

3R - 79

REPORTS

DATE:

1/1997

REPORT FOR SEMI-ANNUAL GROUNDWATER SAMPLING
BURLINGTON RESOURCES OIL AND GAS COMPANY'S THOMAS NO. 1
LOCATION
BLOOMFIELD, NEW MEXICO

January 1997

RECEIVED

MAR 27 1997

Environmental Bureau
Oil Conservation Division

PREPARED FOR:

BURLINGTON RESOURCES
OIL AND GAS COMPANY
FARMINGTON, NEW MEXICO

Project 13164

PHILIP
ENVIRONMENTAL

4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262



Environmental Services Group
Southern Region

January 28, 1997

Project 13164

Mr. Craig A. Bock
Burlington Oil and Gas Company
3535 East 30th
Farmington, New Mexico 87401

**RE: Report for January, 1997, Semi-Annual Groundwater Sampling at the
Burlington Resources Oil and Gas Company Thomas No. 1 Location,
Bloomfield, New Mexico**

Dear Mr. Bock:

During October 1994, Philip Environmental Services Corporation (Philip) initiated a semi-annual groundwater sampling program at the Burlington Oil and Gas Company (Burlington) Thomas No. 1 production well location (the site). The site is located in San Juan County, New Mexico, in the southwest corner of Section 20, Township 29 North, Range 11 West. A site map showing locations of the monitoring wells is presented in Figure 1.

Groundwater sampling included:

- Collecting depth-to-groundwater measurements.
- Purging a minimum of three well casing volumes and monitoring pH, conductivity, and temperature levels until stabilization occurred for monitoring wells 1 through 5.
- Collecting groundwater samples from each monitoring well and submitting the samples for laboratory analysis for benzene, toluene, ethylbenzene, and xylenes (BTEX) by U.S. Environmental Protection Agency (USEPA) Method 602.

METHODOLOGY

Groundwater sampling of the five monitoring wells at the site took place on January 8, 1996, and was completed that same day.

Philip's field representative began sampling by taking a static depth-to-groundwater reading with an electronic water level indicator at each well site. In addition, the total depth of the well was measured using a weighted survey tape. Both measurements were taken at the same reference point, starting at the top of the well casing. The total linear feet of water in the well was then used to calculate the water volume in each well casing. At least three well casing volumes were removed from each well.

Each well was purged and sampled using a pre-cleaned disposable bailer, with an approximate volume of one-liter.



Field water-quality measurements of pH, conductivity, and temperature were performed periodically during the purging of the well to ensure that the water sampled was representative of the ambient groundwater in the aquifer. Once the water quality parameters were stable and at least three well casing volumes had been removed, the groundwater was sampled by pouring groundwater from a disposable bailer directly into 40-milliliter glass containers with Teflon™ septum closures. All samples collected were preserved with hydrochloric acid, placed directly on ice, and transported via overnight service under strict chain-of-custody procedures to Zenon Environmental Laboratories. Each sample was to be analyzed for BTEX by USEPA Method 602, but were analyzed for BTEX by USEPA Method 8260 due to laboratory equipment problems. In addition to collecting samples from each well, a duplicate of MW-2 was also analyzed.

All groundwater purged from each monitoring well was stored in 5-gallon buckets and transported, by hand, to a discharge storage tank at the site for disposal, as directed by Burlington personnel.

RESULTS

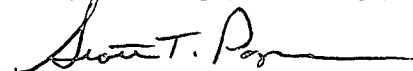
Laboratory results indicated BTEX compounds present in the samples collected from MW-2, MW-3 and MW-4. Of the BTEX compounds detected, benzene in MW-02 was the only detected compound above New Mexico Water Quality Control Commission (NMWQCC) standards. The results from the semi-annual sampling are presented in Table 1, along with historical data from previous sampling events. Table 2 presents the final field measurements of groundwater elevations and field data collected during this sampling event, as well as limited data provided by Burlington for previous sampling events. A copy of the original laboratory report is included as Attachment A. Field documentation of purging and sampling data is included in Attachment B.

Figure 1 also presents groundwater elevations and contours for the current sampling event. This map was derived from a base map provided to Philip by Burlington.

If you have any questions, or require additional information, please contact Scott T. Pope of Philip at (505) 326-2262.

