

Energen Resources

Bullridge #101S, NE 33, T32N, R5W

32-5

Bullridge #101S

Lower Lateral Survey

API: 30-039-29631

Plan: Actual Drill Path

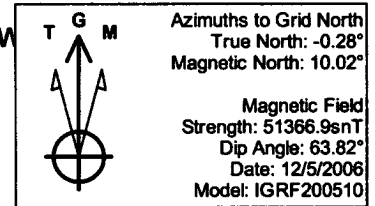
Energen Resources - Survey

05 December, 2006

			MD	TVD
Surface	1846/N	1176/W		
BHL1	1314/N	2443/E	4349	3882
BHL2	898/N	1177 E	5682	3547

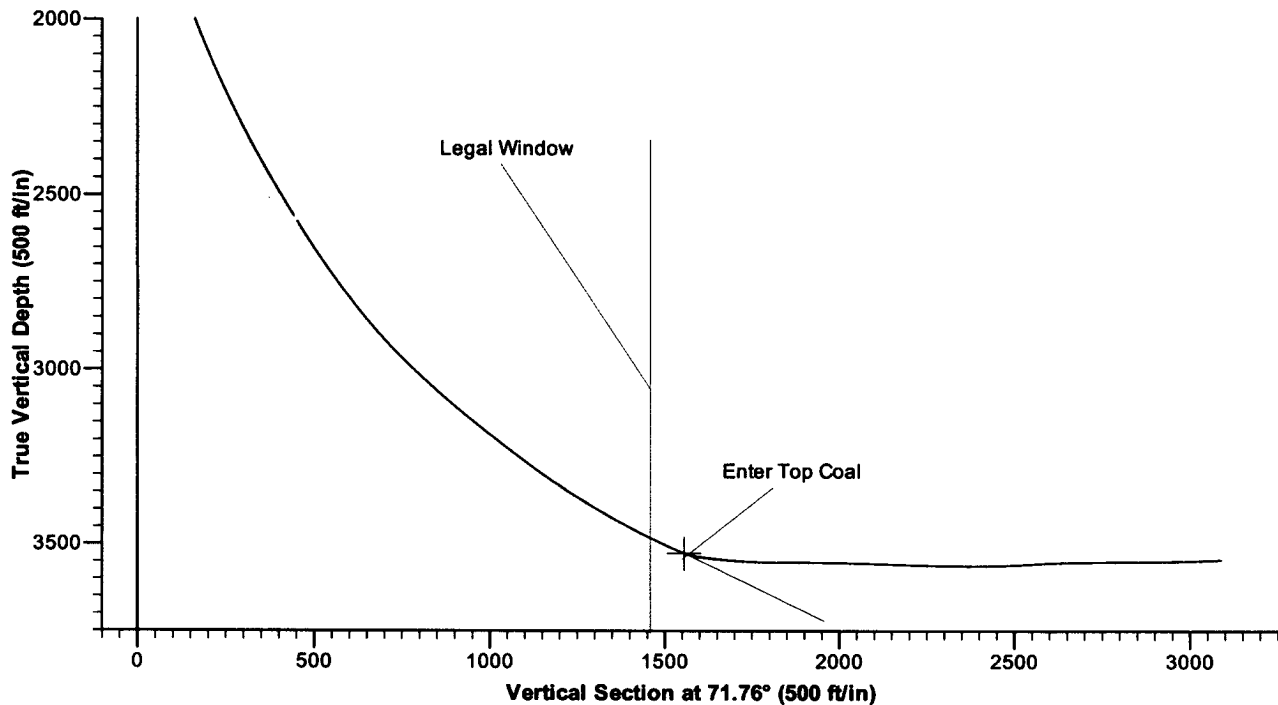
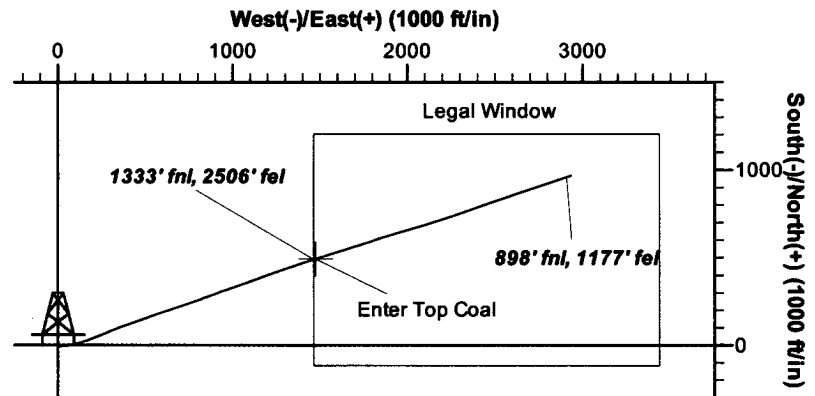


