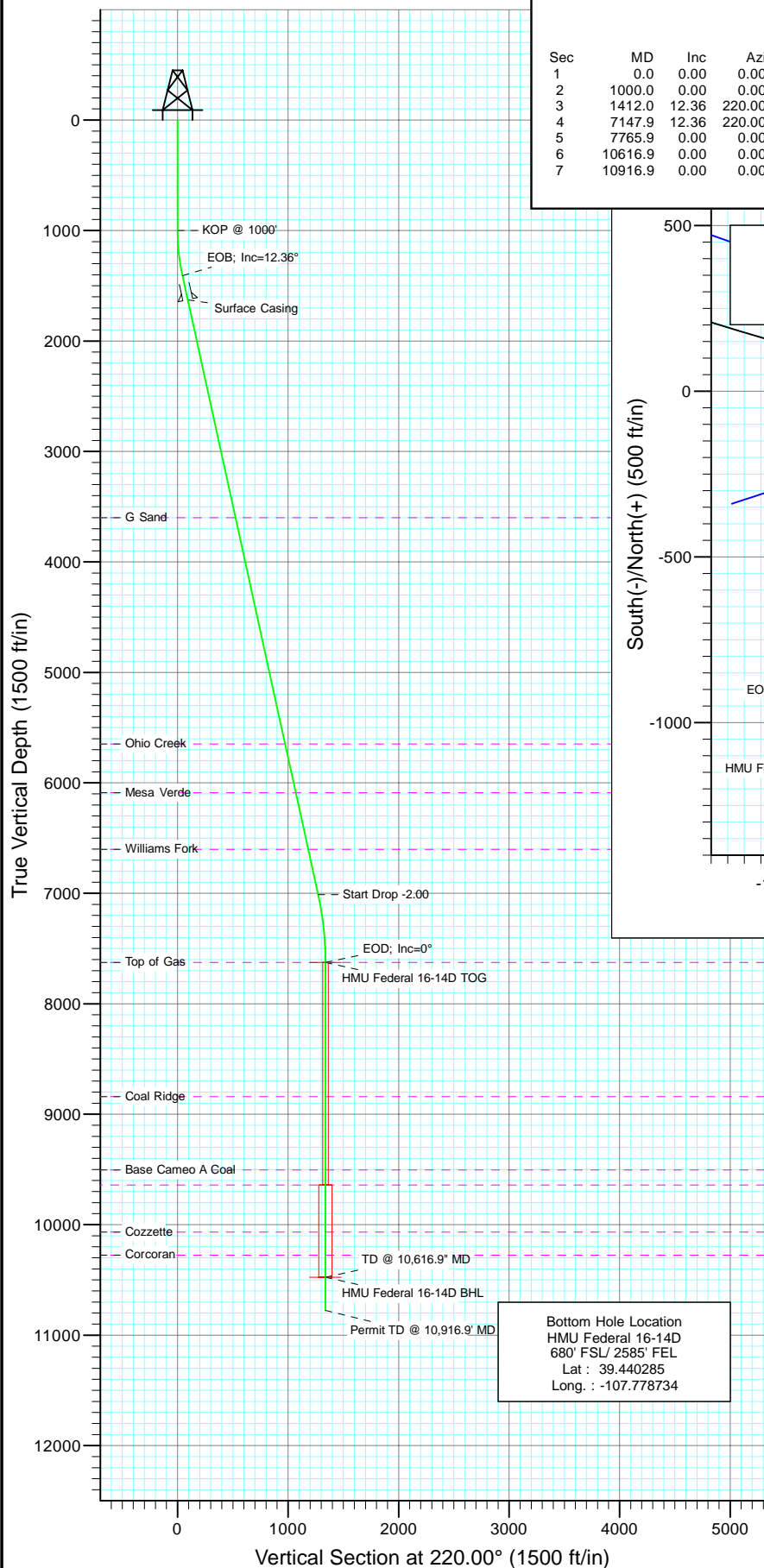
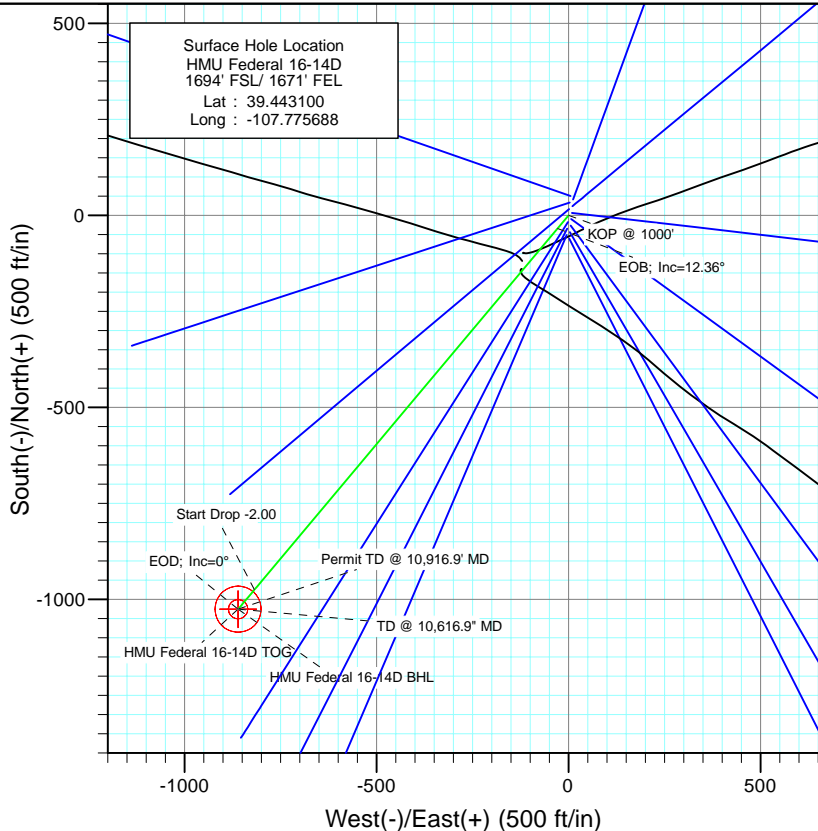




Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-14D
Wellbore: DD
Design: Plan #1



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1412.0	12.36	220.00	1408.8	-33.9	-28.4	3.00	220.00	44.3	
4	7147.9	12.36	220.00	7011.8	-974.4	-817.6	0.00	0.00	1272.0	
5	7765.9	0.00	0.00	7625.0	-1025.3	-860.3	2.00	180.00	1338.4	HMU Federal 16-14D TOG
6	10616.9	0.00	0.00	10476.0	-1025.3	-860.3	0.00	0.00	1338.4	HMU Federal 16-14D BHL
7	10916.9	0.00	0.00	10776.0	-1025.3	-860.3	0.00	0.00	1338.4	



Azimuths to True North
Magnetic North: 10.30°

Magnetic Field
Strength: 52331.7snT
Dip Angle: 65.77°
Date: 10/25/2010
Model: IGRF200510

FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
3599.0	3654.2	G Sand
5649.0	5752.8	Ohio Creek
6090.0	6204.3	Mesa Verde
6602.0	6728.4	Williams Fork
7625.0	7765.9	Top of Gas
8841.0	8981.9	Coal Ridge
9505.0	9645.9	Base Cameo A Coal
9641.0	9781.9	Rollins
10067.0	10207.9	Cozzette
10276.0	10416.9	Corcoran

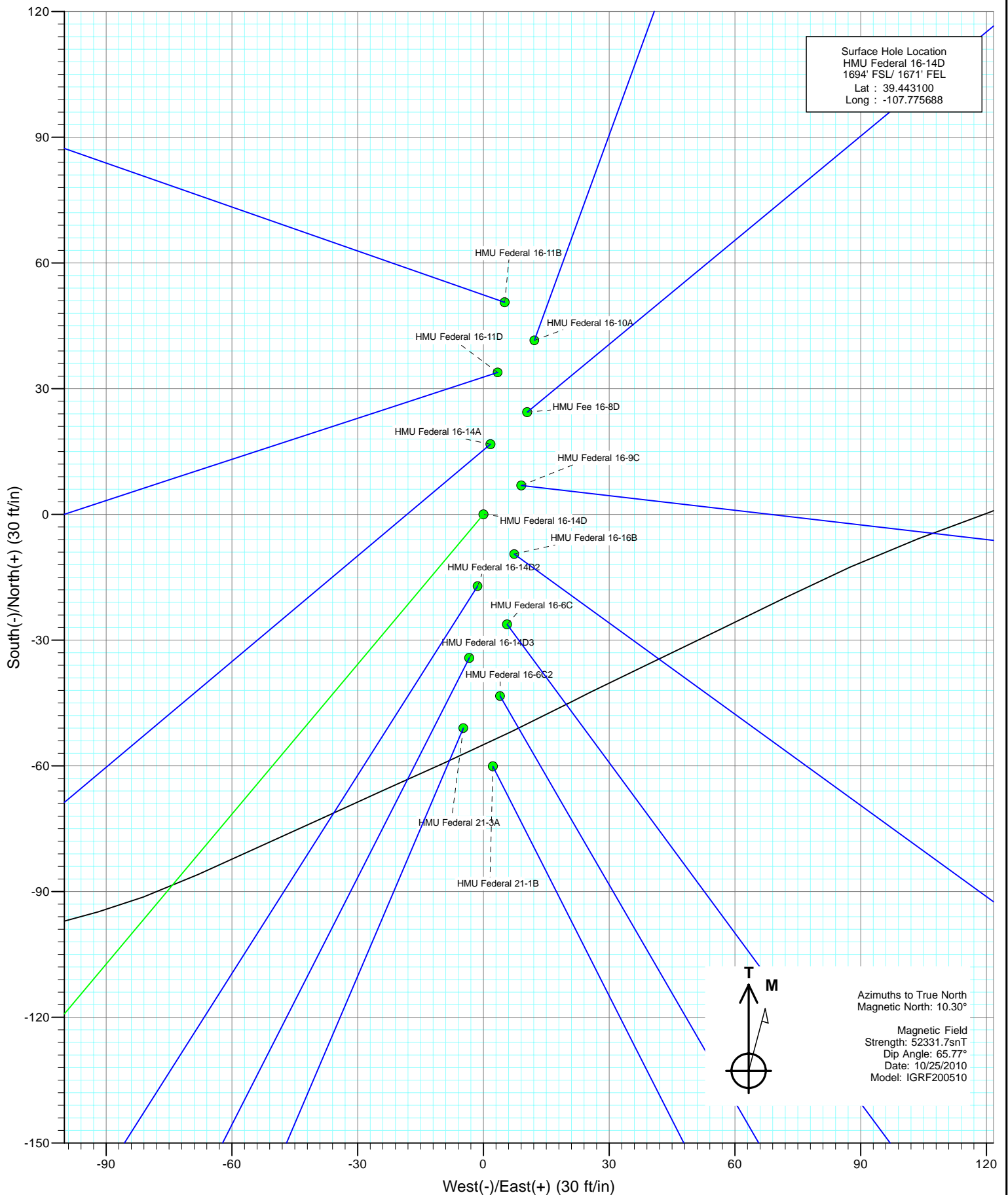
DESIGN DETAILS: Plan #1

Job #10xxx: KR
WELL @ 7667.0ft (Original Well Elev)

Target	Azimuth	Origin	N/S	E/W	From TVD
HMU Federal 16-14D BHL	220.00	Slot	0.0	0.0	0.0



Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-14D
Wellbore: DD
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

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

Site		(J16W)			
Site Position:		Northing:	1,594,381.52 ft	Latitude:	39.443239
From:	Lat/Long	Easting:	2,357,395.39 ft	Longitude:	-107.775670
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.44 °

Well	HMU Federal 16-14D					
Well Position	+N/-S	0.0 ft	Northing:	1,594,331.03 ft	Latitude:	39.443100
	+E/-W	0.0 ft	Easting:	2,357,389.04 ft	Longitude:	-107.775688
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,645.0 ft

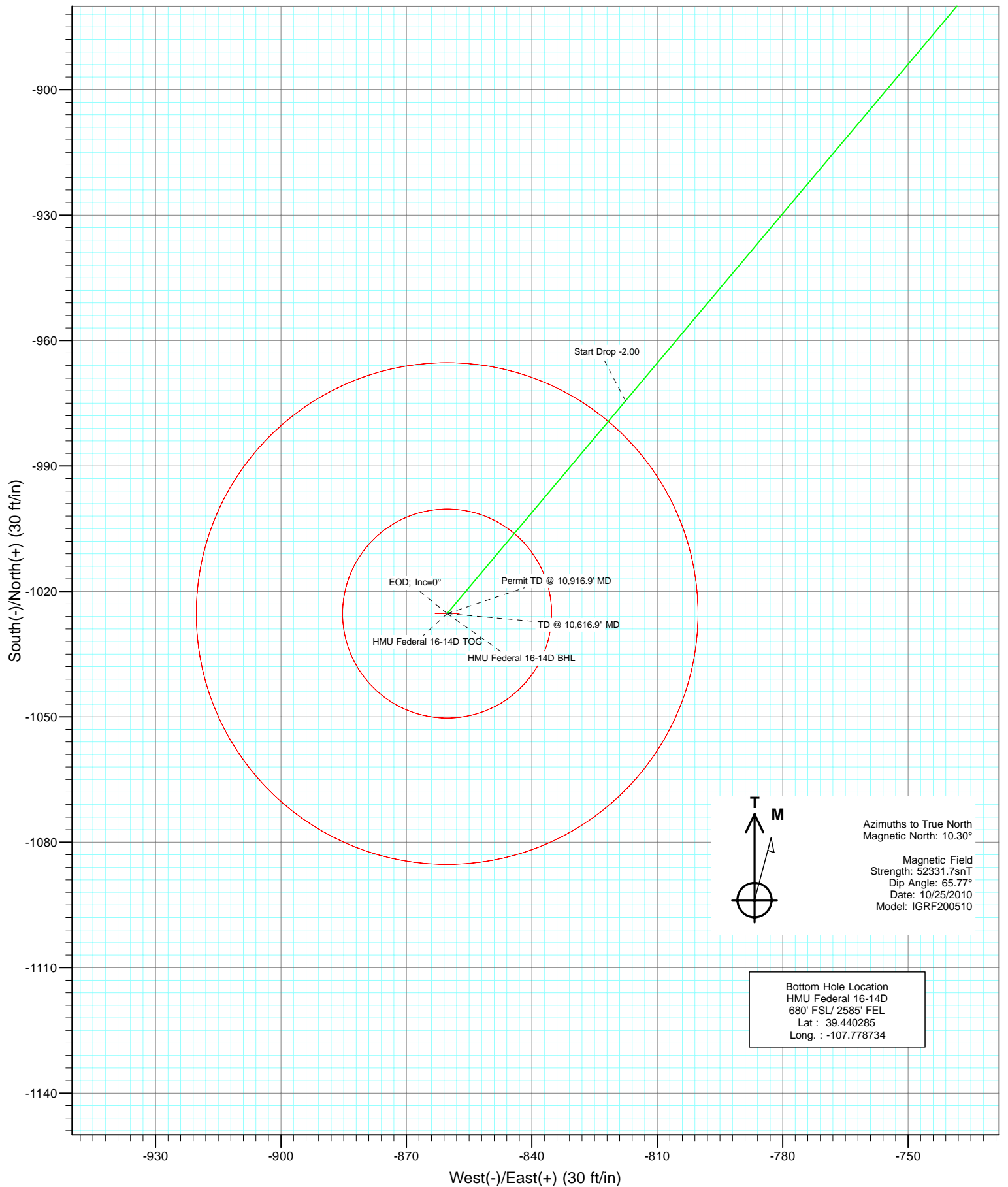
Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/25/2010	10.30	65.77	52,332

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	220.00

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,412.0	12.36	220.00	1,408.8	-33.9	-28.4	3.00	3.00	0.00	220.00	
7,147.9	12.36	220.00	7,011.8	-974.4	-817.6	0.00	0.00	0.00	0.00	
7,765.9	0.00	0.00	7,625.0	-1,025.3	-860.3	2.00	-2.00	0.00	180.00	HMU Federal 16-14D
10,616.9	0.00	0.00	10,476.0	-1,025.3	-860.3	0.00	0.00	0.00	0.00	HMU Federal 16-14D
10,916.9	0.00	0.00	10,776.0	-1,025.3	-860.3	0.00	0.00	0.00	0.00	



Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-14D
Wellbore: DD
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D	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	
30.0	0.00	0.00	30.0	0.0	0.0	0.0	0.00	0.00	
60.0	0.00	0.00	60.0	0.0	0.0	0.0	0.00	0.00	
90.0	0.00	0.00	90.0	0.0	0.0	0.0	0.00	0.00	
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	
180.0	0.00	0.00	180.0	0.0	0.0	0.0	0.00	0.00	
210.0	0.00	0.00	210.0	0.0	0.0	0.0	0.00	0.00	
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	
270.0	0.00	0.00	270.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
330.0	0.00	0.00	330.0	0.0	0.0	0.0	0.00	0.00	
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	
390.0	0.00	0.00	390.0	0.0	0.0	0.0	0.00	0.00	
420.0	0.00	0.00	420.0	0.0	0.0	0.0	0.00	0.00	
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	
510.0	0.00	0.00	510.0	0.0	0.0	0.0	0.00	0.00	
540.0	0.00	0.00	540.0	0.0	0.0	0.0	0.00	0.00	
570.0	0.00	0.00	570.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
630.0	0.00	0.00	630.0	0.0	0.0	0.0	0.00	0.00	
660.0	0.00	0.00	660.0	0.0	0.0	0.0	0.00	0.00	
690.0	0.00	0.00	690.0	0.0	0.0	0.0	0.00	0.00	
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	
750.0	0.00	0.00	750.0	0.0	0.0	0.0	0.00	0.00	
780.0	0.00	0.00	780.0	0.0	0.0	0.0	0.00	0.00	
810.0	0.00	0.00	810.0	0.0	0.0	0.0	0.00	0.00	
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	
870.0	0.00	0.00	870.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
930.0	0.00	0.00	930.0	0.0	0.0	0.0	0.00	0.00	
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	
990.0	0.00	0.00	990.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1000'
1,020.0	0.60	220.00	1,020.0	-0.1	-0.1	0.1	3.00	3.00	
1,050.0	1.50	220.00	1,050.0	-0.5	-0.4	0.7	3.00	3.00	
1,080.0	2.40	220.00	1,080.0	-1.3	-1.1	1.7	3.00	3.00	
1,110.0	3.30	220.00	1,109.9	-2.4	-2.0	3.2	3.00	3.00	
1,140.0	4.20	220.00	1,139.9	-3.9	-3.3	5.1	3.00	3.00	
1,170.0	5.10	220.00	1,169.8	-5.8	-4.9	7.6	3.00	3.00	
1,200.0	6.00	220.00	1,199.6	-8.0	-6.7	10.5	3.00	3.00	
1,230.0	6.90	220.00	1,229.4	-10.6	-8.9	13.8	3.00	3.00	
1,260.0	7.80	220.00	1,259.2	-13.5	-11.4	17.7	3.00	3.00	
1,290.0	8.70	220.00	1,288.9	-16.8	-14.1	22.0	3.00	3.00	
1,320.0	9.60	220.00	1,318.5	-20.5	-17.2	26.7	3.00	3.00	
1,350.0	10.50	220.00	1,348.0	-24.5	-20.6	32.0	3.00	3.00	
1,380.0	11.40	220.00	1,377.5	-28.9	-24.2	37.7	3.00	3.00	
1,410.0	12.30	220.00	1,406.9	-33.6	-28.2	43.8	3.00	3.00	
1,412.0	12.36	220.00	1,408.8	-33.9	-28.4	44.3	3.00	3.00	EOB; Inc=12.36°
1,440.0	12.36	220.00	1,436.2	-38.5	-32.3	50.3	0.00	0.00	
1,470.0	12.36	220.00	1,465.5	-43.4	-36.4	56.7	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D	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
1,500.0	12.36	220.00	1,494.8	-48.3	-40.6	63.1	0.00	0.00	
1,530.0	12.36	220.00	1,524.1	-53.3	-44.7	69.5	0.00	0.00	
1,560.0	12.36	220.00	1,553.4	-58.2	-48.8	75.9	0.00	0.00	
1,590.0	12.36	220.00	1,582.7	-63.1	-52.9	82.4	0.00	0.00	
1,620.0	12.36	220.00	1,612.0	-68.0	-57.1	88.8	0.00	0.00	
1,635.1	12.36	220.00	1,626.7	-70.5	-59.1	92.0	0.00	0.00	Surface Casing
1,650.0	12.36	220.00	1,641.3	-72.9	-61.2	95.2	0.00	0.00	
1,680.0	12.36	220.00	1,670.6	-77.9	-65.3	101.6	0.00	0.00	
1,710.0	12.36	220.00	1,699.9	-82.8	-69.5	108.1	0.00	0.00	
1,740.0	12.36	220.00	1,729.2	-87.7	-73.6	114.5	0.00	0.00	
1,770.0	12.36	220.00	1,758.5	-92.6	-77.7	120.9	0.00	0.00	
1,800.0	12.36	220.00	1,787.8	-97.5	-81.8	127.3	0.00	0.00	
1,830.0	12.36	220.00	1,817.1	-102.5	-86.0	133.7	0.00	0.00	
1,860.0	12.36	220.00	1,846.4	-107.4	-90.1	140.2	0.00	0.00	
1,890.0	12.36	220.00	1,875.7	-112.3	-94.2	146.6	0.00	0.00	
1,920.0	12.36	220.00	1,905.0	-117.2	-98.3	153.0	0.00	0.00	
1,950.0	12.36	220.00	1,934.3	-122.1	-102.5	159.4	0.00	0.00	
1,980.0	12.36	220.00	1,963.6	-127.0	-106.6	165.8	0.00	0.00	
2,010.0	12.36	220.00	1,993.0	-132.0	-110.7	172.3	0.00	0.00	
2,040.0	12.36	220.00	2,022.3	-136.9	-114.9	178.7	0.00	0.00	
2,070.0	12.36	220.00	2,051.6	-141.8	-119.0	185.1	0.00	0.00	
2,100.0	12.36	220.00	2,080.9	-146.7	-123.1	191.5	0.00	0.00	
2,130.0	12.36	220.00	2,110.2	-151.6	-127.2	197.9	0.00	0.00	
2,160.0	12.36	220.00	2,139.5	-156.6	-131.4	204.4	0.00	0.00	
2,190.0	12.36	220.00	2,168.8	-161.5	-135.5	210.8	0.00	0.00	
2,220.0	12.36	220.00	2,198.1	-166.4	-139.6	217.2	0.00	0.00	
2,250.0	12.36	220.00	2,227.4	-171.3	-143.7	223.6	0.00	0.00	
2,280.0	12.36	220.00	2,256.7	-176.2	-147.9	230.1	0.00	0.00	
2,310.0	12.36	220.00	2,286.0	-181.2	-152.0	236.5	0.00	0.00	
2,340.0	12.36	220.00	2,315.3	-186.1	-156.1	242.9	0.00	0.00	
2,370.0	12.36	220.00	2,344.6	-191.0	-160.3	249.3	0.00	0.00	
2,400.0	12.36	220.00	2,373.9	-195.9	-164.4	255.7	0.00	0.00	
2,430.0	12.36	220.00	2,403.2	-200.8	-168.5	262.2	0.00	0.00	
2,460.0	12.36	220.00	2,432.5	-205.8	-172.6	268.6	0.00	0.00	
2,490.0	12.36	220.00	2,461.8	-210.7	-176.8	275.0	0.00	0.00	

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									
HMU Federal 16-14D TC	0.00	0.00	7,625.0	-1,025.3	-860.3	1,593,327.60	2,356,503.36	39.440285	-107.778734
- plan misses target center by 5271.5ft at 2490.0ft MD (2461.8 TVD, -210.7 N, -176.8 E)									
- Circle (radius 25.0)									
HMU Federal 16-14D Bl	0.00	0.00	10,476.0	-1,025.3	-860.3	1,593,327.60	2,356,503.36	39.440285	-107.778734
- plan misses target center by 8084.4ft at 2490.0ft MD (2461.8 TVD, -210.7 N, -176.8 E)									
- Circle (radius 60.0)									