Respectfully submitted,

PHILIP ENVIRONMENTAL SERVICES CORPORATION



Scott T. Pope
Project Manager

TABLE 1

BTEX RESULTS FROM GROUNDWATER SAMPLING
BURLINGTON RESOURCES OIL AND GAS COMPANY
THOMAS NUMBER 1

Location	Date	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L
MW-1	01/08/97	<1.0	1.2	<1.0	<1.0
	07/15/96	<0.10	0.10	<0.10	<0.20
	01/10/96	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)
	07/10/95	1.9	ND (1.0)	2.2	ND (2.0)
	01/04/95	<0.3	<0.3	<0.3	<0.9
	10/20/94	<0.3	<0.3	<0.3	<0.9
	06/15/93	ND	ND	ND	ND
	09/01/92	ND	ND	ND	ND
	11/01/91	ND	ND	ND	ND
MW-2	01/08/97	400	2.3	78	400
	07/15/96	150	<5.0	22	110
	01/10/96	390	ND(10.0)	64	395
	07/10/95	400	ND(10.0)	47.0	324
	01/04/95	448	8.3	48.0	340
	10/20/94	556	<0.3	79.4	569
	06/15/93	860	420	130	2,540
	12/07/92	850	291	98	912
	11/13/92	3.00	484	164	1,190
	10/28/92	1,230	570	113	2,750
	09/15/92	251	64	23	397
	09/01/92	251	64	23	346
	11/01/91	800	2,800	400	8,100
	08/31/91	800	2,800	400	8,100
	08/18/91	10	750	750	620
MW-3	01/08/97	<1.0	150	22	77
	07/15/96	<1.0	57	8.0	33
	01/10/96	ND (25.0)	1200	88	470
	07/11/95	ND (10.0)	620	61	273
	01/04/95	122	2,700	155	1,322
	10/20/94	521	10,900	455	4,040
	06/15/93	ND	7,800	780	7,100
	12/08/92	25.6	1,560	570	1,720
	11/13/92	117	4,270	980	9,850
	10/28/92	256	11,400	1,120	5,640
	09/15/92	ND	8,220	ND	3,630

TABLE 1

BTEX RESULTS FROM GROUNDWATER SAMPLING
BURLINGTON RESOURCES OIL AND GAS COMPANY
THOMAS NUMBER 1

CONTINUED

Location	Date	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L
MW-3	09/01/92	ND	8,220	ND	ND
	11/01/91	1,500	30,000	2,000	36,000
	08/31/91	1,500	30,000	2,000	38,000
	08/18/91	10	750	750	620
MW-4	01/08/97	<1.0	1.3	3.7	35
	07/16/96	<1.0	0.10	<0.10	0.2
	01/10/96	ND (1.0)	ND (1.0)	3.6	15.4
	07/10/95	ND (1.0)	ND (1.0)	ND (1.0)	1.3
	01/04/95	<0.3	<0.3	<0.3	<0.5
	10/20/94	<0.3	<0.3	<0.3	<0.9
	06/15/93	ND	ND	ND	ND
	09/04/92	ND	ND	ND	ND
	11/01/91	ND	ND	ND	ND
MW-5	01/08/97	<1.0	1.1	<1.0	<1.0
	07/16/96	<0.10	<0.01	<0.10	<0.20
	01/10/96	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)
	07/11/95	13.0	6.1	3.7	9.0
	01/04/95	<0.3	<0.3	<0.3	<0.9
	10/20/94	<0.3	<0.3	<0.3	<0.9
	06/15/93	9.7	ND	ND	ND
	09/01/92	ND	ND	ND	ND
	11/01/91	ND	ND	ND	ND
Trip Blank	10/20/94	<0.3	<0.3	<0.3	<0.9

TABLE 1

BTEX RESULTS FROM GROUNDWATER SAMPLING
BURLINGTON RESOURCES OIL AND GAS COMPANY
THOMAS NUMBER 1

CONTINUED

Location	Date	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L
MW-52	01/08/97	NR	1.9	72	380
(Duplicate of MW-2)	7/15/96	160	<5.0	26	130
	01/10/96	330	ND(25.0)	55	310
	07/10/95	490	71.0	79.0	448
	01/04/95	294	44.0	33.0	238
MW-52	10/20/95	610	<0.03	72.0	555
µg/L = micrograms per liter				ND = Not Detected	
BTEX Analysis by USEPA Method 8020				(1.0) Detection Limit in µg/L	
NR = No results					

