME	WATER REMOVED	EC	TEMP	pH
		9:55	0			
		1:20	2	1413 µm	19.2°C	6.4
		1:25	4	1489	16.8	6.5
		1:30	6.5	1665	17.5	6.3

TOTAL INITIAL WATER VOLUME

SAMPLING EQUIPMENT DISPOSABLE BAILERS
SAMPLE TIME
SAMPLE ANALYSIS 8260 LIST 1; TPHD
LABORATORY
REMARKS

07/20/05
4/20/05

WELL NO. MW-6
TOTAL DEPTH 14.75
DEPTH TO WATER 1.00

ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 13.75 X(0.16) CASING VOL 2.2 X3 = 6.6 gal

DEPTH	TIME	TIME	WATER REMOVED	EC	TEMP	pH
		9:50	0			
		11:20	2	1140 ppm	17.9 C	6.58
		11:25	4	1210	14.8 C	6.19
		11:30	6.5	1208	15.7 C	6.14

TOTAL INITIAL WATER VOLUME

SAMPLING EQUIPMENT DISPOSABLE BAILER
SAMPLE TIME
SAMPLE ANALYSIS 8260 LIST 1 ; TPHD
LABORATORY N.C.L.
REMARKS

MONTH April YEAR 2005

Pump Disconnected - OFF LINE -

DATE	TIME	START	FINISH	TOTAL HRS.	WELL LEVEL START	WELL LEVEL FINISH	LEVEL MW3 START	LEVEL MW3 FINISH	Bag Filter CHANGE	PRESSURE READINGS OUTLETS BAG FILT IN	BAG FILT OUT	DRUM #1	DRUM #2		METER READINGS START	METER READINGS FINISH	TOTAL CUBIC FT.	NOTES
31																		
30																		
29																		
28																		
27	12:30	721.2													128.03			
26																		
25																		
24																		
23																		
22																		
21																		
20	8:30	721.2				.05		.05							128.03			
19																		
18																OFF		
17																LINE		
16																		
15																		
14																		
13	8:30	721.2				.05		.05							128.03			
12																		
11																		
10																		
9																		
8																		
7																		
6																		
5																		
4																		
3																		
2																		
1																		

MONTH MARCH YEAR 2005

DATE	TIME	START	FINISH	TOTAL HRS.	WELL LEVEL START	WELL LEVEL FINISH	LEVEL MW3 START	LEVEL MW3 FINISH	BagFilter CHANGE	PRESSURE READINGS OUTLETS BAG FILT IN	BAG FILT OUT	DRUM#1	DRUM#2		METER READINGS START	METER READINGS FINISH	TOTAL CUBIC FT.	NOTES
31																		
30																		
29																		
28																		
27			OFF	LINE -		NO	PUMPING		-		PUMPING		AIR -					
26																		
25																		
24																		
23	930	6255			1.90 ~~201~~		201								127.09			- CHANGED FILTER BAG FILTER PLUGGED W/ SILT
22																		
21																		
20																		
19																		
18																		
17																		
16	8:30	504.5			4.57		4.77								123.79			
15																		
14																		
13																		
12																		
11																		
10																		
9	9:00	4764			4.92		5.11								122.70			
8																		
7																		
6																		
5																		
4	10:30	416.5			5.44		5.65								120.24			
3																		
2	8:30	3932			5.23		5.44								119.67			
1																		

DATE	TIME	START	FINISH	TOTAL HRS.	WELL LEVEL START	WELL LEVEL FINISH	LEVEL MW3 START	LEVEL MW3 FINISH	Bag Filter CHANGE	PRESSURE READINGS OUTLETS BAG FILT IN	BAG FILT OUT	DRUM #1	DRUM #2		METER READINGS START	METER READINGS FINISH	TOTAL CUBIC FT.	NOTES
31																		
30																		
29																		
28			347.8						change									CHANGED Bag FILTER
27																		PLUGGED WITH SEDIMENT
26																		
25																		
24																		
23	8:30	303.0				5.33		5.45							116.38			FIXED SUCTION LEAKS
22	8:30	278.0													115.92			
21																		
20																		
19																		
18																		
17																		
16	8:30		191.9	24.9		4.70		4.90								111.51	4.08	
15																		
14																		
13																		
12																		
11																		
10																		
9	8:00		166.70	9.5		4.28		4.49								107.43	1.74	
8																		
7																		
6																		
5																		
4																		
3																		
2	8:30		157.5			4.74		4.95								105.69		
1																		

