

ENGINEERING CALCS

Nasik

Cascade Creek 697-15-54

Cascade Creek 697-15-55A

CC 697-15-55A

Plan: CC 697-15-55A PLAN 1

Standard Planning Report - Geographic

12 February, 2014

Oxy
Planning Report - Geographic

Database:	HOPSPP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A PLAN 1		

Project	Nasik, Planning		
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 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 697-15-55A				
Well Position	+N/-S	0.00 ft	Northing:	625,310.57 ft	Latitude:	39° 31' 9.096 N
	+E/-W	0.00 ft	Easting:	1,238,115.98 ft	Longitude:	108° 12' 3.685 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,640.00 ft

Wellbore	CC 697-15-55A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/29/2014	10.11	65.65	51,950

Design	CC 697-15-55A PLAN 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	231.82

Plan Sections										
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	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,350.00	15.00	231.82	1,341.46	-60.33	-76.74	2.00	2.00	0.00	231.82	
5,116.82	15.00	231.82	4,979.93	-662.90	-843.15	0.00	0.00	0.00	0.00	
5,866.82	0.00	0.00	5,721.39	-723.24	-919.89	2.00	-2.00	0.00	180.00	
9,262.43	0.00	0.00	9,117.00	-723.24	-919.89	0.00	0.00	0.00	0.00	CC 697-15-55A BHL

