

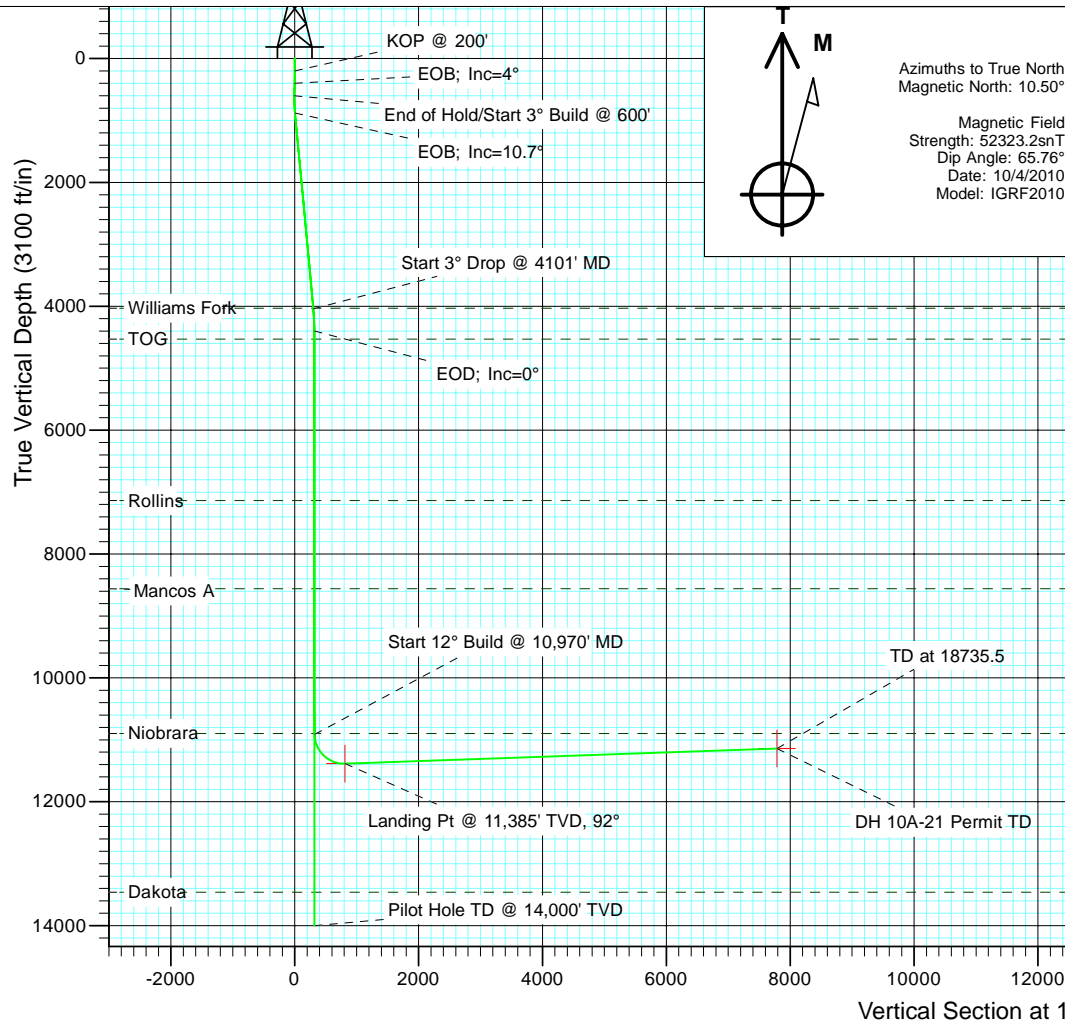
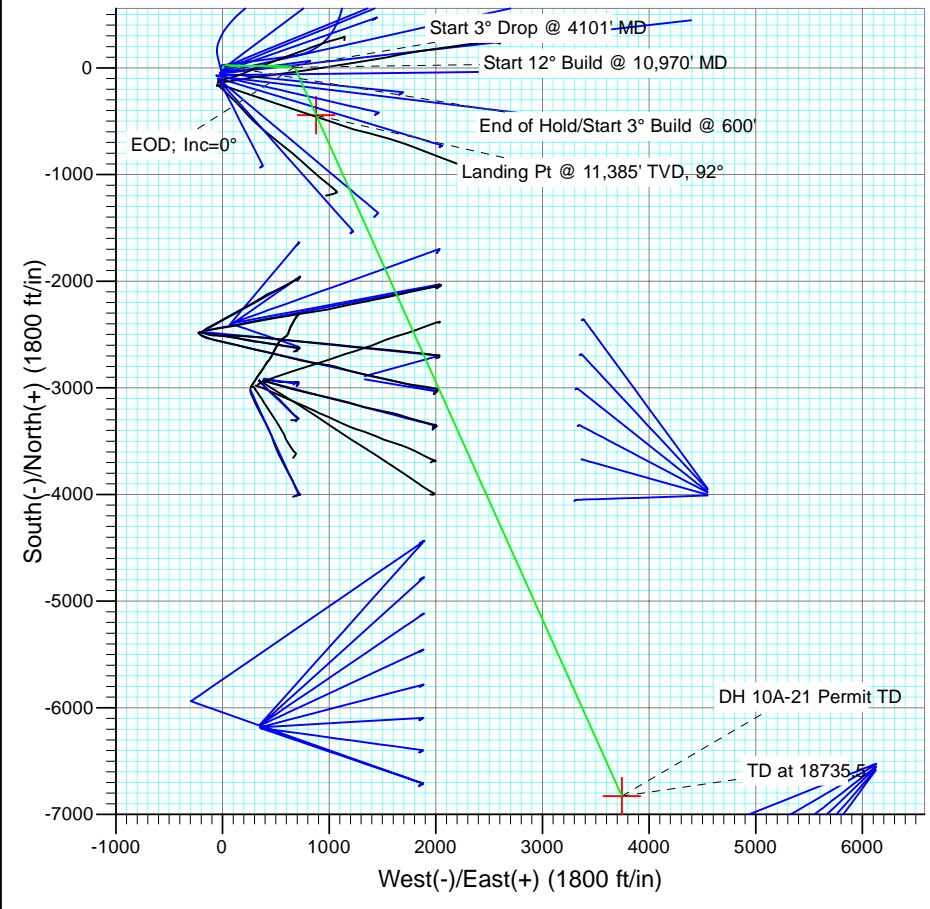


