



Scientific Drilling

OXY USA RMAT

Garfield County, CO NAD27

Cascade Creek 608-43-31 Pad

Cascade Creek 697-08-47A - Slot N

OH

Design: OH

Standard Survey Report

04 February, 2011

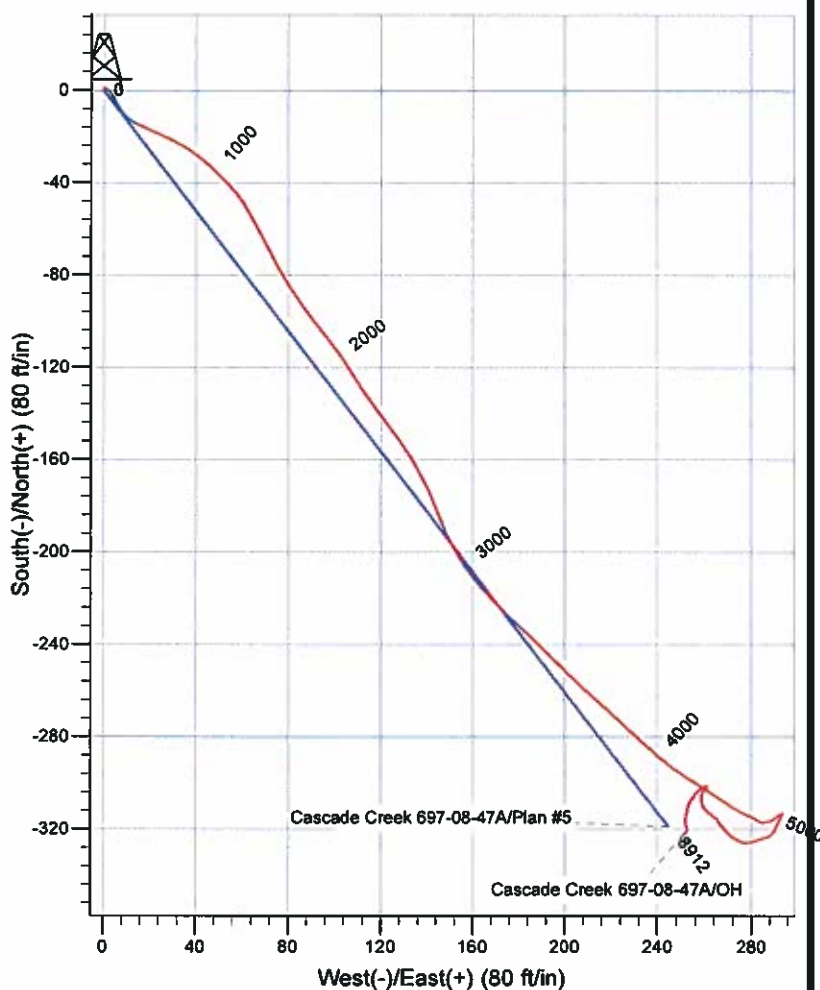
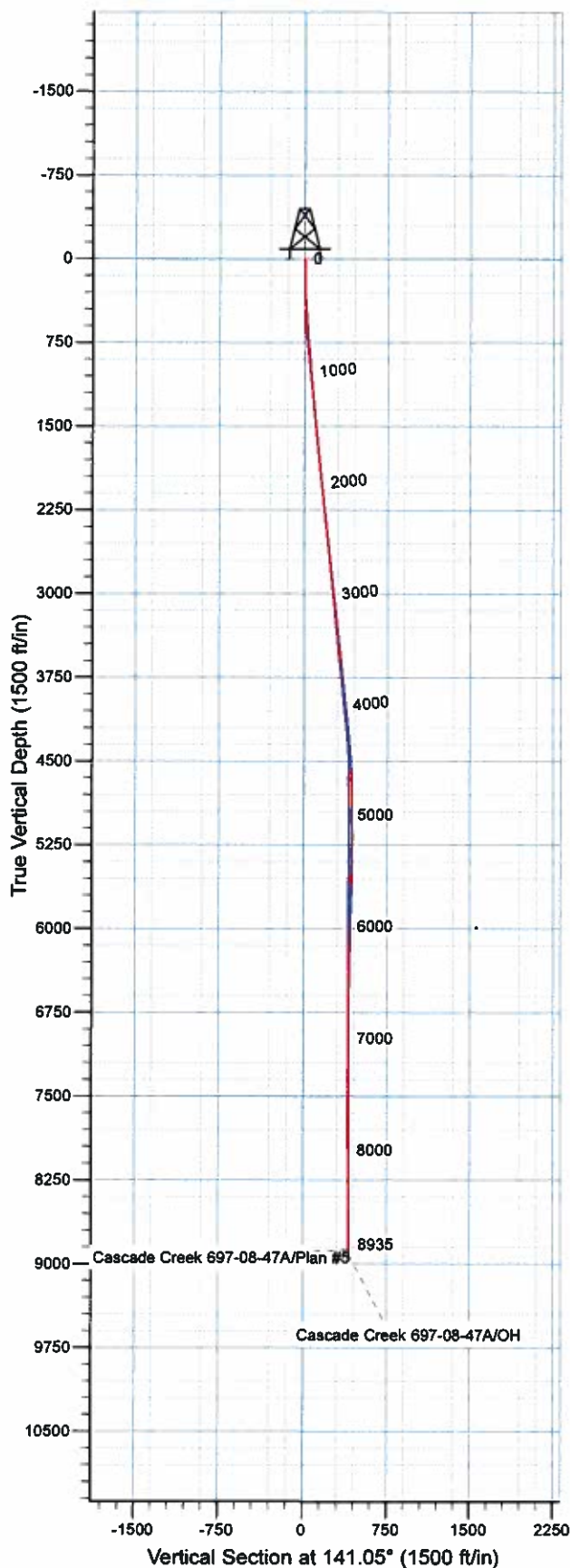




