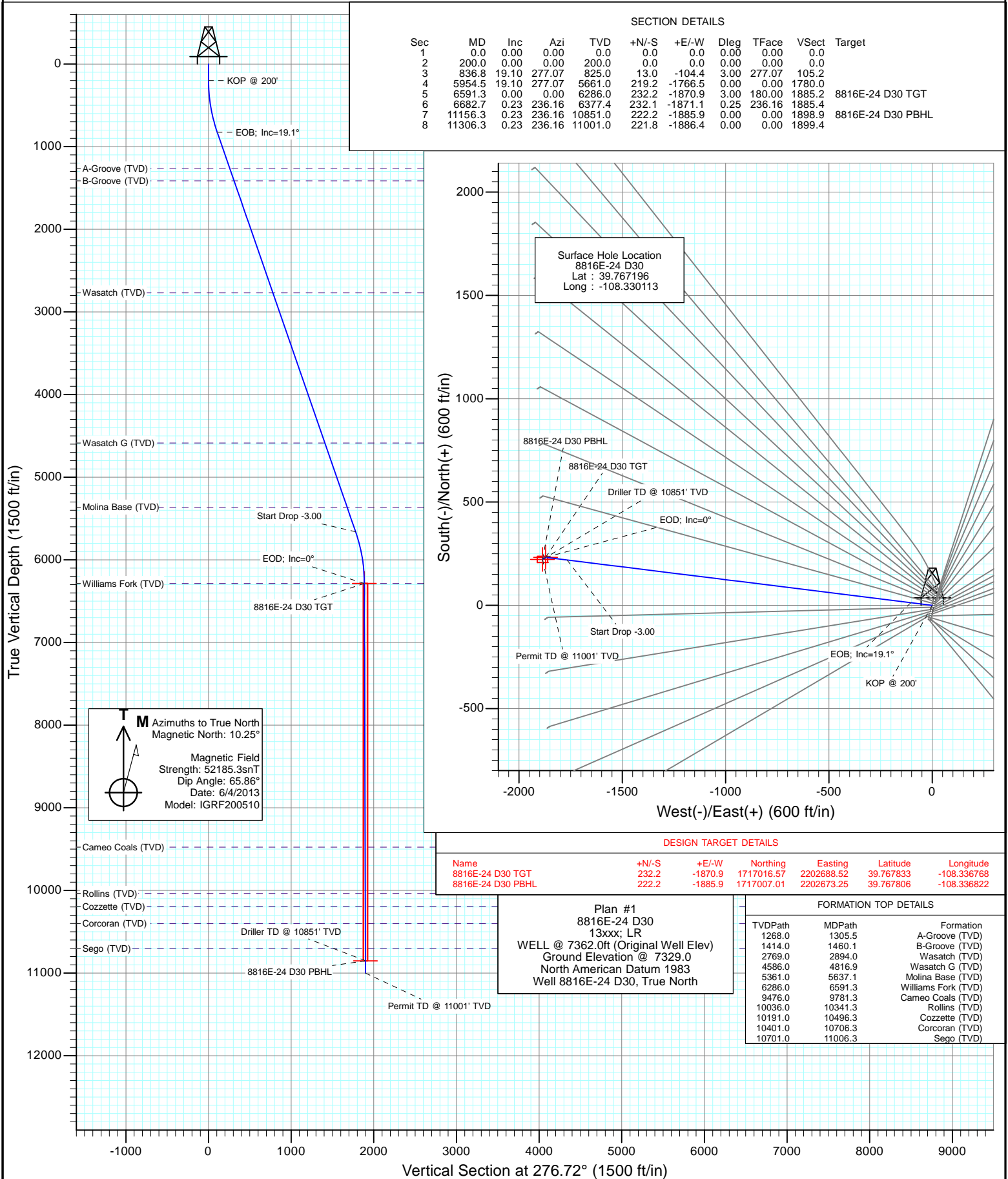




Project: Eureka Unit
Site: S19-T3S-R97W (D30 397 Pad)
Well: 8816E-24 D30
Wellbore: DD
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well 8816E-24 D30
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7362.0ft (Original Well Elev)
Project:	Eureka Unit	MD Reference:	WELL @ 7362.0ft (Original Well Elev)
Site:	S19-T3S-R97W (D30 397 Pad)	North Reference:	True
Well:	8816E-24 D30	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project	Eureka Unit		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		S19-T3S-R97W (D30 397 Pad)			
Site Position:		Northing:	1,716,819.83 ft	Latitude:	39.767450
From:	Lat/Long	Easting:	2,204,516.45 ft	Longitude:	-108.330247
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.79 °

Well	8816E-24 D30					
Well Position	+N/-S	0.0 ft	Northing:	1,716,726.21 ft	Latitude:	39.767196
	+E/-W	0.0 ft	Easting:	2,204,551.28 ft	Longitude:	-108.330113
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,329.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/4/2013	10.25	65.86	52,185

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	276.72

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
836.8	19.10	277.07	825.0	13.0	-104.4	3.00	3.00	0.00	277.07	
5,954.5	19.10	277.07	5,661.0	219.2	-1,766.5	0.00	0.00	0.00	0.00	
6,591.3	0.00	0.00	6,286.0	232.2	-1,870.9	3.00	-3.00	0.00	180.00	8816E-24 D30 TGT
6,682.7	0.23	236.16	6,377.4	232.1	-1,871.1	0.25	0.25	-135.56	236.16	
11,156.3	0.23	236.16	10,851.0	222.2	-1,885.9	0.00	0.00	0.00	0.00	8816E-24 D30 PBHL
11,306.3	0.23	236.16	11,001.0	221.8	-1,886.4	0.00	0.00	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well 8816E-24 D30
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7362.0ft (Original Well Elev)
Project:	Eureka Unit	MD Reference:	WELL @ 7362.0ft (Original Well Elev)
Site:	S19-T3S-R97W (D30 397 Pad)	North Reference:	True
Well:	8816E-24 D30	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	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)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200'