Project: North Piceance
 Site: H17 696 (S17-T6S-R96W)
 Well: DH 10A-21 H17 696
 Wellbore: Hz
 Design: Plan #4



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	400.0	4.00	45.00	399.8	4.9	4.9	2.00	45.00	-2.0	
4	600.0	4.00	45.00	599.4	14.8	14.8	0.00	0.00	-5.9	
5	881.0	10.71	91.00	878.1	21.3	47.9	3.00	65.74	4.4	
6	4101.0	10.71	91.00	4042.0	10.8	646.2	0.00	0.00	301.1	
7	4458.0	0.00	0.00	4396.9	10.3	679.5	3.00	180.00	317.6	
8	10061.1	0.00	0.00	10000.0	10.3	679.5	0.00	0.00	317.6	
9	10064.9	0.30	192.94	10003.8	10.3	679.5	8.00	192.94	317.6	
10	10970.9	0.30	192.94	10909.8	5.6	678.4	0.00	0.00	321.2	
11	11735.5	92.00	155.83	11384.9	-445.9	879.3	12.00	-37.11	813.6	
12	18735.5	92.00	155.83	11141.0	-6828.4	3743.5	0.00	0.00	7787.2	DH 10A-21 Permit TD



Plan #4
 DH 10A-21 H17 696
 1054xx; LR
 WELL @ 5687.0ft (Original Well Elev)
 North American Datum 1983
 Well DH 10A-21 H17 696, True North

Type	Target	Target	Target	Target	Target	Target	Target
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Origin Type	E/W From TVD
DH 10A-21 Permit TD	11141.0	-6828.4	3743.5	39° 30' 31.91 N	108° 6' 36.68 W	N/S	0.0
DH 10A-21 Landing Pt	11385.0	-444.4	878.6	39° 31' 35.01 N	108° 7' 13.23 W	0.0	0.0

Vertical Section at 151.27° (3100 ft/in)

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference: Well DH 10A-21 H17 696
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: WELL @ 5687.0ft (Original Well Elev)
Project: North Piceance	MD Reference: WELL @ 5687.0ft (Original Well Elev)
Site: H17 696 (S17-T6S-R96W)	North Reference: True
Well: DH 10A-21 H17 696	Survey Calculation Method: Minimum Curvature
Wellbore: Hz	
Design: Plan #4	

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

Site H17 696 (S17-T6S-R96W)					
Site Position:		Northing: 1,627,645.46 ft	Latitude: 39° 31' 38.37 N		
From: Lat/Long		Easting: 2,260,053.39 ft	Longitude: 108° 7' 24.99 W		
Position Uncertainty: 0.0 ft		Slot Radius: 13.200 in	Grid Convergence: -1.65 °		