MONTH FEB

YEAR 2005

DATE	TIME	START	FINISH	TOTAL HRS.	WELL LEVEL START	WELL LEVEL FINISH	LEVEL MW3 START	LEVEL MW3 FINISH	Bag Filter CHANGE	PRESSURE READINGS OUTLETS BAG FILT IN	BAG FILT OUT	DRUM #1	DRUM #2		METER READINGS START	METER READINGS FINISH	TOTAL CUBIC FT.	NOTES
31			157.5	259												105.69	6.53	
30																		
29																		
28																		
27																		
26	10:30		131.6			4.1		4.3	✓							99.16		
25																		
24	8:30		131.6	9.1												99.16	3.82	
23																		
22																		
21	9:30	122.5													95.34		9.61	
20	8:30	98.8													1/86.73			
19																		
18																		
17																		
16																		
15																		
14																		
13																		
12	8:30		98.7	-		.9		1.08								86.72		
11																		
10																		
9																		
8																		
7																		
6																		
5	8:30		98.7	-		3.41		3.82								86.72		
4																		
3	7:30		98.7													86.72		
2																		
1																		

MONTH JAN YEAR 2005

Appendix B

Historic Monitoring Data

Table B-1
Historical Groundwater Elevations
City of Arcata Corporation Yard, Arcata, CA

Sample Location	Sample Date	Top of Casing Elevation[1] (feet MSL)[2]	Depth to Water (feet)[3]	Groundwater Elevation (feet MSL)
MW-1	9/26/2002	8.73	7.73	1.00
	1/22/2003		5.79	2.94
	4/23/2003		5.33	3.40
	7/23/2003		6.60	2.13
	10/22/2003		7.34	1.39
	1/21/2004		3.90	4.83
	4/21/2004		3.81	4.92
	7/21/2004		5.72	3.01
	10/7/2004		7.33	1.40
	1/19/2005		5.80	2.93
	4/20/2005		4.73	4.00
MW-2	9/27/2002	9.86	8.82	1.04
	1/22/2003		6.44	3.42
	4/23/2003		9.38	0.48
	7/23/2003		8.90	0.96
	10/22/2003		8.70	1.16
	1/21/2004		7.38	2.48
	4/21/2004		9.53	0.33
	7/21/2004		8.10	1.76
	10/7/2004		8.76	1.10
	1/19/2005		9.00	0.86
	4/20/2005		8.72	1.14
MW-3	9/26/2002	6.97	2.84	4.13
	1/22/2003		1.36	5.61
	4/23/2003		1.11	5.86
	7/23/2003		2.50	4.47
	10/22/2003		2.81	4.16
	1/21/2004		3.27	3.70
	4/21/2004		1.00	5.97
	7/21/2004		2.95	4.02
	10/7/2004		3.59	3.38
	1/19/2005		1.45	5.52
	4/20/2005		1.02	5.95
MW-4	9/27/2002	6.96	4.01	2.95
	1/22/2003		2.36	4.60
	4/23/2003		2.35	4.61
	7/23/2003		2.50	4.46
	10/22/2003		4.34	2.62
	1/21/2004		1.26	5.70
	4/21/2004		3.67	3.29
	7/21/2004		5.20	1.76
	10/7/2004		4.15	2.81
	1/19/2005		3.75	3.21
	4/20/2005		3.52	3.44
MW-5	9/26/2002	6.83	2.70	4.13
	1/22/2003		1.24	5.59
	4/23/2003		1.05	5.78
	7/23/2003		2.30	4.53
	10/22/2003		2.68	4.15
	1/21/2004		1.18	5.65
	4/21/2004		0.50	6.33
	7/21/2004		3.80	3.03
	10/7/2004		2.95	3.88
	1/19/2005		1.41	5.42
	4/20/2005		1.05	5.78
MW-6	9/27/2002	6.73	5.11	1.62
	1/22/2003		3.23	3.50
	4/23/2003		1.91	4.82
	7/23/2003		5.60	1.13
	10/22/2003		3.75	2.98
	1/21/2004		1.71	5.02
	4/21/2004		5.65	1.08
	7/21/2004		2.70	4.03
	10/7/2004		3.16	3.57
	1/19/2005		1.80	4.93
	4/20/2005		1.00	5.73

1. Top of casing elevation referenced to City of Arcata Bench Mark #4, elevation
2. Mean Sea Level (MSL).
3. Below Top of Casing

Table B-2
Historical Groundwater Analytical Results
City of Arcata Corporation Yard, Arcata, CA
(in ug/L)[1]