300.0	3.00	277.07	300.0	0.3	-2.6	2.6	3.00	3.00	
400.0	6.00	277.07	399.6	1.3	-10.4	10.5	3.00	3.00	
500.0	9.00	277.07	498.8	2.9	-23.3	23.5	3.00	3.00	
600.0	12.00	277.07	597.1	5.1	-41.4	41.7	3.00	3.00	
700.0	15.00	277.07	694.3	8.0	-64.6	65.1	3.00	3.00	
800.0	18.00	277.07	790.2	11.5	-92.8	93.5	3.00	3.00	
836.8	19.10	277.07	825.0	13.0	-104.4	105.2	3.00	3.00	EOB; Inc=19.1°
900.0	19.10	277.07	884.8	15.5	-124.9	125.9	0.00	0.00	
1,000.0	19.10	277.07	979.3	19.5	-157.4	158.6	0.00	0.00	
1,100.0	19.10	277.07	1,073.8	23.6	-189.9	191.3	0.00	0.00	
1,200.0	19.10	277.07	1,168.3	27.6	-222.3	224.0	0.00	0.00	
1,300.0	19.10	277.07	1,262.8	31.6	-254.8	256.8	0.00	0.00	
1,305.5	19.10	277.07	1,268.0	31.8	-256.6	258.6	0.00	0.00	A-Groove (TVD)
1,400.0	19.10	277.07	1,357.3	35.7	-287.3	289.5	0.00	0.00	
1,460.1	19.10	277.07	1,414.0	38.1	-306.8	309.2	0.00	0.00	B-Groove (TVD)
1,500.0	19.10	277.07	1,451.7	39.7	-319.8	322.2	0.00	0.00	
1,600.0	19.10	277.07	1,546.2	43.7	-352.3	355.0	0.00	0.00	
1,700.0	19.10	277.07	1,640.7	47.7	-384.7	387.7	0.00	0.00	
1,800.0	19.10	277.07	1,735.2	51.8	-417.2	420.4	0.00	0.00	
1,900.0	19.10	277.07	1,829.7	55.8	-449.7	453.1	0.00	0.00	
2,000.0	19.10	277.07	1,924.2	59.8	-482.2	485.9	0.00	0.00	
2,100.0	19.10	277.07	2,018.7	63.9	-514.6	518.6	0.00	0.00	
2,200.0	19.10	277.07	2,113.2	67.9	-547.1	551.3	0.00	0.00	
2,300.0	19.10	277.07	2,207.7	71.9	-579.6	584.0	0.00	0.00	
2,400.0	19.10	277.07	2,302.2	76.0	-612.1	616.8	0.00	0.00	
2,500.0	19.10	277.07	2,396.7	80.0	-644.6	649.5	0.00	0.00	
2,600.0	19.10	277.07	2,491.2	84.0	-677.0	682.2	0.00	0.00	
2,700.0	19.10	277.07	2,585.7	88.1	-709.5	714.9	0.00	0.00	
2,800.0	19.10	277.07	2,680.2	92.1	-742.0	747.7	0.00	0.00	
2,894.0	19.10	277.07	2,769.0	95.9	-772.5	778.4	0.00	0.00	Wasatch (TVD)
2,900.0	19.10	277.07	2,774.6	96.1	-774.5	780.4	0.00	0.00	
3,000.0	19.10	277.07	2,869.1	100.2	-807.0	813.1	0.00	0.00	
3,100.0	19.10	277.07	2,963.6	104.2	-839.4	845.9	0.00	0.00	
3,200.0	19.10	277.07	3,058.1	108.2	-871.9	878.6	0.00	0.00	
3,300.0	19.10	277.07	3,152.6	112.2	-904.4	911.3	0.00	0.00	
