

OXY USA RMAT

Garfield County, CO NAD27

Shell 797-03B Pad

Shell 797-03-23A - Slot M

OH

Design: OH

Standard Survey Report

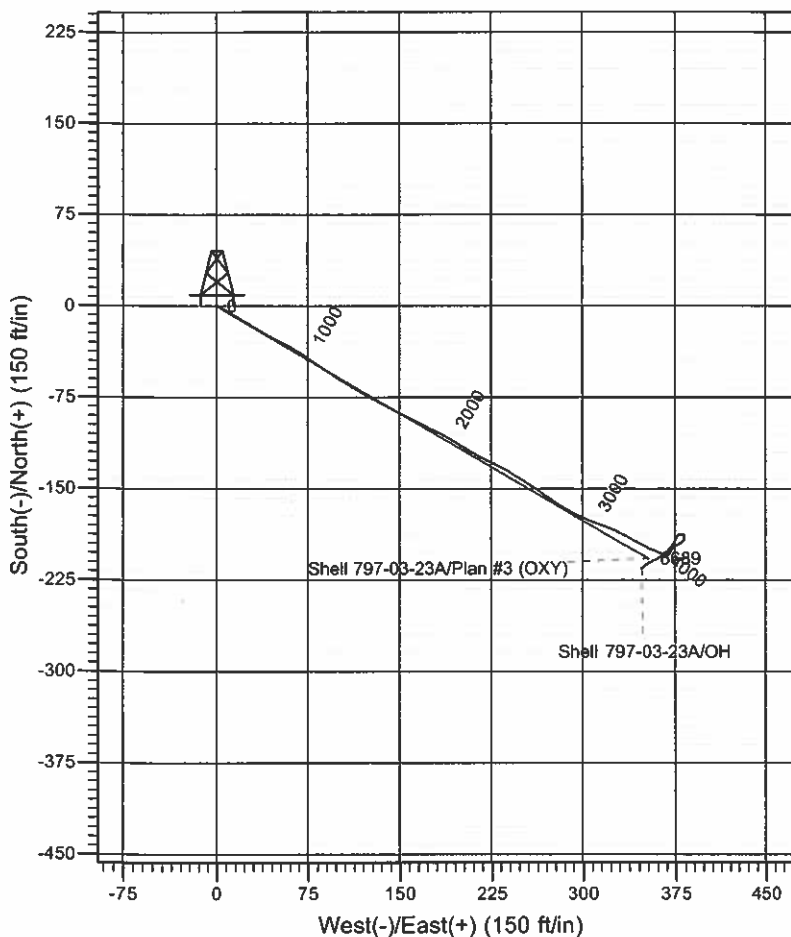
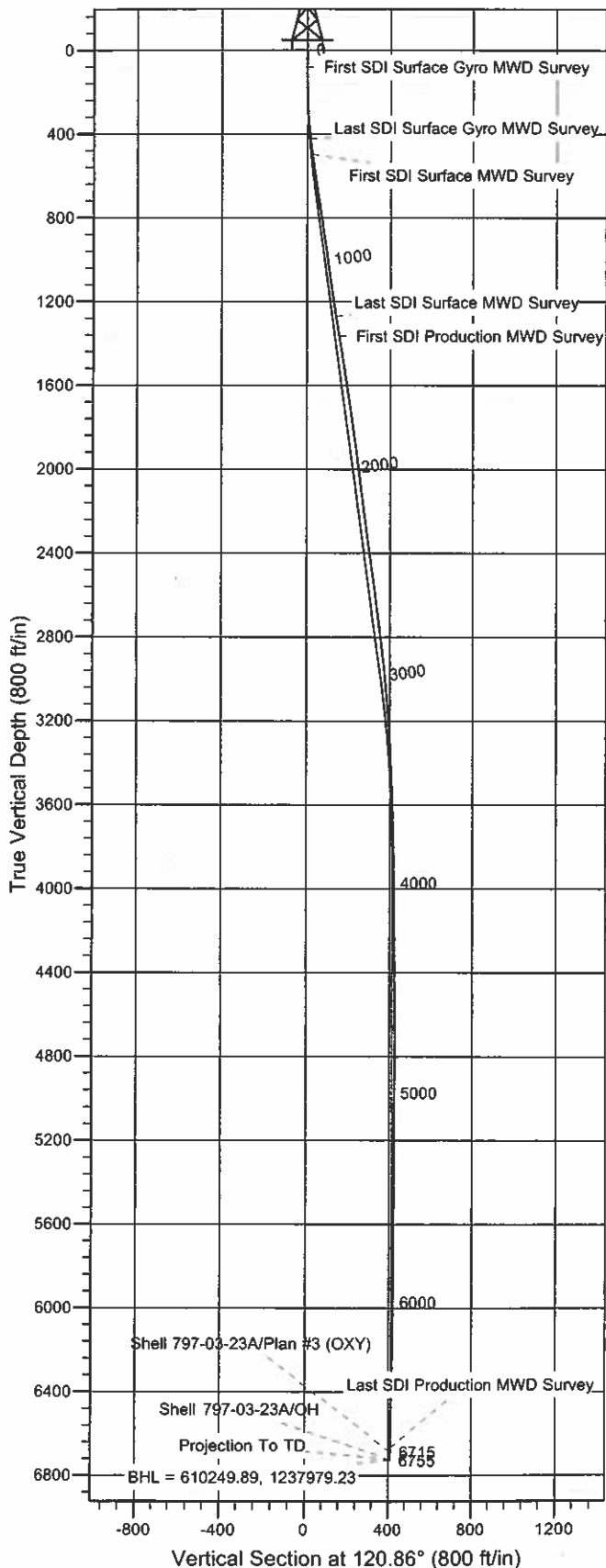
18 November, 2010