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D	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
2,500.0	12.36	220.00	2,471.6	-212.3	-178.1	277.1	0.00	0.00	
2,600.0	12.36	220.00	2,569.3	-228.7	-191.9	298.5	0.00	0.00	
2,700.0	12.36	220.00	2,667.0	-245.1	-205.7	320.0	0.00	0.00	
2,800.0	12.36	220.00	2,764.6	-261.5	-219.4	341.4	0.00	0.00	
2,900.0	12.36	220.00	2,862.3	-277.9	-233.2	362.8	0.00	0.00	
3,000.0	12.36	220.00	2,960.0	-294.3	-246.9	384.2	0.00	0.00	
3,100.0	12.36	220.00	3,057.7	-310.7	-260.7	405.6	0.00	0.00	
3,200.0	12.36	220.00	3,155.4	-327.1	-274.4	427.0	0.00	0.00	
3,300.0	12.36	220.00	3,253.1	-343.5	-288.2	448.4	0.00	0.00	
3,400.0	12.36	220.00	3,350.7	-359.9	-302.0	469.8	0.00	0.00	
3,500.0	12.36	220.00	3,448.4	-376.3	-315.7	491.2	0.00	0.00	
3,600.0	12.36	220.00	3,546.1	-392.7	-329.5	512.6	0.00	0.00	
3,654.2	12.36	220.00	3,599.0	-401.6	-336.9	524.2	0.00	0.00	G Sand
3,700.0	12.36	220.00	3,643.8	-409.1	-343.2	534.0	0.00	0.00	
3,800.0	12.36	220.00	3,741.5	-425.5	-357.0	555.4	0.00	0.00	
3,900.0	12.36	220.00	3,839.2	-441.9	-370.7	576.8	0.00	0.00	
4,000.0	12.36	220.00	3,936.8	-458.3	-384.5	598.2	0.00	0.00	
4,100.0	12.36	220.00	4,034.5	-474.7	-398.3	619.6	0.00	0.00	
4,200.0	12.36	220.00	4,132.2	-491.1	-412.0	641.0	0.00	0.00	
4,300.0	12.36	220.00	4,229.9	-507.5	-425.8	662.4	0.00	0.00	
4,400.0	12.36	220.00	4,327.6	-523.9	-439.5	683.8	0.00	0.00	
4,500.0	12.36	220.00	4,425.2	-540.3	-453.3	705.2	0.00	0.00	
4,600.0	12.36	220.00	4,522.9	-556.6	-467.1	726.6	0.00	0.00	
4,700.0	12.36	220.00	4,620.6	-573.0	-480.8	748.0	0.00	0.00	
4,800.0	12.36	220.00	4,718.3	-589.4	-494.6	769.4	0.00	0.00	
4,900.0	12.36	220.00	4,816.0	-605.8	-508.3	790.8	0.00	0.00	
5,000.0	12.36	220.00	4,913.7	-622.2	-522.1	812.2	0.00	0.00	
5,100.0	12.36	220.00	5,011.3	-638.6	-535.8	833.7	0.00	0.00	
5,200.0	12.36	220.00	5,109.0	-655.0	-549.6	855.1	0.00	0.00	
5,300.0	12.36	220.00	5,206.7	-671.4	-563.4	876.5	0.00	0.00	
5,400.0	12.36	220.00	5,304.4	-687.8	-577.1	897.9	0.00	0.00	
5,500.0	12.36	220.00	5,402.1	-704.2	-590.9	919.3	0.00	0.00	
5,600.0	12.36	220.00	5,499.8	-720.6	-604.6	940.7	0.00	0.00	
5,700.0	12.36	220.00	5,597.4	-737.0	-618.4	962.1	0.00	0.00	
5,752.8	12.36	220.00	5,649.0	-745.7	-625.6	973.4	0.00	0.00	Ohio Creek
5,800.0	12.36	220.00	5,695.1	-753.4	-632.1	983.5	0.00	0.00	
5,900.0	12.36	220.00	5,792.8	-769.8	-645.9	1,004.9	0.00	0.00	
6,000.0	12.36	220.00	5,890.5	-786.2	-659.7	1,026.3	0.00	0.00	
6,100.0	12.36	220.00	5,988.2	-802.6	-673.4	1,047.7	0.00	0.00	
6,200.0	12.36	220.00	6,085.8	-819.0	-687.2	1,069.1	0.00	0.00	
6,204.3	12.36	220.00	6,090.0	-819.7	-687.8	1,070.0	0.00	0.00	Mesa Verde
6,300.0	12.36	220.00	6,183.5	-835.4	-700.9	1,090.5	0.00	0.00	
6,400.0	12.36	220.00	6,281.2	-851.8	-714.7	1,111.9	0.00	0.00	
6,500.0	12.36	220.00	6,378.9	-868.2	-728.4	1,133.3	0.00	0.00	
6,600.0	12.36	220.00	6,476.6	-884.6	-742.2	1,154.7	0.00	0.00	
6,700.0	12.36	220.00	6,574.3	-901.0	-756.0	1,176.1	0.00	0.00	
6,728.4	12.36	220.00	6,602.0	-905.6	-759.9	1,182.2	0.00	0.00	Williams Fork
6,800.0	12.36	220.00	6,671.9	-917.4	-769.7	1,197.5	0.00	0.00	
6,900.0	12.36	220.00	6,769.6	-933.8	-783.5	1,218.9	0.00	0.00	
7,000.0	12.36	220.00	6,867.3	-950.2	-797.2	1,240.3	0.00	0.00	
7,100.0	12.36	220.00	6,965.0	-966.6	-811.0	1,261.7	0.00	0.00	
7,147.9	12.36	220.00	7,011.8	-974.4	-817.6	1,272.0	0.00	0.00	Start Drop -2.00

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D	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
7,200.0	11.32	220.00	7,062.8	-982.6	-824.5	1,282.7	2.00	-2.00	
7,300.0	9.32	220.00	7,161.1	-996.3	-836.0	1,300.6	2.00	-2.00	
7,400.0	7.32	220.00	7,260.1	-1,007.4	-845.3	1,315.1	2.00	-2.00	
7,500.0	5.32	220.00	7,359.5	-1,015.9	-852.3	1,326.1	2.00	-2.00	
7,600.0	3.32	220.00	7,459.2	-1,021.6	-857.2	1,333.6	2.00	-2.00	
7,700.0	1.32	220.00	7,559.1	-1,024.7	-859.8	1,337.6	2.00	-2.00	
7,765.9	0.00	0.00	7,625.0	-1,025.3	-860.3	1,338.4	2.00	-2.00	EOD; Inc=0° - Top of Gas - HMU Federal 16-14
7,800.0	0.00	0.00	7,659.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
7,900.0	0.00	0.00	7,759.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,000.0	0.00	0.00	7,859.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,100.0	0.00	0.00	7,959.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,200.0	0.00	0.00	8,059.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,300.0	0.00	0.00	8,159.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,400.0	0.00	0.00	8,259.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,500.0	0.00	0.00	8,359.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,600.0	0.00	0.00	8,459.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,700.0	0.00	0.00	8,559.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,800.0	0.00	0.00	8,659.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,900.0	0.00	0.00	8,759.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
8,981.9	0.00	0.00	8,841.0	-1,025.3	-860.3	1,338.4	0.00	0.00	Coal Ridge
9,000.0	0.00	0.00	8,859.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,100.0	0.00	0.00	8,959.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,200.0	0.00	0.00	9,059.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,300.0	0.00	0.00	9,159.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,400.0	0.00	0.00	9,259.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,500.0	0.00	0.00	9,359.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,600.0	0.00	0.00	9,459.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,645.9	0.00	0.00	9,505.0	-1,025.3	-860.3	1,338.4	0.00	0.00	Base Cameo A Coal
9,700.0	0.00	0.00	9,559.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,781.9	0.00	0.00	9,641.0	-1,025.3	-860.3	1,338.4	0.00	0.00	Rollins
9,800.0	0.00	0.00	9,659.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
9,900.0	0.00	0.00	9,759.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,000.0	0.00	0.00	9,859.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,100.0	0.00	0.00	9,959.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,200.0	0.00	0.00	10,059.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,207.9	0.00	0.00	10,067.0	-1,025.3	-860.3	1,338.4	0.00	0.00	Cozzette
10,300.0	0.00	0.00	10,159.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,400.0	0.00	0.00	10,259.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,416.9	0.00	0.00	10,276.0	-1,025.3	-860.3	1,338.4	0.00	0.00	Corcoran
10,500.0	0.00	0.00	10,359.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,600.0	0.00	0.00	10,459.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,616.9	0.00	0.00	10,476.0	-1,025.3	-860.3	1,338.4	0.00	0.00	TD @ 10,616.9" MD - HMU Federal 16-14D BH
10,700.0	0.00	0.00	10,559.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,800.0	0.00	0.00	10,659.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,900.0	0.00	0.00	10,759.1	-1,025.3	-860.3	1,338.4	0.00	0.00	
10,916.9	0.00	0.00	10,776.0	-1,025.3	-860.3	1,338.4	0.00	0.00	Permit TD @ 10,916.9" MD

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

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									
HMU Federal 16-14D TC - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,625.0	-1,025.3	-860.3	1,593,327.60	2,356,503.36	39.440285	-107.778734
HMU Federal 16-14D Bt - plan hits target center - Circle (radius 60.0)	0.00	0.00	10,476.0	-1,025.3	-860.3	1,593,327.60	2,356,503.36	39.440285	-107.778734

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(in)	(in)
1,635.1	1,626.7	Surface Casing		5.500	6.000

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(ft)	(ft)			(°)	(°)	
3,654.2	3,599.0	G Sand				
5,752.8	5,649.0	Ohio Creek				
6,204.3	6,090.0	Mesa Verde				
6,728.4	6,602.0	Williams Fork				
7,765.9	7,625.0	Top of Gas				
8,981.9	8,841.0	Coal Ridge				
9,645.9	9,505.0	Base Cameo A Coal				
9,781.9	9,641.0	Rollins				
10,207.9	10,067.0	Cozzette				
10,416.9	10,276.0	Corcoran				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)		
1,000.0	1,000.0	0.0	0.0	KOP @ 1000'	
1,412.0	1,408.8	-33.9	-28.4	EOB; Inc=12.36°	
7,147.9	7,011.8	-974.4	-817.6	Start Drop -2.00	
7,765.9	7,625.0	-1,025.3	-860.3	EOD; Inc=0°	
10,616.9	10,476.0	-1,025.3	-860.3	TD @ 10,616.9" MD	
10,916.9	10,776.0	-1,025.3	-860.3	Permit TD @ 10,916.9' MD	

EnCana Oil & Gas (USA) Inc

Mamm Creek

(J16W)