3,400.0	19.10	277.07	3,247.1	116.3	-936.9	944.0	0.00	0.00	
3,500.0	19.10	277.07	3,341.6	120.3	-969.3	976.8	0.00	0.00	
3,600.0	19.10	277.07	3,436.1	124.3	-1,001.8	1,009.5	0.00	0.00	
3,700.0	19.10	277.07	3,530.6	128.4	-1,034.3	1,042.2	0.00	0.00	
3,800.0	19.10	277.07	3,625.1	132.4	-1,066.8	1,074.9	0.00	0.00	
3,900.0	19.10	277.07	3,719.6	136.4	-1,099.3	1,107.7	0.00	0.00	
4,000.0	19.10	277.07	3,814.1	140.5	-1,131.7	1,140.4	0.00	0.00	
4,100.0	19.10	277.07	3,908.6	144.5	-1,164.2	1,173.1	0.00	0.00	
4,200.0	19.10	277.07	4,003.1	148.5	-1,196.7	1,205.8	0.00	0.00	
4,300.0	19.10	277.07	4,097.5	152.6	-1,229.2	1,238.6	0.00	0.00	
4,400.0	19.10	277.07	4,192.0	156.6	-1,261.6	1,271.3	0.00	0.00	
4,500.0	19.10	277.07	4,286.5	160.6	-1,294.1	1,304.0	0.00	0.00	
4,600.0	19.10	277.07	4,381.0	164.6	-1,326.6	1,336.8	0.00	0.00	
4,700.0	19.10	277.07	4,475.5	168.7	-1,359.1	1,369.5	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well 8816E-24 D30
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7362.0ft (Original Well Elev)
Project:	Eureka Unit	MD Reference:	WELL @ 7362.0ft (Original Well Elev)
Site:	S19-T3S-R97W (D30 397 Pad)	North Reference:	True
Well:	8816E-24 D30	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	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)	Comments / Formations
4,800.0	19.10	277.07	4,570.0	172.7	-1,391.6	1,402.2	0.00	0.00	
4,816.9	19.10	277.07	4,586.0	173.4	-1,397.1	1,407.7	0.00	0.00	Wasatch G (TVD)
4,900.0	19.10	277.07	4,664.5	176.7	-1,424.0	1,434.9	0.00	0.00	
5,000.0	19.10	277.07	4,759.0	180.8	-1,456.5	1,467.7	0.00	0.00	
5,100.0	19.10	277.07	4,853.5	184.8	-1,489.0	1,500.4	0.00	0.00	
5,200.0	19.10	277.07	4,948.0	188.8	-1,521.5	1,533.1	0.00	0.00	
5,300.0	19.10	277.07	5,042.5	192.9	-1,553.9	1,565.8	0.00	0.00	
5,400.0	19.10	277.07	5,137.0	196.9	-1,586.4	1,598.6	0.00	0.00	
5,500.0	19.10	277.07	5,231.5	200.9	-1,618.9	1,631.3	0.00	0.00	
5,600.0	19.10	277.07	5,326.0	205.0	-1,651.4	1,664.0	0.00	0.00	
5,637.1	19.10	277.07	5,361.0	206.5	-1,663.4	1,676.2	0.00	0.00	Molina Base (TVD)