Scientific Drilling

Rocky Mountain Operations

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Shell 797-03B Pad
Well: Shell 797-03-23A
Wellbore: OH
Design: OH



Well Details: Shell 797-03-23A

+N/-S	+E/-W	TVD Reference: GL 6325' & RKB 22' @ 6347.00ft (M37) Fund Level: 6325.00	Slot
		Northing Easting Latitude Longitude	M
0.00	0.00	610475.79 1237638.31 39° 28' 42.410 N 108° 12' 4.119 W	

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Shell 797-03-23A - Slot M, True North
Vertical (TVD) Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
Section (VS) Reference: Slot - M(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

12:05, November 18 2010
Created By: Rex Hall

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-23A - Slot M
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 797-03-23A	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 797-03-23A - Slot M,					
Well Position	+N/-S	0.00 ft	Northing:	610,475.79 usft	Latitude:	39° 28' 42.410 N
	+E/-W	0.00 ft	Easting:	1,237,638.31 usft	Longitude:	108° 12' 4.119 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,325.00 ft

Wellbore	OH				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	11/2/2010	10.50	65.71	52,304

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	120.86	

Survey Program		Date	11/18/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
81.00	424.00	Survey #1 - Surface Gyro MWD (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
499.00	1,281.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
1,377.00	6,755.00	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
81.00	0.35	333.19	81.00	0.22	-0.11	-0.21	0.43	0.43	0.00
First SDI Surface Gyro MWD Survey									
112.00	0.35	54.05	112.00	0.36	-0.08	-0.25	1.46	0.00	260.84
144.00	0.53	108.98	144.00	0.37	0.14	-0.07	1.36	0.56	171.66
175.00	0.70	122.70	175.00	0.22	0.44	0.26	0.72	0.55	44.26
237.00	2.38	111.88	236.97	-0.46	1.95	1.91	2.74	2.71	-17.45
300.00	3.78	118.56	299.88	-1.94	4.99	5.28	2.29	2.22	10.60
362.00	4.75	123.13	361.71	-4.32	8.93	9.89	1.66	1.56	7.37

