3R – 467

2003 AGWMR

04 / 17 / 2004

BURLINGTON RESOURCES
SAN JUAN DIVISION

March 17, 2004

Certified: 70993400001842167562

Bill Olson
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

RE: 2003 Annual Groundwater Investigation and Remediation Reports
San Juan Basin, New Mexico

Dear Mr. Olson:

As required in Burlington Resources' approved Groundwater Investigation and Remediation Plan dated August, 1998, enclosed are the 2003 annual reports for Burlington's groundwater impact sites in the San Juan Basin. Separate reports are enclosed for the following locations:

- Cozzens B#1
- Hampton #4M
- Johnson Federal #4 Metering Station
- Maddox Com 1A
- Flora Vista
- Marcotte Pool Unit #1
- Sategna #2

If you have questions or additional information is needed, please contact me at (505) 326-9537.

Sincerely,

Gregg Wurtz
Sr. Environmental Representative

Attachments - Groundwater Investigation and Remediation Reports

cc: Denny Foust - NMOCD Aztec
WFS - Mark Harvey (Cozzens B#1, Hampton #4M)
EPFS - Scott Pope (Johnson Fed. #4, Standard Oil Com.#1)
Facility and Correspondence Files

3401 East 30th Street, 87402-8807, P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700, Fax 505-326-9833

BURLINGTON RESOURCES 2003 ANNUAL GROUNDWATER REPORT

Marcotte Pool Unit 1

SITE DETAILS

Location: Unit Letter G, Section 08, Township 31N, Range 10W; San Juan County, New Mexico
Land Type: Federal

2003 ACTIVITIES

Hydrocarbon impacted soil was discovered at Burlington Resources (BR) production location Marcotte Pool Unit 1 on 9/16/03. The impacted soil was discovered during excavation work to reset the production equipment. Remediation excavation and land treatment of impacted soils started 9/17/03.

The Marcotte Pool Unit #1 is located in the OCD determined vulnerable area. A second order ephemeral wash boarders the location approximately 30 yds. to the north. A seasonal irrigation ditch is located approximately 100 yds. to the west. The soils at the location area are mainly fine to coarse sands with minor amounts of cobbles and boulders. The ground water gradient is approximately west/southwest parallel to the adjacent stream coarse.

The attached facility maps (Attachment 1) display: 1) regional and general location layout; 2) perimeter of the excavation; 3) surface water features; 4) boring and well locations and 5) proposed source well MW-1 location.

The well has been producing oil and gas since Nov. 1953.

Soil Impacts

Approximately 3000 cubic yards of impacted soil was removed and land farmed on the adjacent Marcotte #2. Permission to landfarm was obtained from OCD and BLM (Attachment 2, BLM Sundry Notice). No soil was land farmed on the Marcotte Pool Unit 1 because of the limited area available on location. The land farmed soil will be tested to confirm soil is below OCD clean up standards and filled back into the excavation.

The vertical extent of contamination and the extent of the excavation was determined by the depth to ground water. Soils were excavated down to ground water at approximately 30 feet below grade. The vertical extent of contamination appears to stop at the ground water table. A black organic decaying gravel layer marks the extent of vertical soil impacts approximately 6 inch in depth above the water table . Soils below this layer were water saturated and no hydrocarbons were detected in the field. The horizontal extent of contamination was determined by the limits of the open excavation and four soil borings. Soil monitoring using a photo ionization detector was used for field-testing. Soil samples collected during soil boring were using a split spoon sampler every 2.5 feet . The four soil borings were used to determine the northwest, west and southwest extent of contamination (Attachment 3). Soil samples collected from the sides of the excavation determined the horizontal extent on the north, northeast, and east sides of the location. An x-section of the soil contamination plume approximates the shape of a bell at depth with the top of the bell at the source of contamination , the old earth pit, and the bottom of the bell at the ground

water surface. The contamination spread at depth to form the sides of the bell. The soil contamination spread furthest from the source directly above the water table (i.e., vadose zone). The soil borings, Boring 3 and Boring 4 were completed into downgradient monitoring wells, monitoring wells MW-2 and MW-3. An additional source well (MW-1) and soil borings are proposed and will be used to confirm the north, northeast and southeast limits of contamination. Production equipment and the lack of open space prevented the subsequent drilling to start until backfilling the excavation in 2004. Boring logs and well diagrams are provided for the work completed in 2003 (Attachment 4).

Ground Water Impacts

Observations of the water in the bottom of the open excavation showed minor free phase hydrocarbons during excavation activities. Water and oil was removed from the open excavation using a pump truck over a period of 2 months as the excavation recharged. Prior to backfilling the excavation no free phase hydrocarbons were visible on the water surface in the excavation.
The downgradient extent of the groundwater contamination was defined by the monitoring wells (MW-2 and MW-3) located down gradient of the excavation. These wells where first sampled in October 2003 for a general list of water quality parameters and BTEX and then subsequently for BTEX only. No constituents of concern were detected in the general or BTEX analysis (Attachment 5).

CONCLUSIONS

The analytical results of groundwater sampling in 2003 from the downgradient wells show that levels of benzene, toluene, ethylbenzene, total xylenes and general water quality parameters are below the New Mexico Groundwater Standards in all wells.

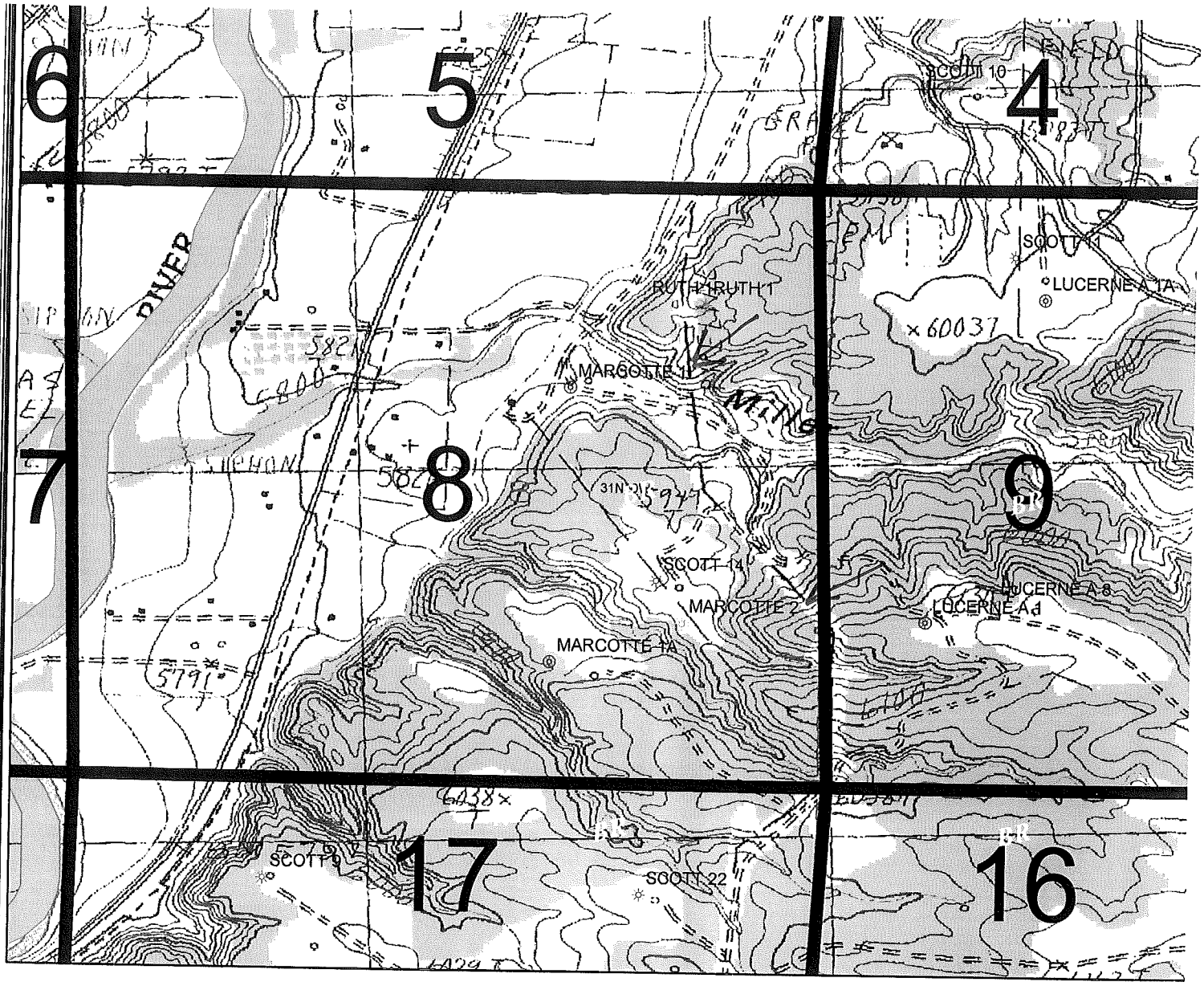
RECOMMENDATIONS

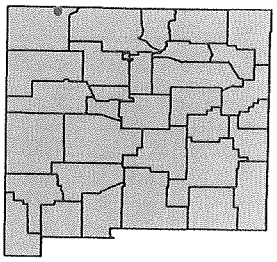
- Installation of the source well MW-1 and additional soil boring to the east to confirm soil clean up levels have been reached.
- Burlington Resources proposes to continue quarterly sampling at this site and submit for closure after four quarters of below standard results.