TABLE 2

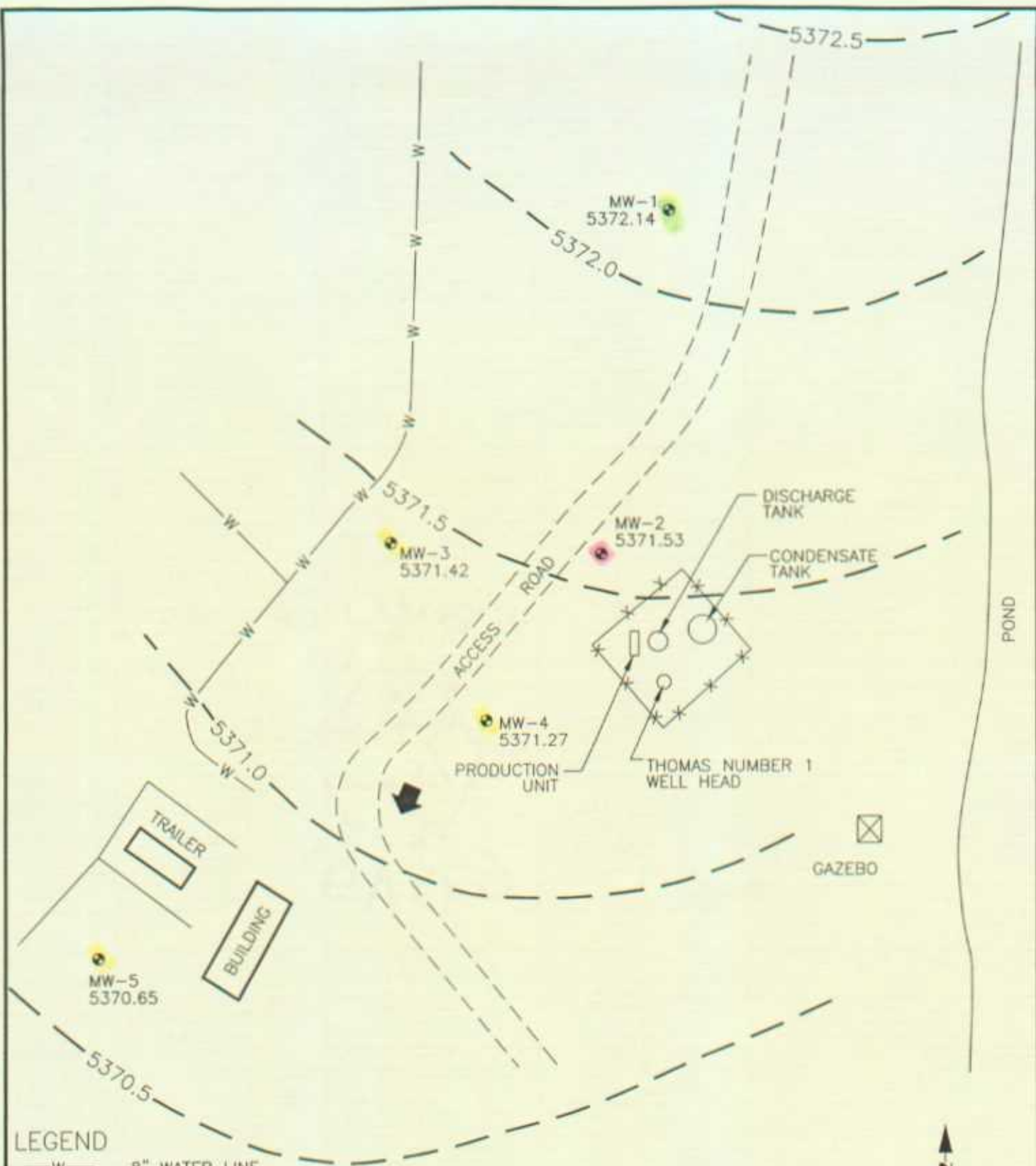
MONITORING WELL SAMPLING

GROUNDWATER ELEVATIONS AND WATER QUALITY FIELD MEASUREMENTS

Location	Date	Elevation feet MSL	pH	Conductivity µmhos/cm	Temperature °F	Gallons Removed
MW-1	01/08/97	5,372.14	7.00	2,200	50.4	5.0
	07/15/96	5,371.76	7.04	2,160	64.0	5.0
	01/10/96	5,372.04	7.18	3,960	48.0	5.0
	07/10/95	5,372.05	7.05	2,790	62.0	2.5
	01/04/95	5,371.72	6.96	2,120	45.5	2.5
	10/20/94	5,371.95	6.81	2,280	58.7	2.0
MW-2	01/08/97	5,371.53	NR	NR	NR	5.5
	07/15/96	5,371.23	NR	NR	NR	5.0
	01/10/96	5,371.40	NR	NR	NR	4.0
	07/10/95	5,371.23	NR	NR	NR	4.0
	01/04/95	5,371.02	6.95	2,160	44.8	1.5
	10/20/94	5,371.26	6.64	2,460	66.4	2.5
	10/28/92	*5,370.54	7.20	2,200	68.0	10.0
	11/13/92	*5,370.48	6.97	2,250	61.0	5.0
MW-3	01/08/97	5,371.42	7.21	2,550	48.7	2.25
	07/15/96	5,371.11	6.95	1,610	73.8	3.0
	01/10/96	5,371.29	7.43	4,640	47.1	2.0
	07/11/95	5,371.21	7.08	2,160	62.6	1.25
	01/04/95	5,371.01	5.35	2,640	43.4	2.0
	10/20/94	5,371.26	2.86	2,970	61.7	2.5
	10/28/92	*5,371.08	7.12	2,450	68.0	10.0
	11/13/92	*5,371.00	7.03	2,300	56.3	5.0
MW-4	01/08/97	5,371.27	7.23	1,660	46.8	4.0
	07/16/96	5,370.98	7.20	1,470	70.9	3.0
	01/10/96	5,371.15	7.52	2,770	47.1	2.0
	07/10/95	5,370.98	7.11	1,840	59.0	2.0
	01/04/95	5,370.80	6.97	2,350	43.0	2.0
	10/20/94	5,370.04	6.92	4,160	53.4	2.0