Scientific Drilling

Project: Garfield County, CO NAD27
 Site: Cascade Creek 608-43-31 Pad
 Well: Cascade Creek 697-08-47A
 Wellbore: OH
 Design: OH

OXY USA RMAT



WELL DETAILS: Cascade Creek 697-08-47A

Ground Level: GL 8479' & RKB 30' @ 8509.00ft (H&P)						
	0.00	0.00	Northing	Easting	Latitude	Longitude
			631785.93	1228169.70	39° 32' 10.139 N	108° 14' 13.008 W
						N

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Cascade Creek 697-08-47A - Slot N, True North
 Vertical (TVD) Reference: GL 8479' & RKB 30' @ 8509.00ft (H&P)
 Section (VS) Reference: Slot - N(0.00N, 0.00E)
 Measured Depth Reference: GL 8479' & RKB 30' @ 8509.00ft (H&P)
 Calculation Method: Minimum Curvature
 Local North: True
 Location: Sec 8 T6S R97W

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

Design: OH (Cascade Creek 697-08-47A/OH)

Created By: Julie Cruse Date: 2011-02-04

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Cascade Creek 697-08-47A - Slot N
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8479' & RKB 30' @ 8509.00ft (H&P)
Site:	Cascade Creek 608-43-31 Pad	MD Reference:	GL 8479' & RKB 30' @ 8509.00ft (H&P)
Well:	Cascade Creek 697-08-47A	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	Cascade Creek 608-43-31 Pad, Sec 8 T6S R97W				
Site Position:		Northing:	39.54 usft	Latitude:	37° 37' 28.115 N
From:	Map	Easting:	-108.24 usft	Longitude:	112° 24' 37.715 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-4.36 °

Well	Cascade Creek 697-08-47A - Slot N				
Well Position	+N/-S	0.00 ft	Northing:	631,785.93 usft	Latitude: 39° 32' 10.139 N
	+E/-W	0.00 ft	Easting:	1,228,169.69 usft	Longitude: 108° 14' 13.008 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level: 8,479.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	2008-11-19	10.77	65.81	52,503