Attachments: Attachment 1 Site Maps
Attachment 2 BLM Sundry
Attachment 3 Soil sample analytical results
Attachment 4 Drilling Log/Wellbore Diagrams
Attachment 5 2003 Ground water sampling and analysis results

Attachment 1

Site maps





N

Legend

- FRUITLAND COAL
- PICTURED CLIFFS
- MESAVERDE
- MORRISON

0 410 820 1,640 2,460 3,280 Feet

1:68,290,339 - 1 " equals 5,690,862 '

GCS North American 1927

BURLINGTON RESOURCES

PLAT

BURLINGTON RESOURCE

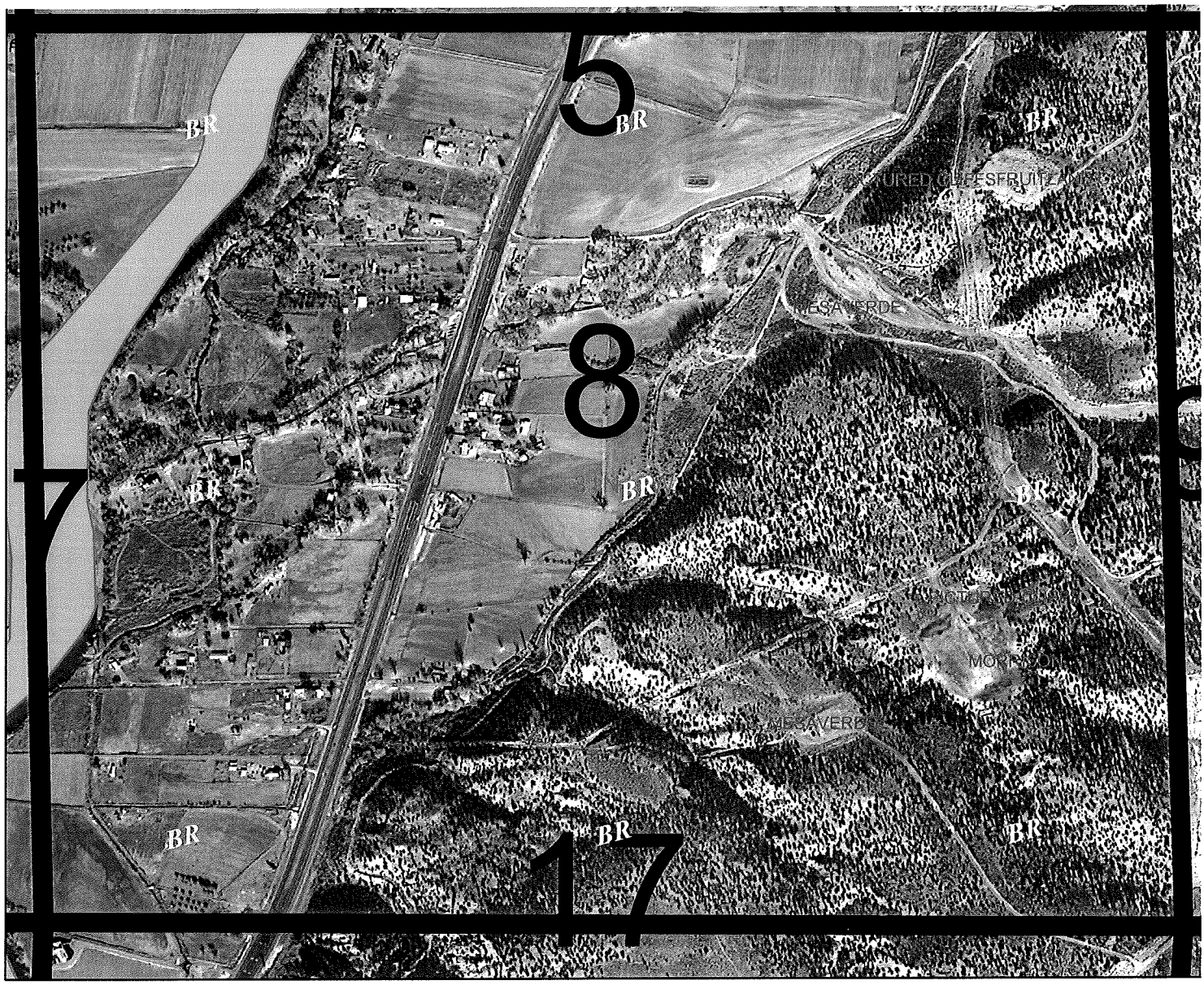
San Juan

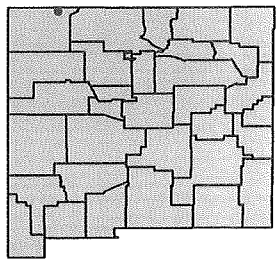
MARCOTTE WELLS

Prepared By: Alan Alexander Date: 9/22/2003

File Number: Revised Date: 9/22/2003

File Name: P:\Public\Projects\1 San Juan Basin Users\1 San Juan Basin I





N

Legend

- FRUITLAND COAL
- PICTURED CLIFFS
- MESAVERDE
- MORRISON

0 275 550 1,100 1,650 2,200 Feet

GCS North American 1927

BURLINGTON RESOURCES

PLAT

BURLINGTON RESOURCE

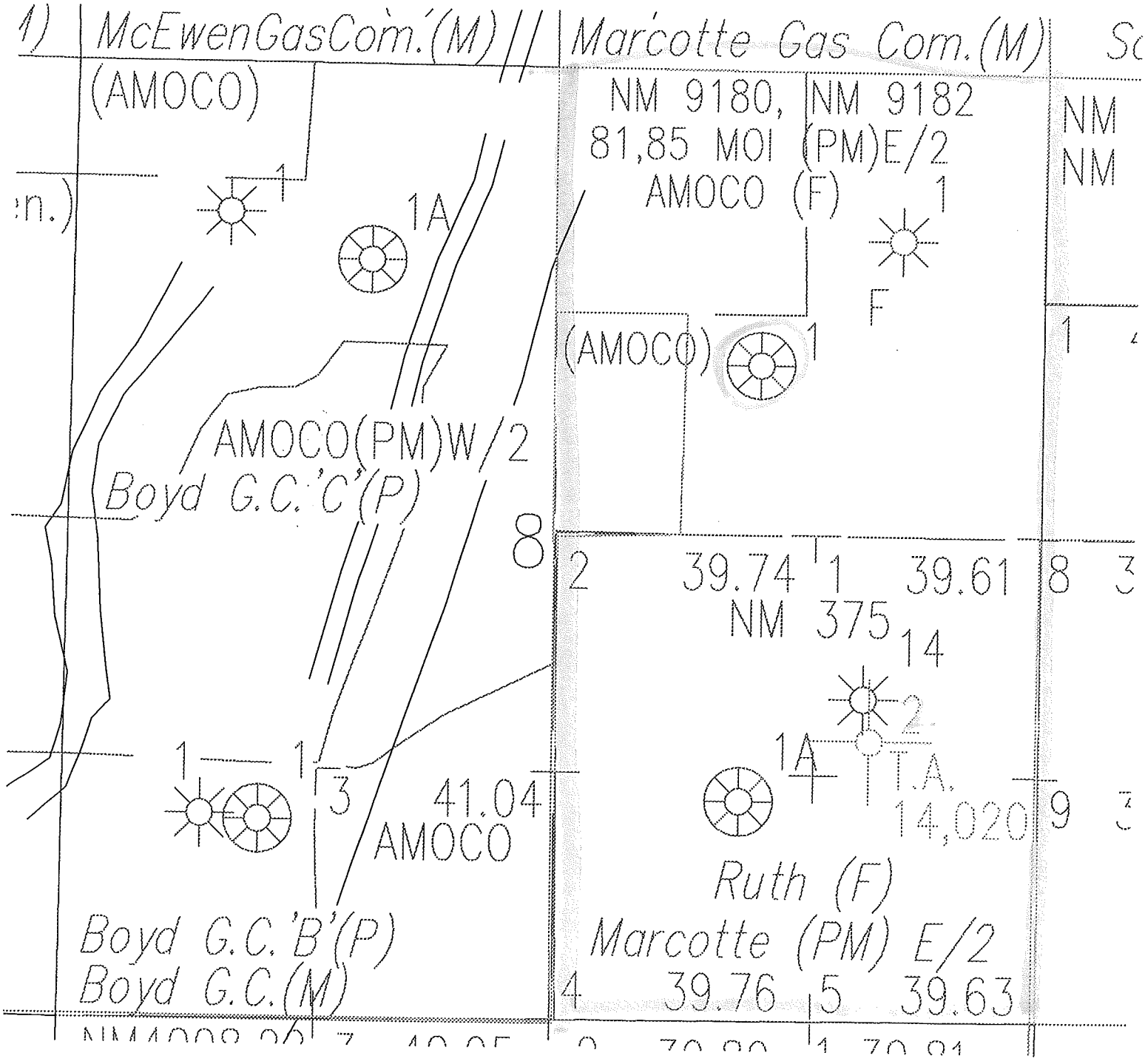
San Juan

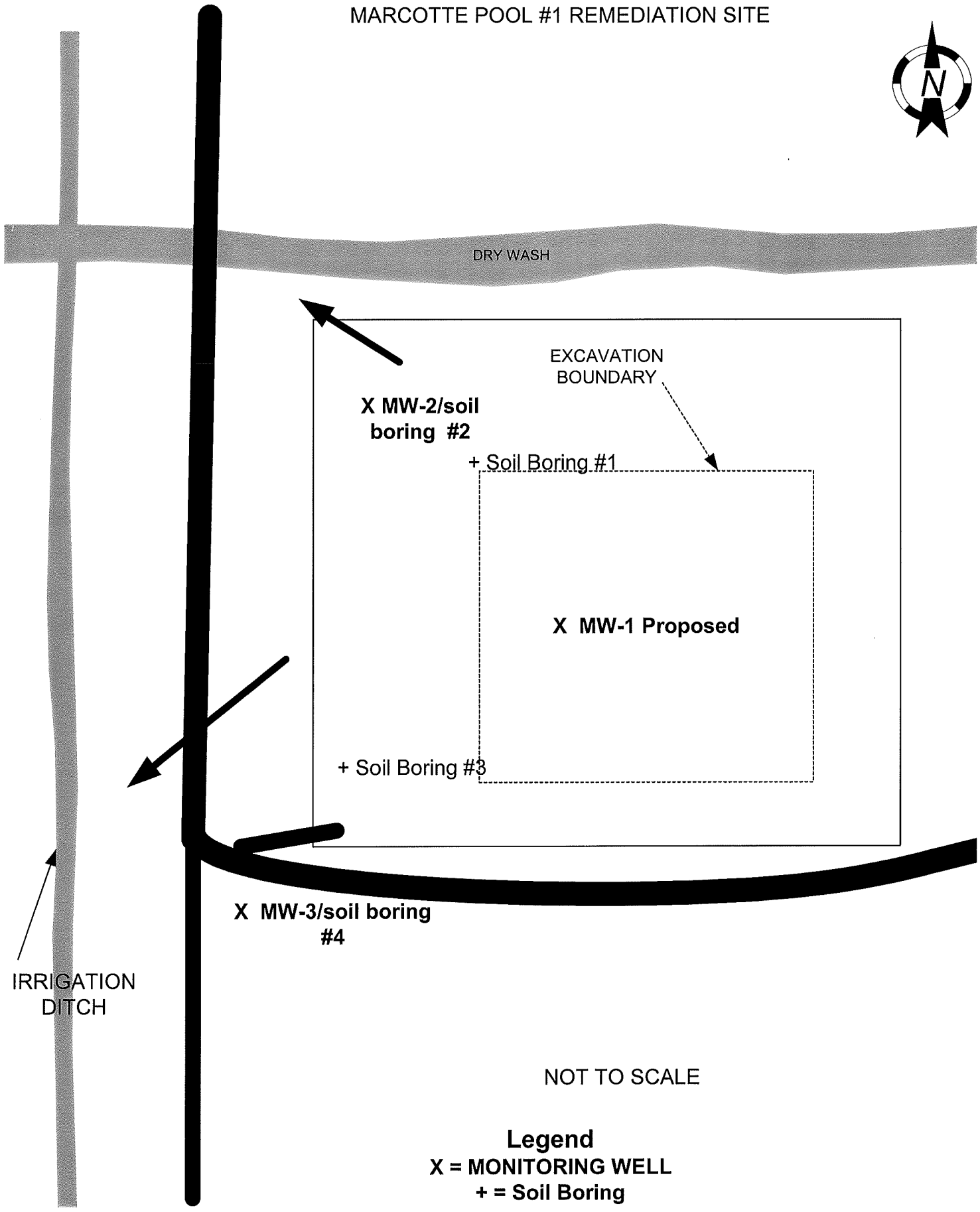
MARCOTTE WELLS

Prepared By: Alan Alexander Date: 9/22/2003

File Number: Revised Date: 9/22/2003

File Name: N:\Public\Projects\1 San Juan Basin Users\1 San Juan Basin


McEwenGasCom.(M)
(AMOCO)
Marcotte Gas Com.(M)
NM 9180, NM 9182
81,85 MOI (PM)E/2
AMOCO (F)
1
1A
F
(AMOCO)
AMOCO(PM)W/2
Boyd G.C.'C'(P)
8
2
39.74
1
39.61
NM 375
14
2
1A
T.A.
14,020
3
41.04
AMOCO
Ruth (F)
Boyd G.C.'B'(P)
Boyd G.C.(M)
Marcotte (PM) E/2
4
39.76
5
39.63


MARCOTTE POOL #1 REMEDIATION SITE
N
DRY WASH
EXCAVATION BOUNDARY
X MW-2/soil boring #2
+ Soil Boring #1
X MW-1 Proposed
+ Soil Boring #3
X MW-3/soil boring #4
IRRIGATION DITCH
NOT TO SCALE
Legend
X = MONITORING WELL
+ = Soil Boring
= Groundwater direction

Attachment 2

BLM Sundry

submitted in lieu of Form 3160-5

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Sundry Notices and Reports on Wells

1. **Type of Well**
   GAS

2. **Name of Operator**
   BURLINGTON RESOURCES OIL & GAS COMPANY

3. **Address & Phone No. of Operator**
   PO Box 4289, Farmington, NM 87499 (505) 326-9700

4. **Location of Well, Footage, Sec., T, R, M**
   1540'FSL, 935'FEL, Sec.8, T-31-N, R-10-W, NMPM

5. **Lease Number**
   NMSF078604
6. **If Indian, All. or Tribe Name**
7. **Unit Agreement Name**
8. **Well Name & Number**
   Marcotte #2
9. **API Well No.**
   30-045-29466
10. **Field and Pool**
    Wildcat Morrison
11. **County and State**
    San Juan Co, NM

12. **CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OTHER DATA**