TABLE 2
MONITORING WELL SAMPLING
GROUNDWATER ELEVATIONS AND WATER QUALITY FIELD MEASUREMENTS
CONTINUED

Location	Date	Elevation feet MSL	pH	Conductivity µmhos/cm	Temperature °F	Gallons Removed
MW-5	01/08/97	5,370.65	6.85	2070	47.3	4.0
	07/15/96	5,370.47	7.02	1,290	58.6	3.0
	01/10/96	5370.54	7.44	3,190	47.8	2.0
	07/11/95	5,370.38	7.11	1,840	59.0	2.0
	01/04/95	5,370.31	6.97	2,350	43.0	2.0
	10/20/95	5,370.55	6.92	4,160	53.4	2.0
MSL = mean sea level µmhos/cm = micromhos per centimeter °F = degrees Fahrenheit NR = No Reading pH, conductivity, and temperature are final measurements prior to sampling. *Philip assumes the reference point on these measurements to be the top of the well pipe.						



LEGEND

- W— 8" WATER LINE
- MW-5 5370.65 MONITORING WELL LOCATION, NUMBER AND GROUNDWATER ELEVATION
- * * * FENCE
- 5372- GROUNDWATER ELEVATION CONTOURS
- ➔ GROUNDWATER FLOW



TITLE:
THOMAS NUMBER 1
WELL SITE

SCALE	1=80	DATE	
DWN:	TMM		
DES:			
CHKD:			
APPD:		8/6/96	

PROJECT NO: 13164
BURLINGTON RESOURCES
OIL & GAS COMPANY

FIGURE 1

REV:
1

ATTACHMENT A

Certificate of Analysis

CLIENT INFORMATION

Attention: Scott Pope
Client Name: Philip Environmental Inc.
Project: 13164
Project Desc: MOI Thomas No.1

Address: 4000 Monroe Road
Farmington, NM
87401
Fax Number: 505 326-2388
Phone Number: 505 326-2262

LABORATORY INFORMATION

Contact: Ada Blythe, B.Sc., C.Chem.
Project: AN960753
Date Received: 97/01/10
Date Reported: 97/01/22

Submission No.: 7A0185
Sample No.: 000834-000839

NOTES: "'-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available
LOQ can be determined for all analytes by multiplying the appropriate MDL X 3.33
Solids data is based on dry weight except for biota analyses.
Organic analyses are not corrected for extraction recovery standards except for isotope
dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)

Methods used by Zenon are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Seventeenth Edition. Other methods are based on the principles of MISA or EPA methodologies.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at Zenon for a period of three weeks from receipt of data or as per contract.

COMMENTS:

(1) Benzene not available due to sample dilution.

Certified by: 

Page 1

Zenon Environmental Laboratories - Certificate of Analysis

Component	Client ID:		Method		Zenon ID:		Date Sampled:		MDL		Units		Duplicate		M. Spike	
	Blank		MW-01		MW-02		MW-02		MW-03		MW-04		MW-04		MW-04	
	000834 97		000835 97		000836 97		000836 97		000837 97		000838 97		000838 97		000838 97	
	97/01/08		97/01/08		97/01/08		97/01/08		97/01/08		97/01/08		97/01/08		97/01/08	
BTEX via SW846 Method 8260																
Benzene	1.0	ug/L	<	<	400	(1)	<	<	49							
Toluene	1.0	"	<	1.2	2.3	1.9	150	1.3	49							
Ethylbenzene	1.0	"	<	<	78	72	22	3.7	55							
Xylenes (total)	1.0	"	<	<	400	380	77	35	180							
Surrogate Recoveries		%														
d4-1,2-Dichloroethane			98	106	101	100	103	100	100							
d8-Toluene			100	102	109	104	101	101	103							
Bromofluorobenzene			90	91	108	101	107	92	108							

Zenon Environmental Laboratories - Certificate of Analysis

Client ID: MW-04 MW-04 MW-04 MW-05
 Zenon ID: 000838 97 000838 97 000838 97 000839 97
 Date Sampled: 97/01/08 97/01/08 97/01/08 97/01/08
 MDL Units MS % Rec. MS Dup MSD % Rec.

