

RED WILLOW PROD. CO.

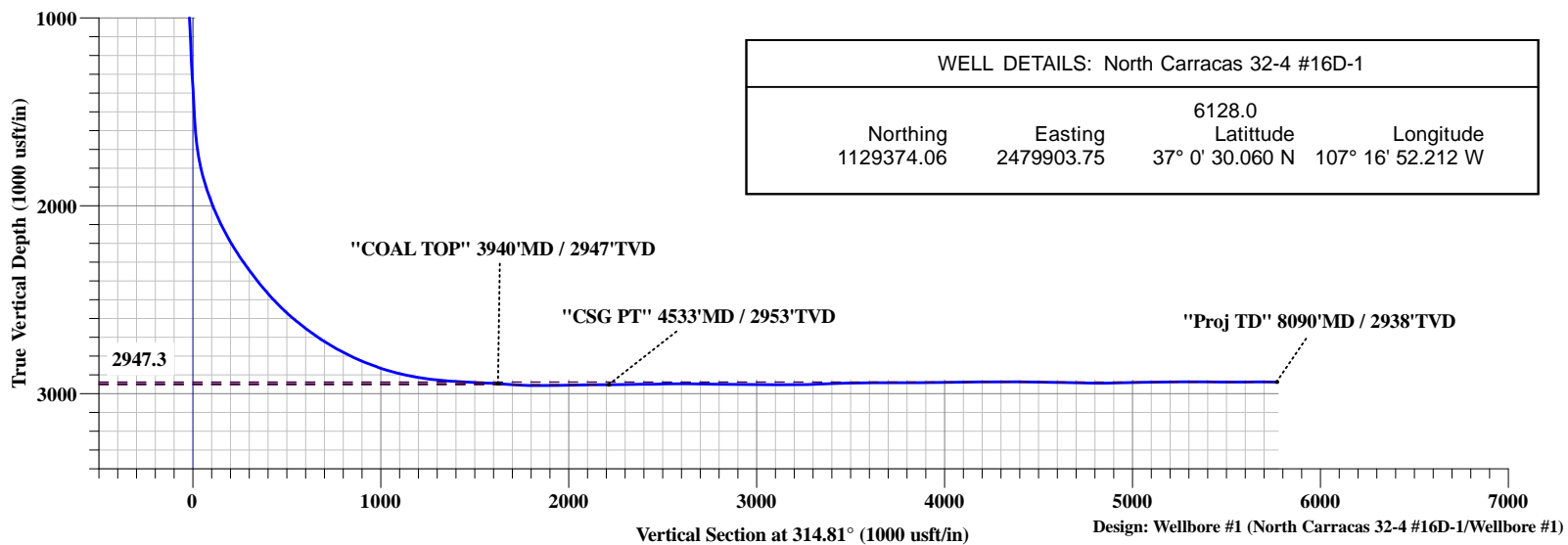