Oxy
Planning Report - Geographic

Database:	HOPSPP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A PLAN 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
90.00	0.00	0.00	90.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
16" Conductor									
100.00	0.00	0.00	100.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
200.00	0.00	0.00	200.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
300.00	0.00	0.00	300.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
400.00	0.00	0.00	400.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
500.00	0.00	0.00	500.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
600.00	0.00	0.00	600.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
700.00	2.00	231.82	699.98	-1.08	-1.37	625,309.54	1,238,114.57	39° 31' 9.085 N	108° 12' 3.703 W
800.00	4.00	231.82	799.84	-4.31	-5.49	625,306.43	1,238,110.37	39° 31' 9.053 N	108° 12' 3.755 W
900.00	6.00	231.82	899.45	-9.70	-12.34	625,301.25	1,238,103.36	39° 31' 9.000 N	108° 12' 3.843 W
1,000.00	8.00	231.82	998.70	-17.23	-21.92	625,294.00	1,238,093.56	39° 31' 8.926 N	108° 12' 3.965 W
1,100.00	10.00	231.82	1,097.47	-26.90	-34.21	625,284.70	1,238,080.98	39° 31' 8.830 N	108° 12' 4.122 W
1,200.00	12.00	231.82	1,195.62	-38.69	-49.21	625,273.36	1,238,065.64	39° 31' 8.714 N	108° 12' 4.313 W
1,300.00	14.00	231.82	1,293.06	-52.60	-66.90	625,259.99	1,238,047.55	39° 31' 8.576 N	108° 12' 4.539 W
1,350.00	15.00	231.82	1,341.46	-60.33	-76.74	625,252.55	1,238,037.48	39° 31' 8.500 N	108° 12' 4.664 W
1,400.00	15.00	231.82	1,389.76	-68.33	-86.91	625,244.86	1,238,027.07	39° 31' 8.421 N	108° 12' 4.794 W
1,500.00	15.00	231.82	1,486.35	-84.33	-107.26	625,229.47	1,238,006.26	39° 31' 8.262 N	108° 12' 5.054 W
1,600.00	15.00	231.82	1,582.94	-100.32	-127.60	625,214.09	1,237,985.45	39° 31' 8.104 N	108° 12' 5.313 W
1,700.00	15.00	231.82	1,679.54	-116.32	-147.95	625,198.70	1,237,964.63	39° 31' 7.946 N	108° 12' 5.573 W
1,800.00	15.00	231.82	1,776.13	-132.32	-168.30	625,183.32	1,237,943.82	39° 31' 7.788 N	108° 12' 5.833 W
1,900.00	15.00	231.82	1,872.72	-148.32	-188.64	625,167.93	1,237,923.01	39° 31' 7.630 N	108° 12' 6.092 W
2,000.00	15.00	231.82	1,969.31	-164.31	-208.99	625,152.55	1,237,902.20	39° 31' 7.472 N	108° 12' 6.352 W
2,100.00	15.00	231.82	2,065.91	-180.31	-229.34	625,137.16	1,237,881.38	39° 31' 7.314 N	108° 12' 6.612 W
2,200.00	15.00	231.82	2,162.50	-196.31	-249.68	625,121.78	1,237,860.57	39° 31' 7.156 N	108° 12' 6.871 W
2,300.00	15.00	231.82	2,259.09	-212.30	-270.03	625,106.39	1,237,839.76	39° 31' 6.998 N	108° 12' 7.131 W
2,400.00	15.00	231.82	2,355.68	-228.30	-290.37	625,091.01	1,237,818.94	39° 31' 6.840 N	108° 12' 7.391 W
2,500.00	15.00	231.82	2,452.28	-244.30	-310.72	625,075.62	1,237,798.13	39° 31' 6.681 N	108° 12' 7.650 W
2,600.00	15.00	231.82	2,548.87	-260.29	-331.07	625,060.24	1,237,777.32	39° 31' 6.523 N	108° 12' 7.910 W
2,700.00	15.00	231.82	2,645.46	-276.29	-351.41	625,044.85	1,237,756.51	39° 31' 6.365 N	108° 12' 8.169 W
2,800.00	15.00	231.82	2,742.05	-292.29	-371.76	625,029.47	1,237,735.69	39° 31' 6.207 N	108° 12' 8.429 W
2,900.00	15.00	231.82	2,838.65	-308.28	-392.11	625,014.08	1,237,714.88	39° 31' 6.049 N	108° 12' 8.689 W
3,000.00	15.00	231.82	2,935.24	-324.28	-412.45	624,998.70	1,237,694.07	39° 31' 5.891 N	108° 12' 8.948 W
9 5/8"									
3,100.00	15.00	231.82	3,031.83	-340.28	-432.80	624,983.31	1,237,673.25	39° 31' 5.733 N	108° 12' 9.208 W
3,200.00	15.00	231.82	3,128.42	-356.27	-453.15	624,967.93	1,237,652.44	39° 31' 5.575 N	108° 12' 9.468 W
3,300.00	15.00	231.82	3,225.02	-372.27	-473.49	624,952.54	1,237,631.63	39° 31' 5.417 N	108° 12' 9.727 W
3,400.00	15.00	231.82	3,321.61	-388.27	-493.84	624,937.16	1,237,610.81	39° 31' 5.258 N	108° 12' 9.987 W
3,500.00	15.00	231.82	3,418.20	-404.26	-514.19	624,921.77	1,237,590.00	39° 31' 5.100 N	108° 12' 10.246 W
3,600.00	15.00	231.82	3,514.80	-420.26	-534.53	624,906.39	1,237,569.19	39° 31' 4.942 N	108° 12' 10.506 W
3,700.00	15.00	231.82	3,611.39	-436.26	-554.88	624,891.00	1,237,548.38	39° 31' 4.784 N	108° 12' 10.766 W
3,800.00	15.00	231.82	3,707.98	-452.25	-575.22	624,875.62	1,237,527.56	39° 31' 4.626 N	108° 12' 11.025 W
3,900.00	15.00	231.82	3,804.57	-468.25	-595.57	624,860.23	1,237,506.75	39° 31' 4.468 N	108° 12' 11.285 W
4,000.00	15.00	231.82	3,901.17	-484.25	-615.92	624,844.85	1,237,485.94	39° 31' 4.310 N	108° 12' 11.545 W
4,100.00	15.00	231.82	3,997.76	-500.24	-636.26	624,829.46	1,237,465.12	39° 31' 4.152 N	108° 12' 11.804 W
4,200.00	15.00	231.82	4,094.35	-516.24	-656.61	624,814.08	1,237,444.31	39° 31' 3.994 N	108° 12' 12.064 W
4,300.00	15.00	231.82	4,190.94	-532.24	-676.96	624,798.70	1,237,423.50	39° 31' 3.835 N	108° 12' 12.323 W
4,400.00	15.00	231.82	4,287.54	-548.24	-697.30	624,783.31	1,237,402.69	39° 31' 3.677 N	108° 12' 12.583 W
4,500.00	15.00	231.82	4,384.13	-564.23	-717.65	624,767.93	1,237,381.87	39° 31' 3.519 N	108° 12' 12.843 W
4,600.00	15.00	231.82	4,480.72	-580.23	-738.00	624,752.54	1,237,361.06	39° 31' 3.361 N	108° 12' 13.102 W
4,700.00	15.00	231.82	4,577.31	-596.23	-758.34	624,737.16	1,237,340.25	39° 31' 3.203 N	108° 12' 13.362 W
4,800.00	15.00	231.82	4,673.91	-612.22	-778.69	624,721.77	1,237,319.43	39° 31' 3.045 N	108° 12' 13.622 W
4,900.00	15.00	231.82	4,770.50	-628.22	-799.03	624,706.39	1,237,298.62	39° 31' 2.887 N	108° 12' 13.881 W