Sample Location	Date	TPHD[2]	TPHG[3]	B[3]	T[3]	E[3]	X[3]	MTBE[3]	TBA[3]	DIPE[3]	ETBE[3]	TAME[3]
MW-1	9/26/2002	<50[4]	<50	<0.50	<0.50	<0.50	<0.50	4.3	<20	<1.0	<1.0	<1.0
	1/22/2003	<50	<50	<0.50	<0.50	<0.50	<0.50	34	<20	<1.0	<1.0	1.3
	4/23/2003	<50	<50	<0.50	<0.50	<0.50	<0.50	21	<20	<1.0	<1.0	1.1
	7/23/2003	<50	76	<0.50	<0.50	<0.50	<0.50	100	<20	<1.0	<1.0	4.4
	10/22/2003	<50	75	<0.50	<0.50	<0.50	<0.50	35	<20	<1.0	<1.0	1.6
	1/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	5	<20	<1.0	<1.0	<1.0
	4/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	9.1	<10	<1.0	<1.0	<1.0
	7/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	31	<10	<1.0	<1.0	1.1
	10/7/2004	<50	<50	<0.50	<0.50	<0.50	<1.0	20	<10	<1.0	<1.0	<1.0
	1/19/2005	<50	<50	<0.50	<0.50	<0.50	<1.0	4.6	<10	<1.0	<1.0	<1.0
	4/20/2005	<50	<50	<0.50	<0.50	<0.50	<1.0	5.9	<10	<1.0	<1.0	<1.0
MW-2	9/27/2002	820	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<20	<1.0	<1.0	<1.0
	1/22/2003	<50	72	<0.50	<0.50	<0.50	<0.50	130	<20	<1.0	<1.0	9.8
	4/23/2003	<50	<50	<0.50	<0.50	<0.50	<0.50	57	<20	<1.0	<1.0	3.5
	7/23/2003	<50	52	<0.50	<0.50	<0.50	<0.50	59	<20	<1.0	<1.0	3.4
	10/22/2003	<50	64	<0.50	<0.50	<0.50	<0.50	37	<20	<1.0	<1.0	2.2
	1/21/2004	<50	83	<0.50	<0.50	<0.50	<0.50	61	<20	<1.0	<1.0	3.8
	4/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	22	<10	<1.0	<1.0	1.5
	7/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	24	<10	<1.0	<1.0	1.5
	10/7/2004	<50	<50	<0.50	<0.50	<0.50	<1.0	26	<10	<1.0	<1.0	1.5
	1/19/2005	<50	<50	<0.50	<0.50	<0.50	<1.0	33	<10	<1.0	<1.0	1.7
	4/20/2005	<50	<50	<0.50	<0.50	<0.50	<1.0	31	<10	<1.0	<1.0	1.8
MW-3	9/26/2002	<50	990	63	<0.50	<0.50	<0.50	860	58	<1.0	<1.0	55
	1/22/2003	220	1,600	110	13	41	50.9	990	250	<1.0	<1.0	75
	4/23/2003	150	660	55	1.1	3	1.5	720	82	<1.0	<1.0	48
	7/23/2003	83	210	120	<0.50	<0.50	<0.50	530	94	<1.0	<1.0	11
	10/22/2003	330	720	26	<0.50	<0.50	<0.50	570	32	<1.0	<1.0	32
	1/21/2004	78	740	58	5.7	17	8.2	310	<90	<1.0	<1.0	25
	4/21/2004	<50	360	77	1.4	1.7	0.88	120	<28	<1.0	<1.0	7.2
	7/21/2004	130	260	<0.50	<0.50	<0.50	<0.50	280	43	<1.0	<1.0	9.7
	10/7/2004	57	640	1.6	<0.50	<0.50	<1.0	450	64	<1.0	<1.0	28
	1/19/2005	<50	120	1.5	<0.50	<0.50	<1.0	110	<45	<1.0	<1.0	4
	4/20/2005	<50	67	0.59	<0.50	<0.50	<1.0	65	<15	<1.0	<1.0	2
MW-4	9/27/2002	<50	270	<0.50	<0.50	<0.50	<0.50	270	32	<1.0	<1.0	6.2
	1/22/2003	150	250	<0.50	<0.50	<0.50	<0.50	340	170	<1.0	<1.0	13
	4/23/2003	110	520	<0.50	<0.50	<0.50	<0.50	350	160	<1.0	<1.0	11
	7/23/2003	<50	1,000	160	3	0.78	4.1	330	66	<1.0	<1.0	41
	10/22/2003	130	290	<0.50	<0.50	<0.50	<0.50	260	62	<1.0	<1.0	6.5
	1/21/2004	97	550	<0.50	<0.50	<0.50	<0.50	580	190	<1.0	<1.0	16
	4/21/2004	<50	480	<0.50	<0.50	<0.50	<0.50	490	130	<1.0	<1.0	15
	7/21/2004	140	380	25	<0.50	<0.50	<0.50	500	29	<1.0	<1.0	22
	10/7/2004	<50	440	<0.50	<0.50	<0.50	<1.0	380	110	<1.0	<1.0	8.5
	1/19/2005	<50	410	<0.50	<0.50	<0.50	<1.0	380	<10	<1.0	<1.0	12
	4/20/2005	<50	320	<0.50	<0.50	<0.50	<1.0	370	<100	<1.0	<1.0	12
MW-5	9/26/2002	160	750	<0.50	<0.50	<0.50	<0.50	490	66	<1.0	<1.0	12
	1/22/2003	1,300	590	<0.50	0.87	<0.50	<0.50	330	160	<1.0	<1.0	13
	4/23/2003	1,100	520	<0.50	<0.50	<0.50	<0.50	280	56	<1.0	<1.0	8.1
	7/23/2003	930	150	<0.50	<0.50	<0.50	<0.50	300	35	<1.0	<1.0	6.2
	10/22/2003	3,400	780	<0.50	<0.50	<0.50	<0.50	320	41	<1.0	<1.0	7.7
	1/21/2004	810	610	<0.50	<0.50	<0.50	<0.50	300	<120	<1.0	<1.0	8.2
	4/21/2004	180	430	<0.50	<0.50	<0.50	<0.50	200	<60	<1.0	<1.0	6.2
	7/21/2004	50	320	<0.50	<0.50	<0.50	<0.50	420	110	<1.0	<1.0	12
	10/7/2004	610	780	<0.50	<0.50	<0.50	<1.0	290	57	<1.0	<1.0	7.2
	1/19/2005	440	530	<0.50	<0.50	<0.50	<1.0	240	<90	<1.0	<1.0	6
	4/20/2005	120	210	<0.50	<0.50	<0.50	<1.0	160	<30	<1.0	<1.0	5.3
MW-6	9/27/2002	78	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<20	<1.0	<1.0	<1.0
	1/22/2003	280	170	<0.50	<0.50	<0.50	<0.50	250	55	<1.0	<1.0	5.5
	4/23/2003	320	250	<0.50	<0.50	<0.50	<0.50	290	45	<1.0	<1.0	7.9
	7/23/2003	<50	510	<0.50	<0.50	<0.50	0.55	190	38	<1.0	<1.0	7.7
	10/22/2003	290	340	0.83	<0.50	<0.50	<0.50	290	36	<1.0	<1.0	7
	1/21/2004	290	310	<0.50	<0.50	<0.50	<0.50	270	<120	<1.0	<1.0	7.6
	4/21/2004	<50	290	0.67	<0.50	<0.50	<0.50	260	43	<1.0	<1.0	7.7
	7/21/2004	1,000	470	<0.50	<0.50	<0.50	<0.50	350	39	<1.0	<1.0	7.0
	10/7/2004	110	260	<0.50	<0.50	<0.50	<1.0	210	<80	<1.0	<1.0	5.7
	1/19/2005	81	170	<0.50	<0.50	<0.50	<1.0	130	46	<1.0	<1.0	4.1
	4/20/2005	440	500	<0.50	<0.50	<0.50	<1.0	180	<50	<1.0	<1.0	5.5