Type of Submission	Type of Action		
_X_ Notice of Intent	___ Abandonment	___ Change of Plans	
	___ Recompletion	___ New Construction	
___ Subsequent Report	___ Plugging Back	___ Non-Routine Fracturing	
	___ Casing Repair	___ Water Shut off	
___ Final Abandonment	___ Altering Casing	___ Conversion to Injection	
	_X_ Other -		

13. **Describe Proposed or Completed Operations**
Attn: Ray Sanchez
It is intended to move impacted soil from the Marcotte #1 to the Marcotte #2.
Background:

- The Marcotte #1 and the Marcotte #2 are in the same Mesaverde spacing unit.
- The wells share the same spacing unit and are on fee land
- Work start date 9/22/03
- The duration of the soil being placed on the Marcotte #2 is a maximum of 1 year
- The impacted soils will be generated from a soil remediation excavation activity at the Marcotte #1.
- The soils will be transported within two weeks across gravel/soil oil and gas lease roads starting 9/22/03.
- Landfarm every 2 weeks. The area used for landfarming will be ½ to 1 acre.
- We will conduct the Landfarming operations in accordance with applicable OCD and BLM regulations.
- Soils will be land farmed on location to expedite the natural remediation of the impacted soil
- Upon successful remediation the excavated soils will be returned to the original excavation at the Marcotte #1 or a suitable environmentally approved use will be determined.
- Approximate amount of soils to be moved to the Marcotte #2 is 1000-1500 cu yds

14. **I hereby certify that the foregoing is true and correct.**

Signed Tammy Wimsatt (GW & EH) Title Regulatory Specialist Date 9/22/03

(This space for Federal or State Office use)
APPROVED BY _____ Title _____ Date _____
CONDITION OF APPROVAL, if any:

Attachment 3

Soil Sample Analytical Results

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **310026**
October 23, 2003

MARTIN NEE
26 CR 3500
FLORA VISTA, NM 87415

BURLINGTON RESOURCES
P.O. BOX 4289
FARMINGTON, NM 87499

Project Name MARCOTE POOL
Project Number (NONE)

Attention: MARTIN NEE/GREGG WURTZ

On 10/02/03 Pinnacle Laboratories Inc., (ADHS Lincense No. AZ0643), received a request to analyze **non-aq** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

H. Mitchell Rubenstein, Ph.D.
General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	: MARTIN NEE	PINNACLE ID	: 310026
PROJECT #	: (NONE)	DATE RECEIVED	: 10/02/03
PROJECT NAME	: MARCOTE POOL	REPORT DATE	: 10/23/03

