

Williams Production Co. - San Juan Basin

New Mexico
Rio Arriba County
Sec. 21-T31N-R6W
Rosa Unit #32C

Rosa Unit 32C MWD & Single-Shot Survey

30-039-27240

Surface: 1675/N 1700/W Sec. 21, 31N, 6W
B/L 615/N 763/W

SURVEY REPORT

NSL

1 November, 2002



sperry-sun
DRILLING SERVICES
A Halliburton Company

Survey Ref: svy7701

Sperry-Sun Drilling Services

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Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
560.00	0.300	354.000	560.00	1.46 N	0.15 W	1.13	0.054
650.00	2.300	304.000	649.97	2.70 N	1.68 W	3.09	2.355
741.00	4.800	304.500	740.79	5.88 N	6.33 W	8.64	2.747
831.00	8.000	308.900	830.22	11.95 N	14.31 W	18.58	3.594
925.00	10.900	314.800	922.93	22.32 N	25.71 W	33.99	3.249
1020.00	12.900	315.500	1015.89	36.21 N	39.51 W	53.57	2.111
1115.00	14.500	320.200	1108.18	52.92 N	54.56 W	76.01	2.050
1210.00	17.800	320.100	1199.42	73.20 N	71.49 W	102.29	3.474
1306.00	20.000	318.700	1290.24	96.79 N	91.74 W	133.26	2.340
1401.00	23.000	316.900	1378.62	122.56 N	115.15 W	168.01	3.233
1496.00	25.800	313.000	1465.13	150.21 N	142.96 W	207.23	3.399
1590.00	29.100	313.600	1548.54	179.94 N	174.48 W	250.55	3.523
1685.00	30.900	314.600	1630.81	213.00 N	208.58 W	298.04	1.966
1779.00	32.600	315.300	1710.74	247.95 N	243.58 W	347.50	1.850
1874.00	32.700	315.800	1790.73	284.53 N	279.47 W	398.74	0.303
1968.00	32.900	313.900	1869.74	320.44 N	315.57 W	449.65	1.115
2063.00	33.000	313.400	1949.46	356.11 N	352.96 W	501.32	0.305
2158.00	33.200	313.400	2029.05	391.75 N	390.65 W	553.19	0.211
2284.00	33.200	314.600	2134.48	439.68 N	440.28 W	622.18	0.521
2347.00	33.000	314.800	2187.26	463.88 N	464.74 W	656.59	0.362
2441.00	33.200	316.000	2266.00	500.43 N	500.78 W	707.91	0.729
2536.00	33.000	316.900	2345.59	538.03 N	536.52 W	759.75	0.559
2630.00	32.800	315.100	2424.51	574.75 N	571.99 W	810.78	1.062
2724.00	32.100	314.200	2503.83	610.20 N	607.86 W	861.22	0.905
2819.00	31.900	314.500	2584.40	645.39 N	643.86 W	911.56	0.269
2920.00	31.600	313.900	2670.28	682.44 N	681.96 W	964.70	0.431
3015.00	30.900	313.000	2751.50	716.34 N	717.74 W	1013.98	0.886
3108.00	28.800	312.000	2832.16	747.62 N	751.85 W	1080.24	2.321
3203.00	26.600	312.900	2916.27	777.41 N	784.44 W	1104.38	2.357
3298.00	24.800	313.600	3001.94	805.53 N	814.35 W	1145.41	2.129
3392.00	22.700	314.300	3088.04	831.69 N	841.50 W	1183.12	2.043
3487.00	20.100	313.900	3176.48	855.82 N	866.38 W	1217.78	2.741
3581.00	18.700	315.000	3265.14	877.67 N	888.68 W	1249.00	1.539
3674.00	16.800	315.100	3353.71	897.74 N	908.71 W	1277.35	2.043
3769.00	14.900	314.800	3445.09	916.07 N	927.07 W	1303.29	2.002
3863.00	12.300	312.900	3536.45	931.40 N	942.98 W	1325.39	2.806
3958.00	9.700	311.800	3629.70	943.63 N	956.36 W	1343.51	2.746
4052.00	6.700	313.300	3722.73	952.67 N	966.26 W	1356.90	3.199
4226.00	8.000	330.800	3895.32	970.20 N	979.56 W	1378.66	1.479
4411.00	7.500	344.800	4078.64	993.09 N	989.00 W	1401.41	1.053
4600.00	7.750	1.800	4265.99	1017.74 N	991.84 W	1420.65	1.196
5108.00	3.750	35.800	4771.46	1065.48 N	981.04 W	1446.27	1.002
5424.00	2.500	130.800	5087.15	1069.36 N	969.77 W	1440.91	1.482
5928.00	1.750	118.800	5590.80	1058.47 N	954.70 W	1422.52	0.172