Project: Bullridge #101S, NE 33, T32N, R5W
Site: 32-5
Well: Bullridge #101S
Wellbore: Lower Lateral Survey
Plan: Actual Drill Path (Bullridge #101S/Lower Lateral Survey)



PROJECT DETAILS: Bullridge #101S, NE 33, T32N, R5W	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	New Mexico Western Zone
System Datum:	Mean Sea Level

SURFACE LOCATION	
Easting:	2857847.95
Northing:	2161410.21



Energen

Energen Resources - Survey



Company: Energen Resources Project: Bullridge #101S, NE 33, T32N, R5W Site: 32-5 Well: Bullridge #101S Wellbore: Lower Lateral Survey Design: Actual Drill Path	Local Co-ordinate Reference: Well Bullridge #101S TVD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222) MD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222) North Reference: Grid Survey Calculation Method: Minimum Curvature Database: EDM 2003.16 Single User Db	
--	---	--

Project	Bullridge #101S, NE 33, T32N, R5W, Eul Canyon Area, FC Dual Lateral		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	32-5		
Site Position:		Northing:	2,161,410.21 ft
From:	Lat/Long	Easting:	2,857,847.95 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	36° 56' 20.000 N
		Longitude:	107° 22' 20.000 W
		Grid Convergence:	0.28 °

Well	Bullridge #101S		
Well Position	+N/-S	0.0 ft	Northing: 2,161,410.21 ft
	+E/-W	0.0 ft	Easting: 2,857,847.95 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	6,821.0 ft
		Latitude:	36° 56' 20.000 N
		Longitude:	107° 22' 20.000 W
		Ground Level:	6,821.0 ft

Wellbore	Lower Lateral Survey				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/5/2006	10.29	63.82	51,367

Design	Actual Drill Path				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	71.76	

Survey Tool Program		Date 12/5/2006
From (ft)	To (ft)	Survey (Wellbore)
0.0	5,682.0	Actual Drill Path (Lower Lateral Survey)
		Tool Name
		MWD
		Description
		MWD - Standard

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
0.0	0.0	0.00	0.00	0.0	0.0	0.0
100.0	100.0	0.00	0.00	0.0	0.0	0.0
200.0	200.0	0.00	0.00	0.0	0.0	0.0
235.0	235.0	0.00	0.00	0.0	0.0	0.0
300.0	300.0	0.07	207.88	0.0	0.0	0.0
400.0	400.0	0.18	207.88	-0.2	-0.2	-0.1
469.0	469.0	0.26	207.88	-0.4	-0.5	-0.2
500.0	500.0	0.28	204.67	-0.5	-0.6	-0.3
600.0	600.0	0.35	196.96	-0.8	-1.1	-0.5
700.0	700.0	0.42	191.88	-1.2	-1.8	-0.7
800.0	800.0	0.50	188.34	-1.6	-2.6	-0.8
900.0	900.0	0.58	185.74	-2.0	-3.5	-0.9

Energen
Energen Resources - Survey



Company: Energen Resources
Project: Bullridge #101S, NE 33, T32N, R5W
Site: 32-5
Well: Bullridge #101S
Wellbore: Lower Lateral Survey
Design: Actual Drill Path

