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Energen Resources

Carson National Forest - S19, T32N, R4W

Carracas Mesa

Carracas 19 B #10

Carracas 19 B #10 ST

Plan: Final Survey

Energen Resources

07 June, 2007





Project: Carson Natl Forest; S19, T32N, R4W
Site: Carracas Mesa
Well: Carracas 19 B #10
Wellbore: Carracas 19 B #10 ST
Plan: Final Survey (Carracas 19 B #10/Carracas 19 B #10 ST)



Azimuths to True North
Magnetic North: 10.21°

Magnetic Field
Strength: 51404.8nT
Dip Angle: 63.85°
Date: 5/23/2007
Model: IGRF200510

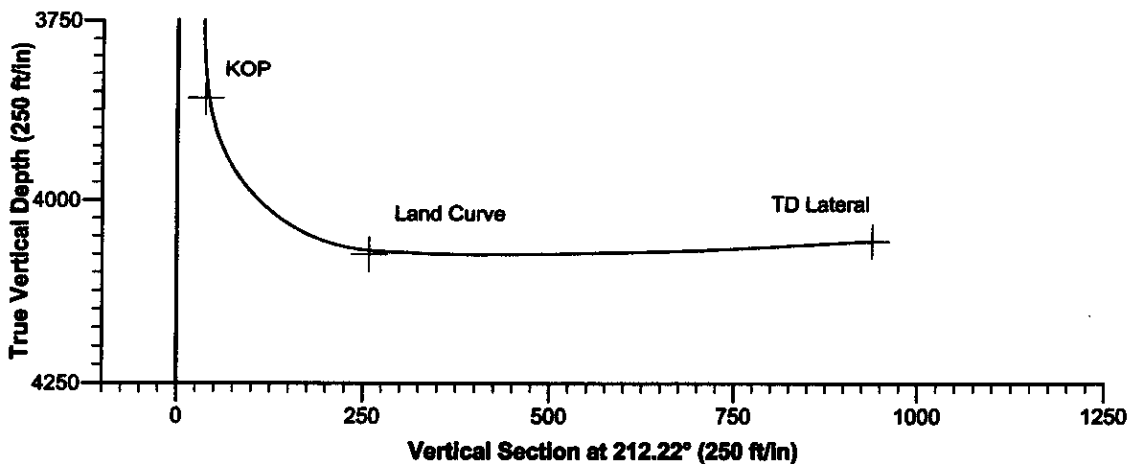
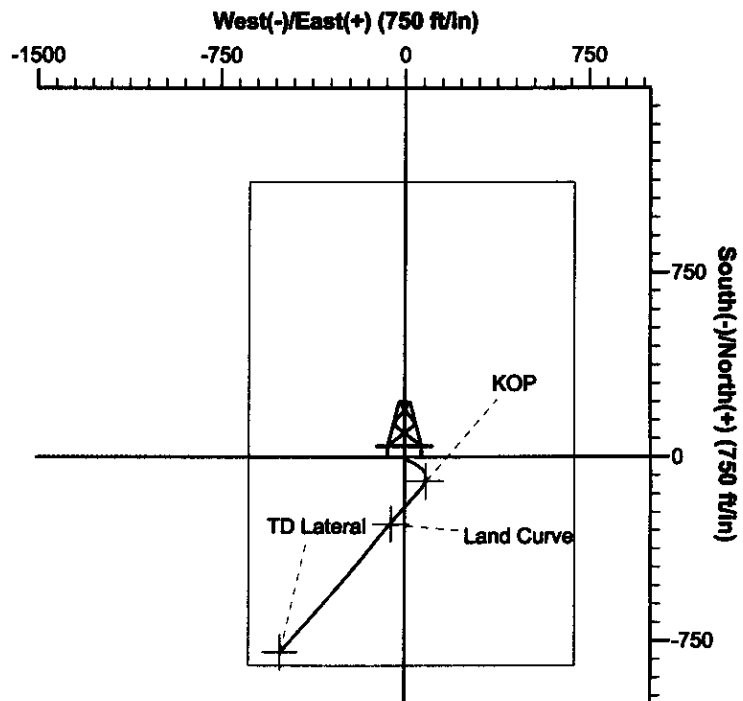
PROJECT DETAILS: Carson Natl Forest; S19, T32N, R4W