Well DH 10A-21 H17 696					
Well Position	+N/-S 0.0 ft	Northing: 1,627,748.21 ft	Latitude: 39° 31' 39.40 N		
	+E/-W 0.0 ft	Easting: 2,260,099.32 ft	Longitude: 108° 7' 24.44 W		
Position Uncertainty	0.0 ft	Wellhead Elevation: ft	Ground Level: 5,654.0 ft		

Wellbore Hz					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/4/2010	10.50	65.76	52,323

Design Plan #4					
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	151.27	

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	
400.0	4.00	45.00	399.8	4.9	4.9	2.00	2.00	0.00	45.00	
600.0	4.00	45.00	599.4	14.8	14.8	0.00	0.00	0.00	0.00	
881.0	10.71	91.00	878.1	21.3	47.9	3.00	2.39	16.37	65.74	
4,101.0	10.71	91.00	4,042.0	10.8	646.2	0.00	0.00	0.00	0.00	
4,458.0	0.00	0.00	4,396.9	10.3	679.5	3.00	-3.00	-25.49	180.00	
10,061.1	0.00	0.00	10,000.0	10.3	679.5	0.00	0.00	0.00	0.00	
10,064.9	0.30	192.94	10,003.8	10.3	679.5	8.00	8.00	-4,402.33	192.94	
10,970.9	0.30	192.94	10,909.8	5.6	678.4	0.00	0.00	0.00	0.00	
11,735.5	92.00	155.83	11,384.9	-445.9	879.3	12.00	11.99	-4.85	-37.11	
18,735.5	92.00	155.83	11,141.0	-6,828.4	3,743.5	0.00	0.00	0.00	0.00	DH 10A-21 Permit TD

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference: Well DH 10A-21 H17 696
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: WELL @ 5687.0ft (Original Well Elev)
Project: North Piceance	MD Reference: WELL @ 5687.0ft (Original Well Elev)
Site: H17 696 (S17-T6S-R96W)	North Reference: True
Well: DH 10A-21 H17 696	Survey Calculation Method: Minimum Curvature
Wellbore: Hz	
Design: Plan #4	