HMU Federal 16-14D

DD

Plan #1

Anticollision Report

01 November, 2010

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference		
Interpolation Method:	MD Interval 100.0ft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,291.7ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	11/1/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	10,916.9	Plan #1 (DD)	MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
(J16W)						
Existing 16-11 - DD - DD	500.7	500.9	168.0	166.3	99.507	CC, ES
Existing 16-11 - DD - DD	4,600.0	4,460.8	861.1	834.2	32.041	SF
Existing 16-16 - DD - DD	0.0	0.0	184.6			
Existing 16-16 - DD - DD	1,448.2	1,428.3	186.2	180.6	32.976	ES
Existing 16-16 - DD - DD	1,700.0	1,663.9	205.5	198.8	30.546	SF
Existing 16-9 - DD - DD	1,354.3	1,360.5	36.9	31.2	6.473	CC, ES, SF
HMU Federal 16-10A - DD - Plan #1	500.0	500.0	43.3	41.6	25.928	CC, ES
HMU Federal 16-10A - DD - Plan #1	700.0	694.9	53.5	51.1	22.540	SF
HMU Federal 16-11B - DD - Plan #1	200.0	200.0	50.9	50.3	81.900	CC, ES
HMU Federal 16-11B - DD - Plan #1	5,600.0	5,433.9	1,268.9	1,233.4	35.747	SF
HMU Federal 16-11D - DD - Plan #1	528.8	529.3	31.1	29.3	17.186	CC, ES
HMU Federal 16-11D - DD - Plan #1	10,200.0	10,138.4	740.3	685.4	13.481	SF
HMU Federal 16-14A - DD - Plan #1	414.5	414.9	11.7	10.3	8.305	CC, ES
HMU Federal 16-14A - DD - Plan #1	3,600.0	3,587.0	100.5	78.3	4.512	SF
HMU Federal 16-14D2 - DD - Plan #1	1,000.0	1,000.0	17.2	13.8	5.032	CC
HMU Federal 16-14D2 - DD - Plan #1	1,100.0	1,099.2	17.3	13.6	4.612	ES
HMU Federal 16-14D2 - DD - Plan #1	1,400.0	1,396.8	20.4	15.4	4.113	SF
HMU Federal 16-14D3 - DD - Plan #1	500.0	500.0	34.4	32.7	20.620	CC, ES
HMU Federal 16-14D3 - DD - Plan #1	10,230.4	10,350.8	674.6	627.5	14.313	SF
HMU Federal 16-16B - DD - Plan #1	200.0	200.0	12.0	11.4	19.292	CC, ES
HMU Federal 16-16B - DD - Plan #1	300.0	299.3	14.5	13.5	14.935	SF
HMU Federal 16-6C - DD - Plan #1	300.0	300.0	26.8	25.9	27.644	CC, ES
HMU Federal 16-6C - DD - Plan #1	500.0	496.8	36.5	34.8	21.849	SF
HMU Federal 16-6C2 - DD - Plan #1	200.0	200.0	43.5	42.9	70.049	CC, ES
HMU Federal 16-6C2 - DD - Plan #1	5,300.0	5,106.6	1,276.9	1,243.8	38.528	SF
HMU Federal 16-9C - DD - Plan #1	300.0	300.0	11.4	10.4	11.730	CC, ES
HMU Federal 16-9C - DD - Plan #1	400.0	399.5	13.4	12.1	10.100	SF
HMU Federal 21-1B - DD - Plan #1	300.0	300.0	60.1	59.2	61.975	CC, ES
HMU Federal 21-1B - DD - Plan #1	600.0	589.4	81.4	79.4	40.320	SF
HMU Federal 21-3A - DD - Plan #1	200.0	200.0	51.2	50.6	82.432	CC, ES
HMU Federal 21-3A - DD - Plan #1	10,916.9	11,104.2	1,014.8	965.9	20.770	SF
HMU Fee 16-8D - DD - Plan #1	200.0	200.0	26.5	25.9	42.719	CC, ES
HMU Fee 16-8D - DD - Plan #1	400.0	396.9	36.0	34.7	26.606	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-11 - DD - DD													Offset Site Error:	0.0 ft
Survey Program: 212-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Between Centres (ft)	Between Ellipses (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-134.54	-118.4	-120.3	168.8					
100.0	100.0	99.8	99.8	0.1	0.2	-134.43	-118.2	-120.5	168.8	168.5	0.29	575.380		
200.0	200.0	199.6	199.6	0.3	0.3	-134.11	-117.6	-121.3	169.0	168.4	0.63	270.287		
300.0	300.0	300.3	300.3	0.5	0.5	-133.48	-116.3	-122.7	169.1	168.1	0.98	173.283		
400.0	400.0	401.5	401.5	0.7	0.7	-132.45	-113.7	-124.3	168.5	167.1	1.33	126.602		
500.0	500.0	500.2	500.0	0.8	0.9	-131.09	-110.4	-126.6	168.0	166.3	1.69	99.662		
500.7	500.7	500.9	500.7	0.8	0.9	-131.08	-110.4	-126.7	168.0	166.3	1.69	99.507 CC, ES		
600.0	600.0	598.2	597.9	1.0	1.1	-129.34	-106.9	-130.4	168.6	166.5	2.05	82.217		
700.0	700.0	695.5	695.0	1.2	1.3	-127.25	-103.3	-135.8	170.7	168.2	2.43	70.184		
800.0	800.0	792.9	792.1	1.4	1.5	-124.92	-99.7	-142.9	174.4	171.6	2.82	61.812		
900.0	900.0	889.3	887.9	1.5	1.7	-122.14	-95.5	-152.0	179.9	176.6	3.24	55.581		
1,000.0	1,000.0	983.5	981.3	1.7	2.0	-119.27	-91.6	-163.4	188.2	184.5	3.67	51.229		
1,100.0	1,100.0	1,077.1	1,073.8	1.9	2.3	23.90	-87.7	-177.6	197.4	193.4	3.99	49.422		
1,200.0	1,199.6	1,171.1	1,166.1	2.1	2.6	27.82	-83.4	-194.7	205.3	200.9	4.38	46.894		
1,300.0	1,298.8	1,266.1	1,258.9	2.3	3.0	32.62	-78.0	-214.2	211.7	206.9	4.75	44.568		
1,400.0	1,397.1	1,361.3	1,351.6	2.6	3.4	38.07	-72.3	-235.1	216.9	211.8	5.11	42.450		
1,500.0	1,494.8	1,456.6	1,444.3	2.9	3.8	43.83	-66.6	-256.8	222.8	217.3	5.49	40.567		
1,600.0	1,592.5	1,553.9	1,538.7	3.2	4.2	49.41	-60.8	-279.4	231.4	225.5	5.90	39.229		
1,700.0	1,690.1	1,651.3	1,633.3	3.6	4.6	54.67	-54.6	-301.7	242.0	235.6	6.34	38.170		
1,800.0	1,787.8	1,749.3	1,728.5	3.9	5.0	59.60	-47.9	-324.0	254.2	247.4	6.82	37.286		
1,900.0	1,885.5	1,849.1	1,825.7	4.3	5.5	64.14	-41.3	-345.8	267.4	260.0	7.34	36.422		
2,000.0	1,983.2	1,944.5	1,918.6	4.7	5.9	68.10	-34.9	-366.5	281.8	273.9	7.90	35.675		
2,100.0	2,080.9	2,043.0	2,014.5	5.1	6.3	71.84	-28.0	-387.7	297.4	288.9	8.50	34.987		
2,200.0	2,178.5	2,138.0	2,107.1	5.5	6.7	75.13	-21.2	-408.1	314.3	305.2	9.13	34.427		
2,300.0	2,276.2	2,230.0	2,196.5	5.9	7.2	77.88	-14.7	-429.1	333.3	323.5	9.78	34.084		
2,400.0	2,373.9	2,328.0	2,291.5	6.3	7.6	80.40	-8.0	-452.0	353.3	342.9	10.46	33.768		
2,500.0	2,471.6	2,419.4	2,380.0	6.7	8.0	82.49	-1.7	-473.9	374.5	363.3	11.15	33.595		
2,600.0	2,569.3	2,517.7	2,474.9	7.1	8.5	84.47	5.4	-498.1	396.8	384.9	11.86	33.446		
2,700.0	2,667.0	2,618.0	2,572.1	7.5	9.0	86.29	12.3	-522.1	418.8	406.2	12.60	33.240		
2,800.0	2,764.6	2,712.4	2,663.6	7.9	9.4	87.85	18.7	-544.6	441.0	427.7	13.32	33.102		
2,900.0	2,862.3	2,808.9	2,756.9	8.3	9.9	89.22	25.1	-568.2	463.9	449.8	14.07	32.979		
3,000.0	2,960.0	2,909.1	2,853.9	8.7	10.4	90.50	31.5	-592.5	486.6	471.8	14.82	32.837		
3,100.0	3,057.7	3,009.0	2,950.8	9.1	10.8	91.71	37.6	-615.8	508.8	493.2	15.58	32.662		
3,200.0	3,155.4	3,101.4	3,040.4	9.5	11.3	92.71	43.4	-637.9	531.5	515.2	16.32	32.579		
3,300.0	3,253.1	3,199.8	3,135.7	9.9	11.7	93.71	49.8	-661.3	554.6	537.6	17.07	32.492		
3,400.0	3,350.7	3,299.4	3,232.4	10.3	12.2	94.71	56.5	-684.3	577.5	559.7	17.83	32.395		
3,500.0	3,448.4	3,397.5	3,327.9	10.7	12.6	95.70	63.2	-706.0	600.0	581.4	18.59	32.285		
3,600.0	3,546.1	3,487.2	3,414.9	11.1	13.1	96.49	69.6	-726.7	623.5	604.2	19.32	32.276		
3,700.0	3,643.8	3,585.4	3,510.1	11.5	13.5	97.25	76.5	-750.0	647.4	627.3	20.08	32.243		
3,800.0	3,741.5	3,684.0	3,605.6	11.9	14.0	97.94	83.0	-773.3	671.1	650.2	20.84	32.199		
3,900.0	3,839.2	3,781.6	3,700.2	12.4	14.4	98.56	89.3	-796.5	694.8	673.2	21.60	32.169		
4,000.0	3,936.8	3,882.2	3,797.9	12.8	14.9	99.19	95.8	-819.8	718.1	695.8	22.36	32.114		
4,100.0	4,034.5	3,977.4	3,890.5	13.2	15.3	99.80	102.2	-841.3	741.4	718.3	23.11	32.083		
4,200.0	4,132.2	4,071.4	3,981.6	13.6	15.8	100.34	108.6	-863.0	765.3	741.4	23.85	32.084		
4,300.0	4,229.9	4,168.1	4,075.5	14.0	16.2	100.88	115.4	-885.2	789.2	764.6	24.61	32.074		
4,400.0	4,327.6	4,264.6	4,169.0	14.4	16.7	101.33	121.8	-908.1	813.4	788.0	25.36	32.071		
4,500.0	4,425.2	4,364.5	4,265.9	14.8	17.1	101.77	128.3	-931.6	837.3	811.2	26.12	32.052		
4,600.0	4,522.9	4,460.8	4,359.4	15.2	17.6	102.20	134.6	-953.8	861.1	834.2	26.88	32.041 SF		
4,700.0	4,620.6	4,551.3	4,447.1	15.7	18.0	102.56	140.7	-975.2	885.4	857.8	27.61	32.069		
4,800.0	4,718.3	4,643.1	4,536.0	16.1	18.5	102.89	147.4	-997.4	910.5	882.1	28.34	32.124		
4,900.0	4,816.0	4,745.9	4,635.5	16.5	19.0	103.26	154.7	-1,022.1	935.5	906.3	29.12	32.127		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-11 - DD - DD													Offset Site Error:	0.0 ft
Survey Program: 212-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,000.0	4,913.7	4,847.0	4,733.4	16.9	19.4	103.59	161.4	-1,046.0	959.8	929.9	29.88	32.117		
5,100.0	5,011.3	4,942.9	4,826.5	17.3	19.9	103.92	167.9	-1,068.4	984.0	953.4	30.63	32.128		
5,200.0	5,109.0	5,038.8	4,919.6	17.7	20.3	104.25	174.7	-1,090.6	1,008.5	977.1	31.37	32.143		
5,300.0	5,206.7	5,135.8	5,013.7	18.1	20.8	104.57	181.6	-1,112.9	1,032.9	1,000.8	32.12	32.159		
5,400.0	5,304.4	5,234.9	5,109.9	18.5	21.2	104.90	188.8	-1,135.4	1,057.4	1,024.5	32.87	32.167		
5,500.0	5,402.1	5,337.4	5,209.6	19.0	21.7	105.24	196.0	-1,158.4	1,081.4	1,047.8	33.64	32.152		
5,600.0	5,499.8	5,439.4	5,308.8	19.4	22.2	105.56	202.6	-1,181.0	1,105.0	1,070.6	34.40	32.126		
5,700.0	5,597.4	5,540.3	5,407.1	19.8	22.6	105.87	209.0	-1,203.0	1,128.3	1,093.1	35.15	32.099		
5,800.0	5,695.1	5,628.7	5,493.2	20.2	23.0	106.13	214.7	-1,222.3	1,151.7	1,115.8	35.87	32.110		
5,900.0	5,792.8	5,723.7	5,585.5	20.6	23.4	106.38	221.1	-1,243.8	1,175.7	1,139.1	36.61	32.119		
6,000.0	5,890.5	5,821.5	5,680.5	21.0	23.9	106.61	227.5	-1,266.0	1,199.7	1,162.4	37.35	32.120		
6,100.0	5,988.2	5,924.8	5,781.0	21.4	24.3	106.86	234.3	-1,289.1	1,223.6	1,185.4	38.12	32.101		
6,200.0	6,085.8	6,024.0	5,877.6	21.9	24.8	107.11	240.6	-1,310.7	1,247.0	1,208.1	38.86	32.089		
6,300.0	6,183.5	6,127.2	5,978.1	22.3	25.2	107.38	247.1	-1,332.8	1,270.1	1,230.5	39.62	32.061		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-16 - DD - DD													Offset Site Error:	0.0 ft
Survey Program: 212-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-138.68	-138.6	-121.8	184.6					
100.0	100.0	98.2	98.2	0.1	0.2	-138.68	-139.0	-122.2	185.0	184.7	0.29	635.608		
200.0	200.0	196.4	196.4	0.3	0.3	-138.69	-140.1	-123.1	186.5	185.9	0.62	300.501		
300.0	300.0	296.6	296.6	0.5	0.5	-138.73	-141.6	-124.3	188.5	187.5	0.97	194.736		
400.0	400.0	396.4	396.4	0.7	0.7	-138.97	-143.5	-124.9	190.2	188.9	1.32	144.570		
500.0	500.0	495.5	495.4	0.8	0.8	-139.67	-146.6	-124.5	192.4	190.7	1.66	115.733		
600.0	600.0	596.8	596.6	1.0	1.0	-140.84	-150.8	-122.8	194.5	192.5	2.01	96.689		
700.0	700.0	697.6	697.3	1.2	1.2	-142.39	-155.3	-119.6	196.1	193.7	2.36	82.958		
800.0	800.0	798.5	797.9	1.4	1.4	-144.42	-160.5	-114.8	197.3	194.6	2.72	72.549		
900.0	900.0	899.7	898.6	1.5	1.7	-147.23	-166.5	-107.2	198.1	195.0	3.08	64.201		
1,000.0	1,000.0	999.3	997.4	1.7	1.9	-150.96	-174.1	-96.7	199.2	195.7	3.46	57.599		
1,100.0	1,100.0	1,097.9	1,094.5	1.9	2.2	-16.04	-183.4	-82.3	198.6	194.5	4.06	48.933		
1,200.0	1,199.6	1,194.7	1,189.0	2.1	2.6	-22.68	-194.1	-64.7	195.2	190.6	4.53	43.042		
1,300.0	1,298.8	1,289.6	1,281.4	2.3	3.0	-30.47	-205.3	-46.2	190.7	185.7	4.99	38.184		
1,400.0	1,397.1	1,383.2	1,372.3	2.6	3.3	-39.45	-217.2	-27.3	186.9	181.5	5.43	34.416		
1,448.2	1,444.3	1,428.3	1,416.1	2.7	3.5	-44.11	-223.2	-18.0	186.2	180.6	5.65	32.976 ES		
1,500.0	1,494.8	1,476.8	1,463.1	2.9	3.8	-49.23	-229.6	-8.0	186.8	181.0	5.87	31.823		
1,600.0	1,592.5	1,569.3	1,552.7	3.2	4.2	-58.74	-241.9	11.5	193.1	186.8	6.30	30.637		
1,700.0	1,690.1	1,663.9	1,644.1	3.6	4.6	-67.82	-254.6	32.1	205.5	198.8	6.73	30.546 SF		
1,800.0	1,787.8	1,758.3	1,735.5	3.9	5.0	-75.70	-267.1	52.2	222.4	215.2	7.16	31.070		
1,900.0	1,885.5	1,853.4	1,827.7	4.3	5.5	-82.45	-279.6	72.0	242.6	235.0	7.61	31.901		
2,000.0	1,983.2	1,948.8	1,920.3	4.7	5.9	-88.18	-291.8	91.5	265.3	257.2	8.08	32.818		
2,100.0	2,080.9	2,041.6	2,010.3	5.1	6.3	-92.84	-303.8	110.3	290.1	281.5	8.59	33.787		
2,200.0	2,178.5	2,138.8	2,104.7	5.5	6.7	-96.89	-316.7	129.7	316.4	307.2	9.12	34.678		
2,300.0	2,276.2	2,229.7	2,193.0	5.9	7.2	-99.99	-329.3	147.4	343.8	334.1	9.67	35.538		
2,400.0	2,373.9	2,325.8	2,286.1	6.3	7.6	-102.71	-343.3	166.2	372.5	362.2	10.25	36.332		
2,500.0	2,471.6	2,420.6	2,378.2	6.7	8.0	-105.00	-357.1	184.5	401.4	390.6	10.84	37.021		
2,600.0	2,569.3	2,511.8	2,466.5	7.1	8.5	-106.79	-371.2	202.0	431.2	419.8	11.44	37.690		
2,700.0	2,667.0	2,609.7	2,561.3	7.5	8.9	-108.39	-387.0	220.7	461.6	449.5	12.06	38.259		
2,800.0	2,764.6	2,706.0	2,654.7	7.9	9.4	-109.78	-402.2	238.6	491.5	478.9	12.69	38.737		
2,900.0	2,862.3	2,802.4	2,748.3	8.3	9.8	-111.04	-417.2	256.2	521.5	508.2	13.32	39.154		
3,000.0	2,960.0	2,888.9	2,832.1	8.7	10.2	-112.05	-430.7	272.6	552.1	538.2	13.93	39.646		
3,100.0	3,057.7	2,984.0	2,924.2	9.1	10.7	-113.05	-445.9	291.3	583.8	569.3	14.56	40.102		
3,200.0	3,155.4	3,069.5	3,006.9	9.5	11.1	-113.87	-459.3	308.5	616.0	600.8	15.16	40.620		
3,300.0	3,253.1	3,161.5	3,095.6	9.9	11.6	-114.70	-473.9	328.2	649.4	633.6	15.79	41.135		
3,400.0	3,350.7	3,257.6	3,188.2	10.3	12.0	-115.49	-488.9	348.5	682.8	666.4	16.42	41.574		
3,500.0	3,448.4	3,350.6	3,278.0	10.7	12.5	-116.22	-503.0	368.2	716.1	699.1	17.05	42.012		
3,600.0	3,546.1	3,443.7	3,367.9	11.1	12.9	-116.94	-516.4	388.2	749.7	732.1	17.66	42.442		
3,700.0	3,643.8	3,538.4	3,459.5	11.5	13.4	-117.66	-529.5	408.6	783.4	765.1	18.29	42.843		
3,800.0	3,741.5	3,635.7	3,553.6	11.9	13.9	-118.37	-542.6	429.4	816.9	798.0	18.91	43.203		
3,900.0	3,839.2	3,732.8	3,647.7	12.4	14.3	-119.05	-555.0	449.8	850.1	830.6	19.53	43.534		
4,000.0	3,936.8	3,827.4	3,739.5	12.8	14.7	-119.68	-566.9	469.5	883.2	863.1	20.15	43.834		
4,100.0	4,034.5	3,921.2	3,830.3	13.2	15.2	-120.18	-579.9	488.9	916.4	895.6	20.78	44.103		
4,200.0	4,132.2	4,017.7	3,923.7	13.6	15.7	-120.59	-594.2	508.6	949.5	928.1	21.42	44.339		
4,300.0	4,229.9	4,111.4	4,014.4	14.0	16.1	-120.97	-608.2	527.5	982.5	960.5	22.04	44.571		
4,400.0	4,327.6	4,207.7	4,107.6	14.4	16.6	-121.33	-622.4	547.0	1,015.6	992.9	22.68	44.780		
4,500.0	4,425.2	4,304.8	4,201.7	14.8	17.0	-121.67	-636.8	566.4	1,048.4	1,025.1	23.32	44.960		
4,600.0	4,522.9	4,402.9	4,296.8	15.2	17.5	-122.00	-651.2	585.7	1,080.9	1,057.0	23.96	45.120		
4,700.0	4,620.6	4,499.5	4,390.6	15.7	17.9	-122.32	-665.0	604.5	1,113.2	1,088.7	24.59	45.271		
4,800.0	4,718.3	4,599.4	4,487.6	16.1	18.4	-122.64	-679.2	623.7	1,145.3	1,120.1	25.23	45.391		
4,900.0	4,816.0	4,695.8	4,581.2	16.5	18.8	-122.93	-692.8	641.8	1,177.1	1,151.2	25.86	45.508		
5,000.0	4,913.7	4,774.9	4,658.1	16.9	19.2	-123.14	-704.3	657.0	1,209.3	1,182.8	26.45	45.712		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-16 - DD - DD												Offset Site Error:	0.0 ft
Survey Program: 212-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
5,100.0	5,011.3	4,859.5	4,739.8	17.3	19.6	-123.34	-717.1	674.3	1,242.7	1,215.7	27.06	45.924	
5,200.0	5,109.0	4,951.6	4,828.8	17.7	20.1	-123.53	-731.3	693.5	1,276.6	1,248.9	27.69	46.105	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-9 - DD - DD													Offset Site Error: 0.0 ft	
Survey Program: 195-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-129.77	-98.1	-117.9	153.4					
100.0	100.0	100.2	100.2	0.1	0.2	-129.71	-98.0	-118.0	153.3	153.1	0.29	526.214		
200.0	200.0	200.5	200.5	0.3	0.3	-129.53	-97.4	-118.1	153.1	152.5	0.62	246.057		
300.0	300.0	301.0	301.0	0.5	0.5	-129.52	-97.2	-117.8	152.7	151.8	0.97	157.057		
400.0	400.0	403.0	403.0	0.7	0.7	-130.17	-97.6	-115.7	151.4	150.1	1.33	113.972		
500.0	500.0	505.5	505.4	0.8	0.9	-131.41	-98.3	-111.5	148.7	147.0	1.69	87.840		
600.0	600.0	609.2	608.8	1.0	1.1	-133.08	-98.0	-104.9	143.8	141.7	2.07	69.351		
700.0	700.0	713.2	712.5	1.2	1.3	-135.02	-96.0	-96.0	136.3	133.8	2.48	55.020		
800.0	800.0	816.6	815.1	1.4	1.6	-137.70	-92.3	-83.9	125.6	122.7	2.91	43.167		
900.0	900.0	918.5	915.8	1.5	1.9	-141.13	-86.8	-69.9	112.6	109.2	3.37	33.392		
1,000.0	1,000.0	1,018.7	1,014.7	1.7	2.2	-145.56	-79.9	-54.8	97.9	94.1	3.86	25.365		
1,100.0	1,100.0	1,117.4	1,111.8	1.9	2.5	-12.53	-72.5	-38.5	80.4	76.3	4.09	19.662		
1,200.0	1,199.6	1,213.7	1,206.5	2.1	2.8	-24.69	-65.3	-22.9	59.9	55.3	4.65	12.903		
1,300.0	1,298.8	1,309.3	1,300.5	2.3	3.2	-51.79	-58.3	-7.2	41.1	35.7	5.40	7.616		
1,354.3	1,352.3	1,360.5	1,350.8	2.4	3.3	-77.38	-54.4	1.5	36.9	31.2	5.71	6.473	CC, ES, SF	
1,400.0	1,397.1	1,403.0	1,392.6	2.6	3.5	-100.33	-50.9	8.6	40.4	34.8	5.67	7.128		
1,500.0	1,494.8	1,494.8	1,482.7	2.9	3.8	-132.36	-43.0	24.5	66.4	60.9	5.44	12.196		
1,600.0	1,592.5	1,586.2	1,572.3	3.2	4.2	-145.29	-35.0	40.8	101.7	96.1	5.59	18.187		
1,700.0	1,690.1	1,679.0	1,663.3	3.6	4.5	-151.63	-27.0	57.2	139.1	133.2	5.88	23.652		
1,800.0	1,787.8	1,772.5	1,755.1	3.9	4.9	-155.31	-19.3	73.1	176.7	170.4	6.21	28.426		
1,900.0	1,885.5	1,865.6	1,846.6	4.3	5.2	-157.61	-12.0	88.6	214.1	207.5	6.56	32.617		
2,000.0	1,983.2	1,958.1	1,937.5	4.7	5.5	-159.02	-5.6	104.3	251.6	244.6	6.92	36.346		
2,100.0	2,080.9	2,050.0	2,027.8	5.1	5.9	-159.93	0.4	120.3	289.3	282.0	7.28	39.723		
2,200.0	2,178.5	2,140.7	2,116.8	5.5	6.2	-160.59	6.3	136.4	327.4	319.8	7.64	42.835		