5,700.0	19.10	277.07	5,420.4	209.0	-1,683.9	1,696.7	0.00	0.00	
5,800.0	19.10	277.07	5,514.9	213.0	-1,716.3	1,729.5	0.00	0.00	
5,900.0	19.10	277.07	5,609.4	217.0	-1,748.8	1,762.2	0.00	0.00	
5,954.5	19.10	277.07	5,661.0	219.2	-1,766.5	1,780.0	0.00	0.00	Start Drop -3.00
6,000.0	17.74	277.07	5,704.1	221.0	-1,780.8	1,794.4	3.00	-3.00	
6,100.0	14.74	277.07	5,800.1	224.5	-1,808.5	1,822.4	3.00	-3.00	
6,200.0	11.74	277.07	5,897.4	227.3	-1,831.3	1,845.3	3.00	-3.00	
6,300.0	8.74	277.07	5,995.8	229.5	-1,848.9	1,863.0	3.00	-3.00	
6,400.0	5.74	277.07	6,095.0	231.0	-1,861.4	1,875.6	3.00	-3.00	
6,500.0	2.74	277.07	6,194.7	231.9	-1,868.7	1,883.0	3.00	-3.00	
6,591.3	0.00	0.00	6,286.0	232.2	-1,870.9	1,885.2	3.00	-3.00	EOD; Inc=0° - Williams Fork (TVD) - 8816E-24
6,600.0	0.02	236.16	6,294.7	232.2	-1,870.9	1,885.2	0.25	0.25	
6,682.7	0.23	236.16	6,377.4	232.1	-1,871.1	1,885.4	0.25	0.25	
6,700.0	0.23	236.16	6,394.7	232.1	-1,871.1	1,885.4	0.00	0.00	
6,800.0	0.23	236.16	6,494.7	231.8	-1,871.4	1,885.7	0.00	0.00	
6,900.0	0.23	236.16	6,594.7	231.6	-1,871.8	1,886.0	0.00	0.00	
7,000.0	0.23	236.16	6,694.7	231.4	-1,872.1	1,886.3	0.00	0.00	
7,100.0	0.23	236.16	6,794.7	231.2	-1,872.4	1,886.6	0.00	0.00	
7,200.0	0.23	236.16	6,894.7	231.0	-1,872.8	1,886.9	0.00	0.00	
7,300.0	0.23	236.16	6,994.7	230.7	-1,873.1	1,887.2	0.00	0.00	
7,400.0	0.23	236.16	7,094.7	230.5	-1,873.4	1,887.5	0.00	0.00	
7,500.0	0.23	236.16	7,194.7	230.3	-1,873.8	1,887.8	0.00	0.00	
7,600.0	0.23	236.16	7,294.7	230.1	-1,874.1	1,888.1	0.00	0.00	
7,700.0	0.23	236.16	7,394.7	229.8	-1,874.4	1,888.4	0.00	0.00	
7,800.0	0.23	236.16	7,494.7	229.6	-1,874.8	1,888.7	0.00	0.00	
7,900.0	0.23	236.16	7,594.7	229.4	-1,875.1	1,889.0	0.00	0.00	
8,000.0	0.23	236.16	7,694.7	229.2	-1,875.4	1,889.3	0.00	0.00	
8,100.0	0.23	236.16	7,794.7	229.0	-1,875.7	1,889.6	0.00	0.00	
8,200.0	0.23	236.16	7,894.7	228.7	-1,876.1	1,890.0	0.00	0.00	
8,300.0	0.23	236.16	7,994.7	228.5	-1,876.4	1,890.3	0.00	0.00	
8,400.0	0.23	236.16	8,094.7	228.3	-1,876.7	1,890.6	0.00	0.00	
8,500.0	0.23	236.16	8,194.7	228.1	-1,877.1	1,890.9	0.00	0.00	