1. ug/L: micrograms per Liter
2. TPHD: Total Petroleum Hydrocarbons as Diesel, analyzed in general accordance with EPA Method 3510/GCFID.
3. TPHG: Total Petroleum Hydrocarbons as Gasoline, Benzene (B), Toluene (T), Ethylbenzene (E), and total Xylenes (X), Methyl Tertiary-ButylEther (MTBE), Tertiary-Butyl Alcohol (TBA), Diisopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), Tertiary-Amyl Butyl Ether (TAME), analyzed in general accordance with EPA Method 8260B.
4. <: Denotes a laboratory values less than the method detection limit.

Appendix C

Laboratory Analytical Reports

NORTH COAST LABORATORIES LTD.

May 02, 2005

City of Arcata
Dept. of Public Works
736 F Street
Arcata, CA 95521
Attn: Kim Watson

Order No.: 0504455
Invoice No.: 49775
PO No.:
ELAP No. 1247-Expires July 2006

RE: 000108100, Arcata Corp Yard

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	MW-1
01D	MW-1
02A	MW-2
02D	MW-2
03A	MW-4
03D	MW-4
04A	MW-6
04D	MW-6
05A	MW-3
05D	MW-3
06A	MW-5
06D	MW-5

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s) | QA Unit | Jesse G. Chaney, Jr. Laboratory Director

5680 West End Road • Arcata California 95521-9202 • 707-822-4649 • FAX 707-822-6831

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North Coast Laboratories, Ltd.

