

Energen Resources

Carson National Forest, S16, T32N, R4W

Carracas Mesa

Carracas 16 B #12

Final Survey

30-03A-24327

Surface: 1450/S 990/W
BH1 1475/S 1126/W. m23724 Tol 3651
BH2 1897/S 2375/W m24998 Tol 3663

Plan: Actual Drill Path

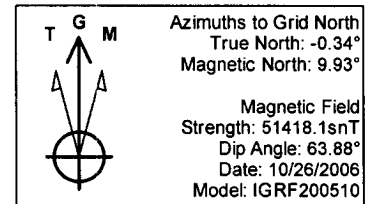
Energen Resources - Survey

26 October, 2006

BY

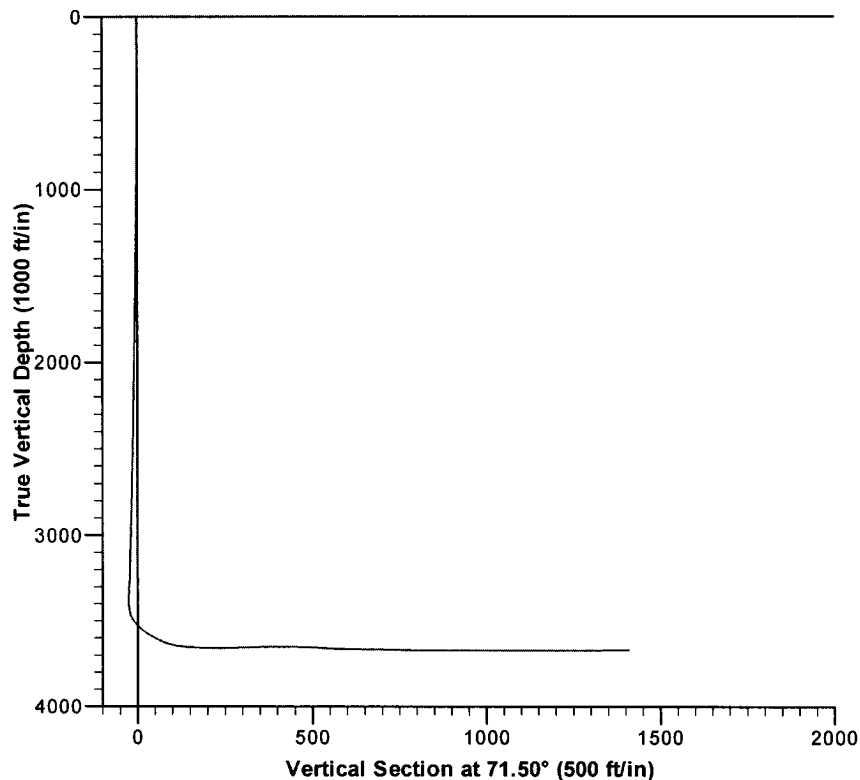
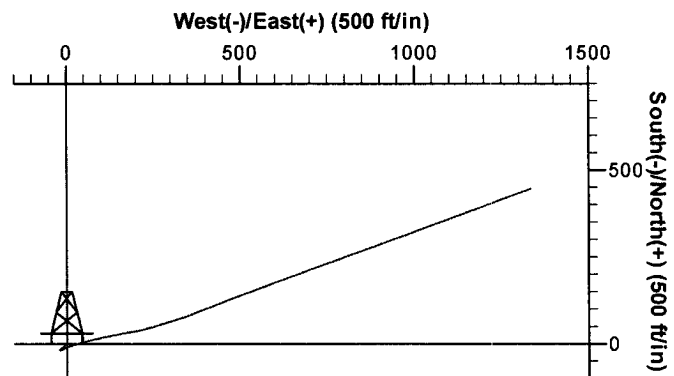


Project: Carson National Forest
Site: Carracas Mesa
Well: Carracas 16 B #12
Wellbore: Final Survey
Plan: Actual Drill Path (Carracas 16 B #12/Final Survey)



PROJECT DETAILS: Carson National Forest, S16, T32N, R4W	
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:	2888840.13
Northing:	2177946.98