Local Co-ordinate Reference: Well Bullridge #101S
TVD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
MD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
951.0	951.0	0.62	184.67	-2.2	-4.0	-1.0
1,000.0	1,000.0	0.57	187.23	-2.4	-4.5	-1.0
1,043.0	1,043.0	0.53	189.85	-2.6	-5.0	-1.1
1,074.0	1,074.0	0.62	194.78	-2.7	-5.3	-1.2
1,103.0	1,103.0	0.88	201.46	-3.0	-5.6	-1.3
1,134.0	1,134.0	1.67	182.82	-3.3	-6.3	-1.4
1,164.0	1,164.0	2.37	139.32	-3.2	-7.2	-1.0
1,194.0	1,193.9	2.99	107.15	-2.3	-7.9	0.2
1,200.0	1,199.9	3.07	103.21	-2.1	-8.0	0.5
1,225.0	1,224.9	3.52	89.13	-0.8	-8.1	1.9
1,255.0	1,254.8	4.13	86.76	1.2	-8.0	3.9
1,287.0	1,286.7	4.92	88.34	3.6	-7.9	6.4
1,300.0	1,299.7	5.23	88.22	4.7	-7.9	7.5
1,317.0	1,316.6	5.63	88.08	6.2	-7.9	9.2
1,347.0	1,346.4	6.42	87.37	9.3	-7.7	12.3
1,378.0	1,377.2	7.21	85.70	12.8	-7.5	16.0
1,409.0	1,407.9	8.00	84.56	16.8	-7.1	20.1
1,439.0	1,437.6	8.71	83.59	21.1	-6.7	24.4
1,471.0	1,469.2	9.41	83.24	26.0	-6.1	29.4
1,502.0	1,499.8	10.02	83.24	31.1	-5.5	34.6
1,532.0	1,529.3	10.73	83.95	36.4	-4.9	40.0
1,563.0	1,559.7	11.17	84.03	42.2	-4.3	45.8
1,595.0	1,591.1	11.70	83.42	48.4	-3.6	52.1
1,600.0	1,596.0	11.77	83.21	49.4	-3.5	53.1
1,627.0	1,622.4	12.13	82.10	54.9	-2.8	58.7
1,658.0	1,652.6	12.75	81.05	61.4	-1.8	65.3
1,689.0	1,682.8	13.37	81.05	68.4	-0.7	72.2
1,700.0	1,693.5	13.52	80.83	70.9	-0.3	74.7
1,721.0	1,713.9	13.81	80.43	75.8	0.5	79.6
1,751.0	1,743.1	14.25	79.29	83.0	1.8	86.8
1,783.0	1,774.0	14.95	78.58	91.0	3.4	94.7
1,800.0	1,790.4	15.28	78.14	95.4	4.2	99.0
1,814.0	1,803.9	15.56	77.79	99.1	5.0	102.7
1,846.0	1,834.7	16.18	75.51	107.8	7.0	111.2
1,875.0	1,862.5	16.71	73.93	116.0	9.2	119.1
1,907.0	1,893.1	17.32	71.73	125.4	12.0	128.1
1,938.0	1,922.7	18.11	69.97	134.8	15.1	137.0
1,970.0	1,953.0	19.17	69.27	145.0	18.6	146.6
2,002.0	1,983.1	20.05	69.27	155.8	22.4	156.6
2,034.0	2,013.1	20.75	69.00	166.9	26.4	167.0
2,063.0	2,040.2	21.46	68.83	177.3	30.2	176.8
2,095.0	2,069.8	22.42	69.09	189.3	34.5	187.9
2,100.0	2,074.5	22.51	69.06	191.2	35.1	189.7
2,126.0	2,098.4	22.95	68.92	201.2	38.7	199.1

Energen
Energen Resources - Survey



Company: Energen Resources
Project: Bullridge #101S, NE 33, T32N, R5W
Site: 32-5
Well: Bullridge #101S
Wellbore: Lower Lateral Survey
Design: Actual Drill Path