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	141.05	

Survey Program	Date	2011-02-04			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
75.00	444.00	Survey #1 - Surface Gyro (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
526.00	2,672.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,790.00	8,935.00	Survey #3 - Production (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
75.00	0.75	339.24	75.00	0.46	-0.17	-0.47	1.00	1.00	0.00
First SDI Gyro Survey									
168.00	0.85	87.19	167.99	1.08	0.30	-0.64	1.39	0.11	116.08
260.00	1.69	136.97	259.97	0.10	1.91	1.12	1.43	0.91	54.11
352.00	3.38	150.63	351.88	-3.25	4.16	5.15	1.94	1.84	14.85
444.00	4.66	148.90	443.65	-8.82	7.42	11.52	1.40	1.39	-1.88
Last SDI Gyro Survey									

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Cascade Creek 697-08-47A - Slot N
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8479' & RKB 30' @ 8509.00ft (H&P)
Site:	Cascade Creek 608-43-31 Pad	MD Reference:	GL 8479' & RKB 30' @ 8509.00ft (H&P)
Well:	Cascade Creek 697-08-47A	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)
526.00	5.15	119.51	525.36	-13.48	12.35	18.25	3.09	0.60	-35.84
First SDI MWD Survey									
619.00	4.90	111.09	618.01	-16.97	19.69	25.57	0.84	-0.27	-9.05
711.00	4.93	117.27	709.67	-20.19	26.87	32.59	0.58	0.03	6.72
803.00	5.01	116.68	801.32	-23.81	33.97	39.87	0.10	0.09	-0.64
897.00	5.10	131.02	894.96	-28.39	40.79	47.72	1.34	0.10	15.26
992.00	4.57	129.44	989.62	-33.57	46.90	55.59	0.58	-0.56	-1.86
1,087.00	5.10	136.91	1,084.29	-39.06	52.71	63.51	0.87	0.56	7.86
1,181.00	5.01	141.04	1,177.92	-45.30	58.14	71.78	0.40	-0.10	4.39
1,276.00	5.19	153.69	1,272.55	-52.38	62.65	80.12	1.20	0.19	13.32
1,371.00	5.63	149.74	1,367.12	-60.25	66.91	88.92	0.61	0.46	-4.16
1,466.00	5.80	153.96	1,461.65	-68.59	71.36	98.20	0.48	0.18	4.44
1,561.00	5.01	150.62	1,556.23	-76.52	75.50	106.97	0.89	-0.83	-3.52
1,655.00	5.98	149.12	1,649.80	-84.30	80.03	115.87	1.04	1.03	-1.60
1,750.00	5.45	142.88	1,744.32	-92.14	85.29	125.28	0.86	-0.56	-6.57
1,845.00	5.98	144.29	1,838.85	-99.76	90.90	134.73	0.58	0.56	1.48
1,939.00	6.16	139.02	1,932.33	-107.54	97.07	144.66	0.62	0.19	-5.61
2,034.00	6.42	146.66	2,026.76	-115.83	103.33	155.04	0.92	0.27	8.04
2,129.00	6.86	149.39	2,121.12	-125.15	109.14	165.94	0.57	0.46	2.87
2,224.00	5.80	143.59	2,215.54	-133.89	114.88	176.34	1.30	-1.12	-6.11
2,318.00	6.43	143.41	2,309.00	-141.94	120.83	186.35	0.67	0.67	-0.19
2,413.00	6.07	143.50	2,403.44	-150.25	126.99	196.68	0.38	-0.38	0.09
2,508.00	6.33	147.81	2,497.88	-158.72	132.77	206.90	0.56	0.27	4.54
2,603.00	6.51	153.43	2,592.29	-167.97	137.97	217.36	0.69	0.19	5.92
2,672.00	6.42	154.05	2,660.85	-174.94	141.41	224.94	0.17	-0.13	0.90
Last Survey in 14 3/4" Hole									
2,790.00	6.33	161.16	2,778.12	-187.02	146.40	237.48	0.67	-0.08	6.03
First Survey in 8 3/4" Hole									
2,885.00	6.86	149.91	2,872.50	-196.89	150.93	248.00	1.47	0.56	-11.84
2,980.00	5.72	146.49	2,966.92	-205.75	156.39	258.32	1.26	-1.20	-3.60
3,075.00	6.24	139.02	3,061.41	-213.59	162.39	268.19	0.98	0.55	-7.86
3,169.00	5.80	138.05	3,154.89	-220.98	168.91	278.04	0.48	-0.47	-1.03
3,264.00	6.60	132.86	3,249.33	-228.27	176.13	288.24	1.03	0.84	-5.46
3,359.00	6.77	132.16	3,343.69	-235.74	184.28	299.18	0.20	0.16	-0.74
3,453.00	6.77	136.47	3,437.03	-243.47	192.20	310.17	0.54	0.00	4.59
3,548.00	7.12	133.48	3,531.34	-251.58	200.33	321.59	0.53	0.37	-3.15
3,643.00	6.16	133.39	3,625.70	-259.14	208.31	332.48	1.01	-1.01	-0.09
3,737.00	5.72	131.72	3,719.19	-265.72	215.47	342.10	0.50	-0.47	-1.78
3,832.00	7.12	132.34	3,813.60	-272.84	223.35	352.59	1.48	1.47	0.65
3,927.00	6.33	133.48	3,907.94	-280.40	231.51	363.60	0.84	-0.83	1.20
4,022.00	6.07	132.60	4,002.39	-287.41	239.00	373.76	0.29	-0.27	-0.93
4,116.00	6.33	126.18	4,095.84	-293.83	246.84	383.69	0.79	0.28	-6.83
4,211.00	6.07	122.67	4,190.28	-299.63	255.30	393.52	0.48	-0.27	-3.69
4,306.00	6.07	124.07	4,284.75	-305.16	263.69	403.09	0.16	0.00	1.47

