



30-039-27453

Energen Resources

Carson Nat'l Forest-S20, T32N, R5W

Carracas Mesa

Arboles 20 A #1R

Sidetrack/Recompletion

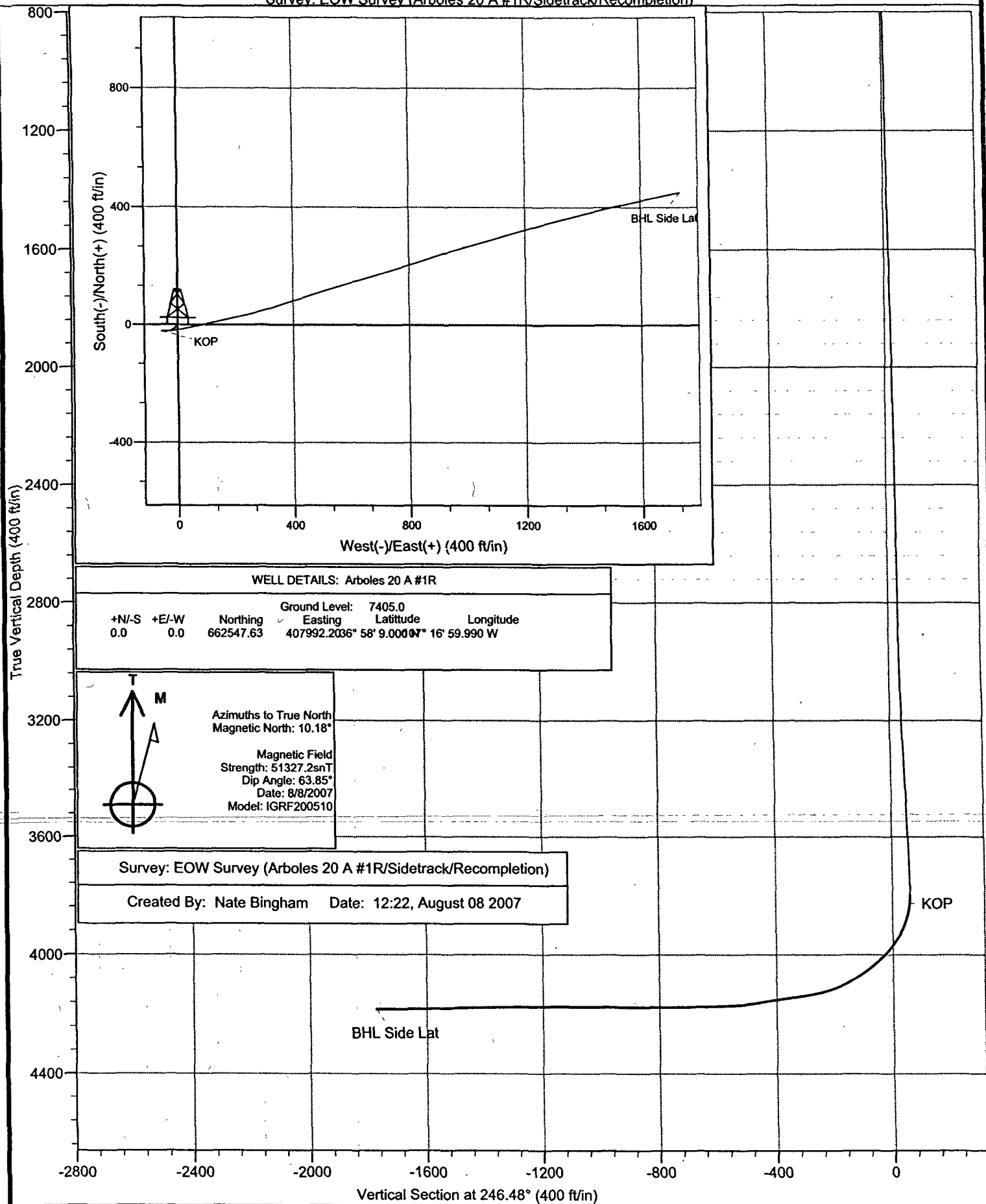
Survey: EOW Survey

End of Well Survey

08 August, 2007

PATHFINDER
ENERGY SERVICES

Survey: EOW Survey (Arboles 20 A #1R/Sidetrack/Recompletion)