Oxy
Planning Report - Geographic

Database:	HOPSPP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A PLAN 1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
4,917.67	15.00	231.82	4,787.57	-631.05	-802.63	624,703.67	1,237,294.94	39° 31' 2.859 N	108° 12' 13.927 W	
FORT UNION										
5,000.00	15.00	231.82	4,867.09	-644.22	-819.38	624,691.00	1,237,277.81	39° 31' 2.729 N	108° 12' 14.141 W	
5,100.00	15.00	231.82	4,963.68	-660.21	-839.73	624,675.62	1,237,256.99	39° 31' 2.570 N	108° 12' 14.400 W	
5,116.82	15.00	231.82	4,979.93	-662.90	-843.15	624,673.03	1,237,253.50	39° 31' 2.544 N	108° 12' 14.444 W	
5,200.00	13.34	231.82	5,060.58	-675.49	-859.15	624,660.93	1,237,237.12	39° 31' 2.420 N	108° 12' 14.648 W	
5,300.00	11.34	231.82	5,158.26	-688.69	-875.95	624,648.23	1,237,219.94	39° 31' 2.289 N	108° 12' 14.863 W	
5,400.00	9.34	231.82	5,256.64	-699.78	-890.05	624,637.56	1,237,205.51	39° 31' 2.179 N	108° 12' 15.043 W	
5,500.00	7.34	231.82	5,355.57	-708.74	-901.45	624,628.94	1,237,193.86	39° 31' 2.091 N	108° 12' 15.188 W	
5,600.00	5.34	231.82	5,454.96	-715.56	-910.13	624,622.38	1,237,184.98	39° 31' 2.023 N	108° 12' 15.299 W	
5,700.00	3.34	231.82	5,554.67	-720.23	-916.07	624,617.89	1,237,178.90	39° 31' 1.977 N	108° 12' 15.375 W	
5,800.00	1.34	231.82	5,654.58	-722.75	-919.27	624,615.47	1,237,175.62	39° 31' 1.952 N	108° 12' 15.415 W	
5,866.82	0.00	0.00	5,721.39	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
5,900.00	0.00	0.00	5,754.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,000.00	0.00	0.00	5,854.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,100.00	0.00	0.00	5,954.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,188.51	0.00	0.00	6,043.09	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
Mesaverde Group Top										
6,200.00	0.00	0.00	6,054.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,300.00	0.00	0.00	6,154.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,372.44	0.00	0.00	6,227.02	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
Williams Fork ("base Ohio Creek")										
6,400.00	0.00	0.00	6,254.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,500.00	0.00	0.00	6,354.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,600.00	0.00	0.00	6,454.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,700.00	0.00	0.00	6,554.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,800.00	0.00	0.00	6,654.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
6,866.15	0.00	0.00	6,720.72	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
Williams Fork Shale Marker										
6,900.00	0.00	0.00	6,754.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,000.00	0.00	0.00	6,854.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,100.00	0.00	0.00	6,954.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,200.00	0.00	0.00	7,054.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,300.00	0.00	0.00	7,154.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,383.43	0.00	0.00	7,238.00	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
Continuous Top of Gas										
7,400.00	0.00	0.00	7,254.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,500.00	0.00	0.00	7,354.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,600.00	0.00	0.00	7,454.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,700.00	0.00	0.00	7,554.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,800.00	0.00	0.00	7,654.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
7,900.00	0.00	0.00	7,754.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,000.00	0.00	0.00	7,854.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,100.00	0.00	0.00	7,954.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,200.00	0.00	0.00	8,054.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,300.00	0.00	0.00	8,154.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,400.00	0.00	0.00	8,254.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,500.00	0.00	0.00	8,354.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,600.00	0.00	0.00	8,454.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,630.23	0.00	0.00	8,484.81	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
Cameo Coal										
8,700.00	0.00	0.00	8,554.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,800.00	0.00	0.00	8,654.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	
8,900.00	0.00	0.00	8,754.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W	

