



Scientific Drilling

Project: Rio Arriba, NM
Site: SEC 12-T27N-R5W
Well: SAN JUAN 27-5 #104N

Wellbore: OH

Survey: MWD SURVEY (SAN JUAN 27-5 #104N/OH)

BURLINGTON
RESOURCES

SURVEY PROGRAM

Date: 2006-10-18T00:00:00 Validated: Yes Version:

Depth From 453.0 Depth To 5515.0 Survey/Plan MWD SURVEY (OH) Tool MWD

LEGEND

—○— SAN JUAN 27-5 #104N, OH, Plan #1 V1
—○— MWD SURVEY

3003929824

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	8608.0	568.5	1444.3	2035587.32	653861.18	36° 35' 35.448 N 107° 18' 33.192 W		Circle (Radius: 100.0)

Surface 1340/N 1115/W
Int. Bottomhole 773/N 2559/W

RCVD OCT 20 06
OIL COM - DIV
DIST 3

PROJECT DETAILS: Rio Arriba, NM

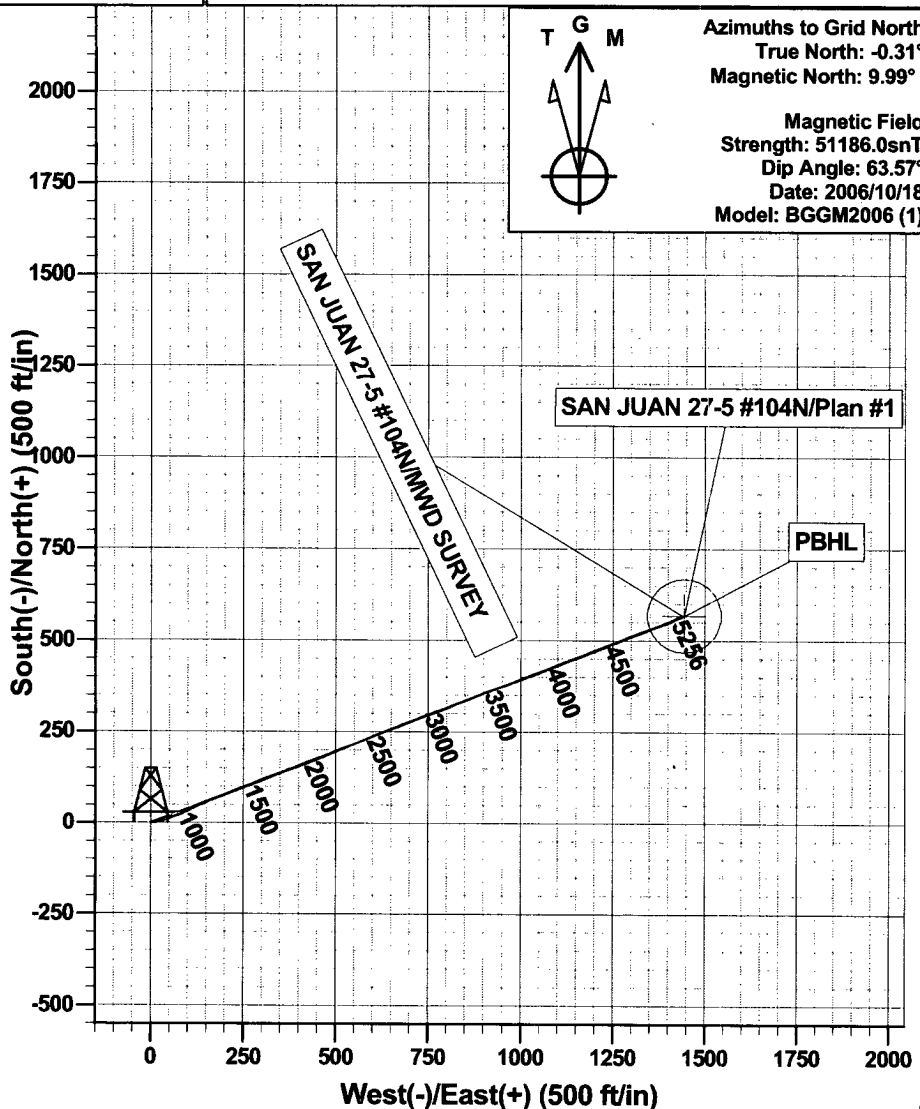
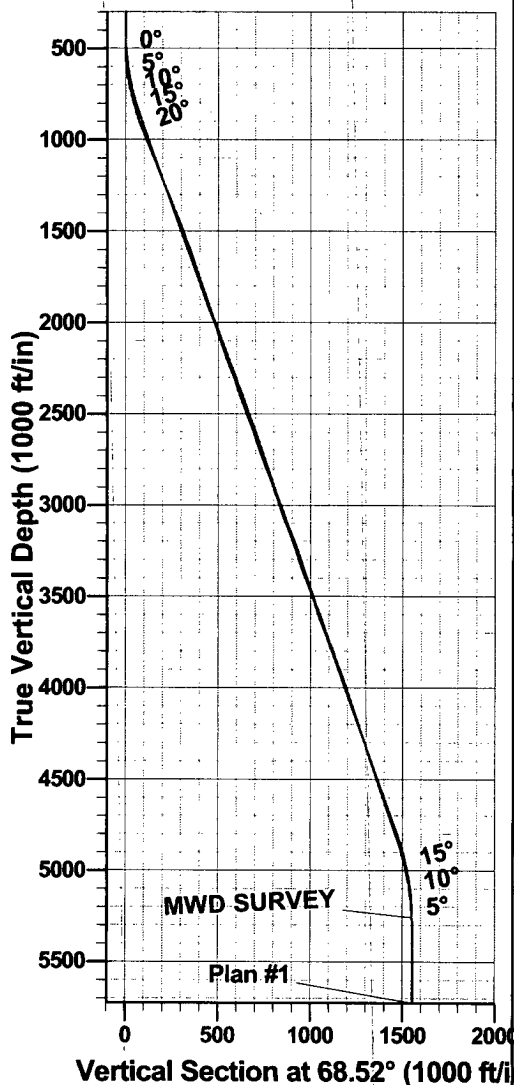
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico West 3003