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Site:	Cascade Creek 608-43-31 Pad	MD Reference:	GL 8479' & RKB 30' @ 8509.00ft (H&P)
Well:	Cascade Creek 697-08-47A	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)
4,401.00	5.10	123.55	4,379.30	-310.31	271.37	411.92	1.02	-1.02	-0.55
4,495.00	3.69	112.91	4,473.02	-313.79	277.64	418.57	1.73	-1.50	-11.32
4,590.00	2.37	123.02	4,567.88	-316.05	282.10	423.13	1.49	-1.39	10.84
4,685.00	1.85	95.69	4,662.82	-317.28	285.27	426.08	1.18	-0.55	-28.77
4,780.00	2.90	86.07	4,757.74	-316.45	289.00	427.78	1.67	1.11	-31.18
4,874.00	2.37	43.48	4,851.65	-314.08	292.51	428.14	1.23	-0.56	-24.03
4,969.00	0.79	188.85	4,946.62	-313.30	293.76	428.32	3.21	-1.66	153.02
5,063.00	2.11	207.48	5,040.59	-315.48	292.86	429.45	1.47	1.40	19.82
5,158.00	2.02	208.52	5,135.53	-318.53	291.30	430.84	0.10	-0.09	-1.01
5,253.00	1.67	200.80	5,230.48	-321.32	290.07	432.23	0.42	-0.37	-6.02
5,347.00	2.29	247.47	5,324.43	-323.32	287.84	432.39	1.77	0.66	49.65
5,442.00	2.55	255.56	5,419.34	-324.57	284.04	430.98	0.45	0.27	8.52
5,536.00	2.90	250.29	5,513.24	-325.90	279.78	429.33	0.46	0.37	-5.61
5,631.00	1.58	299.06	5,608.17	-326.07	276.37	427.32	2.32	-1.39	51.34
5,726.00	1.58	293.00	5,703.14	-324.92	274.02	424.95	0.18	0.00	-6.38
5,820.00	1.93	310.93	5,797.09	-323.38	271.63	422.25	0.69	0.37	19.07
5,915.00	1.41	318.23	5,892.05	-321.46	269.65	419.51	0.59	-0.55	7.68
6,010.00	1.49	310.93	5,987.02	-319.78	267.94	417.13	0.21	0.06	-7.68
6,105.00	1.32	338.97	6,081.99	-317.95	266.61	414.87	0.74	-0.18	29.52
6,200.00	1.14	324.29	6,176.97	-316.16	265.67	412.88	0.38	-0.19	-15.45
6,294.00	1.32	302.23	6,270.95	-314.82	264.20	410.93	0.53	0.19	-23.47
6,389.00	1.76	308.38	6,365.92	-313.33	262.13	408.47	0.49	0.46	6.47
6,484.00	1.32	318.66	6,460.88	-311.61	260.27	405.95	0.55	-0.46	10.82
6,578.00	1.23	340.11	6,554.86	-309.84	259.21	403.91	0.51	-0.10	22.82
6,673.00	1.06	4.37	6,649.84	-308.01	258.93	402.31	0.54	-0.18	25.54
6,768.00	1.49	352.59	6,744.82	-305.91	258.84	400.62	0.53	0.45	-12.40
6,862.00	1.14	38.10	6,838.79	-303.94	259.23	399.34	1.09	-0.37	46.29
6,957.00	0.62	56.22	6,933.78	-302.89	260.21	399.14	0.63	-0.55	21.18
7,052.00	0.53	22.74	7,028.78	-302.20	260.81	398.98	0.36	-0.09	-35.24
7,146.00	0.18	34.95	7,122.78	-301.68	261.06	398.73	0.38	-0.37	12.99
7,241.00	0.09	324.64	7,217.78	-301.50	261.11	398.61	0.18	-0.09	-74.01
7,336.00	0.18	288.34	7,312.78	-301.39	260.92	398.41	0.13	0.09	-38.21
7,430.00	0.18	192.89	7,406.78	-301.48	260.75	398.38	0.28	0.00	-101.54
7,525.00	0.62	253.89	7,501.77	-301.77	260.22	398.27	0.58	0.46	64.21
7,620.00	0.79	240.18	7,596.77	-302.24	259.16	397.97	0.25	0.18	-14.43
7,714.00	0.88	239.83	7,690.76	-302.93	257.97	397.76	0.10	0.10	-0.37
7,809.00	0.88	216.45	7,785.75	-303.88	256.91	397.83	0.38	0.00	-24.61
7,904.00	0.97	221.72	7,880.73	-305.07	255.94	398.14	0.13	0.09	5.55
7,998.00	1.06	206.69	7,974.72	-306.44	255.02	398.63	0.30	0.10	-15.99
8,093.00	1.14	217.41	8,069.70	-307.97	254.05	399.22	0.23	0.08	11.28
8,188.00	1.32	193.42	8,164.68	-309.79	253.22	400.11	0.57	0.19	-25.25
8,283.00	1.58	189.43	8,259.65	-312.14	252.75	401.65	0.29	0.27	-4.20
8,377.00	1.57	191.09	8,353.61	-314.69	252.29	403.33	0.05	-0.01	1.77