Local Co-ordinate Reference: Well Bullridge #101S
TVD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
MD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
2,157.0	2,126.9	23.65	68.83	213.5	43.2	210.5
2,189.0	2,156.2	24.01	68.21	226.4	47.9	222.6
2,200.0	2,166.2	24.26	68.27	230.9	49.6	226.7
2,220.0	2,184.4	24.71	68.39	239.1	52.6	234.4
2,252.0	2,213.4	25.32	68.21	252.6	57.6	247.0
2,283.0	2,241.4	25.85	68.13	266.0	62.6	259.4
2,300.0	2,256.7	26.15	67.98	273.4	65.4	266.3
2,313.0	2,268.3	26.38	67.86	279.2	67.6	271.7
2,344.0	2,296.1	26.73	67.60	293.0	72.8	284.5
2,375.0	2,323.7	27.35	67.60	307.0	78.2	297.5
2,407.0	2,352.0	27.79	67.16	321.8	83.9	311.2
2,438.0	2,379.4	28.40	68.39	336.4	89.4	324.7
2,469.0	2,406.5	29.28	68.92	351.3	94.8	338.6
2,500.0	2,433.5	29.72	69.44	366.6	100.3	352.9
2,532.0	2,461.2	30.16	69.71	382.5	105.8	367.9
2,563.0	2,488.0	30.60	70.15	398.2	111.2	382.6
2,594.0	2,514.6	30.95	70.24	414.0	116.6	397.5
2,600.0	2,519.8	31.02	70.39	417.1	117.6	400.4
2,626.0	2,542.0	31.30	71.03	430.6	122.1	413.1
2,657.0	2,568.4	31.83	70.67	446.8	127.4	428.5
2,688.0	2,594.7	32.18	71.47	463.2	132.7	444.0
2,700.0	2,604.9	32.32	71.54	469.6	134.8	450.1
2,719.0	2,620.9	32.54	71.64	479.8	138.0	459.7
2,750.0	2,647.0	33.06	71.73	496.6	143.3	475.7
2,782.0	2,673.7	33.59	71.38	514.2	148.8	492.4
2,800.0	2,688.7	33.95	70.66	524.2	152.1	501.8
2,813.0	2,699.4	34.21	70.15	531.5	154.5	508.7
2,843.0	2,724.1	35.00	69.44	548.5	160.4	524.7
2,875.0	2,750.2	35.96	69.62	567.1	166.9	542.1
2,906.0	2,775.1	36.84	70.24	585.5	173.2	559.4
2,938.0	2,800.6	37.90	70.50	604.9	179.7	577.6
2,969.0	2,824.9	38.69	71.03	624.1	186.1	595.8
3,000.0	2,849.0	39.31	70.85	643.6	192.4	614.2
3,030.0	2,872.1	40.01	71.29	662.7	198.6	632.3
3,059.0	2,894.2	40.80	71.73	681.5	204.6	650.2
3,091.0	2,918.2	42.03	72.26	702.7	211.1	670.3
3,100.0	2,924.8	42.39	72.18	708.7	213.0	676.1
3,122.0	2,941.0	43.26	71.99	723.7	217.6	690.3
3,153.0	2,963.3	44.58	70.94	745.2	224.4	710.7
3,184.0	2,985.2	45.73	71.03	767.2	231.6	731.4
3,200.0	2,996.3	46.25	70.63	778.7	235.4	742.3
3,216.0	3,007.3	46.78	70.24	790.3	239.3	753.3
3,247.0	3,028.4	47.31	70.41	813.0	246.9	774.6
3,279.0	3,049.9	48.45	69.88	836.7	255.0	796.9

Energen

Energen Resources - Survey



Company: Energen Resources
Project: Bullridge #101S, NE 33, T32N, R5W
Site: 32-5
Well: Bullridge #101S
Wellbore: Lower Lateral Survey
Design: Actual Drill Path