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
310026 - 01	MARCOTE BH-1, 28.5'-29'	NON-AQ	09/30/03
310026 - 02	MARCOTE BH-2, 33'-35'	NON-AQ	09/30/03
310026 - 03	MARCOTE BH-3, 26'-28'	NON-AQ	09/30/03
310026 - 04	MARCOTE BH-4, 25'-27'	NON-AQ	10/01/03

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED / 8015B GRO
CLIENT : MARTIN NEE
PROJECT # : (NONE)
PROJECT NAME : MARCOTE POOL

PINNACLE I.D. : 310026
ANALYST : BP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MARCOTE BH-1, 28.5'-29'	NON-AQ	09/30/03	10/07/03	10/09/03	1
02	MARCOTE BH-2, 33'-35'	NON-AQ	09/30/03	10/07/03	10/09/03	2
03	MARCOTE BH-3, 26'-28'	NON-AQ	09/30/03	10/07/03	10/08/03	1

PARAMETER	DET. LIMIT	UNITS	MARCOTE BH-1, 28.5'-29'	MARCOTE BH-2, 33'-35'	MARCOTE BH-3, 26'-28'
FUEL HYDROCARBONS	**10**	**MG/KG**	< 10	**79**	< 10
HYDROCARBON RANGE			C6-C10	**C6-C10**	C6-C10
HYDROCARBONS QUANTITATED USING			GASOLINE	**GASOLINE**	GASOLINE
BENZENE	0.025	MG/KG	< 0.025	< 0.050	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.050	< 0.025
ETHYLBENZENE	**0.025**	**MG/KG**	< 0.025	**0.37**	< 0.025
TOTAL XYLENES	**0.050**	**MG/KG**	< 0.050	**1.7**	< 0.050
SURROGATE:					
BROMOFLUOROBENZENE (%)			90	113	86
SURROGATE LIMITS	(65 - 120)				

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED / 8015B GRO
CLIENT : MARTIN NEE
PROJECT # : (NONE)
PROJECT NAME : MARCOTE POOL

PINNACLE I.D. : 310026
ANALYST : BP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MARCOTE BH-4, 25'-27'	NON-AQ	10/01/03	10/07/03	10/08/03	1

PARAMETER	DET. LIMIT	UNITS	MARCOTE BH-4, 25'-27'
FUEL HYDROCARBONS	10	MG/KG	< 10
HYDROCARBON RANGE			C6-C10
HYDROCARBONS QUANTITATED USING			GASOLINE
BENZENE	0.025	MG/KG	< 0.025
TOLUENE	0.025	MG/KG	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025
TOTAL XYLENES	0.050	MG/KG	< 0.050
SURROGATE:			
BROMOFLUOROBENZENE (%)			92
SURROGATE LIMITS	(65 - 120)		

CHEMIST NOTES:
N/A

Attachment 4
Drilling Log/Wellbore Diagrams

WELL DEVELOPMENT AND SAMPLING LOG

Project No.: 30003.0 Project Name: Burlington Marcote 1 Client: Burlington Resources
Location: Marcote Pool Unit 1 Well No: MW-2 Development **Sampling**
Project Manager MJN Date 10/6/03 Start Time 1541 Weather sunny 80s
Depth to Water 28.76 Depth to Product na Product Thickness na Measuring Point TOC
Water Column Height 10.09 Well Dia. 2"

Sampling Method: Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other ☐
Bottom Valve Bailer x Double Check Valve Bailer ☐ Stainless-Steel Kemmerer ☐

Criteria: 3 to 5 Casing Volumes of Water Removal **X** stabilization of Indicator Parameters **X** Other: or bail dry

Gal/ft x ft of water	Water Volume in Well		**Gal**/oz to be removed
	Gallons	Ounces	
10.09 x .16	1.61 x 3		4.84

Time (military)	pH (su)	SC (umhos/cm)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate
1607	**7.47**	**2400**	**19.6**				**1**	**Silty, brown**
	7.46	**2250**	**18.0**				**2**	**Silty, brown**
	7.39	**2260**	**17.4**				**3**	**Silty, brown**
	7.36	**2240**	**17.9**				**4**	**Silty, brown**
1624	**7.48**	**2260**	**17.6**				**5**	**Silty, brown**

Final: Time	pH	SC	Temp	Eh-ORP	D.O.	Turbidity	Ferrous Iron	Vol Evac.	Comments/Flow Rate
1624	**7.48**	**2260**	**17.6**					**5**	**Silty, brown**

COMMENTS:

INSTRUMENTATION: pH Meter **X** _____ Temperature Meter **x**
DO Monitor _____ Other _____
Conductivity Meter **X** _____
Water Disposal onsite Sample ID Marcote 1 MW-2 Sample Time 1630
BTEX VOCs **Alkalinity** **TDS** **Cations** **Anions** Nitrate Nitrite Ammonia TKN **NMWQCC** **Metals** Total Phosphorus

MS/MSD_____ BD_____ BD Name/Time_____ TB_____

WELL DEVELOPMENT AND SAMPLING LOG

Project No.: 30001.0 Project Name: Burlington ~~Flora Vista~~ Marcote Client: Burlington Resources
Location: Marcote Pool Unit 1 Well No: MW-3 **Development** Sampling
Project Manager MJN Date 10/6/03 Start Time 1458 Weather sunny 80s
Depth to Water 30.74 Depth to Product na Product Thickness na Measuring Point TOC
Water Column Height 8.28 Well Dia. 2"

Sampling Method: Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other ☐
Bottom Valve Bailer x Double Check Valve Bailer ☐ Stainless-Steel Kemmerer ☐

Criteria: 3 to 5 Casing Volumes of Water Removal **X** stabilization of Indicator Parameters **X** Other_____

Gal/ft x ft of water	Water Volume in Well		**Gal**/oz to be removed
	Gallons	Ounces	
8.28 x .16	1.32 x 3		3.79

Time (military)	pH (su)	SC (umhos/cm)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate
1507	**7.16**	**2230**	**19.1**				**0.5**	**muddy, brown, very good flow to well**
	7.26	**2150**	**18.4**				**1**	**muddy, brown, very good flow to well**
	7.31	**2130**	**17.9**				**1.5**	**muddy, brown, very good flow to well**
	7.17	**2270**	**18.0**				**5**	**muddy, brown, very good flow to well**
	7.38	**2220**	**17.4**				**10**	**muddy, brown, very good flow to well**
	7.48	**2240**	**17.1**				**15**	**muddy, brown, very good flow to well**
1603	**7.38**	**2390**	**17.3**				**20**	**muddy, brown, very good flow to well**
1617	**7.42**	**2330**	**17.3**				**30**	**muddy, brown, very good flow to well**

Final: Time	pH	SC	Temp	Eh-ORP	D.O.	Turbidity	Ferrous Iron	Vol Evac.	Comments/Flow Rate
1617	**7.42**	**2330**	**17.3**					**30**	**muddy, brown, very good flow to well**

COMMENTS:

INSTRUMENTATION: pH Meter **X** _____ Temperature Meter **x**
DO Monitor _____ Other _____
Conductivity Meter **X** _____
Water Disposal onsite Sample ID NA Sample Time na
BTEX VOCs Alkalinity TDS Cations Anions Nitrate Nitrite Ammonia TKN NMWQCC Metals Total Phosphorus

MS/MSD_____ BD_____ BD Name/Time_____ TB_____

RECORD OF SUBSURFACE EXPLORATION

Borehole 1

Lodestar Services, Inc

PO Box 3681
Farmington, New Mexico 87499
(505) 334-2791

Project Name: Burlington Resources Marcote Pool Unit 1
Project Number: 30003 Phase
Project Location: 1 mile south of Dutchman's Hill transfer station

Elevation
Borehole Location: WNW of former pit
GWL Depth: -29
Logged By: MJN
Drilled By: Terracon
Date/Time Started: 9/30/2003 0800 hrs
Date/Time Completed: 9/30/2003 1043 hrs

Well Logged By: M Nee
Personnel On-Site: R Thompson, Tony
Contractors On-Site: Terracon
Client Personnel On-Site: G Wurtz

Drilling Method: Mobile B59 Hollow Stem Auger
Air Monitoring Method: Photo Vac 2020

Depth (Feet)	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0		Split spoon	0-13 ' Sand, Moderate Yellow Brown, Sand is fine to medium grained, poorly sorted, unconsolidated.			0			
	3-5	12							
5	6-7	14							
	7-9	16							
10	9-11	16	minor gravel and cobble in sample at 10.5-12.5						
	11-13	16							
	13-15	18	13-25' Sand, moderate yellow brown, very fine, minor small <1" silt stringers,						
15	15-17	20	moderate sorted, unconsolidated. Minor silt 16-17'						
	17-19	20							
20	19-21	24							
	21-23	24							
	23-25	20							
25	25-27	16	25-28.5 Sand, coarse, minor gravel, well sorted, moisture increasing, saturated at 28'						
	27-29	12	28.5-30.0 Silty clay lense, black						
30	29-31	12	30-31, Gravel, black, saturated, with cobbles			0			Refusal in cobbles/gravel 31'
			TD 31'						
35									
40									