Component
 BTEX via SW846 Method 8260

Benzene	1.0	ug/L	97	47	93	<
Toluene	1.0	"	97	49	99	1.1
Ethylbenzene	1.0	"	100	55	100	<
Xylenes (total)	1.0	"	97	180	96	<
Surrogate Recoveries		%				
d4-1,2-Dichloroethane			100	108	108	105
d8-Toluene			103	106	106	108
Bromofluorobenzene			108	110	110	92

1/23/97

ZEL Summary of Analysis Pre. Dates

Page MS-4 of 4

Batch Code: 0121SM02

BTEX 000834 97

000835 97

000836 97

000837 97

000838 97

000839 97

Date analysed 97/01/21

Date prepared 97/01/21

PHILIP

Chain of Custody Record

4000 Monroe Road
Farmington, NM 87401

(505) 326-2262 Phone
(505) 326-2388 FAX

COC Serial No. C 2920

MB-834



Project Name <u>Building Materials Thomas Ave. 2</u>			Project Number <u>13164</u>		Phase Task <u>0077.77</u>								
Samplers <u>STD/SRO</u>			Laboratory Name <u>Earth</u>										
Location			Total Number of Bottles										
Sample Number (and depth)			Date	Time	Matrix	Type of Analysis and Bottle							
MW-01			835	1/8/97	1058 water	3 X							
MW-02			836	1/8/97	1330 water	3 X							
MW-03			837	1/8/97	1348 STD 1336 water	3 X							
MW-04			838	1/8/97	1523 water	3 X							
MW-05			839	1/8/97	1635 water	3 X							
BTEX Method 82													
Comments													

Relinquished by:		Signature		Date	Time	Received By:		Signature		Date	Time
		<u>[Signature]</u>		11/9/96	1500						

Preservatives (ONLY for Water Samples)		Carrier: <u>FedEx</u>	Airbill No. <u>7483873386</u>
☐ Cyanide	☐ Sodium hydroxide (NaOH)	Shipping and Lab Notes: <u>Please turn a Duplicate on MW-02</u>	
☒ Volatile Organic Analysis	☐ Hydrochloric acid (HCl)	Please Report Xylenes as Total Xylenes, I you have Any	
☐ Metals	☐ Nitric acid (HNO3)	Question's Please call Scott Pope	
☐ TPH (418.1)	☐ Sulfuric acid (H2SO4)		
☐ Other (Specify)			
☐ Other (Specify)			

ATTACHMENT B



Water Sampling Data

Location No. MW-01

Serial No. WSD- _____

Group List Number 1Sample Type: ☒ Groundwater ☐ Surface Water ☐ Other _____Date 1/8/97Project Name Thomas No. 1Project No. 13164Project Manager S. PopePhase/Task No. 0077.7.7Site Name Burlington Resources

Sampling Specifications

Requested Sampling

Depth Interval (feet) TOP 3'

Requested Wait Following

Development/Purging (hours) NONE

Initial Measurements

Time Elapsed From Final Development/Purging (hours) 33Initial Water Depth (feet) 3.02Nonaqueous Liquids Present (Describe) N/A

Water Quality/Water Collection

DO = Dissolved Oxygen; Cond. = Conductivity

Date	Time	Sampler Initials	Water Quality Readings				Water Collection Data				Notes (Explain in Comments Below)
			Temp. (°C)	pH	DO (mg/L)	Cond. (µmhos/ cm)	Volume Removed (gallons)	Removal Rate (gal/min)	Pump Intake Depth (feet)	Bail	
SEE WELL DEVELOPMENT AND PURGING DATA SHEET											

Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (Specify)

Sample Containers

Preservatives: H = HCl; N = HNO₃; S = H₂SO₄; A = NaOH; O = Other (Specify); - = None

Analytical Parameter List	Container			Field Filtered		Preserved	Cooled During Collection		Comments
	Number	Type	Volume (mL)	Yes	No		Yes	No	
BTEV	3	G	40		X	H	X		1058

Filter Type _____

Chain-of-Custody Form Number C 2920

Comments _____

Signature Steve AllenDate 1/9/97Reviewer STPDate 1/29/97



Well Development and Purging Data

Serial No. WDPD-_____

☐ Development
☒ Purging

Well Number

ML-01

Page 1 of 1

Project Name Atte Building Ten Resources

Project Manager Therese #1

Scott Pope

Project No. 13164

Client Company Barboursville Resources

Phase Task No. CB017.77

Site Name Therese #2

Site Address Bloomfield, ALA

Development Criteria

- ☒ 3 to 5 Casing Volumes of Water Removal
☒ Stabilization of Indicator Parameters
☐ Other _____

Water Volume Calculation

Initial Depth of Well (feet) 7.96

Initial Depth to Water (feet) 3.02 (TOR)

Height of Water Column in Well (feet) 4.94

Diameter (inches): Well 2 Gravel Pack _____

Item	Water Volume in Well		Gallons to be Removed
	Cubic Feet	Gallons	
Well Casing		.81	.81
Gravel Pack			
Drilling Fluids			
Total			(x3) 2.42