Date: *02-May-05*

CLIENT: City of Arcata
Project: 000108100, Arcata Corp Yard
Lab Order: 0504455

CASE NARRATIVE

All samples submitted for a silica gel cleanup were initially analyzed for diesel. The samples showing no detectable levels of the analyte were not subjected to the cleanup procedure.

TPH as Diesel with Silica Gel Cleanup:
Samples MW-6 and MW-5 contain material similar to degraded or weathered diesel oil.

Gasoline Components/Additives:
The gasoline value for sample MW-3 includes the reported gasoline components and additives in addition to other peaks in the gasoline range.

The gasoline values for samples MW-6 and MW-5 include the reported gasoline additives in addition to other peaks in the gasoline range.

The gasoline value for sample MW-4 is primarily from the reported gasoline additives.

Some reporting limits were raised for samples MW-4, MW-6, MW-3 and MW-5 due to matrix interference.

The surrogate recovery was below the lower acceptance limit for sample MW-1. The response of the reporting limit standard was such that the analytes would have been detected even with the low recovery; therefore, the data were accepted.

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Date: 02-May-05
WorkOrder: 0504455

ANALYTICAL REPORT

Client Sample ID: MW-1 **Received:** 4/20/05 **Collected:** 4/20/05 14:00
Lab ID: 0504455-01A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	5.9	1.0	µg/L	1.0		4/28/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		4/28/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/28/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/28/05
Benzene	ND	0.50	µg/L	1.0		4/28/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		4/28/05
Toluene	ND	0.50	µg/L	1.0		4/28/05
Ethylbenzene	ND	0.50	µg/L	1.0		4/28/05
m,p-Xylene	ND	0.50	µg/L	1.0		4/28/05
o-Xylene	ND	0.50	µg/L	1.0		4/28/05
Surrogate: 1,4-Dichlorobenzene-d4	80.2	80.8-139	% Rec	1.0		4/28/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		4/27/05

Client Sample ID: MW-1 **Received:** 4/20/05 **Collected:** 4/20/05 14:00
Lab ID: 0504455-01D

Test Name: TPH as Diesel **Reference:** EPA 3510/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	4/26/05	4/26/05
Surrogate: N-Tricosane	90.0	70-130	% Rec	1.0	4/26/05	4/26/05

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Date: 02-May-05
WorkOrder: 0504455

ANALYTICAL REPORT

Client Sample ID: MW-2 **Received:** 4/20/05 **Collected:** 4/20/05 14:15
Lab ID: 0504455-02A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	31	1.0	µg/L	1.0		4/28/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		4/28/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/28/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/28/05
Benzene	ND	0.50	µg/L	1.0		4/28/05
Tert-amyl methyl ether (TAME)	1.8	1.0	µg/L	1.0		4/28/05
Toluene	ND	0.50	µg/L	1.0		4/28/05
Ethylbenzene	ND	0.50	µg/L	1.0		4/28/05
m,p-Xylene	ND	0.50	µg/L	1.0		4/28/05
o-Xylene	ND	0.50	µg/L	1.0		4/28/05
Surrogate: 1,4-Dichlorobenzene-d4	86.2	80.8-139	% Rec	1.0		4/28/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		4/28/05

Client Sample ID: MW-2 **Received:** 4/20/05 **Collected:** 4/20/05 14:15
Lab ID: 0504455-02D

Test Name: TPH as Diesel **Reference:** EPA 3510/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	4/26/05	4/26/05
Surrogate: N-Tricosane	90.1	70-130	% Rec	1.0	4/26/05	4/26/05

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Date: 02-May-05
WorkOrder: 0504455

ANALYTICAL REPORT

Client Sample ID: MW-4 **Received:** 4/20/05 **Collected:** 4/20/05 14:20
Lab ID: 0504455-03A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	370	50	µg/L	50		4/28/05
Tert-butyl alcohol (TBA)	ND	100	µg/L	1.0		4/28/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/28/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/28/05
Benzene	ND	0.50	µg/L	1.0		4/28/05
Tert-amyl methyl ether (TAME)	12	1.0	µg/L	1.0		4/28/05
Toluene	ND	0.50	µg/L	1.0		4/28/05
Ethylbenzene	ND	0.50	µg/L	1.0		4/28/05
m,p-Xylene	ND	0.50	µg/L	1.0		4/28/05
o-Xylene	ND	0.50	µg/L	1.0		4/28/05
Surrogate: 1,4-Dichlorobenzene-d4	85.8	80.8-139	% Rec	1.0		4/28/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	320	50	µg/L	1.0		4/28/05