Local Co-ordinate Reference: Well Bullridge #101S
TVD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
MD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
3,309.0	3,069.6	49.33	69.88	859.3	262.7	818.2
3,341.0	3,090.4	49.68	69.36	883.6	271.2	841.0
3,372.0	3,110.4	50.03	69.44	907.3	279.5	863.2
3,403.0	3,130.3	50.03	69.97	931.0	287.8	885.4
3,435.0	3,150.8	50.39	69.80	955.6	296.2	908.5
3,466.0	3,170.4	50.83	70.67	979.6	304.3	931.1
3,497.0	3,189.9	51.27	71.11	1,003.7	312.2	953.9
3,500.0	3,191.8	51.35	71.07	1,006.0	313.0	956.1
3,529.0	3,209.7	52.14	70.67	1,028.8	320.5	977.6
3,560.0	3,228.7	52.67	71.47	1,053.3	328.4	1,000.8
3,591.0	3,247.4	53.11	70.59	1,078.0	336.5	1,024.2
3,600.0	3,252.8	53.19	70.44	1,085.2	338.9	1,031.0
3,623.0	3,266.5	53.38	70.06	1,103.7	345.1	1,048.3
3,655.0	3,285.5	53.82	69.80	1,129.4	353.9	1,072.5
3,686.0	3,303.6	54.61	70.15	1,154.6	362.5	1,096.2
3,700.0	3,311.7	55.08	70.23	1,166.0	366.4	1,106.9
3,717.0	3,321.3	55.66	70.32	1,180.0	371.1	1,120.1
3,748.0	3,338.7	56.37	70.76	1,205.7	379.7	1,144.3
3,780.0	3,356.2	57.24	70.50	1,232.5	388.6	1,169.6
3,800.0	3,367.0	57.64	70.84	1,249.3	394.2	1,185.5
3,811.0	3,372.8	57.86	71.03	1,258.6	397.2	1,194.3
3,843.0	3,389.7	58.30	71.03	1,285.8	406.0	1,220.0
3,874.0	3,405.8	59.18	70.85	1,312.3	414.7	1,245.0
3,904.0	3,420.9	60.41	70.85	1,338.2	423.2	1,269.5
3,935.0	3,436.0	61.20	71.20	1,365.2	432.0	1,295.1
3,966.0	3,450.8	62.08	71.38	1,392.5	440.7	1,320.9
3,998.0	3,465.5	63.22	71.20	1,420.9	449.9	1,347.9
4,000.0	3,466.4	63.29	71.21	1,422.7	450.4	1,349.6
4,029.0	3,479.2	64.37	71.38	1,448.8	458.8	1,374.2
4,060.0	3,492.5	64.63	71.73	1,476.7	467.6	1,400.8
4,092.0	3,506.1	64.90	72.26	1,505.7	476.6	1,428.3
4,100.0	3,509.5	64.88	72.24	1,512.9	478.8	1,435.2
4,123.0	3,519.3	64.81	72.17	1,533.7	485.2	1,455.0 Tie into 8 1/4" Wellbore
4,125.0	3,520.2	65.27	72.17	1,535.6	485.7	1,456.7
4,150.0	3,529.5	70.96	72.17	1,558.7	492.8	1,478.8
4,162.0	3,533.1	73.69	72.17	1,570.2	496.3	1,489.7
4,180.0	3,537.5	78.11	72.17	1,587.6	501.7	1,506.3
4,191.0	3,539.5	80.81	72.17	1,598.4	505.0	1,516.6
4,200.0	3,540.9	81.97	72.17	1,607.3	507.7	1,525.1
4,223.0	3,543.5	84.94	72.17	1,630.2	514.7	1,546.8
4,254.0	3,546.3	84.50	73.84	1,661.1	523.7	1,576.3
4,286.0	3,549.2	85.30	73.31	1,692.9	532.7	1,606.9
4,300.0	3,550.2	85.99	73.12	1,706.9	536.8	1,620.3
4,318.0	3,551.4	86.88	72.87	1,724.8	542.0	1,637.5
4,349.0	3,552.7	88.02	72.87	1,755.8	551.1	1,667.0

Energen

Energen Resources - Survey



Company: Energen Resources
Project: Bullridge #101S, NE 33, T32N, R5W
Site: 32-5
Well: Bullridge #101S
Wellbore: Lower Lateral Survey
Design: Actual Drill Path

