



Energen Resources

Rio Arriba County, NM

Carracas Mesa (Carracas 36A#1R)

Carracas Canyon 36 A #1R

Carracas Canyon 36 A #1R ST

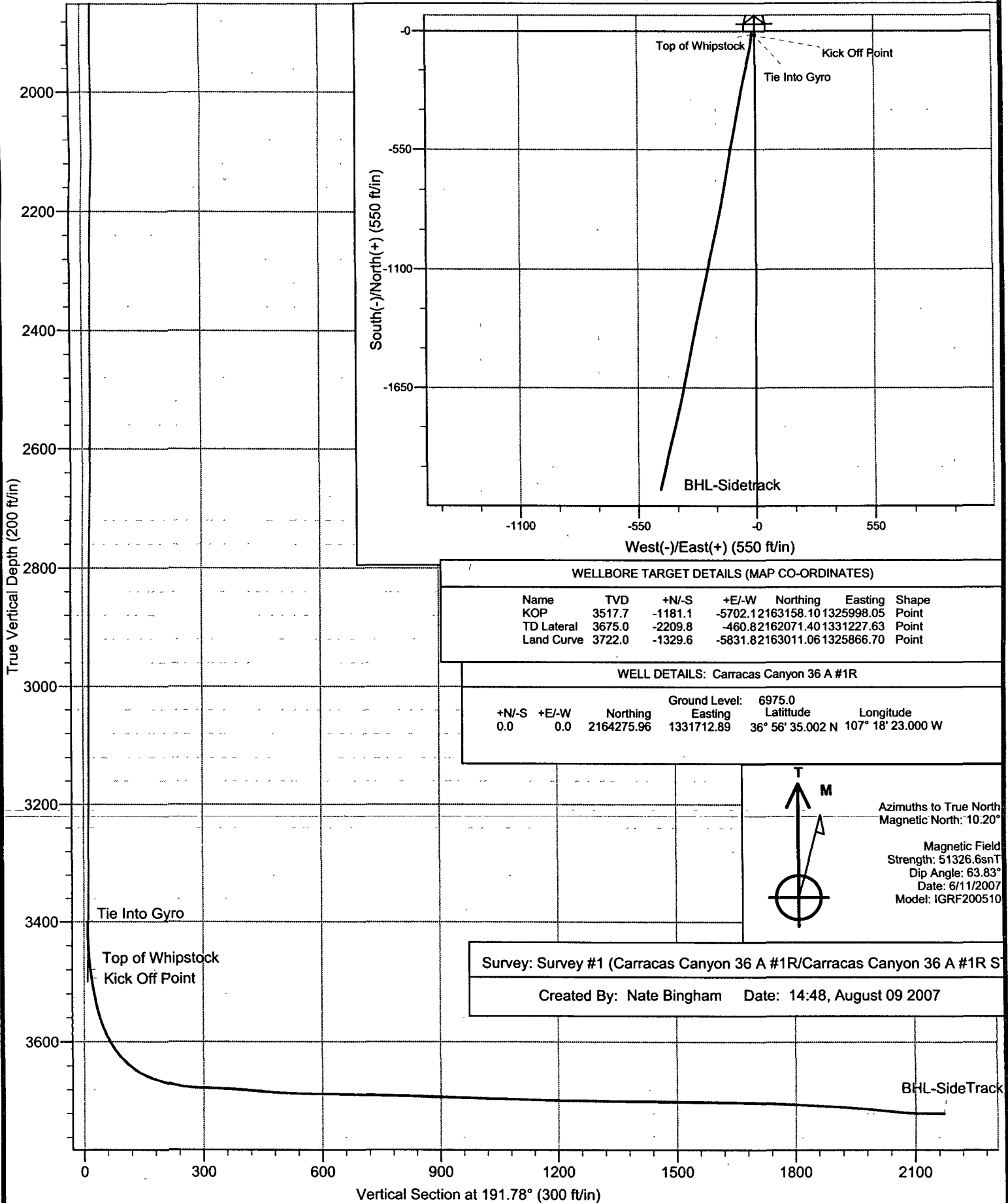
Survey: Survey #1

End of Well Survey

09 August, 2007

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8-17-07

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Company:	Energen Resources	Local Co-ordinate Reference:	Well Carracas Canyon 36 A #1R
Project:	Rio Arriba County, NM	TVD Reference:	KB @ 6987.0ft (AWS 289)
Site:	Carracas Mesa (Carracas 36A#1R)	MD Reference:	KB @ 6987.0ft (AWS 289)
Well:	Carracas Canyon 36 A #1R	North Reference:	True
Wellbore:	Carracas Canyon 36 A #1R ST	Survey Calculation Method:	Minimum Curvature
Design:	Carracas Canyon 36 A #1R ST	Database:	EDM 2003.16 Single User Db

Project:	Rio Arriba County, NM		
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 (Carracas 36A#1R)					
Site Position:		Northing:	2,164,275.96	ft	Latitude:	36° 56' 35.002 N
From:	Lat/Long	Easting:	1,331,712.89	ft	Longitude:	107° 18' 23.000 W
Position Uncertainty:	0.0	Slot Radius:		"	Grid Convergence:	-0.64

Well:	Carracas Canyon 36 A #1R							
Well Position	+N/-S	0.0	ft	Northing:	2,164,275.96	ft	Latitude:	36° 56' 35.002 N
	+E/-W	0.0	ft	Easting:	1,331,712.89	ft	Longitude:	107° 18' 23.000 W
Position Uncertainty	0.0	ft		Wellhead Elevation:	6,975.0	ft	Ground Level:	6,975.0

