



# Scientific Drilling

Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 697-08A Pad



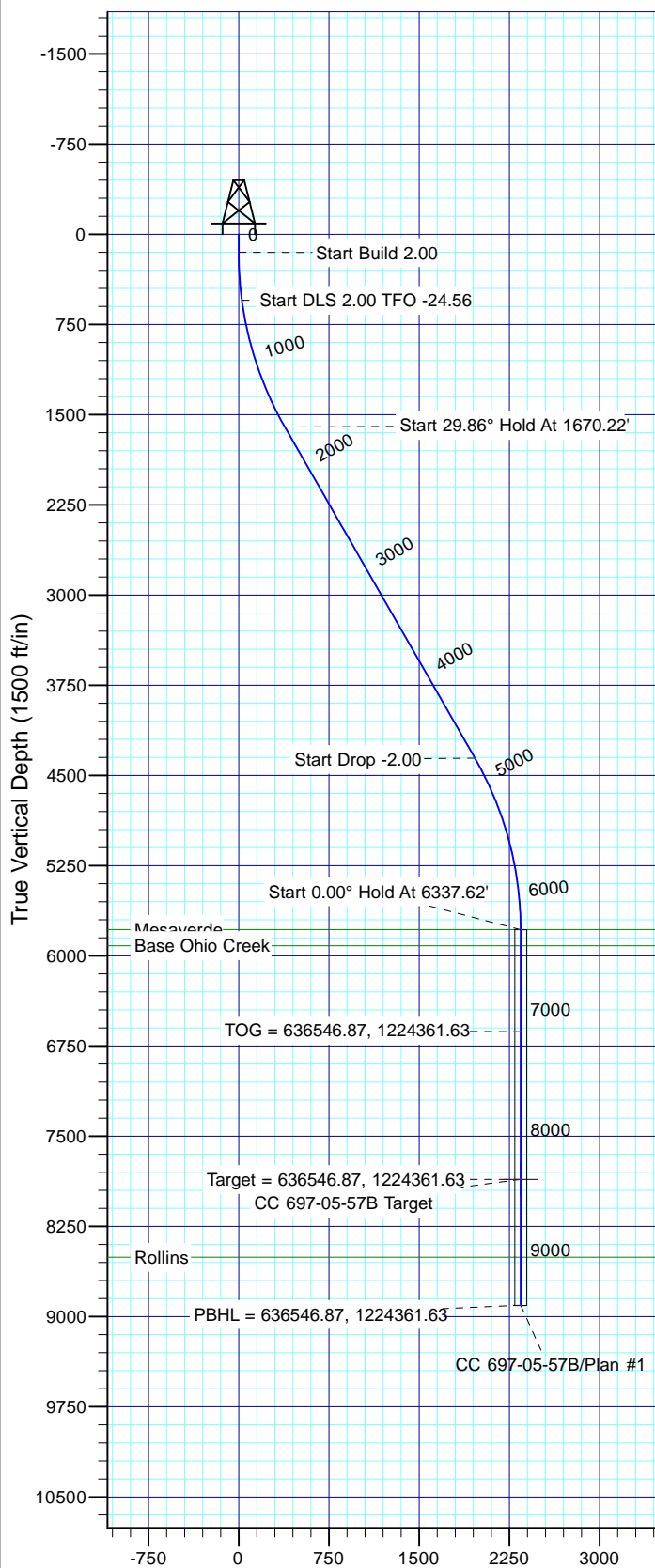
Well Details: CC 697-05-57B

TVD Reference: GL 8401' & RKB 30' @ 8431.00ft (H&P Rig) Ground Level: 8401.00

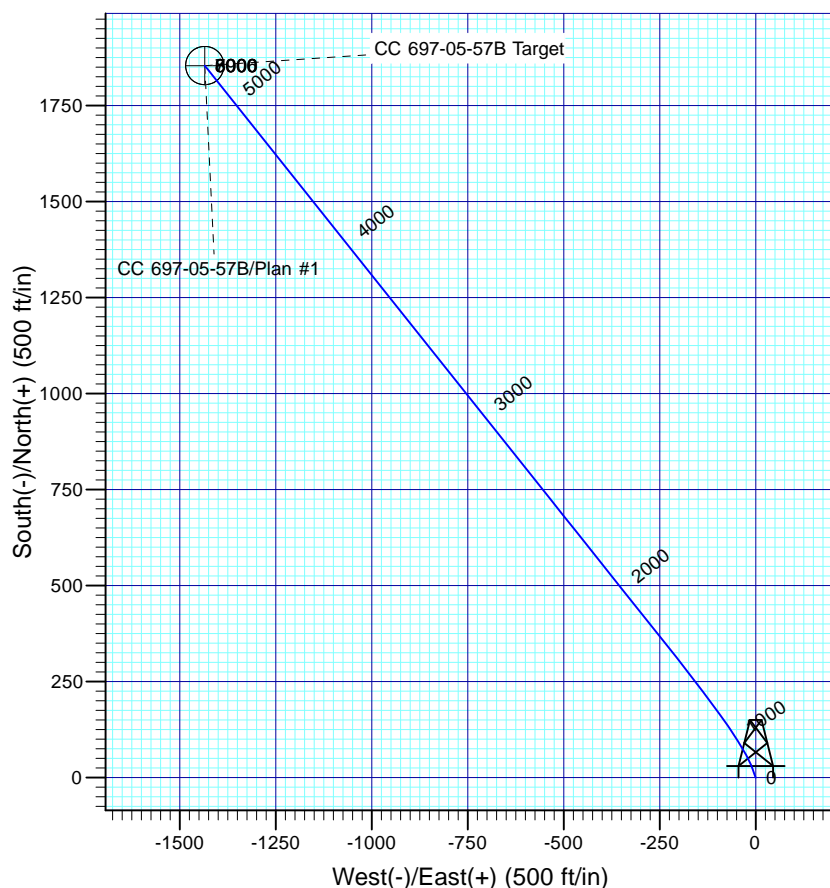
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot B
0.00	0.00	634649.94	1225739.60	39° 32' 37.708 N	108° 14' 45.116 W	

**T M** Azimuths to True North  
Magnetic North: 10.48°

Magnetic Field  
Strength: 52229.6snT  
Dip Angle: 65.73°  
Date: 5/24/2011  
Model: IGRF2010



Vertical Section at 322.27° (1500 ft/in)



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5781.00	6336.62	Mesaverde
5916.00	6471.62	Base Ohio Creek
8506.00	9061.62	Rollins

Plan: Plan #1

**15:34, May 25 2011**  
**Created By: Rex Hall**

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

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	
3	550.00	8.00	340.00	548.70	26.20	-9.54	2.00	340.00	26.56	
4	1670.20	29.86	321.44	1602.57	321.26	-212.59	2.00	-24.56	384.17	CC 697-05-57B Target
5	1670.22	29.86	321.44	1602.59	321.26	-212.59	2.00	0.00	384.18	
6	4844.80	29.86	321.44	4355.83	1557.09	-1197.67	0.00	0.00	1964.41	
7	6337.62	0.00	0.00	5782.00	1854.42	-1434.67	2.00	180.00	2344.60	
8	8414.62	0.00	0.00	7859.00	1854.42	-1434.67	0.00	0.00	2344.60	CC 697-05-57B Target
9	9461.62	0.00	0.00	8906.00	1854.42	-1434.67	0.00	0.00	2344.60	

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-08A Pad  
CC 697-05-57B - Slot B**

**OH**

**Plan: Plan #1**

## **Standard Planning Report**

**25 May, 2011**





<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-57B - Slot B
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-57B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

<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		

<b>Site</b>	Cascade Creek 697-08A Pad, Sec 8 T6S R97W			
<b>Site Position:</b>		<b>Northing:</b>	635,765.16 usft	<b>Latitude:</b> 39° 32' 48.728 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,225,748.33 usft	<b>Longitude:</b> 108° 14' 45.434 W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> -1.73 °

<b>Well</b>	CC 697-05-57B - Slot B			
<b>Well Position</b>	<b>+N/-S</b>	-1,114.98 ft	<b>Northing:</b>	634,649.94 usft
	<b>+E/-W</b>	24.97 ft	<b>Easting:</b>	1,225,739.59 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b> 8,401.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	5/24/2011	10.48	65.73	52,230

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	322.27

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	0.00	
550.00	8.00	340.00	548.70	26.20	-9.54	2.00	2.00	0.00	340.00	
1,670.20	29.86	321.44	1,602.57	321.26	-212.59	2.00	1.95	-1.66	-24.56	CC 697-05-57B Target
1,670.22	29.86	321.44	1,602.59	321.26	-212.59	2.00	2.00	0.00	0.00	
4,844.80	29.86	321.44	4,355.83	1,557.09	-1,197.67	0.00	0.00	0.00	0.00	
6,337.62	0.00	0.00	5,782.00	1,854.42	-1,434.67	2.00	-2.00	0.00	180.00	
8,414.62	0.00	0.00	7,859.00	1,854.42	-1,434.67	0.00	0.00	0.00	0.00	CC 697-05-57B Target
9,461.62	0.00	0.00	8,906.00	1,854.42	-1,434.67	0.00	0.00	0.00	0.00	



<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-57B - Slot B
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-57B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned 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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Start Build 2.00</b>									
200.00	1.00	340.00	200.00	0.41	-0.15	0.42	2.00	2.00	0.00
300.00	3.00	340.00	299.93	3.69	-1.34	3.74	2.00	2.00	0.00
400.00	5.00	340.00	399.68	10.24	-3.73	10.38	2.00	2.00	0.00
500.00	7.00	340.00	499.13	20.07	-7.30	20.34	2.00	2.00	0.00
550.00	8.00	340.00	548.70	26.20	-9.54	26.56	2.00	2.00	0.00
<b>Start DLS 2.00 TFO -24.56</b>									
600.00	8.92	337.32	598.16	33.04	-12.22	33.61	2.00	1.84	-5.36
700.00	10.80	333.33	696.68	48.57	-19.42	50.30	2.00	1.88	-3.99
800.00	12.72	330.53	794.57	66.53	-29.04	70.39	2.00	1.92	-2.81
900.00	14.66	328.45	891.73	86.89	-41.07	93.86	2.00	1.94	-2.08
1,000.00	16.61	326.85	988.03	109.64	-55.51	120.69	2.00	1.95	-1.60
1,100.00	18.57	325.58	1,083.35	134.75	-72.33	150.84	2.00	1.96	-1.27
1,200.00	20.54	324.54	1,177.57	162.18	-91.51	184.27	2.00	1.97	-1.04
1,300.00	22.52	323.68	1,270.59	191.90	-113.03	220.95	2.00	1.97	-0.86
1,400.00	24.50	322.95	1,362.29	223.88	-136.86	260.82	2.00	1.98	-0.73
1,500.00	26.48	322.33	1,452.55	258.08	-162.98	303.85	2.00	1.98	-0.63
1,600.00	28.46	321.78	1,541.27	294.45	-191.35	349.97	2.00	1.98	-0.54
1,670.20	29.86	321.44	1,602.57	321.26	-212.59	384.17	2.00	1.99	-0.49
1,670.22	29.86	321.44	1,602.59	321.26	-212.59	384.18	0.00	0.00	0.00
<b>Start 29.86° Hold At 1670.22'</b>									
1,700.00	29.86	321.44	1,628.42	332.86	-221.83	399.01	0.00	0.00	0.00
1,800.00	29.86	321.44	1,715.15	371.79	-252.86	448.79	0.00	0.00	0.00
1,900.00	29.86	321.44	1,801.88	410.71	-283.89	498.56	0.00	0.00	0.00
2,000.00	29.86	321.44	1,888.60	449.64	-314.93	548.34	0.00	0.00	0.00
2,100.00	29.86	321.44	1,975.33	488.57	-345.96	598.12	0.00	0.00	0.00
2,200.00	29.86	321.44	2,062.06	527.50	-376.99	647.90	0.00	0.00	0.00
2,300.00	29.86	321.44	2,148.79	566.43	-408.02	697.67	0.00	0.00	0.00
2,400.00	29.86	321.44	2,235.51	605.36	-439.05	747.45	0.00	0.00	0.00
2,500.00	29.86	321.44	2,322.24	644.29	-470.08	797.23	0.00	0.00	0.00
2,600.00	29.86	321.44	2,408.97	683.22	-501.11	847.01	0.00	0.00	0.00
2,700.00	29.86	321.44	2,495.70	722.15	-532.14	896.78	0.00	0.00	0.00
2,800.00	29.86	321.44	2,582.42	761.08	-563.17	946.56	0.00	0.00	0.00
2,900.00	29.86	321.44	2,669.15	800.00	-594.20	996.34	0.00	0.00	0.00
3,000.00	29.86	321.44	2,755.88	838.93	-625.23	1,046.12	0.00	0.00	0.00
3,100.00	29.86	321.44	2,842.61	877.86	-656.26	1,095.90	0.00	0.00	0.00
3,200.00	29.86	321.44	2,929.33	916.79	-687.29	1,145.67	0.00	0.00	0.00
3,300.00	29.86	321.44	3,016.06	955.72	-718.32	1,195.45	0.00	0.00	0.00
3,400.00	29.86	321.44	3,102.79	994.65	-749.35	1,245.23	0.00	0.00	0.00
3,500.00	29.86	321.44	3,189.52	1,033.58	-780.38	1,295.01	0.00	0.00	0.00
3,600.00	29.86	321.44	3,276.24	1,072.51	-811.41	1,344.78	0.00	0.00	0.00
3,700.00	29.86	321.44	3,362.97	1,111.44	-842.44	1,394.56	0.00	0.00	0.00
3,800.00	29.86	321.44	3,449.70	1,150.37	-873.47	1,444.34	0.00	0.00	0.00
3,900.00	29.86	321.44	3,536.43	1,189.29	-904.50	1,494.12	0.00	0.00	0.00
4,000.00	29.86	321.44	3,623.15	1,228.22	-935.53	1,543.89	0.00	0.00	0.00
4,100.00	29.86	321.44	3,709.88	1,267.15	-966.56	1,593.67	0.00	0.00	0.00
4,200.00	29.86	321.44	3,796.61	1,306.08	-997.59	1,643.45	0.00	0.00	0.00
4,300.00	29.86	321.44	3,883.34	1,345.01	-1,028.62	1,693.23	0.00	0.00	0.00
4,400.00	29.86	321.44	3,970.06	1,383.94	-1,059.65	1,743.00	0.00	0.00	0.00
4,500.00	29.86	321.44	4,056.79	1,422.87	-1,090.68	1,792.78	0.00	0.00	0.00



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<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-57B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned 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)
4,600.00	29.86	321.44	4,143.52	1,461.80	-1,121.71	1,842.56	0.00	0.00	0.00
4,700.00	29.86	321.44	4,230.25	1,500.73	-1,152.74	1,892.34	0.00	0.00	0.00
4,800.00	29.86	321.44	4,316.98	1,539.65	-1,183.77	1,942.11	0.00	0.00	0.00
4,844.80	29.86	321.44	4,355.83	1,557.09	-1,197.67	1,964.41	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
4,900.00	28.75	321.44	4,403.96	1,578.22	-1,214.51	1,991.43	2.00	-2.00	0.00
5,000.00	26.75	321.44	4,492.46	1,614.63	-1,243.53	2,037.99	2.00	-2.00	0.00
5,100.00	24.75	321.44	4,582.52	1,648.61	-1,270.61	2,081.43	2.00	-2.00	0.00
5,200.00	22.75	321.44	4,674.05	1,680.10	-1,295.72	2,121.70	2.00	-2.00	0.00
5,300.00	20.75	321.44	4,766.92	1,709.08	-1,318.82	2,158.75	2.00	-2.00	0.00
5,400.00	18.75	321.44	4,861.03	1,735.51	-1,339.88	2,192.55	2.00	-2.00	0.00
5,500.00	16.75	321.44	4,956.26	1,759.35	-1,358.88	2,223.03	2.00	-2.00	0.00
5,600.00	14.75	321.44	5,052.50	1,780.58	-1,375.80	2,250.17	2.00	-2.00	0.00
5,700.00	12.75	321.44	5,149.63	1,799.16	-1,390.62	2,273.94	2.00	-2.00	0.00
5,800.00	10.75	321.44	5,247.53	1,815.09	-1,403.32	2,294.31	2.00	-2.00	0.00
5,900.00	8.75	321.44	5,346.08	1,828.34	-1,413.87	2,311.24	2.00	-2.00	0.00
6,000.00	6.75	321.44	5,445.16	1,838.88	-1,422.28	2,324.73	2.00	-2.00	0.00
6,100.00	4.75	321.44	5,544.65	1,846.72	-1,428.53	2,334.75	2.00	-2.00	0.00
6,200.00	2.75	321.44	5,644.43	1,851.84	-1,432.61	2,341.30	2.00	-2.00	0.00
6,300.00	0.75	321.44	5,744.38	1,854.23	-1,434.51	2,344.35	2.00	-2.00	0.00
6,336.62	0.02	321.44	5,781.00	1,854.42	-1,434.67	2,344.60	2.00	-2.00	0.00
<b>Mesaverde</b>									
6,337.62	0.00	0.00	5,782.00	1,854.42	-1,434.67	2,344.60	2.00	-2.00	0.00
<b>Start 0.00° Hold At 6337.62'</b>									
6,400.00	0.00	0.00	5,844.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
6,471.62	0.00	0.00	5,916.00	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
<b>Base Ohio Creek</b>									
6,500.00	0.00	0.00	5,944.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
6,600.00	0.00	0.00	6,044.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
6,700.00	0.00	0.00	6,144.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
6,800.00	0.00	0.00	6,244.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
6,900.00	0.00	0.00	6,344.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,000.00	0.00	0.00	6,444.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,100.00	0.00	0.00	6,544.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,186.62	0.00	0.00	6,631.00	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
<b>TOG = 636546.87, 1224361.63</b>									
7,200.00	0.00	0.00	6,644.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,300.00	0.00	0.00	6,744.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,400.00	0.00	0.00	6,844.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,500.00	0.00	0.00	6,944.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,600.00	0.00	0.00	7,044.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,700.00	0.00	0.00	7,144.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,800.00	0.00	0.00	7,244.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
7,900.00	0.00	0.00	7,344.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,000.00	0.00	0.00	7,444.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,100.00	0.00	0.00	7,544.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,200.00	0.00	0.00	7,644.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,300.00	0.00	0.00	7,744.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,400.00	0.00	0.00	7,844.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,414.62	0.00	0.00	7,859.00	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
<b>Target = 636546.87, 1224361.63</b>									
8,500.00	0.00	0.00	7,944.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,600.00	0.00	0.00	8,044.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00



<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-57B - Slot B
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-57B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Planned 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)
8,700.00	0.00	0.00	8,144.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,800.00	0.00	0.00	8,244.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
8,900.00	0.00	0.00	8,344.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
9,000.00	0.00	0.00	8,444.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
9,061.62	0.00	0.00	8,506.00	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
<b>Rollins</b>									
9,100.00	0.00	0.00	8,544.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
9,200.00	0.00	0.00	8,644.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
9,300.00	0.00	0.00	8,744.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
9,400.00	0.00	0.00	8,844.38	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00
9,461.62	0.00	0.00	8,906.00	1,854.42	-1,434.67	2,344.60	0.00	0.00	0.00

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
CC 697-05-57B Target - plan hits target center - Circle (radius 50.00)	0.00	321.57	7,859.00	1,854.42	-1,434.67	636,546.87	1,224,361.63	39° 32' 56.036 N	108° 15' 3.431 W

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,336.62	5,781.00	Mesaverde		0.00	
6,471.62	5,916.00	Base Ohio Creek		0.00	
9,061.62	8,506.00	Rollins		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
150.00	150.00	0.00	0.00	Start Build 2.00
550.00	548.70	26.20	-9.54	Start DLS 2.00 TFO -24.56
1,670.22	1,602.59	321.26	-212.59	Start 29.86° Hold At 1670.22'
4,844.80	4,355.83	1,557.09	-1,197.67	Start Drop -2.00
6,337.62	5,782.00	1,854.42	-1,434.67	Start 0.00° Hold At 6337.62'
7,186.62	6,631.00	1,854.42	-1,434.67	TOG = 636546.87, 1224361.63
8,414.62	7,859.00	1,854.42	-1,434.67	Target = 636546.87, 1224361.63
9,461.62	8,906.00	1,854.42	-1,434.67	PBHL = 636546.87, 1224361.63