Oxy
Planning Report - Geographic

Database:	HOPSPP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A PLAN 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
9,000.00	0.00	0.00	8,854.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W
9,001.10	0.00	0.00	8,855.68	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W
Rollins									
9,100.00	0.00	0.00	8,954.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W
9,200.00	0.00	0.00	9,054.57	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W
9,262.43	0.00	0.00	9,117.00	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W
TD - 4 1/2"									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
CC 697-15-55A SRF - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
CC 697-15-55A BHL - plan hits target center - Point	0.00	0.00	9,117.00	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W

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	2,935.24	9 5/8"	9.625	14.752	
9,262.43	9,117.00	4 1/2"	4.500	8.750	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,917.67	4,787.57	FORT UNION		1.00	106.00
6,188.51	6,043.09	Mesaverde Group Top		1.00	74.00
6,372.44	6,227.02	Williams Fork ("base Ohio Creek")		2.00	7.00
6,866.15	6,720.72	Williams Fork Shale Marker		3.00	54.00
7,383.43	7,238.00	Continuous Top of Gas			
8,630.23	8,484.81	Cameo Coal		2.00	31.00
9,001.10	8,855.68	Rollins		3.00	52.00
9,262.43	9,117.00	TD			

ENGINEERING CALCS

Nasik

Cascade Creek 697-15-54

Cascade Creek 697-15-55A

CC 697-15-55A

Plan: CC 697-15-55A PLAN 1

Standard Planning Report

12 February, 2014

Oxy

Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A PLAN 1		

Project	Nasik, Planning		
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 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 697-15-55A					
Well Position	+N/-S	-52.08 ft	Northing:	625,310.57 ft	Latitude:	39° 31' 9.096 N
	+E/-W	-33.01 ft	Easting:	1,238,115.98 ft	Longitude:	108° 12' 3.685 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,640.00 ft

Wellbore	CC 697-15-55A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/29/2014	10.11	65.65	51,950

Design	CC 697-15-55A PLAN 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	231.82

Plan Sections										
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	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,350.00	15.00	231.82	1,341.46	-60.33	-76.74	2.00	2.00	0.00	231.82	
5,116.82	15.00	231.82	4,979.93	-662.90	-843.15	0.00	0.00	0.00	0.00	
5,866.82	0.00	0.00	5,721.39	-723.24	-919.89	2.00	-2.00	0.00	180.00	
9,262.43	0.00	0.00	9,117.00	-723.24	-919.89	0.00	0.00	0.00	0.00	CC 697-15-55A BHL

Oxy

Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A 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
700.00	2.00	231.82	699.98	-1.08	-1.37	1.75	2.00	2.00	0.00
800.00	4.00	231.82	799.84	-4.31	-5.49	6.98	2.00	2.00	0.00
900.00	6.00	231.82	899.45	-9.70	-12.34	15.69	2.00	2.00	0.00
1,000.00	8.00	231.82	998.70	-17.23	-21.92	27.88	2.00	2.00	0.00
1,100.00	10.00	231.82	1,097.47	-26.90	-34.21	43.52	2.00	2.00	0.00
1,200.00	12.00	231.82	1,195.62	-38.69	-49.21	62.60	2.00	2.00	0.00
1,300.00	14.00	231.82	1,293.06	-52.60	-66.90	85.10	2.00	2.00	0.00
1,350.00	15.00	231.82	1,341.46	-60.33	-76.74	97.62	2.00	2.00	0.00
1,400.00	15.00	231.82	1,389.76	-68.33	-86.91	110.56	0.00	0.00	0.00
1,500.00	15.00	231.82	1,486.35	-84.33	-107.26	136.44	0.00	0.00	0.00
1,600.00	15.00	231.82	1,582.94	-100.32	-127.60	162.32	0.00	0.00	0.00
1,700.00	15.00	231.82	1,679.54	-116.32	-147.95	188.20	0.00	0.00	0.00
1,800.00	15.00	231.82	1,776.13	-132.32	-168.30	214.08	0.00	0.00	0.00
1,900.00	15.00	231.82	1,872.72	-148.32	-188.64	239.97	0.00	0.00	0.00
2,000.00	15.00	231.82	1,969.31	-164.31	-208.99	265.85	0.00	0.00	0.00
2,100.00	15.00	231.82	2,065.91	-180.31	-229.34	291.73	0.00	0.00	0.00
2,200.00	15.00	231.82	2,162.50	-196.31	-249.68	317.61	0.00	0.00	0.00
2,300.00	15.00	231.82	2,259.09	-212.30	-270.03	343.49	0.00	0.00	0.00
2,400.00	15.00	231.82	2,355.68	-228.30	-290.37	369.38	0.00	0.00	0.00
2,500.00	15.00	231.82	2,452.28	-244.30	-310.72	395.26	0.00	0.00	0.00
2,600.00	15.00	231.82	2,548.87	-260.29	-331.07	421.14	0.00	0.00	0.00
2,700.00	15.00	231.82	2,645.46	-276.29	-351.41	447.02	0.00	0.00	0.00
2,800.00	15.00	231.82	2,742.05	-292.29	-371.76	472.90	0.00	0.00	0.00
2,900.00	15.00	231.82	2,838.65	-308.28	-392.11	498.78	0.00	0.00	0.00
3,000.00	15.00	231.82	2,935.24	-324.28	-412.45	524.67	0.00	0.00	0.00
9 5/8"									
3,100.00	15.00	231.82	3,031.83	-340.28	-432.80	550.55	0.00	0.00	0.00
3,200.00	15.00	231.82	3,128.42	-356.27	-453.15	576.43	0.00	0.00	0.00
3,300.00	15.00	231.82	3,225.02	-372.27	-473.49	602.31	0.00	0.00	0.00
3,400.00	15.00	231.82	3,321.61	-388.27	-493.84	628.19	0.00	0.00	0.00
3,500.00	15.00	231.82	3,418.20	-404.26	-514.19	654.08	0.00	0.00	0.00
3,600.00	15.00	231.82	3,514.80	-420.26	-534.53	679.96	0.00	0.00	0.00
3,700.00	15.00	231.82	3,611.39	-436.26	-554.88	705.84	0.00	0.00	0.00
3,800.00	15.00	231.82	3,707.98	-452.25	-575.22	731.72	0.00	0.00	0.00
3,900.00	15.00	231.82	3,804.57	-468.25	-595.57	757.60	0.00	0.00	0.00
4,000.00	15.00	231.82	3,901.17	-484.25	-615.92	783.49	0.00	0.00	0.00
4,100.00	15.00	231.82	3,997.76	-500.24	-636.26	809.37	0.00	0.00	0.00
4,200.00	15.00	231.82	4,094.35	-516.24	-656.61	835.25	0.00	0.00	0.00
4,300.00	15.00	231.82	4,190.94	-532.24	-676.96	861.13	0.00	0.00	0.00
4,400.00	15.00	231.82	4,287.54	-548.24	-697.30	887.01	0.00	0.00	0.00
4,500.00	15.00	231.82	4,384.13	-564.23	-717.65	912.90	0.00	0.00	0.00
4,600.00	15.00	231.82	4,480.72	-580.23	-738.00	938.78	0.00	0.00	0.00
4,700.00	15.00	231.82	4,577.31	-596.23	-758.34	964.66	0.00	0.00	0.00
4,800.00	15.00	231.82	4,673.91	-612.22	-778.69	990.54	0.00	0.00	0.00
4,900.00	15.00	231.82	4,770.50	-628.22	-799.03	1,016.42	0.00	0.00	0.00

