3R - 0141

QUARTERLY MONITORING REPORT

11/15/2007

ENVIROTECH INC.

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

3R0141

November 15, 2007

Project No. 05161-008

Mr. Glen von Gonten
NMOCD
1220 South St. Francis Dr.
Santa Fe, NM 87505

Phone (505) 476-3440

RE: DUNCAN OIL SIXTH 2006-2007 QUARTERLY MONITORING REPORT

Dear Mr. von Gonten;

Enclosed please find one (1) copy of the report entitled, *Duncan Oil Sixth 2006-2007 Quarterly Monitoring Report.* This report details the sixth quarterly monitoring for the North Hogback 12-1, and North Hogback 12-9 locations on the Navajo Nation in San Juan County, New Mexico.

We appreciate the opportunity to be of service. If you should have any questions or require additional information, please contact our office at (505) 632-0615.

Respectfully Submitted,
ENVIROTECH, INC.

David Young
Environmental Scientist
dyoung@envirotech-inc.com

Enclosure: One (1) copy

Cc: Mr. Fallin, Duncan Oil
Mr. Lee, NNEPA
Ms. Spencer, BIA
Mr. Walker, USEPA
Client File 05161

RECEIVED
2007 NOV 19 PM 3 59

ENVIROTECH INC.

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

DUNCAN OIL
SIXTH 2006-2007 QUARTERLY MONITORING REPORT

AT:

NORTH HOGBACK 12-1 AND 12-9
NAVAJO NATION
SAN JUAN COUNTY, NEW MEXICO

FOR:

MR. STEVE FALLIN, PRODUCTION MANAGER
DUNCAN OIL
1777 SOUTH HARRISON – PENTHOUSE ONE
DENVER, COLORADO 80210

PROJECT NO. 05161-008

OCTOBER 2007

5796 U.S. HIGHWAY 64 • FARMINGTON, NM 87401 • (505) 632-0615

DUNCAN OIL
SIXTH 2006-2007 QUARTERLY MONITORING REPORT
NORTH HOGBACK 12-1 AND 12-9
NAVAJO NATION
SAN JUAN COUNTY, NEW MEXICO

TABLE OF CONTENTS

INTRODUCTION

Envirotech, Inc. has completed the sixth quarterly monitoring of two (2) monitor wells at the Duncan Oil North Hogback 12-1 well site and collected water level measurements on two (2) wells at the 12-9 well site; see ***Figure 1 Vicinity Map.*** Contaminated soil was previously excavated from the sites in September and October of 2005 and monitor wells were installed. The contaminated soil was transported to Envirotech's NMOCD permitted landfarm at Hilltop, New Mexico, for remediation. Water samples collected at the time of excavation indicated that the two (2) sites previously referenced had residual contaminants in the groundwater above the guidelines set forth by the USEPA and adopted by the NNEPA.

GROUNDWATER SAMPLING AND ANALYSIS

Groundwater sampling/monitoring was performed on two (2) monitor wells and water level measurements were taken on two (2) wells to establish a water gradient on October 17, 2007. Prior to sampling the wells at the 12-1 a minimum of three (3) well volumes of water were bailed out of each well with a new disposable bailer.

Water levels were calculated from the surveying data to draw a water level map. Water levels and groundwater gradient for the North Hogback 12-1 and 12-9 are shown on ***Figure 3, North Hogback 12-1 and 12-9 Water Level Map.*** It appears that the groundwater is moving from southeast to northwest across the 12-1 and 12-9 sites. Water levels for the individual wells are tabulated in ***Table 1: Water Levels*** below.

Table 1: Water Levels

Name	Casing Elevation	Water Depth	Water Elevation
N. Hogback 12-1 MW-1	5025.84	19.65	5006.19
N. Hogback 12-1 MW-2	5027.47	18.92	5008.55
N. Hogback 12-9 MW-1	5026.12	7.35	5018.77
N. Hogback 12-9 MW-2	5025.61	8.10	5017.51

NS = Not Sampled

North Hogback 12-9

The North Hogback 12-9 MW-1 and MW-2 monitor wells were not sampled in this event and were monitored for water levels only. Though manganese is present in the wells of interest, the NNEPA and USEPA have given permission to discontinue Metals sampling at this time.

