

RCVD OCT23'06
OIL CONS. DIV.
DIST. 3



Weatherford

Drilling Services

30-034-29882

Final Survey Report

Surface 310/N 150/W SCG/6 T31N R5W
BHL 466/5 654/W Sec 9 " "
Md 3248 TV 62451



WILLIAMS PRODUCTION COMPANY

ROSA UNIT 360

HOLD C104 FOR NSL

Prepared by: Jose A Perez

Submitted: 10/05/06

Weatherford Drilling Services
3611 Plaza East Court
Granbury, Texas 76049 USA
+1.817.573.8500 Main
+1.817.573.8001 Fax
www.weatherford.com

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Weatherford Drilling Services

Survey Report



Weatherford

Company: WILLIAMS PRODUCTION Date: 10/5/2006 Time: 14:11:51 Page: 1
 Field: RIO ARRIBA COUNTY (NAD 27) Co-ordinate(NE) Reference: Site: Rosa Unit 360, True North
 Site: Rosa Unit 360 Vertical (TVD) Reference: SITE 6285.0
 Well: Rosa Unit 360 Section (VS) Reference: Well (0.00N,0.00E,27.45Azi)
 Wellpath: 1 Survey Calculation Method: Minimum Curvature Db: Sybase

Field: RIO ARRIBA COUNTY (NAD 27)
 NEW MEXICO

Map System: US State Plane Coordinate System 1927
 Geo Datum: NAD27 (Clarke 1866)
 Sys Datum: Mean Sea Level

Map Zone: New Mexico, Western Zone
 Coordinate System: Site Centre
 Geomagnetic Model: igrf2005

Site: Rosa Unit 360

Rio Arriba County, NM

Site Position: Northing: 2149308.69 ft Latitude: 36 54 21.000 N
 From: Geographic Easting: 633843.15 ft Longitude: 107 22 32.000 W
 Position Uncertainty: 0.00 ft North Reference: True
 Ground Level: 6271.00 ft Grid Convergence: 0.27 deg

Well: Rosa Unit 360
 S well

Slot Name:

Well Position: +N/-S 0.00 ft Northing: 2149308.69 ft Latitude: 36 54 21.000 N
 +E/-W 0.00 ft Easting: 633843.15 ft Longitude: 107 22 32.000 W
 Position Uncertainty: 0.00 ft

Wellpath: 1

310' FNL & 150' FWL

Drilled From: Surface

Current Datum: SITE Height: 6285.00 ft

Tie-on Depth: 0.00 ft

Magnetic Data: 6/29/2006

Above System Datum: Mean Sea Level

Field Strength: 51443 nT

Declination: 10.35 deg

Vertical Section: Depth From (TVD)

Mag Dip Angle: 63.80 deg

ft

+N/-S

+E/-W

Direction

ft

ft

ft

deg

0.00

0.00

0.00

27.45

Survey: MWD Surveys

Start Date: 7/25/2006

Company: Weatherford Drilling Services

Engineer:

Tool:

Tied-to:

