### BURLINGTON RESOURCES

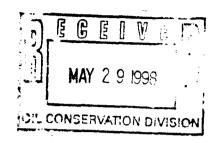
SAN JUAN DIVISION

May 28, 1998

Certified: P 103 693 121

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

RE: Hampton 4M - Groundwater Contamination Unit Letter N, Section 13, Township 30N, Range 11W



Dear Mr. Olson:

As requested in your April 7, 1998 letter, the following is a status report on the soil/groundwater investigation and remediation activities that have been conducted at the Hampton 4M gas production location. This report addresses the activity by Burlington Resources Oil and Gas Company (BR) near our area of operations. Details on earlier investigation work were submitted to you on July 30, 1997 and January 30, 1998, and will not be repeated in this report. A site diagram showing the location of the discussed monitoring wells and soil excavation is included in Attachment #1.

### Additional Monitor Well Installation

As required in your April 7 letter, BR installed additional monitor wells near the locations of the former temporary boreholes TPW-1 and TPW-2. On May 11, 1998, Philip Services Corporation drilled and completed both monitor wells (identified as MW-9 and MW-10). The geologic logs and well completion diagrams for these wells are included in Attachment #2.

### Monitoring Well Sampling

Since the last report on January 30, 1998, the monitor wells have been sampled twice, first on April 14, 1998 and again on May 12, 1998. The details of the sample results, along with earlier sample results, are shown in Table 1. Due to MW-3 showing "non-detect" for BTEX components over the last five sampling events, it was not sampled during the last sampling event.

Table 1
Groundwater Sampling Summary
BTEX (ppb)

		<i>D</i> 11	ZZZ (PPD)			
	MW-1	MW-3	MW-4	MW-8	MW-9	MW-10
1/31/97		ND	2651.3			
5/1/97		ND	3477.0			
10/30/97	5.8	ND				
1/12/98	8.8	ND	1362.0	33,801		
4/14/98	2.3	ND	1147.2	0.37 ft		
5/12/98	ND	Not sampled	1024.8	0.29 ft	10.5	1.41 ft

NOTE: The shaded areas indicate the thickness of free phase hydrocarbons.

The well development details and analytical results of the May 12 sampling event are included in Attachment #3. PNM collected the April 14 samples and BR does not have copies of the laboratory reports. In addition to the BTEX components, the water was also analyzed for New Mexico Water Quality Control Commission (WQCC) metals and cations and anions pursuant to your April 7 letter.

PNM had all the monitoring wells surveyed for location and groundwater elevation on January 12, 1998. The direction and magnitude of the hydraulic gradient, using this data, is shown in Attachment #4. The map, which was provided to BR from PNM, also details the analytical results of the sampling events up through April 14, 1998. The most recent monitor wells (MW-9 and MW-10) have not been surveyed for location or elevation yet and are not included on this groundwater contour map.

### Ongoing Remediation/Investigation

The excavation created during BR's source removal work in December 1997 remains open to allow air to contact the groundwater. This should continue the improvement of the quality of groundwater. PNM sampled the water from this excavation in February 1998 and total BTEX was 4920 ppb. No further sampling has taken place.

In addition to the source removal work that BR performed in the southeast corner of the location, BR has tested both our well bore and the underground flowline from the well to our separation equipment for mechanical integrity. Both tests showed we have mechanical integrity with no indication of leakage.

### Conclusions

The water quality of the upgradient well (MW#1) indicates the likelihood that groundwater contamination is not coming from an off site source. The quality of the water from the monitoring well, located approximately 50 feet south of the location, has been tested four times and is within water quality standards.

The groundwater in MW-3 and the recently installed MW-9 has shown to be below regulatory limits. This indicates that the potential plume is relatively narrow and does not travel to the west. The fact that water was not encountered in TPW-3 indicates that the potential plume does not leave location to the east.

The BTEX level in MW-4, located near BR's excavation, continues to drop. Since the last sample prior to our source removal work, the BTEX level in MW-4 has dropped over 70 percent (from 3477.0 ppb to 1024.8 ppb). The BTEX level dropped a little over 10 percent in less than a month between the last two sampling events. It appears that the source removal in the southeast portion of the location is having a positive impact on groundwater.

Less than five inches of free phase hydrocarbons were detected in MW-8 during the April (4.44") and May (3.48") sampling events. BR anticipates the level of free phase will continue to decrease and the groundwater will clean up over time due to the source removal work.