Comments:

Geologist Signature _____

RECORD OF SUBSURFACE EXPLORATION

Borehole 2

Lodestar Services, Inc

PO Box 3681
Farmington, New Mexico 87499
(505) 334-2791

Project Name: Burlington Resources Marcote Pool Unit 1
Project Number: 30003 Phase:
Project Location: 1 mile south of Dutchman's Hill transfer station

Elevation:
Borehole Location: West of former pit
GWL Depth: -33
Logged By: MJN
Drilled By: Terracon
Date/Time Started: 9/30/2003 1116 hrs
Date/Time Completed: 9/30/2003 1340 hrs

Well Logged By: M Nee
Personnel On-Site: R Thompson, Tony
Contractors On-Site: Terracon
Client Personnel On-Site: G Wurtz

Drilling Method: Mobile B59 Hollow Stem Auger
Air Monitoring Method: Photo Vac 2020

Depth (Feet)	Sample Interval	Sample Type & Recovery (%)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0		Split spoon	0-23' Sand moderate yellow brown, coarse to fine moderately sorted, unconsolidated, minor cobble/gravel.			0			
5									
10									
15									
20									
25	23-25	90	27-29' fine-very fine sand, unconsolidated, well sorted.						
	25-27	90	27-29, clay, then very fine sand for 1" then into brown stiff clay to 36', some black marbleing 28.5-29						
	27-29	95							
30	29-31	100						465	
	31-33	100	30-31, Gravel, black, saturated, with cobbles			0		582	
	33-35	100						2750	
35	35-37	100						0	
			36-36.5, coarse sand, saturated, black, well sorted, unconsolidated.						
			36.5-37, clay						
40			TD-37						

Comments: **Borehole logged on cutting returns from 0-23 feet beneath ground surface.**

Geologist Signature _____

RECORD OF SUBSURFACE EXPLORATION

Borehole 3, MW-3

Lodestar Services, Inc

PO Box 3681
Farmington, New Mexico 87499
(505) 334-2791

Project Name: Burlington Resources Marcote Pool Unit 1
Project Number: 30003 Phase:
Project Location: 1 mile south of Dutchman's Hill transfer station

Elevation:
Borehole Location: West of BH-2
GWL Depth: 27.1
Logged By: MJN
Drilled By: Terracon
Date/Time Started: 9/30/2003 1359 hrs
Date/Time Completed: 9/30/2003 1730 hrs

Well Logged By: M Nee
Personnel On-Site: R Thompson, Tony
Contractors On-Site: Terracon
Client Personnel On-Site: G Wurtz

Drilling Method: Mobile B59 Hollow Stem Auger
Air Monitoring Method: Photo Vac 2020

Depth (Feet)	Sample Interval	Sample Type & Recovery (%)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0		Split spoon	0-34' Sand moderate yellow brown, fine to medium grains, moderately well sorted, unconsolidated.			0			
20	20-22	95				0		0	
	22-24	95				0		0	
25	24-26	95				0		0	
	26-28	85	Saturated at 27.5			0		1.9	
	28-30	90				0		0	
30									
35			34-37 Cobbles						34-37 rough drilling, cobbles
40			TD-37						Refusal at 37'

Comments: **Borehole logged on cutting returns from 0-20 and 30-37 feet beneath ground surface. Groundwater at 27.1' beneath ground surface at 1600 hrs.**

Geologist Signature _____

RECORD OF SUBSURFACE EXPLORATION

Borehole 4, MW-2

Lodestar Services, Inc

PO Box 3681
Farmington, New Mexico 87499
(505) 334-2791

Project Name: Burlington Resources Marcote Pool Unit 1
Project Number: 30003 Phase:
Project Location: 1 mile south of Dutchman's Hill transfer station
Well Logged By: M Nee
Personnel On-Site: R Thompson, Tony
Contractors On-Site: Terracon
Client Personnel On-Site: G Wurtz

Elevation:
Borehole Location: North northwest of pit.
GWL Depth: 26.3
Logged By: MJN
Drilled By: Terracon
Date/Time Started: 10/1/2003 0820 hrs
Date/Time Completed: 10/1/2003 1600 hrs

Drilling Method: Mobile B59 Hollow Stem Auger
Air Monitoring Method: Photo Vac 2020

Depth (Feet)	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0		Split spoon	0-23.5' Sand, moderate yellow brown, fine to coarse grains, moderately sorted, unconsolidated.			0			
5									
10									
15						0			
20									
25	23-25	6	23.5-34 gravel/sand/cobble						Poor recovery due to cobbles
	25-27	8	Saturated at 26.3						cobbles/gravel/sand, saturated at bottom
	27-29	8							coarse sand, gravel, and cobbles in spoon.
30						0			No cuttings beneath 34 feet. Lithology based on material on auger flights after retrevial
35			34-38.5 Clay, gray						
40			TD-38.5						

Comments: **borehole logged on cuttings from 0-23 feet. Water level at 26.3' @ 1004**

Geologist Signature _____

MONITORING WELL INSTALLATION RECORD

Borehole # 3
Well # 3
Page 1 of 1

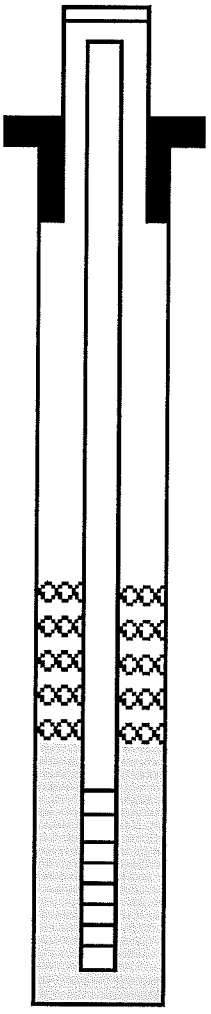
Lodestar Services, Inc
PO Box 3861
Farmington, New Mexico 87499
(505) 334-2791

Project Name: Burlington Resources Flora Vista 1
Project Number: 30003.0 Cost Code:
Project Location: 1 mi south of Dutchman's Hill transfer station
On-Site Geologist: M. Nee
Personnel On-Site: R. Thompson, Tony
Contractors On-Site: Terracon
Client Personnel On-Site: G. Wurtz

Elevation:
Well Location: West of fromer pit
GWL Depth: 26.30' beneath ground surface
Installed By: Terracon
Date/Time Started: 10/1//03 0820
Date/Time Completed: 10/1/03 1600

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing	Flush to grade vault	2.83
Bottom of Protective Casing		-2.17
Top of Permanent Borehole Casing		na
Bottom of Permanent Borehole Casing		na
Top of Concrete	2 bags quickcrete	0.31
Bottom of Concrete		0.0
Top of Grout	5 96# bags portland with 5% bentonite chips	0.0
Bottom of Grout		-16.33
Top of Well Riser	2" flush threaded schedule 40 pvc	2.83
Bottom of Well Riser		-23.06
Top of Well Screen	10 slot schedule 40 flush threaded pvc	-23.06
Bottom of Well Screen		-38.06
Top of Peltonite Seal	1 bag 3/8 bentonite chips	-16.33
Bottom of Peltonite Seal		-18.67
Top of Gravel Pack	8 #50 bags 10-20 silica sand	-18.67
Bottom of Gravel Pack		-37.5
Top of Natural Cave-In		-37.5
Bottom of Natural Cave-In		-38.5
Top of Groundwater		-30.74
Total Depth of Borehole		-38.5



Top of Protective Casing 2.83
Top of Riser 2.83
Ground Surface 0.0
Top of Seal -16.33
Top of Gravel Pack -18.67
Top of Screen -23.06
Bottom of Screen -38.06
Bottom of Borehole -38.5

Comments: Water level is 30.74 beneath top of casing

Geologist Signature _____

MONITORING WELL INSTALLATION RECORD

Borehole # 4
Well # 2
Page 1 of 1

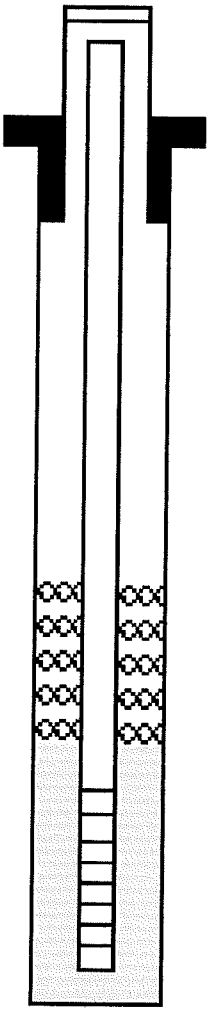
Lodestar Services, Inc
PO Box 3861
Farmington, New Mexico 87499
(505) 334-2791