From Surface

Survey: MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Surface Casing First MWD Survey
342.00	0.00	0.00	342.00	0.00	0.00	0.00	0.00	0.00	0.00	
378.00	1.94	245.35	377.99	-0.25	-0.55	-0.48	5.39	5.39	0.00	
439.00	0.44	281.35	438.98	-0.64	-1.72	-1.36	2.63	-2.46	59.02	
500.00	1.75	55.78	499.97	-0.07	-1.18	-0.61	3.41	2.15	220.38	
561.00	4.25	48.60	560.88	1.95	1.28	2.32	4.14	4.10	-11.77	
622.00	6.44	40.23	621.61	6.06	5.19	7.77	3.80	3.59	-13.72	
683.00	10.19	32.35	681.96	13.23	10.29	16.48	6.41	6.15	-12.92	
744.00	13.63	32.73	741.64	23.84	17.06	29.02	5.64	5.64	0.62	
804.00	17.25	33.85	799.47	37.18	25.84	44.91	6.05	6.03	1.87	
865.00	21.13	34.48	857.07	53.76	37.11	64.81	6.37	6.36	1.03	
926.00	24.38	30.98	913.31	73.62	49.82	88.30	5.77	5.33	-5.74	
986.00	26.38	29.85	967.52	95.80	62.83	113.98	3.43	3.33	-1.88	
1046.00	28.44	28.60	1020.78	119.91	76.31	141.59	3.56	3.43	-2.08	
1106.00	30.25	28.85	1073.08	145.69	90.44	170.98	3.02	3.02	0.42	
1169.00	32.06	26.85	1126.99	174.51	105.65	203.57	3.31	2.87	-3.17	
1231.00	34.63	26.23	1178.78	205.00	120.87	237.64	4.18	4.15	-1.00	
1294.00	34.94	26.35	1230.52	237.23	136.79	273.57	0.50	0.49	0.19	
1357.00	35.94	25.73	1281.85	270.05	152.82	310.09	1.69	1.59	-0.98	
1419.00	38.00	27.23	1331.38	303.42	169.46	347.37	3.63	3.32	2.42	
1482.00	38.63	26.98	1380.82	338.18	187.25	386.43	1.03	1.00	-0.40	
1545.00	39.38	27.60	1429.77	373.42	205.43	426.08	1.34	1.19	0.98	
1607.00	38.94	27.60	1477.85	408.12	223.57	465.23	0.71	-0.71	0.00	
1670.00	40.81	26.48	1526.19	444.09	241.93	505.62	3.18	2.97	-1.78	



Weatherford Drilling Services

Survey Report

**Weatherford**

Company: WILLIAMS PRODUCTION Date: 10/5/2006 Time: 14:11:51 Page: 2
Field: RIO ARRIBA COUNTY (NAD 27) Co-ordinate(N/E) Reference: Site: Rosa Unit 360, True North
Site: Rosa Unit 360 Vertical (TVD) Reference: SITE 6285.0
Well: Rosa Unit 360 Section (VS) Reference: Well (0.00N,0.00E,27.45Azi)
Wellpath: 1 Survey Calculation Method: Minimum Curvature Db: Sybase

Survey: MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
1730.00	40.88	26.73	1571.58	479.18	259.50	544.85	0.30	0.12	0.42	
1761.00	40.75	27.35	1595.04	497.23	268.71	565.12	1.37	-0.42	2.00	
1793.00	39.25	24.00	1619.56	515.76	277.63	585.67	8.20	-4.69	-10.47	
1855.00	39.25	26.73	1667.58	551.19	294.43	624.86	2.79	0.00	4.40	
1916.00	36.38	25.10	1715.76	584.82	310.79	662.24	4.98	-4.70	-2.67	
1979.00	34.75	25.60	1767.01	617.93	326.47	698.86	2.63	-2.59	0.79	
2041.00	32.44	24.73	1818.65	648.98	341.07	733.13	3.81	-3.73	-1.40	
2103.00	31.31	25.48	1871.30	678.62	354.95	765.85	1.93	-1.82	1.21	
2134.00	31.13	26.48	1897.81	693.07	361.99	781.91	1.77	-0.58	3.23	
2165.00	31.38	27.23	1924.31	707.42	369.26	797.99	1.49	0.81	2.42	
2196.00	31.56	28.35	1950.75	721.73	376.80	814.17	1.97	0.58	3.61	
2227.00	30.88	27.10	1977.26	735.96	384.28	830.24	3.03	-2.19	-4.03	
2258.00	30.13	26.60	2003.97	749.99	391.39	845.98	2.55	-2.42	-1.61	
2289.00	29.25	26.10	2030.90	763.75	398.20	861.33	2.95	-2.84	-1.61	
2352.00	27.06	25.35	2086.44	790.53	411.11	891.04	3.52	-3.48	-1.19	
2415.00	24.75	26.73	2143.11	815.26	423.18	918.55	3.79	-3.67	2.19	
2477.00	23.19	25.85	2199.76	837.84	434.34	943.73	2.58	-2.52	-1.42	
2509.00	22.06	27.85	2229.30	848.82	439.90	956.04	4.27	-3.53	6.25	
2540.00	20.88	27.23	2258.15	858.88	445.14	967.38	3.88	-3.81	-2.00	
2601.00	18.69	28.48	2315.54	877.14	454.78	988.03	3.66	-3.59	2.05	
2633.00	17.56	28.10	2345.95	885.91	459.50	997.98	3.55	-3.53	-1.19	
2664.00	17.00	26.73	2375.55	894.08	463.74	1007.19	2.23	-1.81	-4.42	
2695.00	16.19	25.73	2405.26	902.02	467.65	1016.04	2.77	-2.61	-3.23	
2726.00	14.88	25.23	2435.13	909.52	471.23	1024.34	4.25	-4.23	-1.61	
2818.00	12.25	26.10	2524.56	928.97	480.56	1045.90	2.87	-2.86	0.95	
2881.00	10.31	25.73	2586.34	940.05	485.95	1058.22	3.08	-3.08	-0.59	
2944.00	9.06	25.60	2648.44	949.60	490.54	1068.82	1.98	-1.98	-0.21	
3006.00	7.25	30.23	2709.81	957.39	494.62	1077.60	3.10	-2.92	7.47	
3068.00	5.94	24.85	2771.40	963.68	497.93	1084.72	2.33	-2.11	-8.68	
3131.00	4.69	24.98	2834.12	968.97	500.39	1090.55	1.98	-1.98	0.21	
3194.00	3.38	27.23	2896.97	972.96	502.33	1094.98	2.09	-2.08	3.57	Last MWD Survey
3248.00	3.38	27.23	2950.87	975.79	503.79	1098.16	0.00	0.00	0.00	Projection to TD

