

OXY USA RMAT

Garfield County, CO NAD27

Shell 797-03B Pad

Shell 797-03-31A - Slot W

OH

Design: OH

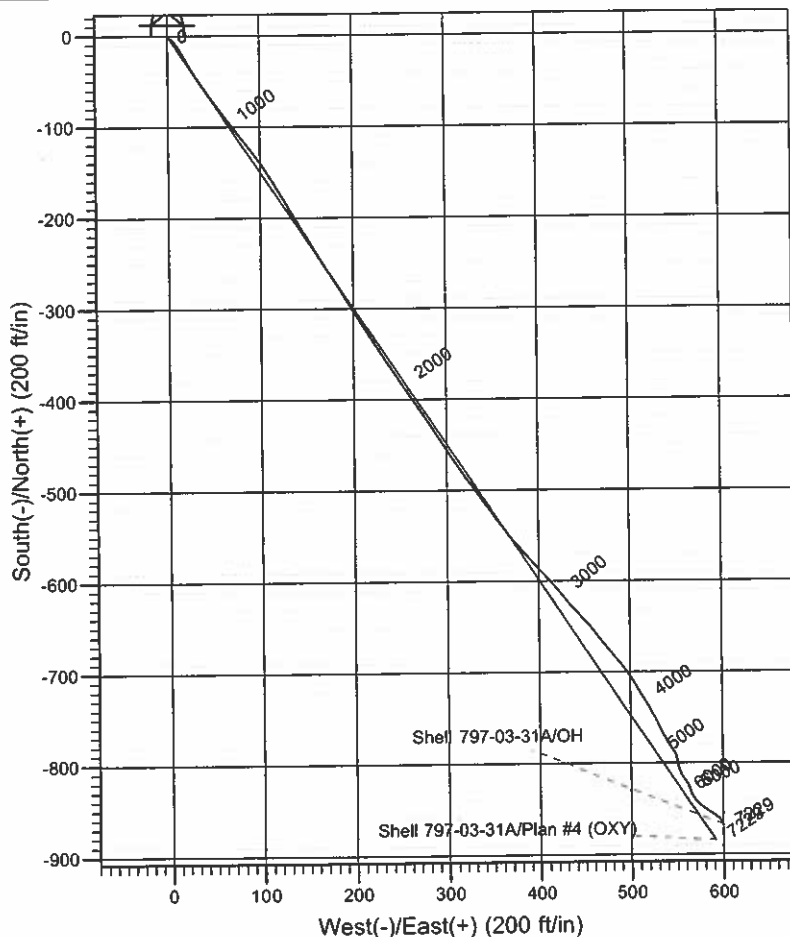
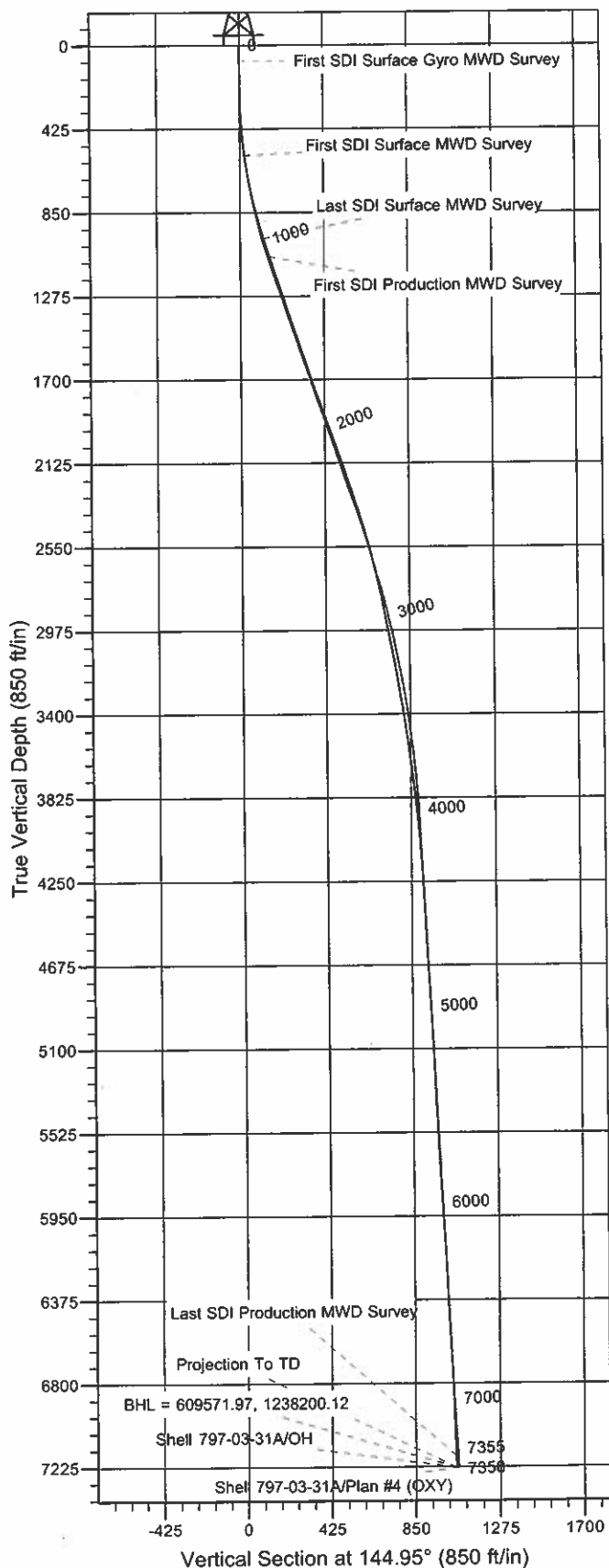
Standard Survey Report