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Company:	Energen Resources	Local Co-ordinate Reference:	Well Carracas 16 B #12
Project:	Carson National Forest, S16, T32N, R4W	TVD Reference:	Rig Floor @ 6819.0ft (AWS 56)
Site:	Carracas Mesa	MD Reference:	Rig Floor @ 6819.0ft (AWS 56)
Well:	Carracas 16 B #12	North Reference:	Grid
Wellbore:	Final Survey	Survey Calculation Method:	Minimum Curvature
Design:	Actual Drill Path	Database:	EDM 2003.16 Single User Db

Project:	Carson National Forest, S16, T32N, R4W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site		Carracas Mesa			
Site Position:		Northing:	2,177,946.98 ft	Latitude:	36° 59' 1.860 N
From:	Lat/Long	Easting:	2,888,840.13 ft	Longitude:	107° 15' 57.024 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.34 °

Well	Carracas 16 B #12					
Well Position	+N/-S	0.0 ft	Northing:	2,177,946.98 ft	Latitude:	36° 59' 1.860 N
	+E/-W	0.0 ft	Easting:	2,888,840.13 ft	Longitude:	107° 15' 57.024 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	6,804.0 ft	Ground Level:	6,804.0 ft

Wellbore:	Final Survey				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/26/2006	10.27	63.88	51,418

Design:	Actual Drill Path				
Audit Notes:					
Version:	Phase:	PROTOTYPE		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	71.50	

Survey Tool Program	Date: 10/26/2006			
From	To	Survey (Wellbore)	Tool Name	Description
(ft)	(ft)			
0.0	4,998.0	Actual Drill Path (Final Survey)	MWD	MWD - Standard

Planned Survey						
MD	TVD	Inc	Azi	V. Sec	N/S	E/W
(ft)	(ft)	(°)	(°)	(ft)	(ft)	(ft)
0.0	0.0	0.00	0.00	0.0	0.0	0.0
100.0	100.0	0.03	226.97	0.0	0.0	0.0
200.0	200.0	0.05	226.97	-0.1	-0.1	-0.1
300.0	300.0	0.08	226.97	-0.2	-0.1	-0.2
400.0	400.0	0.11	226.97	-0.3	-0.3	-0.3
500.0	500.0	0.14	226.97	-0.5	-0.4	-0.4
600.0	600.0	0.16	226.97	-0.8	-0.6	-0.6
700.0	700.0	0.19	226.97	-1.1	-0.8	-0.9
800.0	800.0	0.22	226.97	-1.4	-1.0	-1.1
900.0	900.0	0.25	226.97	-1.8	-1.3	-1.4
1,000.0	1,000.0	0.27	226.97	-2.2	-1.6	-1.7
1,100.0	1,100.0	0.30	226.97	-2.6	-2.0	-2.1

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Site:	Carracas Mesa	MD Reference:	Rig Floor @ 6819.0ft (AWS 56)
Well:	Carracas 16 B #12	North Reference:	Grid
Wellbore:	Final Survey	Survey Calculation Method:	Minimum Curvature
Design:	Actual Drill Path	Database:	EDM 2003.16 Single User Db

