

# **ENGINEERING CALCS**

**Nasik**

**Cascade Creek 697-15-54**

**Cascade Creek 697-15-58**

**CC 697-15-58**

**Plan: CC 697-15-58 PLAN 1**

## **Standard Planning Report**

**12 February, 2014**

# Oxy

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Cascade Creek 697-15-58
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 PLAN 1		

<b>Project</b>	Nasik, Planning		
<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 697-15-54, 16-54			
Site Position:		Northing:	625,361.65 ft	Latitude:	39° 31' 9.611 N
From:	Map	Easting:	1,238,150.52 ft	Longitude:	108° 12' 3.264 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.70 °

Well	Cascade Creek 697-15-58, Cascade Creek 697-15-58					
Well Position	+N/-S	-71.03 ft	Northing:	625,291.34 ft	Latitude:	39° 31' 8.909 N
	+E/-W	-23.13 ft	Easting:	1,238,125.29 ft	Longitude:	108° 12' 3.559 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,640.00 ft

<b>Wellbore</b>	CC 697-15-58				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	1/29/2014	10.11	65.65	51,950

<b>Design</b>	CC 697-15-58 PLAN 1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	124.31	

<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	
650.00	0.00	0.00	650.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,650.00	20.00	124.31	1,629.82	-97.39	142.70	2.00	2.00	0.00	124.31	
4,867.93	20.00	124.31	4,653.68	-717.80	1,051.77	0.00	0.00	0.00	0.00	
5,867.93	0.00	0.00	5,633.50	-815.19	1,194.47	2.00	-2.00	0.00	180.00	
9,439.43	0.00	0.00	9,205.00	-815.19	1,194.47	0.00	0.00	0.00	0.00	CC 697-15-58 BHL