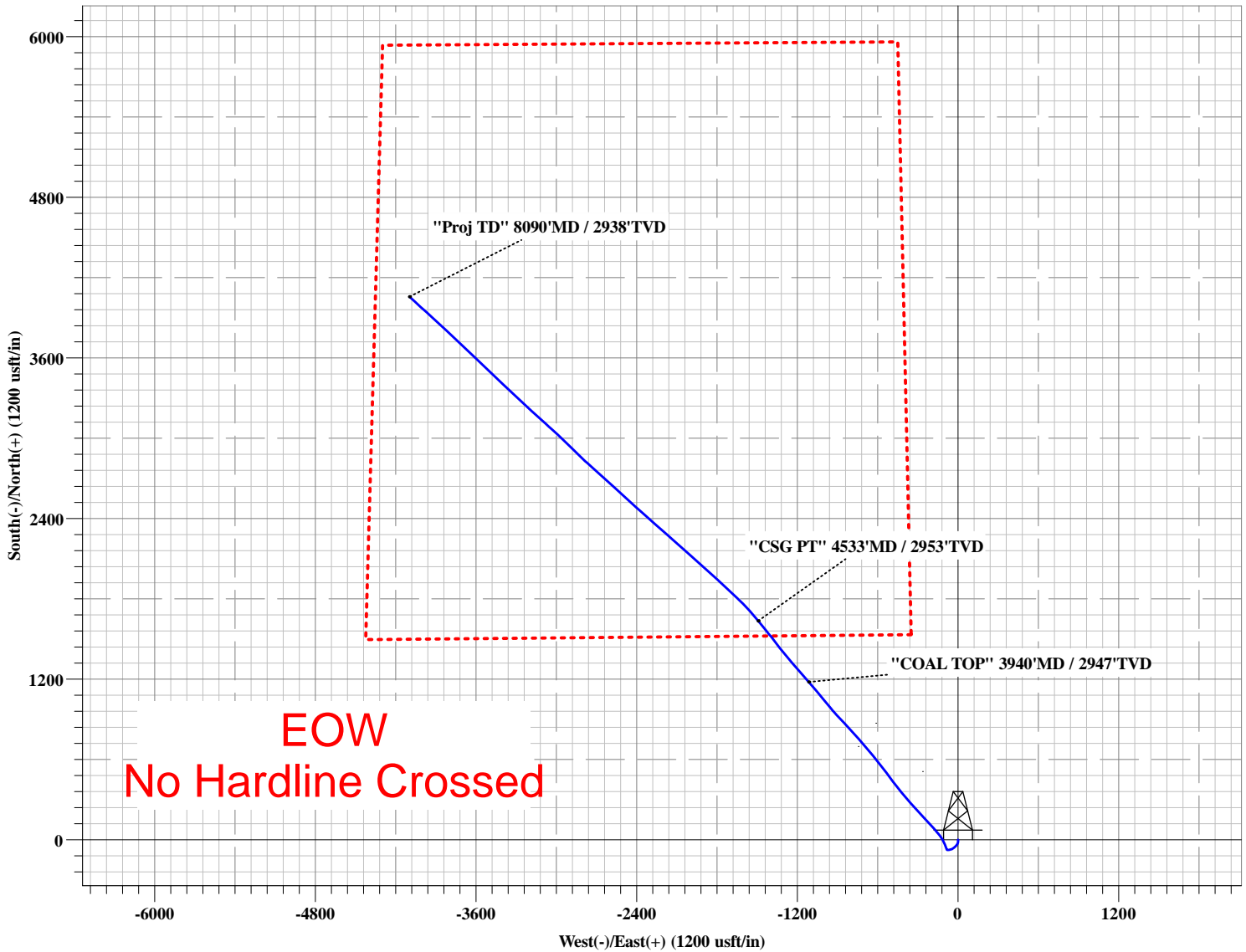
North Carracas 32-4 #16D-1
Sec21 T32N-R04W - 16D-1