System Datum: Mean Sea Level

WELL DETAILS: SAN JUAN 27-5 #104N

Ground Level:	7313.0		
North	East	Lat	Long
2035018.85	652416.92	36° 35' 29.904 N 107° 18' 50.940 W	

HOLD CTM FOR Bottom hole survey



to file 10/20

RCVD OCT20'06
OIL CONS. DIV
DIST. 3

Burlington Resources

Rio Arriba, NM

SEC 12-T27N-R5W

SAN JUAN 27-5 #104N

OH

Survey: MWD SURVEY

Standard Survey Report

18 October, 2006

Scientific Drilling

Survey Report

Company:	Burlington Resources	Local Co-ordinate Reference:	Well SAN JUAN 27-5 #104N
Project:	Rio Arriba, NM	TVD Reference:	SITE @ 7327.0ft (Original Site Elev)
Site:	SEC 12-T27N-R5W	MD Reference:	SITE @ 7327.0ft (Original Site Elev)
Well:	SAN JUAN 27-5 #104N	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 2004.16 Database

Project	Rio Arriba, NM, United States of America		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		

Site	SEC 12-T27N-R5W		
Site Position:		Northing:	2,035,018.85 ft
From:	Map	Easting:	652,416.92 ft
Position Uncertainty:	0.0 ft	Slot Radius:	0"
		Latitude:	36° 35' 29.904 N
		Longitude:	107° 18' 50.940 W
		Grid Convergence:	0.31 °

Well	SAN JUAN 27-5 #104N		
Well Position	+N/-S	0.0 ft	Northing: 2,035,018.85 ft
	+E/-W	0.0 ft	Easting: 652,416.92 ft
Position Uncertainty		0.0 ft	Wellhead Elevation: ft
			Latitude: 36° 35' 29.904 N
			Longitude: 107° 18' 50.940 W
			Ground Level: 7,313.0 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	BGGM2006 (1)	2006/10/18	10.30
			Dip Angle
			(°)
			63.57
			Field Strength
			(nT)
			51,186