# Oxy Planning Report

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<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 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
90.00	0.00	0.00	90.00	0.00	0.00	0.00	0.00	0.00	0.00
16" Conductor									
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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
650.00	0.00	0.00	650.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	1.00	124.31	700.00	-0.25	0.36	0.44	2.00	2.00	0.00
800.00	3.00	124.31	799.93	-2.21	3.24	3.93	2.00	2.00	0.00
900.00	5.00	124.31	899.68	-6.15	9.00	10.90	2.00	2.00	0.00
1,000.00	7.00	124.31	999.13	-12.04	17.64	21.35	2.00	2.00	0.00
1,100.00	9.00	124.31	1,098.15	-19.88	29.13	35.27	2.00	2.00	0.00
1,200.00	11.00	124.31	1,196.63	-29.67	43.47	52.63	2.00	2.00	0.00
1,300.00	13.00	124.31	1,294.44	-41.39	60.65	73.42	2.00	2.00	0.00
1,400.00	15.00	124.31	1,391.46	-55.03	80.63	97.62	2.00	2.00	0.00
1,500.00	17.00	124.31	1,487.58	-70.56	103.39	125.18	2.00	2.00	0.00
1,600.00	19.00	124.31	1,582.68	-87.98	128.92	156.08	2.00	2.00	0.00
1,650.00	20.00	124.31	1,629.82	-97.39	142.70	172.77	2.00	2.00	0.00
1,700.00	20.00	124.31	1,676.80	-107.03	156.83	189.87	0.00	0.00	0.00
1,800.00	20.00	124.31	1,770.77	-126.31	185.08	224.07	0.00	0.00	0.00
1,900.00	20.00	124.31	1,864.74	-145.59	213.33	258.27	0.00	0.00	0.00
2,000.00	20.00	124.31	1,958.71	-164.87	241.58	292.47	0.00	0.00	0.00
2,100.00	20.00	124.31	2,052.68	-184.15	269.83	326.68	0.00	0.00	0.00
2,200.00	20.00	124.31	2,146.65	-203.43	298.08	360.88	0.00	0.00	0.00
2,300.00	20.00	124.31	2,240.62	-222.71	326.33	395.08	0.00	0.00	0.00
2,400.00	20.00	124.31	2,334.59	-241.99	354.58	429.28	0.00	0.00	0.00
2,500.00	20.00	124.31	2,428.55	-261.27	382.83	463.49	0.00	0.00	0.00
2,600.00	20.00	124.31	2,522.52	-280.55	411.08	497.69	0.00	0.00	0.00
2,700.00	20.00	124.31	2,616.49	-299.83	439.33	531.89	0.00	0.00	0.00
2,800.00	20.00	124.31	2,710.46	-319.11	467.58	566.09	0.00	0.00	0.00
2,900.00	20.00	124.31	2,804.43	-338.39	495.83	600.29	0.00	0.00	0.00
3,000.00	20.00	124.31	2,898.40	-357.67	524.08	634.50	0.00	0.00	0.00
9 5/8"									
3,100.00	20.00	124.31	2,992.37	-376.95	552.33	668.70	0.00	0.00	0.00
3,200.00	20.00	124.31	3,086.34	-396.23	580.58	702.90	0.00	0.00	0.00
3,300.00	20.00	124.31	3,180.31	-415.51	608.83	737.10	0.00	0.00	0.00
3,400.00	20.00	124.31	3,274.28	-434.79	637.08	771.30	0.00	0.00	0.00
3,500.00	20.00	124.31	3,368.25	-454.07	665.33	805.51	0.00	0.00	0.00
3,600.00	20.00	124.31	3,462.22	-473.35	693.58	839.71	0.00	0.00	0.00
3,700.00	20.00	124.31	3,556.19	-492.63	721.83	873.91	0.00	0.00	0.00
3,800.00	20.00	124.31	3,650.15	-511.91	750.08	908.11	0.00	0.00	0.00
3,900.00	20.00	124.31	3,744.12	-531.19	778.33	942.31	0.00	0.00	0.00
4,000.00	20.00	124.31	3,838.09	-550.47	806.58	976.52	0.00	0.00	0.00
4,100.00	20.00	124.31	3,932.06	-569.75	834.83	1,010.72	0.00	0.00	0.00
4,200.00	20.00	124.31	4,026.03	-589.03	863.08	1,044.92	0.00	0.00	0.00
4,300.00	20.00	124.31	4,120.00	-608.31	891.33	1,079.12	0.00	0.00	0.00
4,400.00	20.00	124.31	4,213.97	-627.59	919.58	1,113.32	0.00	0.00	0.00
4,500.00	20.00	124.31	4,307.94	-646.87	947.83	1,147.53	0.00	0.00	0.00
4,600.00	20.00	124.31	4,401.91	-666.15	976.08	1,181.73	0.00	0.00	0.00
4,700.00	20.00	124.31	4,495.88	-685.43	1,004.33	1,215.93	0.00	0.00	0.00
4,800.00	20.00	124.31	4,589.85	-704.71	1,032.58	1,250.13	0.00	0.00	0.00

# Oxy

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<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Cascade Creek 697-15-58
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 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)
4,867.93	20.00	124.31	4,653.68	-717.80	1,051.77	1,273.36	0.00	0.00	0.00
4,900.00	19.36	124.31	4,683.88	-723.89	1,060.69	1,284.16	2.00	-2.00	0.00
5,000.00	17.36	124.31	4,778.78	-741.64	1,086.70	1,315.66	2.00	-2.00	0.00
5,032.65	16.71	124.31	4,810.00	-747.03	1,094.60	1,325.22	2.00	-2.00	0.00
<b>FORT UNION</b>									
5,100.00	15.36	124.31	4,874.73	-757.52	1,109.97	1,343.82	2.00	-2.00	0.00
5,200.00	13.36	124.31	4,971.60	-771.50	1,130.45	1,368.62	2.00	-2.00	0.00
5,300.00	11.36	124.31	5,069.28	-783.56	1,148.13	1,390.02	2.00	-2.00	0.00
5,400.00	9.36	124.31	5,167.64	-793.70	1,162.98	1,408.00	2.00	-2.00	0.00
5,500.00	7.36	124.31	5,266.58	-801.89	1,174.98	1,422.54	2.00	-2.00	0.00
5,600.00	5.36	124.31	5,365.96	-808.13	1,184.13	1,433.61	2.00	-2.00	0.00
5,700.00	3.36	124.31	5,465.66	-812.42	1,190.41	1,441.21	2.00	-2.00	0.00
5,800.00	1.36	124.31	5,565.57	-814.74	1,193.81	1,445.33	2.00	-2.00	0.00
5,867.93	0.00	0.00	5,633.50	-815.19	1,194.47	1,446.13	2.00	-2.00	0.00
5,900.00	0.00	0.00	5,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,000.00	0.00	0.00	5,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,100.00	0.00	0.00	5,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,200.00	0.00	0.00	5,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,300.00	0.00	0.00	6,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,350.45	0.00	0.00	6,116.02	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Mesaverde Group Top</b>									
6,400.00	0.00	0.00	6,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,500.00	0.00	0.00	6,265.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,533.26	0.00	0.00	6,298.83	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Williams Fork ("base Ohio Creek")</b>									
6,600.00	0.00	0.00	6,365.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,700.00	0.00	0.00	6,465.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,800.00	0.00	0.00	6,565.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,900.00	0.00	0.00	6,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,000.00	0.00	0.00	6,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,100.00	0.00	0.00	6,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,105.63	0.00	0.00	6,871.19	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Williams Fork Shale Marker</b>									
7,200.00	0.00	0.00	6,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,300.00	0.00	0.00	7,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,400.00	0.00	0.00	7,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,462.43	0.00	0.00	7,228.00	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Continuous Top of Gas</b>									
7,500.00	0.00	0.00	7,265.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,600.00	0.00	0.00	7,365.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,700.00	0.00	0.00	7,465.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,800.00	0.00	0.00	7,565.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,900.00	0.00	0.00	7,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,000.00	0.00	0.00	7,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,100.00	0.00	0.00	7,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,200.00	0.00	0.00	7,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,300.00	0.00	0.00	8,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,400.00	0.00	0.00	8,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,500.00	0.00	0.00	8,265.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,600.00	0.00	0.00	8,365.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,700.00	0.00	0.00	8,465.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,800.00	0.00	0.00	8,565.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,861.65	0.00	0.00	8,627.21	-815.19	1,194.47	1,446.13	0.00	0.00	0.00

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<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Cascade Creek 697-15-58
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 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)
<b>Cameo Coal</b>									
8,900.00	0.00	0.00	8,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,000.00	0.00	0.00	8,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,100.00	0.00	0.00	8,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,200.00	0.00	0.00	8,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,240.92	0.00	0.00	9,006.49	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Rollins</b>									
9,300.00	0.00	0.00	9,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,400.00	0.00	0.00	9,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,439.43	0.00	0.00	9,205.00	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>TD - 4 1/2"</b>									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
CC 697-15-58 SRF	0.00	0.00	0.00	0.00	0.00	625,291.34	1,238,125.29	39° 31' 8.909 N	108° 12' 3.559 W
- plan hits target center									
- Point									
CC 697-15-58 BHL	0.00	0.00	9,205.00	-815.19	1,194.47	624,441.00	1,239,295.00	39° 31' 0.851 N	108° 11' 48.317 W
- plan hits target center									
- Circle (radius 50.00)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
90.00	90.00	16" Conductor	16.000	20.000	
3,000.00	2,898.40	9 5/8"	9.625	14.750	
9,439.43	9,205.00	4 1/2"	4.500	8.750	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,032.65	4,810.00	FORT UNION		0.00	206.00
6,350.45	6,116.02	Mesaverde Group Top		2.00	158.00
6,533.26	6,298.83	Williams Fork ("base Ohio Creek")		3.00	41.00
7,105.63	6,871.19	Williams Fork Shale Marker		3.00	39.00
7,462.43	7,228.00	Continuous Top of Gas			
8,861.65	8,627.21	Cameo Coal		3.00	70.00
9,240.92	9,006.49	Rollins		2.00	36.00
9,439.43	9,205.00	TD		0.00	

# **ENGINEERING CALCS**

**Nasik**

**Cascade Creek 697-15-54**

**Cascade Creek 697-15-58**

**CC 697-15-58**

**Plan: CC 697-15-58 PLAN 1**

## **Standard Planning Report**

**12 February, 2014**

# Oxy

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Cascade Creek 697-15-58
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 PLAN 1		

<b>Project</b>	Nasik, Planning		
<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 697-15-54, 16-54		
<b>Site Position:</b>		<b>Northing:</b>	625,361.65 ft
<b>From:</b>	Map	<b>Easting:</b>	1,238,150.52 ft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	39° 31' 9.611 N
		<b>Longitude:</b>	108° 12' 3.264 W
		<b>Grid Convergence:</b>	-1.70 °

<b>Well</b>	Cascade Creek 697-15-58, Cascade Creek 697-15-58		
<b>Well Position</b>	<b>+N/-S</b>	-71.03 ft	<b>Northing:</b> 625,291.34 ft
	<b>+E/-W</b>	-23.13 ft	<b>Easting:</b> 1,238,125.29 ft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 39° 31' 8.909 N
			<b>Longitude:</b> 108° 12' 3.559 W
			<b>Ground Level:</b> 8,640.00 ft

<b>Wellbore</b>	CC 697-15-58				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	1/29/2014	10.11	65.65	51,950

<b>Design</b>	CC 697-15-58 PLAN 1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	124.31	

<b>Plan Sections</b>										
<b>Measured Depth</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical Depth</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Dogleg Rate</b>	<b>Build Rate</b>	<b>Turn Rate</b>	<b>TFO</b>	<b>Target</b>
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	(°)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
650.00	0.00	0.00	650.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,650.00	20.00	124.31	1,629.82	-97.39	142.70	2.00	2.00	0.00	124.31	
4,867.93	20.00	124.31	4,653.68	-717.80	1,051.77	0.00	0.00	0.00	0.00	
5,867.93	0.00	0.00	5,633.50	-815.19	1,194.47	2.00	-2.00	0.00	180.00	
9,439.43	0.00	0.00	9,205.00	-815.19	1,194.47	0.00	0.00	0.00	0.00	CC 697-15-58 BHL

# Oxy Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Cascade Creek 697-15-58
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 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
90.00	0.00	0.00	90.00	0.00	0.00	0.00	0.00	0.00	0.00
16" Conductor									
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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
650.00	0.00	0.00	650.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	1.00	124.31	700.00	-0.25	0.36	0.44	2.00	2.00	0.00
800.00	3.00	124.31	799.93	-2.21	3.24	3.93	2.00	2.00	0.00
900.00	5.00	124.31	899.68	-6.15	9.00	10.90	2.00	2.00	0.00
1,000.00	7.00	124.31	999.13	-12.04	17.64	21.35	2.00	2.00	0.00
1,100.00	9.00	124.31	1,098.15	-19.88	29.13	35.27	2.00	2.00	0.00
1,200.00	11.00	124.31	1,196.63	-29.67	43.47	52.63	2.00	2.00	0.00
1,300.00	13.00	124.31	1,294.44	-41.39	60.65	73.42	2.00	2.00	0.00
1,400.00	15.00	124.31	1,391.46	-55.03	80.63	97.62	2.00	2.00	0.00
1,500.00	17.00	124.31	1,487.58	-70.56	103.39	125.18	2.00	2.00	0.00
1,600.00	19.00	124.31	1,582.68	-87.98	128.92	156.08	2.00	2.00	0.00
1,650.00	20.00	124.31	1,629.82	-97.39	142.70	172.77	2.00	2.00	0.00
1,700.00	20.00	124.31	1,676.80	-107.03	156.83	189.87	0.00	0.00	0.00
1,800.00	20.00	124.31	1,770.77	-126.31	185.08	224.07	0.00	0.00	0.00
1,900.00	20.00	124.31	1,864.74	-145.59	213.33	258.27	0.00	0.00	0.00
2,000.00	20.00	124.31	1,958.71	-164.87	241.58	292.47	0.00	0.00	0.00
2,100.00	20.00	124.31	2,052.68	-184.15	269.83	326.68	0.00	0.00	0.00
2,200.00	20.00	124.31	2,146.65	-203.43	298.08	360.88	0.00	0.00	0.00
2,300.00	20.00	124.31	2,240.62	-222.71	326.33	395.08	0.00	0.00	0.00
2,400.00	20.00	124.31	2,334.59	-241.99	354.58	429.28	0.00	0.00	0.00
2,500.00	20.00	124.31	2,428.55	-261.27	382.83	463.49	0.00	0.00	0.00
2,600.00	20.00	124.31	2,522.52	-280.55	411.08	497.69	0.00	0.00	0.00
2,700.00	20.00	124.31	2,616.49	-299.83	439.33	531.89	0.00	0.00	0.00
2,800.00	20.00	124.31	2,710.46	-319.11	467.58	566.09	0.00	0.00	0.00
2,900.00	20.00	124.31	2,804.43	-338.39	495.83	600.29	0.00	0.00	0.00
3,000.00	20.00	124.31	2,898.40	-357.67	524.08	634.50	0.00	0.00	0.00
9 5/8"									
3,100.00	20.00	124.31	2,992.37	-376.95	552.33	668.70	0.00	0.00	0.00
3,200.00	20.00	124.31	3,086.34	-396.23	580.58	702.90	0.00	0.00	0.00
3,300.00	20.00	124.31	3,180.31	-415.51	608.83	737.10	0.00	0.00	0.00
3,400.00	20.00	124.31	3,274.28	-434.79	637.08	771.30	0.00	0.00	0.00
3,500.00	20.00	124.31	3,368.25	-454.07	665.33	805.51	0.00	0.00	0.00
3,600.00	20.00	124.31	3,462.22	-473.35	693.58	839.71	0.00	0.00	0.00
3,700.00	20.00	124.31	3,556.19	-492.63	721.83	873.91	0.00	0.00	0.00
3,800.00	20.00	124.31	3,650.15	-511.91	750.08	908.11	0.00	0.00	0.00
3,900.00	20.00	124.31	3,744.12	-531.19	778.33	942.31	0.00	0.00	0.00
4,000.00	20.00	124.31	3,838.09	-550.47	806.58	976.52	0.00	0.00	0.00
4,100.00	20.00	124.31	3,932.06	-569.75	834.83	1,010.72	0.00	0.00	0.00
4,200.00	20.00	124.31	4,026.03	-589.03	863.08	1,044.92	0.00	0.00	0.00
4,300.00	20.00	124.31	4,120.00	-608.31	891.33	1,079.12	0.00	0.00	0.00
4,400.00	20.00	124.31	4,213.97	-627.59	919.58	1,113.32	0.00	0.00	0.00
4,500.00	20.00	124.31	4,307.94	-646.87	947.83	1,147.53	0.00	0.00	0.00
4,600.00	20.00	124.31	4,401.91	-666.15	976.08	1,181.73	0.00	0.00	0.00
4,700.00	20.00	124.31	4,495.88	-685.43	1,004.33	1,215.93	0.00	0.00	0.00
4,800.00	20.00	124.31	4,589.85	-704.71	1,032.58	1,250.13	0.00	0.00	0.00



# Oxy

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Cascade Creek 697-15-58
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 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)
4,867.93	20.00	124.31	4,653.68	-717.80	1,051.77	1,273.36	0.00	0.00	0.00
4,900.00	19.36	124.31	4,683.88	-723.89	1,060.69	1,284.16	2.00	-2.00	0.00
5,000.00	17.36	124.31	4,778.78	-741.64	1,086.70	1,315.66	2.00	-2.00	0.00
5,032.65	16.71	124.31	4,810.00	-747.03	1,094.60	1,325.22	2.00	-2.00	0.00
<b>FORT UNION</b>									
5,100.00	15.36	124.31	4,874.73	-757.52	1,109.97	1,343.82	2.00	-2.00	0.00
5,200.00	13.36	124.31	4,971.60	-771.50	1,130.45	1,368.62	2.00	-2.00	0.00
5,300.00	11.36	124.31	5,069.28	-783.56	1,148.13	1,390.02	2.00	-2.00	0.00
5,400.00	9.36	124.31	5,167.64	-793.70	1,162.98	1,408.00	2.00	-2.00	0.00
5,500.00	7.36	124.31	5,266.58	-801.89	1,174.98	1,422.54	2.00	-2.00	0.00
5,600.00	5.36	124.31	5,365.96	-808.13	1,184.13	1,433.61	2.00	-2.00	0.00
5,700.00	3.36	124.31	5,465.66	-812.42	1,190.41	1,441.21	2.00	-2.00	0.00
5,800.00	1.36	124.31	5,565.57	-814.74	1,193.81	1,445.33	2.00	-2.00	0.00
5,867.93	0.00	0.00	5,633.50	-815.19	1,194.47	1,446.13	2.00	-2.00	0.00
5,900.00	0.00	0.00	5,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,000.00	0.00	0.00	5,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,100.00	0.00	0.00	5,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,200.00	0.00	0.00	5,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,300.00	0.00	0.00	6,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,350.45	0.00	0.00	6,116.02	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Mesaverde Group Top</b>									
6,400.00	0.00	0.00	6,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,500.00	0.00	0.00	6,265.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,533.26	0.00	0.00	6,298.83	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Williams Fork ("base Ohio Creek")</b>									
6,600.00	0.00	0.00	6,365.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,700.00	0.00	0.00	6,465.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,800.00	0.00	0.00	6,565.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
6,900.00	0.00	0.00	6,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,000.00	0.00	0.00	6,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,100.00	0.00	0.00	6,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,105.63	0.00	0.00	6,871.19	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Williams Fork Shale Marker</b>									
7,200.00	0.00	0.00	6,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,300.00	0.00	0.00	7,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,400.00	0.00	0.00	7,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,462.43	0.00	0.00	7,228.00	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Continuous Top of Gas</b>									
7,500.00	0.00	0.00	7,265.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,600.00	0.00	0.00	7,365.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,700.00	0.00	0.00	7,465.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,800.00	0.00	0.00	7,565.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
7,900.00	0.00	0.00	7,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,000.00	0.00	0.00	7,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,100.00	0.00	0.00	7,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,200.00	0.00	0.00	7,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,300.00	0.00	0.00	8,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,400.00	0.00	0.00	8,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,500.00	0.00	0.00	8,265.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,600.00	0.00	0.00	8,365.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,700.00	0.00	0.00	8,465.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,800.00	0.00	0.00	8,565.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
8,861.65	0.00	0.00	8,627.21	-815.19	1,194.47	1,446.13	0.00	0.00	0.00

# Oxy Planning Report

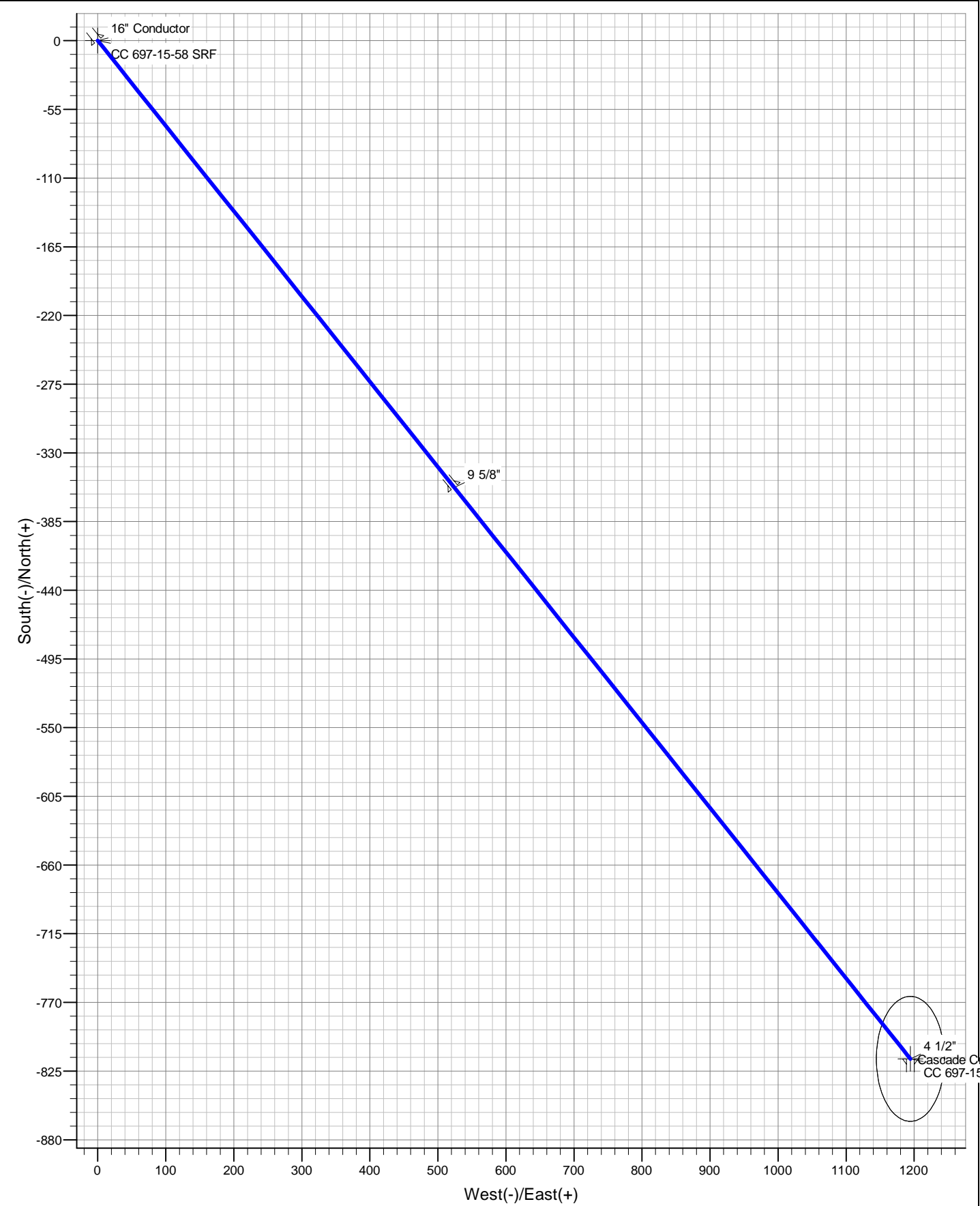
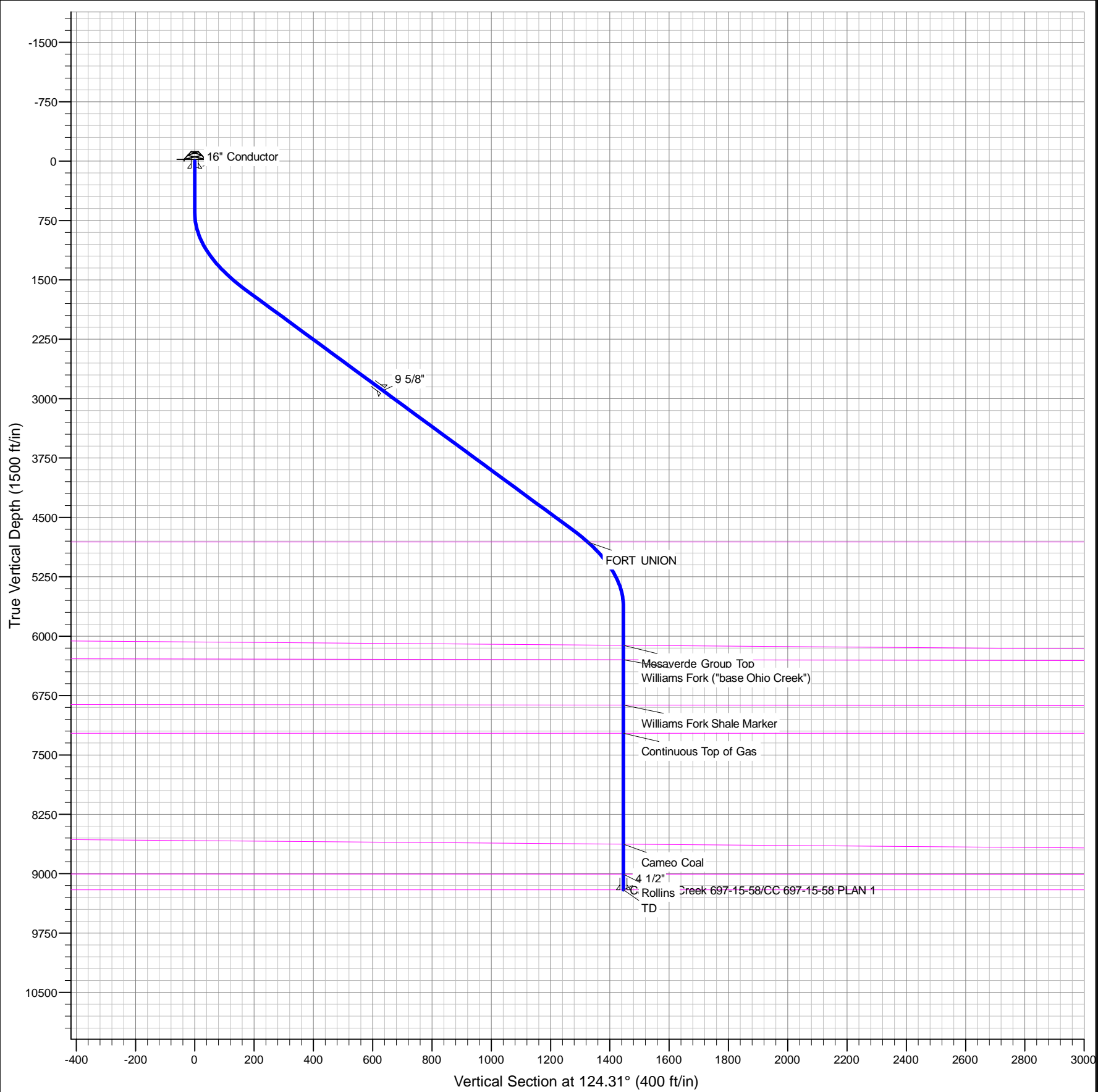
<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Cascade Creek 697-15-58
<b>Company:</b>	ENGINEERING CALCS	<b>TVD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Project:</b>	Nasik	<b>MD Reference:</b>	WELL @ 8665.00ft (Original Well Elev)
<b>Site:</b>	Cascade Creek 697-15-54	<b>North Reference:</b>	True
<b>Well:</b>	Cascade Creek 697-15-58	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CC 697-15-58		
<b>Design:</b>	CC 697-15-58 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)
<b>Cameo Coal</b>									
8,900.00	0.00	0.00	8,665.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,000.00	0.00	0.00	8,765.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,100.00	0.00	0.00	8,865.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,200.00	0.00	0.00	8,965.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,240.92	0.00	0.00	9,006.49	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>Rollins</b>									
9,300.00	0.00	0.00	9,065.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,400.00	0.00	0.00	9,165.57	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
9,439.43	0.00	0.00	9,205.00	-815.19	1,194.47	1,446.13	0.00	0.00	0.00
<b>TD - 4 1/2"</b>									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
CC 697-15-58 SRF	0.00	0.00	0.00	0.00	0.00	625,291.34	1,238,125.29	39° 31' 8.909 N	108° 12' 3.559 W
- plan hits target center									
- Point									
CC 697-15-58 BHL	0.00	0.00	9,205.00	-815.19	1,194.47	624,441.00	1,239,295.00	39° 31' 0.851 N	108° 11' 48.317 W
- plan hits target center									
- Circle (radius 50.00)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
90.00	90.00	16" Conductor	16.000	20.000	
3,000.00	2,898.40	9 5/8"	9.625	14.750	
9,439.43	9,205.00	4 1/2"	4.500	8.750	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,032.65	4,810.00	FORT UNION		0.00	206.00
6,350.45	6,116.02	Mesaverde Group Top		2.00	158.00
6,533.26	6,298.83	Williams Fork ("base Ohio Creek")		3.00	41.00
7,105.63	6,871.19	Williams Fork Shale Marker		3.00	39.00
7,462.43	7,228.00	Continuous Top of Gas			
8,861.65	8,627.21	Cameo Coal		3.00	70.00
9,240.92	9,006.49	Rollins		2.00	36.00
9,439.43	9,205.00	TD		0.00	



Plan: CC 697-15-58 PLAN 1 (Cascade Creek 697-15-58/CC 697-15-58)	
Created By: Oxy	Date: 12:44, February 13 2014
Checked: _____	Date: _____
Reviewed: _____	Date: _____
Approved: _____	Date: _____

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
CC 697-15-58 SRF	0.00	0.00	0.00	625291.34	1238125.29	39° 31' 8.909 N	108° 12' 3.559 W
- plan hits target center							
CC 697-15-58 TD	-815.19	1194.47		624441.00	1239295.00	39° 31' 0.851 N	108° 11' 48.317 W
- plan hits target center							

T

M

Azimuths to True North

Magnetic North: 10.11°

Magnetic Field

Strength: 51950.1snT

Dip Angle: 65.65°

Date: 1/29/2014

Model: IGRF2010

