



#### Well Details: CC 697-09-10B

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	633920.42	1228080.15	39° 32' 31.199 N	108° 14' 14.971 W	U

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-09-10B - Slot U, True North  
Vertical (TVD) Reference: GL 8407' & RKB 30' @ 8437.00ft (H&P)  
Section (VS) Reference: Slot - U(0.00N, 0.00E)  
Measured Depth Reference: GL 8407' & RKB 30' @ 8437.00ft (H&P)  
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

14:12, May 10 2011  
Created By: Janie Cooke

# **OXY USA RMAT**

**Garfield County, CO NAD27**

**Cascade Creek 608-41 Pad**

**CC 697-09-10B - Slot U**

**OH**

**Design: OH**

## **Standard Survey Report**

**10 May, 2011**

**Scientific Drilling International, Inc.**  
Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-09-10B - Slot U
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8407' & RKB 30' @ 8437.00ft (H&P)
<b>Site:</b>	Cascade Creek 608-41 Pad	<b>MD Reference:</b>	GL 8407' & RKB 30' @ 8437.00ft (H&P)
<b>Well:</b>	CC 697-09-10B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

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

Site		Cascade Creek 608-41 Pad, SEction 8 T6S R97W			
Site Position:		Northing:	633,966.95 usft	Latitude:	39° 32' 31.685 N
From:	Map	Easting:	1,228,168.67 usft	Longitude:	108° 14' 13.859 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.73 °

Well	CC 697-09-10B - Slot U					
Well Position	+N/-S	0.00 ft	Northing:	633,920.42 usft	Latitude:	39° 32' 31.199 N
	+E/-W	0.00 ft	Easting:	1,228,080.15 usft	Longitude:	108° 14' 14.971 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,407.00 ft

<b>Wellbore</b>	OH
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	12/31/2009	10.63	65.78	52,399

<b>Design</b>	OH
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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	92.44

Survey Program		Date	5/10/2011		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.00	2,665.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,781.00	9,500.00	Survey #2 - Production MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	

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
156.00	1.17	70.94	155.99	0.52	1.51	1.48	0.75	0.75	0.00
<b>First Surface MWD</b>									
248.00	3.28	92.81	247.92	0.70	5.02	4.99	2.43	2.29	23.77
339.00	4.86	95.72	338.68	0.19	11.46	11.44	1.75	1.74	3.20
431.00	6.41	96.47	430.24	-0.78	20.44	20.45	1.69	1.68	0.82
523.00	8.35	89.83	521.47	-1.34	32.22	32.25	2.30	2.11	-7.22
614.00	10.57	85.83	611.23	-0.71	47.16	47.15	2.54	2.44	-4.40
706.00	12.57	92.45	701.36	-0.53	65.58	65.54	2.61	2.17	7.20
800.00	15.27	94.04	792.59	-1.84	88.15	88.15	2.90	2.87	1.69

**Scientific Drilling International, Inc.**  
Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-09-10B - Slot U
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8407' & RKB 30' @ 8437.00ft (H&P)
<b>Site:</b>	Cascade Creek 608-41 Pad	<b>MD Reference:</b>	GL 8407' & RKB 30' @ 8437.00ft (H&P)
<b>Well:</b>	CC 697-09-10B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
895.00	15.56	91.30	884.17	-3.01	113.37	113.39	0.83	0.31	-2.88
989.00	17.53	89.51	974.28	-3.17	140.13	140.14	2.16	2.10	-1.90
1,084.00	19.75	89.76	1,064.29	-2.98	170.49	170.46	2.34	2.34	0.26
1,178.00	21.34	92.31	1,152.31	-3.61	203.47	203.44	1.94	1.89	2.71
1,273.00	22.20	96.65	1,240.54	-6.38	238.57	238.62	1.92	0.91	4.57
1,367.00	24.46	97.09	1,326.85	-10.84	275.52	275.73	2.41	2.40	0.47
1,462.00	24.63	93.00	1,413.27	-14.30	314.81	315.14	1.80	0.18	-4.31
1,557.00	25.71	92.38	1,499.25	-16.20	355.17	355.54	1.17	1.14	-0.65
1,651.00	26.47	91.98	1,583.67	-17.77	396.48	396.88	0.83	0.81	-0.43
1,746.00	24.08	90.25	1,669.57	-18.58	437.03	437.42	2.63	-2.52	-1.82
1,840.00	23.36	87.80	1,755.63	-17.95	474.83	475.16	1.30	-0.77	-2.61
1,935.00	24.54	87.25	1,842.45	-16.28	513.35	513.58	1.26	1.24	-0.58
2,029.00	24.30	91.40	1,928.05	-15.82	552.19	552.36	1.84	-0.26	4.41
2,124.00	25.17	94.54	2,014.33	-17.89	591.87	592.10	1.66	0.92	3.31
2,219.00	24.48	94.04	2,100.56	-20.88	631.64	631.96	0.76	-0.73	-0.53
2,313.00	23.61	93.26	2,186.40	-23.32	669.87	670.25	0.99	-0.93	-0.83
2,407.00	24.64	94.73	2,272.19	-26.01	708.19	708.65	1.27	1.10	1.56
2,501.00	24.14	94.23	2,357.80	-29.04	746.89	747.45	0.58	-0.53	-0.53
2,596.00	23.24	95.05	2,444.79	-32.13	784.93	785.59	1.01	-0.95	0.86
2,665.00	23.97	95.05	2,508.02	-34.56	812.45	813.19	1.06	1.06	0.00
<b>Last Surface MWD</b>									
2,781.00	24.01	96.28	2,614.00	-39.21	859.38	860.27	0.43	0.03	1.06
<b>First Production MWD</b>									
2,876.00	22.95	96.72	2,701.13	-43.50	896.99	898.03	1.13	-1.12	0.46
2,970.00	23.39	94.35	2,787.55	-47.05	933.80	934.95	1.10	0.47	-2.52
3,065.00	20.75	93.21	2,875.58	-49.43	969.41	970.63	2.82	-2.78	-1.20
3,160.00	19.43	90.83	2,964.80	-50.60	1,002.01	1,003.26	1.63	-1.39	-2.51
3,254.00	22.69	94.09	3,052.51	-52.12	1,035.74	1,037.02	3.68	3.47	3.47
3,349.00	25.59	96.02	3,139.20	-55.58	1,074.43	1,075.82	3.16	3.05	2.03
3,443.00	27.08	93.38	3,223.44	-58.97	1,115.98	1,117.48	2.02	1.59	-2.81
3,538.00	26.38	91.63	3,308.29	-60.84	1,156.66	1,160.20	1.11	-0.74	-1.84
3,632.00	27.17	94.61	3,392.22	-63.16	1,200.93	1,202.53	1.66	0.84	3.17
3,727.00	26.20	93.65	3,477.10	-66.24	1,243.48	1,245.17	1.12	-1.02	-1.01
3,821.00	25.68	91.63	3,561.63	-68.14	1,284.55	1,286.29	1.09	-0.55	-2.15
3,916.00	25.94	92.50	3,647.15	-69.63	1,325.89	1,327.65	0.48	0.27	0.92
4,010.00	24.80	91.54	3,732.09	-71.06	1,366.13	1,367.92	1.29	-1.21	-1.02
4,105.00	24.45	94.79	3,818.45	-73.24	1,405.64	1,407.49	1.47	-0.37	3.42
4,199.00	24.27	93.65	3,904.08	-76.09	1,444.31	1,446.24	0.54	-0.19	-1.21
4,294.00	24.27	95.14	3,990.69	-79.08	1,483.24	1,485.26	0.64	0.00	1.57
4,388.00	24.53	95.76	4,076.29	-82.77	1,521.90	1,524.04	0.39	0.28	0.66
4,483.00	24.80	94.88	4,162.62	-86.45	1,561.37	1,563.63	0.48	0.28	-0.93
4,578.00	24.36	96.99	4,249.02	-90.53	1,600.67	1,603.07	1.03	-0.46	2.22
4,672.00	23.48	97.16	4,334.94	-95.22	1,638.49	1,641.06	0.94	-0.94	0.18



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Survey Report

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<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8407' & RKB 30' @ 8437.00ft (H&P)
<b>Site:</b>	Cascade Creek 608-41 Pad	<b>MD Reference:</b>	GL 8407' & RKB 30' @ 8437.00ft (H&P)
<b>Well:</b>	CC 697-09-10B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
4,767.00	24.27	95.67	4,421.81	-99.51	1,676.70	1,679.41	1.05	0.83	-1.57
4,861.00	22.69	94.09	4,508.03	-102.71	1,714.01	1,716.83	1.81	-1.68	-1.68
4,956.00	22.69	93.91	4,595.67	-105.27	1,750.57	1,753.46	0.07	0.00	-0.19
5,050.00	23.04	92.06	4,682.29	-107.16	1,787.04	1,789.98	0.85	0.37	-1.97
5,145.00	23.39	91.63	4,769.60	-108.37	1,824.46	1,827.42	0.41	0.37	-0.45
5,239.00	23.39	89.87	4,855.87	-108.86	1,861.77	1,864.72	0.74	0.00	-1.87
5,334.00	22.86	89.52	4,943.24	-108.66	1,899.08	1,901.98	0.58	-0.56	-0.37
5,428.00	22.86	94.35	5,029.87	-109.89	1,935.55	1,938.47	2.00	0.00	5.14
5,523.00	23.48	93.12	5,117.20	-112.32	1,972.85	1,975.84	0.83	0.65	-1.29
5,617.00	21.72	94.96	5,203.98	-114.85	2,008.88	2,011.94	2.02	-1.87	1.96
5,712.00	20.58	93.56	5,292.58	-117.40	2,043.06	2,046.20	1.31	-1.20	-1.47
5,806.00	19.35	94.88	5,380.93	-119.75	2,075.06	2,078.28	1.39	-1.31	1.40
5,901.00	18.82	94.26	5,470.71	-122.23	2,106.03	2,109.32	0.60	-0.56	-0.65
5,995.00	18.55	94.61	5,559.76	-124.56	2,136.05	2,139.41	0.31	-0.29	0.37
6,090.00	16.53	93.21	5,650.33	-126.53	2,164.61	2,168.03	2.17	-2.13	-1.47
6,184.00	13.28	89.52	5,741.16	-127.19	2,188.76	2,192.19	3.60	-3.46	-3.93
6,279.00	10.38	91.19	5,834.13	-127.27	2,208.23	2,211.65	3.07	-3.05	1.76
6,373.00	9.23	92.59	5,926.76	-127.79	2,224.23	2,227.65	1.25	-1.22	1.49
6,468.00	7.91	94.88	6,020.70	-128.69	2,238.36	2,241.80	1.43	-1.39	2.41
6,562.00	8.27	93.65	6,113.76	-129.67	2,251.55	2,255.03	0.42	0.38	-1.31
6,657.00	8.71	86.44	6,207.72	-129.66	2,265.55	2,269.01	1.21	0.46	-7.59
6,751.00	7.47	84.86	6,300.79	-128.67	2,278.74	2,282.15	1.34	-1.32	-1.68
6,846.00	7.30	84.51	6,395.00	-127.54	2,290.90	2,294.25	0.19	-0.18	-0.37
6,940.00	5.80	81.87	6,488.38	-126.30	2,301.54	2,304.83	1.63	-1.60	-2.81
7,035.00	5.63	84.33	6,582.91	-125.16	2,310.93	2,314.16	0.31	-0.18	2.59
7,129.00	7.21	84.33	6,676.32	-124.12	2,321.39	2,324.57	1.68	1.68	0.00
7,224.00	7.65	83.10	6,770.52	-122.77	2,333.60	2,336.71	0.49	0.46	-1.29
7,319.00	8.00	82.84	6,864.83	-121.19	2,346.44	2,349.47	0.37	0.37	-0.27
7,413.00	8.09	79.67	6,957.71	-119.19	2,359.43	2,362.37	0.48	0.10	-3.37
7,508.00	8.62	76.24	7,051.70	-116.29	2,372.93	2,375.72	0.77	0.56	-3.61
7,602.00	7.74	75.10	7,144.74	-112.99	2,385.89	2,388.53	0.95	-0.94	-1.21
7,696.00	7.91	78.97	7,237.87	-110.13	2,398.35	2,400.86	0.59	0.18	4.12
7,791.00	7.12	80.73	7,332.05	-107.93	2,410.58	2,412.99	0.87	-0.83	1.85
7,886.00	6.86	83.01	7,426.35	-106.29	2,422.02	2,424.35	0.40	-0.27	2.40
7,980.00	6.95	84.42	7,519.67	-105.05	2,433.25	2,435.52	0.20	0.10	1.50
8,075.00	8.09	85.82	7,613.85	-104.01	2,445.64	2,447.85	1.22	1.20	1.47
8,169.00	7.30	83.89	7,707.00	-102.89	2,458.18	2,460.33	0.88	-0.84	-2.05
8,263.00	6.42	85.12	7,800.33	-101.80	2,469.35	2,471.45	0.95	-0.94	1.31
8,358.00	5.80	89.78	7,894.79	-101.33	2,479.44	2,481.51	0.84	-0.65	4.91
8,452.00	5.28	99.36	7,988.35	-102.02	2,488.46	2,490.55	1.13	-0.55	10.19
8,547.00	4.04	109.12	8,083.03	-103.83	2,495.93	2,498.09	1.54	-1.31	10.27
8,641.00	3.43	114.56	8,176.84	-106.08	2,501.62	2,503.87	0.75	-0.65	5.79
8,735.00	1.93	108.50	8,270.73	-107.75	2,505.68	2,508.00	1.62	-1.60	-6.45
8,830.00	2.64	155.96	8,365.66	-110.26	2,508.09	2,510.51	2.05	0.75	49.96

**Scientific Drilling International, Inc.**  
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<b>Site:</b>	Cascade Creek 608-41 Pad	<b>MD Reference:</b>	GL 8407' & RKB 30' @ 8437.00ft (H&P)
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<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
8,924.00	2.46	162.20	8,459.57	-114.15	2,509.59	2,512.17	0.35	-0.19	6.64
9,019.00	2.73	177.14	8,554.47	-118.36	2,510.32	2,513.08	0.76	0.28	15.73
9,113.00	2.90	194.37	8,648.36	-122.90	2,509.84	2,512.80	0.91	0.18	18.33
9,208.00	2.81	204.94	8,743.24	-127.33	2,508.27	2,511.41	0.56	-0.09	11.13
9,302.00	2.64	206.41	8,837.14	-131.36	2,506.33	2,509.65	0.20	-0.18	1.56
9,397.00	2.64	210.19	8,932.04	-135.21	2,504.26	2,507.74	0.18	0.00	3.98
9,445.00	2.99	220.21	8,979.98	-137.12	2,502.89	2,506.46	1.26	0.73	20.88
<b>Last Production MWD</b>									
9,500.00	2.99	220.21	9,034.90	-139.32	2,501.04	2,504.70	0.00	0.00	0.00
<b>Projection to TD - BHL = 633705.81, 1230575.85</b>									

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
156.00	155.99	0.52	1.51	First Surface MWD
2,665.00	2,508.02	-34.56	812.45	Last Surface MWD
2,781.00	2,614.00	-39.21	859.38	First Production MWD
9,445.00	8,979.98	-137.12	2,502.89	Last Production MWD
9,500.00	9,034.90	-139.32	2,501.04	Projection to TD
9,500.00	9,034.90	-139.32	2,501.04	BHL = 633705.81, 1230575.85

Checked By: _____	Approved By: _____	Date: _____
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