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Well:	Cascade Creek 697-08-47A	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)
8,472.00	0.91	188.95	8,448.59	-316.71	251.93	404.67	0.70	-0.69	-2.25
8,567.00	0.70	157.18	8,543.58	-317.99	252.03	405.74	0.51	-0.22	-33.44
8,661.00	0.78	163.76	8,637.57	-319.13	252.44	406.88	0.12	0.08	7.00
8,756.00	0.67	161.31	8,732.57	-320.28	252.80	408.00	0.12	-0.12	-2.58
8,851.00	0.88	232.30	8,827.56	-321.25	252.40	408.50	0.96	0.22	74.73
8,879.00	1.06	232.97	8,855.56	-321.54	252.02	408.49	0.64	0.64	2.39
Last SDI MWD Survey									
8,935.00	1.06	232.97	8,911.55	-322.16	251.19	408.45	0.00	0.00	0.00
Projection to TD - BHL = 631456.35 ft N, 1228411.07 ft E									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
75.00	75.00	0.46	-0.17	First SDI Gyro Survey
444.00	443.65	-8.82	7.42	Last SDI Gyro Survey
526.00	525.36	-13.48	12.35	First SDI MWD Survey
2,672.00	2,660.85	-174.94	141.41	Last Survey in 14 3/4" Hole
2,790.00	2,778.12	-187.02	146.40	First Survey in 8 3/4" Hole
8,879.00	8,855.56	-321.54	252.02	Last SDI MWD Survey
8,935.00	8,911.55	-322.16	251.19	Projection to TD
8,935.00	8,911.55	-322.16	251.19	BHL = 631456.35 ft N, 1228411.07 ft E

Checked By: _____ Approved By: _____ Date: _____