Client Sample ID: MW-4 **Received:** 4/20/05 **Collected:** 4/20/05 14:20
Lab ID: 0504455-03D

Test Name: TPH as Diesel **Reference:** EPA 3510/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	4/26/05	4/26/05
Surrogate: N-Tricosane	84.2	70-130	% Rec	1.0	4/26/05	4/26/05

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Date: 02-May-05
WorkOrder: 0504455

ANALYTICAL REPORT

Client Sample ID: MW-6 **Received:** 4/20/05 **Collected:** 4/20/05 14:30
Lab ID: 0504455-04A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	180	50	µg/L	50		4/28/05
Tert-butyl alcohol (TBA)	ND	50	µg/L	1.0		4/28/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/28/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/28/05
Benzene	ND	0.50	µg/L	1.0		4/28/05
Tert-amyl methyl ether (TAME)	5.5	1.0	µg/L	1.0		4/28/05
Toluene	ND	0.50	µg/L	1.0		4/28/05
Ethylbenzene	ND	0.50	µg/L	1.0		4/28/05
m,p-Xylene	ND	0.50	µg/L	1.0		4/28/05
o-Xylene	ND	0.50	µg/L	1.0		4/28/05
Surrogate: 1,4-Dichlorobenzene-d4	97.7	80.8-139	% Rec	1.0		4/28/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	500	50	µg/L	1.0		4/28/05

Client Sample ID: MW-6 **Received:** 4/20/05 **Collected:** 4/20/05 14:30
Lab ID: 0504455-04D

Test Name: TPH as Diesel with Silica Gel Cleanup **Reference:** EPA 3510/3630/GCFID(LUFT)/8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	440	50	µg/L	1.0	4/27/05	4/29/05
Surrogate: N-Tricosane	114	70-130	% Rec	1.0	4/27/05	4/29/05

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Date: 02-May-05
WorkOrder: 0504455

ANALYTICAL REPORT

Client Sample ID: MW-3 **Received:** 4/20/05 **Collected:** 4/20/05 14:40
Lab ID: 0504455-05A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	65	1.0	µg/L	1.0		4/28/05
Tert-butyl alcohol (TBA)	ND	15	µg/L	1.0		4/28/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/28/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/28/05
Benzene	0.59	0.50	µg/L	1.0		4/28/05
Tert-amyl methyl ether (TAME)	2.0	1.0	µg/L	1.0		4/28/05
Toluene	ND	0.50	µg/L	1.0		4/28/05
Ethylbenzene	ND	0.50	µg/L	1.0		4/28/05
m,p-Xylene	ND	0.50	µg/L	1.0		4/28/05
o-Xylene	ND	0.50	µg/L	1.0		4/28/05
Surrogate: 1,4-Dichlorobenzene-d4	84.8	80.8-139	% Rec	1.0		4/28/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	67	50	µg/L	1.0		4/28/05

Client Sample ID: MW-3 **Received:** 4/20/05 **Collected:** 4/20/05 14:40
Lab ID: 0504455-05D

Test Name: TPH as Diesel with Silica Gel Cleanup **Reference:** EPA 3510/3630/GCFID(LUFT)/8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	4/27/05	4/29/05
Surrogate: N-Tricosane	117	70-130	% Rec	1.0	4/27/05	4/29/05

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Date: 02-May-05
WorkOrder: 0504455

ANALYTICAL REPORT

Client Sample ID: MW-5 **Received:** 4/20/05 **Collected:** 4/20/05 14:45
Lab ID: 0504455-06A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	160	50	µg/L	50		4/28/05
Tert-butyl alcohol (TBA)	ND	30	µg/L	1.0		4/28/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		4/28/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		4/28/05
Benzene	ND	0.50	µg/L	1.0		4/28/05
Tert-amyl methyl ether (TAME)	5.3	1.0	µg/L	1.0		4/28/05
Toluene	ND	0.50	µg/L	1.0		4/28/05
Ethylbenzene	ND	0.50	µg/L	1.0		4/28/05
m,p-Xylene	ND	0.50	µg/L	1.0		4/28/05
o-Xylene	ND	0.50	µg/L	1.0		4/28/05
Surrogate: 1,4-Dichlorobenzene-d4	89.2	80.8-139	% Rec	1.0		4/28/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	210	50	µg/L	1.0		4/28/05

Client Sample ID: MW-5 **Received:** 4/20/05 **Collected:** 4/20/05 14:45
Lab ID: 0504455-06D

Test Name: TPH as Diesel with Silica Gel Cleanup **Reference:** EPA 3510/3630/GCFID(LUFT)/8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	120	50	µg/L	1.0	4/27/05	4/29/05
Surrogate: N-Tricosane	113	70-130	% Rec	1.0	4/27/05	4/29/05

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North Coast Laboratories, Ltd.