2,300.0	2,276.2	2,233.9	2,208.3	5.9	6.6	-161.13	12.5	153.3	365.8	357.8	8.01	45.672		
2,400.0	2,373.9	2,327.4	2,300.1	6.3	6.9	-161.57	18.6	169.8	403.9	395.5	8.38	48.205		
2,500.0	2,471.6	2,417.1	2,388.2	6.7	7.3	-161.86	24.1	186.0	442.1	433.3	8.74	50.562		
2,600.0	2,569.3	2,509.1	2,478.4	7.1	7.6	-162.10	29.9	203.0	480.7	471.6	9.11	52.753		
2,700.0	2,667.0	2,596.6	2,564.1	7.5	8.0	-162.29	35.5	219.4	519.6	510.2	9.48	54.841		
2,800.0	2,764.6	2,688.8	2,654.4	7.9	8.3	-162.41	41.4	237.5	559.2	549.3	9.85	56.782		
2,900.0	2,862.3	2,775.4	2,739.2	8.3	8.7	-162.52	47.1	254.5	598.8	588.6	10.21	58.643		
3,000.0	2,960.0	2,864.9	2,826.5	8.7	9.1	-162.62	53.4	272.7	639.3	628.8	10.58	60.441		
3,100.0	3,057.7	2,959.4	2,918.9	9.1	9.5	-162.74	60.2	291.6	679.6	668.7	10.95	62.049		
3,200.0	3,155.4	3,053.7	3,011.1	9.5	9.8	-162.87	67.0	310.0	719.5	708.2	11.33	63.521		
3,300.0	3,253.1	3,147.9	3,103.3	9.9	10.2	-163.00	73.7	328.1	759.1	747.4	11.70	64.879		
3,400.0	3,350.7	3,243.3	3,196.7	10.3	10.6	-163.13	80.5	346.0	798.4	786.3	12.08	66.115		
3,500.0	3,448.4	3,340.5	3,292.1	10.7	11.0	-163.25	87.2	363.8	837.2	824.7	12.45	67.221		
3,600.0	3,546.1	3,428.8	3,378.7	11.1	11.3	-163.35	93.0	379.7	875.7	862.8	12.82	68.308		
3,700.0	3,643.8	3,516.4	3,464.5	11.5	11.6	-163.40	98.7	396.5	915.0	901.8	13.19	69.396		
3,800.0	3,741.5	3,615.7	3,561.8	11.9	12.0	-163.46	105.2	415.3	954.1	940.5	13.57	70.299		
3,900.0	3,839.2	3,708.7	3,653.1	12.4	12.4	-163.51	110.9	432.3	992.5	978.5	13.95	71.160		
4,000.0	3,936.8	3,793.9	3,736.5	12.8	12.7	-163.55	116.3	448.3	1,031.4	1,017.1	14.31	72.085		
4,100.0	4,034.5	3,882.1	3,823.0	13.2	13.1	-163.60	122.4	465.2	1,070.8	1,056.2	14.67	72.977		
4,200.0	4,132.2	3,978.1	3,917.0	13.6	13.5	-163.66	129.1	483.4	1,110.3	1,095.2	15.05	73.765		
4,300.0	4,229.9	4,080.0	4,016.8	14.0	13.8	-163.74	136.1	502.0	1,149.0	1,133.6	15.44	74.423		
4,400.0	4,327.6	4,172.7	4,107.9	14.4	14.2	-163.79	142.0	518.6	1,187.3	1,171.4	15.81	75.086		
4,500.0	4,425.2	4,259.1	4,192.6	14.8	14.5	-163.85	147.9	534.3	1,226.0	1,209.8	16.17	75.812		
4,600.0	4,522.9	4,355.8	4,287.5	15.2	14.9	-163.92	154.6	551.7	1,264.6	1,248.1	16.55	76.420		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-10A - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	16.30	41.5	12.1	43.3						
100.0	100.0	100.0	100.0	0.1	0.1	16.30	41.5	12.1	43.3	43.0	0.27	158.893			
200.0	200.0	200.0	200.0	0.3	0.3	16.30	41.5	12.1	43.3	42.6	0.62	69.627			
300.0	300.0	300.0	300.0	0.5	0.5	16.30	41.5	12.1	43.3	42.3	0.97	44.582			
400.0	400.0	400.0	400.0	0.7	0.7	16.30	41.5	12.1	43.3	41.9	1.32	32.788			
500.0	500.0	500.0	500.0	0.8	0.8	16.30	41.5	12.1	43.3	41.6	1.67	25.928	CC, ES		
600.0	600.0	597.7	597.7	1.0	1.0	16.50	43.9	13.0	45.8	43.8	2.02	22.732			
700.0	700.0	694.9	694.6	1.2	1.2	16.99	50.9	15.5	53.5	51.1	2.37	22.540	SF		
800.0	800.0	793.0	792.0	1.4	1.4	17.54	61.8	19.5	65.3	62.6	2.74	23.827			
900.0	900.0	892.2	890.4	1.5	1.7	17.93	73.3	23.7	77.6	74.5	3.12	24.882			
1,000.0	1,000.0	991.5	988.9	1.7	1.9	18.21	84.8	27.9	89.9	86.4	3.50	25.679			
1,100.0	1,100.0	1,090.4	1,087.1	1.9	2.2	158.80	96.2	32.1	104.7	100.9	3.74	27.987			
1,200.0	1,199.6	1,188.4	1,184.3	2.1	2.4	160.02	107.6	36.2	124.2	120.2	4.07	30.507			
1,300.0	1,298.8	1,285.2	1,280.5	2.3	2.7	161.48	118.8	40.3	148.7	144.3	4.40	33.818			
1,400.0	1,397.1	1,380.7	1,375.2	2.6	2.9	162.95	129.8	44.3	178.1	173.4	4.71	37.779			
1,500.0	1,494.8	1,475.2	1,468.9	2.9	3.2	164.41	140.8	48.3	210.5	205.5	5.06	41.641			
1,600.0	1,592.5	1,569.6	1,562.7	3.2	3.4	165.52	151.7	52.3	243.1	237.7	5.40	44.997			
1,700.0	1,690.1	1,664.1	1,656.4	3.6	3.7	166.36	162.6	56.2	275.7	270.0	5.75	47.957			
1,800.0	1,787.8	1,758.6	1,750.2	3.9	4.0	167.03	173.6	60.2	308.4	302.3	6.10	50.585			
1,900.0	1,885.5	1,853.0	1,843.9	4.3	4.2	167.56	184.5	64.2	341.1	334.6	6.44	52.935			
2,000.0	1,983.2	1,947.5	1,937.6	4.7	4.5	168.01	195.4	68.2	373.8	367.0	6.79	55.047			
2,100.0	2,080.9	2,041.9	2,031.4	5.1	4.7	168.38	206.4	72.2	406.5	399.4	7.14	56.957			
2,200.0	2,178.5	2,136.4	2,125.1	5.5	5.0	168.70	217.3	76.1	439.3	431.8	7.48	58.691			
2,300.0	2,276.2	2,230.9	2,218.9	5.9	5.3	168.97	228.2	80.1	472.0	464.2	7.83	60.273			
2,400.0	2,373.9	2,325.3	2,312.6	6.3	5.5	169.21	239.2	84.1	504.8	496.6	8.18	61.722			
2,500.0	2,471.6	2,419.8	2,406.4	6.7	5.8	169.42	250.1	88.1	537.6	529.0	8.53	63.054			
2,600.0	2,569.3	2,514.2	2,500.1	7.1	6.0	169.60	261.0	92.1	570.3	561.5	8.87	64.282			
2,700.0	2,667.0	2,608.7	2,593.8	7.5	6.3	169.77	272.0	96.1	603.1	593.9	9.22	65.419			
2,800.0	2,764.6	2,703.2	2,687.6	7.9	6.6	169.91	282.9	100.0	635.9	626.3	9.57	66.473			
2,900.0	2,862.3	2,797.6	2,781.3	8.3	6.8	170.05	293.8	104.0	668.7	658.8	9.91	67.455			
3,000.0	2,960.0	2,892.1	2,875.1	8.7	7.1	170.17	304.8	108.0	701.5	691.2	10.26	68.370			
3,100.0	3,057.7	2,986.5	2,968.8	9.1	7.3	170.28	315.7	112.0	734.3	723.7	10.61	69.226			
3,200.0	3,155.4	3,081.0	3,062.5	9.5	7.6	170.38	326.6	116.0	767.1	756.1	10.95	70.027			
3,300.0	3,253.1	3,175.5	3,156.3	9.9	7.9	170.47	337.6	119.9	799.9	788.6	11.30	70.780			
3,400.0	3,350.7	3,269.9	3,250.0	10.3	8.1	170.56	348.5	123.9	832.7	821.0	11.65	71.488			
3,500.0	3,448.4	3,364.4	3,343.8	10.7	8.4	170.63	359.4	127.9	865.5	853.5	11.99	72.156			
3,600.0	3,546.1	3,458.8	3,437.5	11.1	8.6	170.71	370.4	131.9	898.3	885.9	12.34	72.786			
3,700.0	3,643.8	3,553.3	3,531.2	11.5	8.9	170.77	381.3	135.9	931.1	918.4	12.69	73.381			
3,800.0	3,741.5	3,647.8	3,625.0	11.9	9.2	170.84	392.2	139.8	963.9	950.9	13.04	73.945			
3,900.0	3,839.2	3,742.2	3,718.7	12.4	9.4	170.90	403.2	143.8	996.7	983.3	13.38	74.480			
4,000.0	3,936.8	3,836.7	3,812.5	12.8	9.7	170.95	414.1	147.8	1,029.5	1,015.8	13.73	74.988			
4,100.0	4,034.5	3,931.1	3,906.2	13.2	9.9	171.00	425.0	151.8	1,062.3	1,048.2	14.08	75.471			
4,200.0	4,132.2	4,025.6	4,000.0	13.6	10.2	171.05	436.0	155.8	1,095.1	1,080.7	14.42	75.931			
4,300.0	4,229.9	4,120.1	4,093.7	14.0	10.5	171.10	446.9	159.8	1,127.9	1,113.2	14.77	76.370			
4,400.0	4,327.6	4,214.5	4,187.4	14.4	10.7	171.14	457.8	163.7	1,160.7	1,145.6	15.12	76.788			
4,500.0	4,425.2	4,309.0	4,281.2	14.8	11.0	171.18	468.8	167.7	1,193.5	1,178.1	15.46	77.187			
4,600.0	4,522.9	4,403.5	4,374.9	15.2	11.2	171.22	479.7	171.7	1,226.4	1,210.5	15.81	77.570			
4,700.0	4,620.6	4,497.9	4,468.7	15.7	11.5	171.26	490.7	175.7	1,259.2	1,243.0	16.16	77.935			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-11B - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
0.0	0.0	0.0	0.0	0.0	0.0	5.73	50.6	5.1	50.9						
100.0	100.0	100.0	100.0	0.1	0.1	5.73	50.6	5.1	50.9	50.6	0.27	186.900			
200.0	200.0	200.0	200.0	0.3	0.3	5.73	50.6	5.1	50.9	50.3	0.62	81.900 CC, ES			
300.0	300.0	299.3	299.2	0.5	0.5	2.94	51.5	2.6	51.6	50.6	0.97	53.052			
400.0	400.0	398.0	397.7	0.7	0.7	-4.87	54.0	-4.6	54.3	52.9	1.33	40.895			
500.0	500.0	495.8	494.6	0.8	1.0	-15.83	58.2	-16.5	60.7	59.0	1.67	36.286			
600.0	600.0	591.9	589.2	1.0	1.3	-27.16	63.8	-32.7	72.6	70.6	2.01	36.189			
700.0	700.0	687.7	682.5	1.2	1.7	-36.77	70.9	-53.0	90.2	87.9	2.35	38.363			
800.0	800.0	785.0	777.1	1.4	2.1	-43.47	78.3	-74.3	110.4	107.6	2.74	40.300			
900.0	900.0	882.2	871.8	1.5	2.6	-48.09	85.8	-95.6	131.5	128.3	3.15	41.681			
1,000.0	1,000.0	979.5	966.4	1.7	3.0	-51.42	93.2	-116.9	153.2	149.6	3.59	42.664			
1,100.0	1,100.0	1,077.0	1,061.2	1.9	3.4	86.27	100.7	-138.2	175.2	171.3	3.91	44.847			
1,200.0	1,199.6	1,174.6	1,156.1	2.1	3.9	85.90	108.1	-159.6	196.8	192.5	4.29	45.865			
1,300.0	1,298.8	1,272.1	1,251.0	2.3	4.3	86.87	115.6	-180.9	218.2	213.5	4.74	45.998			
1,400.0	1,397.1	1,369.2	1,345.4	2.6	4.7	88.81	123.0	-202.2	239.6	234.4	5.29	45.308			
1,500.0	1,494.8	1,466.0	1,439.6	2.9	5.2	91.61	130.4	-223.3	261.5	255.6	5.92	44.181			
1,600.0	1,592.5	1,562.8	1,533.7	3.2	5.6	94.06	137.8	-244.5	284.0	277.4	6.59	43.121			
1,700.0	1,690.1	1,659.5	1,627.9	3.6	6.0	96.14	145.2	-265.7	306.9	299.6	7.27	42.189			
1,800.0	1,787.8	1,756.3	1,722.0	3.9	6.5	97.94	152.6	-286.9	330.1	322.1	7.98	41.387			
1,900.0	1,885.5	1,853.1	1,816.2	4.3	6.9	99.50	160.0	-308.1	353.5	344.9	8.69	40.703			
2,000.0	1,983.2	1,949.9	1,910.3	4.7	7.3	100.87	167.4	-329.3	377.2	367.8	9.40	40.119			
2,100.0	2,080.9	2,046.7	2,004.4	5.1	7.8	102.08	174.8	-350.5	401.1	391.0	10.12	39.619			
2,200.0	2,178.5	2,143.4	2,098.6	5.5	8.2	103.15	182.2	-371.6	425.1	414.3	10.85	39.190			
2,300.0	2,276.2	2,240.2	2,192.7	5.9	8.6	104.11	189.6	-392.8	449.3	437.7	11.57	38.820			
2,400.0	2,373.9	2,337.0	2,286.9	6.3	9.1	104.97	197.0	-414.0	473.6	461.3	12.30	38.499			
2,500.0	2,471.6	2,433.8	2,381.0	6.7	9.5	105.75	204.4	-435.2	497.9	484.9	13.03	38.219			
2,600.0	2,569.3	2,530.5	2,475.1	7.1	9.9	106.45	211.8	-456.4	522.3	508.6	13.76	37.974			
2,700.0	2,667.0	2,627.3	2,569.3	7.5	10.4	107.09	219.2	-477.6	546.8	532.4	14.48	37.757			
2,800.0	2,764.6	2,724.1	2,663.4	7.9	10.8	107.68	226.6	-498.7	571.4	556.2	15.21	37.565			
2,900.0	2,862.3	2,820.9	2,757.6	8.3	11.2	108.22	234.0	-519.9	596.0	580.1	15.94	37.394			
3,000.0	2,960.0	2,917.7	2,851.7	8.7	11.7	108.71	241.4	-541.1	620.7	604.0	16.67	37.242			
3,100.0	3,057.7	3,014.4	2,945.9	9.1	12.1	109.17	248.8	-562.3	645.3	628.0	17.39	37.104			
3,200.0	3,155.4	3,111.2	3,040.0	9.5	12.5	109.59	256.2	-583.5	670.1	652.0	18.12	36.981			
3,300.0	3,253.1	3,208.0	3,134.1	9.9	13.0	109.99	263.6	-604.7	694.8	676.0	18.85	36.869			
3,400.0	3,350.7	3,304.8	3,228.3	10.3	13.4	110.36	271.0	-625.8	719.6	700.1	19.57	36.767			
3,500.0	3,448.4	3,401.6	3,322.4	10.7	13.8	110.70	278.4	-647.0	744.4	724.2	20.30	36.675			
3,600.0	3,546.1	3,498.3	3,416.6	11.1	14.3	111.02	285.8	-668.2	769.3	748.3	21.02	36.590			
3,700.0	3,643.8	3,595.1	3,510.7	11.5	14.7	111.32	293.2	-689.4	794.2	772.4	21.75	36.513			
3,800.0	3,741.5	3,691.9	3,604.8	11.9	15.1	111.60	300.6	-710.6	819.0	796.6	22.48	36.442			
3,900.0	3,839.2	3,788.7	3,699.0	12.4	15.6	111.87	308.0	-731.8	843.9	820.7	23.20	36.376			
4,000.0	3,936.8	3,885.4	3,793.1	12.8	16.0	112.12	315.4	-753.0	868.8	844.9	23.92	36.316			
4,100.0	4,034.5	3,982.2	3,887.3	13.2	16.5	112.35	322.7	-774.1	893.8	869.1	24.65	36.259			
4,200.0	4,132.2	4,079.0	3,981.4	13.6	16.9	112.58	330.1	-795.3	918.7	893.3	25.37	36.207			
4,300.0	4,229.9	4,175.8	4,075.6	14.0	17.3	112.79	337.5	-816.5	943.7	917.6	26.10	36.159			
4,400.0	4,327.6	4,272.6	4,169.7	14.4	17.8	112.99	344.9	-837.7	968.6	941.8	26.82	36.114			
4,500.0	4,425.2	4,369.3	4,263.8	14.8	18.2	113.18	352.3	-858.9	993.6	966.1	27.55	36.072			
4,600.0	4,522.9	4,466.1	4,358.0	15.2	18.6	113.36	359.7	-880.1	1,018.6	990.3	28.27	36.033			
4,700.0	4,620.6	4,562.9	4,452.1	15.7	19.1	113.54	367.1	-901.2	1,043.6	1,014.6	28.99	35.996			
4,800.0	4,718.3	4,659.7	4,546.3	16.1	19.5	113.70	374.5	-922.4	1,068.6	1,038.9	29.72	35.961			
4,900.0	4,816.0	4,756.5	4,640.4	16.5	19.9	113.86	381.9	-943.6	1,093.6	1,063.2	30.44	35.929			
5,000.0	4,913.7	4,853.2	4,734.5	16.9	20.4	114.01	389.3	-964.8	1,118.6	1,087.5	31.16	35.898			
5,100.0	5,011.3	4,950.0	4,828.7	17.3	20.8	114.15	396.7	-986.0	1,143.7	1,111.8	31.88	35.869			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-11B - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
5,200.0	5,109.0	5,046.8	4,922.8	17.7	21.2	114.29	404.1	-1,007.2	1,168.7	1,136.1	32.61	35.842			
5,300.0	5,206.7	5,143.6	5,017.0	18.1	21.7	114.42	411.5	-1,028.4	1,193.7	1,160.4	33.33	35.817			
5,400.0	5,304.4	5,240.3	5,111.1	18.5	22.1	114.55	418.9	-1,049.5	1,218.8	1,184.7	34.05	35.792			
5,500.0	5,402.1	5,337.1	5,205.3	19.0	22.5	114.67	426.3	-1,070.7	1,243.8	1,209.1	34.77	35.769			
5,600.0	5,499.8	5,433.9	5,299.4	19.4	23.0	114.79	433.7	-1,091.9	1,268.9	1,233.4	35.50	35.747 SF			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-11D - DD - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD		Offset Well Error: 0.0 ft												
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	5.71	33.9	3.4	34.0					
100.0	100.0	100.0	100.0	0.1	0.1	5.71	33.9	3.4	34.0	33.8	0.27	125.033		
200.0	200.0	200.0	200.0	0.3	0.3	5.71	33.9	3.4	34.0	33.4	0.62	54.790		
300.0	300.0	300.0	300.0	0.5	0.5	5.71	33.9	3.4	34.0	33.1	0.97	35.081		
400.0	400.0	400.6	400.6	0.7	0.7	1.51	33.0	0.9	33.1	31.7	1.33	24.931		
500.0	500.0	500.7	500.3	0.8	0.9	-12.22	30.6	-6.6	31.3	29.6	1.70	18.410		
528.8	528.8	529.3	528.8	0.9	1.0	-18.11	29.6	-9.7	31.1	29.3	1.81	17.186 CC, ES		
600.0	600.0	599.7	598.5	1.0	1.1	-35.43	26.6	-18.9	32.7	30.6	2.06	15.855		
700.0	700.0	698.1	695.4	1.2	1.5	-58.33	21.4	-34.7	41.0	38.7	2.37	17.304		
800.0	800.0	796.6	792.5	1.4	1.8	-72.32	16.2	-50.7	53.8	51.1	2.71	19.831		
900.0	900.0	895.1	889.6	1.5	2.1	-80.70	10.9	-66.8	68.4	65.4	3.09	22.171		
1,000.0	1,000.0	993.6	986.6	1.7	2.4	-86.06	5.7	-82.8	84.0	80.6	3.48	24.124		
1,100.0	1,100.0	1,092.5	1,084.0	1.9	2.8	51.10	0.4	-98.9	98.5	94.6	3.87	25.463		
1,200.0	1,199.6	1,191.9	1,181.9	2.1	3.1	51.07	-4.8	-115.0	109.8	105.5	4.25	25.828		
1,300.0	1,298.8	1,291.4	1,280.0	2.3	3.4	53.06	-10.1	-131.2	117.8	113.2	4.69	25.142		
1,400.0	1,397.1	1,390.9	1,378.1	2.6	3.8	56.82	-15.4	-147.4	123.2	117.9	5.22	23.594		
1,500.0	1,494.8	1,490.3	1,476.0	2.9	4.1	61.59	-20.7	-163.5	127.4	121.6	5.85	21.780		
1,600.0	1,592.5	1,589.6	1,573.9	3.2	4.5	66.05	-26.0	-179.7	132.5	126.0	6.54	20.262		
1,700.0	1,690.1	1,689.0	1,671.7	3.6	4.8	70.17	-31.3	-195.8	138.4	131.1	7.27	19.023		
1,800.0	1,787.8	1,788.3	1,769.6	3.9	5.2	73.93	-36.6	-212.0	144.9	136.8	8.04	18.026		
1,900.0	1,885.5	1,887.7	1,867.5	4.3	5.5	77.37	-41.8	-228.2	152.0	143.1	8.82	17.231		
2,000.0	1,983.2	1,987.0	1,965.4	4.7	5.9	80.48	-47.1	-244.3	159.5	149.9	9.61	16.599		
2,100.0	2,080.9	2,086.4	2,063.3	5.1	6.2	83.32	-52.4	-260.5	167.5	157.1	10.41	16.098		
2,200.0	2,178.5	2,185.8	2,161.2	5.5	6.5	85.88	-57.7	-276.6	175.9	164.7	11.20	15.701		
2,300.0	2,276.2	2,285.1	2,259.1	5.9	6.9	88.21	-63.0	-292.8	184.6	172.6	12.00	15.386		
2,400.0	2,373.9	2,384.5	2,356.9	6.3	7.2	90.33	-68.3	-308.9	193.6	180.8	12.79	15.137		
2,500.0	2,471.6	2,483.8	2,454.8	6.7	7.6	92.26	-73.5	-325.1	202.8	189.2	13.57	14.941		
2,600.0	2,569.3	2,583.2	2,552.7	7.1	7.9	94.03	-78.8	-341.3	212.2	197.9	14.35	14.786		
2,700.0	2,667.0	2,682.5	2,650.6	7.5	8.3	95.64	-84.1	-357.4	221.8	206.7	15.13	14.664		
2,800.0	2,764.6	2,781.9	2,748.5	7.9	8.6	97.11	-89.4	-373.6	231.6	215.7	15.90	14.569		
2,900.0	2,862.3	2,881.2	2,846.4	8.3	9.0	98.47	-94.7	-389.7	241.5	224.9	16.66	14.496		
3,000.0	2,960.0	2,980.6	2,944.3	8.7	9.3	99.72	-100.0	-405.9	251.5	234.1	17.42	14.441		
3,100.0	3,057.7	3,079.9	3,042.2	9.1	9.7	100.87	-105.3	-422.0	261.7	243.5	18.17	14.400		
3,200.0	3,155.4	3,179.3	3,140.0	9.5	10.0	101.94	-110.5	-438.2	271.9	253.0	18.92	14.370		
3,300.0	3,253.1	3,278.6	3,237.9	9.9	10.4	102.93	-115.8	-454.3	282.3	262.6	19.67	14.351		
3,400.0	3,350.7	3,378.0	3,335.8	10.3	10.7	103.85	-121.1	-470.5	292.7	272.2	20.41	14.339		
3,500.0	3,448.4	3,477.3	3,433.7	10.7	11.0	104.71	-126.4	-486.7	303.1	282.0	21.15	14.333		
3,600.0	3,546.1	3,576.7	3,531.6	11.1	11.4	105.50	-131.7	-502.8	313.7	291.8	21.88	14.333		
3,700.0	3,643.8	3,676.0	3,629.5	11.5	11.7	106.25	-137.0	-519.0	324.3	301.6	22.62	14.337		
3,800.0	3,741.5	3,775.4	3,727.4	11.9	12.1	106.95	-142.2	-535.1	334.9	311.5	23.35	14.345		
3,900.0	3,839.2	3,874.7	3,825.2	12.4	12.4	107.61	-147.5	-551.3	345.6	321.5	24.07	14.355		
4,000.0	3,936.8	3,974.1	3,923.1	12.8	12.8	108.23	-152.8	-567.4	356.3	331.5	24.80	14.368		
4,100.0	4,034.5	4,073.4	4,021.0	13.2	13.1	108.81	-158.1	-583.6	367.1	341.6	25.52	14.383		
4,200.0	4,132.2	4,172.8	4,118.9	13.6	13.5	109.35	-163.4	-599.7	377.9	351.6	26.24	14.399		
4,300.0	4,229.9	4,272.1	4,216.8	14.0	13.8	109.87	-168.7	-615.9	388.7	361.8	26.96	14.417		
4,400.0	4,327.6	4,371.5	4,314.7	14.4	14.2	110.36	-173.9	-632.1	399.6	371.9	27.68	14.435		
4,500.0	4,425.2	4,470.8	4,412.6	14.8	14.5	110.83	-179.2	-648.2	410.5	382.1	28.40	14.455		
4,600.0	4,522.9	4,570.2	4,510.4	15.2	14.9	111.27	-184.5	-664.4	421.4	392.3	29.11	14.475		
4,700.0	4,620.6	4,669.5	4,608.3	15.7	15.2	111.68	-189.8	-680.5	432.4	402.5	29.83	14.495		
4,800.0	4,718.3	4,768.9	4,706.2	16.1	15.6	112.08	-195.1	-696.7	443.3	412.8	30.54	14.516		
4,900.0	4,816.0	4,868.2	4,804.1	16.5	15.9	112.46	-200.4	-712.8	454.3	423.0	31.25	14.537		
