



Company: Devon Energy
Lease/Well: Aquila 22 Federal Com /No. 013H



State/County: New Mexico/Eddy
Latitude: 32.65, Longitude: -103.85
GRID North is 0.26 Degrees East of True North
VS-Azi: 0.00 Degrees

Depth Reference : RKB=26 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...22 fed.com #13h gyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/7/2014 / 11:11

VES Survey International

West Texas

432-563-5444

Surveyor: Chris Bankson

Aquila 22 Federal Com No. 013H / API 30-015-41914

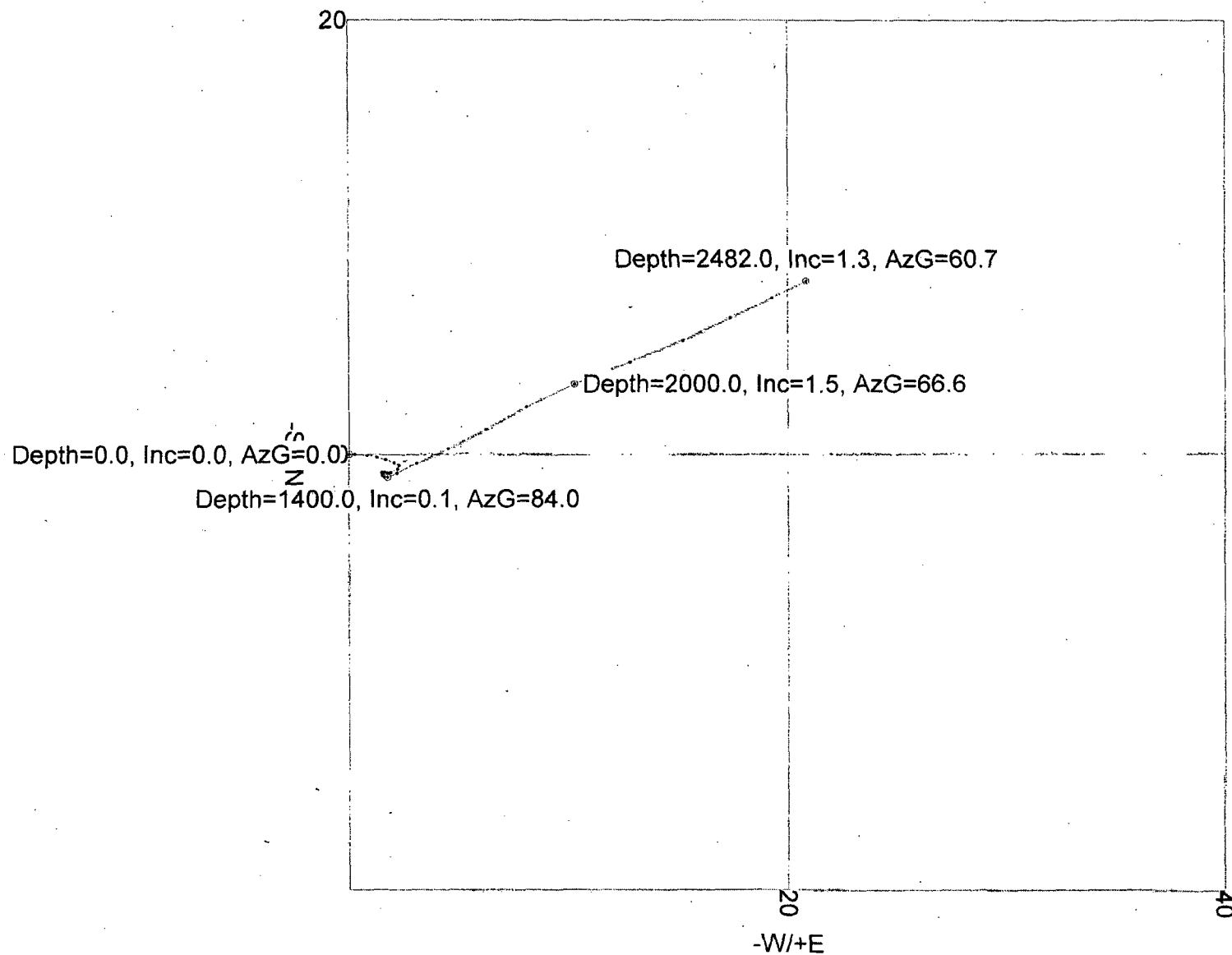
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.29	87.61	100.00	0.01	0.25	0.01	0.25	87.61	0.29
200.00	0.37	101.08	200.00	-0.04	0.82	-0.04	0.83	92.83	0.11
300.00	0.16	100.86	300.00	-0.13	1.28	-0.13	1.29	95.77	0.21
400.00	0.30	108.30	400.00	-0.24	1.67	-0.24	1.69	98.16	0.15
500.00	0.17	114.57	500.00	-0.39	2.06	-0.39	2.10	100.61	0.13
600.00	0.13	120.62	599.99	-0.51	2.29	-0.51	2.35	102.44	0.05
700.00	0.24	234.20	699.99	-0.69	2.22	-0.69	2.32	107.18	0.32
800.00	0.16	255.41	799.99	-0.84	1.91	-0.84	2.09	113.82	0.11
900.00	0.02	299.32	899.99	-0.87	1.76	-0.87	1.96	116.28	0.14
1000.00	0.13	283.59	999.99	-0.83	1.63	-0.83	1.83	117.05	0.11
1100.00	0.03	201.70	1099.99	-0.83	1.51	-0.83	1.72	118.90	0.13
1200.00	0.11	155.35	1199.99	-0.95	1.54	-0.95	1.80	121.65	0.09
1300.00	0.04	114.03	1299.99	-1.05	1.61	-1.05	1.92	123.13	0.09
1400.00	0.15	84.02	1399.99	-1.05	1.77	-1.05	2.06	120.74	0.11
1500.00	0.40	60.94	1499.99	-0.87	2.20	-0.87	2.37	111.58	0.27
1600.00	0.74	64.35	1599.99	-0.42	3.09	-0.42	3.12	97.78	0.34
1700.00	1.07	65.32	1699.97	0.25	4.52	0.25	4.53	86.87	0.33
1800.00	1.18	60.81	1799.95	1.14	6.27	1.14	6.37	79.70	0.14

