Scientific Drilling

Directional Survey Certification

7327 West Barton Road
Casper, WY 82604
(307)-472-6621 Fax (307) 472-5439

Operator	OXY USA RMAT
Well Name & No.	Shell 797-03-39B
County & State	Garfield County, CO
SDI Job No.	42DEFK10121309
Rig	Nabors M-37

I, Rex Hall, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 0 feet to a measured depth of 7220 feet is true and correct as determined from all available records.

Signature

15-Dec-10
Date

Rex Hall
Grand Junction Drilling Engineer
Scientific Drilling - Rocky Mountain District

OXY USA RMAT

Garfield County, CO NAD27
Shell 797-03B Pad
Shell 797-03-39B - Slot V

OH

Design: OH

Standard Survey Report

15 December, 2010

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	**Local Co-ordinate Reference:**	Well Shell 797-03-39B - Slot V
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 797-03-39B	**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 797-03-39B - Slot V,

Well Position	**+N/-S**	0.00 ft	**Northing:**	610,455.34 usft	**Latitude:**	39° 28' 42.200 N
	+E/-W	0.00 ft	**Easting:**	1,237,611.11 usft	**Longitude:**	108° 12' 4.458 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	2008/09/15	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	154.41

Survey Program **Date** 2010/12/15

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
81.00	455.00	Survey #1 - Surface Gyro MWD (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3
526.00	995.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA
1,092.00	7,220.00	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	0.53	14.68	81.00	0.36	0.09	-0.29	0.65	0.65	0.00
First SDI Surface Gyro MWD Survey									
113.00	0.35	167.17	113.00	0.41	0.15	-0.30	2.67	-0.56	476.53
143.00	0.97	167.61	143.00	0.07	0.23	0.03	2.07	2.07	1.47
174.00	1.58	161.46	173.99	-0.59	0.42	0.71	2.01	1.97	-19.84
206.00	2.38	153.02	205.97	-1.60	0.86	1.81	2.65	2.50	-26.38
237.00	2.82	154.34	236.94	-2.86	1.49	3.22	1.43	1.42	4.26
268.00	3.70	153.02	267.89	-4.44	2.27	4.98	2.85	2.84	-4.26