Archuleta Co. CO.

GE: 6128' / KB: 20'

PATHFINDER®

A Schlumberger Company



WELL DETAILS: North Carracas 32-4 #16D-1

Northing	Easting	Latitude	Longitude
1129374.06	2479903.75	37° 0' 30.060 N	107° 16' 52.212 W

RED WILLOW PROD. CO.

Archuleta Co. CO.

Sec21 T32N-R04W - 16D-1

North Carracas 32-4 #16D-1

Wellbore #1

Design: Wellbore #1

Standard Survey Report

08 September, 2011

Survey Report

Company:	RED WILLOW PROD. CO.	Local Co-ordinate Reference:	Site Sec21 T32N-R04W - 16D-1
Project:	Archuleta Co. CO.	TVD Reference:	WELL @ 6148.0usft (Original Well Elev)
Site:	Sec21 T32N-R04W - 16D-1	MD Reference:	WELL @ 6148.0usft (Original Well Elev)
Well:	North Carracas 32-4 #16D-1	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Archuleta Co. CO.		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site		Sec21 T32N-R04W - 16D-1			
Site Position:		Northing:	1,129,374.06 usft	Latitude:	37° 0' 30.060 N
From:	Map	Easting:	2,479,903.75 usft	Longitude:	107° 16' 52.212 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.09 °