5,000.0	4,913.7	4,967.6	4,902.0	16.9	16.2	112.82	-205.6	-729.0	465.3	433.3	31.96	14.558		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-11D - DD - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,100.0	5,011.3	5,066.9	4,999.9	17.3	16.6	113.16	-210.9	-745.1	476.3	443.7	32.67	14.579		
5,200.0	5,109.0	5,166.3	5,097.8	17.7	16.9	113.49	-216.2	-761.3	487.4	454.0	33.38	14.600		
5,300.0	5,206.7	5,265.6	5,195.7	18.1	17.3	113.80	-221.5	-777.5	498.4	464.3	34.09	14.621		
5,400.0	5,304.4	5,365.0	5,293.5	18.5	17.6	114.10	-226.8	-793.6	509.5	474.7	34.79	14.642		
5,500.0	5,402.1	5,464.3	5,391.4	19.0	18.0	114.39	-232.1	-809.8	520.6	485.1	35.50	14.663		
5,600.0	5,499.8	5,563.7	5,489.3	19.4	18.3	114.66	-237.3	-825.9	531.6	495.4	36.21	14.684		
5,700.0	5,597.4	5,663.0	5,587.2	19.8	18.7	114.93	-242.6	-842.1	542.7	505.8	36.91	14.704		
5,800.0	5,695.1	5,762.4	5,685.1	20.2	19.0	115.18	-247.9	-858.2	553.9	516.2	37.62	14.724		
5,900.0	5,792.8	5,861.8	5,783.0	20.6	19.4	115.42	-253.2	-874.4	565.0	526.7	38.32	14.744		
6,000.0	5,890.5	5,961.1	5,880.9	21.0	19.7	115.66	-258.5	-890.6	576.1	537.1	39.02	14.763		
6,100.0	5,988.2	6,060.5	5,978.7	21.4	20.1	115.88	-263.8	-906.7	587.3	547.5	39.73	14.783		
6,200.0	6,085.8	6,159.8	6,076.6	21.9	20.4	116.10	-269.0	-922.9	598.4	558.0	40.43	14.802		
6,300.0	6,183.5	6,259.2	6,174.5	22.3	20.8	116.31	-274.3	-939.0	609.6	568.4	41.13	14.821		
6,400.0	6,281.2	6,358.5	6,272.4	22.7	21.1	116.51	-279.6	-955.2	620.7	578.9	41.83	14.839		
6,500.0	6,378.9	6,457.9	6,370.3	23.1	21.4	116.70	-284.9	-971.3	631.9	589.4	42.53	14.857		
6,600.0	6,476.6	6,557.2	6,468.2	23.5	21.8	116.89	-290.2	-987.5	643.1	599.9	43.23	14.875		
6,700.0	6,574.3	6,656.6	6,566.1	23.9	22.1	117.07	-295.5	-1,003.6	654.3	610.3	43.93	14.893		
6,800.0	6,671.9	6,755.9	6,664.0	24.3	22.5	117.24	-300.7	-1,019.8	665.5	620.8	44.63	14.910		
6,900.0	6,769.6	6,855.3	6,761.8	24.8	22.8	117.41	-306.0	-1,036.0	676.7	631.3	45.33	14.927		
7,000.0	6,867.3	6,954.6	6,859.7	25.2	23.2	117.58	-311.3	-1,052.1	687.9	641.8	46.03	14.943		
7,100.0	6,965.0	7,054.0	6,957.6	25.6	23.5	117.73	-316.6	-1,068.3	699.1	652.4	46.73	14.960		
7,200.0	7,062.8	7,153.3	7,055.5	26.0	23.9	117.95	-321.9	-1,084.4	710.1	662.7	47.43	14.972		
7,300.0	7,161.1	7,253.2	7,154.0	26.3	24.2	118.03	-327.2	-1,100.6	719.6	671.5	48.10	14.963		
7,400.0	7,260.1	7,354.5	7,254.2	26.6	24.5	118.02	-331.7	-1,114.6	727.4	678.7	48.67	14.946		
7,500.0	7,359.5	7,456.0	7,355.0	26.8	24.7	118.02	-335.2	-1,125.2	733.3	684.2	49.13	14.925		
7,600.0	7,459.2	7,557.6	7,456.4	27.0	24.9	118.03	-337.6	-1,132.5	737.4	687.9	49.49	14.898		
7,700.0	7,559.1	7,659.4	7,558.0	27.1	25.0	118.03	-338.9	-1,136.4	739.5	689.8	49.75	14.866		
7,800.0	7,659.1	7,760.5	7,659.1	27.2	25.1	-21.96	-339.1	-1,137.0	739.9	690.0	49.94	14.817		
7,900.0	7,759.1	7,860.5	7,759.1	27.3	25.2	-21.96	-339.1	-1,137.0	739.9	689.8	50.13	14.760		
8,000.0	7,859.1	7,960.5	7,859.1	27.4	25.3	-21.96	-339.1	-1,137.0	739.9	689.6	50.32	14.704		
8,100.0	7,959.1	8,060.5	7,959.1	27.5	25.4	-21.96	-339.1	-1,137.0	739.9	689.4	50.51	14.648		
8,200.0	8,059.1	8,160.5	8,059.1	27.6	25.5	-21.96	-339.1	-1,137.0	739.9	689.2	50.71	14.591		
8,300.0	8,159.1	8,260.5	8,159.1	27.7	25.6	-21.96	-339.1	-1,137.0	739.9	689.0	50.91	14.535		
8,400.0	8,259.1	8,360.5	8,259.1	27.7	25.7	-21.96	-339.1	-1,137.0	739.9	688.8	51.11	14.479		
8,500.0	8,359.1	8,460.5	8,359.1	27.8	25.8	-21.96	-339.1	-1,137.0	739.9	688.6	51.31	14.422		
8,600.0	8,459.1	8,560.5	8,459.1	27.9	25.9	-21.96	-339.1	-1,137.0	739.9	688.4	51.51	14.366		
8,700.0	8,559.1	8,660.5	8,559.1	28.0	26.0	-21.96	-339.1	-1,137.0	739.9	688.2	51.71	14.309		
8,800.0	8,659.1	8,760.5	8,659.1	28.1	26.1	-21.96	-339.1	-1,137.0	739.9	688.0	51.91	14.253		
8,900.0	8,759.1	8,860.5	8,759.1	28.2	26.2	-21.96	-339.1	-1,137.0	739.9	687.8	52.12	14.196		
9,000.0	8,859.1	8,960.5	8,859.1	28.3	26.3	-21.96	-339.1	-1,137.0	739.9	687.6	52.33	14.140		
9,100.0	8,959.1	9,060.5	8,959.1	28.4	26.4	-21.96	-339.1	-1,137.0	739.9	687.4	52.54	14.084		
9,200.0	9,059.1	9,160.5	9,059.1	28.5	26.5	-21.96	-339.1	-1,137.0	739.9	687.2	52.75	14.027		
9,300.0	9,159.1	9,260.5	9,159.1	28.6	26.6	-21.96	-339.1	-1,137.0	739.9	687.0	52.96	13.971		
9,400.0	9,259.1	9,360.5	9,259.1	28.7	26.7	-21.96	-339.1	-1,137.0	739.9	686.8	53.18	13.915		
9,500.0	9,359.1	9,460.5	9,359.1	28.8	26.9	-21.96	-339.1	-1,137.0	739.9	686.5	53.39	13.859		
9,600.0	9,459.1	9,560.5	9,459.1	28.9	27.0	-21.96	-339.1	-1,137.0	739.9	686.3	53.61	13.803		
9,700.0	9,559.1	9,660.5	9,559.1	29.0	27.1	-21.96	-339.1	-1,137.0	739.9	686.1	53.82	13.747		
9,800.0	9,659.1	9,760.5	9,659.1	29.1	27.2	-21.96	-339.1	-1,137.0	739.9	685.9	54.04	13.691		
9,900.0	9,759.1	9,860.5	9,759.1	29.2	27.3	-21.96	-339.1	-1,137.0	739.9	685.7	54.26	13.636		
10,000.0	9,859.1	9,960.5	9,859.1	29.3	27.4	-21.96	-339.1	-1,137.0	739.9	685.4	54.49	13.580		
10,100.0	9,959.1	10,060.5	9,959.1	29.4	27.5	-21.96	-339.1	-1,137.0	739.9	685.2	54.71	13.525		
10,157.2	10,016.3	10,117.7	10,016.3	29.5	27.6	-21.96	-339.1	-1,137.0	739.9	685.1	54.84	13.493		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-11D - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
10,200.0	10,059.1	10,138.4	10,037.0	29.5	27.6	-21.96	-339.1	-1,137.0	740.3	685.4	54.91	13.481 SF		
10,300.0	10,159.1	10,138.4	10,037.0	29.6	27.6	-21.96	-339.1	-1,137.0	749.9	694.9	55.02	13.629		
10,400.0	10,259.1	10,138.4	10,037.0	29.7	27.6	-21.96	-339.1	-1,137.0	772.5	717.4	55.14	14.011		
10,500.0	10,359.1	10,138.4	10,037.0	29.8	27.6	-21.96	-339.1	-1,137.0	807.0	751.7	55.25	14.605		
10,600.0	10,459.1	10,138.4	10,037.0	29.9	27.6	-21.96	-339.1	-1,137.0	851.9	796.5	55.37	15.385		
10,700.0	10,559.1	10,138.4	10,037.0	30.1	27.6	-21.96	-339.1	-1,137.0	905.6	850.1	55.48	16.321		
10,800.0	10,659.1	10,138.4	10,037.0	30.2	27.6	-21.96	-339.1	-1,137.0	966.7	911.1	55.60	17.386		
10,900.0	10,759.1	10,138.4	10,037.0	30.3	27.6	-21.96	-339.1	-1,137.0	1,033.9	978.2	55.72	18.555		
10,916.9	10,776.0	10,138.4	10,037.0	30.3	27.6	-21.96	-339.1	-1,137.0	1,045.8	990.0	55.74	18.762		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14A - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total	Separation	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	5.77	16.8	1.7	16.8					
100.0	100.0	100.0	100.0	0.1	0.1	5.77	16.8	1.7	16.8	16.6	0.27	61.851		
200.0	200.0	200.0	200.0	0.3	0.3	5.77	16.8	1.7	16.8	16.2	0.62	27.103		
300.0	300.0	300.5	300.5	0.5	0.5	-1.26	15.1	-0.3	15.1	14.1	0.98	15.370		
400.0	400.0	400.5	400.2	0.7	0.7	-32.48	10.0	-6.4	11.8	10.5	1.36	8.704		
414.5	414.5	414.9	414.5	0.7	0.8	-40.05	9.0	-7.6	11.7	10.3	1.41	8.305 CC, ES		
500.0	500.0	499.4	498.2	0.8	1.0	-84.08	1.7	-16.2	16.4	14.8	1.67	9.837		
600.0	600.0	598.0	595.5	1.0	1.3	-106.77	-8.6	-28.4	30.0	28.0	2.04	14.709		
700.0	700.0	696.7	692.9	1.2	1.6	-114.87	-18.8	-40.7	45.4	42.9	2.45	18.530		
800.0	800.0	795.4	790.3	1.4	1.9	-118.84	-29.1	-52.9	61.2	58.3	2.86	21.358		
900.0	900.0	894.1	887.7	1.5	2.3	-121.18	-39.4	-65.1	77.1	73.8	3.28	23.502		
1,000.0	1,000.0	992.8	985.0	1.7	2.6	-122.71	-49.7	-77.4	93.1	89.4	3.70	25.173		
1,100.0	1,100.0	1,091.8	1,082.8	1.9	2.9	16.48	-60.0	-89.6	106.7	103.0	3.77	28.344		
1,200.0	1,199.6	1,191.4	1,181.1	2.1	3.2	16.59	-70.4	-102.0	115.4	111.2	4.12	28.017		
1,300.0	1,298.8	1,291.3	1,279.7	2.3	3.6	17.45	-80.8	-114.4	119.0	114.5	4.47	26.598		
1,400.0	1,397.1	1,391.3	1,378.3	2.6	3.9	19.10	-91.2	-126.7	117.7	112.8	4.84	24.300		
1,500.0	1,494.8	1,491.1	1,476.8	2.9	4.2	21.35	-101.6	-139.1	113.5	108.2	5.25	21.602		
1,600.0	1,592.5	1,590.9	1,575.3	3.2	4.6	23.77	-112.0	-151.5	109.4	103.7	5.69	19.212		
1,700.0	1,690.1	1,690.7	1,673.8	3.6	4.9	26.37	-122.4	-163.8	105.6	99.4	6.17	17.098		
1,800.0	1,787.8	1,790.5	1,772.2	3.9	5.2	29.16	-132.8	-176.2	101.9	95.2	6.70	15.219		
1,900.0	1,885.5	1,890.3	1,870.7	4.3	5.6	32.15	-143.2	-188.6	98.6	91.3	7.28	13.550		
2,000.0	1,983.2	1,990.1	1,969.2	4.7	5.9	35.34	-153.6	-201.0	95.5	87.6	7.91	12.072		
2,100.0	2,080.9	2,089.9	2,067.7	5.1	6.2	38.72	-164.0	-213.3	92.8	84.2	8.62	10.769		
2,200.0	2,178.5	2,189.7	2,166.2	5.5	6.6	42.30	-174.4	-225.7	90.4	81.0	9.39	9.630		
2,300.0	2,276.2	2,289.5	2,264.7	5.9	6.9	46.06	-184.8	-238.1	88.4	78.1	10.22	8.644		
2,400.0	2,373.9	2,389.3	2,363.2	6.3	7.2	49.98	-195.2	-250.4	86.7	75.6	11.12	7.800		
2,500.0	2,471.6	2,489.1	2,461.7	6.7	7.6	54.03	-205.6	-262.8	85.5	73.4	12.07	7.085		
2,600.0	2,569.3	2,589.0	2,560.2	7.1	7.9	58.17	-216.0	-275.2	84.7	71.7	13.06	6.489		
2,700.0	2,667.0	2,688.8	2,658.7	7.5	8.2	62.36	-226.4	-287.5	84.4	70.3	14.08	5.997		
2,720.4	2,686.9	2,709.1	2,678.8	7.5	8.3	63.22	-228.5	-290.1	84.4	70.1	14.29	5.908		
2,800.0	2,764.6	2,788.6	2,757.1	7.9	8.6	66.57	-236.7	-299.9	84.6	69.4	15.10	5.598		
2,900.0	2,862.3	2,888.4	2,855.6	8.3	8.9	70.74	-247.1	-312.3	85.1	69.0	16.12	5.280		
3,000.0	2,960.0	2,988.2	2,954.1	8.7	9.2	74.83	-257.5	-324.6	86.2	69.0	17.13	5.032		
3,100.0	3,057.7	3,088.0	3,052.6	9.1	9.6	78.80	-267.9	-337.0	87.6	69.5	18.10	4.843		
3,200.0	3,155.4	3,187.8	3,151.1	9.5	9.9	82.63	-278.3	-349.4	89.5	70.5	19.03	4.705		
3,300.0	3,253.1	3,287.6	3,249.6	9.9	10.2	86.28	-288.7	-361.8	91.8	71.9	19.91	4.609		
3,400.0	3,350.7	3,387.4	3,348.1	10.3	10.6	89.75	-299.1	-374.1	94.4	73.6	20.75	4.549		
3,500.0	3,448.4	3,487.2	3,446.6	10.7	10.9	93.02	-309.5	-386.5	97.3	75.8	21.54	4.518		
3,600.0	3,546.1	3,587.0	3,545.1	11.1	11.2	96.09	-319.9	-398.9	100.5	78.3	22.28	4.512 SF		
3,700.0	3,643.8	3,686.8	3,643.6	11.5	11.6	98.96	-330.3	-411.2	104.1	81.1	22.99	4.527		
3,800.0	3,741.5	3,786.6	3,742.1	11.9	11.9	101.64	-340.7	-423.6	107.8	84.2	23.65	4.558		
3,900.0	3,839.2	3,886.4	3,840.5	12.4	12.2	104.13	-351.1	-436.0	111.8	87.5	24.29	4.602		
4,000.0	3,936.8	3,986.2	3,939.0	12.8	12.6	106.45	-361.5	-448.3	115.9	91.1	24.89	4.658		
4,100.0	4,034.5	4,086.1	4,037.5	13.2	12.9	108.60	-371.9	-460.7	120.3	94.8	25.47	4.723		
4,200.0	4,132.2	4,185.9	4,136.0	13.6	13.2	110.60	-382.3	-473.1	124.8	98.8	26.03	4.795		
4,300.0	4,229.9	4,285.7	4,234.5	14.0	13.6	112.46	-392.7	-485.4	129.4	102.9	26.57	4.872		
4,400.0	4,327.6	4,385.5	4,333.0	14.4	13.9	114.19	-403.1	-497.8	134.2	107.1	27.09	4.954		
4,500.0	4,425.2	4,485.3	4,431.5	14.8	14.2	115.81	-413.5	-510.2	139.1	111.5	27.60	5.039		
4,600.0	4,522.9	4,585.1	4,530.0	15.2	14.6	117.31	-423.9	-522.6	144.1	116.0	28.10	5.126		
4,700.0	4,620.6	4,684.9	4,628.5	15.7	14.9	118.70	-434.3	-534.9	149.1	120.6	28.60	5.216		
4,800.0	4,718.3	4,784.7	4,727.0	16.1	15.2	120.01	-444.7	-547.3	154.3	125.2	29.08	5.306		
4,900.0	4,816.0	4,884.5	4,825.4	16.5	15.6	121.23	-455.1	-559.7	159.5	130.0	29.56	5.397		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14A - DD - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,000.0	4,913.7	4,984.3	4,923.9	16.9	15.9	122.38	-465.5	-572.0	164.9	134.8	30.04	5.488		
5,100.0	5,011.3	5,084.1	5,022.4	17.3	16.2	123.45	-475.9	-584.4	170.2	139.7	30.51	5.580		
5,200.0	5,109.0	5,183.9	5,120.9	17.7	16.6	124.45	-486.3	-596.8	175.6	144.7	30.97	5.670		
5,300.0	5,206.7	5,283.7	5,219.4	18.1	16.9	125.40	-496.7	-609.1	181.1	149.7	31.44	5.761		
5,400.0	5,304.4	5,383.5	5,317.9	18.5	17.2	126.29	-507.1	-621.5	186.6	154.7	31.90	5.850		
5,500.0	5,402.1	5,483.4	5,416.4	19.0	17.6	127.13	-517.5	-633.9	192.2	159.8	32.37	5.938		
5,600.0	5,499.8	5,583.2	5,514.9	19.4	17.9	127.92	-527.9	-646.2	197.8	165.0	32.83	6.025		
5,700.0	5,597.4	5,683.0	5,613.4	19.8	18.2	128.67	-538.2	-658.6	203.4	170.1	33.29	6.111		
5,800.0	5,695.1	5,782.8	5,711.9	20.2	18.6	129.37	-548.6	-671.0	209.1	175.3	33.75	6.196		
5,900.0	5,792.8	5,882.6	5,810.3	20.6	18.9	130.04	-559.0	-683.4	214.8	180.6	34.21	6.279		
6,000.0	5,890.5	5,982.4	5,908.8	21.0	19.2	130.68	-569.4	-695.7	220.5	185.9	34.66	6.361		
6,100.0	5,988.2	6,082.2	6,007.3	21.4	19.6	131.28	-579.8	-708.1	226.3	191.1	35.12	6.442		
6,200.0	6,085.8	6,182.0	6,105.8	21.9	19.9	131.85	-590.2	-720.5	232.0	196.5	35.58	6.521		
6,300.0	6,183.5	6,281.8	6,204.3	22.3	20.2	132.40	-600.6	-732.8	237.8	201.8	36.04	6.599		
6,400.0	6,281.2	6,381.6	6,302.8	22.7	20.6	132.92	-611.0	-745.2	243.7	207.2	36.50	6.675		
6,500.0	6,378.9	6,481.4	6,401.3	23.1	20.9	133.41	-621.4	-757.6	249.5	212.5	36.96	6.750		
6,600.0	6,476.6	6,581.2	6,499.8	23.5	21.2	133.89	-631.8	-769.9	255.3	217.9	37.42	6.824		
6,700.0	6,574.3	6,681.0	6,598.3	23.9	21.6	134.34	-642.2	-782.3	261.2	223.3	37.88	6.896		
6,800.0	6,671.9	6,780.8	6,696.8	24.3	21.9	134.77	-652.6	-794.7	267.1	228.8	38.34	6.966		
6,900.0	6,769.6	6,880.6	6,795.2	24.8	22.2	135.18	-663.0	-807.0	273.0	234.2	38.80	7.035		
7,000.0	6,867.3	6,980.5	6,893.7	25.2	22.5	135.58	-673.4	-819.4	278.9	239.7	39.27	7.103		
7,100.0	6,965.0	7,080.3	6,992.2	25.6	22.9	135.95	-683.8	-831.8	284.8	245.1	39.73	7.170		
7,200.0	7,062.8	7,180.1	7,090.7	26.0	23.2	136.29	-694.2	-844.2	290.4	250.2	40.21	7.224		
7,300.0	7,161.1	7,278.2	7,187.5	26.3	23.5	136.24	-704.3	-856.2	293.9	253.1	40.78	7.207		
7,400.0	7,260.1	7,372.4	7,280.9	26.6	23.8	136.12	-712.5	-865.9	296.4	255.1	41.29	7.178		
7,500.0	7,359.5	7,466.6	7,374.6	26.8	24.0	136.03	-718.7	-873.3	298.3	256.6	41.71	7.151		
7,600.0	7,459.2	7,560.8	7,468.6	27.0	24.2	135.98	-722.9	-878.3	299.6	257.6	42.04	7.126		
7,700.0	7,559.1	7,655.0	7,562.7	27.1	24.3	135.96	-725.1	-881.0	300.3	258.1	42.29	7.103		
7,800.0	7,659.1	7,751.4	7,659.1	27.2	24.4	-4.04	-725.5	-881.4	300.5	258.0	42.48	7.073		
7,900.0	7,759.1	7,851.4	7,759.1	27.3	24.5	-4.04	-725.5	-881.4	300.5	257.8	42.71	7.036		
8,000.0	7,859.1	7,951.4	7,859.1	27.4	24.6	-4.04	-725.5	-881.4	300.5	257.6	42.93	7.000		
8,100.0	7,959.1	8,051.4	7,959.1	27.5	24.7	-4.04	-725.5	-881.4	300.5	257.4	43.16	6.963		
8,200.0	8,059.1	8,151.4	8,059.1	27.6	24.8	-4.04	-725.5	-881.4	300.5	257.1	43.39	6.926		
8,300.0	8,159.1	8,251.4	8,159.1	27.7	24.9	-4.04	-725.5	-881.4	300.5	256.9	43.62	6.890		
8,400.0	8,259.1	8,351.4	8,259.1	27.7	25.0	-4.04	-725.5	-881.4	300.5	256.7	43.85	6.853		
8,500.0	8,359.1	8,451.4	8,359.1	27.8	25.1	-4.04	-725.5	-881.4	300.5	256.4	44.08	6.817		
8,600.0	8,459.1	8,551.4	8,459.1	27.9	25.2	-4.04	-725.5	-881.4	300.5	256.2	44.32	6.781		
8,700.0	8,559.1	8,651.4	8,559.1	28.0	25.3	-4.04	-725.5	-881.4	300.5	256.0	44.55	6.745		
8,800.0	8,659.1	8,751.4	8,659.1	28.1	25.4	-4.04	-725.5	-881.4	300.5	255.7	44.79	6.709		
8,900.0	8,759.1	8,851.4	8,759.1	28.2	25.5	-4.04	-725.5	-881.4	300.5	255.5	45.03	6.674		
9,000.0	8,859.1	8,951.4	8,859.1	28.3	25.6	-4.04	-725.5	-881.4	300.5	255.2	45.27	6.638		
9,100.0	8,959.1	9,051.4	8,959.1	28.4	25.7	-4.04	-725.5	-881.4	300.5	255.0	45.51	6.603		
9,200.0	9,059.1	9,151.4	9,059.1	28.5	25.8	-4.04	-725.5	-881.4	300.5	254.8	45.75	6.568		
9,300.0	9,159.1	9,251.4	9,159.1	28.6	25.9	-4.04	-725.5	-881.4	300.5	254.5	46.00	6.533		
9,400.0	9,259.1	9,351.4	9,259.1	28.7	26.0	-4.04	-725.5	-881.4	300.5	254.3	46.24	6.498		
9,500.0	9,359.1	9,451.4	9,359.1	28.8	26.1	-4.04	-725.5	-881.4	300.5	254.0	46.49	6.464		
9,600.0	9,459.1	9,551.4	9,459.1	28.9	26.2	-4.04	-725.5	-881.4	300.5	253.8	46.74	6.430		
9,700.0	9,559.1	9,651.4	9,559.1	29.0	26.3	-4.04	-725.5	-881.4	300.5	253.5	46.99	6.395		
9,800.0	9,659.1	9,751.4	9,659.1	29.1	26.5	-4.04	-725.5	-881.4	300.5	253.3	47.24	6.361		
9,900.0	9,759.1	9,851.4	9,759.1	29.2	26.6	-4.04	-725.5	-881.4	300.5	253.0	47.49	6.328		
10,000.0	9,859.1	9,951.4	9,859.1	29.3	26.7	-4.04	-725.5	-881.4	300.5	252.8	47.75	6.294		
10,100.0	9,959.1	10,051.4	9,959.1	29.4	26.8	-4.04	-725.5	-881.4	300.5	252.5	48.00	6.261		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14A - DD - Plan #1												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
10,157.2	10,016.3	10,108.6	10,016.3	29.5	26.9	-4.04	-725.5	-881.4	300.5	252.4	48.15	6.242	
10,200.0	10,059.1	10,129.3	10,037.0	29.5	26.9	-4.04	-725.5	-881.4	301.3	253.1	48.23	6.248	
10,300.0	10,159.1	10,129.3	10,037.0	29.6	26.9	-4.04	-725.5	-881.4	324.4	276.0	48.36	6.708	
10,400.0	10,259.1	10,129.3	10,037.0	29.7	26.9	-4.04	-725.5	-881.4	373.7	325.2	48.49	7.707	
10,500.0	10,359.1	10,129.3	10,037.0	29.8	26.9	-4.04	-725.5	-881.4	440.5	391.9	48.62	9.061	
10,600.0	10,459.1	10,129.3	10,037.0	29.9	26.9	-4.04	-725.5	-881.4	518.1	469.4	48.75	10.630	
10,700.0	10,559.1	10,129.3	10,037.0	30.1	26.9	-4.04	-725.5	-881.4	602.4	553.5	48.88	12.325	
10,800.0	10,659.1	10,129.3	10,037.0	30.2	26.9	-4.04	-725.5	-881.4	690.9	641.9	49.01	14.097	