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-23A - Slot M
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 797-03-23A	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)
424.00	6.69	119.71	423.40	-7.52	14.22	16.06	3.18	3.13	-5.52
Last SDI Surface Gyro MWD Survey									
499.00	7.47	121.07	497.82	-12.20	22.19	25.31	1.06	1.04	1.81
First SDI Surface MWD Survey									
593.00	8.18	120.54	590.95	-18.75	33.18	38.10	0.76	0.76	-0.56
686.00	8.79	118.96	682.93	-25.55	45.10	51.82	0.70	0.66	-1.70
779.00	9.50	116.23	774.75	-32.39	58.20	66.57	0.89	0.76	-2.94
873.00	7.91	125.11	867.67	-39.53	70.45	80.76	2.21	-1.69	9.45
967.00	8.00	125.69	960.76	-47.07	81.06	93.72	0.13	0.10	0.62
1,062.00	8.00	123.09	1,054.84	-54.54	91.96	106.92	0.38	0.00	-2.74
1,157.00	8.35	121.77	1,148.87	-61.78	103.37	120.42	0.42	0.37	-1.39
1,252.00	8.79	120.28	1,242.81	-69.07	115.50	134.58	0.52	0.46	-1.57
1,281.00	8.88	120.19	1,271.47	-71.31	119.35	139.03	0.31	0.31	-0.31
Last SDI Surface MWD Survey									
1,377.00	9.85	118.34	1,366.19	-78.94	132.98	154.64	1.06	1.01	-1.93
First SDI Production MWD Survey									
1,472.00	9.09	117.53	1,459.89	-86.26	146.79	170.25	0.81	-0.80	-0.85
1,567.00	8.62	117.29	1,553.76	-93.00	159.77	184.85	0.50	-0.49	-0.25
1,663.00	8.53	117.20	1,648.69	-99.55	172.49	199.14	0.09	-0.09	-0.09
1,757.00	7.91	114.91	1,741.72	-105.46	184.56	212.53	0.75	-0.66	-2.44
1,853.00	7.83	125.37	1,836.82	-112.03	195.88	225.62	1.49	-0.08	10.90
1,948.00	7.74	119.48	1,930.95	-118.92	206.73	238.46	0.84	-0.09	-6.20
2,044.00	7.30	117.11	2,026.12	-124.88	217.79	251.01	0.56	-0.46	-2.47
2,139.00	7.21	114.12	2,120.36	-130.07	228.60	262.95	0.41	-0.09	-3.15
2,234.00	7.91	122.12	2,214.54	-135.98	239.58	275.41	1.33	0.74	8.42
2,330.00	7.21	121.59	2,309.70	-142.65	250.30	288.04	0.73	-0.73	-0.55
2,425.00	8.71	124.49	2,403.78	-149.85	261.31	301.18	1.63	1.58	3.05
2,520.00	8.27	123.79	2,497.74	-157.72	272.92	315.18	0.48	-0.46	-0.74
2,615.00	7.56	123.09	2,591.84	-164.93	283.83	328.25	0.75	-0.75	-0.74
2,710.00	6.95	117.73	2,686.08	-171.02	294.16	340.23	0.96	-0.64	-5.64
2,806.00	7.30	110.96	2,781.34	-175.90	304.99	352.04	0.95	0.36	-7.05
2,902.00	7.03	109.82	2,876.59	-180.07	316.22	363.82	0.32	-0.28	-1.19
2,997.00	5.72	113.24	2,971.00	-183.91	326.04	374.21	1.44	-1.38	3.60
3,093.00	4.75	119.22	3,066.60	-187.74	333.90	382.93	1.16	-1.01	6.23
3,189.00	3.78	121.51	3,162.33	-191.34	340.07	390.07	1.03	-1.01	2.39
3,284.00	3.68	117.90	3,257.13	-194.40	345.43	396.24	0.27	-0.11	-3.80
3,380.00	3.17	119.92	3,352.96	-197.17	350.46	401.97	0.55	-0.53	2.10
3,476.00	3.25	112.80	3,448.81	-199.54	355.26	407.32	0.42	0.08	-7.42
3,572.00	1.85	114.56	3,544.71	-201.24	359.18	411.56	1.46	-1.46	1.83
3,668.00	1.85	109.11	3,640.66	-202.39	362.06	414.61	0.18	0.00	-5.68
3,763.00	1.36	110.87	3,735.62	-203.30	364.56	417.23	0.52	-0.52	1.85
3,859.00	1.67	123.62	3,831.59	-204.48	366.79	419.74	0.48	0.32	13.28
3,954.00	0.88	74.04	3,926.57	-205.04	368.64	421.63	1.36	-0.83	-52.19
4,048.00	1.85	32.65	4,020.54	-203.57	370.15	422.17	1.41	1.03	-44.03