Planned Survey						
MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
1,200.0	1,200.0	0.33	226.97	-3.1	-2.3	-2.5
1,300.0	1,300.0	0.36	226.97	-3.7	-2.8	-2.9
1,400.0	1,400.0	0.38	226.97	-4.3	-3.2	-3.4
1,500.0	1,500.0	0.41	226.97	-4.9	-3.7	-3.9
1,600.0	1,600.0	0.44	226.97	-5.6	-4.2	-4.5
1,700.0	1,700.0	0.47	226.97	-6.3	-4.7	-5.0
1,800.0	1,800.0	0.49	226.97	-7.0	-5.3	-5.7
1,900.0	1,900.0	0.52	226.97	-7.8	-5.9	-6.3
2,000.0	2,000.0	0.55	226.97	-8.7	-6.5	-7.0
2,100.0	2,100.0	0.57	226.97	-9.6	-7.2	-7.7
2,200.0	2,200.0	0.60	226.97	-10.5	-7.9	-8.4
2,300.0	2,300.0	0.63	226.97	-11.5	-8.6	-9.2
2,400.0	2,399.9	0.66	226.97	-12.5	-9.4	-10.1
2,500.0	2,499.9	0.68	226.97	-13.6	-10.2	-10.9
2,600.0	2,599.9	0.71	226.97	-14.7	-11.0	-11.8
2,700.0	2,699.9	0.74	226.97	-15.8	-11.9	-12.7
2,800.0	2,799.9	0.77	226.97	-17.0	-12.8	-13.7
2,900.0	2,899.9	0.79	226.97	-18.3	-13.7	-14.7
3,000.0	2,999.9	0.82	226.97	-19.5	-14.7	-15.7
3,100.0	3,099.9	0.85	226.97	-20.9	-15.7	-16.8
3,200.0	3,199.9	0.88	226.97	-22.2	-16.7	-17.9
3,300.0	3,299.9	0.90	226.97	-23.6	-17.7	-19.0
3,400.0	3,399.9	0.93	226.97	-25.1	-18.8	-20.2 Directional Driller Tie In
3,425.0	3,424.8	2.79	83.31	-24.7	-18.9	-19.7
3,440.0	3,439.8	4.92	79.45	-23.7	-18.7	-18.7
3,460.0	3,459.7	9.30	67.37	-21.2	-18.0	-16.4
3,471.0	3,470.5	11.78	64.60	-19.2	-17.1	-14.5
3,475.0	3,474.4	12.69	64.55	-18.4	-16.8	-13.8
3,500.0	3,498.4	18.40	64.35	-11.7	-13.9	-7.7
3,503.0	3,501.3	19.08	64.33	-10.8	-13.5	-6.9
3,525.0	3,521.8	23.42	67.92	-2.9	-10.3	0.4
3,535.0	3,530.9	25.41	69.17	1.3	-8.7	4.3
3,550.0	3,544.3	28.64	70.63	8.1	-6.4	10.7
3,566.0	3,558.1	32.10	71.89	16.2	-3.8	18.3
3,580.0	3,569.7	35.47	72.24	24.0	-1.4	25.7
3,597.0	3,583.2	39.57	72.60	34.3	1.7	35.6
3,600.0	3,585.5	40.09	73.09	36.2	2.3	37.4
3,625.0	3,604.0	44.49	76.80	53.0	6.6	53.7
3,629.0	3,606.8	45.20	77.34	55.8	7.2	56.4
3,650.0	3,621.0	49.79	76.99	71.2	10.7	71.5
3,662.0	3,628.5	52.41	76.81	80.5	12.8	80.6
3,670.0	3,633.2	56.43	76.84	87.0	14.3	86.9
3,680.0	3,638.3	61.44	76.87	95.5	16.2	95.3
3,690.0	3,642.7	66.46	76.89	104.5	18.3	104.0

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Wellbore: Final Survey
Design: Actual Drill Path