The recently installed MW-10, located near PNM's operations, had 1.41 feet of free phase hydrocarbons on May 12, 1998. Attachment #5 shows an approximate cross section from MW-4 to PNM's MW-2 (including MW-8 and MW-10). The cross section shows that the elevation of the hydrocarbons in MW-10

is less than the level in PNM's MW-2. The progressively increased thickness of "free product" towards PNM's operations implicates at a minimum either an active source of free phase hydrocarbons or unresolved soil contamination. Depending on the source of this hydrocarbon, it can clearly migrate in a contrary direction to groundwater flow until it reaches a static level. Based upon the close proximity to PNM's equipment and that the free phase hydrocarbons are at a lower elevation, BR feels the contamination present in MW-10 is directly related to the contamination under and around PNM's operations.

### Plan of Action

Given the continued improvement shown in MW-4, BR's plans are to continue to leave the source removal excavation open for a period of time while we monitor the contaminant levels in the monitor wells.

As the downward trend of contaminant levels continues to progress in the wells near Burlington's source removal area, the excavation will be backfilled with clean soils. A monitoring well will then be installed in the source area. Water quality from the source well and the other monitor wells will be tested periodically to show improvement in water quality.

The Hampton 4M location continues to require monitoring and potentially further remediation. BR's source removal in the southeast corner of the location should continue to have a positive impact on the situation. If you have questions or additional information is needed, please contact me at (505) 326-9841.

Sincerely,

Ed Hasely

Sr. Staff Environmental Representative

Enclosures: Attachment #1: Hampton 4M Site Diagram

Attachment #2: Geologic Logs and Well Completion Diagrams

Attachment #3: Well Development Laboratory Results

Attachment #4: Groundwater Contour Map

Attachment #5: Cross Section from MW-4 to MW-2

cc: Denny Foust - NMOCD Aztec

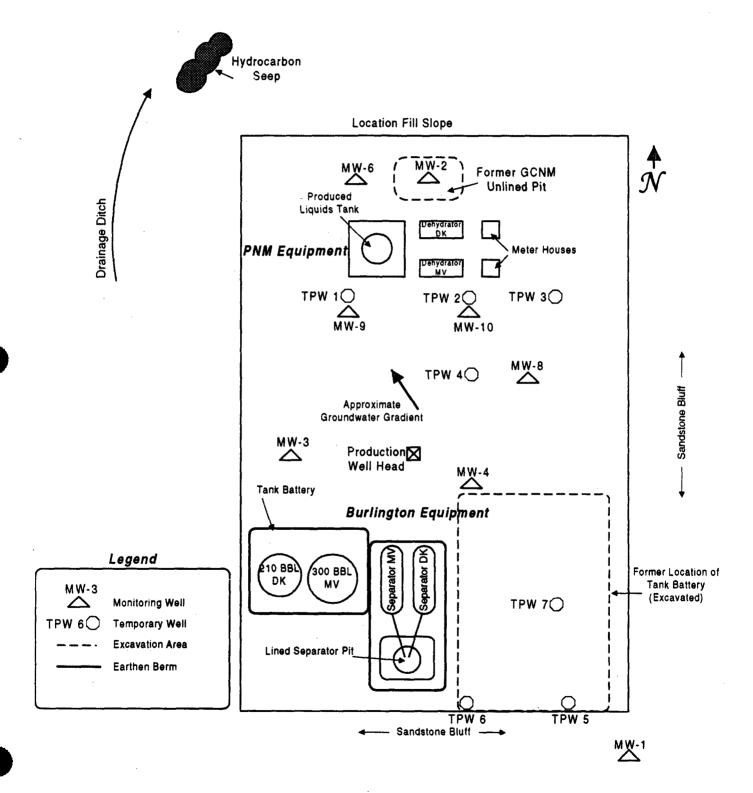
Johnny Ellis - BR Ken Raybon - BR Bruce Gantner - BR John Bemis - BR

Denver Bearden - PNM Farmington Maurene Gannon - PNM Albuquerque

Hampton 4M File

# ATTACHMENT #1 SITE DIAGRAM

### Hampton 4M Site Diagram



### **ATTACHMENT #2**

### GEOLOGIC LOGS AND WELL COMPLETION DIAGRAMS

### RECORD OF SUBSURFACE PLORATION

Borehole # BH- 1 - 51/ Well # Bage 1

PHILIP SERVICES CORP.

4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Project Number 19584 Phase 6000.77
Project Name Burlington Resources Hampton 4M
Project Location Hampton 4M

Drilling Method 4 1/4 ID HSA
Air Monitoring Method PID

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Charige (feet)		r Monito Inits: PF BH	•	Drilling Conditions & Blow Counts
		C - 7	. ) u	L. D. I SANOF-med Sand			0	O	0/0	0005/
	<b>.</b>		<b>.</b>	L+ Br clay eySAND, F-med sand, +r coarse, loose, dry			0	0	0	-0905h
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15	)	15-17	18	Br sandy CLAY, mod rf sand, low plastic, stiff, dry			0	U	0/0	-09184-
20	4	20-	12	Br clayey SAND, VF-FSA-D, dense, moist			U	0	%	-0925hy -0939
25	s	<b>3</b> 5^	6	Gry weathered SANDSTONE med sand, poorly cemented, and moist	צ		0	0	00	-0939
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Comments: GLOD.7' @ 0953 hr. GLODAD.7 after setting 10 min. Will set well

Geologist Signature

Con Clary

### MONITOR WELL INSTALLAT ) FORM

Philip Services Corp.