Design	Actual		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.0	0.0	0.0
			Direction
			(°)
			68.52

Survey Program	Date 2006/10/18		
From	To	Survey (Wellbore)	Tool Name
(ft)	(ft)		
453.0	5,515.0	MWD SURVEY (OH)	MWD
			Description
			MWD - Standard ISCWSA

Survey	Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)
	453.0	0.00	0.00	453.0	0.0	0.0	0.0	0.00	0.00	0.00
	480.0	1.56	144.57	480.0	-0.3	0.2	0.1	5.78	5.78	0.00
	511.0	2.29	112.31	511.0	-0.9	1.0	0.6	4.13	2.35	-104.06
	559.0	4.42	85.79	558.9	-1.1	3.8	3.1	5.38	4.44	-55.25
	590.0	5.54	81.80	589.8	-0.8	6.4	5.7	3.78	3.61	-12.87
	622.0	6.89	80.91	621.6	-0.3	9.9	9.1	4.23	4.22	-2.78
	653.0	8.28	79.88	652.3	0.4	13.9	13.1	4.51	4.48	-3.32
	684.0	10.08	77.66	682.9	1.4	18.7	17.9	5.92	5.81	-7.16
	715.0	11.79	74.80	713.4	2.8	24.4	23.8	5.79	5.52	-9.23
	746.0	13.21	73.60	743.6	4.6	30.9	30.4	4.66	4.58	-3.87
	777.0	14.39	71.98	773.7	6.8	38.0	37.8	4.01	3.81	-5.23
	808.0	15.54	70.23	803.7	9.4	45.5	45.8	3.99	3.71	-5.65
	839.0	16.69	67.53	833.5	12.5	53.6	54.4	4.43	3.71	-8.71

Scientific Drilling

Survey Report

Company:	Burlington Resources	Local Co-ordinate Reference:	Well SAN JUAN 27-5 #104N
Project:	Rio Arriba, NM	TVD Reference:	SITE @ 7327.0ft (Original Site Elev)
Site:	SEC 12-T27N-R5W	MD Reference:	SITE @ 7327.0ft (Original Site Elev)
Well:	SAN JUAN 27-5 #104N	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 2004.16 Database