8,600.0	0.23	236.16	8,294.7	227.8	-1,877.4	1,891.2	0.00	0.00	
8,700.0	0.23	236.16	8,394.7	227.6	-1,877.7	1,891.5	0.00	0.00	
8,800.0	0.23	236.16	8,494.7	227.4	-1,878.1	1,891.8	0.00	0.00	
8,900.0	0.23	236.16	8,594.7	227.2	-1,878.4	1,892.1	0.00	0.00	
9,000.0	0.23	236.16	8,694.7	227.0	-1,878.7	1,892.4	0.00	0.00	
9,100.0	0.23	236.16	8,794.7	226.7	-1,879.1	1,892.7	0.00	0.00	
9,200.0	0.23	236.16	8,894.7	226.5	-1,879.4	1,893.0	0.00	0.00	
9,300.0	0.23	236.16	8,994.7	226.3	-1,879.7	1,893.3	0.00	0.00	
9,400.0	0.23	236.16	9,094.7	226.1	-1,880.0	1,893.6	0.00	0.00	

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Project:	Eureka Unit	MD Reference:	WELL @ 7362.0ft (Original Well Elev)
Site:	S19-T3S-R97W (D30 397 Pad)	North Reference:	True
Well:	8816E-24 D30	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	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)	Comments / Formations
9,500.0	0.23	236.16	9,194.7	225.8	-1,880.4	1,893.9	0.00	0.00	
9,600.0	0.23	236.16	9,294.7	225.6	-1,880.7	1,894.2	0.00	0.00	
9,700.0	0.23	236.16	9,394.7	225.4	-1,881.0	1,894.5	0.00	0.00	
9,781.3	0.23	236.16	9,476.0	225.2	-1,881.3	1,894.7	0.00	0.00	Cameo Coals (TVD)
9,800.0	0.23	236.16	9,494.7	225.2	-1,881.4	1,894.8	0.00	0.00	
9,900.0	0.23	236.16	9,594.7	225.0	-1,881.7	1,895.1	0.00	0.00	
10,000.0	0.23	236.16	9,694.7	224.7	-1,882.0	1,895.4	0.00	0.00	
10,100.0	0.23	236.16	9,794.7	224.5	-1,882.4	1,895.7	0.00	0.00	
10,200.0	0.23	236.16	9,894.7	224.3	-1,882.7	1,896.0	0.00	0.00	
10,300.0	0.23	236.16	9,994.7	224.1	-1,883.0	1,896.3	0.00	0.00	
10,341.3	0.23	236.16	10,036.0	224.0	-1,883.2	1,896.4	0.00	0.00	Rollins (TVD)
10,400.0	0.23	236.16	10,094.7	223.8	-1,883.4	1,896.6	0.00	0.00	
10,496.3	0.23	236.16	10,191.0	223.6	-1,883.7	1,896.9	0.00	0.00	Cozzette (TVD)
10,500.0	0.23	236.16	10,194.7	223.6	-1,883.7	1,896.9	0.00	0.00	
10,600.0	0.23	236.16	10,294.7	223.4	-1,884.0	1,897.2	0.00	0.00	
10,700.0	0.23	236.16	10,394.7	223.2	-1,884.4	1,897.5	0.00	0.00	
10,706.3	0.23	236.16	10,401.0	223.2	-1,884.4	1,897.5	0.00	0.00	Corcoran (TVD)
10,800.0	0.23	236.16	10,494.7	223.0	-1,884.7	1,897.8	0.00	0.00	
