

15269
Certificate Number



Energen Resources

SJBR-SE S18, T30N, R4W

San Juan 30-4 Unit #103

San Juan 30-4 Unit #103 ST 01

Sidetrack

Survey: MWD #1

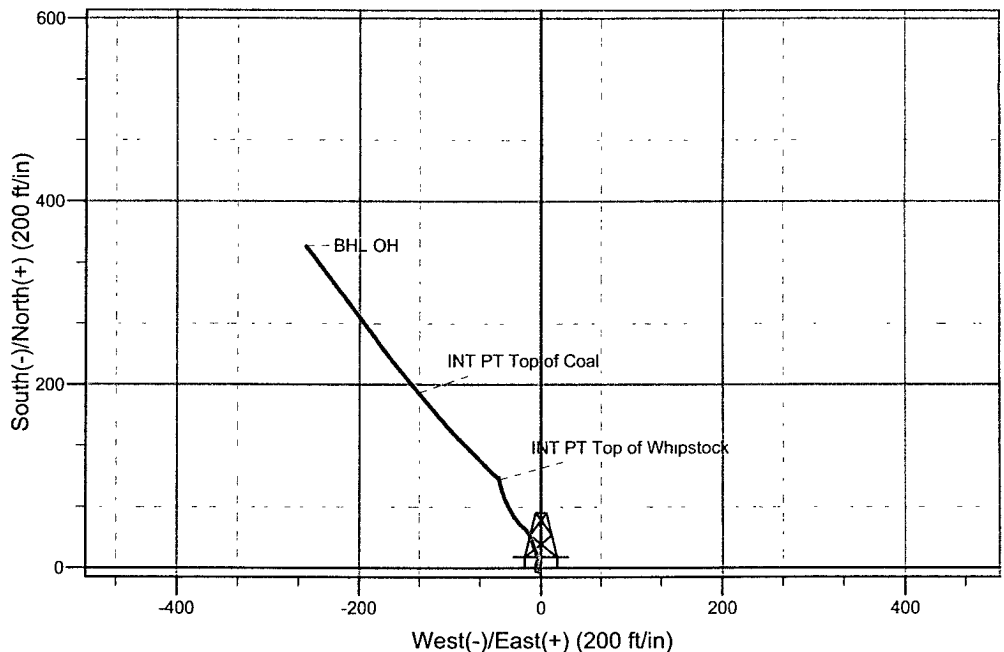
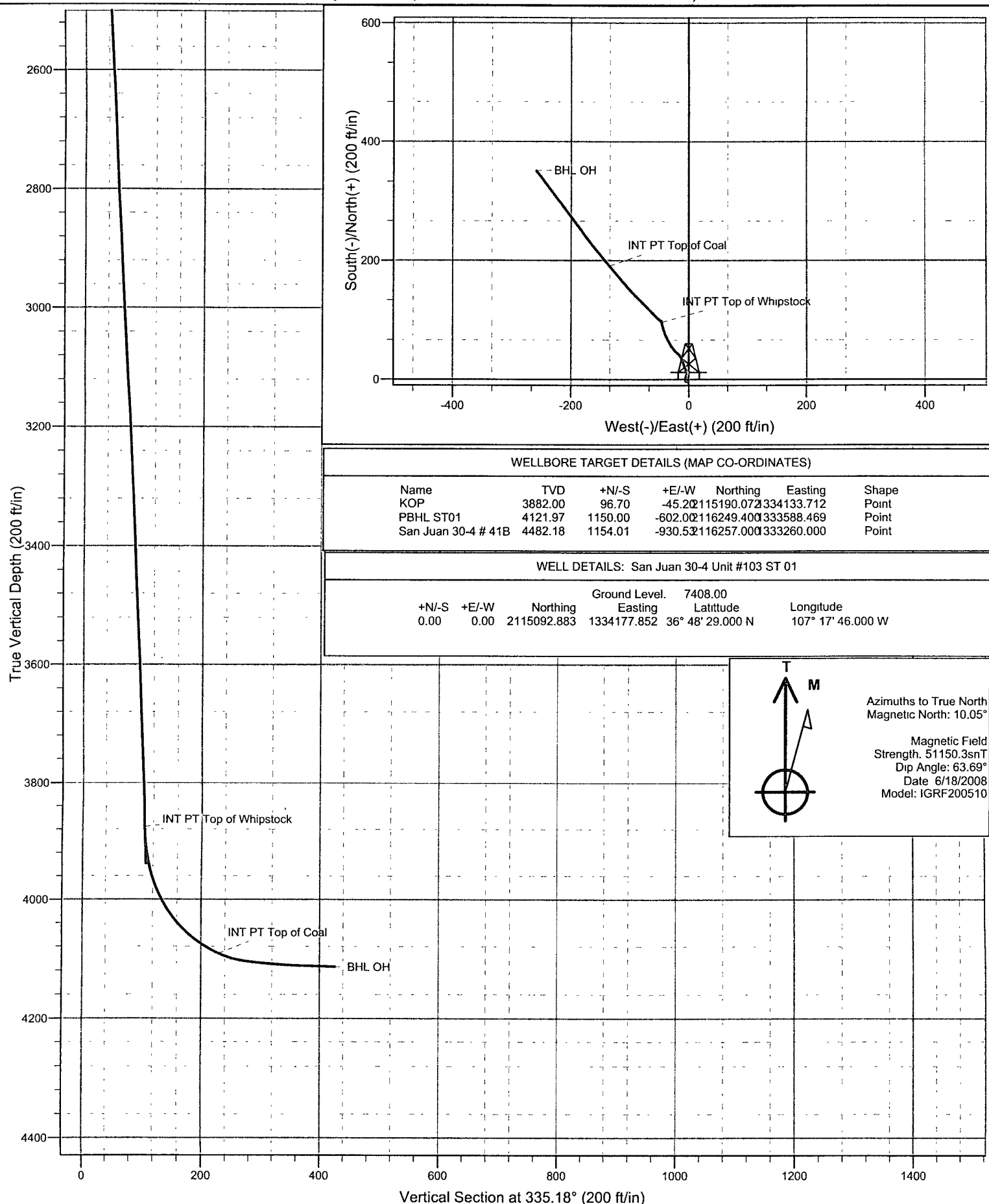
RCVD SEP 25 '08
OIL CONS. DIV.
DIST. 3