300541914

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.25	60.64	1899.93	2.18	8.12	2.18	8.40	74.99	0.07
2000.00	1.51	66.63	1999.90	3.23	10.28	3.23	10.77	72.53	0.30
2100.00	1.60	69.48	2099.87	4.24	12.79	4.24	13.48	71.64	0.12
2200.00	1.40	65.60	2199.83	5.24	15.21	5.24	16.08	71.00	0.22
2300.00	1.35	62.84	2299.80	6.28	17.37	6.28	18.47	70.12	0.08
2400.00	1.10	66.70	2399.78	7.20	19.31	7.20	20.60	69.54	0.26
2482.00	1.31	60.66	2481.76	7.97	20.85	7.97	22.32	69.07	0.30



VES Survey International
West Texas
432-563-5444
Surveyor: Chris Bankson
Aquila 22 Federal Com No. 013H / API 30-015-41914



VES Survey Date: 06/21/2014

AQUILA 22 FED COM 13H

WEST UNRESTRICTED

devon

Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location SEC23 T19S R31E	API/UWI 3001541914	Latitude (°) 32° 38' 47.84" N	Longitude (°) 103° 50' 53.103" W	Ground Elev... 3,540.80'
			KB - GL (ft) 26.20	Orig KB Elev (ft) 3,567.00
				Tubing Head Elevation (ft)

Wellbores				
Wellbore Name OH	Parent Wellbore OH	SAP Well ID	Kick Off Depth (ftKB) 8,530.0	Vertical Section Direction (°) 266.55
Actual Deviation Survey GYRO/MWD, Proposed? No	Definitive? Yes	Proposed? No	Proposed Deviation Survey	

Deviation Survey				
Date 6/22/2014	Description GYRO/MWD			
MD Tie In (ftKB) 0.00	TVD Tie In (ftKB) 0.00	Inclination Tie In (°) 0.00	Azimuth Tie In (°) 0.00	NS Tie In (ft) 0.00
				EW Tie In (ft) 0.00