Instruments

Serial No. (if applicable)

☒ pH Meter

Oyster

☐ DO Monitor

☒ Conductivity Meter

Oyster

☒ Temperature Meter

Oyster

☐ Other _____

Water Disposal

IN TANK ON SITE

Water Removal Data

Date	Time	Development Method	Pump	Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons)		Product Volume Removed (gallons)		Temperature (°C)	pH	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	Comments
								Increment	Cumulative	Increment	Cumulative					
1/8/97	0955							0.5	0.5			8.8	6.80	2100		gray/silty
	1010							0.5	1.0			9.2	6.90	2160		gray/clearing
	1018							1.0	2.0			9.7	6.91	2210		gray/clearing
	1024							1.0	3.0			9.9	6.96	2210		almost clear
	1032							1.0	4.0			10.0	6.97	2200		mostly clear
	1038							1.00	5.0			10.2	7.00	2200		mostly clear

Circle the date and time that the development criteria are met.

Comments _____

Developer's Signature(s)

Steve Allen

Date 1/9/97

Reviewer STP

Date 1/28/97



Water Sampling Data

Location No. MW-02Serial No. WSD-Group List Number Sample Type: ☒ Groundwater ☐ Surface Water ☐ Other Date 1/8/98Project Name Thomas NO. 1 Project No. 13164Project Manager S. Pope Phase Task No. 0077-77Site Name Berlington Resources Thomas No. 1

Sampling Specifications

Requested Sampling
Depth Interval (feet) Top 3'
Requested Wait Following
Development/Purging (hours) None

Initial Measurements

Time Elapsed From Final Development/Purging (hours) 1.590
Initial Water Depth (feet) 3.55
Nonaqueous Liquids Present (Describe) light sheen

Water Quality/Water Collection

DO = Dissolved Oxygen; Cond. = Conductivity

Date	Time	Sampler Initials	Water Quality Readings				Water Collection Data				Notes (Explain in Comments Below)	
			Temp. (°C)	pH	DO (mg/L)	Cond. (µmhos/ cm)	Volume Removed (gallons)	Removal Rate (gal/min)	Pump Intake Depth (feet)	Bail		Final Water Depth (feet)
See	well	Development and										Purging Data Sheet

Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (Specify)
Preservatives: H = HCl; N = HNO₃; S = H₂SO₄; A = NaOH; O = Other (Specify); - = None

Sample Containers

Analytical Parameter List	Container			Field Filtered		Preserved	Cooled During Collection		Comments
	Number	Type	Volume (mL)	Yes	No		Yes	No	
BTEX	3	G	40		X	H	X		1330

Filter Type Chain-of-Custody Form Number C2920Comments Signature Steve Offer Date 1/9/97 Reviewer 1/28/97 Date STP

Mul.-02

Page 1 of 1

Project No. 13164

Phase.Task No. 00.77.77

Serial No. (If applicable)

Quæstio

5/21/11

Oyster

10

1935

On site in tank

Item	Water Volume in Well		Gallons to be Removed
	Cubic Feet	Gallons	
Well Casing		6	43 1/8
Gravel Pack			
Drilling Fluids			
Total			43 1/8

End Physical

0

Date 1/26/97



Water Sampling Data

Location No. MW-03

Serial No. WSD- _____

Group List Number _____

Sample Type: ☒ Groundwater ☐ Surface Water ☐ Other _____Date 1/8/97Project Name Thomas No. 1Project No. 13164Project Manager S. PopePhase/Task No. 0077.77Site Name Burlington Resources Thomas No. 1

Sampling Specifications

Requested Sampling

Depth Interval (feet) Top 3'

Requested Wait Following

Development/Purging (hours) none

Initial Measurements

Time Elapsed From Final Development/Purging (hours) .55Initial Water Depth (feet) 2.22Nonaqueous Liquids Present (Describe) n/a

Water Quality/Water Collection

DO = Dissolved Oxygen; Cond. = Conductivity

Date	Time	Sampler Initials	Water Quality Readings				Water Collection Data				Notes (Explain in Comments Below)
			Temp. (°C)	pH	DO (mg/L)	Cond. (µmhos/ cm)	Volume Removed (gallons)	Removal Rate (gal/min)	Pump Intake Depth (feet)	Bail	
See Well Development and Purging Data Sheet											

Sample Containers

Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (Specify)

Preservatives: H = HCl; N = HNO₃; S = H₂SO₄; A = NaOH; O = Other (Specify); - = None

Analytical Parameter List	Container			Field Filtered		Preserved	Cooled During Collection		Comments
	Number	Type	Volume (mL)	Yes	No		Yes	No	
<u>BTEX</u>	<u>3</u>	<u>G</u>	<u>40</u>		<u>X</u>	<u>H</u>	<u>X</u>		<u>1348</u>