Annotation

MD ft	TVD ft	
342.00	342.00	Surface Casing
378.00	377.99	First MWD Survey
3194.00	2896.97	Last MWD Survey
3248.00	2950.87	Projection to TD



Weatherford

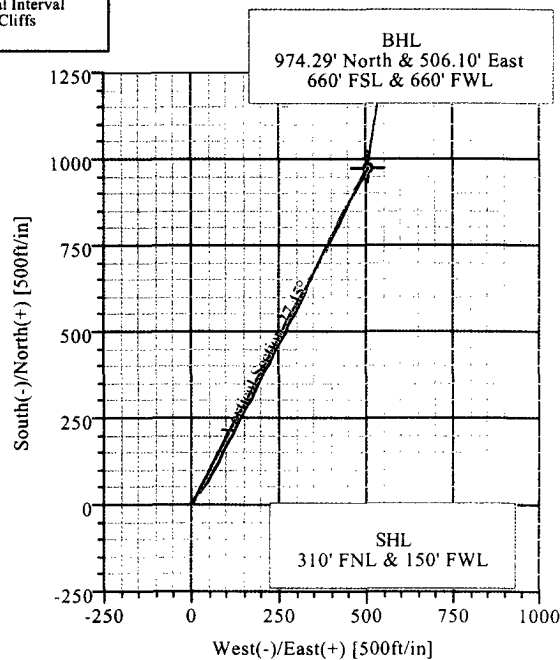
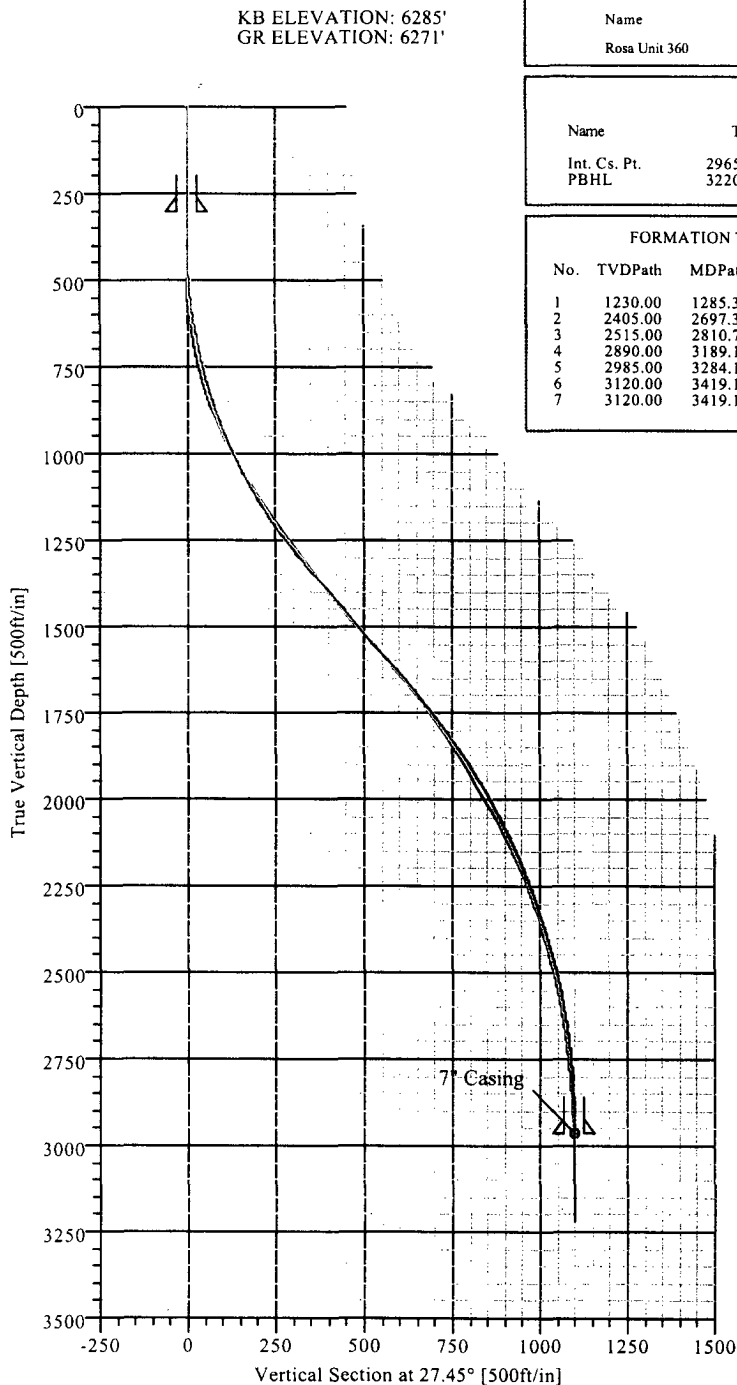
ROSA UNIT 360
Section 16 T 31N R 5W
310' FNL & 150' FWL
RIO ARriba COUNTY, NM
Plan vs. Actual