Date/Time Completed

4000 Monroe Rd.

Farmington, NM 87401

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

Elevation	
Well Location S.	of troduction 1/1
GWL Depth	29.7
Installed By	K PADILLA
Date/Time Started	5/11/98

5/11/98

	Borehole #	* BH1-511					
٠	Weil#	~	W	9			
	Page	1	of	1			

Project Name Project Number 19584 Phase 6000
Site Location Hampton 4M

On-Site Geologist C CHANCE
Personnel On-Site
Contractors On-Site
Client Personnel On-Site

Depths in Reference to Gro	und Surface			F	=	Top of Protective Casing  Top of Riser (survey elev.)	0
Item	Material	Depth (feet)				Ground Surface	D
Top of Protective Casing		0					
Bottom of Protective Casing		1					
Top of Permanent Borehole Casing Bottom of		NA					:
Permanent Borehole Casing		M					
Top of Concrete		0					
Bottom of Concrete				1			
Top of Grout							· !
Bottom of Grout		13					
Top of Well Riser		18					
Bottom of Well Riser		18				To A Coul	13
Top of Well Screen  Bottom of Well Screen		23		X X X X X X	x x x x		
Top of Peltonite Seal		13	•	X X	x x x x		_
Bottom of Peltonite Seal		15		x x	ХX	·	<u>15</u>
Top of Gravel Pack		1.5			1	Top of Screen	18
Bottom of Gravel Pack		33			4		
Top of Natural Cave-In		33			1		
Bottom of Natural Cave-In		3).5			7		
Top of Groundwater		29.7		E	J	Bottom of Screen Bottom of Borehole	33
Total Depth of Borehole		33.5		p. 1000000.1700	v 10000 00 50.		

as Flush mount of locking well cap + padlock

Geologist Signature

### RECORD OF SUBSURFACE JPLORATION

PHILIP SERVICES CORP.

4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388



| BH-2-51/ | Wetl # | M W / O | Page 1 | of

Project Number	19584	Phase	6000.77	
Project Name	Burlington	Resources I	Hampton 4M	•
<b>Project Location</b>	Hampton 4	4M		

Elevation					
Borehole Location	LTR:	S:	T:	R:	S. of Dehy
GWL Depth	٦٠	1.7'			_
Drilled By	K. PAI	OILLA			_
Well Logged By	C. CH	ANCE			•
Date Started	57	11/98			-
Date Completed	5/1	1108			-

Drilling Method 4 1/4 ID HSA
Air Monitoring Method PID

				Sample			Depth	-	·		
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comments: GWQ24.7 after setting 10 min. Will set well Q27'.

**Geologist Signature** 

Con Clery

### MONITOR WELL INSTALLA ( ) FORM

Philip Services Corp. 4000 Monroe Rd.

Farmington, NM 87401

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

Elevation
Well Location
GWL Depth
Installed By

K PADILLA

Date/Time Started 5/11/9 %
Date/Time Completed 5/11/9 %

$\bigcirc$	Borehole #	ole # BH2 - 511					
	Well#	-r	りんし	D			
	Page	1_	of	1			

Project Name
Project Number
Site Location

Project Number
Site Geologist
On-Site Geologist
Personnel On-Site
Contractors On-Site
Client Personnel On-Site
Client Personnel On-Site

Item	Material	Depth (feet)				Top of Riser (survey elev.) Ground Surface	0
p of Protective Casing		0				-	
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op of ermanent Borehole Casing		NA					
Sottom of Permanent Borehole Casing		MA					
op of Concrete		0					
Sottom of Concrete		1					
op of Grout		1					
ottom of Grout		11					
op of Well Riser		.3	,				
ottom of Well Riser		17					
op of Well Screen		17				Top of Seal	1/_
ottom of Well Screen		27	X	x	X		
op of Peltonite Seal		11	×	$x \mid x$	X		
ottom of Peltonite Seal		13-6	X	X   X	X	Top of Gravel Pack	13-6
op of Gravel Pack		13.6		目		Top of Screen	_17_
ottom of Gravel Pack		27		目			
op of Natural Cave-In		27		H			
ottom of Natural Cave-In		27		H			
op of Groundwater		24.7		H		Bottom of Screen	47
otal Depth of Borehole		127				Bottom of Borehole	<u> </u>