Filter Type _____

Chain-of-Custody Form Number C2920

Comments _____

Signature Steve OllerDate 1/9/97Reviewer STPDate 1/29/97

Well Development and Purging Data

- ☐ Development
- ☒ ~~Design~~

Well Number

MIL-03

Serial No. WDPD-

Page 1 of 1

Project Name Bismarck's Reserves Thomas Ahl

Project Manager

57002

Project No. 13164

Client Company Bank of America

Phase, Task No. 0077.77

Site Name Thomas's Apts

Site Address

DIOMEDID 2013

Development Criteria

- ☐ 3 to 5 Casing Volumes of Water Removal
☒ Stabilization of Indicator Parameters
☐ Other

Water Volume Calculation

Initial Depth of Well (feet) 621Initial Depth to Water (feet) 2.25

Height of Water Column in Well (feet) 3.91

Diameter (inches): Well 2' Gravel Pack

Methods of Development

- | Equipment | Material | Quantity | Unit | Remarks |
|--------------------------|----------|----------|------|---------|
| Pump | | | | |
| Centrifugal | | | | |
| Submersible | | | | |
| Peristaltic | | | | |
| Other | | | | |
| Bailer | | | | |
| Bottom Valve | | | | |
| Double Check Valve | | | | |
| Stainless-steel Kemmerer | | | | |

Instruments

- ☒ pH Meter
- ☐ DO Monitor
- ☒ Conductivity Meter
- ☒ Temperature Meter
- ☐ Other _____
- SYSTEM
- SYSTEM
- SYSTEM

Water Disposal

IN TANK CITIES

Water Removal Data

[illegible]

Circle the date and time that the development criteria are met.

Comments * Poured Day After Removing Gallon. ** Poured Day After Removing Additional ~~25~~ 10 gallon

~~Boiled~~ Boiled hrs after removing additional 1 gal.

Developer's Signature(s)

Steve Olson

Date 1/9/97

Reviewer STP

Date 12/27



Water Sampling Data

Location No. MW-001Serial No. WSD-Group List Number Sample Type: ☒ Groundwater ☐ Surface Water ☐ Other Date 1/8/97Project Name Thomas No. 1 Project No. 13164Project Manager S. Pope Phase Task No. 0077.77Site Name Burlington Resources Thomas No. 1

Sampling Specifications

Requested Sampling

Depth Interval (feet) Top 3'

Requested Wait Following

Development/Purging (hours) NONE

Initial Measurements

Time Elapsed From Final Development/Purging (hours) 26Initial Water Depth (feet) 2.38Nonaqueous Liquids Present (Describe) N/A

Water Quality/Water Collection

DO = Dissolved Oxygen; Cond. = Conductivity

Date	Time	Sampler Initials	Water Quality Readings				Water Collection Data				Notes (Explain in Comments Below)
			Temp. (°C)	pH	DO (mg/L)	Cond. (µmhos/ cm)	Volume Removed (gallons)	Removal Rate (gal/min)	Pump Intake Depth (feet)	Bail	
See Well Development and Purging Data Sheet											

Sample Containers

Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (Specify)

Preservatives: H = HCl; N = HNO₃; S = H₂SO₄; A = NaOH; O = Other (Specify); - = None

Analytical Parameter List	Container			Field Filtered		Preserved	Cooled During Collection		Comments
	Number	Type	Volume (mL)	Yes	No		Yes	No	
BTEX	3	G	40		X	H	X		1523

Filter Type Chain-of-Custody Form Number C2920Comments Signature Steve Oller Date 1/9/97 Reviewer SP Date 1/28/97

Well Number MW-04Page 1 of 1

Project No. 13164

Phase.Task No. 0077.77

Site Address Blackmfield, N.H.

Serial No. (If applicable)

Director

121560

~~Chyter~~ SR

Dyster

Oster

Item	Water Volume in Well		Gallons to be Removed
	Cubic Feet	Gallons	
Well Casing		.33	.33
Gravel Pack			
Drilling Fluids			
Total			13.99

Water Disposal
Landfill Site

Date 11/8/95 Reviewer STP Date 1/28/97



Water Sampling Data

Location No. MLW-055Serial No. WSD-Group List Number Sample Type: ☒ Groundwater ☐ Surface Water ☐ Other Date 1/8/97Project Name Burlington Resources Thomas #1 Project No. 13164Project Manager S. Pope Phase Task No. 6077.77Site Name Thomas NO. 1

Sampling Specifications

Requested Sampling

Depth Interval (feet) TOP 3'

Requested Wait Following

Development/Purging (hours) NONE

Initial Measurements

Time Elapsed From Final Development/Purging (hours) .18Initial Water Depth (feet) 3.79Nonaqueous Liquids Present (Describe) N/A