Scientific Drilling International

Survey Report

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Well:	Shell 797-03-23A	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)
4,144.00	1.37	27.85	4,116.50	-201.25	371.53	422.16	0.52	-0.50	-5.00
4,239.00	1.23	40.34	4,211.48	-199.47	372.72	422.26	0.33	-0.15	13.15
4,334.00	1.49	50.34	4,306.45	-197.90	374.33	422.84	0.37	0.27	10.53
4,429.00	1.32	57.26	4,401.42	-196.52	376.20	423.74	0.25	-0.18	7.28
4,524.00	1.06	65.87	4,496.40	-195.57	377.92	424.73	0.33	-0.27	9.06
4,619.00	1.14	64.03	4,591.39	-194.80	379.57	425.75	0.09	0.08	-1.94
4,714.00	1.14	35.46	4,686.37	-193.61	380.97	426.35	0.59	0.00	-30.07
4,810.00	0.70	26.41	4,782.35	-192.31	381.79	426.38	0.48	-0.46	-9.43
4,905.00	0.97	355.47	4,877.35	-190.99	381.98	425.87	0.54	0.28	-32.57
5,000.00	0.88	0.92	4,972.33	-189.46	381.93	425.04	0.13	-0.09	5.74
5,095.00	0.44	356.70	5,067.33	-188.36	381.92	424.47	0.47	-0.46	-4.44
5,191.00	0.44	305.55	5,163.32	-187.78	381.60	423.90	0.40	0.00	-53.28
5,286.00	0.26	252.81	5,258.32	-187.63	381.10	423.39	0.37	-0.19	-55.52
5,381.00	0.41	291.37	5,353.32	-187.57	380.57	422.91	0.28	0.16	40.59
5,476.00	0.97	271.54	5,448.31	-187.43	379.45	421.87	0.63	0.59	-20.87
5,572.00	0.74	235.54	5,544.30	-187.76	378.13	420.90	0.60	-0.24	-37.50
5,667.00	0.79	208.43	5,639.30	-188.68	377.31	420.68	0.38	0.05	-28.54
5,762.00	1.32	208.34	5,734.28	-190.22	376.48	420.75	0.56	0.56	-0.09
5,857.00	1.58	213.44	5,829.25	-192.28	375.24	420.74	0.31	0.27	5.37
5,953.00	1.93	211.51	5,925.20	-194.76	373.67	420.66	0.37	0.36	-2.01
6,048.00	2.52	214.22	6,020.13	-197.85	371.66	420.52	0.63	0.62	2.85
6,143.00	2.29	222.93	6,115.05	-200.97	369.19	420.00	0.45	-0.24	9.17
6,238.00	2.11	231.02	6,209.98	-203.45	366.54	419.00	0.38	-0.19	8.52
6,334.00	2.37	239.10	6,305.90	-205.59	363.46	417.46	0.43	0.27	8.42
6,429.00	2.81	242.27	6,400.81	-207.68	359.71	415.31	0.49	0.46	3.34
6,524.00	2.81	240.42	6,495.69	-209.91	355.63	412.95	0.10	0.00	-1.95
6,618.00	2.81	235.15	6,589.58	-212.37	351.73	410.86	0.27	0.00	-5.61
6,698.00	2.02	230.31	6,669.51	-214.39	349.04	409.59	1.02	-0.99	-6.05
Last SDI Production MWD Survey									
6,755.00	2.02	230.31	6,726.47	-215.67	347.49	408.92	0.00	0.00	0.00
Projection To TD - BHL = 610249.89, 1237979.23									

Scientific Drilling International Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-23A - Slot M
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 797-03-23A	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)	
81.00	81.00	0.22	-0.11	First SDI Surface Gyro MWD Survey
424.00	423.40	-7.52	14.22	Last SDI Surface Gyro MWD Survey
499.00	497.82	-12.20	22.19	First SDI Surface MWD Survey
1,281.00	1,271.47	-71.31	119.35	Last SDI Surface MWD Survey
1,377.00	1,366.19	-78.94	132.98	First SDI Production MWD Survey
6,698.00	6,669.51	-214.39	349.04	Last SDI Production MWD Survey
6,755.00	6,726.47	-215.67	347.49	Projection To TD
6,755.00	6,726.47	-215.67	347.49	BHL = 610249.89, 1237979.23

Checked By: _____	Approved By: _____	Date: _____
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