North Hogback 12-1

Samples were collected from the two (2) monitor wells at the North Hogback 12-1 and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) via USEPA Method 8021B. Results from this analysis are summarized in ***Table 2: Summary of Laboratory BTEX Analysis for North Hogback 12-1*** below and laboratory certificates are presented in ***Section 2: Laboratory Water Sample Results.***

Table 2: Summary of Laboratory BTEX Analysis for North Hogback 12-1

Analyte	Monitor Well #1	Monitor Well #2	**Regulated Level**
Benzene (ppb)	ND	0.2	**5.0**
Toluene (ppb)	ND	0.4	**1,000**
Ethylbenzene (ppb)	ND	0.3	**700**
Total Xylenes (ppb)	ND	0.9	**10,000**

ND – indicates analyte is below the method detection limit

SUMMARY AND CONCLUSIONS

Envirotech has completed the sixth quarterly monitoring of two (2) monitor wells at the North Hogback 12-1 well site and water level measurements from two (2) wells at the 12-9 well site.

At the North Hogback 12-1 location, all contaminants of concern analyzed for are below the regulated limit. BTEX levels increased negligibly from the previous sampling event, possibly due to the fluctuation in water levels.

Envirotech recommends a minimum of one (1) additional sampling event at this site where contaminants of concern are below regulated limits.

We appreciate the opportunity to be of service. Should you have any questions or require additional information, please contact our office at (505) 632-0615.

Respectfully submitted,
ENVIROTECH, INC.

Reviewed By:

KYLE P. KERR, C.E.S. NEW MEXICO 299 CERTIFIED SCIENTIST

David Young
Environmental Scientist
dyoung@envirotech-inc.com

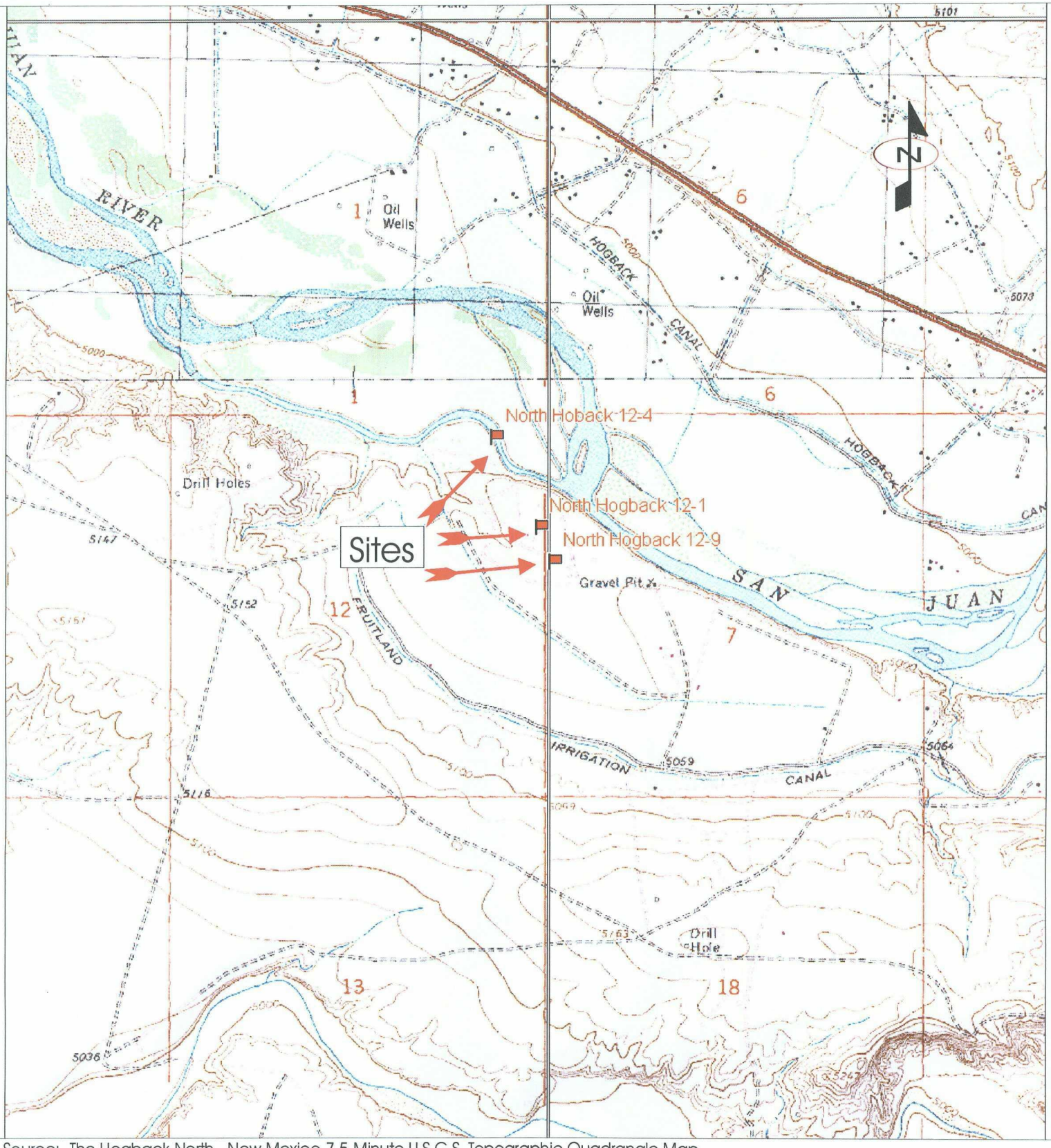
Kyle P. Kerr
Chief Environmental Scientist
NMCES #299
kpkerr@envirotech-inc.com