10,900.0	10,759.1	10,129.3	10,037.0	30.3	26.9	-4.04	-725.5	-881.4	782.1	733.0	49.14	15.916	
10,916.9	10,776.0	10,129.3	10,037.0	30.3	26.9	-4.04	-725.5	-881.4	797.8	748.6	49.16	16.227	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D2 - DD - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-175.28	-17.1	-1.4	17.2					
100.0	100.0	100.0	100.0	0.1	0.1	-175.28	-17.1	-1.4	17.2	16.9	0.27	63.088		
200.0	200.0	200.0	200.0	0.3	0.3	-175.28	-17.1	-1.4	17.2	16.6	0.62	27.645		
300.0	300.0	300.0	300.0	0.5	0.5	-175.28	-17.1	-1.4	17.2	16.2	0.97	17.701		
400.0	400.0	400.0	400.0	0.7	0.7	-175.28	-17.1	-1.4	17.2	15.9	1.32	13.018		
500.0	500.0	500.0	500.0	0.8	0.8	-175.28	-17.1	-1.4	17.2	15.5	1.67	10.295		
600.0	600.0	600.0	600.0	1.0	1.0	-175.28	-17.1	-1.4	17.2	15.2	2.02	8.514		
700.0	700.0	700.0	700.0	1.2	1.2	-175.28	-17.1	-1.4	17.2	14.8	2.37	7.258		
800.0	800.0	800.0	800.0	1.4	1.4	-175.28	-17.1	-1.4	17.2	14.5	2.72	6.325		
900.0	900.0	900.0	900.0	1.5	1.5	-175.28	-17.1	-1.4	17.2	14.1	3.06	5.605		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-175.28	-17.1	-1.4	17.2	13.8	3.41	5.032 CC		
1,100.0	1,100.0	1,099.2	1,099.2	1.9	1.9	-36.28	-19.3	-2.8	17.3	13.6	3.76	4.612 ES		
1,200.0	1,199.6	1,198.4	1,198.1	2.1	2.1	-39.17	-25.8	-6.9	17.9	13.8	4.11	4.345		
1,300.0	1,298.8	1,297.6	1,296.4	2.3	2.3	-43.59	-36.7	-13.8	18.8	14.3	4.50	4.191		
1,400.0	1,397.1	1,396.8	1,393.9	2.6	2.6	-49.00	-51.8	-23.4	20.4	15.4	4.95	4.113 SF		
1,500.0	1,494.8	1,495.9	1,490.4	2.9	2.9	-50.87	-71.2	-35.7	23.8	18.3	5.48	4.338		
1,600.0	1,592.5	1,595.8	1,586.9	3.2	3.3	-48.90	-92.7	-49.3	29.0	23.0	6.00	4.828		
1,700.0	1,690.1	1,695.6	1,683.5	3.6	3.7	-47.52	-114.3	-63.0	34.2	27.7	6.54	5.233		
1,800.0	1,787.8	1,795.5	1,780.0	3.9	4.1	-46.52	-135.8	-76.7	39.4	32.4	7.08	5.570		
1,900.0	1,885.5	1,895.4	1,876.5	4.3	4.5	-45.75	-157.4	-90.3	44.7	37.1	7.64	5.854		
2,000.0	1,983.2	1,995.2	1,973.1	4.7	5.0	-45.14	-179.0	-104.0	50.0	41.8	8.20	6.095		
2,100.0	2,080.9	2,095.1	2,069.6	5.1	5.4	-44.64	-200.5	-117.7	55.2	46.5	8.76	6.303		
2,200.0	2,178.5	2,194.9	2,166.2	5.5	5.9	-44.24	-222.1	-131.3	60.5	51.1	9.33	6.483		
2,300.0	2,276.2	2,294.8	2,262.7	5.9	6.3	-43.89	-243.6	-145.0	65.7	55.8	9.90	6.640		
2,400.0	2,373.9	2,394.7	2,359.3	6.3	6.8	-43.60	-265.2	-158.6	71.0	60.5	10.48	6.779		
2,500.0	2,471.6	2,494.5	2,455.8	6.7	7.3	-43.35	-286.7	-172.3	76.3	65.2	11.05	6.901		
2,600.0	2,569.3	2,594.4	2,552.4	7.1	7.7	-43.13	-308.3	-186.0	81.6	69.9	11.63	7.011		
2,700.0	2,667.0	2,694.2	2,648.9	7.5	8.2	-42.94	-329.8	-199.6	86.8	74.6	12.21	7.109		
2,800.0	2,764.6	2,794.1	2,745.4	7.9	8.7	-42.77	-351.4	-213.3	92.1	79.3	12.80	7.197		
2,900.0	2,862.3	2,894.0	2,842.0	8.3	9.1	-42.62	-372.9	-226.9	97.4	84.0	13.38	7.277		
3,000.0	2,960.0	2,993.8	2,938.5	8.7	9.6	-42.48	-394.5	-240.6	102.7	88.7	13.97	7.350		
3,100.0	3,057.7	3,093.7	3,035.1	9.1	10.1	-42.36	-416.0	-254.3	107.9	93.4	14.55	7.416		
3,200.0	3,155.4	3,193.5	3,131.6	9.5	10.6	-42.25	-437.6	-267.9	113.2	98.1	15.14	7.477		
3,300.0	3,253.1	3,293.4	3,228.2	9.9	11.0	-42.15	-459.1	-281.6	118.5	102.7	15.73	7.533		
3,400.0	3,350.7	3,393.3	3,324.7	10.3	11.5	-42.05	-480.7	-295.3	123.8	107.4	16.32	7.585		
3,500.0	3,448.4	3,493.1	3,421.3	10.7	12.0	-41.97	-502.2	-308.9	129.0	112.1	16.91	7.633		
3,600.0	3,546.1	3,593.0	3,517.8	11.1	12.5	-41.89	-523.8	-322.6	134.3	116.8	17.49	7.677		
3,700.0	3,643.8	3,692.8	3,614.4	11.5	12.9	-41.82	-545.3	-336.2	139.6	121.5	18.09	7.718		
3,800.0	3,741.5	3,792.7	3,710.9	11.9	13.4	-41.75	-566.9	-349.9	144.9	126.2	18.68	7.757		
3,900.0	3,839.2	3,892.6	3,807.4	12.4	13.9	-41.69	-588.4	-363.6	150.1	130.9	19.27	7.793		
4,000.0	3,936.8	3,992.4	3,904.0	12.8	14.4	-41.63	-610.0	-377.2	155.4	135.6	19.86	7.826		
4,100.0	4,034.5	4,092.3	4,000.5	13.2	14.8	-41.58	-631.6	-390.9	160.7	140.2	20.45	7.858		
4,200.0	4,132.2	4,192.1	4,097.1	13.6	15.3	-41.53	-653.1	-404.5	166.0	144.9	21.04	7.888		
4,300.0	4,229.9	4,292.0	4,193.6	14.0	15.8	-41.48	-674.7	-418.2	171.3	149.6	21.63	7.916		
4,400.0	4,327.6	4,391.9	4,290.2	14.4	16.3	-41.43	-696.2	-431.9	176.5	154.3	22.23	7.942		
4,500.0	4,425.2	4,491.7	4,386.7	14.8	16.8	-41.39	-717.8	-445.5	181.8	159.0	22.82	7.967		
4,600.0	4,522.9	4,591.6	4,483.3	15.2	17.2	-41.35	-739.3	-459.2	187.1	163.7	23.41	7.991		
4,700.0	4,620.6	4,691.5	4,579.8	15.7	17.7	-41.31	-760.9	-472.9	192.4	168.4	24.01	8.013		
4,800.0	4,718.3	4,791.3	4,676.4	16.1	18.2	-41.28	-782.4	-486.5	197.6	173.0	24.60	8.034		
4,900.0	4,816.0	4,891.2	4,772.9	16.5	18.7	-41.24	-804.0	-500.2	202.9	177.7	25.19	8.055		
5,000.0	4,913.7	4,991.0	4,869.4	16.9	19.2	-41.21	-825.5	-513.8	208.2	182.4	25.79	8.074		
5,100.0	5,011.3	5,090.9	4,966.0	17.3	19.6	-41.18	-847.1	-527.5	213.5	187.1	26.38	8.092		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D2 - DD - Plan #1													Offset Site Error: 0.0 ft			
Survey Program: 0-MWD															Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning			
5,200.0	5,109.0	5,190.8	5,062.5	17.7	20.1	-41.15	-868.6	-541.2	218.8	191.8	26.98	8.110				
5,300.0	5,206.7	5,290.6	5,159.1	18.1	20.6	-41.12	-890.2	-554.8	224.0	196.5	27.57	8.126				
5,400.0	5,304.4	5,390.5	5,255.6	18.5	21.1	-41.10	-911.7	-568.5	229.3	201.2	28.16	8.142				
5,500.0	5,402.1	5,490.3	5,352.2	19.0	21.6	-41.07	-933.3	-582.1	234.6	205.8	28.76	8.157				
5,600.0	5,499.8	5,590.2	5,448.7	19.4	22.0	-41.05	-954.8	-595.8	239.9	210.5	29.35	8.172				
5,700.0	5,597.4	5,690.1	5,545.3	19.8	22.5	-41.02	-976.4	-609.5	245.2	215.2	29.95	8.186				
5,800.0	5,695.1	5,789.9	5,641.8	20.2	23.0	-41.00	-997.9	-623.1	250.4	219.9	30.54	8.199				
5,900.0	5,792.8	5,889.8	5,738.4	20.6	23.5	-40.98	-1,019.5	-636.8	255.7	224.6	31.14	8.212				
6,000.0	5,890.5	5,989.6	5,834.9	21.0	24.0	-40.96	-1,041.0	-650.5	261.0	229.3	31.73	8.225				
6,100.0	5,988.2	6,089.5	5,931.4	21.4	24.4	-40.94	-1,062.6	-664.1	266.3	233.9	32.33	8.237				
6,200.0	6,085.8	6,189.4	6,028.0	21.9	24.9	-40.92	-1,084.2	-677.8	271.6	238.6	32.92	8.248				
6,300.0	6,183.5	6,289.2	6,124.5	22.3	25.4	-40.90	-1,105.7	-691.4	276.8	243.3	33.52	8.259				
6,400.0	6,281.2	6,389.1	6,221.1	22.7	25.9	-40.89	-1,127.3	-705.1	282.1	248.0	34.11	8.270				
6,500.0	6,378.9	6,488.9	6,317.6	23.1	26.4	-40.87	-1,148.8	-718.8	287.4	252.7	34.71	8.280				
6,600.0	6,476.6	6,588.8	6,414.2	23.5	26.8	-40.85	-1,170.4	-732.4	292.7	257.4	35.30	8.290				
6,700.0	6,574.3	6,688.7	6,510.7	23.9	27.3	-40.84	-1,191.9	-746.1	297.9	262.0	35.90	8.299				
6,800.0	6,671.9	6,788.5	6,607.3	24.3	27.8	-40.82	-1,213.5	-759.7	303.2	266.7	36.50	8.309				
6,900.0	6,769.6	6,888.4	6,703.8	24.8	28.3	-40.81	-1,235.0	-773.4	308.5	271.4	37.09	8.318				
7,000.0	6,867.3	6,988.2	6,800.3	25.2	28.8	-40.79	-1,256.6	-787.1	313.8	276.1	37.69	8.326				
7,100.0	6,965.0	7,088.1	6,896.9	25.6	29.2	-40.78	-1,278.1	-800.7	319.1	280.8	38.28	8.334				
7,200.0	7,062.8	7,197.6	7,003.2	26.0	29.7	-40.91	-1,300.3	-814.8	323.3	284.4	38.94	8.303				
7,300.0	7,161.1	7,308.0	7,111.3	26.3	30.1	-41.07	-1,319.1	-826.7	326.7	287.2	39.54	8.264				
7,400.0	7,260.1	7,418.5	7,220.3	26.6	30.5	-41.19	-1,334.4	-836.4	329.5	289.5	40.05	8.229				
7,500.0	7,359.5	7,529.1	7,330.0	26.8	30.7	-41.27	-1,346.2	-843.9	331.8	291.3	40.47	8.198				
7,600.0	7,459.2	7,639.7	7,440.2	27.0	30.9	-41.32	-1,354.4	-849.1	333.4	292.6	40.80	8.171				
7,700.0	7,559.1	7,750.5	7,550.8	27.1	31.1	-41.32	-1,359.0	-852.0	334.4	293.4	41.05	8.147				
7,800.0	7,659.1	7,858.8	7,659.1	27.2	31.2	178.70	-1,360.0	-852.7	334.8	293.6	41.25	8.117				
7,900.0	7,759.1	7,958.8	7,759.1	27.3	31.2	178.70	-1,360.0	-852.7	334.8	293.3	41.48	8.071				
8,000.0	7,859.1	8,058.8	7,859.1	27.4	31.3	178.70	-1,360.0	-852.7	334.8	293.1	41.72	8.026				
8,100.0	7,959.1	8,158.8	7,959.1	27.5	31.4	178.70	-1,360.0	-852.7	334.8	292.9	41.95	7.981				
8,200.0	8,059.1	8,258.8	8,059.1	27.6	31.5	178.70	-1,360.0	-852.7	334.8	292.6	42.19	7.937				
8,300.0	8,159.1	8,358.8	8,159.1	27.7	31.6	178.70	-1,360.0	-852.7	334.8	292.4	42.42	7.892				
8,400.0	8,259.1	8,458.8	8,259.1	27.7	31.6	178.70	-1,360.0	-852.7	334.8	292.2	42.66	7.848				
8,500.0	8,359.1	8,558.8	8,359.1	27.8	31.7	178.70	-1,360.0	-852.7	334.8	291.9	42.90	7.804				
8,600.0	8,459.1	8,658.8	8,459.1	27.9	31.8	178.70	-1,360.0	-852.7	334.8	291.7	43.15	7.760				
8,700.0	8,559.1	8,758.8	8,559.1	28.0	31.9	178.70	-1,360.0	-852.7	334.8	291.4	43.39	7.716				
8,800.0	8,659.1	8,858.8	8,659.1	28.1	32.0	178.70	-1,360.0	-852.7	334.8	291.2	43.64	7.673				
8,900.0	8,759.1	8,958.8	8,759.1	28.2	32.0	178.70	-1,360.0	-852.7	334.8	290.9	43.88	7.630				
9,000.0	8,859.1	9,058.8	8,859.1	28.3	32.1	178.70	-1,360.0	-852.7	334.8	290.7	44.13	7.587				
9,100.0	8,959.1	9,158.8	8,959.1	28.4	32.2	178.70	-1,360.0	-852.7	334.8	290.4	44.38	7.544				
9,200.0	9,059.1	9,258.8	9,059.1	28.5	32.3	178.70	-1,360.0	-852.7	334.8	290.2	44.63	7.502				
9,300.0	9,159.1	9,358.8	9,159.1	28.6	32.4	178.70	-1,360.0	-852.7	334.8	289.9	44.88	7.460				
9,400.0	9,259.1	9,458.8	9,259.1	28.7	32.5	178.70	-1,360.0	-852.7	334.8	289.7	45.14	7.418				
9,500.0	9,359.1	9,558.8	9,359.1	28.8	32.6	178.70	-1,360.0	-852.7	334.8	289.4	45.39	7.376				
9,600.0	9,459.1	9,658.8	9,459.1	28.9	32.7	178.70	-1,360.0	-852.7	334.8	289.2	45.65	7.335				
9,700.0	9,559.1	9,758.8	9,559.1	29.0	32.8	178.70	-1,360.0	-852.7	334.8	288.9	45.90	7.294				
9,800.0	9,659.1	9,858.8	9,659.1	29.1	32.8	178.70	-1,360.0	-852.7	334.8	288.7	46.16	7.253				
9,900.0	9,759.1	9,958.8	9,759.1	29.2	32.9	178.70	-1,360.0	-852.7	334.8	288.4	46.42	7.213				
10,000.0	9,859.1	10,058.8	9,859.1	29.3	33.0	178.70	-1,360.0	-852.7	334.8	288.1	46.68	7.172				
10,100.0	9,959.1	10,158.8	9,959.1	29.4	33.1	178.70	-1,360.0	-852.7	334.8	287.9	46.94	7.132				
10,164.1	10,023.2	10,222.9	10,023.2	29.5	33.2	178.70	-1,360.0	-852.7	334.8	287.7	47.11	7.107				
10,200.0	10,059.1	10,251.7	10,052.0	29.5	33.2	178.70	-1,360.0	-852.7	334.9	287.7	47.20	7.096				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D2 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
10,300.0	10,159.1	10,251.7	10,052.0	29.6	33.2	178.70	-1,360.0	-852.7	351.5	304.2	47.33	7.427		
10,400.0	10,259.1	10,251.7	10,052.0	29.7	33.2	178.70	-1,360.0	-852.7	393.7	346.2	47.46	8.295		
10,500.0	10,359.1	10,251.7	10,052.0	29.8	33.2	178.70	-1,360.0	-852.7	454.3	406.7	47.59	9.546		
10,600.0	10,459.1	10,251.7	10,052.0	29.9	33.2	178.70	-1,360.0	-852.7	527.1	479.4	47.73	11.044		
10,700.0	10,559.1	10,251.7	10,052.0	30.1	33.2	178.70	-1,360.0	-852.7	607.7	559.8	47.86	12.696		
10,800.0	10,659.1	10,251.7	10,052.0	30.2	33.2	178.70	-1,360.0	-852.7	693.3	645.3	48.00	14.445		
10,900.0	10,759.1	10,251.7	10,052.0	30.3	33.2	178.70	-1,360.0	-852.7	782.4	734.2	48.13	16.255		
10,916.9	10,776.0	10,251.7	10,052.0	30.3	33.2	178.70	-1,360.0	-852.7	797.7	749.5	48.15	16.565		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D3 - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor			
0.0	0.0	0.0	0.0	0.0	0.0	-174.35	-34.2	-3.4	34.4						
100.0	100.0	100.0	100.0	0.1	0.1	-174.35	-34.2	-3.4	34.4	34.1	0.27	126.364			
200.0	200.0	200.0	200.0	0.3	0.3	-174.35	-34.2	-3.4	34.4	33.8	0.62	55.373			
300.0	300.0	300.0	300.0	0.5	0.5	-174.35	-34.2	-3.4	34.4	33.4	0.97	35.455			
400.0	400.0	400.0	400.0	0.7	0.7	-174.35	-34.2	-3.4	34.4	33.1	1.32	26.075			
500.0	500.0	500.0	500.0	0.8	0.8	-174.35	-34.2	-3.4	34.4	32.7	1.67	20.620 CC, ES			
600.0	600.0	598.3	598.2	1.0	1.0	-172.92	-36.5	-4.5	36.8	34.8	2.02	18.247			
700.0	700.0	696.0	695.7	1.2	1.2	-169.58	-43.2	-7.9	44.1	41.8	2.38	18.538			
800.0	800.0	792.7	791.6	1.4	1.4	-165.98	-54.2	-13.5	56.5	53.7	2.77	20.411			
900.0	900.0	888.0	885.3	1.5	1.7	-162.99	-69.2	-21.2	73.9	70.7	3.18	23.207			
1,000.0	1,000.0	981.3	976.2	1.7	2.1	-160.76	-88.0	-30.7	96.2	92.6	3.63	26.492			
1,100.0	1,100.0	1,074.4	1,065.9	1.9	2.5	-19.28	-110.5	-42.2	120.8	117.0	3.73	32.384			
1,200.0	1,199.6	1,172.2	1,159.6	2.1	3.0	-18.85	-135.3	-54.7	141.8	137.7	4.08	34.788			
1,300.0	1,298.8	1,270.8	1,254.2	2.3	3.5	-19.16	-160.3	-67.4	158.0	153.6	4.43	35.681			
1,400.0	1,397.1	1,370.2	1,349.4	2.6	4.0	-20.02	-185.4	-80.2	169.3	164.5	4.79	35.339			
1,500.0	1,494.8	1,469.7	1,444.9	2.9	4.5	-21.23	-210.6	-93.0	177.7	172.5	5.19	34.255			
1,600.0	1,592.5	1,569.3	1,540.4	3.2	5.0	-22.34	-235.8	-105.8	186.1	180.5	5.60	33.229			
1,700.0	1,690.1	1,668.9	1,635.8	3.6	5.5	-23.36	-261.0	-118.7	194.6	188.6	6.03	32.275			
1,800.0	1,787.8	1,768.5	1,731.3	3.9	6.0	-24.30	-286.3	-131.5	203.2	196.7	6.47	31.386			
1,900.0	1,885.5	1,868.1	1,826.8	4.3	6.6	-25.16	-311.5	-144.3	211.8	204.8	6.93	30.559			
2,000.0	1,983.2	1,967.6	1,922.3	4.7	7.1	-25.95	-336.7	-157.1	220.4	213.0	7.40	29.788			
2,100.0	2,080.9	2,067.2	2,017.8	5.1	7.6	-26.68	-361.9	-169.9	229.1	221.2	7.88	29.070			
2,200.0	2,178.5	2,166.8	2,113.2	5.5	8.1	-27.36	-387.1	-182.7	237.8	229.4	8.37	28.402			
2,300.0	2,276.2	2,266.4	2,208.7	5.9	8.6	-27.99	-412.3	-195.5	246.5	237.6	8.87	27.781			
2,400.0	2,373.9	2,366.0	2,304.2	6.3	9.2	-28.57	-437.5	-208.3	255.3	245.9	9.38	27.202			
2,500.0	2,471.6	2,465.6	2,399.7	6.7	9.7	-29.12	-462.8	-221.2	264.1	254.2	9.90	26.663			
2,600.0	2,569.3	2,565.1	2,495.2	7.1	10.2	-29.63	-488.0	-234.0	272.9	262.5	10.43	26.161			
2,700.0	2,667.0	2,664.7	2,590.7	7.5	10.7	-30.11	-513.2	-246.8	281.7	270.8	10.97	25.693			
2,800.0	2,764.6	2,764.3	2,686.1	7.9	11.3	-30.57	-538.4	-259.6	290.6	279.1	11.51	25.256			
2,900.0	2,862.3	2,863.9	2,781.6	8.3	11.8	-30.99	-563.6	-272.4	299.5	287.4	12.05	24.847			
3,000.0	2,960.0	2,963.5	2,877.1	8.7	12.3	-31.39	-588.8	-285.2	308.4	295.7	12.60	24.465			
3,100.0	3,057.7	3,063.0	2,972.6	9.1	12.8	-31.77	-614.0	-298.0	317.3	304.1	13.16	24.106			
3,200.0	3,155.4	3,162.6	3,068.1	9.5	13.4	-32.12	-639.2	-310.8	326.2	312.4	13.72	23.770			
3,300.0	3,253.1	3,262.2	3,163.5	9.9	13.9	-32.46	-664.5	-323.7	335.1	320.8	14.29	23.455			
3,400.0	3,350.7	3,361.8	3,259.0	10.3	14.4	-32.78	-689.7	-336.5	344.0	329.2	14.86	23.158			
3,500.0	3,448.4	3,461.4	3,354.5	10.7	14.9	-33.09	-714.9	-349.3	353.0	337.6	15.43	22.878			
3,600.0	3,546.1	3,561.0	3,450.0	11.1	15.5	-33.38	-740.1	-362.1	361.9	345.9	16.00	22.615			
3,700.0	3,643.8	3,660.5	3,545.5	11.5	16.0	-33.65	-765.3	-374.9	370.9	354.3	16.58	22.366			
3,800.0	3,741.5	3,760.1	3,641.0	11.9	16.5	-33.91	-790.5	-387.7	379.9	362.7	17.16	22.131			
3,900.0	3,839.2	3,859.7	3,736.4	12.4	17.0	-34.16	-815.7	-400.5	388.9	371.1	17.75	21.909			
4,000.0	3,936.8	3,959.3	3,831.9	12.8	17.6	-34.40	-840.9	-413.3	397.8	379.5	18.34	21.698			
4,100.0	4,034.5	4,058.9	3,927.4	13.2	18.1	-34.63	-866.2	-426.2	406.8	387.9	18.92	21.498			
4,200.0	4,132.2	4,158.4	4,022.9	13.6	18.6	-34.85	-891.4	-439.0	415.8	396.3	19.52	21.309			
4,300.0	4,229.9	4,258.0	4,118.4	14.0	19.1	-35.06	-916.6	-451.8	424.8	404.7	20.11	21.128			
4,400.0	4,327.6	4,357.6	4,213.8	14.4	19.7	-35.26	-941.8	-464.6	433.9	413.2	20.70	20.957			
4,500.0	4,425.2	4,457.2	4,309.3	14.8	20.2	-35.45	-967.0	-477.4	442.9	421.6	21.30	20.793			
4,600.0	4,522.9	4,556.8	4,404.8	15.2	20.7	-35.64	-992.2	-490.2	451.9	430.0	21.90	20.638			
4,700.0	4,620.6	4,656.4	4,500.3	15.7	21.2	-35.81	-1,017.4	-503.0	460.9	438.4	22.50	20.489			
4,800.0	4,718.3	4,755.9	4,595.8	16.1	21.8	-35.98	-1,042.6	-515.8	470.0	446.9	23.10	20.347			
4,900.0	4,816.0	4,855.5	4,691.2	16.5	22.3	-36.15	-1,067.9	-528.7	479.0	455.3	23.70	20.211			
5,000.0	4,913.7	4,955.1	4,786.7	16.9	22.8	-36.31	-1,093.1	-541.5	488.0	463.7	24.30	20.081			
5,100.0	5,011.3	5,054.7	4,882.2	17.3	23.3	-36.46	-1,118.3	-554.3	497.1	472.2	24.91	19.957			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D3 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Separation Factor		
5,200.0	5,109.0	5,154.3	4,977.7	17.7	23.9	-36.61	-1,143.5	-567.1	506.1	480.6	25.51	19.838		
5,300.0	5,206.7	5,253.8	5,073.2	18.1	24.4	-36.75	-1,168.7	-579.9	515.2	489.0	26.12	19.724		
5,400.0	5,304.4	5,353.4	5,168.7	18.5	24.9	-36.88	-1,193.9	-592.7	524.2	497.5	26.73	19.614		
5,500.0	5,402.1	5,453.0	5,264.1	19.0	25.5	-37.02	-1,219.1	-605.5	533.3	505.9	27.34	19.508		
5,600.0	5,499.8	5,552.6	5,359.6	19.4	26.0	-37.14	-1,244.3	-618.4	542.3	514.4	27.94	19.407		
5,700.0	5,597.4	5,652.2	5,455.1	19.8	26.5	-37.27	-1,269.6	-631.2	551.4	522.8	28.56	19.310		