Well	North Carracas 32-4 #16D-1					
Well Position	+N/-S	0.0 usft	Northing:	1,129,374.06 usft	Latitude:	37° 0' 30.060 N
	+E/-W	0.0 usft	Easting:	2,479,903.75 usft	Longitude:	107° 16' 52.212 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	6,128.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	09/08/11	9.69	63.78	50,931

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	314.81	

Survey Program	Date	09/08/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
107.0	8,090.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
107.0	0.24	288.42	107.0	0.1	-0.2	0.2	0.22	0.22	0.00	
207.0	0.24	182.01	207.0	-0.1	-0.4	0.2	0.38	0.00	-106.41	
307.0	1.73	164.01	307.0	-1.7	0.0	-1.2	1.50	1.49	-18.00	
407.0	3.59	174.79	406.9	-6.3	0.7	-4.9	1.92	1.86	10.78	
507.0	5.35	189.15	506.6	-14.0	0.2	-10.0	2.07	1.76	14.36	
607.0	6.87	200.08	606.0	-24.2	-2.6	-15.3	1.91	1.52	10.93	
707.0	8.23	213.06	705.1	-35.9	-8.5	-19.2	2.17	1.36	12.98	
727.0	8.39	216.64	724.9	-38.2	-10.2	-19.7	2.71	0.80	17.90	
869.0	8.44	229.69	865.4	-53.3	-24.3	-20.3	1.34	0.04	9.19	