End of Well Survey

30 June, 2008

PATHFINDER
ENERGY SERVICES

Survey: MWD #1 (San Juan 30-4 Unit #103 ST 01/Sidetrack)



WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
KOP	3882.00	96.70	-45.20	2115190.07	1334133.712	Point
PBHL ST01	4121.97	1150.00	-602.00	2116249.40	1333588.469	Point
San Juan 30-4 # 41B	4482.18	1154.01	-930.52	2116257.00	1333260.000	Point

WELL DETAILS: San Juan 30-4 Unit #103 ST 01

+N/-S	+E/-W	Northing	Ground Level	7408.00	Latitude	Longitude
0.00	0.00	2115092.883	Easting	1334177.852	36° 48' 29.000 N	107° 17' 46.000 W



Azimuths to True North
Magnetic North: 10.05°

Magnetic Field
Strength: 51150.3nT
Dip Angle: 63.69°
Date: 6/18/2008
Model: IGRF200510

Vertical Section at 335.18° (200 ft/in)

Company: Energen Resources
Project: SJBR-SE S18, T30N, R4W
Site: San Juan 30-4 Unit #103
Well: San Juan 30-4 Unit #103 ST 01
Wellbore: Sidetrack
Design: Sidetrack

Local Co-ordinate Reference: Well San Juan 30-4 Unit #103 ST 01
TVD Reference: WELL @ 7423.00ft (AWS #289(RKB=15'))
MD Reference: WELL @ 7423.00ft (AWS #289(RKB=15'))
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Project SJBR-SE S18, T30N, R4W
Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Central Zone

System Datum: Mean Sea Level

Site San Juan 30-4 Unit #103

Site Position:
From: Lat/Long
Position Uncertainty: 0.00 ft
Northing: 2,115,092.883 ft
Easting: 1,334,177.852 ft
Slot Radius: "
Latitude: 36° 48' 29.000 N
Longitude: 107° 17' 46.000 W
Grid Convergence: -0 63 °

Well San Juan 30-4 Unit #103 ST 01

Well Position +N/-S 0.00 ft **Northing:** 2,115,092.883 ft **Latitude:** 36° 48' 29.000 N
 +E/-W 0.00 ft **Easting:** 1,334,177.852 ft **Longitude:** 107° 17' 46.000 W
Position Uncertainty 0.00 ft **Wellhead Elevation:** 7,408.00 ft **Ground Level:** 7,408.00 ft

Wellbore Sidetrack

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/18/2008	10 05	63.69	51,150

Design Sidetrack

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	335.18

Survey Program **Date** 6/30/2008

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
108.00	3,942.00	Gyro Surveys (Sidetrack)		

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108.00	0.58	182.73	108.00	-0.55	-0.03	0.54	-0.48
208.00	0.63	153.20	207.99	-1.54	0.20	0.31	-1.48
308.00	0.40	225.47	307.99	-2.28	0.20	0.64	-2.15
408.00	0.49	246.97	407.99	-2.69	-0.45	0.19	-2.25
508.00	0.61	261.74	507.98	-2.93	-1.37	0.18	-2.09
608.00	0.68	259.24	607.98	-3.12	-2.48	0.08	-1.79
708.00	0.72	288.80	707.97	-3.03	-3.65	0.36	-1.22
808.00	0.98	345.93	807.96	-2.00	-4.46	0.84	0.06
908.00	1.06	359.92	907.94	-0.24	-4.67	0.26	1.74
1,008.00	1.17	12.91	1,007.92	1.68	-4.44	0.27	3.39
1,108.00	1.21	8.47	1,107.90	3.72	-4.05	0.10	5.08