Local Co-ordinate Reference: Well Carracas 16 B #12
TVD Reference: Rig Floor @ 6819.0ft (AWS 56)
MD Reference: Rig Floor @ 6819.0ft (AWS 56)
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)
3,693.0	3,643.9	67.97	76.90	107.2	18.9	106.7
3,700.0	3,646.3	71.22	77.30	113.7	20.4	113.1
3,710.0	3,649.2	75.88	77.84	123.3	22.4	122.5
3,720.0	3,651.2	80.53	78.37	133.0	24.4	132.1
3,724.0	3,651.8	82.39	78.57	136.9	25.2	135.9
3,750.0	3,655.0	83.39	80.21	162.5	30.0	161.3
3,756.0	3,655.7	83.62	80.59	168.4	31.0	167.2
3,788.0	3,658.9	85.03	79.19	199.9	36.6	198.5
3,800.0	3,659.6	87.75	77.65	211.8	39.0	210.3
3,819.0	3,659.6	92.07	75.23	230.7	43.4	228.7
3,851.0	3,657.9	94.18	73.04	262.6	52.2	259.4
3,882.0	3,655.6	94.44	73.12	293.5	61.2	289.0
3,900.0	3,654.4	93.27	72.71	311.4	66.4	306.2
3,913.0	3,653.7	92.42	72.42	324.4	70.3	318.6
3,944.0	3,652.5	91.98	70.57	355.4	80.1	348.0
3,950.0	3,652.3	91.75	70.24	361.4	82.2	353.6
3,976.0	3,651.8	90.75	68.82	387.4	91.3	378.0
4,000.0	3,651.8	88.96	67.83	411.3	100.1	400.3
4,008.0	3,652.0	88.37	67.50	419.3	103.2	407.7
4,039.0	3,652.6	89.52	68.73	450.3	114.7	436.4
4,050.0	3,652.8	88.31	69.06	461.2	118.7	446.7
4,071.0	3,653.8	86.00	69.70	482.2	126.1	466.3
4,103.0	3,656.8	83.45	69.08	514.0	137.3	496.1
4,135.0	3,660.2	84.15	69.52	545.8	148.5	525.9
4,166.0	3,663.2	85.03	69.26	576.7	159.4	554.8
4,198.0	3,665.0	88.29	69.26	608.6	170.7	584.6
4,200.0	3,665.1	88.28	69.33	610.6	171.4	586.5
4,229.0	3,666.0	88.20	70.31	639.6	181.4	613.7
4,261.0	3,666.9	88.29	70.14	671.5	192.2	643.8
4,293.0	3,667.9	88.37	69.52	703.5	203.2	673.8
4,300.0	3,668.1	88.26	69.64	710.5	205.7	680.4
4,325.0	3,668.9	87.85	70.05	735.5	214.3	703.9
4,356.0	3,670.1	87.67	69.78	766.4	224.9	732.9
4,388.0	3,671.2	88.46	70.05	798.4	235.9	763.0
4,400.0	3,671.5	88.79	70.05	810.4	240.0	774.3
4,420.0	3,671.8	89.34	70.05	830.4	246.8	793.1
4,450.0	3,672.1	89.78	69.78	860.4	257.1	821.2
4,480.0	3,672.0	90.31	69.96	890.4	267.5	849.4
4,500.0	3,672.0	90.03	69.96	910.4	274.3	868.2
4,512.0	3,672.0	89.87	69.96	922.4	278.4	879.5
4,544.0	3,672.0	90.13	70.05	954.3	289.4	909.5
4,575.0	3,672.3	88.90	69.70	985.3	300.0	938.6
4,607.0	3,672.8	89.08	69.52	1,017.3	311.2	968.6
4,638.0	3,673.2	89.52	70.05	1,048.3	321.9	997.7

Energen
Energen Resources - Survey



Company:	Energen Resources	Local Co-ordinate Reference:	Well Carracas 16 B #12
Project:	Carson National Forest, S16, T32N, R4W	TVD Reference:	Rig Floor @ 6819.0ft (AWS 56)
Site:	Carracas Mesa	MD Reference:	Rig Floor @ 6819.0ft (AWS 56)
Well:	Carracas 16 B #12	North Reference:	Grid
Wellbore:	Final Survey	Survey Calculation Method:	Minimum Curvature
Design:	Actual Drill Path	Database:	EDM 2003.16 Single User Db

Planned Survey						
MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
4,670.0	3,673.3	90.04	70.22	1,080.3	332.8	1,027.8
4,702.0	3,673.2	90.57	70.31	1,112.3	343.6	1,057.9
4,733.0	3,672.8	90.66	70.93	1,143.3	353.9	1,087.2
4,765.0	3,672.8	89.52	69.96	1,175.3	364.6	1,117.3
4,796.0	3,672.9	90.04	69.34	1,206.2	375.3	1,146.4
4,800.0	3,672.9	90.04	69.34	1,210.2	376.8	1,150.1
4,827.0	3,672.9	90.04	69.34	1,237.2	386.3	1,175.4
4,859.0	3,672.7	90.40	69.17	1,269.2	397.6	1,205.3
4,891.0	3,672.2	91.71	69.43	1,301.2	408.9	1,235.2
4,900.0	3,671.9	91.92	69.58	1,310.2	412.1	1,243.7
4,922.0	3,671.0	92.42	69.96	1,332.1	419.7	1,264.3
4,954.0	3,670.1	91.10	68.82	1,364.1	430.9	1,294.2
4,998.0	3,669.2	91.10	68.82	1,408.0	446.8	1,335.3

Checked By: _____ Approved By: _____ Date: _____