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Site:	Sec21 T32N-R04W - 16D-1	MD Reference:	WELL @ 6148.0usft (Original Well Elev)
Well:	North Carracas 32-4 #16D-1	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
960.0	8.00	234.80	955.5	-61.3	-34.6	-18.6	0.94	-0.48	5.62	
1,051.0	7.12	244.12	1,045.7	-67.4	-44.8	-15.7	1.66	-0.97	10.24	
1,141.0	6.33	250.21	1,135.1	-71.5	-54.5	-11.7	1.18	-0.88	6.77	
1,233.0	5.36	257.43	1,226.6	-74.1	-63.5	-7.2	1.32	-1.05	7.85	
1,324.0	5.10	266.34	1,317.2	-75.3	-71.7	-2.2	0.94	-0.29	9.79	
1,419.0	3.78	281.89	1,411.9	-74.9	-78.9	3.2	1.87	-1.39	16.37	
1,451.0	3.52	288.52	1,443.9	-74.4	-80.9	4.9	1.55	-0.81	20.72	
1,483.0	3.08	298.97	1,475.8	-73.7	-82.6	6.7	2.32	-1.38	32.66	
1,514.0	2.73	309.71	1,506.8	-72.8	-83.9	8.2	2.08	-1.13	34.65	
1,546.0	2.90	323.54	1,538.7	-71.7	-84.9	9.8	2.18	0.53	43.22	
1,578.0	3.52	332.52	1,570.7	-70.2	-85.9	11.5	2.49	1.94	28.06	
1,610.0	4.57	336.98	1,602.6	-68.1	-86.8	13.6	3.42	3.28	13.94	
1,642.0	6.16	338.86	1,634.5	-65.3	-88.0	16.4	5.00	4.97	5.88	
1,674.0	7.74	340.01	1,666.2	-61.7	-89.3	19.9	4.96	4.94	3.59	
1,706.0	9.50	341.30	1,697.9	-57.2	-90.9	24.2	5.53	5.50	4.03	
1,738.0	11.08	340.85	1,729.3	-51.8	-92.7	29.3	4.94	4.94	-1.41	
1,770.0	12.57	339.42	1,760.7	-45.6	-95.0	35.2	4.75	4.66	-4.47	
1,801.0	13.81	339.12	1,790.8	-39.0	-97.5	41.7	4.01	4.00	-0.97	
1,833.0	14.95	337.77	1,821.8	-31.6	-100.4	49.0	3.71	3.56	-4.22	
1,865.0	16.18	336.07	1,852.7	-23.7	-103.8	56.9	4.10	3.84	-5.31	
1,897.0	17.32	334.08	1,883.3	-15.3	-107.7	65.6	3.99	3.56	-6.22	
1,929.0	18.55	331.95	1,913.8	-6.6	-112.1	74.9	4.36	3.84	-6.66	
1,961.0	19.96	330.09	1,944.0	2.7	-117.3	85.1	4.80	4.41	-5.81	
1,993.0	21.28	328.02	1,973.9	12.3	-123.1	96.0	4.71	4.13	-6.47	
2,024.0	22.34	325.03	2,002.7	21.9	-129.4	107.3	4.95	3.42	-9.65	
2,056.0	23.39	323.26	2,032.2	32.0	-136.7	119.5	3.92	3.28	-5.53	
2,088.0	24.36	320.88	2,061.4	42.2	-144.7	132.4	4.27	3.03	-7.44	
2,120.0	25.76	319.84	2,090.4	52.6	-153.3	145.9	4.59	4.38	-3.25	
2,151.0	27.26	320.39	2,118.2	63.3	-162.2	159.6	4.90	4.84	1.77	
2,182.0	28.31	319.53	2,145.6	74.3	-171.5	174.0	3.63	3.39	-2.77	
2,214.0	29.63	318.55	2,173.6	86.0	-181.6	189.5	4.38	4.13	-3.06	
2,246.0	30.78	318.52	2,201.3	98.1	-192.3	205.6	3.59	3.59	-0.09	
2,277.0	31.92	317.54	2,227.7	110.1	-203.1	221.7	4.03	3.68	-3.16	
2,309.0	32.89	317.01	2,254.7	122.7	-214.7	238.8	3.16	3.03	-1.66	
2,341.0	34.12	317.14	2,281.4	135.6	-226.8	256.4	3.85	3.84	0.41	
2,373.0	35.35	316.74	2,307.7	148.9	-239.2	274.7	3.91	3.84	-1.25	
2,405.0	36.58	316.94	2,333.6	162.6	-252.1	293.4	3.86	3.84	0.63	
2,436.0	36.84	316.97	2,358.5	176.2	-264.7	312.0	0.84	0.84	0.10	
2,468.0	37.64	316.26	2,383.9	190.2	-278.0	331.3	2.84	2.50	-2.22	
2,500.0	38.43	316.82	2,409.2	204.6	-291.6	351.0	2.69	2.47	1.75	
2,532.0	39.66	317.40	2,434.0	219.3	-305.3	371.2	4.01	3.84	1.81	
2,564.0	40.80	317.39	2,458.4	234.5	-319.3	391.8	3.56	3.56	-0.03	
2,596.0	42.21	318.71	2,482.4	250.3	-333.5	413.0	5.19	4.41	4.13	
2,628.0	43.53	319.11	2,505.9	266.7	-347.8	434.7	4.21	4.13	1.25	