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	2.00	45.00	300.0	1.2	1.2	-0.5	2.00	2.00	
400.0	4.00	45.00	399.8	4.9	4.9	-2.0	2.00	2.00	EOB; Inc=4°
500.0	4.00	45.00	499.6	9.9	9.9	-3.9	0.00	0.00	
600.0	4.00	45.00	599.4	14.8	14.8	-5.9	0.00	0.00	End of Hold/Start 3° Build @ 600'
700.0	5.90	72.64	699.0	18.8	22.2	-5.8	3.00	1.90	
800.0	8.47	85.34	798.2	20.9	34.4	-1.8	3.00	2.56	
881.0	10.71	91.00	878.1	21.3	47.9	4.4	3.00	2.77	EOB; Inc=10.7°
900.0	10.71	91.00	896.7	21.2	51.4	6.1	0.00	0.00	
1,000.0	10.71	91.00	995.0	20.9	70.0	15.3	0.00	0.00	
1,100.0	10.71	91.00	1,093.2	20.6	88.6	24.5	0.00	0.00	
1,200.0	10.71	91.00	1,191.5	20.3	107.2	33.8	0.00	0.00	
1,300.0	10.71	91.00	1,289.8	19.9	125.7	43.0	0.00	0.00	
1,400.0	10.71	91.00	1,388.0	19.6	144.3	52.2	0.00	0.00	
1,500.0	10.71	91.00	1,486.3	19.3	162.9	61.4	0.00	0.00	
1,600.0	10.71	91.00	1,584.5	19.0	181.5	70.6	0.00	0.00	
1,700.0	10.71	91.00	1,682.8	18.6	200.1	79.8	0.00	0.00	
1,800.0	10.71	91.00	1,781.1	18.3	218.7	89.1	0.00	0.00	
1,900.0	10.71	91.00	1,879.3	18.0	237.2	98.3	0.00	0.00	
2,000.0	10.71	91.00	1,977.6	17.7	255.8	107.5	0.00	0.00	
2,100.0	10.71	91.00	2,075.8	17.3	274.4	116.7	0.00	0.00	
2,200.0	10.71	91.00	2,174.1	17.0	293.0	125.9	0.00	0.00	
2,300.0	10.71	91.00	2,272.3	16.7	311.6	135.1	0.00	0.00	
2,400.0	10.71	91.00	2,370.6	16.4	330.1	144.4	0.00	0.00	
2,500.0	10.71	91.00	2,468.9	16.0	348.7	153.6	0.00	0.00	
2,600.0	10.71	91.00	2,567.1	15.7	367.3	162.8	0.00	0.00	
2,700.0	10.71	91.00	2,665.4	15.4	385.9	172.0	0.00	0.00	
2,800.0	10.71	91.00	2,763.6	15.1	404.5	181.2	0.00	0.00	
2,900.0	10.71	91.00	2,861.9	14.7	423.0	190.4	0.00	0.00	
3,000.0	10.71	91.00	2,960.2	14.4	441.6	199.7	0.00	0.00	
3,100.0	10.71	91.00	3,058.4	14.1	460.2	208.9	0.00	0.00	
3,200.0	10.71	91.00	3,156.7	13.8	478.8	218.1	0.00	0.00	
3,300.0	10.71	91.00	3,254.9	13.4	497.4	227.3	0.00	0.00	
3,400.0	10.71	91.00	3,353.2	13.1	515.9	236.5	0.00	0.00	
3,500.0	10.71	91.00	3,451.4	12.8	534.5	245.7	0.00	0.00	
3,600.0	10.71	91.00	3,549.7	12.5	553.1	255.0	0.00	0.00	
3,700.0	10.71	91.00	3,648.0	12.1	571.7	264.2	0.00	0.00	
3,800.0	10.71	91.00	3,746.2	11.8	590.3	273.4	0.00	0.00	
3,900.0	10.71	91.00	3,844.5	11.5	608.9	282.6	0.00	0.00	
4,000.0	10.71	91.00	3,942.7	11.2	627.4	291.8	0.00	0.00	
4,089.8	10.71	91.00	4,031.0	10.9	644.1	300.1	0.00	0.00	Williams Fork
4,100.0	10.71	91.00	4,041.0	10.8	646.0	301.0	0.00	0.00	
4,101.0	10.71	91.00	4,042.0	10.8	646.2	301.1	0.00	0.00	Start 3° Drop @ 4101' MD
4,200.0	7.74	91.00	4,139.7	10.6	662.1	309.0	3.00	-3.00	
4,300.0	4.74	91.00	4,239.1	10.4	672.9	314.4	3.00	-3.00	
4,400.0	1.74	91.00	4,338.9	10.3	678.6	317.2	3.00	-3.00	
4,458.0	0.00	0.00	4,396.9	10.3	679.5	317.6	3.00	-3.00	EOB; Inc=0°
4,500.0	0.00	0.00	4,438.9	10.3	679.5	317.6	0.00	0.00	
4,592.1	0.00	0.00	4,531.0	10.3	679.5	317.6	0.00	0.00	TOG
4,600.0	0.00	0.00	4,538.9	10.3	679.5	317.6	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: North Piceance
Site: H17 696 (S17-T6S-R96W)
Well: DH 10A-21 H17 696
Wellbore: Hz
Design: Plan #4