Company: Energen Resources
Project: Carson Nat'l Forest-S20, T32N, R5W
Site: Carracas Mesa
Well: Arboles 20 A #1R
Wellbore: Sidetrack/Recompletion
Design: Sidetrack/Recompletion

Local Co-ordinate Reference: Well Arboles 20 A #1R
TVD Reference: WELL @ 7417.0ft (Original Well Elev)
MD Reference: WELL @ 7417.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Project	Carson Nat'l Forest-S20, T32N, R5W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	Carracas Mesa		
Site Position:		Northings:	662,547.63 m
From:	Lat/Long	Easting:	407,992.20 m
Position Uncertainty:	0.0 ft	Slot Radius:	in
		Latitude:	36° 58' 9.000 N
		Longitude:	107° 16' 59.990 W
		Grid Convergence:	-0.62

Well	Arboles 20 A #1R		
Well Position	+N/-S 0.0 ft	Northings:	662,547.63 m
	+E/-W 0.0 ft	Easting:	407,992.20 m
Position Uncertainty	0.0 ft	Wellhead Elevation:	7,417.0 ft
		Ground Level:	7,405.0 ft

Wellbore	Sidetrack/Recompletion		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	8/8/2007	10.18
		Dip Angle (°)	63.85
		Field Strength (nT)	51,327

Design	Sidetrack/Recompletion		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)
	0.0	0.0	0.0
		Direction (°)	246.48

Survey Program	Date 8/8/2007		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
200.0	3,800.0	Gyrodata (Sidetrack/Recompletion)	Pathfinder
3,803.0	5,831.0	EOW Survey (Sidetrack/Recompletion)	Pathfinder
		Description	
		Pathfinder MWD	
		Pathfinder MWD	

Survey							
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
3,800.0	1.52	286.50	3,799.2	-24.5	-55.1	0.00	60.3
3,803.0	0.81	302.25	3,802.2	-24.5	-55.2	25.68	60.3
3,813.0	1.93	76.87	3,812.2	-24.4	-55.0	25.68	60.2
3,828.8	5.96	85.70	3,828.0	-24.3	-54.0	25.68	59.2
KOP							
3,857.0	13.19	88.02	3,855.8	-24.1	-49.3	25.68	54.8
3,888.0	20.93	95.24	3,885.4	-24.4	-40.2	25.84	46.6
3,919.0	27.00	87.21	3,913.7	-24.6	-27.7	22.19	35.2
3,949.0	32.62	79.16	3,939.7	-22.7	-12.9	22.96	20.9
3,980.0	38.16	78.01	3,965.0	-19.2	4.7	18.00	3.4
4,011.0	43.35	78.79	3,988.5	-15.1	24.5	16.82	-16.4