Survey	Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
	869.0	18.15	66.90	862.1	16.0	61.8	63.4	4.91	4.87	-2.10
	900.0	19.52	68.53	891.4	19.8	71.1	73.4	4.73	4.42	5.26
	930.0	20.37	66.88	919.6	23.7	80.6	83.6	3.40	2.83	-5.50
	961.0	20.89	65.39	948.6	28.1	90.6	94.5	2.38	1.68	-4.81
	992.0	21.13	64.42	977.6	32.8	100.6	105.6	1.36	0.77	-3.13
	1,054.0	21.57	64.66	1,035.3	42.5	121.0	128.2	0.72	0.71	0.39
	1,114.0	21.42	65.95	1,091.1	51.7	141.0	150.1	0.83	-0.25	2.15
	1,175.0	21.85	66.24	1,147.8	60.8	161.5	172.6	0.73	0.70	0.48
	1,237.0	21.33	68.14	1,205.5	69.6	182.6	195.4	1.40	-0.84	3.06
	1,300.0	21.44	69.32	1,264.2	78.0	204.0	218.4	0.71	0.17	1.88
	1,362.0	22.13	69.29	1,321.7	86.1	225.5	241.4	1.11	1.11	-0.05
	1,424.0	21.67	67.96	1,379.3	94.5	247.0	264.5	1.09	-0.74	-2.15
	1,486.0	21.38	68.43	1,436.9	103.0	268.1	287.2	0.54	-0.47	0.76
	1,550.0	21.27	67.77	1,496.6	111.7	289.7	310.5	0.41	-0.17	-1.03
	1,613.0	19.76	68.15	1,555.6	120.0	310.2	332.6	2.41	-2.40	0.60
	1,676.0	18.20	69.70	1,615.1	127.3	329.3	353.1	2.60	-2.48	2.46
	1,740.0	18.59	68.08	1,675.9	134.6	348.1	373.3	1.00	0.61	-2.53
	1,805.0	18.75	69.23	1,737.4	142.2	367.5	394.1	0.62	0.25	1.77
	1,867.0	18.95	69.77	1,796.1	149.2	386.3	414.1	0.43	0.32	0.87
	1,928.0	18.79	69.15	1,853.8	156.1	404.8	433.8	0.42	-0.26	-1.02
	1,992.0	19.82	68.09	1,914.2	163.8	424.5	455.0	1.70	1.61	-1.66
	2,054.0	19.98	67.23	1,972.5	171.9	444.0	476.1	0.54	0.26	-1.39
	2,117.0	20.34	67.34	2,031.7	180.2	464.0	497.8	0.57	0.57	0.17
	2,179.0	19.51	66.75	2,090.0	188.5	483.5	518.9	1.38	-1.34	-0.95
	2,242.0	20.03	66.46	2,149.2	196.9	503.0	540.2	0.84	0.83	-0.46
	2,306.0	19.83	68.17	2,209.4	205.4	523.2	562.0	0.96	-0.31	2.67
	2,369.0	20.05	67.79	2,268.6	213.4	543.1	583.5	0.41	0.35	-0.60
	2,431.0	20.32	68.47	2,326.8	221.4	562.9	604.9	0.58	0.44	1.10
	2,493.0	20.39	67.47	2,385.0	229.5	582.9	626.5	0.57	0.11	-1.61
	2,557.0	19.77	67.51	2,445.1	237.9	603.2	648.4	0.97	-0.97	0.06
	2,620.0	19.89	66.24	2,504.3	246.3	622.9	669.8	0.71	0.19	-2.02
	2,683.0	19.49	67.87	2,563.6	254.6	642.4	691.0	1.08	-0.63	2.59
	2,746.0	18.59	67.53	2,623.2	262.4	661.4	711.6	1.44	-1.43	-0.54
	2,808.0	18.58	68.96	2,682.0	269.7	679.8	731.3	0.74	-0.02	2.31
	2,871.0	18.12	69.00	2,741.8	276.8	698.3	751.1	0.73	-0.73	0.06
	2,935.0	17.89	69.42	2,802.6	283.8	716.8	770.9	0.41	-0.36	0.66
	2,998.0	18.55	69.52	2,862.5	290.7	735.2	790.6	1.05	1.05	0.16
	3,060.0	19.93	69.35	2,921.0	297.9	754.4	811.0	2.23	2.23	-0.27
	3,122.0	20.21	68.54	2,979.2	305.5	774.2	832.3	0.64	0.45	-1.31
	3,185.0	20.10	69.06	3,038.4	313.4	794.5	854.0	0.33	-0.17	0.83
	3,248.0	20.12	68.04	3,097.5	321.3	814.6	875.7	0.56	0.03	-1.62
	3,343.0	20.28	68.64	3,186.7	333.4	845.1	908.5	0.28	0.17	0.63
	3,406.0	19.14	68.89	3,246.0	341.1	864.9	929.7	1.81	-1.81	0.40
	3,470.0	18.70	68.77	3,306.6	348.6	884.3	950.5	0.69	-0.69	-0.19
	3,534.0	18.28	68.47	3,367.2	356.0	903.2	970.8	0.67	-0.66	-0.47
	3,597.0	18.65	70.24	3,427.0	363.0	921.8	990.7	1.07	0.59	2.81
	3,661.0	19.09	70.62	3,487.6	370.0	941.3	1,011.4	0.71	0.69	0.59
	3,724.0	19.35	68.95	3,547.1	377.1	960.8	1,032.2	0.97	0.41	-2.65
	3,787.0	19.31	69.78	3,606.5	384.5	980.3	1,053.0	0.44	-0.06	1.32
	3,850.0	19.90	69.56	3,665.9	391.8	1,000.1	1,074.1	0.94	0.94	-0.35
	3,912.0	20.31	69.10	3,724.1	399.4	1,020.1	1,095.5	0.71	0.66	-0.74
	3,976.0	19.79	69.50	3,784.2	407.1	1,040.6	1,117.4	0.84	-0.81	0.62
	4,038.0	20.08	67.82	3,842.5	414.8	1,060.3	1,138.5	1.04	0.47	-2.71
	4,101.0	19.60	68.12	3,901.7	422.8	1,080.1	1,159.9	0.78	-0.76	0.48