Local Co-ordinate Reference: Well DH 10A-21 H17 696
TVD Reference: WELL @ 5687.0ft (Original Well Elev)
MD Reference: WELL @ 5687.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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
4,700.0	0.00	0.00	4,638.9	10.3	679.5	317.6	0.00	0.00	
4,800.0	0.00	0.00	4,738.9	10.3	679.5	317.6	0.00	0.00	
4,900.0	0.00	0.00	4,838.9	10.3	679.5	317.6	0.00	0.00	
5,000.0	0.00	0.00	4,938.9	10.3	679.5	317.6	0.00	0.00	
5,100.0	0.00	0.00	5,038.9	10.3	679.5	317.6	0.00	0.00	
5,200.0	0.00	0.00	5,138.9	10.3	679.5	317.6	0.00	0.00	
5,300.0	0.00	0.00	5,238.9	10.3	679.5	317.6	0.00	0.00	
5,400.0	0.00	0.00	5,338.9	10.3	679.5	317.6	0.00	0.00	
5,500.0	0.00	0.00	5,438.9	10.3	679.5	317.6	0.00	0.00	
5,600.0	0.00	0.00	5,538.9	10.3	679.5	317.6	0.00	0.00	
5,700.0	0.00	0.00	5,638.9	10.3	679.5	317.6	0.00	0.00	
5,800.0	0.00	0.00	5,738.9	10.3	679.5	317.6	0.00	0.00	
5,900.0	0.00	0.00	5,838.9	10.3	679.5	317.6	0.00	0.00	
6,000.0	0.00	0.00	5,938.9	10.3	679.5	317.6	0.00	0.00	
6,100.0	0.00	0.00	6,038.9	10.3	679.5	317.6	0.00	0.00	
6,200.0	0.00	0.00	6,138.9	10.3	679.5	317.6	0.00	0.00	
6,300.0	0.00	0.00	6,238.9	10.3	679.5	317.6	0.00	0.00	
6,400.0	0.00	0.00	6,338.9	10.3	679.5	317.6	0.00	0.00	
6,500.0	0.00	0.00	6,438.9	10.3	679.5	317.6	0.00	0.00	
6,600.0	0.00	0.00	6,538.9	10.3	679.5	317.6	0.00	0.00	
6,700.0	0.00	0.00	6,638.9	10.3	679.5	317.6	0.00	0.00	
6,800.0	0.00	0.00	6,738.9	10.3	679.5	317.6	0.00	0.00	
6,900.0	0.00	0.00	6,838.9	10.3	679.5	317.6	0.00	0.00	
7,000.0	0.00	0.00	6,938.9	10.3	679.5	317.6	0.00	0.00	
7,100.0	0.00	0.00	7,038.9	10.3	679.5	317.6	0.00	0.00	
7,198.1	0.00	0.00	7,137.0	10.3	679.5	317.6	0.00	0.00	Rollins
7,200.0	0.00	0.00	7,138.9	10.3	679.5	317.6	0.00	0.00	
7,300.0	0.00	0.00	7,238.9	10.3	679.5	317.6	0.00	0.00	
7,400.0	0.00	0.00	7,338.9	10.3	679.5	317.6	0.00	0.00	
7,500.0	0.00	0.00	7,438.9	10.3	679.5	317.6	0.00	0.00	
7,600.0	0.00	0.00	7,538.9	10.3	679.5	317.6	0.00	0.00	
7,700.0	0.00	0.00	7,638.9	10.3	679.5	317.6	0.00	0.00	
7,800.0	0.00	0.00	7,738.9	10.3	679.5	317.6	0.00	0.00	
7,900.0	0.00	0.00	7,838.9	10.3	679.5	317.6	0.00	0.00	
8,000.0	0.00	0.00	7,938.9	10.3	679.5	317.6	0.00	0.00	
8,100.0	0.00	0.00	8,038.9	10.3	679.5	317.6	0.00	0.00	
8,200.0	0.00	0.00	8,138.9	10.3	679.5	317.6	0.00	0.00	
8,300.0	0.00	0.00	8,238.9	10.3	679.5	317.6	0.00	0.00	
8,400.0	0.00	0.00	8,338.9	10.3	679.5	317.6	0.00	0.00	
8,500.0	0.00	0.00	8,438.9	10.3	679.5	317.6	0.00	0.00	
8,600.0	0.00	0.00	8,538.9	10.3	679.5	317.6	0.00	0.00	
8,623.1	0.00	0.00	8,562.0	10.3	679.5	317.6	0.00	0.00	Mancos A
8,700.0	0.00	0.00	8,638.9	10.3	679.5	317.6	0.00	0.00	
8,800.0	0.00	0.00	8,738.9	10.3	679.5	317.6	0.00	0.00	
8,900.0	0.00	0.00	8,838.9	10.3	679.5	317.6	0.00	0.00	
9,000.0	0.00	0.00	8,938.9	10.3	679.5	317.6	0.00	0.00	
9,100.0	0.00	0.00	9,038.9	10.3	679.5	317.6	0.00	0.00	
9,200.0	0.00	0.00	9,138.9	10.3	679.5	317.6	0.00	0.00	
9,300.0	0.00	0.00	9,238.9	10.3	679.5	317.6	0.00	0.00	
9,400.0	0.00	0.00	9,338.9	10.3	679.5	317.6	0.00	0.00	
9,500.0	0.00	0.00	9,438.9	10.3	679.5	317.6	0.00	0.00	
9,600.0	0.00	0.00	9,538.9	10.3	679.5	317.6	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well DH 10A-21 H17 696
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5687.0ft (Original Well Elev)
Project:	North Piceance	MD Reference:	WELL @ 5687.0ft (Original Well Elev)
Site:	H17 696 (S17-T6S-R96W)	North Reference:	True
Well:	DH 10A-21 H17 696	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #4		