10,900.0	0.23	236.16	10,594.7	222.7	-1,885.0	1,898.1	0.00	0.00	
11,000.0	0.23	236.16	10,694.7	222.5	-1,885.3	1,898.4	0.00	0.00	
11,006.3	0.23	236.16	10,701.0	222.5	-1,885.4	1,898.4	0.00	0.00	Sego (TVD)
11,100.0	0.23	236.16	10,794.7	222.3	-1,885.7	1,898.7	0.00	0.00	
11,156.3	0.23	236.16	10,851.0	222.2	-1,885.9	1,898.9	0.00	0.00	Driller TD @ 10851' TVD - 8816E-24 D30 PBHL
11,200.0	0.23	236.16	10,894.7	222.1	-1,886.0	1,899.0	0.00	0.00	
11,300.0	0.23	236.16	10,994.7	221.9	-1,886.3	1,899.3	0.00	0.00	
11,306.3	0.23	236.16	11,001.0	221.8	-1,886.4	1,899.4	0.00	0.00	Permit TD @ 11001' TVD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
8816E-24 D30 TGT	0.00	0.00	6,286.0	232.2	-1,870.9	1,717,016.57	2,202,688.52	39.767833	-108.336768
- hit/miss target									
- Shape									
- plan hits target center									
- Point									
8816E-24 D30 PBHL	0.00	0.00	10,851.0	222.2	-1,885.9	1,717,007.01	2,202,673.25	39.767806	-108.336822
- plan hits target center									
- Rectangle (sides W30.0 H50.0 D0.0)									

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Eureka Unit
Site: S19-T3S-R97W (D30 397 Pad)
Well: 8816E-24 D30
Wellbore: DD
Design: Plan #1

Local Co-ordinate Reference: Well 8816E-24 D30
TVD Reference: WELL @ 7362.0ft (Original Well Elev)
MD Reference: WELL @ 7362.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,305.5	1,268.0	A-Groove (TVD)			
1,460.1	1,414.0	B-Groove (TVD)			
2,894.0	2,769.0	Wasatch (TVD)			
4,816.9	4,586.0	Wasatch G (TVD)			
5,637.1	5,361.0	Molina Base (TVD)			
6,591.3	6,286.0	Williams Fork (TVD)			
9,781.3	9,476.0	Cameo Coals (TVD)			
10,341.3	10,036.0	Rollins (TVD)			
10,496.3	10,191.0	Cozzette (TVD)			
10,706.3	10,401.0	Corcoran (TVD)			
11,006.3	10,701.0	Sego (TVD)			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200'
836.8	825.0	13.0	-104.4	EOB; Inc=19.1°
5,954.5	5,661.0	219.2	-1,766.5	Start Drop -3.00
6,591.3	6,286.0	232.2	-1,870.9	EOD; Inc=0°
11,156.3	10,851.0	232.1	-1,871.1	Driller TD @ 10851' TVD
11,306.3	11,001.0	222.2	-1,885.9	Permit TD @ 11001' TVD