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec Target
1	0.00	0.00	27.45	0.00	0.00	0.00	0.00	0.00	0.00
2	400.00	0.00	27.45	400.00	0.00	0.00	0.00	0.00	0.00
3	1400.00	40.00	27.45	1320.73	297.39	154.48	4.00	27.45	335.12
4	1881.46	40.00	27.45	1689.54	572.02	297.14	0.00	0.00	644.59
5	3234.15	0.00	27.45	2935.00	974.29	506.10	2.96	180.00	1097.90
6	3264.15	0.00	27.45	2965.00	974.29	506.10	0.00	0.00	1097.90
7	3519.15	0.00	27.45	3220.00	974.29	506.10	0.00	27.45	1097.90

WELL DETAILS							
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slo
Rosa Unit 360	0.00	0.00	2149308.69	633843.15	36°54'21.000N	107°22'32.000W	N/A

TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
Int. Cs. Pt.	2965.00	974.29	506.10	36°54'30.634N	107°22'25.768W	Point	
PBHL	3220.00	974.29	506.10	36°54'30.634N	107°22'25.768W	Circle (Radius: 50)	

FORMATION TOP DETAILS			
No.	TVDPath	MDPath	Formation
1	1230.00	1285.30	Nacimiento
2	2405.00	2697.31	Ojo Alamo
3	2515.00	2810.79	Kirtland
4	2890.00	3189.14	Fruitland
5	2985.00	3284.15	Top Coal Interval
6	3120.00	3419.15	Base Coal Interval
7	3120.00	3419.15	Pictured Cliffs



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Azimuths to True North
Magnetic North: 10.35°
Magnetic Field
Strength: 51443nT
Dip Angle: 63.80°
Date: 6/29/2006
Model: igrf2005
Total Correction 10.35°

Plan: Plan #1 (Rosa Unit 360) pva
Created By: Jose Perez Date: 10/05/06
Weatherford Drilling Services
3611 Plaza East Court
Granbury TX 76049
(817) 573 8500 MAIN
(817) 573 8001 FAX