02 December, 2010



Scientific Drilling
Rocky Mountain Operations

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Shell 797-03B Pad
Well: Shell 797-03-31A
Wellbore: OH
Design: OH



Well Details: Shell 797-03-31A

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	610457.12	1237626.22	39° 28' 42.222 N	108° 12' 4.266 W	W

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Shell 797-03-31A - Slot W, True North
Vertical (TVD) Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
Section (VS) Reference: Slot - W(0.00N, 0.00E)
Measured Depth Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD27

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Colorado Central 502

System Datum: Mean Sea Level

Plan: OH

9:49, December 02 2010
Created By: Rex Hall

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-31A - Slot W
Project:	Garfield County, CO NAD27	TVD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Site:	Shell 797-03B Pad	MD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-31A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Project	Garfield County, CO NAD27		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Colorado Central 502		

Site	Shell 797-03B Pad, Sec 3 T7S R97W				
Site Position:		Northing:	610,470.20 usft	Latitude:	39° 28' 42.340 N
From:	Lat/Long	Easting:	1,237,588.64 usft	Longitude:	108° 12' 4.750 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.70 °

Well	Shell 797-03-31A - Slot W,					
Well Position	+N/-S	0.00 ft	Northing:	610,457.12 usft	Latitude:	39° 28' 42.222 N
	+E/-W	0.00 ft	Easting:	1,237,626.22 usft	Longitude:	108° 12' 4.266 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,325.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	9/15/2008	10.78	65.77	52,511

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00		144.95

Survey Program	Date	12/2/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
79.00	499.00	Survey #1 - Surface Gyro MWD (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
561.00	996.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
1,092.00	7,355.00	Survey #3 - Production MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
79.00	0.18	22.32	79.00	0.11	0.05	-0.07	0.23	0.23	0.00	
First SDI Surface Gyro MWD Survey										
143.00	0.35	195.12	143.00	0.02	0.03	0.00	0.83	0.27	270.00	
206.00	0.44	149.59	206.00	-0.38	0.11	0.37	0.50	0.14	-72.27	
237.00	0.70	170.07	237.00	-0.66	0.20	0.66	1.05	0.84	66.06	
268.00	1.14	121.73	267.99	-1.01	0.49	1.11	2.75	1.42	-155.94	
299.00	1.85	122.61	298.98	-1.45	1.18	1.86	2.29	2.29	2.84	
331.00	2.29	122.34	330.96	-2.07	2.15	2.93	1.38	1.38	-0.84	