Scientific Drilling Survey Report

Company:	Burlington Resources	Local Co-ordinate Reference:	Well SAN JUAN 27-5 #104N
Project:	Rio Arriba, NM	TVD Reference:	SITE @ 7327.0ft (Original Site Elev)
Site:	SEC 12-T27N-R5W	MD Reference:	SITE @ 7327.0ft (Original Site Elev)
Well:	SAN JUAN 27-5 #104N	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 2004.16 Database

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,163.0	18.89	68.18	3,960.3	430.4	1,099.1	1,180.3	1.15	-1.15	0.10	
4,226.0	18.63	68.63	4,019.9	437.9	1,117.9	1,200.6	0.47	-0.41	0.71	
4,289.0	17.99	68.91	4,079.7	445.1	1,136.4	1,220.4	1.03	-1.02	0.44	
4,351.0	18.31	68.94	4,138.7	452.0	1,154.4	1,239.7	0.52	0.52	0.05	
4,415.0	18.58	68.18	4,199.4	459.4	1,173.2	1,260.0	0.56	0.42	-1.19	
4,477.0	18.50	69.76	4,258.1	466.5	1,191.6	1,279.7	0.82	-0.13	2.55	
4,539.0	18.08	68.30	4,317.0	473.4	1,209.8	1,299.1	1.00	-0.68	-2.35	
4,602.0	18.15	68.01	4,376.9	480.7	1,228.0	1,318.7	0.18	0.11	-0.46	
4,663.0	17.59	66.54	4,434.9	488.0	1,245.2	1,337.4	1.18	-0.92	-2.41	
4,725.0	18.97	66.48	4,493.8	495.7	1,263.1	1,356.9	2.23	2.23	-0.10	
4,788.0	18.68	68.46	4,553.4	503.5	1,281.8	1,377.2	1.11	-0.46	3.14	
4,852.0	17.76	69.58	4,614.2	510.7	1,300.5	1,397.2	1.54	-1.44	1.75	
4,915.0	18.61	69.86	4,674.1	517.5	1,319.0	1,416.8	1.36	1.35	0.44	
4,978.0	18.35	69.20	4,733.8	524.5	1,337.7	1,436.8	0.53	-0.41	-1.05	
5,040.0	18.83	69.95	4,792.6	531.4	1,356.2	1,456.6	0.86	0.77	1.21	
5,102.0	18.12	69.11	4,851.4	538.2	1,374.6	1,476.2	1.22	-1.15	-1.35	
5,165.0	16.17	68.64	4,911.6	544.9	1,391.9	1,494.8	3.10	-3.10	-0.75	
5,226.0	13.89	66.43	4,970.5	550.9	1,406.6	1,510.6	3.85	-3.74	-3.62	
5,290.0	11.31	64.47	5,033.0	556.7	1,419.3	1,524.5	4.09	-4.03	-3.06	
5,353.0	8.50	65.78	5,095.0	561.3	1,429.1	1,535.4	4.47	-4.46	2.08	
5,416.0	5.98	68.68	5,157.5	564.4	1,436.4	1,543.3	4.04	-4.00	4.60	
5,477.0	4.29	68.29	5,218.3	566.4	1,441.5	1,548.7	2.77	-2.77	-0.64	
5,515.0	2.95	64.64	5,256.2	567.3	1,443.7	1,551.1	3.58	-3.53	-9.61	
PBHL										

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL	0.00	0.00	8,608.0	568.5	1,444.3	2,035,587.32	653,861.18	36° 35' 35.448 N	107° 18' 33.192 W
- survey misses by 3351.8ft at 5515.0ft MD (5256.2 TVD, 567.3 N, 1443.7 E)									
- Circle (radius 100.0)									

Checked By: _____ Approved By: _____ Date: _____