Survey Report

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Site:	Sec21 T32N-R04W - 16D-1	MD Reference:	WELL @ 6148.0usft (Original Well Elev)
Well:	North Carracas 32-4 #16D-1	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
2,660.0	45.20	319.45	2,528.7	283.7	-362.4	457.0	5.27	5.22	1.06	
2,692.0	46.43	319.58	2,551.0	301.1	-377.3	479.9	3.85	3.84	0.41	
2,724.0	47.92	319.93	2,572.8	319.0	-392.4	503.3	4.72	4.66	1.09	
2,755.0	49.95	320.74	2,593.1	337.0	-407.3	526.5	6.84	6.55	2.61	
2,787.0	50.56	320.71	2,613.6	356.1	-422.9	551.0	1.91	1.91	-0.09	
2,819.0	51.70	321.10	2,633.7	375.4	-438.6	575.8	3.69	3.56	1.22	
2,851.0	52.76	320.86	2,653.3	395.1	-454.5	600.9	3.37	3.31	-0.75	
2,883.0	53.82	321.38	2,672.4	415.0	-470.6	626.4	3.56	3.31	1.63	
2,915.0	55.22	321.83	2,691.0	435.5	-486.8	652.3	4.52	4.38	1.41	
2,947.0	56.81	322.24	2,708.9	456.4	-503.2	678.6	5.08	4.97	1.28	
2,979.0	58.04	322.74	2,726.1	477.8	-519.6	705.3	4.06	3.84	1.56	
3,011.0	59.44	322.78	2,742.7	499.6	-536.1	732.4	4.38	4.38	0.13	
3,042.0	60.76	323.19	2,758.2	521.0	-552.3	759.0	4.41	4.26	1.32	
3,074.0	62.34	323.32	2,773.4	543.6	-569.1	786.8	4.95	4.94	0.41	
3,106.0	63.58	322.78	2,788.0	566.3	-586.3	815.1	4.16	3.88	-1.69	
3,138.0	65.07	322.72	2,801.8	589.3	-603.7	843.6	4.66	4.66	-0.19	
3,170.0	65.95	321.82	2,815.1	612.3	-621.5	872.5	3.76	2.75	-2.81	
3,201.0	67.44	321.21	2,827.3	634.6	-639.3	900.8	5.13	4.81	-1.97	
3,233.0	68.41	320.23	2,839.4	657.6	-658.0	930.3	4.15	3.03	-3.06	
3,264.0	69.64	319.43	2,850.5	679.7	-676.7	959.1	4.64	3.97	-2.58	
3,296.0	71.23	318.98	2,861.2	702.5	-696.4	989.2	5.14	4.97	-1.41	
3,328.0	72.72	318.44	2,871.1	725.4	-716.5	1,019.5	4.92	4.66	-1.69	
3,360.0	74.48	318.08	2,880.1	748.3	-736.9	1,050.2	5.60	5.50	-1.13	
3,392.0	75.18	317.84	2,888.5	771.2	-757.6	1,081.0	2.30	2.19	-0.75	
3,424.0	76.41	317.40	2,896.3	794.1	-778.5	1,112.0	4.07	3.84	-1.38	
3,456.0	78.00	317.20	2,903.4	817.1	-799.7	1,143.2	5.01	4.97	-0.63	
3,488.0	79.14	317.26	2,909.8	840.1	-821.0	1,174.5	3.57	3.56	0.19	
3,519.0	80.46	316.93	2,915.3	862.4	-841.7	1,205.0	4.39	4.26	-1.06	
3,551.0	82.04	316.74	2,920.1	885.5	-863.4	1,236.6	4.97	4.94	-0.59	
3,583.0	83.36	317.17	2,924.2	908.7	-885.0	1,268.3	4.33	4.13	1.34	
3,615.0	85.47	318.08	2,927.3	932.2	-906.5	1,300.1	7.18	6.59	2.84	
3,647.0	85.74	318.79	2,929.8	956.1	-927.7	1,331.9	2.37	0.84	2.22	
3,679.0	86.09	320.48	2,932.0	980.4	-948.3	1,363.8	5.38	1.09	5.28	
3,711.0	86.09	320.89	2,934.2	1,005.1	-968.6	1,395.5	1.28	0.00	1.28	
3,743.0	86.53	320.46	2,936.3	1,029.8	-988.8	1,427.3	1.92	1.38	-1.34	
3,775.0	86.26	319.98	2,938.3	1,054.4	-1,009.2	1,459.1	1.72	-0.84	-1.50	
3,806.0	86.35	319.83	2,940.3	1,078.0	-1,029.2	1,489.9	0.56	0.29	-0.48	
3,838.0	87.32	320.03	2,942.1	1,102.5	-1,049.7	1,521.7	3.09	3.03	0.63	
3,870.0	87.05	319.87	2,943.6	1,126.9	-1,070.3	1,553.5	0.98	-0.84	-0.50	
3,902.0	87.14	319.70	2,945.3	1,151.3	-1,090.9	1,585.4	0.60	0.28	-0.53	
3,932.0	86.70	319.67	2,946.9	1,174.2	-1,110.3	1,615.2	1.47	-1.47	-0.10	
3,940.0	86.59	319.64	2,947.3	1,180.3	-1,115.5	1,623.2	1.43	-1.38	-0.37	
"COAL TOP" 3940'MD / 2947'TVD										