Wellset m/ Flush mount vault, well capt padlock

Geologist Signature

### **ATTACHMENT #3**

### WELL DEVELOPMENT and LABORATORY RESULTS

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MW-1				41.98		47.69			
MW-4				16.67	_	34.29			
MW-8	!		17.93	18.22		NA_	,29		
mh-9				21.79	_	33.08			
5/38/98 MW-10			23.09	21.68		27.0	1.9/		
MW-10			21.68	23.09		a7.0	1.41		
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Development Development

# WELL DEVELOPMENT AND PURGING DATA

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Client Company Buchington	veling		Resources	2							Phase.Task No.	usk No
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807 S. CARLTON FARMINGTON, NM 87499-1289 (505) 326-2588

### Water Analysis Burlington Resources, Inc.

Sample ID:

MW - 1

Matrix:

Water

Lab ID:

9805054-01

Date Reported:

05/20/98

Date Sampled:

05/12/98

Date Received:

05/12/98

Paramet	er	Analytical Result	Units 2
General			
	pН	4.78	s.u.
	Conductivity	2,790	μmohs/cm
	Specific Gravity	1.005	
	TDS (calc)	3,100	mg/L
	TDS (Measured)	3,330	mg/L ~
Cations			
	Hardness	2,100	mg/L
	Calcium	600	mg/L
	Magnesium	147	mg/L
	Sodium	113	mg/L
	Potassium	7.0	mg/L
Anions			
	Alkalinity	12.5	mg/L
	Carbonate	1.0	mg/L
	Bicarbonate	11.5	mg/L
	Hydroxide	<1.0	mg/L
	Chloride	47.5	mg/L
	Sulfate	2,180	mg/L
Data Valid	lation		Acceptable Limits
	% Difference cations/anions meg/l	0.20	+/- 2 - 5 %
	TDS Ratio	1.1	1.0 - 1.2

Danica Carman, Lab Manager



807 S. CARLTON **FARMINGTON, NM 87499-1289** (505) 326-2588

Philip Environmental 4000 Monroe Rd Farmington, NM 87401 Attn: Robert Thompson

Date:

05/20/98

Project:

**BR Hampton 4M** 

Project No:

19584

Site:

Farmington

Matrix:

Water

Sampled By: C. Chance

Date Sampled:

05/12/98

Sample ID:

MW - 1

Date Received:

05/12/98

	Analytical Data		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	ND	1.0	μg/L
Toluene	ND	1.0	– μg/L
Ethylbenzene	ND	1.0	μ <b>g/L</b>
Total Xylene	ND	1.0	μg/L
Total Volatile Aromatic Hydrocarbons	ND		μg/L

Surrogate 1,4,Difluorobenzene 4-Bromofluorobenzene

Method 8020A\*\*\*

Analyzed by: VHZ

% Recovery

107 97

Date: 05/14/98

**ND-Not Detected** 

Notes:

\*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th Ed \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

Danica Carman, Lab Director



807 S. CARLTON **FARMINGTON, NM 87499-1289** (505) 326-2588

Philip Environmental 4000 Monroe Rd. Farmington, NM 87401 Attn: Robert Thompson

05/20/98 Date:

Project:

**BR Hampton 4M** 

Project No:

19584

Site:

Matrix:

Water

Farmington

Date Sampled:

05/12/98

Sampled By: C. Chance Sample ID:

MW - 1

Date Received:

05/12/98

	Analytical Data		
	-	Detection	
PARAMETER	RESULTS	Limit	UNITS
Dissolved Metals			
Arşenic	ND	0.1	- mg/L
Barium	0.006	0.005	mg/L
Cadmium	ND	0.005	mg/L
Chromium	ND	0.01	mg/L
Copper	ND	0.01	mg/L
Iron	4.50	0.02	mg/L
Lead	ND	0.05	mg/L
Manganese	3.12	0.005	mg/L
Selenium	ND	0.1	mg/L
Silver	ND	0.01	mg/L
Method 6010B ***			· ·
Analyzed by: JM			
Date: 5/19/98	•		
Mercury Method 7470A ***	ND	0.0002	mg/L

### ND-Not Detected

Analyzed by: AG

Date: 5/15/98

Notes:

\*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with

EPA guidelines for quality assurance.