Oxy
Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A 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)	
4,917.67	15.00	231.82	4,787.57	-631.05	-802.63	1,021.00	0.00	0.00	0.00	
FORT UNION										
5,000.00	15.00	231.82	4,867.09	-644.22	-819.38	1,042.30	0.00	0.00	0.00	
5,100.00	15.00	231.82	4,963.68	-660.21	-839.73	1,068.19	0.00	0.00	0.00	
5,116.82	15.00	231.82	4,979.93	-662.90	-843.15	1,072.54	0.00	0.00	0.00	
5,200.00	13.34	231.82	5,060.58	-675.49	-859.15	1,092.90	2.00	-2.00	0.00	
5,300.00	11.34	231.82	5,158.26	-688.69	-875.95	1,114.26	2.00	-2.00	0.00	
5,400.00	9.34	231.82	5,256.64	-699.78	-890.05	1,132.20	2.00	-2.00	0.00	
5,500.00	7.34	231.82	5,355.57	-708.74	-901.45	1,146.70	2.00	-2.00	0.00	
5,600.00	5.34	231.82	5,454.96	-715.56	-910.13	1,157.74	2.00	-2.00	0.00	
5,700.00	3.34	231.82	5,554.67	-720.23	-916.07	1,165.30	2.00	-2.00	0.00	
5,800.00	1.34	231.82	5,654.58	-722.75	-919.27	1,169.38	2.00	-2.00	0.00	
5,866.82	0.00	0.00	5,721.39	-723.24	-919.89	1,170.15	2.00	-2.00	0.00	
5,900.00	0.00	0.00	5,754.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,854.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,954.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,188.51	0.00	0.00	6,043.09	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
Mesaverde Group Top										
6,200.00	0.00	0.00	6,054.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,154.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,372.44	0.00	0.00	6,227.02	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
Williams Fork ("base Ohio Creek")										
6,400.00	0.00	0.00	6,254.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,354.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,454.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,554.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,654.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
6,866.15	0.00	0.00	6,720.72	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
Williams Fork Shale Marker										
6,900.00	0.00	0.00	6,754.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,854.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,954.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,054.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,154.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,383.43	0.00	0.00	7,238.00	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
Continuous Top of Gas										
7,400.00	0.00	0.00	7,254.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,354.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,454.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,554.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,654.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,754.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,854.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,100.00	0.00	0.00	7,954.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,054.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,154.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,254.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,354.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,454.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,630.23	0.00	0.00	8,484.81	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
Cameo Coal										
8,700.00	0.00	0.00	8,554.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,654.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00	