SECTION 1:

Figure 1, Vicinity Map

Figure 2, North Hogback 12-1 and 12-9 Site Map

Figure 3, North Hogback 12-1 and 12-9 Water Level Map



Source: The Hogback North, New Mexico 7.5 Minute U.S.G.S. Topographic Quadrangle Map
Scale: 1:24,000 1" = 2000'

North Hogback 12-1, 12-4, & 12-9
Section 12, Township 29N, Range 16W
San Juan County, NM

PROJECT No 05161-008 | Date Drawn: 7/20/06

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64
FARMINGTON, NEW MEXICO 87401
PHONE (505) 632-0615

Vicinity Map

Figure 1

DRAWN BY: Greg Crabtree | PROJECT MANAGER: Kyle Kerr

Duncan Oil
North Hogback
12-1 and 12-9

SCALE:1" = 100'	FIGURE NO. 2	REV 3
PROJECT NO.05161-008		

REVISIONS

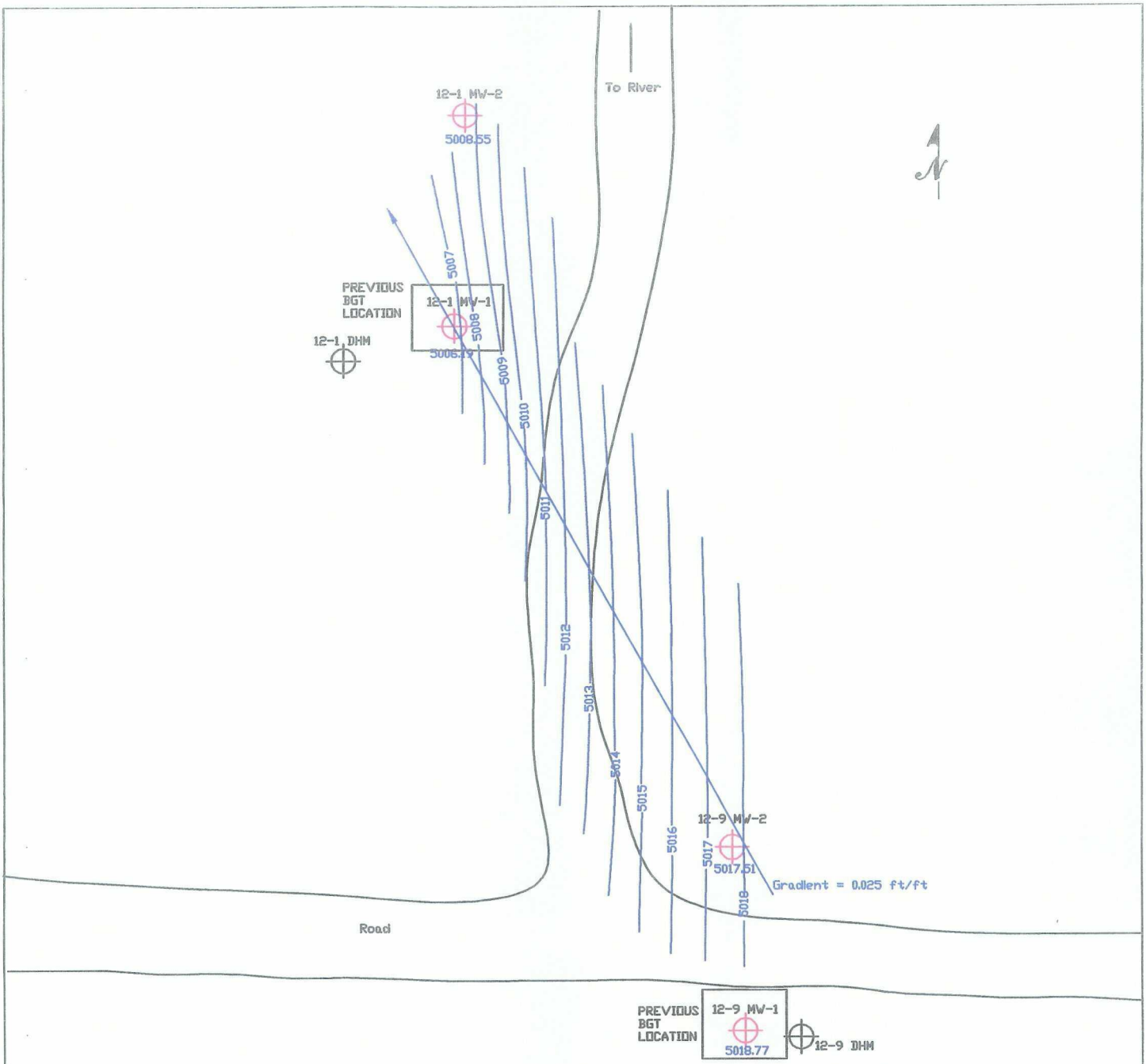
NO.	DATE	BY	DESCRIPTION

MAP DRWN	GWC	7/14/06	BASE DRWN	GWC	7/14/06

Legend

- Dry Hole Marker
- Monitor Well Location

ENVIRONMENTAL SCIENTISTS & ENGINEERS
ENVIROTECH
5796 U.S. HIGHWAY 64, FARMINGTON, NM 87401 505-632-0615



Duncan Oil
North Hogback
12-1 and 12-9

SCALE:1" = 100'	FIGURE NO. 3	REV 3
PROJECT NO.05161-008		