Daniea Carman, Lab Manager

Date	Reviewer		12/98	Date S/							s Sianatui	Developer's Signature(s)	<b>-</b> 1
												Comments	. 0
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AA	368	6.67	13.9		7.0	2.5					1560		_
A#	920	6.55	13.9		5.0	2.5					242		T
Black,	446	9.30	13.8		کا ک	2.6					0936	5/12/98/0936	_
Oxygen (mg/l)	(mmhos/cm)	` T	(°C)	Removed (gallons)		(galk	water Depth (feet)	(feet)	nt Rate (gal/min)	Developmen Method Pump Baller	Time	Date	
1		1			4					ita	noval Da	Water Removal Data	າ≤
) ) ) ) )	Water Disposal		8.6			Drilling Fluids Total	ाव	Stainless-steel Kemmerer	-steel Ke	Stainless		□ Peristattic □ Other	
☐ Other	□ Other _	<u> </u>	Removed		Cubic Feet	Item Well Casing Gravel Pack	তু[হ্বা	alve	Bailer	Bajjer  Bottom Valve  Double Chec	rsible C	Pump  Centrifugal  Submersible	1
© Conductivity Meter	☐ Conduc	<u>6</u> ]	l Pack	Grave	Diameter (inches): Well 🔥 Grave	iameter (in	 7 <u>₽</u>			nment	f Davelo	fethods of Development	<i></i>
ter $O_{yST}e$	D DO Monitor	=	17.	) 34.29 et) 16.6 in Well (feet	Initial Depth of Well (feet) Initial Depth to Water (feet) Height of Water Column in W	witial Depth witial Depth eight of Wa	# 5 5 <b>2</b>	moval	Vater Rei rameters	IIA Imes of \ licator Pa	asing Volution of Ind	Development Citteria  ☑ ③to 5 Casing Volumes of Water Removal ☐ Stabilization of Indicator Parameters ☐ Other	_ m C
		-			Site Address	1	<b> </b>		M	tos	Hampton	Site Name_	. כ
Phase.Task No.							120	Resources	ton	Burlin	1	Client Company_	O
Project No. 19584		SON	Thompson	lager R.	Project Manager_			Wh	Hampton	Haw	ne BR	Project Name_	-ρ
Page									Serial No. WDPD-	Serial N	MENTAL	ENVIRONNEN	: 12 mm
WELL DEVELOPMENT AND PURGING DATA	MENT.	HO13	L DEV	WEL	Development Development	, éo	4	MW-4	Well Number_	Well		TH	

Form A01

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1/31/96

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		<del></del>															•

Form A0202 Rev. 02/24/94

(17)1479

Reviewer \_\_\_\_\_ Date \_



807 S. CARLTON FARMINGTON, NM 87499-1289 (505) 326-2588

### Water Analysis Burlington Resources, Inc.

Sample ID:

MW - 4

Matrix:

Water

Lab ID:

9805054-02

Date Reported:

05/20/98

Date Sampled:

05/12/98

Date Received:

05/12/98

Paramet	er	Analytical Result	Units
General			
	рН	7.07	s.u.
	Conductivity	3,280	μmohs/cm
	Specific Gravity	1.006	
	TDS (calc)	3,480	mg/L
	TDS (Measured)	3,950	mg/L –
Cations			
	Hardness	2,300	mg/L
	Calcium	620	mg/L
	Magnesium	183	mg/L
	Sodium	179	mg/L
	Potassium	5.0	mg/L
Anions			
	Alkalinity	183	mg/L
	Carbonate	15.7	mg/L
	Bicarbonate	167	mg/L
	Hydroxide	<1.0	mg/L
	Chloride	45.0	mg/L
	Sulfate	2,340	mg/L
Data Valid	ation		Acceptable Limits
	% Difference cations/anio	ons meq/l 0.20	+/- 2 - 5 %
	TDS Ratio	1.1	1.0 - 1.2

Danica Carman, Lab Manager



807 S. CARLTON FARMINGTON, NM 87499-1289 (505) 326-2588

Philip Environmental 4000 Monroe Rd Farmington, NM 87401 Attn: Robert Thompson

Date: 05/20/98

Project:

**BR Hampton 4M** 

Project No:

19584

Site:

Water

Farmington

Matrix:

Sampled By: C. Chance Sample ID:

MW - 4

Date Sampled:

05/12/98

Date Received:

05/12/98

	Analytical Data		
•	, ,	DETECTION	
PARAMETER	RESULTS	LIMIT	UNITS
Benzene	1000	10.0	μg/L
Toluene	1.8	1.0	_ μg/L
Ethylbenzene	20	1.0	μg/L
Total Xylene	3.0	1.0	μg/L
Total Volatile Aromatic Hydrocarbons	1024.8		μg/L

Surrogate % Recovery 1,4,Difluorobenzene 107 4-Bromofluorobenzene 93 Method 8020A\*\*\*

Analyzed by: VHZ

Date: 05/15/98

ND-Not Detected

Notes:

\*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th Ed \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

Danica Carman, Lab Director



807 S. CARLTON **FARMINGTON, NM 87499-1289** (505) 326-2588

Philip Environmental 4000 Monroe Rd. Farmington, NM 87401 Attn: Robert Thompson

05/20/98 Date:

Project:

BR Hampton 4M

Project No:

19584

Site:

Matrix:

Water

Sampled By: C. Chance

Farmington

Date Sampled:

05/12/98

Sample ID:

MW - 4

Date Received:

05/12/98

Ana	lytical	Data
,	.,	

	•	Detection	
PARAMETER	RESULTS	Limit	UNITS
Dissolved Metals			e e
Arşenic	ND	0.1	- mg/L
Barium	0.009	0.005	mg/L
Cadmium	ND	0.005	mg/L
Chromium	ND	0.01	mg/L
Copper	ND	0.01	mg/L
Iron	4.87	0.02	mg/L
Lead	ND	0.05	mg/L
Manganese	5.80	0.005	mg/L
Selenium	ND	0.1	mg/L
Silver	ND	0.01	mg/L
Method 6010B ***			-
Analyzed by: JM	_		
Date: 5/19/98			
Mercury Method 7470A ***	0.0002	0.0002	mg/L

ND-Not Detected

Analyzed by: AG

Date: 5/15/98

Notes:

\*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with

EPA guidelines for quality assurance.

Danica Carman, Lab Manager

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Form Ac	Developer's Signature(s)	Comments	Circle the date							80/1/5	Date		Water Removal Data	Other_	☐ Peristattic	☐ Centitugai	Pump	Methods of Development	☐ Stabilization of Indicator Parameters ☐ Other	12 3 to (Casing Volumes of Water Removal	Development Criteria	Site Name_	Client Company	Project Name	ENVIRONMENTAL	D H
Rev. 10/6/94	s Signatu		Cond time t				650)	1050	1201	1034	Time		noval Da				Bc	f Develo	tion of Inc	asing Volu	ent Crite	Han		76 BK	WENTAL	
Ì	re(s) (		To the deal								Pump Bailer	Developmen Method	ta		Stainless-	☐ Double Chect	Bailer	pment	icator Pai	imes of V	<u>"</u>	3,	Burling	7	Serial No. WOPD	∀e‼ N
0		or princing on	alcoment or									Removal Rate (gal/min)			□ Stainless-steel Kemmerer	☐ Double Check Valve	•		ameters	/ater Rem		L/W	ton	1 1	WDPD-	Well Number
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٠. ا	*											Water Depth (feet)			힉	হা হ			<u>.</u> 5	- <del></del> :	<b>≶</b>		ف			0
							25	2,5	8.5	2.6	Increment	Water Volu (gc		Total	Drilling Fluids	Gravel Pack	Item	ameter (	eight of V	itial Dept	ater Vol					•
							10.0	7. 5	S. C	2.5	Cumulative	Water Volume Removed (gallons)					Cubic Feet	Diameter (inches): Well <u>a'</u>	Initial Depth to Water (teet) <u>d.t. / 9</u> Height of Water Column in Well (teet)	Initial Depth of Well (feet)	Water Volume Calculation	Site Address		Project		Development Purging
	Date 5/										Incremen Cumulative	d Product Volume Removed (gattons)	1			- - «	11	water Volume in Well	or (teet) _	(teet)	culation	dress		Project Manager_		
	5/12					_	_				Cumulative	L	1			-		Well	Vell (feet)	-1-0				RThe	r	<b>NELL</b>
	66/48						16.5	15,2	15.5	15.1		Temperature (°C)		5.59		4	Removed	el Pack Gallons to be	11.29					resame		DEVE
	Rev						6.70	6.67	6.65	6.67		P	] .		<u></u>			1			ing			Z		ELOPN
ļ	Reviewer						096	269	262	260		Conductivity (mmhos/cm)		VValet Disposati		Other_	Temperature Meter	Conductivity Meter	DO Monitor	D pH Meter	Instruments					MENT
E Zz	Date											Dissolved Oxygen (mg/l)		)1+P	<u>)</u>		ature Me	ctivity Me	nitor	er '	s,		Phase.1	Project No.		AND F
F:\NEWFORM\PE_AOID	e						41	AA	44	17 8		0					ter	ter		9	Serial		Phase.Task No	-	Page _	WELL DEVELOPMENT AND PURGING DATA
A010								-				Comments								(	Serial No. (If applicable)			580	of _	NG D,
1/31/96									_																_	ATA