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Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-31A - Slot W
Project:	Garfield County, CO NAD27	TVD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Site:	Shell 797-03B Pad	MD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-31A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
362.00	2.73	127.44	361.93	-2.85	3.26	4.20	1.59	1.42	16.45
393.00	3.61	133.59	392.88	-3.97	4.56	5.86	3.04	2.84	19.84
424.00	4.13	138.87	423.81	-5.48	6.00	7.93	2.03	1.68	17.03
455.00	4.92	142.44	454.72	-7.38	7.54	10.37	2.70	2.55	11.52
499.00	6.07	141.56	498.51	-10.69	10.14	14.58	2.62	2.61	-2.00
561.00	7.83	148.85	560.06	-16.88	14.36	22.06	3.17	2.84	11.76
First SDI Surface MWD Survey									
592.00	8.44	151.14	590.74	-20.68	16.55	26.43	2.23	1.97	7.39
686.00	10.55	150.52	683.45	-34.21	24.12	41.86	2.25	2.24	-0.66
779.00	13.28	145.43	774.44	-50.42	34.37	61.02	3.14	2.94	-5.47
873.00	14.68	144.11	865.66	-68.96	47.48	83.72	1.53	1.49	-1.40
966.00	17.06	143.93	955.10	-89.54	62.42	109.15	2.56	2.56	-0.19
996.00	17.41	142.00	983.76	-96.63	67.78	118.03	2.23	1.17	-6.43
Last SDI Surface MWD Survey									
1,092.00	18.11	142.61	1,075.18	-119.80	85.68	147.28	0.75	0.73	0.64
First SDI Production MWD Survey									
1,187.00	19.08	146.13	1,165.22	-144.43	103.30	177.56	1.56	1.02	3.71
1,282.00	18.29	149.91	1,255.22	-170.22	119.43	207.94	1.52	-0.83	3.98
1,377.00	19.35	148.59	1,345.14	-196.55	135.10	238.50	1.20	1.12	-1.39
1,472.00	19.08	149.47	1,434.85	-223.36	151.19	269.68	0.42	-0.28	0.93
1,567.00	17.85	147.38	1,524.96	-249.00	166.93	299.71	1.47	-1.29	-2.20
1,663.00	19.35	149.12	1,615.94	-275.04	183.03	330.27	1.67	1.56	1.81
1,757.00	18.82	147.97	1,704.77	-301.26	199.06	360.95	0.69	-0.56	-1.22
1,853.00	20.49	147.89	1,795.18	-328.62	216.20	393.19	1.74	1.74	-0.08
1,948.00	19.70	146.31	1,884.39	-356.03	233.92	425.81	1.01	-0.83	-1.66
2,044.00	19.26	145.60	1,974.90	-382.56	251.85	457.81	0.52	-0.46	-0.74
2,139.00	19.43	146.57	2,064.53	-408.67	269.40	489.28	0.38	0.18	1.02
2,234.00	19.52	146.57	2,154.10	-435.10	286.85	520.94	0.09	0.09	0.00
2,330.00	18.64	147.10	2,244.82	-461.37	304.02	552.30	0.93	-0.92	0.55
2,425.00	17.41	143.93	2,335.16	-485.61	320.64	581.68	1.66	-1.29	-3.34
2,520.00	16.53	144.11	2,426.03	-508.04	336.93	609.41	0.93	-0.93	0.19
2,615.00	15.65	144.20	2,517.30	-529.39	352.35	635.73	0.93	-0.93	0.09
2,710.00	14.42	141.56	2,609.05	-549.04	367.20	660.35	1.48	-1.29	-2.78
2,806.00	12.93	137.78	2,702.33	-566.36	381.85	682.94	1.81	-1.55	-3.94
2,902.00	11.96	138.04	2,796.07	-581.71	395.71	703.48	1.01	-1.01	0.27
2,997.00	11.08	135.58	2,889.16	-595.55	408.68	722.26	1.06	-0.93	-2.59
3,093.00	11.17	142.17	2,983.36	-609.49	420.84	740.65	1.33	0.09	6.86
3,189.00	10.90	138.22	3,077.58	-623.60	432.60	758.95	0.84	-0.28	-4.11
3,284.00	10.46	136.72	3,170.94	-636.58	444.49	776.40	0.55	-0.46	-1.58
3,380.00	9.94	139.54	3,265.42	-649.22	455.84	793.28	0.75	-0.54	2.94
3,476.00	9.18	142.57	3,360.09	-661.61	465.87	809.18	0.95	-0.79	3.16
3,572.00	8.62	141.56	3,454.93	-673.33	475.00	824.01	0.61	-0.58	-1.05
3,668.00	8.00	139.80	3,549.92	-684.06	483.79	837.84	0.70	-0.65	-1.83
3,763.00	7.65	138.92	3,644.04	-693.88	492.21	850.72	0.39	-0.37	-0.93