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Site:	Shell 797-03B Pad	**MD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-39B	**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)
299.00	4.49	152.93	298.81	-6.41	3.28	7.20	2.55	2.55	-0.29
331.00	5.01	154.60	330.70	-8.79	4.44	9.85	1.68	1.63	5.22
393.00	6.25	161.81	392.40	-14.44	6.66	15.90	2.30	2.00	11.63
455.00	7.39	158.29	453.96	-21.35	9.19	23.23	1.96	1.84	-5.68
Last SDI Surface Gyro MWD Survey									
526.00	8.35	155.53	524.29	-30.29	13.01	32.94	1.45	1.35	-3.89
First SDI Surface MWD Survey									
591.00	9.94	154.83	588.46	-39.66	17.35	43.26	2.45	2.45	-1.08
685.00	11.96	153.77	680.74	-55.74	25.11	61.12	2.16	2.15	-1.13
778.00	13.59	152.45	771.44	-74.07	34.42	81.68	1.78	1.75	-1.42
872.00	15.65	153.59	862.39	-95.22	45.17	105.39	2.21	2.19	1.21
965.00	18.38	154.03	951.31	-119.64	57.17	132.60	2.94	2.94	0.47
995.00	19.08	153.59	979.72	-128.29	61.43	142.24	2.38	2.33	-1.47
Last SDI Surface MWD Survey									
1,092.00	19.26	151.40	1,071.35	-156.53	76.14	174.06	0.76	0.19	-2.26
First SDI Production MWD Survey									
1,186.00	21.02	155.18	1,159.60	-185.45	90.64	206.41	2.33	1.87	4.02
1,282.00	21.72	155.18	1,249.00	-217.20	105.32	241.38	0.73	0.73	0.00
1,377.00	23.65	153.59	1,336.64	-250.22	121.18	278.02	2.13	2.03	-1.67
1,472.00	26.29	152.10	1,422.76	-285.89	139.50	318.10	2.86	2.78	-1.57
1,567.00	26.82	153.68	1,507.74	-323.69	158.85	360.55	0.93	0.56	1.66
1,663.00	28.58	154.56	1,592.73	-363.84	178.31	405.17	1.88	1.83	0.92
1,757.00	30.78	154.21	1,674.39	-405.81	198.44	451.71	2.35	2.34	-0.37
1,853.00	32.10	154.21	1,756.30	-450.89	220.22	501.79	1.38	1.38	0.00
1,948.00	33.59	156.14	1,836.11	-497.66	241.84	553.30	1.92	1.57	2.03
2,044.00	36.23	156.32	1,914.83	-547.94	263.98	608.21	2.75	2.75	0.19
2,139.00	38.08	152.36	1,990.55	-599.61	288.85	665.56	3.18	1.95	-4.17
2,234.00	40.27	154.74	2,064.20	-653.34	315.55	725.55	2.80	2.31	2.51
2,329.00	40.54	155.18	2,136.54	-709.13	341.61	787.12	0.41	0.28	0.46
2,425.00	39.39	154.56	2,210.12	-764.96	367.79	848.78	1.27	-1.20	-0.65
2,520.00	40.36	154.12	2,283.02	-819.85	394.17	909.69	1.06	1.02	-0.46
2,615.00	39.66	152.19	2,355.79	-874.35	421.74	970.74	1.50	-0.74	-2.03
2,710.00	39.04	151.57	2,429.25	-927.47	450.13	1,030.92	0.77	-0.65	-0.65
2,806.00	38.78	153.51	2,503.96	-980.97	477.93	1,091.18	1.30	-0.27	2.02
2,902.00	34.38	156.32	2,581.03	-1,032.73	502.24	1,148.36	4.90	-4.58	2.93
2,997.00	32.45	157.64	2,660.33	-1,080.87	522.71	1,200.62	2.17	-2.03	1.39
3,093.00	31.13	155.09	2,741.93	-1,127.20	542.96	1,251.15	1.96	-1.38	-2.66
3,188.00	30.16	151.31	2,823.67	-1,170.41	564.77	1,299.54	2.27	-1.02	-3.98
3,284.00	32.71	151.40	2,905.57	-1,214.35	588.76	1,349.53	2.66	2.66	0.09
3,380.00	33.50	153.16	2,985.99	-1,260.76	613.14	1,401.92	1.30	0.82	1.83
3,476.00	30.43	155.79	3,067.43	-1,306.59	635.08	1,452.73	3.51	-3.20	2.74
3,572.00	26.64	158.43	3,151.75	-1,348.79	652.97	1,498.52	4.16	-3.95	2.75
3,668.00	23.21	161.51	3,238.80	-1,386.76	666.89	1,538.78	3.82	-3.57	3.21
3,763.00	19.26	159.75	3,327.33	-1,419.23	678.25	1,572.97	4.21	-4.16	-1.85