Date: 02-May-05

CLIENT: City of Arcata
Work Order: 0504455
Project: 000108100, Arcata Corp Yard

QC SUMMARY REPORT

Method Blank

Sample ID: **MB-4/27/05** Batch ID: **R34634** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **4/27/05 8:56:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050427B** SeqNo: **502097**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0									
Tert-butyl alcohol (TBA)	ND	10									
Di-isopropyl ether (DIPE)	ND	1.0									
Ethyl tert-butyl ether (ETBE)	ND	1.0									
Benzene	ND	0.50									
Tert-amyl methyl ether (TAME)	ND	1.0									
Toluene	0.1762	0.50									J
Ethylbenzene	0.1775	0.50									J
m,p-Xylene	0.2584	0.50									J
o-Xylene	0.2227	0.50									J
1,4-Dichlorobenzene-d4	0.821	0.10	1.00	0	82.1%	81	139	0			

Sample ID: **MB-4/27/05** Batch ID: **R34633** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **4/27/05 8:56:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050427A** SeqNo: **502077**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	18.66	50									J

Sample ID: **MB-13407** Batch ID: **13407** Test Code: **SGTPHDW** Units: **µg/L** Analysis Date: **4/29/05 5:59:45 PM** Prep Date: **4/27/05**
Client ID: Run ID: **ORGC5_050429B** SeqNo: **502237**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	46.68	50									J
N-Tricosane	52.3	0.10	50.0	0	105%	70	130	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: City of Arcata
Work Order: 0504455
Project: 000108100, Arcata Corp Yard

QC SUMMARY REPORT

Method Blank

Sample ID: **MB-13393** Batch ID: **13393** Test Code: **TPHDIW** Units: **µg/L** Analysis Date: **4/26/05 3:11:44 PM** Prep Date: **4/26/05**

Client ID: Run ID: **ORGC7_050426A** SeqNo: **501491**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	ND	50									
N-Tricosane	48.4	0.10	50.0	0	96.8%	70	130	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 02-May-05

CLIENT: City of Arcata
Work Order: 0504455
Project: 000108100, Arcata Corp Yard

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-05289** Batch ID: **R34634** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **4/27/05 4:55:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS2_050427B** SeqNo: **502094**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.72	1.0	20.0	0	93.6%	80	120	0			
Tert-butyl alcohol (TBA)	326.4	10	400	0	81.6%	25	162	0			
Di-isopropyl ether (DIPE)	18.69	1.0	20.0	0	93.5%	80	120	0			
Ethyl tert-butyl ether (ETBE)	18.19	1.0	20.0	0	91.0%	77	120	0			
Benzene	19.75	0.50	20.0	0	98.8%	78	117	0			
Tert-amyl methyl ether (TAME)	19.77	1.0	20.0	0	98.9%	64	136	0			
Toluene	18.38	0.50	20.0	0	91.9%	80	120	0			
Ethylbenzene	20.04	0.50	20.0	0	100%	80	120	0			
m,p-Xylene	42.25	0.50	40.0	0	106%	80	120	0			
o-Xylene	20.23	0.50	20.0	0	101%	80	120	0			
1,4-Dichlorobenzene-d4	1.08	0.10	1.00	0	108%	81	139	0			

