



Well Details: CC 697-05-53A

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	638499.90	1227014.93	39° 33' 16.123 N	108° 14' 30.326 W	D

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-05-53A - Slot D, True North
Vertical (TVD) Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Section (VS) Reference: Slot - D(0.00N, 0.00E)
Measured Depth Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
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

10:49, February 29 2012
Created By: Janie Cooke

OXY USA RMAT

**Garfield County, CO NAD27
Cascade Creek 697-05C Pad
CC 697-05-53A - Slot D**

OH

Design: OH

Standard Survey Report

29 February, 2012



Scientific Drilling International, Inc.
Survey Report



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-05-53A - Slot D
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Site:	Cascade Creek 697-05C Pad	MD Reference:	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Well:	CC 697-05-53A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

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		Cascade Creek 697-05C Pad, Sec. 5 T6S R97W			
Site Position:		Northing:	637,463.43 usft	Latitude:	39° 33' 5.626 N
From:	Map	Easting:	1,226,150.07 usft	Longitude:	108° 14' 40.963 W
Position Uncertainty:	0.00 ft	Slot Radius:	0.000 in	Grid Convergence:	-1.73 °

Well	CC 697-05-53A - Slot D					
Well Position	+N/-S	0.00 ft	Northing:	638,499.90 usft	Latitude:	39° 33' 16.123 N
	+E/-W	0.00 ft	Easting:	1,227,014.93 usft	Longitude:	108° 14' 30.326 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,423.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	12/16/2010	10.51	65.77	52,312

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		182.66

Survey Program	Date	02/29/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
164.00	614.00	Survey #1 - Gyro Survey (OH)	SDI Standard Keeper 103	SDI Standard Wireline Keeper ver 1.0.3	
686.00	2,671.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,763.00	9,110.00	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	
164.00	0.44	45.79	164.00	0.44	0.45	-0.46	0.27	0.27	0.00	
First SDI Gyro Survey										
254.00	2.82	167.17	253.96	-1.48	1.19	1.42	3.41	2.64	134.87	
345.00	5.89	178.68	344.69	-8.33	1.80	8.24	3.49	3.37	12.65	
435.00	6.42	180.00	434.17	-17.98	1.90	17.87	0.61	0.59	1.47	
525.00	9.33	180.35	523.31	-30.31	1.86	30.19	3.23	3.23	0.39	
614.00	11.35	181.41	610.86	-46.28	1.60	46.16	2.28	2.27	1.19	

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Survey Report



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Project:	Garfield County, CO NAD27	TVD Reference:	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Site:	Cascade Creek 697-05C Pad	MD Reference:	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Well:	CC 697-05-53A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

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)
Last SDI Gyro Survey									
686.00	13.10	179.94	681.23	-61.52	1.43	61.39	2.47	2.43	-2.04
First SDI Surface MWD									
776.00	11.87	179.59	769.10	-80.98	1.51	80.82	1.37	-1.37	-0.39
866.00	11.08	182.14	857.30	-98.88	1.25	98.71	1.04	-0.88	2.83
957.00	12.57	180.73	946.37	-117.52	0.80	117.35	1.67	1.64	-1.55
1,049.00	13.01	189.17	1,036.09	-137.75	-0.98	137.65	2.08	0.48	9.17
1,144.00	10.73	187.59	1,129.05	-157.08	-3.85	157.09	2.42	-2.40	-1.66
1,238.00	11.78	185.30	1,221.25	-175.31	-5.89	175.39	1.21	1.12	-2.44
1,333.00	14.86	186.18	1,313.68	-197.08	-8.10	197.24	3.25	3.24	0.93
1,427.00	13.98	184.16	1,404.72	-220.39	-10.22	220.63	1.08	-0.94	-2.15
1,522.00	15.21	180.73	1,496.65	-244.30	-11.21	244.55	1.58	1.29	-3.61
1,616.00	17.85	183.37	1,586.76	-271.01	-12.22	271.29	2.92	2.81	2.81
1,711.00	16.53	184.42	1,677.52	-299.02	-14.12	299.36	1.43	-1.39	1.11
1,805.00	13.81	179.76	1,768.23	-323.58	-15.10	323.93	3.17	-2.89	-4.96
1,900.00	14.33	178.89	1,860.38	-346.67	-14.82	346.99	0.59	0.55	-0.92
1,995.00	14.25	180.03	1,952.45	-370.12	-14.60	370.40	0.31	-0.08	1.20
2,089.00	15.04	182.05	2,043.39	-393.88	-15.04	394.15	1.00	0.84	2.15
2,184.00	15.21	183.46	2,135.10	-418.64	-16.24	418.94	0.43	0.18	1.48
2,278.00	15.92	183.98	2,225.65	-443.80	-17.88	444.16	0.77	0.76	0.55
2,372.00	17.50	184.60	2,315.68	-470.75	-19.90	471.17	1.69	1.68	0.66
2,467.00	18.62	184.95	2,406.50	-498.53	-22.22	499.02	0.93	-0.93	0.37
2,561.00	15.30	183.81	2,496.87	-524.30	-24.21	524.86	1.44	-1.40	-1.21
2,671.00	16.27	182.31	2,602.73	-554.18	-25.79	554.78	0.96	0.88	-1.36
Last SDI Surface MWD									
2,763.00	16.71	181.49	2,690.94	-580.27	-26.66	580.89	0.54	0.48	-0.89
First SDI Production MWD									
2,858.00	15.39	179.85	2,782.24	-606.53	-26.98	607.13	1.47	-1.39	-1.73
2,952.00	13.28	175.02	2,873.31	-629.77	-26.01	630.30	2.58	-2.24	-5.14
3,046.00	12.57	176.16	2,964.93	-650.73	-24.39	651.16	0.80	-0.76	1.21
3,141.00	13.28	181.96	3,057.52	-671.95	-24.07	672.34	1.56	0.75	6.11
3,236.00	16.09	191.45	3,149.42	-695.76	-27.05	696.27	3.88	2.96	9.99
3,330.00	14.86	191.01	3,240.01	-720.36	-31.94	721.07	1.31	-1.31	-0.47
3,425.00	14.77	191.89	3,331.86	-744.17	-36.76	745.08	0.26	-0.09	0.93
3,520.00	16.36	188.99	3,423.37	-769.24	-41.35	770.33	1.86	1.67	-3.05
3,614.00	15.48	189.52	3,513.76	-794.69	-45.49	795.94	0.95	-0.94	0.56
3,709.00	15.74	184.95	3,605.26	-820.03	-48.70	821.41	1.32	0.27	-4.81
3,803.00	15.30	186.18	3,695.84	-845.06	-51.14	846.52	0.58	-0.47	1.31
3,898.00	16.27	179.85	3,787.26	-870.83	-52.45	872.33	2.08	1.02	-6.66
3,992.00	16.36	179.59	3,877.47	-897.24	-52.32	898.70	0.12	0.10	-0.28
4,087.00	16.09	180.03	3,968.69	-923.78	-52.23	925.21	0.31	-0.28	0.46
4,181.00	15.48	181.35	4,059.15	-949.35	-52.54	950.76	0.75	-0.65	1.40
4,275.00	15.21	182.58	4,149.79	-974.21	-53.39	975.64	0.45	-0.29	1.31
4,370.00	14.33	182.93	4,241.65	-998.40	-54.55	999.86	0.93	-0.93	0.37