Survey Report

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,964.0	86.26	319.55	2,948.8	1,198.5	-1,131.0	1,647.1	1.43	-1.37	-0.38	
3,996.0	86.00	318.75	2,951.0	1,222.7	-1,151.9	1,678.9	2.62	-0.81	-2.50	
4,028.0	86.00	318.40	2,953.2	1,246.6	-1,173.0	1,710.7	1.09	0.00	-1.09	
4,059.0	86.70	318.65	2,955.2	1,269.8	-1,193.5	1,741.6	2.40	2.26	0.81	
4,091.0	88.46	318.15	2,956.5	1,293.7	-1,214.7	1,773.5	5.72	5.50	-1.56	
4,123.0	90.22	318.37	2,956.9	1,317.6	-1,236.0	1,805.5	5.54	5.50	0.69	
4,154.0	90.48	319.62	2,956.7	1,340.9	-1,256.4	1,836.4	4.12	0.84	4.03	
4,186.0	90.48	320.80	2,956.5	1,365.5	-1,276.9	1,868.2	3.69	0.00	3.69	
4,218.0	90.13	322.06	2,956.3	1,390.6	-1,296.8	1,900.0	4.09	-1.09	3.94	
4,250.0	90.40	322.30	2,956.1	1,415.8	-1,316.4	1,931.8	1.13	0.84	0.75	
4,282.0	90.92	322.15	2,955.8	1,441.1	-1,336.0	1,963.5	1.69	1.63	-0.47	
4,313.0	90.84	321.90	2,955.3	1,465.6	-1,355.1	1,994.2	0.85	-0.26	-0.81	
4,345.0	90.92	321.62	2,954.8	1,490.7	-1,374.9	2,026.0	0.91	0.25	-0.88	
4,377.0	90.84	321.12	2,954.3	1,515.7	-1,394.9	2,057.8	1.58	-0.25	-1.56	
4,409.0	90.75	320.63	2,953.9	1,540.5	-1,415.1	2,089.6	1.56	-0.28	-1.53	
4,441.0	90.48	320.73	2,953.5	1,565.3	-1,435.3	2,121.4	0.90	-0.84	0.31	
4,533.0	90.80	320.99	2,952.5	1,636.6	-1,493.4	2,212.9	0.45	0.35	0.28	
"CSG PT" 4533'MD / 2953'TVD										
4,543.0	90.84	321.02	2,952.4	1,644.4	-1,499.7	2,222.9	0.45	0.35	0.28	
4,606.0	90.75	318.45	2,951.5	1,692.4	-1,540.4	2,285.6	4.08	-0.14	-4.08	
4,702.0	90.13	315.72	2,950.7	1,762.7	-1,605.8	2,381.5	2.92	-0.65	-2.84	
4,765.0	91.19	313.58	2,950.0	1,807.0	-1,650.6	2,444.5	3.79	1.68	-3.40	
4,829.0	91.63	313.34	2,948.4	1,851.0	-1,697.0	2,508.5	0.78	0.69	-0.38	
4,893.0	89.78	312.61	2,947.7	1,894.6	-1,743.8	2,572.4	3.11	-2.89	-1.14	
4,956.0	89.78	312.85	2,947.9	1,937.4	-1,790.1	2,635.4	0.38	0.00	0.38	
5,020.0	89.69	312.33	2,948.2	1,980.7	-1,837.2	2,699.3	0.82	-0.14	-0.81	
5,083.0	88.72	311.77	2,949.1	2,022.9	-1,884.0	2,762.3	1.78	-1.54	-0.89	
5,147.0	88.81	311.59	2,950.4	2,065.4	-1,931.8	2,826.2	0.31	0.14	-0.28	
5,210.0	89.25	311.91	2,951.5	2,107.4	-1,978.8	2,889.1	0.86	0.70	0.51	
5,274.0	90.84	311.61	2,951.5	2,150.0	-2,026.5	2,953.0	2.53	2.48	-0.47	
5,338.0	89.08	311.66	2,951.5	2,192.5	-2,074.4	3,016.9	2.75	-2.75	0.08	
5,401.0	89.60	311.57	2,952.2	2,234.4	-2,121.5	3,079.8	0.84	0.83	-0.14	
5,465.0	90.40	311.28	2,952.2	2,276.7	-2,169.5	3,143.6	1.33	1.25	-0.45	
5,529.0	90.48	311.00	2,951.7	2,318.8	-2,217.7	3,207.5	0.45	0.13	-0.44	
5,592.0	90.84	311.22	2,951.0	2,360.2	-2,265.1	3,270.4	0.67	0.57	0.35	
5,656.0	92.42	311.57	2,949.2	2,402.5	-2,313.1	3,334.2	2.53	2.47	0.55	
5,719.0	92.33	312.23	2,946.6	2,444.6	-2,360.0	3,397.1	1.06	-0.14	1.05	
5,783.0	91.45	311.82	2,944.5	2,487.4	-2,407.5	3,461.0	1.52	-1.38	-0.64	
5,847.0	91.10	312.02	2,943.0	2,530.1	-2,455.1	3,524.9	0.63	-0.55	0.31	
5,908.0	90.48	312.85	2,942.2	2,571.3	-2,500.1	3,585.8	1.70	-1.02	1.36	
5,969.0	89.96	312.50	2,942.0	2,612.6	-2,544.9	3,646.8	1.03	-0.85	-0.57	
6,030.0	90.13	311.46	2,941.9	2,653.4	-2,590.3	3,707.7	1.73	0.28	-1.70	
6,089.0	90.31	312.29	2,941.7	2,692.8	-2,634.2	3,766.6	1.44	0.31	1.41	
6,150.0	89.78	312.24	2,941.6	2,733.9	-2,679.4	3,827.6	0.87	-0.87	-0.08	