Oxy

Planning Report

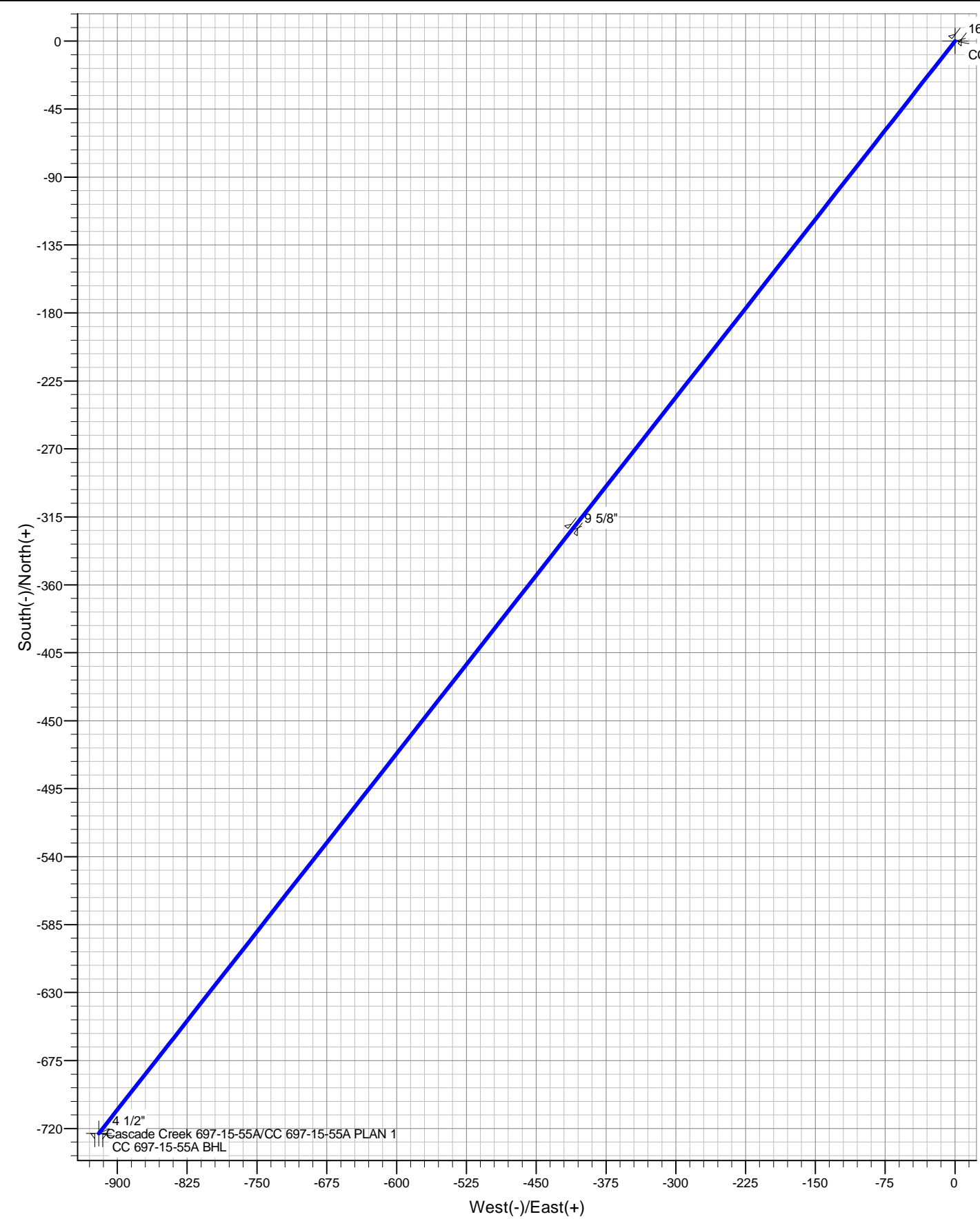
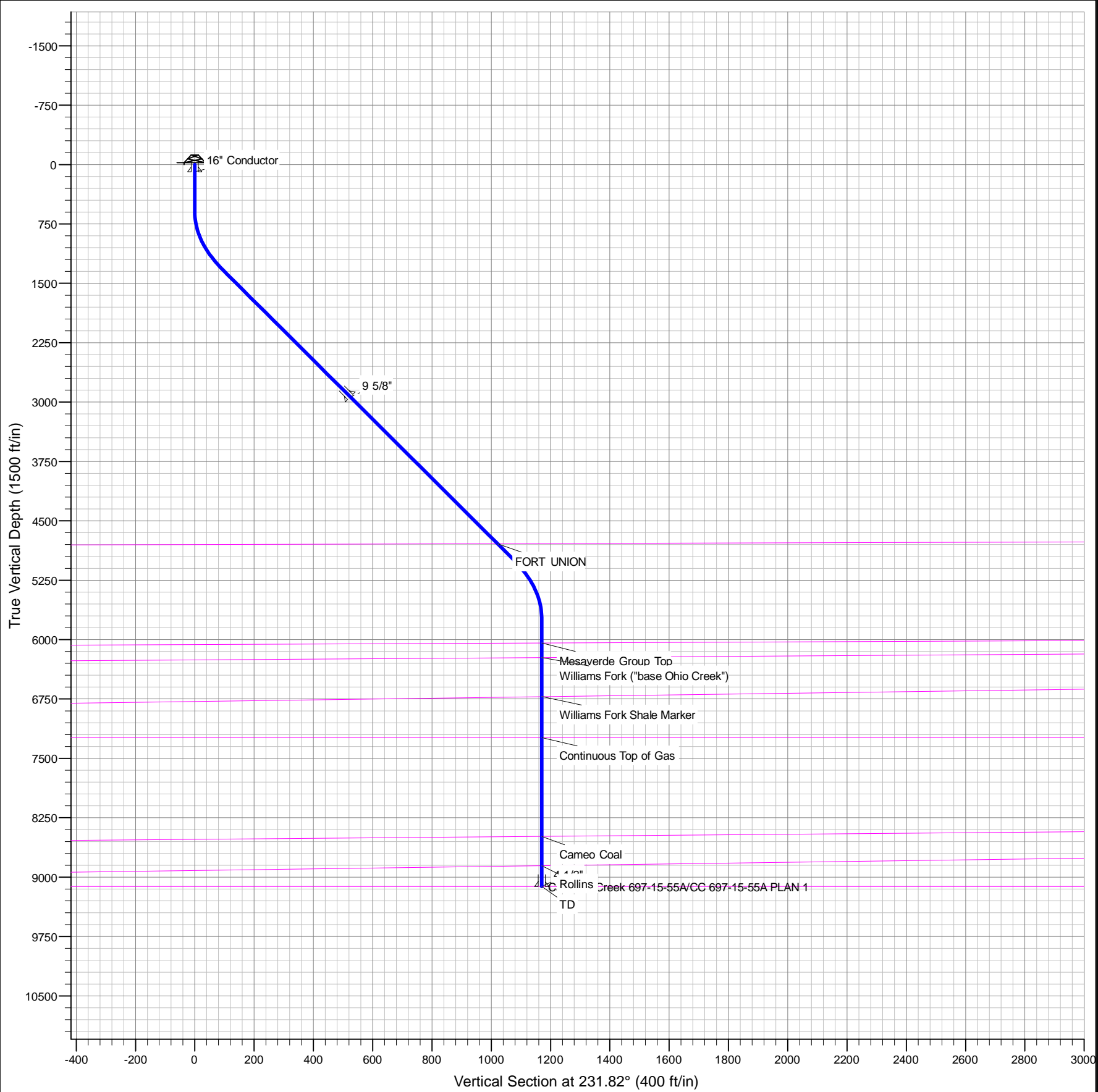
Database:	HOPSP	Local Co-ordinate Reference:	Well Cascade Creek 697-15-55A
Company:	ENGINEERING CALCS	TVD Reference:	WELL @ 8665.00ft (Original Well Elev)
Project:	Nasik	MD Reference:	WELL @ 8665.00ft (Original Well Elev)
Site:	Cascade Creek 697-15-54	North Reference:	True
Well:	Cascade Creek 697-15-55A	Survey Calculation Method:	Minimum Curvature
Wellbore:	CC 697-15-55A		
Design:	CC 697-15-55A 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	8,754.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00
9,000.00	0.00	0.00	8,854.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00
9,001.10	0.00	0.00	8,855.68	-723.24	-919.89	1,170.15	0.00	0.00	0.00
Rollins									
9,100.00	0.00	0.00	8,954.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00
9,200.00	0.00	0.00	9,054.57	-723.24	-919.89	1,170.15	0.00	0.00	0.00
9,262.43	0.00	0.00	9,117.00	-723.24	-919.89	1,170.15	0.00	0.00	0.00
TD - 4 1/2"									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
CC 697-15-55A SRF - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	625,310.57	1,238,115.98	39° 31' 9.096 N	108° 12' 3.685 W
CC 697-15-55A BHL - plan hits target center - Point	0.00	0.00	9,117.00	-723.24	-919.89	624,615.00	1,237,175.00	39° 31' 1.948 N	108° 12' 15.423 W