Scientific Drilling International, Inc.

Survey Report



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-05-53A - Slot D
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Site:	Cascade Creek 697-05C Pad	MD Reference:	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Well:	CC 697-05-53A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

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)
4,465.00	13.89	184.07	4,333.79	-1,021.51	-55.96	1,023.01	0.55	-0.46	1.20
4,559.00	14.07	183.81	4,425.00	-1,044.17	-57.52	1,045.71	0.20	0.19	-0.28
4,654.00	14.68	176.78	4,517.04	-1,067.71	-57.61	1,069.24	1.94	0.64	-7.40
4,748.00	13.45	176.60	4,608.22	-1,090.52	-56.29	1,091.96	1.31	-1.31	-0.19
4,843.00	13.72	177.65	4,700.56	-1,112.80	-55.18	1,114.16	0.38	0.28	1.11
4,937.00	12.40	177.22	4,792.13	-1,134.02	-54.23	1,135.32	1.41	-1.40	-0.46
5,032.00	11.43	178.09	4,885.08	-1,153.62	-53.42	1,154.85	1.04	-1.02	0.92
5,126.00	11.61	172.65	4,977.19	-1,172.31	-51.90	1,173.45	1.17	0.19	-5.79
5,221.00	10.73	174.14	5,070.39	-1,190.59	-49.77	1,191.61	0.97	-0.93	1.57
5,315.00	10.20	173.26	5,162.82	-1,207.56	-47.90	1,208.48	0.59	-0.56	-0.94
5,410.00	9.50	161.83	5,256.43	-1,223.36	-44.47	1,224.11	2.18	-0.74	-12.03
5,505.00	7.56	151.11	5,350.38	-1,236.28	-39.01	1,236.76	2.63	-2.04	-11.28
5,599.00	6.86	148.48	5,443.64	-1,246.48	-33.08	1,246.67	0.82	-0.74	-2.80
5,694.00	6.60	149.27	5,537.98	-1,256.01	-27.33	1,255.93	0.29	-0.27	0.83
5,788.00	4.22	150.23	5,631.56	-1,263.66	-22.85	1,263.36	2.53	-2.53	1.02
5,883.00	2.02	167.55	5,726.41	-1,268.33	-20.75	1,267.92	2.49	-2.32	18.23
5,977.00	1.58	178.09	5,820.37	-1,271.24	-20.35	1,270.81	0.58	-0.47	11.21
6,071.00	1.67	178.80	5,914.33	-1,273.91	-20.28	1,273.47	0.10	0.10	0.76
6,166.00	1.76	197.08	6,009.29	-1,276.69	-20.68	1,276.27	0.58	0.09	19.24
6,260.00	1.32	205.16	6,103.25	-1,279.05	-21.56	1,278.67	0.52	-0.47	8.60
6,355.00	1.49	212.99	6,198.22	-1,281.07	-22.70	1,280.74	0.27	0.18	8.24
6,449.00	1.67	230.74	6,292.19	-1,282.96	-24.43	1,282.71	0.55	0.19	18.88
6,544.00	1.23	206.31	6,387.16	-1,284.75	-25.95	1,284.57	0.79	-0.46	-25.72
6,638.00	0.79	61.64	6,481.15	-1,285.35	-25.83	1,285.16	2.05	-0.47	-153.90
6,733.00	0.88	48.19	6,576.14	-1,284.55	-24.71	1,284.31	0.23	0.09	-14.16
6,827.00	0.70	72.98	6,670.13	-1,283.90	-23.62	1,283.61	0.41	-0.19	26.37
6,922.00	0.70	79.74	6,765.13	-1,283.63	-22.50	1,283.29	0.09	0.00	7.12
7,016.00	0.26	134.32	6,859.12	-1,283.68	-21.78	1,283.30	0.63	-0.47	58.06
7,111.00	0.79	166.14	6,954.12	-1,284.46	-21.47	1,284.07	0.62	0.56	33.49
7,205.00	1.32	194.97	7,048.10	-1,286.14	-21.59	1,285.75	0.78	0.56	30.67
