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Surface 1650/N 1730/W

BHL 685/W 1657/W

Williams Production Company
New Mexico
Rio Arriba County
Rosa Unit #342 A - Rosa Unit 342A MWD
Survey

Sperry-Sun

Survey Report

10 October, 2003

Survey Ref: svy6297



HALLIBURTON

Survey Report for Rosa Unit # 342 A - Rosa Unit 342A MWD Survey

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	
340.00	0.000	0.000	340.00	0.00 N	0.00 E	0.00	0.000
368.00	1.030	192.160	368.00	0.25 S	0.05 W	-0.24	3.679
410.00	0.780	191.300	409.99	0.90 S	0.19 W	-0.88	0.596
440.00	0.170	179.180	439.99	1.14 S	0.23 W	-1.12	2.049
471.00	0.530	1.540	470.99	1.04 S	0.22 W	-1.02	2.258
501.00	1.260	10.200	500.99	0.58 S	0.16 W	-0.56	2.468
532.00	2.170	11.320	531.97	0.33 N	0.01 E	0.33	2.937
562.00	3.330	5.690	561.94	1.76 N	0.21 E	1.73	3.965
592.00	4.510	6.430	591.87	3.79 N	0.43 E	3.75	3.937
622.00	5.560	3.470	621.75	6.42 N	0.65 E	6.34	3.604
652.00	6.490	0.630	651.59	9.56 N	0.76 E	9.47	3.254
683.00	7.830	359.580	682.34	13.43 N	0.76 E	13.32	4.343
715.00	9.320	0.750	713.98	18.20 N	0.78 E	18.08	4.688
745.00	10.370	0.400	743.54	23.33 N	0.83 E	23.18	3.506
776.00	11.690	0.040	773.97	29.26 N	0.85 E	29.09	4.264
807.00	12.830	358.990	804.26	35.84 N	0.79 E	35.66	3.747
837.00	14.150	358.110	833.43	42.84 N	0.61 E	42.65	4.453
869.00	15.200	357.230	864.39	50.94 N	0.28 E	50.75	3.354
901.00	16.440	355.830	895.18	59.64 N	0.25 W	59.47	4.054
932.00	17.750	355.120	924.81	68.73 N	0.97 W	68.58	4.279
963.00	19.070	355.120	954.22	78.48 N	1.80 W	78.37	4.258
995.00	20.130	355.120	984.36	89.18 N	2.72 W	89.10	3.313
1026.00	21.360	354.950	1013.35	100.11 N	3.67 W	100.08	3.972
1058.00	22.850	354.770	1043.00	112.11 N	4.75 W	112.13	4.661
1089.00	23.990	354.420	1071.45	124.37 N	5.91 W	124.45	3.705
1121.00	25.310	354.070	1100.53	137.65 N	7.25 W	137.79	4.150
1151.00	26.720	354.070	1127.49	150.74 N	8.61 W	150.94	4.700
1182.00	27.950	354.420	1155.03	164.90 N	10.03 W	165.18	4.001
1244.00	29.180	354.420	1209.48	194.41 N	12.92 W	194.82	1.984
1306.00	30.230	354.770	1263.33	224.99 N	15.81 W	225.54	1.716
1367.00	31.030	354.950	1315.82	255.95 N	18.59 W	256.61	1.320
1430.00	30.850	354.770	1369.86	288.21 N	21.49 W	289.00	0.321
1492.00	30.150	354.240	1423.28	319.53 N	24.51 W	320.47	1.210
1553.00	29.710	354.240	1476.14	349.81 N	27.56 W	350.90	0.721
1615.00	29.270	354.070	1530.11	380.17 N	30.67 W	381.41	0.722
1677.00	28.480	353.720	1584.40	409.94 N	33.85 W	411.34	1.303
1738.00	28.040	355.650	1638.13	438.70 N	36.53 W	440.22	1.663
1801.00	27.950	357.230	1693.76	468.21 N	38.37 W	469.78	1.186
1833.00	27.950	357.410	1722.03	483.19 N	39.07 W	484.77	0.264
1896.00	28.040	357.060	1777.65	512.73 N	40.49 W	514.33	0.297
1958.00	27.670	355.860	1832.47	541.64 N	42.28 W	543.29	1.083
1989.00	27.490	354.830	1859.95	555.95 N	43.45 W	557.64	1.644
2019.00	27.690	354.600	1886.54	569.78 N	44.73 W	571.53	0.755
2082.00	28.300	355.120	1942.17	599.23 N	47.37 W	601.10	1.043