Pathfinder Energy Services
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Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
4,042.0	47.84	77.34	4,010.2	-10.5	46.2	14.86	-38.1
4,074.0	49.51	76.91	4,031.3	-5.2	69.6	5.32	-61.7
4,105.0	53.64	78.21	4,050.6	0.0	93.3	13.72	-85.6
4,136.0	57.68	78.83	4,068.0	5.1	118.4	13.14	-110.6
4,167.0	60.94	77.13	4,083.9	10.7	144.4	11.52	-136.7
4,199.0	65.69	76.16	4,098.2	17.3	172.3	15.09	-164.8
4,230.0	69.56	78.67	4,110.0	23.5	200.2	14.56	-193.0
4,257.0	72.72	76.73	4,118.8	29.0	225.2	13.53	-218.0
4,288.0	76.94	76.21	4,126.9	36.0	254.3	13.71	-247.5
4,319.0	79.49	74.62	4,133.2	43.6	283.6	9.64	-277.5
4,350.0	81.69	72.51	4,138.3	52.3	313.0	9.77	-307.8
4,381.0	82.13	72.07	4,142.6	61.6	342.2	2.00	-338.4
4,412.0	82.13	72.69	4,146.9	70.9	371.5	1.98	-368.9
4,444.0	81.43	72.43	4,151.4	80.4	401.7	2.33	-400.4
4,475.0	80.28	72.34	4,156.4	89.7	430.8	3.72	-430.8
4,506.0	80.28	72.07	4,161.6	99.0	459.9	0.86	-461.2
4,538.0	82.75	72.16	4,166.3	108.7	490.1	7.72	-492.7
4,568.0	86.00	72.16	4,169.3	117.9	518.5	10.83	-522.4
4,600.0	88.02	73.31	4,170.9	127.3	549.0	7.26	-554.2
4,631.0	87.85	73.22	4,172.1	136.3	578.7	0.62	-585.0
4,662.0	87.58	73.13	4,173.3	145.2	608.3	0.92	-615.7
4,694.0	87.76	73.57	4,174.6	154.4	638.9	1.48	-647.5
4,725.0	89.25	72.87	4,175.4	163.3	668.6	5.31	-678.2
4,756.0	89.43	72.95	4,175.8	172.5	698.2	0.64	-709.0
4,787.0	89.52	73.04	4,176.0	181.5	727.9	0.41	-739.8
4,818.0	89.43	72.60	4,176.3	190.7	757.5	1.45	-770.7
4,850.0	89.60	72.60	4,176.6	200.2	788.0	0.53	-802.5
4,881.0	90.13	72.51	4,176.7	209.5	817.6	1.73	-833.3
4,912.0	89.87	72.16	4,176.7	218.9	847.1	1.41	-864.1
4,943.0	89.96	72.43	4,176.7	228.4	876.7	0.92	-895.0
4,975.0	90.13	72.34	4,176.7	238.1	907.2	0.60	-926.8
5,006.0	90.40	72.34	4,176.5	247.5	936.7	0.87	-957.6
5,037.0	90.48	74.18	4,176.3	256.4	966.4	5.94	-988.4
5,068.0	90.48	74.36	4,176.1	264.8	996.2	0.58	-1,019.1
5,099.0	90.31	74.18	4,175.8	273.2	1,026.1	0.80	-1,049.9
5,131.0	90.22	73.74	4,175.7	282.0	1,056.8	1.40	-1,081.6
5,162.0	90.31	73.74	4,175.5	290.7	1,086.6	0.29	-1,112.3
5,193.0	90.31	73.83	4,175.4	299.4	1,116.4	0.29	-1,143.1
5,225.0	90.04	73.74	4,175.3	308.3	1,147.1	0.89	-1,174.8
5,256.0	89.87	74.18	4,175.3	316.9	1,176.9	1.52	-1,205.6
5,287.0	89.78	74.27	4,175.4	325.3	1,206.7	0.41	-1,236.3
5,319.0	89.43	75.15	4,175.6	333.7	1,237.6	2.96	-1,267.9
5,350.0	89.08	74.62	4,176.0	341.8	1,267.5	2.05	-1,298.6
5,381.0	88.64	74.71	4,176.6	350.0	1,297.4	1.45	-1,329.3
5,413.0	88.72	75.15	4,177.4	358.3	1,328.3	1.40	-1,360.9



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5,444.0	88.55	75.50	4,178.1	366.2	1,358.3	1.25	-1,391.5
5,475.0	88.72	76.47	4,178.9	373.7	1,388.3	3.18	-1,422.1
5,507.0	88.55	77.08	4,179.6	381.0	1,419.5	1.98	-1,453.6
5,538.0	88.90	77.35	4,180.3	387.9	1,449.7	1.43	-1,484.0
5,569.0	88.99	77.00	4,180.9	394.8	1,479.9	1.17	-1,514.5
5,601.0	88.81	77.00	4,181.5	401.9	1,511.1	0.56	-1,546.0
5,632.0	88.72	77.00	4,182.2	408.9	1,541.3	0.29	-1,576.4
5,663.0	88.90	77.44	4,182.8	415.8	1,571.5	1.53	-1,606.9
5,694.0	89.87	78.40	4,183.1	422.3	1,601.8	4.40	-1,637.3
5,726.0	89.78	78.40	4,183.2	428.7	1,633.2	0.28	-1,668.6
5,757.0	89.43	78.40	4,183.4	434.9	1,663.5	1.13	-1,698.9
5,831.0	89.43	78.40	4,184.2	449.8	1,736.0	0.00	-1,771.3

TD Lateral

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N-S (ft)	+E-W (ft)	Comment
3,828.8	3,828.0	-24.3	-54.0	KOP
5,831.0	4,184.2	449.8	1,736.0	TD Lateral

Checked By: _____

Approved By: _____

Date: 8/14/07