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6412.00	1.500	199.800	6074.66	1048.95 N	950.37 W	1412.77	0.438
6909.00	0.500	315.800	6571.61	1044.38 N	954.09 W	1412.24	0.358
7401.00	1.000	92.800	7063.58	1045.71 N	951.30 W	1411.17	0.286
7974.00	1.500	33.800	7636.47	1051.70 N	942.13 W	1408.80	0.228
8355.00	1.500	33.800	8017.34	1059.98 N	936.58 W	1410.61	0.000

All data is in Feet (US) unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet (US).
Vertical Section is from Well and calculated along an Azimuth of 314.300° (True).

Based upon Minimum Curvature type calculations, at a Measured Depth of 8355.00ft.,
The Bottom Hole Displacement is 1414.48ft., in the Direction of 318.537° (True).

Comments

Measured Depth (ft)	Station Coordinates			Comment
	TVD (ft)	Northings (ft)	Eastings (ft)	
560.00	560.00	1.46 N	0.15 W	First MWD Survey
4052.00	3722.73	952.67 N	966.26 W	Final MWD Survey
4226.00	3895.32	970.20 N	979.56 W	Surveys from 4226' through 7974' are Single-Shot Surveys
8355.00	8017.34	1059.98 N	936.58 W	Survey Projection to TD

Survey and Drilling Parameters

Customer : Williams Production Company
 Well Name : Rosa Unit #46A
 Rig : Aztec Well Service Rig #222
 Surveys for BHA 1

Field : Blanco Mesa Verde
 Lease : Federal
 Job # : CA-MJ-20163

North Ref : True
 Declination : °
 VS Dir : 32.88° (from Wellhead)

WELLBORE SURVEY										DRILLING PARAMETERS									
Measured Depth (ft)	Incl Angle (deg)	Azi Dir (deg)	Vertical Depth (ft)	Vertical Section (ft)	Coordinates		DLS (°/100')	Build Rate (°/100')	Turn Rate (°/100')	WOB (lbs)	RPM	Flow Rate (gpm)	Stand Pipe (psi)	Orientation		Tool Face (deg)	ROP (ft/hr)	BHA No. (#)	Comment
					N/S (ft)	E/W (ft)								From (ft)	To (ft)				
321.00	0.30	95.00	321.0	0.4	-0.1	0.8	0.09	0.09	0.00	20	60	500	700	375	390	32m	50	1	
411.00	1.80	29.80	411.0	1.9	1.1	1.8	1.88	1.67	0.00	20		500	700	405	411	32m	36	1	
501.00	4.60	23.00	500.8	6.9	5.7	3.9	3.13	3.11	-7.56	20		530	900	411	415	32m	36	1	
														434	444	37m		1	
														465	475	37m		1	
591.00	7.60	33.50	590.3	16.4	14.0	8.6	3.54	3.33	11.67	20		500	900	495	501	37m	36	1	
														501	505	37m		1	
														525	535	37m		1	
														555	565	50R		1	
														585	591	40R		1	
682.00	8.80	37.70	680.4	29.3	24.5	16.2	1.47	1.32	4.62	20	60	500	950	591	592	40R	70	1	
														615	623	30R		1	
														645	651	40R		1	
														676	681	10R		1	
772.00	10.40	37.70	769.1	44.3	36.4	25.3	1.78	1.78	0.00	20		500	1000	706	713	10R	50	1	
														736	746	HS		1	
														766	772	HS		1	
862.00	12.70	31.40	857.3	62.3	51.2	35.5	2.91	2.56	-7.00	25		500	1000	772	774	HS	50	1	
														795	805	10L		1	
														826	836	30L		1	
														856	862	HS		1	
954.00	15.00	31.80	946.6	84.3	70.0	47.0	2.50	2.50	0.43	34		500	1000	862	866	HS	50	1	
														886	896	10R		1	
														916	926	10R		1	
														946	954	15R		1	
1048.00	17.50	31.80	1036.9	110.6	92.4	60.9	2.66	2.66	0.00	34		500	1000	954	956	15R	50	1	
														977	987	15R		1	
														1008	1018	15R		1	