REVISIONS

NO.	DATE	BY	DESCRIPTION

MAP DRWN	GWC	7/14/06	BASE DRWN	GWC	7/14/06

Legend

Dry Hole Marker

Monitor Well Location

5014.64 Water Level Elevation

ENVIRONMENTAL SCIENTISTS & ENGINEERS
ENVIROTECH
5796 U.S. HIGHWAY 64, FARMINGTON, NM 87401 505-632-0615

SECTION 2:

Laboratory Water Sample Results

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Duncan Oil	Project #:	05161-008
Sample ID:	MW - 1	Date Reported:	10-18-07
Chain of Custody:	3513	Date Sampled:	10-17-07
Laboratory Number:	43375	Date Received:	10-17-07
Sample Matrix:	Water	Date Analyzed:	10-18-07
Preservative:	Cool / HgCl2	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**ND**	**1**	**0.2**
Toluene	**ND**	**1**	**0.2**
Ethylbenzene	**ND**	**1**	**0.2**
p,m-Xylene	**ND**	**1**	**0.2**
o-Xylene	**ND**	**1**	**0.1**
Total BTEX	**ND**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	fluorobenzene	**96 %**
	1,4-difluorobenzene	**96 %**
	4-bromochlorobenzene	**96 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **N. Hogback 12-1**