Wellbore Carracas Canyon 36 A #1R ST

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/11/2007	10.20	63.83	51,327

Design Carracas Canyon 36 A #1R ST

Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
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Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	191.78

Survey Program Date 8/9/2007

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
3,495.0	5,738.0	Survey #1 (Carracas Canyon 36 A #1R ST)	Pathfinder	Pathfinder MWD

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
3,400.0	1.01	340.66	3,399.5	-8.8	-10.9	0.00	10.9
Tie Into Gyro							
3,481.0	10.27	187.95	3,480.2	-15.3	-12.1	13.80	17.5
Top of Whipstock							
3,495.0	12.20	187.57	3,493.9	-18.0	-12.5	13.80	20.2
Kick Off Point							
3,541.0	18.55	186.87	3,538.2	-30.1	-14.0	13.81	32.4
3,573.0	28.31	185.73	3,567.5	-42.8	-15.4	30.53	45.0
3,604.0	37.99	187.84	3,593.5	-59.6	-17.4	31.44	61.9
3,635.0	47.75	190.21	3,616.2	-80.4	-20.8	31.91	82.9
3,666.0	57.33	192.23	3,635.0	-104.5	-25.6	31.33	107.5
3,693.0	65.86	192.94	3,647.8	-127.6	-30.8	31.68	131.2

ENERGEN Pathfinder Energy Services

End of Well Survey

Company: Energen Resources
Project: Rio Arriba County, NM
Site: Carracas Mesa (Carracas 36A#1R)
Well: Carracas Canyon 36 A #1R
Wellbore: Carracas Canyon 36 A #1R ST
Design: Carracas Canyon 36 A #1R ST