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Survey Report

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Project:	Garfield County, CO NAD27	TVD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Site:	Shell 797-03B Pad	MD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-31A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,859.00	6.60	147.36	3,739.30	-703.34	499.38	862.58	1.54	-1.09	8.79
3,954.00	6.24	151.49	3,833.70	-712.48	504.79	873.17	0.62	-0.38	4.35
4,048.00	5.80	147.97	3,927.18	-720.99	509.75	882.99	0.61	-0.47	-3.74
4,144.00	5.28	147.97	4,022.74	-728.85	514.66	892.24	0.54	-0.54	0.00
4,239.00	3.52	151.05	4,117.45	-735.11	518.39	899.51	1.87	-1.85	3.24
4,334.00	3.17	152.11	4,212.29	-739.98	521.04	905.01	0.37	-0.37	1.12
4,429.00	3.34	152.55	4,307.14	-744.76	523.54	910.36	0.18	0.18	0.46
4,524.00	2.81	147.97	4,402.00	-749.19	526.05	915.43	0.61	-0.56	-4.82
4,619.00	2.55	152.37	4,496.90	-753.03	528.27	919.85	0.35	-0.27	4.63
4,714.00	3.34	155.01	4,591.77	-757.42	530.41	924.67	0.84	0.83	2.78
4,810.00	3.25	157.73	4,687.61	-762.47	532.63	930.08	0.19	-0.09	2.83
4,905.00	3.52	151.40	4,782.45	-767.52	535.04	935.60	0.48	0.28	-6.66
5,000.00	3.08	151.49	4,877.29	-772.32	537.66	941.04	0.46	-0.46	0.09
5,095.00	2.29	153.69	4,972.18	-776.27	539.72	945.45	0.84	-0.83	2.32
5,191.00	3.25	143.40	5,068.07	-780.17	542.19	950.06	1.12	1.00	-10.72
5,286.00	2.99	146.22	5,162.93	-784.39	545.17	955.23	0.32	-0.27	2.97
5,381.00	2.46	147.54	5,257.82	-788.17	547.65	959.75	0.56	-0.56	1.39
5,476.00	2.37	160.72	5,352.74	-791.75	549.39	963.67	0.59	-0.09	13.87
5,572.00	3.17	176.10	5,448.63	-796.27	550.22	967.86	1.13	0.83	16.02
5,667.00	2.99	163.88	5,543.49	-801.27	551.09	972.45	0.72	-0.19	-12.86
5,762.00	3.43	166.17	5,638.34	-806.41	552.46	977.44	0.48	0.46	2.41
5,857.00	3.78	153.95	5,733.15	-811.98	554.51	983.18	0.89	0.37	-12.86
5,953.00	3.87	140.50	5,828.94	-817.33	557.96	989.54	0.94	0.09	-14.01
6,048.00	3.52	146.39	5,923.75	-822.23	561.62	995.65	0.54	-0.37	6.20
6,143.00	3.17	161.07	6,018.58	-827.14	564.08	1,001.09	0.97	-0.37	15.45
6,238.00	2.64	167.05	6,113.46	-831.76	565.43	1,005.64	0.64	-0.56	6.29
6,334.00	3.25	150.96	6,209.34	-836.29	567.24	1,010.40	1.06	0.64	-16.76
6,429.00	2.81	141.73	6,304.20	-840.48	569.99	1,015.40	0.69	-0.46	-9.72
6,524.00	1.67	134.00	6,399.13	-843.27	572.43	1,019.08	1.24	-1.20	-8.14
6,618.00	3.17	129.78	6,493.04	-845.88	575.41	1,022.94	1.61	1.60	-4.49
6,714.00	4.57	127.58	6,588.82	-849.91	580.48	1,029.15	1.47	1.46	-2.29
6,807.00	3.17	124.95	6,681.61	-853.64	585.53	1,035.10	1.52	-1.51	-2.83
6,902.00	2.81	120.99	6,776.48	-856.35	589.68	1,039.70	0.44	-0.38	-4.17
6,999.00	2.55	126.88	6,873.37	-858.87	593.44	1,043.92	0.39	-0.27	6.07
7,094.00	1.67	139.89	6,968.31	-861.19	596.02	1,047.31	1.05	-0.93	13.69
7,282.00	1.58	153.25	7,156.23	-865.60	598.95	1,052.60	0.21	-0.05	7.11
7,297.00	1.85	154.48	7,171.23	-866.01	599.15	1,053.05	1.82	1.80	8.20
Last SDI Production MWD Survey									
7,355.00	1.85	154.48	7,229.20	-867.70	599.96	1,054.89	0.00	0.00	0.00
Projection To TD - BHL = 609571.97, 1238200.12									

Scientific Drilling International
Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-31A - Slot W
Project:	Garfield County, CO NAD27	TVD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Site:	Shell 797-03B Pad	MD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-31A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
79.00	79.00	0.11	0.05	First SDI Surface Gyro MWD Survey
561.00	560.06	-16.88	14.36	First SDI Surface MWD Survey
996.00	983.76	-96.63	67.78	Last SDI Surface MWD Survey
1,092.00	1,075.18	-119.80	85.68	First SDI Production MWD Survey
7,297.00	7,171.23	-866.01	599.15	Last SDI Production MWD Survey
7,355.00	7,229.20	-867.70	599.96	Projection To TD
7,355.00	7,229.20	-867.70	599.96	BHL = 609571.97, 1238200.12

Checked By: _____	Approved By: _____	Date: _____
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