Sample ID: **LCSD-05289** Batch ID: **R34634** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **4/27/05 5:25:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS2_050427B** SeqNo: **502095**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.39	1.0	20.0	0	92.0%	80	120	18.7	1.77%	20	
Tert-butyl alcohol (TBA)	308.9	10	400	0	77.2%	25	162	326	5.48%	20	
Di-isopropyl ether (DIPE)	18.42	1.0	20.0	0	92.1%	80	120	18.7	1.48%	20	
Ethyl tert-butyl ether (ETBE)	17.93	1.0	20.0	0	89.7%	77	120	18.2	1.46%	20	
Benzene	19.74	0.50	20.0	0	98.7%	78	117	19.8	0.0821%	20	
Tert-amyl methyl ether (TAME)	19.47	1.0	20.0	0	97.4%	64	136	19.8	1.53%	20	
Toluene	18.51	0.50	20.0	0	92.5%	80	120	18.4	0.698%	20	
Ethylbenzene	19.77	0.50	20.0	0	98.9%	80	120	20.0	1.36%	20	
m,p-Xylene	41.48	0.50	40.0	0	104%	80	120	42.2	1.85%	20	
o-Xylene	20.31	0.50	20.0	0	102%	80	120	20.2	0.400%	20	
1,4-Dichlorobenzene-d4	1.11	0.10	1.00	0	111%	81	139	1.08	2.17%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: City of Arcata
Work Order: 0504455
Project: 000108100, Arcata Corp Yard

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-05290** Batch ID: **R34633** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **4/27/05 6:55:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050427A** SeqNo: **502074**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	1,061	50	1,000	0	106%	80	120	0			

Sample ID: **LCSD-05290** Batch ID: **R34633** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **4/27/05 7:25:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050427A** SeqNo: **502075**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	1,049	50	1,000	0	105%	80	120	1,060	1.13%	20	

Sample ID: **LCS-13407** Batch ID: **13407** Test Code: **SGTPHDW** Units: **µg/L** Analysis Date: **4/29/05 4:00:19 PM** Prep Date: **4/27/05**
Client ID: Run ID: **ORGC5_050429B** SeqNo: **502235**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	376.4	50	500	0	75.3%	40	107	0			
N-Tricosane	65.0	0.10	50.0	0	130%	70	130	0			

Sample ID: **LCSD-13407** Batch ID: **13407** Test Code: **SGTPHDW** Units: **µg/L** Analysis Date: **4/29/05 4:30:18 PM** Prep Date: **4/27/05**
Client ID: Run ID: **ORGC5_050429B** SeqNo: **502236**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	369.4	50	500	0	73.9%	40	107	376	1.89%	15	
N-Tricosane	61.5	0.10	50.0	0	123%	70	130	65.0	5.55%	15	

Sample ID: **LCS-13393** Batch ID: **13393** Test Code: **TPHDIW** Units: **µg/L** Analysis Date: **4/26/05 1:38:32 PM** Prep Date: **4/26/05**
Client ID: Run ID: **ORGC7_050426A** SeqNo: **501488**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	510.3	50	500	0	102%	67	120	0			
N-Tricosane	52.2	0.10	50.0	0	104%	70	130	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: City of Arcata
Work Order: 0504455
Project: 000108100, Arcata Corp Yard

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID: **LCSD-13393** Batch ID: **13393** Test Code: **TPHDIW** Units: **µg/L** Analysis Date: **4/26/05 1:57:14 PM** Prep Date: **4/26/05**

Client ID: Run ID: **ORGC7_050426A** SeqNo: **501489**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	527.1	50	500	0	105%	67	120	510	3.24%	15	
N-Tricosane	51.8	0.10	50.0	0	103%	70	130	52.2	0.934%	15	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

P. 1 of 1

(004) Kthompson 4/20/05
~~0405~~

NORTH COAST LABORATORIES LTD.
5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

LABORATORY NUMBER: 0504455

Attention: KIM WATSON
Results & Invoice to: City OF ARCATA
Address: 736 F. Street
ARCATA, CA 95521
Phone: 825-2180
Copies of Report to: SHN: MIKE Foget
812 W. WABASH EUREKA 95501
Sampler (Sign & Print): [signature]; Tom WISCARSON

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5–7 Day
☐ STD (2–3 Wk) ☐ Other: _____
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☐ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

PROJECT INFORMATION

Project Number: 000108100
Project Name: ARCATA CORP YARD
Purchase Order Number: _____

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	ANALYSIS: TPHDIE 3&2 W/SF	CONTAINER: 7	PRESERVATIVE: 1
	MW-1	04/20/05	2:00	GW		9	5
	MW-2	↓	2:15	↓			
	MW-4	↓	2:20	↓			
	MW-6	↓	2:30	↓			
	MW-3	↓	2:40	↓			
	MW-5	↓	2:45	↓			

ANALYSIS	CONTAINER	PRESERVATIVE
TPHDIE 3&2 W/SF	7	1
8260 LIST 1	9	5
	1	3
	1	3
	1	3
	1	3
	1	3
	1	3

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

Cooler blank = 11.6°C

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
[signature]; Tom Wiscarson	4/20/05 1540	[signature]	4/20/05 1540

SAMPLE DISPOSAL
☐ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT