



# Scientific Drilling

Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 604-12-13 Annex Pad



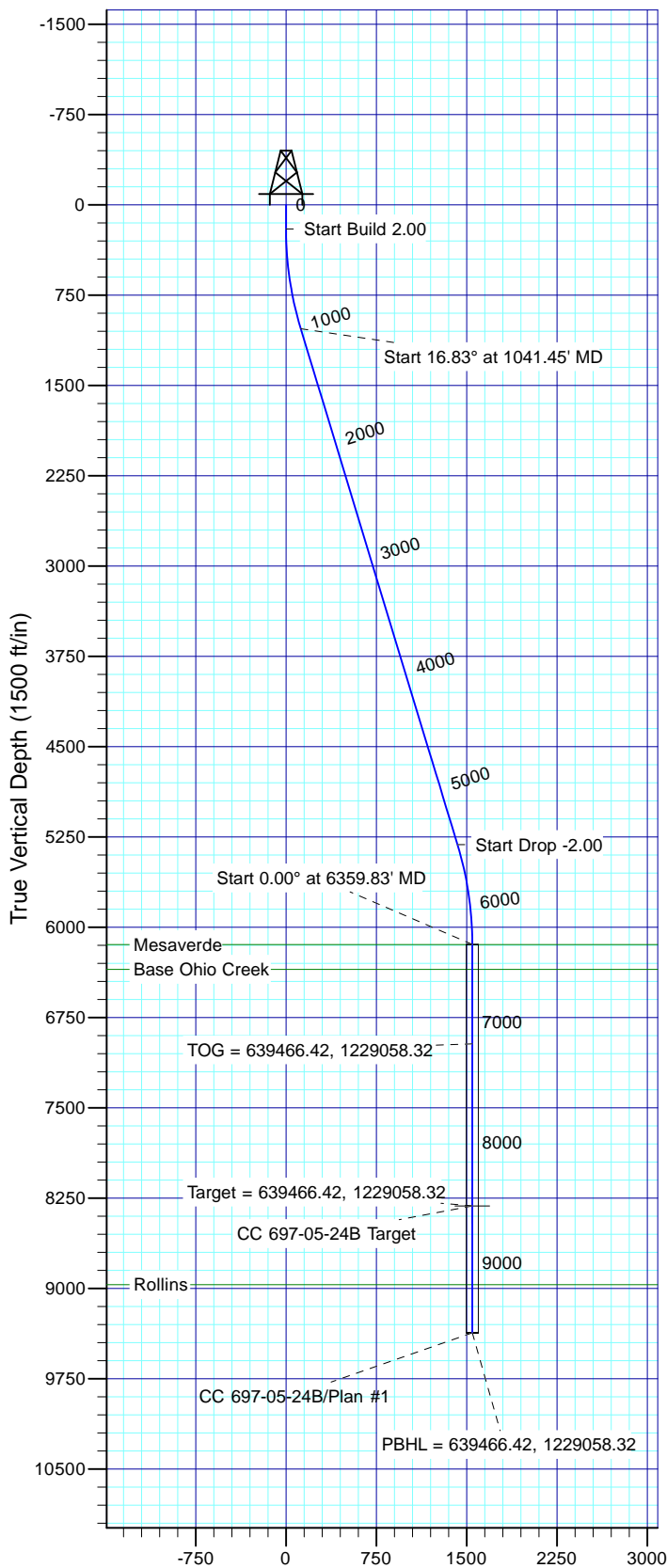
Well Details: CC 697-05-24B

TVD Reference: GL 8529' & RKB 30' @ 8559.00ft (H&P Rig) Ground Level: 8529.00  
+N/-S 0.00 +E/-W 0.00 Northing 637997.01 Easting 1229542.86 Latitude 39° 33' 11.908 N Longitude 108° 13' 57.873 W Slot K

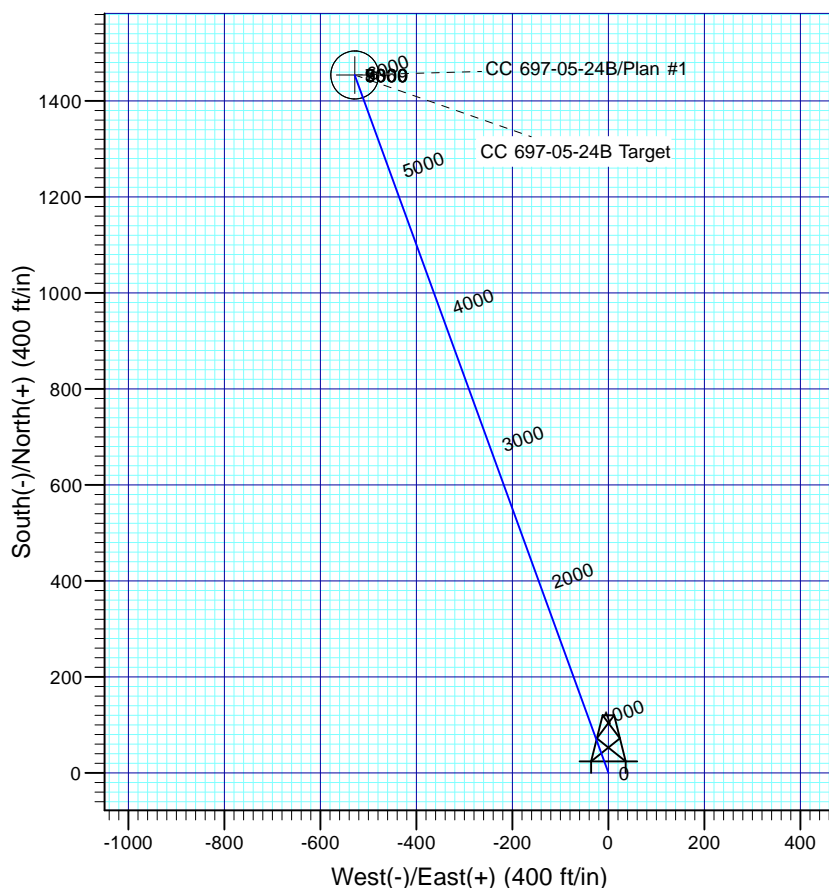


Azimuths to True North  
Magnetic North: 10.46°

Magnetic Field  
Strength: 52229.4snT  
Dip Angle: 65.74°  
Date: 6/15/2011  
Model: IGRF2010



Vertical Section at 340.03° (1500 ft/in)



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6144.00	6361.48	Mesaverde
6349.00	6566.48	Base Ohio Creek
8969.00	9186.48	Rollins

Plan: Plan #1

11:43, July 07 2011

Created By: Janie Cooke

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	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	1044.95	16.90	340.03	1032.75	116.26	-42.26	2.00	340.03	123.71	
4	5516.53	16.90	340.03	5311.25	1337.91	-486.26	0.00	0.00	1423.53	
5	6361.48	0.00	0.00	6144.00	1454.17	-528.52	2.00	180.00	1547.24	
6	8531.48	0.00	0.00	8314.00	1454.17	-528.52	0.00	0.00	1547.24	CC 697-05-24B Target
7	9586.48	0.00	0.00	9369.00	1454.17	-528.52	0.00	0.00	1547.24	

# **OXY USA RMAT**

**Garfield County, CO NAD27**

**Cascade Creek 604-12-13 Annex Pad**

**CC 697-05-24B - Slot K**

**OH**

**Plan: Plan #1**

## **Standard Planning Report**

**07 July, 2011**





<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-24B - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-24B	<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		

Site		Cascade Creek 604-12-13 Annex Pad			
Site Position:		Northing:	638,644.56 usft	Latitude:	39° 33' 18.364 N
From:	Lat/Long	Easting:	1,229,740.19 usft	Longitude:	108° 13' 55.603 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.72 °

Well	CC 697-05-24B - Slot K					
Well Position	+N/-S	-653.19 ft	Northing:	637,997.01 usft	Latitude:	39° 33' 11.908 N
	+E/-W	-177.78 ft	Easting:	1,229,542.86 usft	Longitude:	108° 13' 57.873 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,529.00 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	6/15/2011	10.46	65.74	52,229

<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	340.03

<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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,044.95	16.90	340.03	1,032.75	116.26	-42.26	2.00	2.00	0.00	340.03	
5,516.53	16.90	340.03	5,311.25	1,337.91	-486.26	0.00	0.00	0.00	0.00	
6,361.48	0.00	0.00	6,144.00	1,454.17	-528.52	2.00	-2.00	0.00	180.00	
8,531.48	0.00	0.00	8,314.00	1,454.17	-528.52	0.00	0.00	0.00	0.00	CC 697-05-24B Target
9,586.48	0.00	0.00	9,369.00	1,454.17	-528.52	0.00	0.00	0.00	0.00	



<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-24B - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-24B	<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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Start Build 2.00</b>									
300.00	2.00	340.03	299.98	1.64	-0.60	1.75	2.00	2.00	0.00
400.00	4.00	340.03	399.84	6.56	-2.38	6.98	2.00	2.00	0.00
500.00	6.00	340.03	499.45	14.75	-5.36	15.69	2.00	2.00	0.00
600.00	8.00	340.03	598.70	26.20	-9.52	27.88	2.00	2.00	0.00
700.00	10.00	340.03	697.47	40.90	-14.87	43.52	2.00	2.00	0.00
800.00	12.00	340.03	795.62	58.84	-21.38	62.60	2.00	2.00	0.00
900.00	14.00	340.03	893.06	79.98	-29.07	85.10	2.00	2.00	0.00
1,000.00	16.00	340.03	989.64	104.30	-37.91	110.98	2.00	2.00	0.00
1,041.45	16.83	340.03	1,029.40	115.31	-41.91	122.69	2.00	2.00	0.00
<b>Start 16.83° at 1041.45' MD</b>									
1,044.95	16.90	340.03	1,032.75	116.26	-42.26	123.71	2.00	2.00	0.00
1,100.00	16.90	340.03	1,085.43	131.30	-47.72	139.71	0.00	0.00	0.00
1,200.00	16.90	340.03	1,181.11	158.62	-57.65	168.78	0.00	0.00	0.00
1,300.00	16.90	340.03	1,276.79	185.94	-67.58	197.84	0.00	0.00	0.00
1,400.00	16.90	340.03	1,372.47	213.26	-77.51	226.91	0.00	0.00	0.00
1,500.00	16.90	340.03	1,468.15	240.58	-87.44	255.98	0.00	0.00	0.00
1,600.00	16.90	340.03	1,563.83	267.90	-97.37	285.05	0.00	0.00	0.00
1,700.00	16.90	340.03	1,659.52	295.22	-107.30	314.12	0.00	0.00	0.00
1,800.00	16.90	340.03	1,755.20	322.54	-117.23	343.19	0.00	0.00	0.00
1,900.00	16.90	340.03	1,850.88	349.87	-127.16	372.26	0.00	0.00	0.00
2,000.00	16.90	340.03	1,946.56	377.19	-137.09	401.32	0.00	0.00	0.00
2,100.00	16.90	340.03	2,042.24	404.51	-147.02	430.39	0.00	0.00	0.00
2,200.00	16.90	340.03	2,137.93	431.83	-156.95	459.46	0.00	0.00	0.00
2,300.00	16.90	340.03	2,233.61	459.15	-166.88	488.53	0.00	0.00	0.00
2,400.00	16.90	340.03	2,329.29	486.47	-176.81	517.60	0.00	0.00	0.00
2,500.00	16.90	340.03	2,424.97	513.79	-186.74	546.67	0.00	0.00	0.00
2,600.00	16.90	340.03	2,520.65	541.11	-196.66	575.74	0.00	0.00	0.00
2,700.00	16.90	340.03	2,616.34	568.43	-206.59	604.80	0.00	0.00	0.00
2,800.00	16.90	340.03	2,712.02	595.75	-216.52	633.87	0.00	0.00	0.00
2,900.00	16.90	340.03	2,807.70	623.07	-226.45	662.94	0.00	0.00	0.00
3,000.00	16.90	340.03	2,903.38	650.39	-236.38	692.01	0.00	0.00	0.00
3,100.00	16.90	340.03	2,999.06	677.71	-246.31	721.08	0.00	0.00	0.00
3,200.00	16.90	340.03	3,094.74	705.03	-256.24	750.15	0.00	0.00	0.00
3,300.00	16.90	340.03	3,190.43	732.35	-266.17	779.22	0.00	0.00	0.00
3,400.00	16.90	340.03	3,286.11	759.67	-276.10	808.28	0.00	0.00	0.00
3,500.00	16.90	340.03	3,381.79	786.99	-286.03	837.35	0.00	0.00	0.00
3,600.00	16.90	340.03	3,477.47	814.31	-295.96	866.42	0.00	0.00	0.00
3,700.00	16.90	340.03	3,573.15	841.63	-305.89	895.49	0.00	0.00	0.00
3,800.00	16.90	340.03	3,668.84	868.95	-315.82	924.56	0.00	0.00	0.00
3,900.00	16.90	340.03	3,764.52	896.27	-325.75	953.63	0.00	0.00	0.00
4,000.00	16.90	340.03	3,860.20	923.59	-335.68	982.70	0.00	0.00	0.00
4,100.00	16.90	340.03	3,955.88	950.91	-345.61	1,011.76	0.00	0.00	0.00
4,200.00	16.90	340.03	4,051.56	978.23	-355.54	1,040.83	0.00	0.00	0.00
4,300.00	16.90	340.03	4,147.25	1,005.55	-365.47	1,069.90	0.00	0.00	0.00
4,400.00	16.90	340.03	4,242.93	1,032.87	-375.40	1,098.97	0.00	0.00	0.00
4,500.00	16.90	340.03	4,338.61	1,060.19	-385.32	1,128.04	0.00	0.00	0.00
4,600.00	16.90	340.03	4,434.29	1,087.51	-395.25	1,157.11	0.00	0.00	0.00
4,700.00	16.90	340.03	4,529.97	1,114.83	-405.18	1,186.18	0.00	0.00	0.00
4,800.00	16.90	340.03	4,625.65	1,142.15	-415.11	1,215.24	0.00	0.00	0.00
4,900.00	16.90	340.03	4,721.34	1,169.47	-425.04	1,244.31	0.00	0.00	0.00



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<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-24B	<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)
5,000.00	16.90	340.03	4,817.02	1,196.79	-434.97	1,273.38	0.00	0.00	0.00
5,100.00	16.90	340.03	4,912.70	1,224.11	-444.90	1,302.45	0.00	0.00	0.00
5,200.00	16.90	340.03	5,008.38	1,251.43	-454.83	1,331.52	0.00	0.00	0.00
5,300.00	16.90	340.03	5,104.06	1,278.75	-464.76	1,360.59	0.00	0.00	0.00
5,400.00	16.90	340.03	5,199.75	1,306.07	-474.69	1,389.66	0.00	0.00	0.00
5,500.00	16.90	340.03	5,295.43	1,333.39	-484.62	1,418.72	0.00	0.00	0.00
5,516.53	16.90	340.03	5,311.25	1,337.91	-486.26	1,423.53	0.00	0.00	0.00
5,518.38	16.86	340.03	5,313.01	1,338.41	-486.44	1,424.07	2.00	-2.00	0.00
<b>Start Drop -2.00</b>									
5,600.00	15.23	340.03	5,391.45	1,359.61	-494.15	1,446.63	2.00	-2.00	0.00
5,700.00	13.23	340.03	5,488.38	1,382.71	-502.55	1,471.21	2.00	-2.00	0.00
5,800.00	11.23	340.03	5,586.10	1,402.62	-509.78	1,492.39	2.00	-2.00	0.00
5,900.00	9.23	340.03	5,684.51	1,419.31	-515.85	1,510.15	2.00	-2.00	0.00
6,000.00	7.23	340.03	5,783.47	1,432.76	-520.74	1,524.46	2.00	-2.00	0.00
6,100.00	5.23	340.03	5,882.88	1,442.96	-524.44	1,535.31	2.00	-2.00	0.00
6,200.00	3.23	340.03	5,982.60	1,449.89	-526.96	1,542.69	2.00	-2.00	0.00
6,300.00	1.23	340.03	6,082.52	1,453.55	-528.29	1,546.58	2.00	-2.00	0.00
6,359.83	0.03	340.03	6,142.34	1,454.17	-528.52	1,547.24	2.00	-2.00	0.00
<b>Start 0.00° at 6359.83' MD</b>									
6,361.48	0.00	0.00	6,144.00	1,454.17	-528.52	1,547.24	2.00	-2.00	0.00
<b>Mesaverde</b>									
6,400.00	0.00	0.00	6,182.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
6,500.00	0.00	0.00	6,282.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
6,566.48	0.00	0.00	6,349.00	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
<b>Base Ohio Creek</b>									
6,600.00	0.00	0.00	6,382.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
6,700.00	0.00	0.00	6,482.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
6,800.00	0.00	0.00	6,582.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
6,900.00	0.00	0.00	6,682.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,000.00	0.00	0.00	6,782.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,100.00	0.00	0.00	6,882.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,186.48	0.00	0.00	6,969.00	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
<b>TOG = 639466.42, 1229058.32</b>									
7,200.00	0.00	0.00	6,982.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,300.00	0.00	0.00	7,082.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,400.00	0.00	0.00	7,182.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,500.00	0.00	0.00	7,282.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,600.00	0.00	0.00	7,382.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,700.00	0.00	0.00	7,482.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,800.00	0.00	0.00	7,582.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
7,900.00	0.00	0.00	7,682.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,000.00	0.00	0.00	7,782.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,100.00	0.00	0.00	7,882.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,200.00	0.00	0.00	7,982.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,300.00	0.00	0.00	8,082.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,400.00	0.00	0.00	8,182.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,500.00	0.00	0.00	8,282.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,529.83	0.00	0.00	8,312.34	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
<b>Target = 639466.42, 1229058.32</b>									
8,531.48	0.00	0.00	8,314.00	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,600.00	0.00	0.00	8,382.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,700.00	0.00	0.00	8,482.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
8,800.00	0.00	0.00	8,582.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00



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<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-05-24B	<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)
8,900.00	0.00	0.00	8,682.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
9,000.00	0.00	0.00	8,782.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
9,100.00	0.00	0.00	8,882.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
9,186.48	0.00	0.00	8,969.00	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
<b>Rollins</b>									
9,200.00	0.00	0.00	8,982.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
9,300.00	0.00	0.00	9,082.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
9,400.00	0.00	0.00	9,182.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
9,500.00	0.00	0.00	9,282.52	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
9,584.83	0.00	0.00	9,367.34	1,454.17	-528.52	1,547.24	0.00	0.00	0.00
<b>PBHL = 639466.42, 1229058.32</b>									
9,586.48	0.00	0.00	9,369.00	1,454.17	-528.52	1,547.24	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
CC 697-05-24B Target	0.00	0.00	8,314.00	1,454.17	-528.52	639,466.42	1,229,058.32	39° 33' 26.280 N	108° 14' 4.621 W
- hit/miss target									
- Shape									
- plan hits target center									
- Circle (radius 50.00)									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,361.48	6,144.00	Mesaverde		0.00	
6,566.48	6,349.00	Base Ohio Creek		0.00	
9,186.48	8,969.00	Rollins		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.00	200.00	0.00	0.00	Start Build 2.00
1,041.45	1,029.40	115.31	-41.91	Start 16.83° at 1041.45' MD
5,518.38	5,313.01	1,338.41	-486.44	Start Drop -2.00
6,359.83	6,142.34	1,454.17	-528.52	Start 0.00° at 6359.83' MD
7,186.48	6,969.00	1,454.17	-528.52	TOG = 639466.42, 1229058.32
8,529.83	8,312.34	1,454.17	-528.52	Target = 639466.42, 1229058.32
9,584.83	9,367.34	1,454.17	-528.52	PBHL = 639466.42, 1229058.32