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Central Zone

System Datum: Mean Sea Level

SURFACE LOCATION

Easting: 1336281.45
Northing: 2173733.09



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Energen Resources - Survey



Company:	Energen Resources	Local Co-ordinate Reference:	Well Carracas 19 B #10
Project:	Carson Natl Forest; S19, T32N, R4W	TVD Reference:	KB @ 7382.0ft (AWS 289)
Site:	Carracas Mesa	MD Reference:	KB @ 7382.0ft (AWS 289)
Well:	Carracas 19 B #10	North Reference:	True
Wellbore:	Carracas 19 B #10 ST	Survey Calculation Method:	Minimum Curvature
Design:	Final Survey	Database:	EDM 2003.16 Single User Db

Project:	Carson Natl Forest; S19, T32N, R4W		
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:		Northing:	2,173,733.09 ft	Latitude:	36° 58' 9.000 N
From:	Lat/Long	Easting:	1,336,281.45 ft	Longitude:	107° 17' 28.000 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	-0.63 °

Well	Carracas 19 B #10					
Well Position	+N-S	0.0 ft	Northing:	2,173,733.09 ft	Latitude:	36° 58' 9.000 N
	+E-W	0.0 ft	Easting:	1,336,281.45 ft	Longitude:	107° 17' 28.000 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	7,367.0 ft	Ground Level:	7,367.0 ft

Wellbore:	Carracas 19 B #10 ST				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	5/23/2007	10.21	63.85	51,405

Design:	Final Survey				
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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	212.22

Survey Tool Program		Date: 6/7/2007		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	4,881.0	Final Survey (Carracas 19 B #10 ST)	MWD	MWD - Standard

Planned Survey						
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	0.10	160.12	0.1	-0.1	0.0
200.0	200.0	0.20	160.12	0.2	-0.3	0.1
300.0	300.0	0.37	201.85	0.6	-0.8	0.1
400.0	400.0	0.61	214.20	1.5	-1.5	-0.4
500.0	500.0	0.60	211.76	2.6	-2.4	-0.9
600.0	600.0	0.60	209.27	3.6	-3.3	-1.5
700.0	700.0	0.53	222.15	4.6	-4.1	-2.0
800.0	800.0	0.49	238.00	5.4	-4.7	-2.7
900.0	900.0	0.39	222.84	6.1	-5.2	-3.3
1,000.0	1,000.0	0.34	200.71	6.8	-5.7	-3.6
1,100.0	1,100.0	0.34	150.39	7.2	-6.2	-3.6