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PHIL	P	Wat	er Sa	ımplin	g I	)at	a			Loca	tion N	o. <u>M</u>	N-9
		Serial No	. <u>wso-</u>				•			Gro	up Lis	t Numbe	er
Sample T	ype:	☑ Grou	ndwater	☐ Surface	Water	0	Other				<b></b>	Date _	5/12/98
Project Na	ıme	BR H	ampto	1 4M	<i>1</i>					Project	No.	195	84
Project Ma	anager	_R. J	Thomp	son					<del></del>	Phase.	Task	No	<u> </u>
Site Name		Ampto	n 41	M		<u> </u>				· · · · · ·		· · · · ·	
Samplin Reque	g Spe	cificatio ampling val (feet)	กร	ATOA3	lni '		Measure Elapsed I			evelopm	ent/P	urging (1	nours)
Reques	sted W	ait Follow	ing	. 14			l Water De						
Deve	lopmen	t/Purging	(hours) _	$N\pi$		Nona	queous L	iquid	s Preser	nt (Desc	ribe)	NA	
Water O	uality	/Water (	Collectio	n					D	O = Diss	olved C	)xygen; C	ond. = Conductivi
				Water Qualit	y Read	dings		٧	Vater Co	llection	Data		
										Pump		Final	
		Sam	pler Tem	р.	DO	Con	1		Removal Rate	Intake Depth		Water Depth	Notes - (Explain in
Date	Tim	e Initi	als (°C	) pH	(mg/L)	СП	n) (galk	ons)	(gal/min)	(feet)	Bail	(feet)	Comments Below
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Sample (	Contai	ners		Гуре: G = Cle res: H = HCl;									O = Other (Specify None)
					Fie	ıld		1 -	ooled			•	
Analytic	L		Containe		Filte	red		Col	uring lection				
Parameter		Number	Туре	Volume (mL)	Yes	<del></del>	Preserved	Yes	No		. <u>.</u>	Comment	s
BTE	X	<u> </u>	V	40		$\checkmark$		$\leq$					
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J		7					···· <u> </u>		116.611				

Form A0202 Rev. 02/24/94



807 S. CARLTON FARMINGTON, NM 87499-1289 (505) 326-2588

### Water Analysis Burlington Resources, Inc.

Sample ID:

MW - 9

Matrix:

Water

Lab ID:

9805054-03

Date Reported:

05/20/98

Date Sampled:

05/12/98

Date Received:

05/12/98

	6.14	s.u.
	3,530	μmohs/cm
	1.006	
	3,710	mg/L
	4,080	mg/L –
	2,450	mg/L
	560	mg/L
	256	mg/L
	166	mg/L
	9.0	mg/L
	92.5	mg/L
	19.4	mg/L
	73.1	mg/L
	<1.0	mg/L
	272	mg/L
	2,390	mg/L
		Acceptable Limits
ns/anions meq/l	2.52	+/- 2 - 5 %
·	1.1	1.0 - 1.2
	ns/anions meq/l	3,530 1,006 3,710 4,080  2,450 560 256 166 9.0  92.5 19.4 73.1 <1.0 272 2,390  ans/anions meq/l  2.52

Danica Carman, Lab Manager



807 S. CARLTON **FARMINGTON, NM 87499-1289** (505) 326-2588

Philip Environmental 4000 Monroe Rd Farmington, NM 87401 Attn: Robert Thompson

Date: 05/20/98

Project:

BR Hampton 4M

Project No:

19584

Site:

Farmington

Matrix:

Water

Sampled By: C. Chance

Date Sampled:

05/12/98

Sample ID:

MW - 9

Date Received:

05/12/98

Analytical Data								
PARAMETER	RESULTS	DETECTION LIMIT	UNITS					
Benzene	6.7	1.0	μg/L					
Toluene	1.1	1.0	– μg/L					
Ethylbenzene	ND	1.0	μg/L					
Total Xylene	2.7	1.0	μg/L					
Total Volatile Aromatic Hydrocarbons	10.5		μg/L					

Surrogate % Recovery 1,4,Difluorobenzene 100 4-Bromofluorobenzene 93 Method 8020A\*\*\*

Analyzed by: VHZ

Date: 05/15/98

### **ND-Not Detected**

Notes:

\*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th Ed

\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

Danica Carman, Lab Director



807 S. CARLTON **FARMINGTON, NM 87499-1289** (505) 326-2588

Philip Environmental 4000 Monroe Rd. Farmington, NM 87401 Attn: Robert Thompson

Date:

05/20/98

Project:

**BR Hampton 4M** 

Project No:

19584

Site:

Farmington

Matrix:

Water

Sampled By: C. Chance

Date Sampled:

05/12/98

Sample ID: MW - 9

Date Received:

05/12/98

	Analytical Data					
	•	Detection				
PARAMETER	RESULTS	Limit	UNITS			
Dissolved Metals						
Arsenic	ND .	0.1	- mg/L			
Barium	0.024	0.005	mg/L			
Cadmium	ND	0.005	mg/L			
Chromium	ND	0.01	mg/L			
Copper	ND	0.01	mg/L			
Iron	6.38	0.02	mg/L			
Lead	ND	0.05	mg/L			
Manganese	9.90	0.005	mg/L			
Selenium	ND	0.1	mg/L			
Silver	ND	0.01	mg/L			
Method 6010B ***			J			
Analyzed by: JM						
Date: 5/19/98						
Mercury	0.0002	0.0002	mg/L			
Method 7470A ***		•				
Analyzed by: AG	·					
Date: 5/15/98						

