



Williams Production Company
New Mexico
Rio Arriba County
Sec. 12-T31N-R05W
Rosa Unit #382~~4~~ - MWD survey

Halliburton Sperry-Drilling Survey Report

6 October, 2005

Surface Coordinates: 2149813.97 N, 653414.00 E (36° 54' 25.0000" N, 107° 18' 31.0000" W)
Grid Coordinate System: NAD27 New Mexico State Planes, Western Zone

Surface Coordinates relative to Global Coordinates: 644822.85 N, 355733.24 E (Grid)
Surface Coordinates relative to SE Cor of Sec 12: 95.00 N, 1415.00 W (True)
Kelly Bushing Elevation: 6686.00ft above Mean Sea Level
Kelly Bushing Elevation: 68.00ft below Structure

Survey Ref: svy9360

Surface 95/S 1415/E
B.H.L. 1 573/S 1597/E
B.H.L. 2 1093/S 1843/E
MD 4819
TVD 3493

HALLIBURTON

Sperry Drilling Services

30-039-29364

HALLIBURTON**Sperry Drilling Services**

Williams Production Company
New Mexico
Rio Arriba County

Survey Report for Sec. 12-T31N-R05W - Rosa Unit #382H - MWD survey

Measure Depth (ft)	Incl. Angle (Deg)	Drift Direction (Deg)	True Vertical Depth	Vertical Section (ft)	Local Coordinates		Dogleg Severit (°/100ft)	Lease Calls		Global Coordinates	
					N-S (ft)	E-W (ft)		FNL-FSL (ft)	FEL-FWL (ft)	Grid Y (ft)	Grid X (ft)
0.00	0.000	0.000	0.00	0.00	0.00 N	0.00 E		95.00 FSL	1415.00 FEL	2149813.97 N	653414.00 E
506.00	0.980	78.060	505.98	-0.62	0.90 N	4.23 E	0.19	95.89 FSL	1410.77 FEL	2149814.89 N	653418.23 E
1015.00	1.160	181.620	1014.92	-6.02	3.36 S	8.35 E	0.33	91.64 FSL	1406.65 FEL	2149810.67 N	653422.37 E
1551.00	0.620	156.700	1550.86	-13.96	11.44 S	9.34 E	0.12	83.56 FSL	1405.66 FEL	2149802.58 N	653423.41 E
2242.00	0.700	234.400	2241.82	-18.82	17.33 S	7.39 E	0.12	77.67 FSL	1407.61 FEL	2149796.68 N	653421.49 E
2935.00	0.620	235.100	2934.78	-20.90	21.94 S	0.87 E	0.01	73.06 FSL	1414.13 FEL	2149792.04 N	653414.99 E
2966.00	0.640	217.920	2965.78	-21.03	22.17 S	0.63 E	0.61	72.82 FSL	1414.38 FEL	2149791.80 N	653414.75 E
2997.00	0.500	228.240	2996.77	-21.18	22.40 S	0.42 E	0.56	72.60 FSL	1414.58 FEL	2149791.58 N	653414.55 E
3029.00	0.500	244.180	3028.77	-21.24	22.55 S	0.19 E	0.43	72.44 FSL	1414.81 FEL	2149791.42 N	653414.32 E
3061.00	0.840	325.670	3060.77	-21.03	22.42 S	0.07 W	2.85	72.58 FSL	1415.07 FEL	2149791.55 N	653414.06 E
3091.00	2.820	337.910	3090.75	-20.08	21.56 S	0.47 W	6.69	73.44 FSL	1415.47 FEL	2149792.41 N	653413.65 E
3123.00	5.590	343.000	3122.67	-17.73	19.34 S	1.22 W	8.73	75.66 FSL	1416.22 FEL	2149794.63 N	653412.89 E
3155.00	9.300	343.620	3154.39	-13.59	15.36 S	2.41 W	11.60	79.64 FSL	1417.41 FEL	2149798.60 N	653411.68 E
3185.00	13.790	342.110	3183.78	-7.60	9.63 S	4.19 W	15.00	85.37 FSL	1419.19 FEL	2149804.32 N	653409.87 E
3216.00	18.690	340.370	3213.53	1.06	1.43 S	7.00 W	15.88	93.57 FSL	1422.00 FEL	2149812.50 N	653407.02 E
3249.00	23.860	339.170	3244.27	13.03	9.79 N	11.15 W	15.72	104.79 FSL	1426.15 FEL	2149823.70 N	653402.80 E
3280.00	29.270	338.810	3271.99	26.89	22.73 N	16.12 W	17.46	117.73 FSL	1431.12 FEL	2149836.61 N	653397.76 E
3312.00	34.490	339.990	3299.15	43.78	38.55 N	22.05 W	16.43	133.55 FSL	1437.05 FEL	2149852.40 N	653391.74 E
3343.00	37.840	341.680	3324.18	62.07	55.83 N	28.04 W	11.27	150.83 FSL	1443.04 FEL	2149869.64 N	653385.65 E
3374.00	41.330	343.370	3348.06	81.80	74.67 N	33.96 W	11.78	169.67 FSL	1448.96 FEL	2149888.45 N	653379.63 E
3405.00	45.380	343.520	3370.60	103.03	95.06 N	40.02 W	13.07	190.06 FSL	1455.02 FEL	2149908.81 N	653373.45 E
3436.00	49.570	342.860	3391.55	125.84	116.93 N	46.63 W	13.61	211.93 FSL	1461.63 FEL	2149930.64 N	653366.72 E
3468.00	54.100	342.500	3411.32	150.96	140.94 N	54.12 W	14.18	235.94 FSL	1469.12 FEL	2149954.61 N	653359.10 E
3500.00	58.610	342.530	3429.04	177.56	166.34 N	62.12 W	14.09	261.34 FSL	1477.12 FEL	2149979.97 N	653350.96 E
3531.00	64.340	342.680	3443.84	204.76	192.32 N	70.26 W	18.49	287.32 FSL	1485.26 FEL	2150005.91 N	653342.68 E