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North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
1,208.00	1.30	23.21	1,207.88	5.80	-3.45	0.33	6.72
1,308.00	1.22	22.37	1,307.86	7.83	-2.60	0.08	8.20
1,408.00	1.17	17.02	1,407.83	9.79	-1.90	0.12	9.68
1,508.00	0.95	345.52	1,507.82	11.57	-1.80	0.61	11.26
1,608.00	1.32	329.14	1,607.80	13.36	-2.60	0.49	13.22
1,708.00	1.92	331.80	1,707.76	15.83	-3.99	0.60	16.04
1,808.00	2.18	340.93	1,807.69	19.10	-5.40	0.42	19.60
1,908.00	2.19	340.36	1,907.62	22.70	-6.66	0.02	23.40
2,008.00	2.10	344.57	2,007.55	26.26	-7.79	0.18	27.11
2,108.00	2.11	338.93	2,107.48	29.75	-8.94	0.21	30.75
2,208.00	2.05	336.96	2,207.42	33.11	-10.30	0.09	34.38
2,308.00	2.10	330.72	2,307.35	36.36	-11.90	0.23	37.99
2,408.00	2.05	325.51	2,407.29	39.43	-13.81	0.20	41.58
2,508.00	2.40	311.91	2,507.21	42.30	-16.38	0.63	45.27
2,608.00	2.67	310.44	2,607.11	45.21	-19.71	0.28	49.31
2,708.00	2.67	318.37	2,707.01	48.46	-23.03	0.37	53.65
2,808.00	2.83	325.91	2,806.89	52.25	-25.96	0.40	58.32
2,908.00	2.87	324.04	2,906.77	56.32	-28.81	0.10	63.21
3,008.00	3.00	330.26	3,006.64	60.62	-31.58	0.34	68.27
3,108.00	3.26	334.65	3,106.49	65.46	-34.10	0.35	73.72
3,208.00	3.22	333.16	3,206.33	70.53	-36.58	0.09	79.37
3,308.00	2.69	335.83	3,306.19	75.18	-38.81	0.55	84.53
3,408.00	2.37	341.33	3,406.10	79.28	-40.43	0.40	88.93
3,508.00	2.32	344.03	3,506.01	83.18	-41.65	0.12	92.99
3,608.00	2.37	343.55	3,605.93	87.11	-42.80	0.05	97.03
3,708.00	2.23	346.86	3,705.85	90.99	-43.82	0.19	100.98
3,808.00	1.88	346.43	3,805.78	94.48	-44.65	0.35	104.50
3,878.00	1.62	347.89	3,875.75	96.56	-45.13	0.38	106.59
INT PT Top of Whipstock							
3,937.90	12.00	308.90	3,935.16	101.32	-50.17	18.01	113.02
3,969.20	19.40	316.40	3,965.27	107.13	-56.29	24.47	120.87
3,997.70	26.00	315.60	3,991.55	115.03	-63.94	23.18	131.24
4,029.10	34.60	314.90	4,018.64	126.26	-75.09	27.41	146.12
4,060.50	43.00	315.40	4,043.09	140.21	-88.95	26.77	164.59
4,091.70	51.00	319.10	4,064.35	156.98	-104.38	27.06	186.29
4,123.00	59.80	320.40	4,082.11	176.63	-121.00	28.32	211.10
4,145.00	66.43	319.69	4,092.05	191.66	-133.60	30.29	230.03
INT PT Top of Coal							
4,154.50	69.30	319.40	4,095.63	198.35	-139.31	30.29	238.51
4,185.80	80.60	320.20	4,103.74	221.41	-158.78	36.19	267.60
4,217.10	85.50	323.40	4,107.53	245.82	-177.98	18.65	297.82
4,248.00	84.90	322.90	4,110.12	270.46	-196.45	2.52	327.93
4,280.00	88.30	322.80	4,112.01	295.91	-215.74	10.63	359.14
4,350.00	88.30	322.80	4,114.09	351.65	-258.04	0.00	427.48
BHL OH							

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Targets
Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL ST01 - survey misses by 869.33ft at 4350.00ft MD (4114.09 TVD, 351.65 N, -258.04 E) - Point	0.00	0.00	4,121.97	1,150.00	-602.00	2,116,249.400	1,333,588.469	36° 48' 40.371 N	107° 17' 53.403 W
San Juan 30-4 # 41B - survey misses by 1109.74ft at 4350.00ft MD (4114.09 TVD, 351.65 N, -258.04 E) - Point	0.00	0.00	4,482.18	1,154.01	-930.53	2,116,257.000	1,333,260.000	36° 48' 40.410 N	107° 17' 57.443 W
KOP - survey hits target - Point	0.00	0.00	3,882.00	96.70	-45.20	2,115,190.072	1,334,133.712	36° 48' 29.956 N	107° 17' 46.556 W

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,878.00	3,875.75	96.56	-45.13	INT PT Top of Whipstock
4,145.00	4,092.05	191.66	-133.60	INT PT Top of Coal
4,350.00	4,114.09	351.65	-258.04	BHL OH

Checked By: _____ Approved By: _____ Date: _____