ND-Not Detected

Notes:

\*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Danica Carman, Lab Manager

# **Chain of Custody Record**

4000 Monroe Road

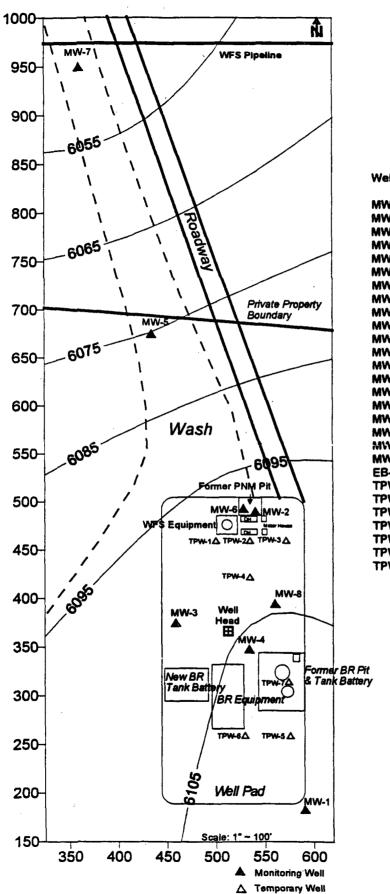
(505) 326-2262 Phone

Analysis Sodium hyroxide (NBOH)  Shipping and Lab Notes: Invoice: ED Hasley  Burlington Resources  Burlington Resources  PO Box 4289  Farmington NM8749  Farmington at above ald (15	Samples Iced: ☑ Yes ☐ No ☐ Carrier: Hand Do June 2	Ling beny 3/12/98 Takucef gimen 7/12	nature Date Time	elinquished by: Received By:						<b>\</b>	1010	18 0910 Water 4	Date Time Matrix	Location Farmington da la	Name SPL lumb	S R S C F	hase Task 6000 .77, B and Bottle	 Farmington, NM 87401 (505) 326-2388 FAX COC Serial No.
	Airbill No.	7/12	Date		1			Λ.								\ \ \		
		7.38	Time										Comments					3192

# ATTACHMENT #4 GROUNDWATER CONTOUR MAP

### Hampton 4M Site $\,$ ap and Analytical Results (Co. Lentrations in ppb) Groundwater Contour Map (January,1998) $_{\Delta}$

EB - Private Well (Not to Scale)



Well #	Date	В	T	Ε	X							
MW-1	10/30/97	2.4	2.3	<0.2	1.1							
MW-1	1/12/98	4.3	3.3	0.2	1							
MW-1	4/14/98	1	1.3	<0.5	<1.5							
MW-2	1/12/98	4.41 f	eet of prod	luct								
MW-2	4/14/98	2.59 feet of product										
MW-3	1/31/97	<0.2	<0.2	<0.2	<0.2							
MW-3	1/12/98	<0.2	<0.2	<0.2	<0.2							
MW-3	4/14/98	<0.5	<0.5	<0.5	<1.5							
MW-4	1/31/97	811.7	1420.5	31.0	388.1							
MW-4	1/12/98	1251	6	81	24							
MW-4	4/14/98	1100	7.2	28	12							
MW-5	10/29/97	5934	10024	709	8188							
MW-5	1/12/98	7521	11213	779	8436							
MW-5	4/14/98	7000	11000	720	7800							
MW-6	1/12/98	4.71 f	eet of proc	luct								
MW-6	4/14/98	Prod	uct Recove	ery (pump ir	n well)							
MW-7	1/12/98	780	246	258	3942							
MW-7	4/14/98	820	340	190	2450							
8-V/M	1/12/92	5410	17301	693	9397							
MW-8	4/14/98	0.37 f	eet of prod	uct								
EB-Well	11/25/97	<0.2	<0.2	<0.2	<0.2							
TPW-1	6/5/97	20	<1.0	<1.0	<1.0							
TPW-2	6/9/97	2.48 f	eet of proc	luct								
TPW-3	6/5/97		roundwate	r Water								
TPW-4	6/6/97	2000	57	3100	810							
TPW-5	6/6/97	5800	460	16000	7000							
TPW-6	6/6/97	1600	48	3400	690							
TPW-7	6/6/97	5300	620	18000	9300							
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# ATTACHMENT #5 CROSS SECTION FROM MW-4 TO MW-2