Local Co-ordinate Reference: Well Bullridge #101S
TVD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
MD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
4,381.0	3,553.9	88.02	72.52	1,787.8	560.6	1,697.6
4,400.0	3,554.3	89.17	71.74	1,806.8	566.5	1,715.7
4,413.0	3,554.4	89.96	71.20	1,819.8	570.6	1,728.0
4,445.0	3,554.3	90.57	71.11	1,851.8	580.9	1,758.3
4,476.0	3,554.1	90.22	71.64	1,882.8	590.8	1,787.6
4,508.0	3,554.0	89.96	72.34	1,914.8	600.7	1,818.1
4,540.0	3,554.3	89.08	72.96	1,946.7	610.3	1,848.6
4,572.0	3,554.9	88.64	73.57	1,978.7	619.5	1,879.3
4,604.0	3,555.8	88.20	73.66	2,010.7	628.5	1,909.9
4,636.0	3,556.9	87.93	73.57	2,042.7	637.5	1,940.6
4,667.0	3,557.9	88.37	73.66	2,073.6	646.3	1,970.4
4,699.0	3,558.8	88.22	73.14	2,105.6	655.4	2,001.0
4,700.0	3,558.9	88.22	73.16	2,106.6	655.7	2,002.0
4,730.0	3,559.8	88.20	73.75	2,136.6	664.2	2,030.7
4,762.0	3,560.6	88.99	73.31	2,168.6	673.3	2,061.4
4,794.0	3,561.3	88.46	72.96	2,200.5	682.6	2,092.0
4,800.0	3,561.5	88.46	72.89	2,206.5	684.4	2,097.7
4,826.0	3,562.2	88.46	72.61	2,232.5	692.1	2,122.6
4,857.0	3,563.4	87.05	72.78	2,263.5	701.3	2,152.1
4,889.0	3,564.7	88.29	72.52	2,295.5	710.8	2,182.6
4,900.0	3,564.9	88.92	72.46	2,306.5	714.1	2,193.1
4,921.0	3,565.1	90.13	72.34	2,327.5	720.5	2,213.2
4,953.0	3,564.9	90.66	72.17	2,359.4	730.2	2,243.6
4,984.0	3,564.5	90.92	71.82	2,390.4	739.8	2,273.1
5,000.0	3,564.2	90.62	71.68	2,406.4	744.8	2,288.3
5,016.0	3,564.1	90.31	71.55	2,422.4	749.9	2,303.5
5,047.0	3,563.8	90.75	70.41	2,453.4	760.0	2,332.8
5,050.0	3,563.8	90.93	70.35	2,456.4	761.0	2,335.6
5,077.0	3,563.0	92.51	69.80	2,483.4	770.2	2,361.0
5,109.0	3,561.3	93.56	70.15	2,515.4	781.1	2,391.0
5,141.0	3,559.3	93.56	70.41	2,547.3	791.9	2,421.1
5,173.0	3,557.3	93.47	70.32	2,579.2	802.6	2,451.2
5,205.0	3,555.7	92.24	70.67	2,611.2	813.3	2,481.3
5,236.0	3,554.6	92.07	70.59	2,642.1	823.6	2,510.5
5,268.0	3,553.7	91.01	71.20	2,674.1	834.0	2,540.7
5,299.0	3,553.3	90.57	71.55	2,705.1	843.9	2,570.1
5,300.0	3,553.3	90.58	71.55	2,706.1	844.2	2,571.1
5,331.0	3,552.9	90.75	71.64	2,737.1	854.0	2,600.5
5,363.0	3,552.5	90.66	71.38	2,769.1	864.2	2,630.8
5,395.0	3,552.1	90.75	71.64	2,801.1	874.3	2,661.2
5,400.0	3,552.1	90.71	71.63	2,806.1	875.9	2,665.9
5,427.0	3,551.8	90.48	71.55	2,833.1	884.4	2,691.5
5,459.0	3,551.5	90.57	71.55	2,865.1	894.6	2,721.9
5,490.0	3,551.1	90.75	71.38	2,896.1	904.4	2,751.3

Energen

Energen Resources - Survey



Company: Energen Resources
Project: Bullridge #101S, NE 33, T32N, R5W
Site: 32-5
Well: Bullridge #101S
Wellbore: Lower Lateral Survey
Design: Actual Drill Path

Local Co-ordinate Reference: Well Bullridge #101S
TVD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
MD Reference: Rig Floor, KB 15' @ 6836.0ft (AWS 222)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
5,500.0	3,551.0	90.75	71.30	2,906.1	907.6	2,760.7
5,523.0	3,550.7	90.75	71.11	2,929.1	915.0	2,782.5
5,554.0	3,550.1	91.36	71.20	2,960.1	925.0	2,811.8
5,586.0	3,549.5	91.01	71.03	2,992.1	935.4	2,842.1
5,600.0	3,549.2	91.13	71.03	3,006.1	939.9	2,855.4
5,618.0	3,548.8	91.28	71.03	3,024.1	945.8	2,872.4
5,650.0	3,547.8	92.33	70.94	3,056.1	956.2	2,902.6
5,682.0	3,546.5	92.42	71.20	3,088.0	966.6	2,932.9

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
Window - plan hits target - Rectangle (sides W1,320.0 H1,972.0 D0.0)	0.00	0.00	0.0	0.0	0.0	2,161,410.21	2,857,847.95	36° 56' 20.000 N	107° 22' 20.000 W
Enter Top Coal - plan hits target - Point	0.00	0.00	3,529.0	492.4	1,477.5	2,161,902.61	2,859,325.45	36° 56' 24.798 N	107° 22' 1.770 W

Checked By: _____ Approved By: _____ Date: _____