Survey Report

Company:	RED WILLOW PROD. CO.	Local Co-ordinate Reference:	Site Sec21 T32N-R04W - 16D-1
Project:	Archuleta Co. CO.	TVD Reference:	WELL @ 6148.0usft (Original Well Elev)
Site:	Sec21 T32N-R04W - 16D-1	MD Reference:	WELL @ 6148.0usft (Original Well Elev)
Well:	North Carracas 32-4 #16D-1	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
6,211.0	91.19	312.46	2,941.1	2,774.9	-2,724.4	3,888.5	2.34	2.31	0.36	
6,272.0	89.96	311.52	2,940.5	2,815.8	-2,769.8	3,949.4	2.54	-2.02	-1.54	
6,333.0	90.57	313.72	2,940.2	2,857.1	-2,814.7	4,010.4	3.74	1.00	3.61	
6,394.0	91.28	315.24	2,939.3	2,899.8	-2,858.2	4,071.4	2.75	1.16	2.49	
6,456.0	90.57	314.09	2,938.3	2,943.4	-2,902.3	4,133.4	2.18	-1.15	-1.85	
6,515.0	90.40	313.93	2,937.8	2,984.4	-2,944.7	4,192.4	0.40	-0.29	-0.27	
6,577.0	90.57	312.25	2,937.2	3,026.7	-2,990.0	4,254.3	2.72	0.27	-2.71	
6,636.0	89.69	311.60	2,937.1	3,066.1	-3,033.9	4,313.3	1.85	-1.49	-1.10	
6,697.0	89.78	313.34	2,937.4	3,107.3	-3,078.9	4,374.2	2.86	0.15	2.85	
6,759.0	89.34	312.15	2,937.9	3,149.4	-3,124.4	4,436.2	2.05	-0.71	-1.92	
6,820.0	89.69	311.84	2,938.4	3,190.2	-3,169.7	4,497.1	0.77	0.57	-0.51	
6,881.0	88.99	312.28	2,939.1	3,231.1	-3,215.0	4,558.0	1.36	-1.15	0.72	
6,942.0	88.81	313.34	2,940.2	3,272.5	-3,259.8	4,619.0	1.76	-0.30	1.74	
7,003.0	88.72	313.60	2,941.6	3,314.5	-3,304.0	4,679.9	0.45	-0.15	0.43	
7,065.0	87.85	313.51	2,943.4	3,357.2	-3,348.9	4,741.9	1.41	-1.40	-0.15	
7,126.0	89.52	312.97	2,944.8	3,398.9	-3,393.3	4,802.8	2.88	2.74	-0.89	
7,186.0	91.54	313.40	2,944.3	3,440.0	-3,437.1	4,862.8	3.44	3.37	0.72	
7,247.0	91.54	312.85	2,942.6	3,481.7	-3,481.6	4,923.8	0.90	0.00	-0.90	
7,309.0	91.36	313.66	2,941.0	3,524.2	-3,526.7	4,985.7	1.34	-0.29	1.31	
7,370.0	90.92	314.47	2,939.8	3,566.6	-3,570.6	5,046.7	1.51	-0.72	1.33	
7,431.0	90.22	314.51	2,939.2	3,609.3	-3,614.1	5,107.7	1.15	-1.15	0.07	
7,491.0	90.66	313.44	2,938.8	3,651.0	-3,657.3	5,167.7	1.93	0.73	-1.78	
7,551.0	91.36	313.62	2,937.7	3,692.3	-3,700.7	5,227.7	1.20	1.17	0.30	
7,612.0	90.40	313.17	2,936.8	3,734.2	-3,745.1	5,288.6	1.74	-1.57	-0.74	
7,674.0	89.16	312.35	2,937.0	3,776.3	-3,790.6	5,350.6	2.40	-2.00	-1.32	
7,735.0	89.08	312.44	2,937.9	3,817.4	-3,835.6	5,411.5	0.20	-0.13	0.15	
7,796.0	89.60	312.88	2,938.7	3,858.7	-3,880.5	5,472.5	1.12	0.85	0.72	
7,857.0	89.87	312.42	2,938.9	3,900.1	-3,925.3	5,533.4	0.87	0.44	-0.75	
7,918.0	91.19	312.51	2,938.4	3,941.3	-3,970.3	5,594.4	2.17	2.16	0.15	
7,979.0	90.40	312.56	2,937.5	3,982.5	-4,015.3	5,655.3	1.30	-1.30	0.08	
8,031.0	89.52	312.55	2,937.6	4,017.7	-4,053.6	5,707.3	1.69	-1.69	-0.02	
8,090.0	89.52	312.55	2,938.1	4,057.6	-4,097.1	5,766.2	0.00	0.00	0.00	
"Proj TD" 8090'MD / 2938'TVD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
3,940.0	2,947.3	1,180.3	-1,115.5	"COAL TOP" 3940'MD / 2947'TVD	
4,533.0	2,952.5	1,636.6	-1,493.4	"CSG PT" 4533'MD / 2953'TVD	
8,090.0	2,938.1	4,057.6	-4,097.1	"Proj TD" 8090'MD / 2938'TVD	

Survey Report

Company:	RED WILLOW PROD. CO.	Local Co-ordinate Reference:	Site Sec21 T32N-R04W - 16D-1
Project:	Archuleta Co. CO.	TVD Reference:	WELL @ 6148.0usft (Original Well Elev)
Site:	Sec21 T32N-R04W - 16D-1	MD Reference:	WELL @ 6148.0usft (Original Well Elev)
Well:	North Carracas 32-4 #16D-1	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Checked By: _____ Approved By: _____ Date: _____