Local Co-ordinate Reference: Well Carracas Canyon 36 A #1R
TVD Reference: KB @ 6987.0ft (AWS 289)
MD Reference: KB @ 6987.0ft (AWS 289)
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)
3,725.0	74.74	192.85	3,658.6	-157.0	-37.5	27.75	161.3
3,756.0	78.44	192.85	3,665.8	-186.4	-44.2	11.94	191.4
3,788.0	81.07	192.67	3,671.5	-217.1	-51.1	8.24	222.9
3,819.0	84.86	192.32	3,675.3	-247.1	-57.8	12.28	253.7
3,850.0	88.29	191.44	3,677.1	-277.4	-64.2	11.42	284.6
3,881.0	89.34	190.47	3,677.8	-307.8	-70.0	4.61	315.6
3,912.0	88.29	190.82	3,678.4	-338.3	-75.8	3.57	346.6
3,944.0	87.23	190.56	3,679.7	-369.7	-81.7	3.41	378.6
3,975.0	87.14	190.21	3,681.2	-400.1	-87.3	1.16	409.5
4,006.0	86.61	190.47	3,682.9	-430.6	-92.8	1.90	440.5
4,038.0	87.23	190.47	3,684.6	-462.0	-98.6	1.94	472.4
4,069.0	88.02	190.56	3,685.9	-492.5	-104.3	2.56	503.4
4,100.0	88.55	190.74	3,686.8	-522.9	-110.0	1.81	534.4
4,131.0	89.34	190.56	3,687.4	-553.4	-115.7	2.61	565.3
4,162.0	89.52	190.12	3,687.7	-583.9	-121.3	1.53	596.3
4,193.0	89.69	189.86	3,687.9	-614.4	-126.7	1.00	627.3
4,225.0	88.90	189.07	3,688.3	-646.0	-132.0	3.49	659.3
4,256.0	89.25	188.98	3,688.8	-676.6	-136.8	1.17	690.2
4,287.0	89.08	189.51	3,689.2	-707.2	-141.8	1.80	721.2
4,319.0	88.90	189.86	3,689.8	-738.7	-147.2	1.23	753.2
4,350.0	88.81	190.12	3,690.4	-769.2	-152.6	0.89	784.2
4,381.0	89.25	190.03	3,691.0	-799.7	-158.0	1.45	815.2
4,413.0	88.72	191.70	3,691.5	-831.2	-164.0	5.47	847.1
4,444.0	88.64	192.32	3,692.2	-861.5	-170.5	2.02	878.1
4,475.0	89.08	192.58	3,692.8	-891.7	-177.1	1.65	909.1
4,507.0	88.90	192.41	3,693.4	-923.0	-184.1	0.77	941.1
4,538.0	88.64	192.76	3,694.1	-953.2	-190.8	1.41	972.1
4,569.0	88.64	192.76	3,694.8	-983.5	-197.7	0.00	1,003.1
4,600.0	89.16	192.94	3,695.4	-1,013.7	-204.5	1.78	1,034.1
4,632.0	88.99	193.02	3,695.9	-1,044.8	-211.7	-0.59	1,066.1
4,663.0	88.90	192.67	3,696.5	-1,075.1	-218.6	1.17	1,097.1
4,694.0	88.72	191.97	3,697.1	-1,105.3	-225.2	2.33	1,128.1
4,725.0	88.72	192.32	3,697.8	-1,135.6	-231.8	1.13	1,159.0
4,757.0	89.52	191.88	3,698.3	-1,166.9	-238.5	2.85	1,191.0
4,788.0	89.60	191.97	3,698.6	-1,197.3	-244.9	0.39	1,222.0
4,819.0	89.69	192.06	3,698.8	-1,227.6	-251.3	0.41	1,253.0
4,851.0	89.60	191.79	3,699.0	-1,258.9	-257.9	0.89	1,285.0
4,882.0	89.25	191.70	3,699.3	-1,289.2	-264.2	1.17	1,316.0
4,913.0	89.43	192.41	3,699.6	-1,319.6	-270.7	2.36	1,347.0
4,945.0	90.04	192.76	3,699.8	-1,350.8	-277.7	2.20	1,379.0
4,975.0	90.04	191.62	3,699.7	-1,380.1	-284.0	3.80	1,409.0
5,007.0	89.52	190.91	3,699.9	-1,411.5	-290.3	2.75	1,441.0
5,038.0	89.16	190.30	3,700.2	-1,442.0	-296.0	2.28	1,472.0
5,069.0	89.78	190.91	3,700.5	-1,472.4	-301.7	2.81	1,503.0