5,800.0	5,695.1	5,751.8	5,550.6	20.2	27.0	-37.39	-1,294.8	-644.0	560.4	531.3	29.17	19.216		
5,900.0	5,792.8	5,851.3	5,646.1	20.6	27.6	-37.50	-1,320.0	-656.8	569.5	539.7	29.78	19.125		
6,000.0	5,890.5	5,950.9	5,741.5	21.0	28.1	-37.61	-1,345.2	-669.6	578.6	548.2	30.39	19.038		
6,100.0	5,988.2	6,050.5	5,837.0	21.4	28.6	-37.72	-1,370.4	-682.4	587.6	556.6	31.00	18.954		
6,200.0	6,085.8	6,150.1	5,932.5	21.9	29.1	-37.83	-1,395.6	-695.2	596.7	565.1	31.62	18.873		
6,300.0	6,183.5	6,249.7	6,028.0	22.3	29.7	-37.93	-1,420.8	-708.0	605.8	573.6	32.23	18.795		
6,400.0	6,281.2	6,349.2	6,123.5	22.7	30.2	-38.03	-1,446.1	-720.9	614.9	582.0	32.85	18.719		
6,500.0	6,378.9	6,448.8	6,218.9	23.1	30.7	-38.13	-1,471.3	-733.7	623.9	590.5	33.46	18.646		
6,600.0	6,476.6	6,548.4	6,314.4	23.5	31.2	-38.22	-1,496.5	-746.5	633.0	598.9	34.08	18.576		
6,700.0	6,574.3	6,648.0	6,409.9	23.9	31.8	-38.31	-1,521.7	-759.3	642.1	607.4	34.69	18.507		
6,800.0	6,671.9	6,747.6	6,505.4	24.3	32.3	-38.40	-1,546.9	-772.1	651.2	615.9	35.31	18.441		
6,900.0	6,769.6	6,847.2	6,600.9	24.8	32.8	-38.49	-1,572.1	-784.9	660.3	624.3	35.93	18.377		
7,000.0	6,867.3	6,949.5	6,699.0	25.2	33.4	-38.57	-1,598.0	-798.1	669.3	632.8	36.56	18.310		
7,100.0	6,965.0	7,075.9	6,821.2	25.6	33.9	-38.80	-1,627.1	-812.9	676.0	638.7	37.31	18.121		
7,200.0	7,062.8	7,202.7	6,944.9	26.0	34.4	-39.22	-1,651.5	-825.2	679.1	641.0	38.12	17.817		
7,300.0	7,161.1	7,329.6	7,069.9	26.3	34.8	-39.64	-1,670.9	-835.1	680.7	641.9	38.84	17.524		
7,400.0	7,260.1	7,456.4	7,195.6	26.6	35.1	-40.02	-1,685.4	-842.5	681.0	641.6	39.48	17.248		
7,500.0	7,359.5	7,583.1	7,321.9	26.8	35.4	-40.35	-1,694.9	-847.3	680.1	640.1	40.04	16.987		
7,600.0	7,459.2	7,709.7	7,448.4	27.0	35.5	-40.65	-1,699.4	-849.6	678.0	637.5	40.50	16.739		
7,700.0	7,559.1	7,820.4	7,559.1	27.1	35.6	-40.85	-1,699.9	-849.8	675.2	634.4	40.84	16.535		
7,800.0	7,659.1	7,920.4	7,659.1	27.2	35.6	179.09	-1,699.9	-849.8	674.3	633.3	41.07	16.420		
7,900.0	7,759.1	8,020.4	7,759.1	27.3	35.7	179.11	-1,699.9	-849.8	674.6	633.4	41.29	16.433		
8,000.0	7,859.1	8,120.4	7,859.1	27.4	35.8	179.11	-1,699.9	-849.8	674.6	633.1	41.52	16.247		
8,100.0	7,959.1	8,220.4	7,959.1	27.5	35.8	179.11	-1,699.9	-849.8	674.6	632.9	41.76	16.155		
8,200.0	8,059.1	8,320.4	8,059.1	27.6	35.9	179.11	-1,699.9	-849.8	674.6	632.6	42.00	16.064		
8,300.0	8,159.1	8,420.4	8,159.1	27.7	36.0	179.11	-1,699.9	-849.8	674.6	632.4	42.24	15.973		
8,400.0	8,259.1	8,520.4	8,259.1	27.7	36.1	179.11	-1,699.9	-849.8	674.6	632.2	42.48	15.882		
8,500.0	8,359.1	8,620.4	8,359.1	27.8	36.1	179.11	-1,699.9	-849.8	674.6	631.9	42.72	15.792		
8,600.0	8,459.1	8,720.4	8,459.1	27.9	36.2	179.11	-1,699.9	-849.8	674.6	631.7	42.97	15.702		
8,700.0	8,559.1	8,820.4	8,559.1	28.0	36.3	179.11	-1,699.9	-849.8	674.6	631.4	43.21	15.612		
8,800.0	8,659.1	8,920.4	8,659.1	28.1	36.3	179.11	-1,699.9	-849.8	674.6	631.2	43.46	15.524		
8,900.0	8,759.1	9,020.4	8,759.1	28.2	36.4	179.11	-1,699.9	-849.8	674.6	630.9	43.71	15.435		
9,000.0	8,859.1	9,120.4	8,859.1	28.3	36.5	179.11	-1,699.9	-849.8	674.6	630.7	43.96	15.348		
9,100.0	8,959.1	9,220.4	8,959.1	28.4	36.6	179.11	-1,699.9	-849.8	674.6	630.4	44.21	15.261		
9,200.0	9,059.1	9,320.4	9,059.1	28.5	36.7	179.11	-1,699.9	-849.8	674.6	630.2	44.46	15.174		
9,300.0	9,159.1	9,420.4	9,159.1	28.6	36.7	179.11	-1,699.9	-849.8	674.6	629.9	44.71	15.088		
9,400.0	9,259.1	9,520.4	9,259.1	28.7	36.8	179.11	-1,699.9	-849.8	674.6	629.7	44.97	15.002		
9,500.0	9,359.1	9,620.4	9,359.1	28.8	36.9	179.11	-1,699.9	-849.8	674.6	629.4	45.23	14.917		
9,600.0	9,459.1	9,720.4	9,459.1	28.9	37.0	179.11	-1,699.9	-849.8	674.6	629.2	45.48	14.833		
9,700.0	9,559.1	9,820.4	9,559.1	29.0	37.0	179.11	-1,699.9	-849.8	674.6	628.9	45.74	14.749		
9,800.0	9,659.1	9,920.4	9,659.1	29.1	37.1	179.11	-1,699.9	-849.8	674.6	628.6	46.00	14.665		
9,900.0	9,759.1	10,020.4	9,759.1	29.2	37.2	179.11	-1,699.9	-849.8	674.6	628.4	46.26	14.583		
10,000.0	9,859.1	10,120.4	9,859.1	29.3	37.3	179.11	-1,699.9	-849.8	674.6	628.1	46.53	14.500		
10,100.0	9,959.1	10,220.4	9,959.1	29.4	37.4	179.11	-1,699.9	-849.8	674.6	627.9	46.79	14.419		
10,200.0	10,059.1	10,320.4	10,059.1	29.5	37.5	179.11	-1,699.9	-849.8	674.6	627.6	47.05	14.338		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D3 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis			
10,230.4	10,089.5	10,350.8	10,089.5	29.6	37.5	179.11	-1,699.9	-849.8	674.6	627.5	47.13	14.313 SF		
10,300.0	10,159.1	10,368.3	10,107.0	29.6	37.5	179.11	-1,699.9	-849.8	676.7	629.4	47.25	14.321		
10,400.0	10,259.1	10,368.3	10,107.0	29.7	37.5	179.11	-1,699.9	-849.8	691.6	644.2	47.38	14.595		
10,500.0	10,359.1	10,368.3	10,107.0	29.8	37.5	179.11	-1,699.9	-849.8	720.2	672.7	47.52	15.157		
10,600.0	10,459.1	10,368.3	10,107.0	29.9	37.5	179.11	-1,699.9	-849.8	761.0	713.3	47.65	15.971		
10,700.0	10,559.1	10,368.3	10,107.0	30.1	37.5	179.11	-1,699.9	-849.8	812.1	764.3	47.78	16.996		
10,800.0	10,659.1	10,368.3	10,107.0	30.2	37.5	179.11	-1,699.9	-849.8	871.8	823.8	47.92	18.192		
10,900.0	10,759.1	10,368.3	10,107.0	30.3	37.5	179.11	-1,699.9	-849.8	938.3	890.2	48.05	19.525		
10,916.9	10,776.0	10,368.3	10,107.0	30.3	37.5	179.11	-1,699.9	-849.8	950.1	902.0	48.08	19.762		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-16B - DD - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	142.22	-9.5	7.3	12.0					
100.0	100.0	100.0	100.0	0.1	0.1	142.22	-9.5	7.3	12.0	11.7	0.27	44.025		
200.0	200.0	200.0	200.0	0.3	0.3	142.22	-9.5	7.3	12.0	11.4	0.62	19.292 CC, ES		
300.0	300.0	299.3	299.3	0.5	0.5	139.36	-11.0	9.4	14.5	13.5	0.97	14.935 SF		
400.0	400.0	398.1	397.7	0.7	0.7	134.72	-15.5	15.7	22.1	20.8	1.33	16.636		
500.0	500.0	495.8	494.6	0.8	1.0	131.53	-22.9	25.9	34.9	33.2	1.72	20.353		
600.0	600.0	594.3	591.9	1.0	1.3	129.79	-32.1	38.6	50.8	48.7	2.12	23.995		
700.0	700.0	693.1	689.3	1.2	1.6	128.87	-41.4	51.3	66.8	64.3	2.53	26.415		
800.0	800.0	791.8	786.8	1.4	1.9	128.31	-50.6	64.1	82.7	79.8	2.94	28.128		
900.0	900.0	890.5	884.2	1.5	2.2	127.93	-59.9	76.9	98.7	95.3	3.36	29.399		
1,000.0	1,000.0	989.2	981.7	1.7	2.6	127.65	-69.1	89.6	114.7	110.9	3.77	30.379		
1,100.0	1,100.0	1,087.8	1,079.1	1.9	2.9	-93.22	-78.4	102.4	130.8	127.0	3.74	34.963		
1,200.0	1,199.6	1,186.2	1,176.1	2.1	3.2	-95.83	-87.6	115.1	147.4	143.3	4.10	35.942		
1,300.0	1,298.8	1,283.9	1,272.6	2.3	3.5	-99.57	-96.8	127.7	165.2	160.7	4.50	36.692		
1,400.0	1,397.1	1,380.7	1,368.2	2.6	3.8	-103.97	-105.9	140.2	184.9	180.0	4.97	37.212		
1,500.0	1,494.8	1,476.9	1,463.1	2.9	4.2	-108.75	-114.9	152.7	206.8	201.3	5.50	37.631		
1,600.0	1,592.5	1,573.1	1,558.1	3.2	4.5	-112.68	-123.9	165.1	229.8	223.8	6.05	37.996		
1,700.0	1,690.1	1,669.3	1,653.1	3.6	4.8	-115.90	-132.9	177.5	253.7	247.1	6.62	38.354		
1,800.0	1,787.8	1,765.5	1,748.0	3.9	5.1	-118.57	-141.9	190.0	278.3	271.1	7.19	38.715		
1,900.0	1,885.5	1,861.7	1,843.0	4.3	5.4	-120.80	-151.0	202.4	303.3	295.5	7.76	39.078		
2,000.0	1,983.2	1,957.9	1,937.9	4.7	5.7	-122.70	-160.0	214.8	328.7	320.3	8.33	39.438		
2,100.0	2,080.9	2,054.0	2,032.9	5.1	6.1	-124.33	-169.0	227.3	354.4	345.5	8.91	39.792		
2,200.0	2,178.5	2,150.2	2,127.8	5.5	6.4	-125.73	-178.0	239.7	380.3	370.8	9.47	40.136		
2,300.0	2,276.2	2,246.4	2,222.8	5.9	6.7	-126.96	-187.0	252.2	406.4	396.3	10.04	40.468		
2,400.0	2,373.9	2,342.6	2,317.7	6.3	7.0	-128.04	-196.1	264.6	432.6	422.0	10.61	40.787		
2,500.0	2,471.6	2,438.8	2,412.7	6.7	7.3	-129.00	-205.1	277.0	459.0	447.8	11.17	41.092		
2,600.0	2,569.3	2,535.0	2,507.6	7.1	7.7	-129.85	-214.1	289.5	485.5	473.8	11.73	41.383		
2,700.0	2,667.0	2,631.2	2,602.6	7.5	8.0	-130.62	-223.1	301.9	512.1	499.8	12.29	41.661		
2,800.0	2,764.6	2,727.4	2,697.5	7.9	8.3	-131.31	-232.1	314.3	538.7	525.9	12.85	41.924		
2,900.0	2,862.3	2,823.5	2,792.5	8.3	8.6	-131.93	-241.1	326.8	565.5	552.1	13.41	42.175		
3,000.0	2,960.0	2,919.7	2,887.4	8.7	8.9	-132.50	-250.2	339.2	592.2	578.3	13.96	42.414		
3,100.0	3,057.7	3,015.9	2,982.4	9.1	9.2	-133.02	-259.2	351.6	619.1	604.6	14.52	42.640		
3,200.0	3,155.4	3,112.1	3,077.3	9.5	9.6	-133.50	-268.2	364.1	646.0	630.9	15.07	42.856		
3,300.0	3,253.1	3,208.3	3,172.3	9.9	9.9	-133.94	-277.2	376.5	672.9	657.2	15.63	43.061		
3,400.0	3,350.7	3,304.5	3,267.3	10.3	10.2	-134.34	-286.2	388.9	699.8	683.6	16.18	43.256		
3,500.0	3,448.4	3,400.7	3,362.2	10.7	10.5	-134.72	-295.3	401.4	726.8	710.1	16.73	43.443		
3,600.0	3,546.1	3,496.9	3,457.2	11.1	10.8	-135.07	-304.3	413.8	753.8	736.5	17.28	43.620		
3,700.0	3,643.8	3,593.0	3,552.1	11.5	11.2	-135.39	-313.3	426.2	780.8	763.0	17.83	43.789		
3,800.0	3,741.5	3,689.2	3,647.1	11.9	11.5	-135.69	-322.3	438.7	807.9	789.5	18.38	43.950		
3,900.0	3,839.2	3,785.4	3,742.0	12.4	11.8	-135.98	-331.3	451.1	834.9	816.0	18.93	44.105		
4,000.0	3,936.8	3,881.6	3,837.0	12.8	12.1	-136.24	-340.4	463.6	862.0	842.5	19.48	44.252		
4,100.0	4,034.5	3,977.8	3,931.9	13.2	12.4	-136.49	-349.4	476.0	889.1	869.1	20.03	44.393		
4,200.0	4,132.2	4,074.0	4,026.9	13.6	12.7	-136.73	-358.4	488.4	916.2	895.7	20.58	44.528		
4,300.0	4,229.9	4,170.2	4,121.8	14.0	13.1	-136.95	-367.4	500.9	943.4	922.2	21.12	44.658		
4,400.0	4,327.6	4,266.4	4,216.8	14.4	13.4	-137.15	-376.4	513.3	970.5	948.8	21.67	44.782		
4,500.0	4,425.2	4,362.5	4,311.7	14.8	13.7	-137.35	-385.5	525.7	997.7	975.4	22.22	44.901		
4,600.0	4,522.9	4,458.7	4,406.7	15.2	14.0	-137.54	-394.5	538.2	1,024.8	1,002.1	22.77	45.015		
4,700.0	4,620.6	4,554.9	4,501.6	15.7	14.3	-137.72	-403.5	550.6	1,052.0	1,028.7	23.31	45.125		
4,800.0	4,718.3	4,651.1	4,596.6	16.1	14.7	-137.88	-412.5	563.0	1,079.2	1,055.3	23.86	45.231		
4,900.0	4,816.0	4,747.3	4,691.5	16.5	15.0	-138.04	-421.5	575.5	1,106.4	1,082.0	24.41	45.333		
5,000.0	4,913.7	4,843.5	4,786.5	16.9	15.3	-138.20	-430.6	587.9	1,133.6	1,108.6	24.95	45.431		
5,100.0	5,011.3	4,939.7	4,881.4	17.3	15.6	-138.34	-439.6	600.3	1,160.8	1,135.3	25.50	45.525		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-16B - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty	Separation Factor		
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	Axis			
5,200.0	5,109.0	5,035.9	4,976.4	17.7	15.9	-138.48	-448.6	612.8	1,188.0	1,161.9	26.04	45.616		
5,300.0	5,206.7	5,132.0	5,071.4	18.1	16.2	-138.61	-457.6	625.2	1,215.2	1,188.6	26.59	45.704		
5,400.0	5,304.4	5,228.2	5,166.3	18.5	16.6	-138.74	-466.6	637.6	1,242.4	1,215.3	27.13	45.788		
5,500.0	5,402.1	5,324.4	5,261.3	19.0	16.9	-138.86	-475.7	650.1	1,269.7	1,242.0	27.68	45.870		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	167.85	-26.2	5.6	26.8					
100.0	100.0	100.0	100.0	0.1	0.1	167.85	-26.2	5.6	26.8	26.6	0.27	98.528		
200.0	200.0	200.0	200.0	0.3	0.3	167.85	-26.2	5.6	26.8	26.2	0.62	43.175		
300.0	300.0	300.0	300.0	0.5	0.5	167.85	-26.2	5.6	26.8	25.9	0.97	27.644 CC, ES		
400.0	400.0	398.6	398.6	0.7	0.7	165.79	-28.3	7.2	29.2	27.9	1.32	22.160		
500.0	500.0	496.8	496.4	0.8	0.9	161.26	-34.4	11.7	36.5	34.8	1.67	21.849 SF		
600.0	600.0	593.9	592.7	1.0	1.1	156.77	-44.4	19.0	48.8	46.8	2.04	23.991		
700.0	700.0	689.5	686.8	1.2	1.5	153.35	-58.1	29.1	66.3	63.9	2.43	27.288		
800.0	800.0	784.8	779.7	1.4	1.8	150.94	-75.2	41.8	88.4	85.5	2.85	30.981		
900.0	900.0	882.0	874.3	1.5	2.2	149.41	-93.3	55.2	111.4	108.1	3.30	33.785		
1,000.0	1,000.0	979.3	968.9	1.7	2.6	148.41	-111.5	68.6	134.5	130.8	3.75	35.845		
1,100.0	1,100.0	1,076.7	1,063.6	1.9	3.1	-72.58	-129.7	82.0	156.9	153.2	3.73	42.072		
1,200.0	1,199.6	1,174.1	1,158.3	2.1	3.5	-74.83	-147.8	95.4	178.0	173.9	4.08	43.597		
1,300.0	1,298.8	1,271.2	1,252.8	2.3	3.9	-77.97	-166.0	108.8	198.4	193.9	4.47	44.338		
1,400.0	1,397.1	1,367.8	1,346.8	2.6	4.3	-81.74	-184.0	122.1	218.7	213.7	4.94	44.260		
1,500.0	1,494.8	1,464.0	1,440.4	2.9	4.8	-86.04	-202.0	135.3	239.8	234.3	5.48	43.730		
1,600.0	1,592.5	1,560.2	1,533.9	3.2	5.2	-89.72	-219.9	148.6	262.1	256.0	6.08	43.099		
1,700.0	1,690.1	1,656.4	1,627.5	3.6	5.6	-92.82	-237.9	161.8	285.2	278.5	6.71	42.480		
1,800.0	1,787.8	1,752.6	1,721.1	3.9	6.0	-95.46	-255.8	175.1	309.1	301.7	7.37	41.923		
1,900.0	1,885.5	1,848.7	1,814.6	4.3	6.5	-97.73	-273.8	188.3	333.5	325.4	8.05	41.442		
2,000.0	1,983.2	1,944.9	1,908.2	4.7	6.9	-99.69	-291.8	201.6	358.3	349.6	8.73	41.036		
2,100.0	2,080.9	2,041.1	2,001.7	5.1	7.3	-101.39	-309.7	214.8	383.5	374.0	9.42	40.697		
2,200.0	2,178.5	2,137.3	2,095.3	5.5	7.7	-102.89	-327.7	228.1	408.9	398.8	10.12	40.416		
2,300.0	2,276.2	2,233.5	2,188.8	5.9	8.2	-104.21	-345.6	241.3	434.6	423.8	10.82	40.183		
2,400.0	2,373.9	2,329.7	2,282.4	6.3	8.6	-105.39	-363.6	254.6	460.5	448.9	11.51	39.990		
2,500.0	2,471.6	2,425.8	2,376.0	6.7	9.0	-106.44	-381.5	267.8	486.5	474.3	12.21	39.829		
2,600.0	2,569.3	2,522.0	2,469.5	7.1	9.4	-107.39	-399.5	281.1	512.7	499.8	12.91	39.696		
2,700.0	2,667.0	2,618.2	2,563.1	7.5	9.9	-108.24	-417.4	294.3	539.0	525.3	13.62	39.586		
2,800.0	2,764.6	2,714.4	2,656.6	7.9	10.3	-109.01	-435.4	307.6	565.4	551.0	14.32	39.493		
2,900.0	2,862.3	2,810.6	2,750.2	8.3	10.7	-109.72	-453.3	320.8	591.8	576.8	15.02	39.416		
3,000.0	2,960.0	2,906.8	2,843.8	8.7	11.1	-110.37	-471.3	334.1	618.4	602.7	15.71	39.352		
3,100.0	3,057.7	3,002.9	2,937.3	9.1	11.6	-110.96	-489.3	347.3	645.0	628.6	16.41	39.298		
3,200.0	3,155.4	3,099.1	3,030.9	9.5	12.0	-111.50	-507.2	360.6	671.7	654.6	17.11	39.254		
3,300.0	3,253.1	3,195.3	3,124.4	9.9	12.4	-112.01	-525.2	373.8	698.5	680.7	17.81	39.216		
3,400.0	3,350.7	3,291.5	3,218.0	10.3	12.8	-112.47	-543.1	387.1	725.2	706.7	18.51	39.185		
3,500.0	3,448.4	3,387.7	3,311.5	10.7	13.3	-112.91	-561.1	400.3	752.1	732.9	19.21	39.160		
3,600.0	3,546.1	3,483.9	3,405.1	11.1	13.7	-113.31	-579.0	413.6	778.9	759.0	19.90	39.139		
3,700.0	3,643.8	3,580.0	3,498.7	11.5	14.1	-113.69	-597.0	426.8	805.8	785.2	20.60	39.122		
3,800.0	3,741.5	3,676.2	3,592.2	11.9	14.6	-114.04	-614.9	440.1	832.8	811.5	21.29	39.108		
3,900.0	3,839.2	3,772.4	3,685.8	12.4	15.0	-114.37	-632.9	453.3	859.7	837.7	21.99	39.097		
4,000.0	3,936.8	3,868.6	3,779.3	12.8	15.4	-114.68	-650.9	466.6	886.7	864.0	22.69	39.088		
4,100.0	4,034.5	3,964.8	3,872.9	13.2	15.8	-114.98	-668.8	479.8	913.7	890.3	23.38	39.081		
4,200.0	4,132.2	4,060.9	3,966.5	13.6	16.3	-115.25	-686.8	493.1	940.7	916.7	24.07	39.076		
4,300.0	4,229.9	4,157.1	4,060.0	14.0	16.7	-115.51	-704.7	506.3	967.8	943.0	24.77	39.073		
4,400.0	4,327.6	4,253.3	4,153.6	14.4	17.1	-115.76	-722.7	519.6	994.8	969.4	25.46	39.071		
4,500.0	4,425.2	4,349.5	4,247.1	14.8	17.5	-115.99	-740.6	532.8	1,021.9	995.8	26.16	39.070		
4,600.0	4,522.9	4,445.7	4,340.7	15.2	18.0	-116.21	-758.6	546.1	1,049.0	1,022.2	26.85	39.070		
4,700.0	4,620.6	4,541.9	4,434.2	15.7	18.4	-116.42	-776.5	559.3	1,076.1	1,048.6	27.54	39.071		
4,800.0	4,718.3	4,638.0	4,527.8	16.1	18.8	-116.62	-794.5	572.6	1,103.2	1,075.0	28.24	39.073		
4,900.0	4,816.0	4,734.2	4,621.4	16.5	19.2	-116.81	-812.5	585.8	1,130.4	1,101.4	28.93	39.075		
5,000.0	4,913.7	4,830.4	4,714.9	16.9	19.7	-116.99	-830.4	599.1	1,157.5	1,127.9	29.62	39.078		
5,100.0	5,011.3	4,926.6	4,808.5	17.3	20.1	-117.16	-848.4	612.3	1,184.7	1,154.4	30.31	39.081		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre +N/-S	+E/-W	Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)				
5,200.0	5,109.0	5,022.8	4,902.0	17.7	20.5	-117.33	-866.3	625.6	1,211.8	1,180.8	31.01	39.084		
5,300.0	5,206.7	5,119.0	4,995.6	18.1	21.0	-117.49	-884.3	638.8	1,239.0	1,207.3	31.70	39.088		
5,400.0	5,304.4	5,215.1	5,089.2	18.5	21.4	-117.64	-902.2	652.1	1,266.2	1,233.8	32.39	39.093		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C2 - DD - Plan #1												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)					
0.0	0.0	0.0	0.0	0.0	0.0	174.79	-43.3	4.0	43.5				
100.0	100.0	100.0	100.0	0.1	0.1	174.79	-43.3	4.0	43.5	43.3	0.27	159.855	
200.0	200.0	200.0	200.0	0.3	0.3	174.79	-43.3	4.0	43.5	42.9	0.62	70.049 CC, ES	
300.0	300.0	297.9	297.8	0.5	0.5	173.47	-45.5	5.2	45.9	44.9	0.97	47.405	
400.0	400.0	395.3	394.9	0.7	0.7	170.23	-52.0	8.9	53.0	51.7	1.32	40.211	
500.0	500.0	491.6	490.5	0.8	1.0	166.45	-62.6	15.1	65.1	63.4	1.68	38.709	
600.0	600.0	586.5	583.9	1.0	1.3	163.06	-77.1	23.5	82.2	80.1	2.07	39.704	
700.0	700.0	679.5	674.5	1.2	1.7	160.37	-95.2	33.9	104.2	101.7	2.49	41.781	