Water Quality/Water Collection

DO = Dissolved Oxygen; Cond. = Conductivity

Date	Time	Sampler Initials	Water Quality Readings				Water Collection Data					Notes (Explain in Comments Below)
			Temp. (°C)	pH	DO (mg/L)	Cond. (µmhos/ cm)	Volume Removed (gallons)	Removal Rate (gal/min)	Pump Intake Depth (feet)	Bail	Final Water Depth (feet)	
See	Well	Development	and	Purging	DATA	Sheet						

Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (Specify)

Preservatives: H = HCl; N = HNO₃; S = H₂SO₄; A = NaOH; O = Other (Specify); - = None

Sample Containers

Analytical Parameter List	Container			Field Filtered		Preserved	Cooled During Collection		Comments
	Number	Type	Volume (mL)	Yes	No		Yes	No	
BTEY	3	G	40		X	H	X		1135

Filter Type Chain-of-Custody Form Number C 2920Comments Signature Steve Allen Date 1/9/97 Reviewer 1/28/97 Date STP



Well Development and Purging Data

Serial No. WDPD-

☐ Development
☒ Purging

Well Number

Page 1 of 1

Project Name Ballwiner Research Thunders

Project Manager

S Pope

Project No. 13164

Client Company Ballwiner Research

Site Address

Blanchfield, NM

Phase, Task No. 0077. 77

Site Name Thunders No. 2

Site Address

Blanchfield, NM

Development Criteria

- ☒ 3 to 5 Casing Volumes of Water Removal
☒ Stabilization of Indicator Parameters
☐ Other

Water Volume Calculation

Initial Depth of Well (feet) 6.44

Initial Depth to Water (feet) 3.79

Height of Water Column in Well (feet) 2.7

Diameter (inches): Well 2 Gravel Pack

Item	Water Volume in Well		Gallons to be Removed
	Cubic Feet	Gallons	
Well Casing		.44	.44
Gravel Pack			
Drilling Fluids			
Total		3.4	1.32

Instruments

Serial No. (if applicable)

☐ pH Meter CYSER

☐ DO Monitor

☒ Conductivity Meter CYSER

☒ Temperature Meter CYSER

☐ Other

Water Disposal

LAUNCH ON SITE

Water Removal Data

Date	Time	Development Method	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons)		Product Volume Removed (gallons)		Temperature (°C)	pH	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	Comments
						Increment	Cumulative	Increment	Cumulative					
1/8/97	1553	X				1.0	1.0			8.4	6.64	2150		6.09 3.14
1/8/97	1602					1.0	2.0			8.4	6.84	2080		6.09 5.14
1/8/97	1616					1.0	3.0			8.4	6.85	2070		11.0 "
1/8/97	1625					1.0	4.0			8.5	6.85	2070		" "

Circle the date and time that the development criteria are met.

Comments

Developer's Signature(s) Steve Allen

Date 1/9/97

Reviewer STP Date 1/20/97

PHILIP

Chain of Custody Record

4000 Monroe Road
Farmington, NM 87401

(505) 326-2262 Phone
(505) 326-2388 FAX

COC Serial No. C 2920

ENVIRONMENTAL

Project Name <i>Bullhead Resources Thomas No. 2</i>			Project Number <i>13164</i>		Phase Task <i>0077. 77</i>	
Samplers <i>STD/SRO</i>			Laboratory			
Name <i>ZENON</i>			Location			
Sample Number (and depth)	Date	Time	Matrix	Total Number of Bottles	Type of Analysis and Bottle	Comments
<i>MW-01</i>	<i>1/8/97</i>	<i>1058</i>	<i>water</i>	<i>3</i>	<i>X</i>	<i>BTEX Method 802</i>
<i>MW-02</i>	<i>1/8/97</i>	<i>1330</i>	<i>water</i>	<i>3</i>	<i>X</i>	
<i>MW-03</i>	<i>1/8/97</i>	<i>1348 310</i>	<i>water</i>	<i>3</i>	<i>X</i>	
<i>MW-04</i>	<i>1/8/97</i>	<i>1523</i>	<i>water</i>	<i>3</i>	<i>X</i>	
<i>MW-05</i>	<i>1/8/97</i>	<i>1635</i>	<i>water</i>	<i>3</i>	<i>X</i>	

Relinquished by:

Signature

Don T. Papp

Date

11/9/96

Time

1500

Received By:

Signature

Date

Time

Samples Iced: ☒ Yes ☐ No

Preservatives (ONLY for Water Samples)

- ☐ Cyanide
- ☒ Volatile Organic Analysis
- ☐ Metals
- ☐ TPH (418.1)
- ☐ Other (Specify)
- ☐ Other (Specify)

Carrier: *FedEx*

Shipping and Lab Notes: *Please Run A Duplicate on MW-02*

Airbill No. *7483873386*

Please Report Xylenes as Total Xylenes, If you have Any Questions Please Call Scott Pope