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Well:	Carracas Canyon 36 A #1R	North Reference:	True
Wellbore:	Carracas Canyon 36 A #1R ST	Survey Calculation Method:	Minimum Curvature
Design:	Carracas Canyon 36 A #1R ST	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)
5,101.0	89.52	191.18	3,700.7	-1,503.8	-307.8	1.17	1,535.0
5,132.0	89.52	191.09	3,701.0	-1,534.2	-313.8	0.29	1,566.0
5,163.0	89.69	191.26	3,701.2	-1,564.7	-319.8	0.78	1,597.0
5,194.0	89.60	191.18	3,701.4	-1,595.1	-325.8	0.39	1,628.0
5,225.0	89.25	190.47	3,701.7	-1,625.5	-331.7	2.55	1,659.0
5,256.0	88.99	190.65	3,702.2	-1,656.0	-337.3	1.02	1,690.0
5,288.0	89.25	191.26	3,702.7	-1,687.4	-343.4	2.07	1,722.0
5,319.0	88.37	192.58	3,703.3	-1,717.7	-349.8	5.12	1,753.0
5,350.0	88.11	193.11	3,704.2	-1,747.9	-356.7	1.90	1,783.9
5,382.0	87.93	193.37	3,705.4	-1,779.1	-364.0	0.99	1,815.9
5,413.0	87.93	193.11	3,706.5	-1,809.2	-371.1	0.84	1,846.9
5,444.0	88.20	193.90	3,707.5	-1,839.3	-378.4	2.69	1,877.9
5,476.0	87.32	193.73	3,708.8	-1,870.4	-386.0	2.80	1,909.8
5,507.0	86.97	194.08	3,710.3	-1,900.4	-393.4	1.60	1,940.7
5,538.0	86.61	193.46	3,712.1	-1,930.5	-400.8	2.31	1,971.7
5,569.0	86.17	193.55	3,714.0	-1,960.6	-408.0	1.45	2,002.6
5,601.0	86.70	193.37	3,716.0	-1,991.7	-415.5	1.75	2,034.5
5,632.0	86.17	193.55	3,717.9	-2,021.7	-422.7	1.81	2,065.5
5,663.0	88.72	193.46	3,719.3	-2,051.9	-429.9	8.23	2,096.4
5,681.0	89.87	193.37	3,719.5	-2,069.4	-434.1	6.41	2,114.4
5,738.0	89.87	193.37	3,719.7	-2,124.8	-447.3	0.00	2,171.4

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Site:	Carracas Mesa (Carracas 36A#1R)	MD Reference:	KB @ 6987.0ft (AWS 289)
Well:	Carracas Canyon 36 A #1R	North Reference:	True
Wellbore:	Carracas Canyon 36 A #1R ST	Survey Calculation Method:	Minimum Curvature
Design:	Carracas Canyon 36 A #1R ST	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
KOP			0.00	0.00	3,517.7	-1,181.1	-5,702.1	2,163,158.10	1,325,998.05	36° 56' 23.318 N	107° 19' 33.236 W
	- survey misses by 5342.7ft at 5738.0ft MD (3719.7 TVD, -2124.8 N, -447.3 E)										
	- Point										
Land Curve			0.00	0.00	3,722.0	-1,329.6	-5,831.8	2,163,011.06	1,325,866.70	36° 56' 21.850 N	107° 19' 34.833 W
	- survey misses by 5443.0ft at 5738.0ft MD (3719.7 TVD, -2124.8 N, -447.3 E)										
	- Point										
TD Lateral			0.00	0.00	3,675.0	-2,209.8	-460.8	2,162,071.40	1,331,227.63	36° 56' 13.153 N	107° 18' 28.676 W
	- survey misses by 97.0ft at 5738.0ft MD (3719.7 TVD, -2124.8 N, -447.3 E)										
	- Point										

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,400.0	3,399.5	-8.8	-10.9	Tie Into Gyro
3,481.0	3,480.2	-15.3	-12.1	Top of Whipstock
3,495.0	3,493.9	-18.0	-12.5	Kick Off Point
5,738.0	3,719.7	-2,124.8	-447.3	BHL-SideTrack

Checked By: _____

Approved By: _____

Date: _____

8/14/07