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	2,935.24	9 5/8"	9.625	14.752	
9,262.43	9,117.00	4 1/2"	4.500	8.750	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,917.67	4,787.57	FORT UNION		1.00	106.00
6,188.51	6,043.09	Mesaverde Group Top		1.00	74.00
6,372.44	6,227.02	Williams Fork ("base Ohio Creek")		2.00	7.00
6,866.15	6,720.72	Williams Fork Shale Marker		3.00	54.00
7,383.43	7,238.00	Continuous Top of Gas			
8,630.23	8,484.81	Cameo Coal		2.00	31.00
9,001.10	8,855.68	Rollins		3.00	52.00
9,262.43	9,117.00	TD			



Plan: CC 697-15-55A PLAN 1 (Cascade Creek 697-15-55A/CC 697-15-55A)	
Created By: Oxy	Date: 15:41, February 12 2014
Checked: _____	Date: _____
Reviewed: _____	Date: _____
Approved: _____	Date: _____

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
CC 697-15-55A BHL	0.00	0.00	0.00	625310.57	1238115.98	39° 31' 9.096 N	108° 12' 3.685 W	Point	
- plan hits target center									
CC 697-15-55A BHL	-723.24	-919.89	624615.00	1237175.00	39° 31' 1.948 N	108° 12' 15.423 W	Point		
- 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