Survey Data										
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
6/22/2014	100.00	0.29	87.61	100.00	-0.25	0.01	0.25	0.29	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	200.00	0.37	101.08	200.00	-0.82	-0.04	0.82	0.11	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	300.00	0.16	100.86	300.00	-1.27	-0.13	1.28	0.21	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	400.00	0.30	108.30	400.00	-1.64	-0.24	1.66	0.14	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	500.00	0.17	114.57	500.00	-2.02	-0.38	2.05	0.13	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	600.00	0.13	120.62	599.99	-2.24	-0.50	2.28	0.04	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	700.00	0.24	234.20	699.99	-2.16	-0.68	2.21	0.32	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	800.00	0.16	255.41	799.99	-1.85	-0.84	1.90	0.11	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	900.00	0.02	299.32	899.99	-1.70	-0.87	1.75	0.15	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,000.00	0.13	283.59	999.99	-1.57	-0.83	1.63	0.11	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,100.00	0.03	201.70	1,099.99	-1.45	-0.83	1.51	0.13	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,200.00	0.11	155.35	1,199.99	-1.48	-0.94	1.54	0.09	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,300.00	0.04	114.03	1,299.99	-1.54	-1.04	1.61	0.08	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,400.00	0.15	84.02	1,399.99	-1.70	-1.04	1.77	0.12	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,500.00	0.40	60.94	1,499.99	-2.15	-0.86	2.20	0.27	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,600.00	0.74	64.35	1,599.99	-3.06	-0.41	3.09	0.34	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,700.00	1.07	65.32	1,699.97	-4.53	0.26	4.52	0.33	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,800.00	1.18	60.81	1,799.96	-6.33	1.15	6.27	0.14	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	1,900.00	1.25	60.64	1,899.93	-8.24	2.19	8.12	0.07	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	2,000.00	1.51	66.63	1,999.90	-10.46	3.25	10.28	0.30	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	2,100.00	1.60	69.48	2,099.87	-13.03	4.26	12.80	0.12	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	2,200.00	1.40	65.60	2,199.83	-15.51	5.25	15.22	0.22	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	2,300.00	1.35	62.84	2,299.80	-17.72	6.29	17.38	0.08	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	2,400.00	1.10	66.70	2,399.78	-19.71	7.21	19.31	0.26	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	2,482.00	1.31	60.66	2,481.76	-21.29	7.98	20.85	0.30	GYRO	VAUHGN ENERGY SERVICES
6/22/2014	2,622.00	1.41	259.81	2,621.75	-21.02	8.46	20.55	1.92	MWD	PATHFINDER ENERGY SE...
6/22/2014	2,716.00	3.87	276.48	2,715.64	-16.74	8.62	16.26	2.71	MWD	PATHFINDER ENERGY SE...
6/22/2014	2,811.00	5.89	282.19	2,810.29	-8.89	10.01	8.30	2.18	MWD	PATHFINDER ENERGY SE...
6/22/2014	2,905.00	5.89	279.90	2,903.80	0.45	11.85	-1.16	0.25	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,000.00	4.31	273.94	2,998.42	8.73	12.94	-9.52	1.75	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,094.00	2.29	282.85	3,092.26	14.03	13.60	-14.88	2.21	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,189.00	1.14	266.04	3,187.22	16.80	13.96	-17.67	1.31	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,283.00	0.88	258.13	3,281.20	18.45	13.74	-19.31	0.31	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,378.00	0.97	260.41	3,376.19	19.97	13.46	-20.82	0.10	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,473.00	0.88	285.99	3,471.18	21.46	13.53	-22.31	0.44	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,567.00	0.44	1.84	3,565.17	22.11	14.08	-23.00	0.94	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,661.00	0.88	24.34	3,659.17	21.74	15.10	-22.69	0.53	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,756.00	1.32	44.82	3,754.15	20.58	16.54	-21.61	0.61	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,848.00	1.32	26.59	3,846.12	19.26	18.24	-20.39	0.45	MWD	PATHFINDER ENERGY SE...
6/22/2014	3,942.00	1.23	4.37	3,940.10	18.58	20.22	-19.83	0.53	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,037.00	1.23	344.91	4,035.08	18.65	22.22	-20.02	0.44	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,131.00	1.06	344.30	4,129.06	19.03	24.03	-20.52	0.18	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,359.00	0.62	348.04	4,357.04	19.66	27.27	-21.34	0.19	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,453.00	1.41	213.66	4,451.03	20.44	26.80	-22.09	2.02	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,548.00	2.46	193.15	4,545.97	21.73	23.84	-23.20	1.31	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,642.00	2.46	194.22	4,639.89	22.91	19.92	-24.16	0.05	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,737.00	3.69	201.64	4,734.75	24.83	15.11	-25.78	1.36	MWD	PATHFINDER ENERGY SE...



Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location SEC23 T19S R31E	API/UWI 3001541914	Latitude (") 32° 38' 47.84" N	Longitude (") 103° 50' 53.103" W	Ground Elev... 3,540.80
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Survey Data										
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
6/22/2014	4,832.00	5.28	201.06	4,829.45	27.94	8.18	-28.48	1.67	MWD	PATHFINDER ENERGY SE...
6/22/2014	4,926.00	6.77	199.77	4,922.93	31.92	-1.07	-31.91	1.59	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,021.00	6.68	199.73	5,017.28	36.30	-11.54	-35.67	0.09	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,115.00	7.39	192.84	5,110.57	40.15	-22.58	-38.86	1.17	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,210.00	6.68	192.54	5,204.86	43.38	-33.93	-41.42	0.75	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,305.00	7.83	191.47	5,299.09	46.57	-45.66	-43.90	1.22	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,399.00	8.79	196.69	5,392.11	50.69	-58.82	-47.24	1.30	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,493.00	8.62	197.71	5,485.02	55.71	-72.41	-51.45	0.24	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,588.00	8.18	199.45	5,579.01	60.91	-85.56	-55.86	0.53	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,682.00	8.00	200.48	5,672.07	66.17	-98.00	-60.38	0.25	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,777.00	8.79	195.57	5,766.05	71.21	-111.18	-64.64	1.12	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,871.00	8.53	196.66	5,858.98	75.95	-124.78	-68.57	0.33	MWD	PATHFINDER ENERGY SE...
6/22/2014	5,965.00	8.27	197.98	5,951.97	80.82	-137.89	-72.65	0.34	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,060.00	7.12	196.07	6,046.12	85.28	-150.05	-76.39	1.24	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,154.00	5.72	192.25	6,139.52	88.49	-160.22	-79.00	1.56	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,249.00	5.01	190.87	6,234.11	90.80	-168.92	-80.78	0.76	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,343.00	3.61	184.80	6,327.84	92.24	-175.90	-81.80	1.56	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,437.00	3.25	177.94	6,421.67	92.73	-181.51	-81.96	0.58	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,532.00	2.11	166.34	6,516.57	92.49	-185.91	-81.45	1.32	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,626.00	1.06	120.57	6,610.53	91.46	-188.03	-80.29	1.67	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,721.00	0.97	110.51	6,705.52	90.00	-188.76	-78.78	0.21	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,815.00	0.79	115.25	6,799.51	88.70	-189.31	-77.45	0.21	MWD	PATHFINDER ENERGY SE...
6/22/2014	6,910.00	0.70	120.46	6,894.50	87.64	-189.89	-76.36	0.12	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,004.00	0.44	123.27	6,988.49	86.88	-190.38	-75.56	0.28	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,099.00	0.53	130.78	7,083.49	86.27	-190.86	-74.92	0.12	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,193.00	0.62	196.09	7,177.49	86.13	-191.64	-74.73	0.67	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,288.00	0.70	210.18	7,272.48	86.62	-192.63	-75.17	0.19	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,382.00	0.53	214.23	7,366.48	87.21	-193.49	-75.70	0.19	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,476.00	0.26	168.75	7,460.47	87.44	-194.06	-75.90	0.42	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,571.00	0.44	136.74	7,555.47	87.18	-194.53	-75.61	0.27	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,665.00	0.70	113.12	7,649.47	86.44	-195.02	-74.84	0.37	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,760.00	1.32	99.83	7,744.45	84.85	-195.44	-73.22	0.69	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,854.00	1.06	98.26	7,838.43	82.95	-195.75	-71.30	0.28	MWD	PATHFINDER ENERGY SE...
6/22/2014	7,949.00	0.70	57.58	7,933.42	81.58	-195.56	-69.94	0.74	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,043.00	0.62	69.65	8,027.41	80.59	-195.08	-68.98	0.17	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,138.00	0.53	197.22	8,122.41	80.25	-195.32	-68.62	1.09	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,232.00	0.88	177.58	8,216.41	80.42	-196.45	-68.72	0.45	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,327.00	2.02	210.22	8,311.37	81.36	-198.63	-69.53	1.44	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,421.00	2.29	210.58	8,405.31	83.33	-201.68	-71.32	0.29	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,436.00	2.11	212.16	8,420.30	83.66	-202.17	-71.62	1.27	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,530.00	2.55	209.96	8,514.22	85.82	-205.45	-73.59	0.48	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,562.00	4.22	223.76	8,546.16	87.07	-206.91	-74.76	5.77	MWD	PATHFINDER ENERGY SE...
6/22/2014	8,593.00	4.04	233.96	8,577.08	88.83	-208.38	-76.43	2.44	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,625.00	3.52	245.21	8,609.01	90.70	-209.45	-78.23	2.82	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,656.00	5.10	249.51	8,639.92	92.90	-210.34	-80.39	5.20	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,688.00	8.35	251.89	8,671.70	96.51	-211.56	-83.93	10.19	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,719.00	11.87	254.00	8,702.21	101.80	-213.14	-89.14	11.42	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,751.00	16.97	253.56	8,733.20	109.57	-215.37	-96.78	15.94	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,782.00	21.37	252.15	8,762.47	119.45	-218.38	-106.50	14.27	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,814.00	24.62	250.83	8,791.92	131.52	-222.36	-118.35	10.28	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,845.00	28.23	248.19	8,819.68	144.70	-227.20	-131.26	12.24	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,877.00	31.30	247.14	8,847.46	159.72	-233.24	-145.95	9.73	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,908.00	34.12	245.65	8,873.54	175.44	-239.96	-161.30	9.46	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,940.00	36.40	243.10	8,899.67	192.54	-247.96	-177.94	8.48	MWD	PATHFINDER ENERGY SE...
7/9/2014	8,971.00	39.92	240.46	8,924.04	209.92	-257.03	-194.81	12.51	MWD	PATHFINDER ENERGY SE...

devon

Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location SEC23 T19S R31E	API/UWI 3001541914	Latitude (°) 32° 38' 47.84" N	Longitude (°) 103° 50' 53.103" W	Ground Elev... 3,540.80
				KB - GL (ft) 26.20
				Orig KB Elev (ft) 3,567.00
				Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Survey Tool	Survey Company
7/9/2014	9,002.00	43.26	238.00	8,947.22	228.19	-267.56	-212.47	11.99	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,034.00	46.08	236.33	8,969.98	247.79	-279.76	-231.37	9.55	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,065.00	48.72	235.36	8,990.96	267.40	-292.58	-250.25	8.82	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,097.00	50.91	234.83	9,011.61	288.25	-306.57	-270.29	6.96	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,128.00	54.43	233.69	9,030.40	309.08	-320.97	-290.30	11.72	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,160.00	57.95	233.34	9,048.21	331.37	-336.78	-311.67	11.04	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,192.00	60.94	234.22	9,064.47	354.54	-353.05	-333.90	9.64	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,223.00	64.28	236.24	9,078.73	378.05	-368.74	-356.51	12.23	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,255.00	68.24	238.79	9,091.62	403.66	-384.46	-381.21	14.36	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,286.00	71.40	240.37	9,102.31	429.59	-399.19	-406.30	11.26	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,318.00	74.13	242.39	9,111.79	457.25	-413.82	-433.13	10.45	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,349.00	74.92	242.83	9,120.06	484.55	-427.57	-459.66	2.89	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,381.00	76.94	242.57	9,127.84	512.94	-441.80	-487.24	6.36	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,412.00	78.96	241.69	9,134.31	540.54	-455.97	-514.04	7.08	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,494.00	88.81	241.43	9,143.04	614.35	-494.76	-585.64	12.02	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,588.00	89.87	240.63	9,144.12	699.17	-540.28	-667.87	1.41	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,683.00	90.48	241.07	9,143.83	784.78	-586.56	-750.84	0.79	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,777.00	90.22	242.57	9,143.25	870.15	-630.94	-833.69	1.62	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,871.00	89.43	244.85	9,143.54	956.77	-672.57	-917.96	2.57	MWD	PATHFINDER ENERGY SE...
7/9/2014	9,966.00	89.60	247.05	9,144.35	1,045.69	-711.29	-1,004.71	2.32	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,060.00	90.75	251.09	9,144.06	1,135.33	-744.86	-1,092.49	4.47	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,155.00	90.84	255.05	9,142.74	1,227.69	-772.51	-1,183.34	4.17	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,249.00	91.19	258.48	9,141.07	1,320.29	-794.03	-1,274.82	3.67	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,344.00	91.19	263.22	9,139.10	1,414.77	-809.13	-1,368.56	4.99	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,438.00	89.87	268.15	9,138.23	1,508.73	-816.20	-1,462.26	5.43	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,533.00	89.78	272.01	9,138.52	1,603.53	-816.07	-1,557.24	4.06	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,627.00	91.10	272.28	9,137.80	1,697.08	-812.55	-1,651.17	1.43	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,721.00	91.45	272.71	9,135.71	1,790.55	-808.46	-1,745.06	0.59	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,816.00	91.10	270.52	9,133.59	1,885.15	-805.78	-1,839.99	2.33	MWD	PATHFINDER ENERGY SE...
7/9/2014	10,910.00	90.66	268.67	9,132.15	1,979.00	-806.44	-1,933.97	2.02	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,005.00	90.92	267.62	9,130.84	2,073.95	-809.52	-2,028.91	1.14	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,099.00	91.01	267.62	9,129.26	2,167.92	-813.42	-2,122.82	0.10	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,194.00	90.66	267.97	9,127.87	2,262.89	-817.08	-2,217.74	0.52	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,288.00	90.57	267.97	9,126.86	2,356.85	-820.41	-2,311.67	0.10	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,383.00	90.57	267.79	9,125.92	2,451.82	-823.92	-2,406.60	0.19	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,477.00	90.48	267.00	9,125.06	2,545.81	-828.19	-2,500.50	0.85	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,571.00	90.04	267.53	9,124.63	2,639.80	-832.68	-2,594.39	0.73	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,666.00	90.13	267.35	9,124.49	2,734.79	-836.92	-2,689.30	0.21	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,760.00	90.13	267.97	9,124.28	2,828.77	-840.76	-2,783.22	0.66	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,855.00	90.31	267.62	9,123.91	2,923.75	-844.41	-2,878.15	0.41	MWD	PATHFINDER ENERGY SE...
7/9/2014	11,949.00	90.48	267.27	9,123.26	3,017.73	-848.60	-2,972.05	0.41	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,044.00	90.84	267.09	9,122.17	3,112.72	-853.28	-3,066.93	0.42	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,138.00	90.75	269.20	9,120.86	3,206.67	-856.32	-3,160.87	2.25	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,233.00	91.36	268.94	9,119.12	3,301.56	-857.86	-3,255.84	0.70	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,328.00	91.89	268.59	9,116.42	3,396.45	-859.91	-3,350.78	0.67	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,422.00	92.07	267.62	9,113.17	3,490.36	-863.01	-3,444.67	1.05	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,516.00	91.19	267.44	9,110.50	3,584.31	-867.06	-3,538.54	0.96	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,611.00	89.43	266.65	9,109.99	3,679.30	-871.96	-3,633.41	2.03	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,705.00	89.43	265.77	9,110.92	3,773.29	-878.17	-3,727.20	0.94	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,800.10	89.78	266.12	9,111.58	3,868.38	-884.90	-3,822.06	0.52	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,894.00	88.64	267.27	9,112.87	3,962.27	-890.31	-3,915.79	1.72	MWD	PATHFINDER ENERGY SE...
7/9/2014	12,989.00	89.52	267.97	9,114.40	4,057.24	-894.26	-4,010.69	1.18	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,083.00	89.78	267.79	9,114.97	4,151.21	-897.73	-4,104.63	0.34	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,178.00	89.43	267.88	9,115.63	4,246.19	-901.32	-4,199.56	0.38	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,272.00	89.52	267.88	9,116.49	4,340.16	-904.80	-4,293.49	0.10	MWD	PATHFINDER ENERGY SE...

devon

Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location SEC23 T19S R31E	API/UWI 3001541914	Latitude (") 32° 38' 47.84" N	Longitude (") 103° 50' 53.103" W	Ground Elev... 3,540.80
			KB - GL (ft) 26.20	Orig KB Elev (ft) 3,567.00
				Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Incl (")	Azm (")	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS ("/100ft)	Survey Tool	Survey Company
7/9/2014	13,367.00	91.01	268.15	9,116.05	4,435.12	-908.09	-4,388.43	1.59	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,461.00	90.92	268.06	9,114.46	4,529.07	-911.20	-4,482.36	0.14	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,556.00	90.31	267.18	9,113.44	4,624.05	-915.14	-4,577.27	1.13	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,651.00	90.48	267.27	9,112.79	4,719.04	-919.74	-4,672.16	0.20	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,745.00	91.19	267.27	9,111.42	4,813.02	-924.22	-4,766.04	0.76	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,839.00	91.19	266.21	9,109.47	4,907.00	-929.56	-4,859.87	1.13	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,934.00	91.28	264.80	9,107.42	5,001.96	-937.01	-4,954.55	1.49	MWD	PATHFINDER ENERGY SE...
7/9/2014	13,963.00	91.63	264.37	9,106.68	5,030.93	-939.74	-4,983.41	1.91	MWD	PATHFINDER ENERGY SE...
7/16/2014	14,045.00	91.63	264.37	9,104.35	5,112.84	-947.78	-5,064.99	0.00	BIT	PATHFINDER ENERGY SE...