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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 797-03-39B	**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	18.82	160.10	3,418.08	-1,448.64	689.00	1,604.14	0.47	-0.46	0.36
3,954.00	17.50	154.39	3,508.36	-1,475.93	700.39	1,633.67	2.33	-1.39	-6.01
4,048.00	15.30	153.77	3,598.53	-1,499.80	711.98	1,660.21	2.35	-2.34	-0.66
4,144.00	14.07	162.82	3,691.40	-1,522.32	721.03	1,684.43	2.71	-1.28	9.43
4,239.00	10.90	157.37	3,784.14	-1,541.65	727.90	1,704.82	3.56	-3.34	-5.74
4,334.00	9.85	153.59	3,877.59	-1,557.22	734.97	1,721.92	1.32	-1.11	-3.98
4,429.00	6.95	171.52	3,971.58	-1,570.18	739.43	1,735.54	4.08	-3.05	18.87
4,524.00	8.97	152.89	4,065.67	-1,582.46	743.66	1,748.44	3.42	2.13	-19.61
4,619.00	8.27	153.77	4,159.60	-1,595.19	750.05	1,762.68	0.75	-0.74	0.93
4,714.00	7.65	145.16	4,253.69	-1,606.50	756.68	1,775.75	1.41	-0.65	-9.06
4,810.00	7.65	151.05	4,348.83	-1,617.34	763.43	1,788.44	0.82	0.00	6.14
4,905.00	7.30	150.96	4,443.03	-1,628.15	769.42	1,800.78	0.37	-0.37	-0.09
5,000.00	7.65	155.09	4,537.22	-1,639.16	775.01	1,813.12	0.67	0.37	4.35
5,095.00	8.00	146.21	4,631.34	-1,650.39	781.35	1,825.99	1.32	0.37	-9.35
5,190.00	7.12	141.11	4,725.51	-1,660.47	788.73	1,838.26	1.16	-0.93	-5.37
5,286.00	8.88	146.12	4,820.58	-1,671.25	796.59	1,851.39	1.97	1.83	5.22
5,380.00	8.88	147.09	4,913.45	-1,683.37	804.58	1,865.76	0.16	0.00	1.03
5,476.00	7.56	145.16	5,008.46	-1,694.77	812.21	1,879.34	1.40	-1.38	-2.01
5,572.00	8.09	137.51	5,103.57	-1,704.93	820.38	1,892.04	1.22	0.55	-7.97
5,667.00	8.79	143.58	5,197.54	-1,715.71	829.21	1,905.57	1.19	0.74	6.39
5,762.00	8.71	149.82	5,291.44	-1,727.76	837.13	1,919.87	1.00	-0.08	6.57
5,857.00	8.27	155.00	5,385.40	-1,740.17	843.64	1,933.87	0.93	-0.46	5.45
5,953.00	7.03	154.03	5,480.54	-1,751.71	849.13	1,946.65	1.30	-1.29	-1.01
6,048.00	7.12	159.40	5,574.82	-1,762.45	853.74	1,958.33	0.70	0.09	5.65
6,143.00	7.30	158.60	5,669.07	-1,773.58	858.02	1,970.21	0.22	0.19	-0.84
6,238.00	8.00	158.78	5,763.22	-1,785.36	862.61	1,982.82	0.74	0.74	0.19
6,333.00	7.39	155.26	5,857.37	-1,797.08	867.56	1,995.52	0.81	-0.64	-3.71
6,429.00	8.18	158.78	5,952.48	-1,809.05	872.62	2,008.51	0.96	0.82	3.67
6,524.00	7.12	158.17	6,046.64	-1,820.82	877.25	2,021.12	1.12	-1.12	-0.64
6,618.00	5.98	155.53	6,140.02	-1,830.68	881.45	2,031.83	1.25	-1.21	-2.81
6,714.00	5.36	152.45	6,235.55	-1,839.21	885.59	2,041.31	0.72	-0.65	-3.21
6,807.00	4.57	158.34	6,328.20	-1,846.50	888.97	2,049.35	1.01	-0.85	6.33
6,902.00	3.87	157.11	6,422.94	-1,852.97	891.62	2,056.33	0.74	-0.74	-1.29
7,001.00	3.43	160.54	6,521.74	-1,858.84	893.90	2,062.61	0.50	-0.44	3.46
7,096.00	2.81	161.07	6,616.60	-1,863.73	895.60	2,067.75	0.65	-0.65	0.56
7,165.00	2.20	156.67	6,685.54	-1,866.54	896.68	2,070.75	0.93	-0.88	-6.38
Last SDI Production MWD Survey									
7,220.00	2.20	156.67	6,740.49	-1,868.48	897.51	2,072.86	0.00	0.00	0.00
Projection To TD - BHL = 608561.01, 1238452.67									

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Site:	Shell 797-03B Pad	**MD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-39B	**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 +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
81.00	81.00	0.36	0.09	First SDI Surface Gyro MWD Survey
455.00	453.96	-21.35	9.19	Last SDI Surface Gyro MWD Survey
526.00	524.29	-30.29	13.01	First SDI Surface MWD Survey
995.00	979.72	-128.29	61.43	Last SDI Surface MWD Survey
1,092.00	1,071.35	-156.53	76.14	First SDI Production MWD Survey
7,165.00	6,685.54	-1,866.54	896.68	Last SDI Production MWD Survey
7,220.00	6,740.49	-1,868.48	897.51	Projection To TD
7,220.00	6,740.49	-1,868.48	897.51	BHL = 608561.01, 1238452.67

Checked By: _____ Approved By: _____ Date: _____