7,300.00	0.44	168.87	7,143.09	-1,287.55	-21.80	1,287.18	0.99	-0.93	-27.47
7,395.00	0.53	232.76	7,238.09	-1,288.18	-22.08	1,287.81	0.55	0.09	67.25
7,489.00	1.06	237.24	7,332.08	-1,288.91	-23.16	1,288.59	0.57	0.56	4.77
7,584.00	1.58	261.85	7,427.05	-1,289.57	-25.20	1,289.35	0.80	0.55	25.91
7,678.00	1.32	254.12	7,521.02	-1,290.05	-27.52	1,289.94	0.35	-0.28	-8.22
7,773.00	0.97	264.05	7,616.01	-1,290.44	-29.37	1,290.41	0.42	-0.37	10.45
7,867.00	1.85	270.73	7,709.98	-1,290.50	-31.68	1,290.58	0.95	0.94	7.11
7,962.00	0.88	261.33	7,804.95	-1,290.59	-33.94	1,290.77	1.04	-1.02	-9.89
8,056.00	0.18	260.54	7,898.94	-1,290.72	-34.79	1,290.94	0.74	-0.74	-0.84
8,151.00	0.44	277.15	7,993.94	-1,290.70	-35.30	1,290.95	0.29	0.27	17.48
8,160.36	0.51	275.86	8,003.30	-1,290.69	-35.38	1,290.94	0.75	0.74	-13.78
CC 697-05-53A Target									
8,245.00	1.14	271.35	8,087.93	-1,290.63	-36.60	1,290.94	0.75	0.75	-5.33
8,340.00	2.11	258.34	8,182.89	-1,290.97	-39.25	1,291.39	1.09	1.02	-13.69

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Survey Report



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Well:	CC 697-05-53A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

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)
8,434.00	2.81	264.93	8,276.81	-1,291.52	-43.24	1,292.13	0.80	0.74	7.01
8,529.00	4.04	263.44	8,371.64	-1,292.11	-48.89	1,292.98	1.30	1.29	-1.57
8,623.00	5.28	261.50	8,465.32	-1,293.12	-56.46	1,294.35	1.33	1.32	-2.06
8,718.00	6.33	256.58	8,559.84	-1,294.99	-65.87	1,296.65	1.22	1.11	-5.18
8,812.00	5.89	260.18	8,653.30	-1,297.01	-75.67	1,299.13	0.62	-0.47	3.83
8,907.00	5.89	261.94	8,747.80	-1,298.53	-85.30	1,301.09	0.19	0.00	1.85
9,001.00	6.24	260.71	8,841.27	-1,300.03	-95.11	1,303.04	0.40	0.37	-1.31
9,055.00	5.80	258.87	8,894.98	-1,301.03	-100.69	1,304.30	0.89	-0.81	-3.41
Last SDI Production MWD									
9,110.00	5.80	258.87	8,949.69	-1,302.10	-106.14	1,305.63	0.00	0.00	0.00
Projection to TD - BHL = 637201.60, 1226869.55									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
164.00	164.00	0.44	0.45	First SDI Gyro Survey
614.00	610.86	-46.28	1.60	Last SDI Gyro Survey
686.00	681.23	-61.52	1.43	First SDI Surface MWD
2,671.00	2,602.73	-554.18	-25.79	Last SDI Surface MWD
2,763.00	2,690.94	-580.27	-26.66	First SDI Production MWD
9,055.00	8,894.98	-1,301.03	-100.69	Last SDI Production MWD
9,110.00	8,949.69	-1,302.10	-106.14	Projection to TD
9,110.00	8,949.69	-1,302.10	-106.14	BHL = 637201.60, 1226869.55

Checked By: _____	Approved By: _____	Date: _____
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