Analyst

Review

5796 U.S. Highway 64 ◦ Farmington, NM 87401 ◦ Tel 505 ◦ 632 ◦ 0615 ◦ Fax 505 ◦ 632 ◦ 1865

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Duncan Oil	Project #:	05161-008
Sample ID:	MW - 2	Date Reported:	10-18-07
Chain of Custody:	3513	Date Sampled:	10-17-07
Laboratory Number:	43376	Date Received:	10-17-07
Sample Matrix:	Water	Date Analyzed:	10-18-07
Preservative:	Cool / HgCl2	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**0.2**	**1**	**0.2**
Toluene	**0.4**	**1**	**0.2**
Ethylbenzene	**0.3**	**1**	**0.2**
p,m-Xylene	**0.6**	**1**	**0.2**
o-Xylene	**0.3**	**1**	**0.1**
Total BTEX	**1.8**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	fluorobenzene	**97 %**
	1,4-difluorobenzene	**97 %**
	4-bromochlorobenzene	**97 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **N. Hogback 12-1**

Analyst

Review

5796 U.S. Highway 64 ◦ Farmington, NM 87401 ◦ Tel 505 ◦ 632 ◦ 0615 ◦ Fax 505 ◦ 632 ◦ 1865

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	10-18-BTEX QA/QC	Date Reported:	10-18-07
Laboratory Number:	43375	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	10-18-07
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF:	C-Cal RF:	%Diff. Accept. Range 0 - 15%	Blank Conc	Detect. Limit
Benzene	1.2074E+008	1.2111E+008	**0.30%**	**ND**	**0.2**
Toluene	1.0448E+008	1.0479E+008	**0.30%**	**ND**	**0.2**
Ethylbenzene	7.7779E+007	7.8013E+007	**0.30%**	**ND**	**0.2**
p,m-Xylene	1.5323E+008	1.5369E+008	**0.30%**	**ND**	**0.2**
o-Xylene	7.2909E+007	7.3128E+007	**0.30%**	**ND**	**0.1**

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept Limit
Benzene	**ND**	**ND**	**0.0%**	**0 - 30%**
Toluene	**ND**	**ND**	**0.0%**	**0 - 30%**
Ethylbenzene	**ND**	**ND**	**0.0%**	**0 - 30%**
p,m-Xylene	**ND**	**ND**	**0.0%**	**0 - 30%**
o-Xylene	**ND**	**ND**	**0.0%**	**0 - 30%**

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	**ND**	**50.0**	**49.9**	**99.8%**	**39 - 150**
Toluene	**ND**	**50.0**	**49.9**	**99.8%**	**46 - 148**
Ethylbenzene	**ND**	**50.0**	**49.9**	**99.8%**	**32 - 160**
p,m-Xylene	**ND**	**100**	**99.8**	**99.8%**	**46 - 148**
o-Xylene	**ND**	**50.0**	**49.9**	**99.8%**	**46 - 148**

ND - Parameter not detected at the stated detection limit.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **QA/QC for samples 43375 - 43376**

Analyst

Review

5796 U.S. Highway 64 ◦ Farmington, NM 87401 ◦ Tel 505 ◦ 632 ◦ 0615 ◦ Fax 505 ◦ 632 ◦ 1865

CHAIN OF CUSTODY RECORD

3513

Client:	Project Name / Location:
Duncan Oil	N. Hogback 12-1
Client Address:	Sampler Name: amy
Client Phone No.:	Client No.: 05161-008

Sample No./ Identification	Sample Date	Sample Time	Lab No.	Sample Matrix	No./Volume of Containers	Preservative $HgCl_2$	Preservative HNO_3	TPH (Method 8015)	BTEX (Method 8021)	VOC (Method 8260)	RCRA 8 Metals	Cation / Anion	RCI	TCLP with H/P	PAH	TPH (418.1)				Sample Cool	Sample Intact
								ANALYSIS / PARAMETERS													
MW-1	10-17	10:00	43375	W	2	x			X											✓	✓
MW-2	10-17	10:30	43376	W	2	x			X											✓	✓

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	10.17.07	12:30	[signature]	10/17/07	1230
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.