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Site:	Carracas Mesa	MD Reference:	KB @ 7382.0ft (AWS 289)
Well:	Carracas 19 B #10	North Reference:	True
Wellbore:	Carracas 19 B #10 ST	Survey Calculation Method:	Minimum Curvature
Design:	Final Survey	Database:	EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	ENW (ft)
1,200.0	1,200.0	0.54	121.41	7.3	-6.8	-3.0
1,300.0	1,300.0	1.03	112.28	7.2	-7.3	-1.8
1,400.0	1,399.9	1.53	109.07	6.7	-8.1	0.3
1,500.0	1,499.9	1.98	109.03	6.0	-9.1	3.2
1,600.0	1,599.8	2.43	109.01	5.1	-10.4	6.8
1,700.0	1,699.7	3.16	112.97	4.2	-12.1	11.4
1,800.0	1,799.5	3.90	115.44	3.4	-14.7	17.0
1,900.0	1,899.2	4.26	116.34	2.6	-17.8	23.4
2,000.0	1,998.9	4.63	117.09	1.8	-21.3	30.3
2,100.0	2,098.6	4.70	120.72	1.4	-25.2	37.4
2,200.0	2,198.3	4.79	124.22	1.4	-29.6	44.4
2,300.0	2,297.9	4.44	124.68	1.7	-34.2	51.0
2,400.0	2,397.7	4.09	125.21	2.1	-38.5	57.1
2,500.0	2,497.4	3.74	128.76	2.6	-42.5	62.6
2,600.0	2,597.2	3.41	133.01	3.6	-46.6	67.3
2,700.0	2,697.1	3.32	138.54	4.9	-50.8	71.4
2,800.0	2,796.9	3.27	144.31	6.8	-55.3	75.0
2,900.0	2,896.8	2.85	146.16	8.9	-59.7	78.0
3,000.0	2,996.7	2.44	148.63	10.9	-63.6	80.5
3,100.0	3,096.6	2.27	158.95	13.0	-67.2	82.3
3,200.0	3,196.5	2.18	170.51	15.6	-71.0	83.4
3,300.0	3,296.4	2.32	174.30	18.6	-74.9	83.9
3,400.0	3,396.3	2.47	177.64	22.0	-79.0	84.2
3,500.0	3,496.2	2.59	177.89	25.6	-83.4	84.3
3,600.0	3,596.1	2.72	178.12	29.5	-88.1	84.5
3,700.0	3,696.0	2.48	173.32	33.1	-92.6	84.8
3,800.0	3,795.9	2.26	167.54	36.2	-96.7	85.5
3,825.0	3,820.9	4.78	197.56	37.5	-98.1	85.3
3,850.0	3,845.7	7.69	206.05	40.2	-100.6	84.2
3,856.0	3,851.7	8.40	207.21	41.0	-101.4	83.9
3,867.0	3,862.5	9.71	208.89	42.8	-102.9	83.1
3,875.0	3,870.4	10.67	209.86	44.2	-104.1	82.4
3,894.5	3,889.5	13.01	211.62	48.2	-107.6	80.3
3,900.0	3,894.8	14.40	212.55	49.5	-108.7	79.6
3,920.0	3,914.0	19.49	214.84	55.3	-113.5	76.4
3,925.3	3,919.0	20.84	215.26	57.1	-115.0	75.3
3,940.0	3,932.5	24.52	214.98	62.8	-119.7	72.1
3,956.9	3,947.6	28.75	214.74	70.4	-125.9	67.7
3,960.0	3,950.3	29.51	215.10	71.9	-127.1	66.9
3,980.0	3,967.3	34.44	217.08	82.4	-135.7	60.6
3,988.3	3,974.0	36.49	217.76	87.2	-139.5	57.7
4,000.0	3,983.3	39.21	219.23	94.4	-145.1	53.2
4,019.6	3,997.9	43.79	221.35	107.2	-155.0	44.8
4,040.0	4,012.0	48.84	222.28	121.8	-166.0	35.0

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Site:	Carracas Mesa	MD Reference:	KB @ 7382.0ft (AWS 289)
Well:	Carracas 19 B #10	North Reference:	True
Wellbore:	Carracas 19 B #10 ST	Survey Calculation Method:	Minimum Curvature
Design:	Final Survey	Database:	EDM 2003.16 Single User Db