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
9,700.0	0.00	0.00	9,638.9	10.3	679.5	317.6	0.00	0.00	
9,800.0	0.00	0.00	9,738.9	10.3	679.5	317.6	0.00	0.00	
9,900.0	0.00	0.00	9,838.9	10.3	679.5	317.6	0.00	0.00	
10,000.0	0.00	0.00	9,938.9	10.3	679.5	317.6	0.00	0.00	
10,061.1	0.00	0.00	10,000.0	10.3	679.5	317.6	0.00	0.00	
10,064.9	0.30	192.94	10,003.8	10.3	679.5	317.6	8.00	8.00	
10,100.0	0.30	192.94	10,038.9	10.1	679.4	317.8	0.00	0.00	
10,200.0	0.30	192.94	10,138.9	9.6	679.3	318.2	0.00	0.00	
10,300.0	0.30	192.94	10,238.9	9.0	679.2	318.6	0.00	0.00	
10,400.0	0.30	192.94	10,338.9	8.5	679.1	319.0	0.00	0.00	
10,500.0	0.30	192.94	10,438.9	8.0	679.0	319.4	0.00	0.00	
10,600.0	0.30	192.94	10,538.9	7.5	678.8	319.8	0.00	0.00	
10,700.0	0.30	192.94	10,638.9	7.0	678.7	320.2	0.00	0.00	
10,800.0	0.30	192.94	10,738.9	6.5	678.6	320.6	0.00	0.00	
10,900.0	0.30	192.94	10,838.9	5.9	678.5	321.0	0.00	0.00	
10,958.1	0.30	192.94	10,897.0	5.6	678.4	321.2	0.00	0.00	Niobrara
10,970.9	0.30	192.94	10,909.8	5.6	678.4	321.2	0.00	0.00	Start 12° Build @ 10,970' MD
11,000.0	3.74	158.64	10,938.9	4.6	678.7	322.2	12.00	11.80	
11,100.0	15.73	156.49	11,037.2	-10.9	685.3	339.0	12.00	12.00	
11,200.0	27.73	156.19	11,130.0	-44.8	700.2	375.8	12.00	12.00	
11,300.0	39.73	156.06	11,213.0	-95.4	722.7	431.1	12.00	12.00	
11,400.0	51.73	155.98	11,282.6	-160.7	751.7	502.3	12.00	12.00	
11,500.0	63.73	155.93	11,335.9	-237.8	786.1	586.4	12.00	12.00	
11,600.0	75.73	155.88	11,370.5	-323.3	824.3	679.8	12.00	12.00	
11,700.0	87.73	155.85	11,384.9	-413.4	864.7	778.2	12.00	12.00	
11,733.9	91.81	155.83	11,385.0	-444.4	878.6	812.0	12.00	12.00	DH 10A-21 Landing Pt
11,735.5	91.99	155.83	11,384.9	-445.8	879.2	813.6	12.00	12.00	Landing Pt @ 11,385' TVD, 92°
11,800.0	92.00	155.83	11,382.7	-504.6	905.6	877.9	0.01	0.01	
11,900.0	92.00	155.83	11,379.2	-595.8	946.6	977.5	0.00	0.00	
12,000.0	92.00	155.83	11,375.7	-687.0	987.5	1,077.1	0.00	0.00	
12,100.0	92.00	155.83	11,372.2	-778.2	1,028.4	1,176.7	0.00	0.00	
12,200.0	92.00	155.83	11,368.8	-869.4	1,069.3	1,276.4	0.00	0.00	
12,300.0	92.00	155.83	11,365.3	-960.5	1,110.2	1,376.0	0.00	0.00	
12,400.0	92.00	155.83	11,361.8	-1,051.7	1,151.1	1,475.6	0.00	0.00	
12,500.0	92.00	155.83	11,358.3	-1,142.9	1,192.1	1,575.2	0.00	0.00	
12,600.0	92.00	155.83	11,354.8	-1,234.1	1,233.0	1,674.8	0.00	0.00	
12,700.0	92.00	155.83	11,351.3	-1,325.3	1,273.9	1,774.5	0.00	0.00	
12,800.0	92.00	155.83	11,347.8	-1,416.4	1,314.8	1,874.1	0.00	0.00	
12,900.0	92.00	155.83	11,344.4	-1,507.6	1,355.7	1,973.7	0.00	0.00	
13,000.0	92.00	155.83	11,340.9	-1,598.8	1,396.6	2,073.3	0.00	0.00	
13,100.0	92.00	155.83	11,337.4	-1,690.0	1,437.6	2,173.0	0.00	0.00	
13,200.0	92.00	155.83	11,333.9	-1,781.1	1,478.5	2,272.6	0.00	0.00	
13,300.0	92.00	155.83	11,330.4	-1,872.3	1,519.4	2,372.2	0.00	0.00	
13,400.0	92.00	155.83	11,326.9	-1,963.5	1,560.3	2,471.8	0.00	0.00	
13,500.0	92.00	155.83	11,323.5	-2,054.7	1,601.2	2,571.4	0.00	0.00	
13,600.0	92.00	155.83	11,320.0	-2,145.9	1,642.1	2,671.1	0.00	0.00	
13,700.0	92.00	155.83	11,316.5	-2,237.0	1,683.1	2,770.7	0.00	0.00	
13,800.0	92.00	155.83	11,313.0	-2,328.2	1,724.0	2,870.3	0.00	0.00	
13,900.0	92.00	155.83	11,309.5	-2,419.4	1,764.9	2,969.9	0.00	0.00	
14,000.0	92.00	155.83	11,306.0	-2,510.6	1,805.8	3,069.6	0.00	0.00	
14,100.0	92.00	155.83	11,302.5	-2,601.8	1,846.7	3,169.2	0.00	0.00	
14,200.0	92.00	155.83	11,299.1	-2,692.9	1,887.7	3,268.8	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: North Piceance
Site: H17 696 (S17-T6S-R96W)
Well: DH 10A-21 H17 696
Wellbore: Hz
Design: Plan #4