5796 U.S. Highway 64 • Farmington, New Mexico 87401 • (505) 632-0615

SECTION 3:

Historical Data

Historical Data

NMED Action Levels		5	1000	700	10000	1	0.20	0.05
Well No.	Sample Date	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)	Iron (ppm)	Manganese (ppm)	Lead (ppm)
North Hogback 12-1 MW-1	07/20/06	NS	NS	NS	NS	NS	NS	NS
	10/13/06	4.30	2.40	3.90	12.20	NS	NS	NS
	01/11/07	ND	ND	0.20	1.50	NS	NS	NS
	04/02/07	**121**	301	359	1748	NS	NS	NS
	07/05/07	ND	ND	ND	0.4	NS	NS	NS
	10/17/07	ND	ND	ND	ND	NS	NS	NS
North Hogback 12-1 MW-2	07/20/06	NS	NS	NS	NS	NS	NS	NS
	10/13/06	**5.90**	3.00	7.10	15.80	NS	NS	NS
	01/11/07	0.20	17.60	5.00	46.30	NS	NS	NS
	04/02/07	ND	ND	0.60	1.80	NS	NS	NS
	07/05/07	ND	ND	ND	0.50	NS	NS	NS
	10/17/07	0.20	0.40	0.30	0.90	NS	NS	NS
North Hogback 12-4 MW-1	07/20/06	1.20	5.90	23.40	16.70	NS	NS	NS
	10/13/06	ND	1.90	1.30	1.90	NS	NS	NS
	01/11/07	ND	51.20	26.60	118.50	NS	NS	NS
North Hogback 12-4 MW-2	07/20/06	1.60	1.80	1.60	8.70	NS	NS	NS
	10/13/06	3.10	1.60	2.80	6.70	NS	NS	NS
	01/11/07	ND	3.50	0.70	8.40	NS	NS	NS
North Hogback 12-4 MW-3	07/20/06	1.30	0.40	0.80	2.80	NS	NS	NS
	10/13/06	ND	ND	0.70	ND	NS	NS	NS
	01/11/07	ND	ND	ND	0.10	NS	NS	NS
North Hogback 12-9 MW-1	07/20/06	NS	NS	NS	NS	0.54	**0.28**	ND
	10/13/06	NS	NS	NS	NS	0.31	**0.50**	ND
	01/11/07	NS	NS	NS	NS	0.74	**0.40**	ND
	04/02/07	NS	NS	NS	NS	0.119	**0.387**	0.004
	07/05/07	NS	NS	NS	NS	0.250	**0.310**	ND
	10/17/07	NS	NS	NS	NS	NS	NS	NS
North Hogback 12-9 MW-2	07/20/06	NS	NS	NS	NS	ND	**0.22**	ND
	10/13/06	NS	NS	NS	NS	0.22	**0.54**	ND
	01/11/07	NS	NS	NS	NS	0.46	**0.55**	ND
	04/02/07	NS	NS	NS	NS	0.325	**0.493**	0.003
	07/05/07	NS	NS	NS	NS	0.411	**0.417**	ND
	10/17/07	NS	NS	NS	NS	NS	NS	NS

NS = Not Sampled
ND = Not Detected

Values in bold exceed New Mexico Water Quality Control Commission (NMWQCC) standards

SECTION 4:

Field Notes

ENVIROTECH INC.
FARMINGTON, NM 5796 HIGHWAY 64
MONITOR WELL DATA

Date: 10-17-07 Project No: 05161-008

Project Name: Duncan Oil Monitoring Chain of Custody No: _____

Location: N Hogback 12-1, 12-9

Project Manager: _____ Sampler: Amy

MONITOR WELL DATA

WELL #	TIME	OVM ppm	pH	COND. µS	TEMP. °F	DEPTH TO WATER FT.	TOTAL DEPTH FT.	WATER COLUMN FT.	BAILED Water Gal.	PRODUCT Ft..	WATER LEVEL FT.
(12-9)											
MW1	—	—	—	—	—	7.35'	20.90'	13.35'	—	—	—
MW2	—	—	—	—	—	8.10'	15.10'	7.0'	—	—	—
(12-1)											
MW-1	10:00	—	7.29	1.73	67.3°	19.65'	21.00'	1.35'	1gal	—	—
MW-2	10:30	—	7.48	2.94	64.7°	18.92'	20.80'	1.90'	1gal	—	

Notes: TOC = Top of Casing
Bailed = 3 well volummes:
1.25" well = 0.19 gal/ft.
2.00" well = 0.49 gal/ft.
4.00" well = 1.96 gal/ft.
Note well diameter if not one of the above.