Measure Depth (ft)	Incl. Angle (Deg)	Drift Direction (Deg)	True Vertical Depth	Vertical Section (ft)	Local Coordinates N-S (ft)	E-W (ft)	Dogleg Severit (°/100ft)	Lease Calls FNL-FSL (ft)	FEL-FWL (ft)	Global Coordinates Grid Y (ft)	Grid X (ft)
3562.00	70.220	342.680	3455.81	233.30	219.61 N	78.77 W	18.97	314.61 FSL	1493.77 FEL	2150033.14 N	653334.02 E
3593.00	76.640	341.980	3464.64	262.97	247.91 N	87.78 W	20.82	342.91 FSL	1502.78 FEL	2150061.39 N	653324.85 E
3662.00	86.260	337.800	3474.89	331.11	311.88 N	111.24 W	15.17	406.88 FSL	1526.24 FEL	2150125.23 N	653301.04 E
3692.00	86.450	337.570	3476.80	361.03	339.58 N	122.60 W	0.99	434.58 FSL	1537.60 FEL	2150152.87 N	653289.52 E
3723.00	86.550	337.310	3478.69	391.94	368.15 N	134.47 W	0.90	463.15 FSL	1549.47 FEL	2150181.37 N	653277.49 E
3752.00	86.480	336.700	3480.46	420.85	394.80 N	145.78 W	2.11	489.80 FSL	1560.78 FEL	2150207.96 N	653266.04 E
3783.00	86.480	336.530	3482.36	451.74	423.20 N	158.06 W	0.55	518.20 FSL	1573.06 FEL	2150236.29 N	653253.60 E
3813.00	85.780	336.180	3484.39	481.62	450.62 N	170.06 W	2.61	545.62 FSL	1585.06 FEL	2150263.64 N	653241.44 E
3843.00	86.840	336.180	3486.32	511.50	478.01 N	182.15 W	3.53	573.01 FSL	1597.15 FEL	2150290.96 N	653229.20 E
3874.00	89.380	336.880	3487.34	542.42	506.42 N	194.49 W	8.50	601.42 FSL	1609.49 FEL	2150319.31 N	653216.71 E
3905.00	90.700	337.230	3487.32	573.39	534.97 N	206.57 W	4.41	629.97 FSL	1621.57 FEL	2150347.79 N	653204.47 E
3937.00	91.670	337.580	3486.65	605.35	564.51 N	218.86 W	3.22	659.51 FSL	1633.86 FEL	2150377.26 N	653192.01 E
3968.00	91.490	337.930	3485.80	636.32	593.19 N	230.59 W	1.27	688.19 FSL	1645.59 FEL	2150405.88 N	653180.12 E
3999.00	90.880	336.350	3485.16	667.27	621.75 N	242.63 W	5.46	716.75 FSL	1657.63 FEL	2150434.37 N	653167.93 E
4030.00	88.420	334.770	3485.35	698.18	649.97 N	255.45 W	9.43	744.97 FSL	1670.45 FEL	2150462.52 N	653154.95 E
4061.00	91.490	334.420	3485.37	729.05	677.97 N	268.75 W	9.97	772.97 FSL	1683.75 FEL	2150490.44 N	653141.50 E
4092.00	92.110	332.490	3484.40	759.84	705.69 N	282.59 W	6.54	800.69 FSL	1697.60 FEL	2150518.08 N	653127.50 E
4123.00	91.410	331.960	3483.45	790.55	733.10 N	297.03 W	2.83	828.10 FSL	1712.03 FEL	2150545.42 N	653112.91 E
4154.00	88.330	330.550	3483.52	821.20	760.28 N	311.94 W	10.93	855.28 FSL	1726.94 FEL	2150572.51 N	653097.85 E
4185.00	86.130	329.500	3485.02	851.70	787.10 N	327.40 W	7.86	882.10 FSL	1742.40 FEL	2150599.25 N	653082.24 E
4217.00	86.040	330.900	3487.20	883.18	814.80 N	343.27 W	4.37	909.80 FSL	1758.27 FEL	2150626.86 N	653066.22 E
4248.00	84.810	332.310	3489.67	913.76	841.99 N	357.96 W	6.02	936.99 FSL	1772.96 FEL	2150653.96 N	653051.37 E
4279.00	85.960	333.890	3492.17	944.44	869.54 N	371.94 W	6.29	964.54 FSL	1786.94 FEL	2150681.44 N	653037.24 E
4310.00	88.510	335.470	3493.66	975.27	897.53 N	385.18 W	9.67	992.53 FSL	1800.18 FEL	2150709.35 N	653023.85 E