Project Name: Burlington Resources Flora Vista 1
Project Number: 30003.0 Cost Code:
Project Location: 1 mi south of Dutchman's Hill transfer station
On-Site Geologist: M. Nee
Personnel On-Site: R. Thompson, Tony
Contractors On-Site: Terracon
Client Personnel On-Site: G. Wurtz

Elevation:
Well Location: North northwest of former pit
GWL Depth: 27.00' beneath ground surface
Installed By: Terracon
Date/Time Started: 9/30//03 0800
Date/Time Completed: 9/30//03 1730

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing	Flush to grade vault	2.67
Bottom of Protective Casing		-2.33
Top of Permanent Borehole Casing		na
Bottom of Permanent Borehole Casing		na
Top of Concrete	2 bags quickcrete	0.31
Bottom of Concrete		0.0
Top of Grout	5 96# bags portland with 5% bentonite chips	0.0
Bottom of Grout		-12.75
Top of Well Riser	2" flush threaded schedule 40 pvc	2.67
Bottom of Well Riser		-22.04
Top of Well Screen	10 slot schedule 40 flush threaded pvc	-22.04
Bottom of Well Screen		-37.04
Top of Peltonite Seal	1 bag 3/8 bentonite chips	-14.60
Bottom of Peltonite Seal		-17.60
Top of Gravel Pack	9.5 #50 bags 10-20 silica sand	-17.60
Bottom of Gravel Pack		-34.25
Top of Natural Cave-In		-34.25
Bottom of Natural Cave-In		-37.00
Top of Groundwater		-27.00
Total Depth of Borehole		-37.04



Top of Protective Casing 2.67
Top of Riser 2.67
Ground Surface 0.0
Top of Seal -14.6
Top of Gravel Pack -17.6
Top of Screen -22.04
Bottom of Screen -37.04
Bottom of Borehole -37.04

Comments: Water level is 28.76 beneath top of casing

Geologist Signature _____

Attachment 5

2003 Ground water sampling and analysis results

Table 1

Marcot Pool Unit 1

Groundwater Monitoring Well Sampling

Well Name	MW #	Sample Date	B (ppb)	T (ppb)	E (ppb)	X (ppb)	BTEX (ppb)	DTW (1) (ft)	Comments
Standard			*10*	*750*	*750*	*620*			
Marcote Pool Unit 1	1	Well not installed open excavation							
	2	10/6/2003	U	U	U	U	U	29.71	muddy brn, very good well flow
		12/16/2004	0.4JJ	U	U	U	0.4J	30.09	Brown muddy
	3	10/6/2003	U	0.2J	U	U	0.2J	30.74	Silty, Brown
		12/16/2004	0.5J	U	U	U	0.5J	34.14	Silty Muddy

J= Analyte concentration detected at a value between MDL and PQL

(1) measured from top of casing

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

L43323

CHAIN of CUSTODY

NO Report → MN

Report to:

Name: Martin Nee | Address: 24 CR 3500

Company: Lodestar | Flora Vista NM 87415

E-mail: mjn@martinnee.com | Telephone: 505 334 2791

Copy of Report to:

Name: Gregg Wurtz | E-mail:

Company: Burlington Resources | Telephone:

Invoice to:

Name: Gregg Wurtz | Address: PO Box 4289

Company: Burlington | Farmington NM 87499-4289

E-mail: | Telephone: 505 326 9700

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES ☐ NO ☐

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #:

Project/PO #:

Shipping Co.: Fed Ex

Tracking #:

Reporting State for compliance testing:

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	BTEX	Metals	GenChem					
Manistee Pad Unit 1 MW-2	10/8/03 1630	GW	6	X	X	X					
Manistee Pad Unit 1 MW-3	10/8/03 1700	GW	6	X	X	X					
Trip Blank			1	X							

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Per Burlington Analyte list

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME	PAGE
	10/9/03 1600	T. ANTANICK	10/10/03 1030hrs.	1 Of 1

FRMQA021.06.03.05

White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

Gregg Wurtz
Burlington Resources, Inc.
3401 E. 30th St. PO BOX 4289
Farmington, NM 87402-4289

October 30, 2003

Project ID:
ACZ Project ID: L43323

Gregg Wurtz:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 10, 2003. This project has been assigned to ACZ's project number, L43323. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 10.0. The enclosed results relate only to the samples received under L43323. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

This report shall be used or copied only in it's entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 30, 2003. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years. Please notify your Project Manager if you have other needs.

If you have any questions, please contact your Project Manager or Customer Service Representative.

Sue Barkey 30/Oct/03

Sue Barkey, Project Manager, has reviewed and approved this report in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac

ACIL

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Burlington Resources, Inc.
Project ID:
Sample ID: M P Unit 1 MW-2

ACZ Sample ID: ***L43323-01***
Date Sampled: *10/08/03 16:30*
Date Received: *10/10/03*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	0.0036			mg/L	0.0001	0.0005	10/24/03 8:49	jb
Barium, dissolved	M200.7 ICP	0.047			mg/L	0.003	0.01	10/31/03 19:57	wfg
Cadmium, dissolved	M200.8 ICP-MS	0.0001	B		mg/L	0.0001	0.0005	10/24/03 8:49	jb
Calcium, dissolved	M200.7 ICP	266			mg/L	0.2	1	10/29/03 14:52	scp
Chromium, dissolved	M200.8 ICP-MS	0.0008			mg/L	0.0001	0.0005	10/24/03 8:49	jb
Copper, dissolved	M200.8 ICP-MS	0.0021	B		mg/L	0.0005	0.003	10/24/03 8:49	jb
Iron, dissolved	M200.7 ICP	0.98			mg/L	0.01	0.05	10/31/03 19:57	wfg
Magnesium, dissolved	M200.7 ICP	34.9			mg/L	0.2	1	10/29/03 14:52	scp
Manganese, dissolved	M200.7 ICP	2.390		*	mg/L	0.005	0.03	10/31/03 19:57	wfg
Potassium, dissolved	M200.7 ICP	1.6			mg/L	0.3	1	10/31/03 19:57	wfg
Sodium, dissolved	M200.7 ICP	419			mg/L	0.3	1	10/31/03 19:57	wfg
Zinc, dissolved	M200.7 ICP	0.02	B		mg/L	0.01	0.05	10/29/03 14:52	scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		302			mg/L	2	10	10/22/03 0:00	mah
Carbonate as CaCO3			U		mg/L	2	10	10/22/03 0:00	mah
Hydroxide as CaCO3			U		mg/L	2	10	10/22/03 0:00	mah
Total Alkalinity		302			mg/L	2	10	10/22/03 0:00	mah
Cation-Anion Balance	Calculation								
Cation-Anion Balance		-0.7			%			10/30/03 0:00	calc
Sum of Anions		35.4			meq/L	0.1	0.5	10/30/03 0:00	calc
Sum of Cations		34.9			meq/L	0.1	0.5	10/30/03 0:00	calc
Chloride	M325.2 - Colorimetric	45			mg/L	1	5	10/22/03 20:09	kmc
Conductivity @25C	M120.1 - Meter	2230			umhos/cm	1	10	10/22/03 0:10	mah
Lab Filtration	SM 3030 B							10/21/03 10:21	lms
Lab Filtration & Acidification	SM 3030 B							10/14/03 11:24	scp
pH (lab)	M150.1 - Electrometric	7.9	H		units	0.1	0.1	10/22/03 0:10	mah
Sulfate	M375.3 - Gravimetric	1340			mg/L	50	300	10/28/03 8:22	lms

** Please refer to Extended Qualifier Report for detail.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Burlington Resources, Inc.
Project ID:
Sample ID: M P Unit 1 MW-3

ACZ Sample ID: ***L43323-02***
Date Sampled: *10/08/03 17:00*
Date Received: *10/10/03*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M200.8 ICP-MS	0.0012			mg/L	0.0001	0.0005	10/24/03 8:55	jb
Barium, dissolved	M200.7 ICP	0.037			mg/L	0.003	0.01	10/31/03 20:09	wfg
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	10/24/03 8:55	jb
Calcium, dissolved	M200.7 ICP	262			mg/L	0.2	1	10/29/03 14:55	scp
Chromium, dissolved	M200.8 ICP-MS	0.0012			mg/L	0.0001	0.0005	10/24/03 8:55	jb
Copper, dissolved	M200.8 ICP-MS	0.0017	B		mg/L	0.0005	0.003	10/24/03 8:55	jb
Iron, dissolved	M200.7 ICP	0.47			mg/L	0.01	0.05	10/31/03 20:09	wfg
Magnesium, dissolved	M200.7 ICP	34.5			mg/L	0.2	1	10/29/03 14:55	scp
Manganese, dissolved	M200.7 ICP	0.063		*	mg/L	0.005	0.03	10/31/03 20:09	wfg
Potassium, dissolved	M200.7 ICP	1.6			mg/L	0.3	1	10/31/03 20:09	wfg
Sodium, dissolved	M200.7 ICP	409			mg/L	0.3	1	10/31/03 20:09	wfg
Zinc, dissolved	M200.7 ICP		U		mg/L	0.01	0.05	10/29/03 14:55	scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		291			mg/L	2	10	10/22/03 0:00	mah
Carbonate as CaCO3			U		mg/L	2	10	10/22/03 0:00	mah
Hydroxide as CaCO3			U		mg/L	2	10	10/22/03 0:00	mah
Total Alkalinity		291			mg/L	2	10	10/22/03 0:00	mah
Cation-Anion Balance	Calculation								
Cation-Anion Balance		-4.2			%			10/30/03 0:00	calc
Sum of Anions		37.0			meq/L	0.1	0.5	10/30/03 0:00	calc
Sum of Cations		34.0			meq/L	0.1	0.5	10/30/03 0:00	calc
Chloride	M325.2 - Colorimetric	48			mg/L	1	5	10/22/03 20:09	kmc
Conductivity @25C	M120.1 - Meter	2340			umhos/cm	1	10	10/22/03 0:26	mah
Lab Filtration	SM 3030 B							10/21/03 10:31	lms
Lab Filtration & Acidification	SM 3030 B							10/14/03 11:25	scp
pH (lab)	M150.1 - Electrometric	7.9	H		units	0.1	0.1	10/22/03 0:26	mah
Sulfate	M375.3 - Gravimetric	1420			mg/L	50	300	10/28/03 8:41	lms