Local Co-ordinate Reference: Well DH 10A-21 H17 696
TVD Reference: WELL @ 5687.0ft (Original Well Elev)
MD Reference: WELL @ 5687.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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
14,300.0	92.00	155.83	11,295.6	-2,784.1	1,928.6	3,368.4	0.00	0.00	
14,400.0	92.00	155.83	11,292.1	-2,875.3	1,969.5	3,468.0	0.00	0.00	
14,500.0	92.00	155.83	11,288.6	-2,966.5	2,010.4	3,567.7	0.00	0.00	
14,600.0	92.00	155.83	11,285.1	-3,057.7	2,051.3	3,667.3	0.00	0.00	
14,700.0	92.00	155.83	11,281.6	-3,148.8	2,092.2	3,766.9	0.00	0.00	
14,800.0	92.00	155.83	11,278.1	-3,240.0	2,133.2	3,866.5	0.00	0.00	
14,900.0	92.00	155.83	11,274.7	-3,331.2	2,174.1	3,966.2	0.00	0.00	
15,000.0	92.00	155.83	11,271.2	-3,422.4	2,215.0	4,065.8	0.00	0.00	
15,100.0	92.00	155.83	11,267.7	-3,513.6	2,255.9	4,165.4	0.00	0.00	
15,200.0	92.00	155.83	11,264.2	-3,604.7	2,296.8	4,265.0	0.00	0.00	
15,300.0	92.00	155.83	11,260.7	-3,695.9	2,337.7	4,364.6	0.00	0.00	
15,400.0	92.00	155.83	11,257.2	-3,787.1	2,378.7	4,464.3	0.00	0.00	
15,500.0	92.00	155.83	11,253.8	-3,878.3	2,419.6	4,563.9	0.00	0.00	
15,600.0	92.00	155.83	11,250.3	-3,969.4	2,460.5	4,663.5	0.00	0.00	
15,700.0	92.00	155.83	11,246.8	-4,060.6	2,501.4	4,763.1	0.00	0.00	
15,800.0	92.00	155.83	11,243.3	-4,151.8	2,542.3	4,862.8	0.00	0.00	
15,900.0	92.00	155.83	11,239.8	-4,243.0	2,583.3	4,962.4	0.00	0.00	
16,000.0	92.00	155.83	11,236.3	-4,334.2	2,624.2	5,062.0	0.00	0.00	
16,100.0	92.00	155.83	11,232.8	-4,425.3	2,665.1	5,161.6	0.00	0.00	
16,200.0	92.00	155.83	11,229.4	-4,516.5	2,706.0	5,261.2	0.00	0.00	
16,300.0	92.00	155.83	11,225.9	-4,607.7	2,746.9	5,360.9	0.00	0.00	
16,400.0	92.00	155.83	11,222.4	-4,698.9	2,787.8	5,460.5	0.00	0.00	
16,500.0	92.00	155.83	11,218.9	-4,790.1	2,828.8	5,560.1	0.00	0.00	
16,600.0	92.00	155.83	11,215.4	-4,881.2	2,869.7	5,659.7	0.00	0.00	
16,700.0	92.00	155.83	11,211.9	-4,972.4	2,910.6	5,759.4	0.00	0.00	
16,800.0	92.00	155.83	11,208.5	-5,063.6	2,951.5	5,859.0	0.00	0.00	
16,900.0	92.00	155.83	11,205.0	-5,154.8	2,992.4	5,958.6	0.00	0.00	
17,000.0	92.00	155.83	11,201.5	-5,246.0	3,033.3	6,058.2	0.00	0.00	
17,100.0	92.00	155.83	11,198.0	-5,337.1	3,074.3	6,157.9	0.00	0.00	
17,200.0	92.00	155.83	11,194.5	-5,428.3	3,115.2	6,257.5	0.00	0.00	
17,300.0	92.00	155.83	11,191.0	-5,519.5	3,156.1	6,357.1	0.00	0.00	
17,400.0	92.00	155.83	11,187.5	-5,610.7	3,197.0	6,456.7	0.00	0.00	
17,500.0	92.00	155.83	11,184.1	-5,701.8	3,237.9	6,556.3	0.00	0.00	
17,600.0	92.00	155.83	11,180.6	-5,793.0	3,278.8	6,656.0	0.00	0.00	
17,700.0	92.00	155.83	11,177.1	-5,884.2	3,319.8	6,755.6	0.00	0.00	
17,800.0	92.00	155.83	11,173.6	-5,975.4	3,360.7	6,855.2	0.00	0.00	
17,900.0	92.00	155.83	11,170.1	-6,066.6	3,401.6	6,954.8	0.00	0.00	
18,000.0	92.00	155.83	11,166.6	-6,157.7	3,442.5	7,054.5	0.00	0.00	
18,100.0	92.00	155.83	11,163.1	-6,248.9	3,483.4	7,154.1	0.00	0.00	
18,200.0	92.00	155.83	11,159.7	-6,340.1	3,524.4	7,253.7	0.00	0.00	
18,300.0	92.00	155.83	11,156.2	-6,431.3	3,565.3	7,353.3	0.00	0.00	
18,400.0	92.00	155.83	11,152.7	-6,522.5	3,606.2	7,452.9	0.00	0.00	
18,500.0	92.00	155.83	11,149.2	-6,613.6	3,647.1	7,552.6	0.00	0.00	
18,600.0	92.00	155.83	11,145.7	-6,704.8	3,688.0	7,652.2	0.00	0.00	
18,700.0	92.00	155.83	11,142.2	-6,796.0	3,728.9	7,751.8	0.00	0.00	
18,735.5	92.00	155.83	11,141.0	-6,828.4	3,743.5	7,787.2	0.00	0.00	TD at 18735.5 - DH 10A-21 Permit TD