last MWD survey

4341.00	90.880	337.410	3493.83	1006.21	925.94 N	397.57 W	9.88	1020.94 FSL	1812.57 FEL	2150737.70 N	653011.30 E
---------	--------	---------	---------	---------	----------	----------	------	-------------	-------------	--------------	-------------

Projection to TD

4419.00	90.880	337.410	3492.63	1084.13	997.95 N	427.52 W	0.00	1092.95 FSL	1842.52 FEL	2150809.54 N	652980.95 E
---------	--------	---------	---------	---------	----------	----------	------	-------------	-------------	--------------	-------------

All data is in Feet (US) unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to RKB (6671' ± 15' KB). Northings and Eastings are relative to Wellhead.

Based upon Minimum Curvature type calculations, at a Measured Depth of 4419.00ft.,
The Bottom Hole Displacement is 1085.67ft., in the Direction of 336.807° (True).

Survey Report for Sec. 12-T31N-R05W - Rosa Unit #382H - MWD survey

Comments

Measured Depth (ft)	Station Coordinates			Comment
	TVD (ft)	Northings (ft)	Eastings (ft)	
4341.00	3493.83	925.94 N	397.57 W	last MWD survey Projection to TD
4419.00	3492.63	997.95 N	427.52 W	

North Reference Sheet for Sec. 12-T31N-R05W - Rosa Unit #382H

Coordinate System is NAD27 New Mexico State Planes, Western Zone, US Foot
Source: Snyder, J.P., 1987, Map Projections - A Working Manual

Datum is North American Datum of 1927 (US48, AK, HI, and Canada)

Spheroid is Clarke - 1866
Equatorial Radius: 6378206.400m.
Polar Radius: 6356583.800m.
Inverse Flattening: 294.978698213901

Projection method is Transverse Mercator or Gauss Kruger Projection
Central Meridian is -107.833°
Longitude Origin: 0.000°
Latitude Origin: 31.000°
False Easting: 152400.00m
False Northing: 0.00m
Scale Reduction: 0.99991667

Grid Coordinates of Well: 2149813.97 N, 653414.00 E
Geographical Coordinates of Well: 36° 54' 25.0000" N, 107° 18' 31.0000" W
Surface Elevation of Well: 6686.00ft
Grid Convergence at Surface is +0.315°
Magnetic Declination at Surface is +10.453° (30 September, 2005)