** Please refer to Extended Qualifier Report for detail.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality control sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Burlington Resources, Inc.

ACZ Project ID: ***L43323***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L43323-01	WG164197	Manganese, dissolved	M200.7 ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
L43323-02	WG164197	Manganese, dissolved	M200.7 ICP	M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.

WELL DEVELOPMENT AND SAMPLING LOG

Project No.:30001.0 Project Name: Burlington Marcote 1 Client: Burlington Resources
Location: Marcote Pool Unit 1 Well No: MW-2 **Development** Sampling
Project Manager MJN Date 10/6/03 Start Time 1627 Weather sunny 80s
Depth to Water 29.71 Depth to Product na Product Thickness na Measuring Point TOC
Water Column Height 9.38 Well Dia. 2"

Sampling Method: Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other ☐
Bottom Valve Bailer x Double Check Valve Bailer ☐ Stainless-Steel Kemmerer ☐

Criteria: 3 to 5 Casing Volumes of Water Removal X stabilization of Indicator Parameters X Other_____

Gal/ft x ft of water	Water Volume in Well		**Gal**/oz to be removed
	Gallons	Ounces	
9.38 x .16	1.50 x 3		4.50

Time (military)	pH (su)	SC (umhos/cm)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate
1632	**7.29**	**2070**	**17.2**				**1**	**muddy, brown, very good flow to well**
	7.45	**2080**	**17.3**				**2**	**muddy, brown, very good flow to well**
	7.34	**2000**	**16.9**				**3**	**muddy, brown, very good flow to well**
	7.33	**2040**	**16.8**				**4**	**muddy, brown, very good flow to well**
	7.34	**2170**	**16.6**				**5**	**muddy, brown, very good flow to well**
1713	**7.36**	**2180**	**16.4**				**10**	**muddy, brown, very good flow to well**

Final: Time	pH	SC	Temp	Eh-ORP	D.O.	Turbidity	Ferrous Iron	Vol Evac.	Comments/Flow Rate
1713	**7.36**	**2180**	**16.4**					**10**	**muddy, brown, very good flow to well**

COMMENTS:

INSTRUMENTATION: pH Meter X _____ Temperature Meter x
DO Monitor _____ Other _____
Conductivity Meter X _____
Water Disposal onsite Sample ID NA Sample Time na
BTEX VOCs Alkalinity TDS Cations Anions Nitrate Nitrite Ammonia TKN NMWQCC Metals Total Phosphorus

MS/MSD_____ BD_____ BD Name/Time_____ TB_____

WELL DEVELOPMENT AND SAMPLING LOG

Project No.: 30003.0 Project Name: Burlington Marcote 1 Client: Burlington Resources
Location: Marcote Pool Unit 1 Well No: MW-3 Development **Sampling**
Project Manager MJN Date 10/6/03 Start Time 1637 Weather sunny 80s
Depth to Water 30.74 Depth to Product na Product Thickness na Measuring Point TOC
Water Column Height 7.92 Well Dia. 2"

Sampling Method: Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other ☐

Bottom Valve Bailer x Double Check Valve Bailer ☐ Stainless-Steel Kemmerer ☐

Criteria: 3 to 5 Casing Volumes of Water Removal X stabilization of Indicator Parameters X Other: or bail dry

Gal/ft x ft of water	Water Volume in Well		**Gal**/oz to be removed
	Gallons	Ounces	
7.92 x .16	1.27 x 3		3.8

Time (military)	pH (su)	SC (umhos/cm)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate
1645	**7.10**	**2470**	**18.0**				**1**	**Silty, brown**
	7.42	**2240**	**17.1**				**2**	**Silty, brown**
	7.44	**2200**	**16.9**				**3**	**Silty, brown**
1656	**7.40**	**2230**	**17.0**				**4**	**Silty, brown**

Final: Time	pH	SC	Temp	Eh-ORP	D.O.	Turbidity	Vol Evac.	Comments/Flow Rate
1656	**7.40**	**2230**	**17.0**				**4**	**Silty, brown**

COMMENTS:

INSTRUMENTATION: pH Meter **X** _____ Temperature Meter **x**
DO Monitor _____ Other _____
Conductivity Meter **X** _____

Water Disposal onsite Sample ID Marcote 1 MW-3 Sample Time 1700

BTEX VOCs **Alkalinity** **TDS** **Cations** **Anions** Nitrate Nitrite Ammonia TKN **NMWQCC** **Metals** Total Phosphorus

MS/MSD_____ BD_____ BD Name/Time_____ TB_____

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Organic Analytical Results

Burlington Resources, Inc.
Project ID:
Sample ID: M P Unit 1 MW-2

ACZ Sample ID: ***L43323-01***
Date Sampled: *10/08/03 16:30*
Date Received: *10/10/03*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021B GC/PID**
Extract Method: **Method**

Analyst: *km*
Extract Date: *10/13/03 20:07*
Analysis Date: *10/13/03 20:07*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	XQ	Units	MDL	PQL
Benzene	000071-43-2		U		ug/L	0.3	1
Ethylbenzene	000100-41-4		U		ug/L	0.2	1
m p Xylene	01330 20 7		U		ug/L	0.4	2
o Xylene	00095-47- 6		U		ug/L	0.2	1
Toluene	000108-88-3		U		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	XQ	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	90.8		%	84	114

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Organic Analytical Results

Burlington Resources, Inc.
Project ID:
Sample ID: M P Unit 1 MW-3

ACZ Sample ID: ***L43323-02***
Date Sampled: *10/08/03 17:00*
Date Received: *10/10/03*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021B GC/PID**
Extract Method: **Method**

Analyst: *km*
Extract Date: *10/13/03 20:49*
Analysis Date: *10/13/03 20:49*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	XQ	Units	MDL	PQL
Benzene	000071-43-2		U		ug/L	0.3	1
Ethylbenzene	000100-41-4		U		ug/L	0.2	1
m p Xylene	01330 20 7		U		ug/L	0.4	2
o Xylene	00095-47- 6		U		ug/L	0.2	1
Toluene	000108-88-3	0.2	J		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	XQ	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	92.6		%	84	114

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Organic Analytical Results

Burlington Resources, Inc.
Project ID:
Sample ID: TB100303-02

ACZ Sample ID: ***L43323-03***
Date Sampled: *10/08/03 0:00*
Date Received: *10/10/03*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021B GC/PID**
Extract Method: **Method**

Analyst: *km*
Extract Date: *10/13/03 21:32*
Analysis Date: *10/13/03 21:32*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	XQ	Units	MDL	PQL
Benzene	000071-43-2		U		ug/L	0.3	1
Ethylbenzene	000100-41-4		U		ug/L	0.2	1
m p Xylene	01330 20 7		U		ug/L	0.4	2
o Xylene	00095-47- 6		U		ug/L	0.2	1
Toluene	000108-88-3		U		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	XQ	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	91		%	84	114

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CHAIN of CUSTODY

Report to:

Name: GREGG WURTZ	Address: 3401 EAST 30TH ST
Company: BURLINGTON RESOURCES	FARMINGTON, NM 87499
E-mail:	Telephone: 505 326 9700

Copy of Report to:

Name:	E-mail:
Company:	Telephone:

Invoice to:

Name: SAME AS ABOVE	Address:
Company:	
E-mail:	Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES ☐ NO ☐

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #:

Project/PO #: MISC. GW SAMPLING

Shipping Co.:

Tracking #:

Reporting State for compliance testing:

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	BTEX							
MW-3 MARCOTE	12-16-03 0847	GW	2	X							
MW-2 MARCOTE	12-16-03 0915	GW	2	X							
MW-1 FLORA VISTA	12-16-03 1030	GW	2	X							
MW-2 COZZENS	12-16-03 1105	GW	2	X							
MW-1 COZZENS	12-16-03 1131	GW	2	X							
TRIP BLANK	12-16-03 1200	O	1	X							

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME	PAGE
(DAVID NEE)	12-16-03 1205			
				Of

White - Return with sample. Yellow - Retain for your records.