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2112.00	28.650	355.470	1968.54	613.49 N	48.55 W	615.41	1.292
2176.00	26.540	354.950	2025.25	643.03 N	51.02 W	645.05	3.318
2207.00	26.630	354.950	2052.98	656.85 N	52.24 W	658.92	0.290
2269.00	27.510	356.000	2108.18	684.98 N	54.46 W	687.14	1.615
2301.00	27.860	356.530	2136.52	699.81 N	55.43 W	702.00	1.337
2332.00	27.510	357.060	2163.97	714.19 N	56.23 W	716.40	1.380
2363.00	26.810	356.880	2191.55	728.32 N	56.98 W	730.55	2.274
2393.00	25.930	356.530	2218.43	741.63 N	57.75 W	743.87	2.979
2423.00	25.400	355.470	2245.47	754.59 N	58.65 W	756.86	2.337
2455.00	24.870	354.770	2274.44	768.13 N	59.81 W	770.45	1.899
2486.00	24.700	354.950	2302.58	781.07 N	60.97 W	783.45	0.600
2515.00	24.520	355.120	2328.95	793.10 N	62.02 W	795.52	0.667
2546.00	23.990	354.950	2357.21	805.79 N	63.12 W	808.26	1.724
2579.00	23.200	353.720	2387.46	818.93 N	64.42 W	821.46	2.821
2609.00	22.500	351.780	2415.10	830.49 N	65.89 W	833.10	3.428
2640.00	21.530	350.200	2443.84	841.97 N	67.70 W	844.68	3.666
2670.00	20.390	350.380	2471.86	852.54 N	69.52 W	855.37	3.806
2702.00	19.160	351.430	2501.97	863.23 N	71.23 W	866.17	4.001
2733.00	18.370	353.720	2531.32	873.12 N	72.52 W	876.12	3.484
2765.00	17.400	356.530	2561.77	882.91 N	73.36 W	885.95	4.056
2797.00	16.350	358.810	2592.40	892.19 N	73.75 W	895.23	3.878
2828.00	14.940	0.570	2622.25	900.55 N	73.80 W	903.56	4.799
2857.00	13.800	1.450	2650.34	907.74 N	73.67 W	910.73	4.002
2889.00	12.570	1.450	2681.49	915.04 N	73.49 W	917.98	3.844
2920.00	11.600	0.220	2711.81	921.53 N	73.39 W	924.44	3.237
2952.00	10.720	359.690	2743.20	927.72 N	73.39 W	930.62	2.769
2983.00	10.200	358.990	2773.69	933.35 N	73.46 W	936.23	1.727
3014.00	9.840	358.110	2804.21	938.74 N	73.59 W	941.62	1.262
3045.00	9.400	357.580	2834.78	943.92 N	73.79 W	946.79	1.448
3076.00	8.700	358.460	2865.39	948.79 N	73.96 W	951.66	2.302
3108.00	8.170	1.270	2897.05	953.48 N	73.97 W	956.34	2.098
3139.00	6.720	4.030	2927.78	957.49 N	73.80 W	960.33	4.816
3162.00	5.980	2.560	2950.64	960.03 N	73.65 W	962.85	3.294
3217.00	4.180	1.000	3005.42	964.90 N	73.49 W	967.68	3.282

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

The Dogleg Severity is in Degrees per 100 feet (US Survey).

Vertical Section is from Wellhead and calculated along an Azimuth of 355.380° (True).

Based upon Minimum Curvature type calculations, at a Measured Depth of 3217.00ft., The Bottom Hole Displacement is 967.69ft., in the Direction of 355.645° (True).

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Comments

Measured Depth (ft)	Station Coordinates			Comment
	TVD (ft)	Northings (ft)	Eastings (ft)	
340.00	340.00	0.00 N	0.00 E	Surface Casing Assumed Vertical at 340'
368.00	368.00	0.25 S	0.05 W	First MWD Survey
3162.00	2950.64	960.03 N	73.65 W	Final MWD Survey
3217.00	3005.42	964.90 N	73.49 W	Survey Projection to TD of Directional Work