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference: Well DH 10A-21 H17 696
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: WELL @ 5687.0ft (Original Well Elev)
Project: North Piceance	MD Reference: WELL @ 5687.0ft (Original Well Elev)
Site: H17 696 (S17-T6S-R96W)	North Reference: True
Well: DH 10A-21 H17 696	Survey Calculation Method: Minimum Curvature
Wellbore: Hz	
Design: Plan #4	

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
DH 10A-21 Permit TD - plan hits target center - Point	0.00	358.36	11,141.0	-6,828.4	3,743.5	1,620,814.58	2,263,644.07	39° 30' 31.91 N	108° 6' 36.68 W
DH 10A-21 Landing Pt - plan hits target center - Point	0.00	358.35	11,385.0	-444.4	878.6	1,627,278.63	2,260,964.72	39° 31' 35.01 N	108° 7' 13.23 W

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
4,089.8	4,031.0	Williams Fork			
4,592.1	4,531.0	TOG			
7,198.1	7,137.0	Rollins			
8,623.1	8,562.0	Mancos A			
10,958.1	10,897.0	Niobrara		0.00	

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S	+E/-W		
		(ft)	(ft)		
200.0	200.0	0.0	0.0	KOP @ 200'	
400.0	399.8	4.9	4.9	EOB; Inc=4°	
600.0	599.4	14.8	14.8	End of Hold/Start 3° Build @ 600'	
881.0	878.1	21.3	47.9	EOB; Inc=10.7°	
4,101.0	4,042.0	10.8	646.2	Start 3° Drop @ 4101' MD	
4,458.0	4,396.9	10.3	679.5	EOD; Inc=0°	
10,970.9	10,909.8	10.3	679.5	Start 12° Build @ 10,970' MD	
11,735.5	11,384.9	10.3	679.5	Landing Pt @ 11,385' TVD, 92°	
18,735.5	11,141.0	5.6	678.4	TD at 18735.5	