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Organic Analytical Results

Burlington Resources, Inc.
Project ID: MISC. GW SAMPLING
Sample ID: M-2 MARCOTE

ACZ Sample ID: ***L44072-12***
Date Sampled: *12/16/03 9:15*
Date Received: *12/17/03*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021B GC/PID**
Extract Method: **Method**

Analyst: *km*
Extract Date: *12/18/03 20:42*
Analysis Date: *12/18/03 20:42*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	XQ	Units	MDL	PQL
Benzene	000071-43-2	0.4	J		ug/L	0.3	1
Ethylbenzene	000100-41-4		U		ug/L	0.2	1
m p Xylene	01330 20 7		U		ug/L	0.4	2
o Xylene	00095-47- 6		U		ug/L	0.2	1
Toluene	000108-88-3		U		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	XQ	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	78.5	*	%	84	114

** Please refer to Extended Qualifier Report for details.*

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Organic Analytical Results

Burlington Resources, Inc.
Project ID: MISC. GW SAMPLING
Sample ID: MW-3 MARCOTE

ACZ Sample ID: ***L44072-11***
Date Sampled: *12/16/03 8:47*
Date Received: *12/17/03*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021B GC/PID**
Extract Method: **Method**

Analyst: *km*
Extract Date: *12/18/03 19:59*
Analysis Date: *12/18/03 19:59*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	XQ	Units	MDL	PQL
Benzene	000071-43-2	0.5	J		ug/L	0.3	1
Ethylbenzene	000100-41-4		U		ug/L	0.2	1
m p Xylene	01330 20 7		U		ug/L	0.4	2
o Xylene	00095-47- 6		U		ug/L	0.2	1
Toluene	000108-88-3		U		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	XQ	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	81.7	*	%	84	114

** Please refer to Extended Qualifier Report for details.*

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Organic Reference

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
LCL	Lower Control Limit
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
UCL	Upper Control Limit
Sample	Value of the Sample of interest

QC Sample Types

SURR	Surrogate	*LFM*	Laboratory Fortified Matrix
INTS	Internal Standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
LCSS	Laboratory Control Sample - Soil	*MS/MSD*	Matrix Spike/Matrix Spike Duplicate
LCSW	Laboratory Control Sample - Water	*PBS*	Prep Blank - Soil
LFB	Laboratory Fortified Blank	*PBW*	Prep Blank - Water

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.

ACZ Qualifiers (Qual)

B	Analyte detected in daily blank
H	Analysis exceeded method hold time.
J	Analyte concentration detected at a value between MDL and PQL
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality contreol sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.
P	Analyte concentration differs from second detector by more than 40%.
E	Analyte concentration is estimated due to result exceeding calibration range.
M	Analyte concentration is estimated due to matrix interferences.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
(3)	EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December, 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Organic analyses are reported on an "as received" basis.

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Organic Extended Qualifier Report

Burlington Resources, Inc.

ACZ Project ID: ***L43323***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION

No extended qualifiers associated with this analysis

ACZ Laboratories, Inc.

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Sample Receipt

Burlington Resources, Inc.

ACZ Project ID: L43323
Date Received: 10/10/2003
Received By: tonya

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			√
2) Are the custody seals on the cooler intact?	√		
3) Are the custody seals on the sample containers intact?			√
4) Is there a Chain of Custody or other directive shipping papers present?	√		
5) Is the Chain of Custody complete?	√		
6) Is the Chain of Custody in agreement with the samples received?	√		
7) Is there enough sample for all requested analyses?	√		
8) Are all samples within holding times for requested analyses?	√		
9) Were all sample containers received intact?	√		
10) Are the temperature blanks present?	√		
11) Are the trip blanks (VOA and/or Cyanide) present?	√		
12) Are samples requiring no headspace, headspace free?	√		
13) Do the samples that require a Foreign Soils Permit have one?			√

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id		Temp (°C)	Rad (µR/hr)
ACZ		6.9	13

Notes

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Sample Receipt

Burlington Resources, Inc.

ACZ Project ID: L43323
Date Received: 10/10/2003
Received By: tonya

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	Y < 2	YG< 2	B < 2	BG< 2	O < 2	T >12	P >12	N/A	RAD
L43323-01	M P Unit 1 MW-2										√	
L43323-02	M P Unit 1 MW-3										√	
L43323-03	TB100303-02										√	

WELL DEVELOPMENT AND SAMPLING LOG

Project No.:30003.0 Project Name: Burlington Marcote 1 Client: Burlington Resources
Location: Marcote Pool Unit 1 Well No: MW-2 Development **Sampling**
Project Manager MJN Date 12/16/03 Start Time 0855 Weather cloudy 40s
Depth to Water 30.09 Depth to Product na Product Thickness na Measuring Point TOC
Water Column Height 8.76 Well Dia. 2"

Sampling Method: Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other ☐
Bottom Valve Bailer x Double Check Valve Bailer ☐ Stainless-Steel Kemmerer ☐

Criteria: 3 to 5 Casing Volumes of Water Removal **X** stabilization of Indicator Parameters **X** Other: or bail dry

	Water Volume in Well		
Gal/ft x ft of water	Gallons	Ounces	**Gal**/oz to be removed
8.76 x .16	1.40 x 3		4.2

Time (military)	pH (su)	SC (umhos/cm)	Temp (°F)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate
0902	**6.96**	**5930**	**48.0**				**.50**	**Brown Muddy**
	7.0	**5930**	**51.7**				**1.0**	**Brown Muddy**
	7.06	**6360**	**51.6**				**1.25**	**Brown Muddy**
	7.05	**6310**	**51.5**				**2.0**	**Brown Muddy**
0912	**7.10**	**6160**	**51**				**3.0**	**Brown Muddy**
							4.0	**Bailing Dry**

Final: Time	pH	SC	Temp	Eh-ORP	D.O.	Turbidity	Ferrous Iron	Vol Evac.	Comments/Flow Rate
0912	**7.10**	**6160**	**51**					**3.0**	**Brown Muddy**

COMMENTS:

INSTRUMENTATION: pH Meter **X** _____ Temperature Meter **x**
DO Monitor _____ Other _____
Conductivity Meter **X** _____
Water Disposal onsite Sample ID Marcote 1 MW-2 Sample Time 0915
BTEX VOCs **Alkalinity** **TDS** **Cations** **Anions** Nitrate Nitrite Ammonia TKN **NMWQCC** **Metals** Total Phosphorus

MS/MSD_____ BD_____ BD Name/Time_____ TB_____

WELL DEVELOPMENT AND SAMPLING LOG

Project No.:30003.0 Project Name: Burlington Marcote 1 Client: Burlington Resources
Location: Marcote Pool Unit 1 Well No: MW-3 Development **Sampling**
Project Manager MJN Date 12/16/03 Start Time 0830 Weather cloudy 40s
Depth to Water 34.14 Depth to Product na Product Thickness na Measuring Point TOC
Water Column Height 4.52 Well Dia. 2"

Sampling Method: Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other ☐
Bottom Valve Bailer x Double Check Valve Bailer ☐ Stainless-Steel Kemmerer ☐

Criteria: 3 to 5 Casing Volumes of Water Removal **X** stabilization of Indicator Parameters **X** Other: or bail dry

	Water Volume in Well		
Gal/ft x ft of water	Gallons	Ounces	**Gal**/oz to be removed
4.52 x .16	.72 x 3		2.2

Time (military)	pH (su)	SC (umhos/cm)	Temp (°F)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate
0833	**6.44**	**6490**	**48.1**				**.25**	**Brown/Heavy**
	6.65	**6560**	**49.6**				**.5**	**Silt/Muddy**
	6.80	**6520**	**.75**				**.75**	**Silt/Muddy**
	6.83	**6540**	**51.3**				**1.0**	**Silt/Muddy**
	6.79	**6540**	**51.3**				**2.0**	**Silt/Muddy**
0845	**6.80**	**6520**	**51.0**				**2.5**	**Silt/Muddy**

Final: Time	pH	SC	Temp	Eh-ORP	D.O.	Turbidity	Vol Evac.	Comments/Flow Rate
0845	**6.80**	**6520**	**51**				**2.5**	**Silt/Muddy**

COMMENTS:

INSTRUMENTATION: pH Meter **X** _____ Temperature Meter **x**
DO Monitor _____ Other _____
Conductivity Meter **X** _____
Water Disposal onsite Sample ID Marcote 1 MW-3 Sample Time 0847
BTEX VOCs **Alkalinity** **TDS** **Cations** **Anions** Nitrate Nitrite Ammonia TKN **NMWQCC** **Metals** Total Phosphorus

MS/MSD_____ BD_____ BD Name/Time_____ TB_____