Planned Survey						
MD (ft)	TVD (ft)	Inc (°)	Azi (°)	V. Sec (ft)	N/S (ft)	E/W (ft)
4,050.8	4,019.0	51.53	222.72	130.0	-172.1	29.4
4,060.0	4,024.5	53.76	222.61	137.1	-177.5	24.4
4,080.0	4,035.7	58.64	222.38	153.5	-189.7	13.2
4,082.2	4,036.8	59.18	222.36	155.3	-191.1	11.9
4,100.0	4,045.3	63.42	221.64	170.7	-202.7	1.5
4,113.6	4,051.1	66.65	221.13	182.8	-211.9	-6.6
4,120.0	4,053.5	68.28	221.05	188.7	-216.4	-10.5
4,140.0	4,060.1	73.36	220.83	207.4	-230.7	-22.9
4,144.8	4,061.4	74.57	220.78	211.9	-234.1	-25.9
4,150.0	4,062.8	75.75	220.55	216.9	-238.0	-29.2
4,167.0	4,066.4	79.58	219.82	233.4	-250.7	-39.9
4,175.0	4,067.7	81.18	219.69	241.2	-256.7	-45.0
4,189.0	4,070.4	86.00	219.29	264.8	-275.1	-60.1
4,200.0	4,070.5	86.04	219.28	265.8	-275.9	-60.8
4,229.0	4,072.2	87.14	219.12	294.5	-298.3	-79.1
4,261.0	4,073.6	87.76	218.94	326.3	-323.2	-99.2
4,292.0	4,074.6	88.46	218.68	357.1	-347.3	-118.6
4,300.0	4,074.8	88.73	218.61	365.0	-353.6	-123.6
4,323.0	4,075.2	89.52	218.41	387.9	-371.6	-137.9
4,355.0	4,075.1	90.84	219.20	419.7	-396.5	-158.0
4,386.0	4,074.8	90.40	219.12	450.4	-420.5	-177.5
4,400.0	4,074.6	90.52	219.12	464.3	-431.4	-186.4
4,417.0	4,074.5	90.66	219.12	481.2	-444.6	-197.1
4,449.0	4,074.0	90.84	219.47	513.0	-469.3	-217.4
4,480.0	4,073.5	91.28	219.82	543.7	-493.2	-237.1
4,500.0	4,073.0	91.62	220.33	563.5	-508.5	-250.0
4,511.0	4,072.6	91.80	220.61	574.4	-516.9	-257.2
4,543.0	4,071.9	91.01	220.17	606.0	-541.2	-277.9
4,572.0	4,071.3	91.10	220.26	634.8	-563.4	-296.6
4,603.0	4,070.6	91.54	220.70	665.4	-587.0	-316.7
4,635.0	4,069.5	92.42	221.58	697.0	-611.0	-337.8
4,666.0	4,068.2	92.42	221.58	727.6	-634.2	-358.3
4,698.0	4,066.7	93.03	221.93	759.1	-658.1	-379.6
4,700.0	4,066.6	93.04	221.90	761.1	-659.5	-380.9
4,729.0	4,065.0	93.21	221.49	789.6	-681.2	-400.2
4,760.0	4,063.3	92.86	221.67	820.2	-704.3	-420.7
4,792.0	4,061.4	94.09	221.75	851.7	-728.2	-442.0
4,800.0	4,060.9	93.69	221.65	859.6	-734.1	-447.3
4,813.0	4,060.1	93.03	221.49	872.4	-743.8	-455.9
4,881.0	4,056.5	93.03	221.49	939.4	-794.7	-500.9

1234/5 1402/5

Energen
Energen Resources - Survey



Company:	Energen Resources	Local Co-ordinate Reference:	Well Carracas 19 B #10
Project:	Carson Natl Forest; S19, T32N, R4W	TVD Reference:	KB @ 7382.0ft (AWS 289)
Site:	Carracas Mesa	MD Reference:	KB @ 7382.0ft (AWS 289)
Well:	Carracas 19 B #10	North Reference:	True
Wellbore:	Carracas 19 B #10 ST	Survey Calculation Method:	Minimum Curvature
Design:	Final Survey	Database:	EDM 2003.16 Single User Db

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
Land Curve - plan misses by 7.8ft at 4193.2ft MD (4069.9 TVD, -270.7 N, -56.5 E) - Point	0.00	0.00	4,075.0	-274.0	-51.5	2,173,459.67	1,336,226.96	36° 58' 6.291 N	107° 17' 28.635 W
Drill Window - plan hits target - Rectangle (sides W1,970.0 H1,320.0 D0.0)	0.00	0.00	0.0	0.0	0.0	2,173,733.09	1,336,281.45	36° 58' 9.000 N	107° 17' 28.000 W
TD Lateral - plan hits target - Point	0.00	0.00	4,056.5	-794.7	-500.9	2,172,943.91	1,335,771.89	36° 58' 1.142 N	107° 17' 34.172 W
KOP - plan misses by 4.1ft at 3862.7ft MD (3856.3 TVD, -102.3 N, 83.4 E) - Point	0.00	0.00	3,858.9	-99.2	86.0	2,173,632.95	1,336,366.36	36° 58' 8.019 N	107° 17' 26.940 W

Checked By: _____	Approved By: _____	Date: _____
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