800.0	800.0	774.7	766.4	1.4	2.2	158.33	-116.6	46.3	129.8	126.9	2.95	44.019	
900.0	900.0	871.2	859.6	1.5	2.6	156.93	-138.4	58.9	155.7	152.3	3.42	45.493	
1,000.0	1,000.0	967.8	952.8	1.7	3.1	155.93	-160.2	71.6	181.7	177.8	3.91	46.522	
1,100.0	1,100.0	1,064.5	1,046.2	1.9	3.5	-64.80	-182.1	84.2	206.6	202.9	3.72	55.538	
1,200.0	1,199.6	1,161.4	1,139.7	2.1	4.0	-66.49	-204.0	96.9	229.6	225.5	4.07	56.437	
1,300.0	1,298.8	1,258.3	1,233.2	2.3	4.5	-68.91	-225.9	109.6	251.1	246.6	4.45	56.483	
1,400.0	1,397.1	1,354.8	1,326.4	2.6	5.0	-71.90	-247.7	122.2	271.5	266.6	4.89	55.552	
1,500.0	1,494.8	1,451.0	1,419.2	2.9	5.4	-75.50	-269.4	134.8	292.1	286.7	5.40	54.055	
1,600.0	1,592.5	1,547.2	1,512.1	3.2	5.9	-78.69	-291.2	147.4	313.7	307.7	5.98	52.449	
1,700.0	1,690.1	1,643.4	1,605.0	3.6	6.4	-81.48	-312.9	159.9	336.1	329.5	6.60	50.890	
1,800.0	1,787.8	1,739.6	1,697.8	3.9	6.8	-83.92	-334.6	172.5	359.2	351.9	7.26	49.456	
1,900.0	1,885.5	1,835.8	1,790.7	4.3	7.3	-86.07	-356.4	185.1	382.8	374.9	7.95	48.176	
2,000.0	1,983.2	1,932.0	1,883.6	4.7	7.8	-87.97	-378.1	197.7	407.0	398.3	8.65	47.052	
2,100.0	2,080.9	2,028.2	1,976.4	5.1	8.3	-89.66	-399.9	210.3	431.4	422.1	9.36	46.072	
2,200.0	2,178.5	2,124.4	2,069.3	5.5	8.7	-91.17	-421.6	222.9	456.3	446.2	10.09	45.221	
2,300.0	2,276.2	2,220.6	2,162.1	5.9	9.2	-92.53	-443.4	235.4	481.3	470.5	10.82	44.481	
2,400.0	2,373.9	2,316.8	2,255.0	6.3	9.7	-93.75	-465.1	248.0	506.6	495.1	11.56	43.836	
2,500.0	2,471.6	2,413.0	2,347.9	6.7	10.1	-94.86	-486.9	260.6	532.2	519.9	12.30	43.272	
2,600.0	2,569.3	2,509.2	2,440.7	7.1	10.6	-95.86	-508.6	273.2	557.8	544.8	13.04	42.777	
2,700.0	2,667.0	2,605.4	2,533.6	7.5	11.1	-96.78	-530.3	285.8	583.7	569.9	13.78	42.341	
2,800.0	2,764.6	2,701.6	2,626.4	7.9	11.6	-97.62	-552.1	298.4	609.6	595.1	14.53	41.955	
2,900.0	2,862.3	2,797.8	2,719.3	8.3	12.0	-98.39	-573.8	310.9	635.7	620.4	15.28	41.612	
3,000.0	2,960.0	2,894.0	2,812.2	8.7	12.5	-99.10	-595.6	323.5	661.8	645.8	16.02	41.307	
3,100.0	3,057.7	2,990.2	2,905.0	9.1	13.0	-99.76	-617.3	336.1	688.1	671.3	16.77	41.033	
3,200.0	3,155.4	3,086.4	2,997.9	9.5	13.4	-100.37	-639.1	348.7	714.4	696.9	17.52	40.787	
3,300.0	3,253.1	3,182.6	3,090.7	9.9	13.9	-100.94	-660.8	361.3	740.8	722.6	18.26	40.565	
3,400.0	3,350.7	3,278.8	3,183.6	10.3	14.4	-101.47	-682.6	373.9	767.3	748.3	19.01	40.365	
3,500.0	3,448.4	3,375.0	3,276.5	10.7	14.9	-101.96	-704.3	386.4	793.8	774.1	19.76	40.182	
3,600.0	3,546.1	3,471.2	3,369.3	11.1	15.3	-102.42	-726.0	399.0	820.4	799.9	20.50	40.016	
3,700.0	3,643.8	3,567.4	3,462.2	11.5	15.8	-102.85	-747.8	411.6	847.0	825.8	21.25	39.864	
3,800.0	3,741.5	3,663.6	3,555.1	11.9	16.3	-103.26	-769.5	424.2	873.7	851.7	21.99	39.725	
3,900.0	3,839.2	3,759.8	3,647.9	12.4	16.8	-103.64	-791.3	436.8	900.4	877.7	22.74	39.598	
4,000.0	3,936.8	3,856.0	3,740.8	12.8	17.2	-104.00	-813.0	449.4	927.1	903.7	23.48	39.480	
4,100.0	4,034.5	3,952.2	3,833.6	13.2	17.7	-104.34	-834.8	461.9	953.9	929.7	24.23	39.372	
4,200.0	4,132.2	4,048.4	3,926.5	13.6	18.2	-104.66	-856.5	474.5	980.7	955.7	24.97	39.271	
4,300.0	4,229.9	4,144.6	4,019.4	14.0	18.6	-104.96	-878.3	487.1	1,007.5	981.8	25.72	39.178	
4,400.0	4,327.6	4,240.8	4,112.2	14.4	19.1	-105.25	-900.0	499.7	1,034.4	1,007.9	26.46	39.092	
4,500.0	4,425.2	4,337.0	4,205.1	14.8	19.6	-105.53	-921.7	512.3	1,061.3	1,034.1	27.20	39.011	
4,600.0	4,522.9	4,433.2	4,297.9	15.2	20.1	-105.79	-943.5	524.8	1,088.2	1,060.2	27.95	38.936	
4,700.0	4,620.6	4,529.4	4,390.8	15.7	20.5	-106.04	-965.2	537.4	1,115.1	1,086.4	28.69	38.866	
4,800.0	4,718.3	4,625.6	4,483.7	16.1	21.0	-106.27	-987.0	550.0	1,142.0	1,112.6	29.43	38.801	
4,900.0	4,816.0	4,721.8	4,576.5	16.5	21.5	-106.50	-1,008.7	562.6	1,169.0	1,138.8	30.18	38.739	
5,000.0	4,913.7	4,818.0	4,669.4	16.9	22.0	-106.71	-1,030.5	575.2	1,196.0	1,165.0	30.92	38.682	
5,100.0	5,011.3	4,914.2	4,762.2	17.3	22.4	-106.92	-1,052.2	587.8	1,222.9	1,191.3	31.66	38.627	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C2 - DD - Plan #1												Offset Site Error:	0.0 ft
Survey Program:		0-MWD										Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
5,200.0	5,109.0	5,010.4	4,855.1	17.7	22.9	-107.11	-1,074.0	600.3	1,249.9	1,217.5	32.40	38.576	
5,300.0	5,206.7	5,106.6	4,948.0	18.1	23.4	-107.30	-1,095.7	612.9	1,276.9	1,243.8	33.14	38.528 SF	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-9C - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	52.56	6.9	9.0	11.4						
100.0	100.0	100.0	100.0	0.1	0.1	52.56	6.9	9.0	11.4	11.1	0.27	41.806			
200.0	200.0	200.0	200.0	0.3	0.3	52.56	6.9	9.0	11.4	10.8	0.62	18.320			
300.0	300.0	300.0	300.0	0.5	0.5	52.56	6.9	9.0	11.4	10.4	0.97	11.730 CC, ES			
400.0	400.0	399.5	399.4	0.7	0.7	60.30	6.6	11.6	13.4	12.1	1.32	10.100 SF			
500.0	500.0	498.4	498.1	0.8	0.9	73.43	5.7	19.3	20.2	18.5	1.70	11.874			
600.0	600.0	597.3	596.3	1.0	1.1	81.95	4.4	30.9	31.5	29.4	2.09	15.074			
700.0	700.0	696.6	694.8	1.2	1.4	86.04	3.0	43.0	43.4	40.9	2.48	17.514			
800.0	800.0	795.8	793.3	1.4	1.6	88.36	1.6	55.0	55.5	52.6	2.87	19.326			
900.0	900.0	895.1	891.8	1.5	1.9	89.85	0.2	67.1	67.6	64.3	3.26	20.714			
1,000.0	1,000.0	994.3	990.3	1.7	2.2	90.89	-1.2	79.1	79.7	76.0	3.65	21.809			
1,100.0	1,100.0	1,093.4	1,088.6	1.9	2.4	-129.30	-2.6	91.1	93.5	89.7	3.75	24.911			
1,200.0	1,199.6	1,191.8	1,186.3	2.1	2.7	-131.38	-4.0	103.1	110.7	106.6	4.11	26.949			
1,300.0	1,298.8	1,289.3	1,283.1	2.3	3.0	-134.42	-5.4	114.9	131.6	127.1	4.47	29.399			
1,400.0	1,397.1	1,385.7	1,378.7	2.6	3.2	-137.75	-6.7	126.6	156.5	151.7	4.86	32.200			
1,500.0	1,494.8	1,481.2	1,473.5	2.9	3.5	-141.13	-8.1	138.2	184.4	179.1	5.28	34.938			
1,600.0	1,592.5	1,576.7	1,568.3	3.2	3.7	-143.69	-9.4	149.7	212.8	207.1	5.70	37.315			
1,700.0	1,690.1	1,672.2	1,663.1	3.6	4.0	-145.64	-10.8	161.3	241.5	235.3	6.13	39.405			
1,800.0	1,787.8	1,767.7	1,757.9	3.9	4.3	-147.18	-12.1	172.9	270.3	263.8	6.55	41.255			
1,900.0	1,885.5	1,863.2	1,852.7	4.3	4.5	-148.42	-13.5	184.5	299.4	292.4	6.98	42.903			
2,000.0	1,983.2	1,958.7	1,947.5	4.7	4.8	-149.44	-14.8	196.1	328.5	321.1	7.40	44.380			
2,100.0	2,080.9	2,054.3	2,042.3	5.1	5.1	-150.30	-16.2	207.7	357.7	349.9	7.83	45.711			
2,200.0	2,178.5	2,149.8	2,137.1	5.5	5.3	-151.03	-17.5	219.3	387.0	378.7	8.25	46.915			
2,300.0	2,276.2	2,245.3	2,231.9	5.9	5.6	-151.65	-18.9	230.9	416.3	407.6	8.67	48.010			
2,400.0	2,373.9	2,340.8	2,326.7	6.3	5.9	-152.19	-20.2	242.4	445.7	436.6	9.09	49.010			
2,500.0	2,471.6	2,436.3	2,421.5	6.7	6.1	-152.67	-21.6	254.0	475.0	465.5	9.51	49.926			
2,600.0	2,569.3	2,531.8	2,516.3	7.1	6.4	-153.09	-22.9	265.6	504.5	494.5	9.94	50.769			
2,700.0	2,667.0	2,627.3	2,611.1	7.5	6.6	-153.46	-24.3	277.2	533.9	523.5	10.36	51.546			
2,800.0	2,764.6	2,722.9	2,705.9	7.9	6.9	-153.80	-25.6	288.8	563.4	552.6	10.78	52.266			
2,900.0	2,862.3	2,818.4	2,800.7	8.3	7.2	-154.10	-26.9	300.4	592.8	581.6	11.20	52.934			
3,000.0	2,960.0	2,913.9	2,895.5	8.7	7.4	-154.37	-28.3	312.0	622.3	610.7	11.62	53.556			
3,100.0	3,057.7	3,009.4	2,990.3	9.1	7.7	-154.62	-29.6	323.5	651.8	639.8	12.04	54.135			
3,200.0	3,155.4	3,104.9	3,085.1	9.5	8.0	-154.85	-31.0	335.1	681.3	668.9	12.46	54.677			
3,300.0	3,253.1	3,200.4	3,179.9	9.9	8.2	-155.06	-32.3	346.7	710.8	698.0	12.88	55.185			
3,400.0	3,350.7	3,295.9	3,274.7	10.3	8.5	-155.25	-33.7	358.3	740.4	727.1	13.30	55.662			
3,500.0	3,448.4	3,391.4	3,369.5	10.7	8.8	-155.43	-35.0	369.9	769.9	756.2	13.72	56.111			
3,600.0	3,546.1	3,487.0	3,464.3	11.1	9.0	-155.59	-36.4	381.5	799.4	785.3	14.14	56.534			
3,700.0	3,643.8	3,582.5	3,559.1	11.5	9.3	-155.74	-37.7	393.1	829.0	814.4	14.56	56.933			
3,800.0	3,741.5	3,678.0	3,653.9	11.9	9.5	-155.88	-39.1	404.7	858.5	843.6	14.98	57.310			
3,900.0	3,839.2	3,773.5	3,748.7	12.4	9.8	-156.02	-40.4	416.2	888.1	872.7	15.40	57.667			
4,000.0	3,936.8	3,869.0	3,843.5	12.8	10.1	-156.14	-41.8	427.8	917.6	901.8	15.82	58.006			
4,100.0	4,034.5	3,964.5	3,938.3	13.2	10.3	-156.26	-43.1	439.4	947.2	931.0	16.24	58.328			
4,200.0	4,132.2	4,060.0	4,033.1	13.6	10.6	-156.37	-44.5	451.0	976.8	960.1	16.66	58.634			
4,300.0	4,229.9	4,155.6	4,127.9	14.0	10.9	-156.47	-45.8	462.6	1,006.3	989.3	17.08	58.925			
4,400.0	4,327.6	4,251.1	4,222.7	14.4	11.1	-156.57	-47.2	474.2	1,035.9	1,018.4	17.50	59.203			
4,500.0	4,425.2	4,346.6	4,317.5	14.8	11.4	-156.66	-48.5	485.8	1,065.5	1,047.6	17.92	59.467			
4,600.0	4,522.9	4,442.1	4,412.3	15.2	11.7	-156.74	-49.8	497.3	1,095.1	1,076.7	18.34	59.720			
4,700.0	4,620.6	4,537.6	4,507.1	15.7	11.9	-156.83	-51.2	508.9	1,124.6	1,105.9	18.76	59.962			
4,800.0	4,718.3	4,633.1	4,601.9	16.1	12.2	-156.90	-52.5	520.5	1,154.2	1,135.0	19.18	60.194			
4,900.0	4,816.0	4,728.6	4,696.7	16.5	12.4	-156.98	-53.9	532.1	1,183.8	1,164.2	19.59	60.415			
5,000.0	4,913.7	4,824.1	4,791.5	16.9	12.7	-157.05	-55.2	543.7	1,213.4	1,193.4	20.01	60.628			
5,100.0	5,011.3	4,919.7	4,886.2	17.3	13.0	-157.11	-56.6	555.3	1,243.0	1,222.5	20.43	60.832			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-9C - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,200.0	5,109.0	5,015.2	4,981.0	17.7	13.2	-157.18	-57.9	566.9	1,272.6	1,251.7	20.85	61.028		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 21-1B - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	177.85	-60.1	2.3	60.1					
100.0	100.0	100.0	100.0	0.1	0.1	177.85	-60.1	2.3	60.1	59.9	0.27	220.887		
200.0	200.0	200.0	200.0	0.3	0.3	177.85	-60.1	2.3	60.1	59.5	0.62	96.793		
300.0	300.0	300.0	300.0	0.5	0.5	177.85	-60.1	2.3	60.1	59.2	0.97	61.975 CC, ES		
400.0	400.0	397.1	397.1	0.7	0.7	176.90	-62.3	3.4	62.5	61.1	1.32	47.498		
500.0	500.0	493.8	493.4	0.8	0.9	174.45	-68.9	6.7	69.5	67.8	1.66	41.806		
600.0	600.0	589.4	588.3	1.0	1.1	171.33	-79.6	12.1	81.4	79.4	2.02	40.320 SF		
700.0	700.0	683.6	681.1	1.2	1.4	168.26	-94.4	19.6	98.2	95.8	2.39	41.028		
800.0	800.0	776.0	771.1	1.4	1.8	165.61	-112.7	28.9	119.9	117.1	2.80	42.862		
900.0	900.0	866.1	857.9	1.5	2.3	163.47	-134.4	39.9	146.4	143.2	3.24	45.222		
1,000.0	1,000.0	958.6	945.9	1.7	2.8	161.74	-159.7	52.7	176.6	172.9	3.71	47.577		
1,100.0	1,100.0	1,054.0	1,036.6	1.9	3.3	-59.40	-186.0	66.0	206.0	202.3	3.72	55.415		
1,200.0	1,199.6	1,149.7	1,127.6	2.1	3.8	-61.27	-212.4	79.4	233.2	229.1	4.06	57.407		
1,300.0	1,298.8	1,245.6	1,218.8	2.3	4.4	-63.68	-238.9	92.8	258.5	254.1	4.43	58.378		
1,400.0	1,397.1	1,341.3	1,309.8	2.6	4.9	-66.53	-265.3	106.2	282.4	277.5	4.85	58.228		
1,500.0	1,494.8	1,436.8	1,400.6	2.9	5.4	-69.97	-291.7	119.5	306.1	300.8	5.34	57.352		
1,600.0	1,592.5	1,532.3	1,491.4	3.2	6.0	-73.00	-318.0	132.9	330.8	324.9	5.89	56.202		
1,700.0	1,690.1	1,627.8	1,582.2	3.6	6.5	-75.61	-344.4	146.2	356.2	349.7	6.48	54.947		
1,800.0	1,787.8	1,723.2	1,673.0	3.9	7.1	-77.88	-370.7	159.6	382.2	375.1	7.12	53.696		
1,900.0	1,885.5	1,818.7	1,763.8	4.3	7.6	-79.86	-397.1	172.9	408.8	401.0	7.78	52.512		
2,000.0	1,983.2	1,914.2	1,854.6	4.7	8.1	-81.60	-423.4	186.3	435.7	427.2	8.47	51.422		
2,100.0	2,080.9	2,009.7	1,945.4	5.1	8.7	-83.14	-449.8	199.6	463.0	453.8	9.18	50.436		
2,200.0	2,178.5	2,105.2	2,036.3	5.5	9.2	-84.51	-476.2	213.0	490.5	480.6	9.90	49.551		
2,300.0	2,276.2	2,200.7	2,127.1	5.9	9.8	-85.74	-502.5	226.3	518.3	507.7	10.63	48.760		
2,400.0	2,373.9	2,296.2	2,217.9	6.3	10.3	-86.84	-528.9	239.7	546.3	535.0	11.37	48.054		
2,500.0	2,471.6	2,391.7	2,308.7	6.7	10.9	-87.84	-555.2	253.0	574.5	562.4	12.11	47.424		
2,600.0	2,569.3	2,487.2	2,399.5	7.1	11.4	-88.74	-581.6	266.4	602.8	589.9	12.86	46.860		
2,700.0	2,667.0	2,582.7	2,490.3	7.5	12.0	-89.56	-608.0	279.7	631.2	617.6	13.62	46.354		
2,800.0	2,764.6	2,678.2	2,581.1	7.9	12.5	-90.32	-634.3	293.1	659.8	645.4	14.37	45.899		
2,900.0	2,862.3	2,773.7	2,671.9	8.3	13.0	-91.01	-660.7	306.4	688.4	673.3	15.13	45.488		
3,000.0	2,960.0	2,869.2	2,762.7	8.7	13.6	-91.64	-687.0	319.8	717.2	701.3	15.90	45.116		
3,100.0	3,057.7	2,964.6	2,853.5	9.1	14.1	-92.23	-713.4	333.1	746.0	729.3	16.66	44.778		
3,200.0	3,155.4	3,060.1	2,944.3	9.5	14.7	-92.77	-739.8	346.5	774.8	757.4	17.42	44.470		
3,300.0	3,253.1	3,155.6	3,035.1	9.9	15.2	-93.28	-766.1	359.8	803.8	785.6	18.19	44.189		
3,400.0	3,350.7	3,251.1	3,125.9	10.3	15.8	-93.75	-792.5	373.2	832.7	813.8	18.96	43.931		
3,500.0	3,448.4	3,346.6	3,216.7	10.7	16.3	-94.18	-818.8	386.5	861.8	842.0	19.72	43.694		
3,600.0	3,546.1	3,442.1	3,307.5	11.1	16.9	-94.59	-845.2	399.9	890.8	870.4	20.49	43.475		
3,700.0	3,643.8	3,537.6	3,398.3	11.5	17.4	-94.98	-871.5	413.2	920.0	898.7	21.26	43.274		
3,800.0	3,741.5	3,633.1	3,489.1	11.9	18.0	-95.34	-897.9	426.6	949.1	927.1	22.03	43.087		
3,900.0	3,839.2	3,728.6	3,580.0	12.4	18.5	-95.67	-924.3	439.9	978.3	955.5	22.80	42.913		
4,000.0	3,936.8	3,824.1	3,670.8	12.8	19.0	-95.99	-950.6	453.3	1,007.5	983.9	23.57	42.752		
4,100.0	4,034.5	3,919.6	3,761.6	13.2	19.6	-96.30	-977.0	466.6	1,036.7	1,012.4	24.34	42.601		
4,200.0	4,132.2	4,015.1	3,852.4	13.6	20.1	-96.58	-1,003.3	480.0	1,066.0	1,040.9	25.11	42.461		
4,300.0	4,229.9	4,110.5	3,943.2	14.0	20.7	-96.85	-1,029.7	493.3	1,095.3	1,069.4	25.88	42.329		
4,400.0	4,327.6	4,206.0	4,034.0	14.4	21.2	-97.10	-1,056.1	506.6	1,124.6	1,097.9	26.65	42.206		
4,500.0	4,425.2	4,301.5	4,124.8	14.8	21.8	-97.35	-1,082.4	520.0	1,153.9	1,126.5	27.42	42.090		
4,600.0	4,522.9	4,397.0	4,215.6	15.2	22.3	-97.58	-1,108.8	533.3	1,183.3	1,155.1	28.19	41.981		
4,700.0	4,620.6	4,492.5	4,306.4	15.7	22.9	-97.80	-1,135.1	546.7	1,212.6	1,183.7	28.96	41.878		
4,800.0	4,718.3	4,588.0	4,397.2	16.1	23.4	-98.01	-1,161.5	560.0	1,242.0	1,212.3	29.73	41.781		
4,900.0	4,816.0	4,683.5	4,488.0	16.5	24.0	-98.21	-1,187.8	573.4	1,271.4	1,240.9	30.50	41.689		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 21-3A - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: O-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
0.0	0.0	0.0	0.0	0.0	0.0	-174.62	-51.0	-4.8	51.2						
100.0	100.0	100.0	100.0	0.1	0.1	-174.62	-51.0	-4.8	51.2	50.9	0.27	188.115			
200.0	200.0	200.0	200.0	0.3	0.3	-174.62	-51.0	-4.8	51.2	50.6	0.62	82.432 CC, ES			
300.0	300.0	297.4	297.4	0.5	0.5	-173.81	-53.3	-5.8	53.7	52.7	0.97	55.216			
400.0	400.0	394.3	394.0	0.7	0.7	-171.79	-60.1	-8.7	61.0	59.7	1.34	45.365			
500.0	500.0	490.3	489.2	0.8	1.0	-169.33	-71.2	-13.4	73.3	71.6	1.75	41.886			
600.0	600.0	584.7	582.1	1.0	1.3	-167.03	-86.5	-19.9	90.6	88.4	2.19	41.343			
700.0	700.0	677.3	672.4	1.2	1.7	-165.12	-105.6	-28.1	112.7	110.0	2.66	42.286			
800.0	800.0	767.7	759.4	1.4	2.2	-163.63	-128.1	-37.6	139.5	136.3	3.17	44.019			
900.0	900.0	860.8	848.0	1.5	2.7	-162.46	-154.2	-48.7	169.8	166.2	3.70	45.959			
1,000.0	1,000.0	955.9	938.6	1.7	3.2	-161.61	-181.1	-60.2	200.5	196.2	4.23	47.361			
1,100.0	1,100.0	1,051.8	1,029.8	1.9	3.7	-20.91	-208.2	-71.7	228.8	225.1	3.69	61.965			
1,200.0	1,199.6	1,149.0	1,122.3	2.1	4.3	-20.79	-235.7	-83.4	252.4	248.3	4.04	62.439			
1,300.0	1,298.8	1,247.2	1,215.7	2.3	4.8	-21.11	-263.4	-95.3	271.2	266.8	4.40	61.644			
1,400.0	1,397.1	1,346.1	1,309.8	2.6	5.4	-21.80	-291.4	-107.2	285.3	280.5	4.77	59.786			
1,500.0	1,494.8	1,445.3	1,404.3	2.9	5.9	-22.78	-319.5	-119.1	296.4	291.3	5.17	57.317			
1,600.0	1,592.5	1,544.6	1,498.7	3.2	6.5	-23.72	-347.5	-131.1	307.6	302.1	5.59	55.051			
1,700.0	1,690.1	1,643.8	1,593.2	3.6	7.1	-24.59	-375.6	-143.0	318.9	312.9	6.02	52.984			
1,800.0	1,787.8	1,743.1	1,687.6	3.9	7.6	-25.39	-403.6	-155.0	330.3	323.8	6.46	51.094			
1,900.0	1,885.5	1,842.3	1,782.1	4.3	8.2	-26.15	-431.7	-166.9	341.7	334.8	6.92	49.364			
2,000.0	1,983.2	1,941.6	1,876.5	4.7	8.7	-26.85	-459.8	-178.9	353.2	345.8	7.39	47.776			
2,100.0	2,080.9	2,040.8	1,970.9	5.1	9.3	-27.52	-487.8	-190.8	364.7	356.9	7.87	46.317			
2,200.0	2,178.5	2,140.1	2,065.4	5.5	9.9	-28.14	-515.9	-202.8	376.3	367.9	8.37	44.975			
2,300.0	2,276.2	2,239.3	2,159.8	5.9	10.4	-28.72	-544.0	-214.7	387.9	379.0	8.87	43.737			
2,400.0	2,373.9	2,338.6	2,254.3	6.3	11.0	-29.27	-572.0	-226.7	399.6	390.2	9.38	42.595			
2,500.0	2,471.6	2,437.8	2,348.7	6.7	11.5	-29.79	-600.1	-238.6	411.3	401.4	9.90	41.539			
2,600.0	2,569.3	2,537.1	2,443.2	7.1	12.1	-30.28	-628.2	-250.6	423.0	412.5	10.43	40.562			
2,700.0	2,667.0	2,636.3	2,537.6	7.5	12.7	-30.74	-656.2	-262.5	434.7	423.8	10.96	39.655			
2,800.0	2,764.6	2,735.5	2,632.1	7.9	13.2	-31.18	-684.3	-274.5	446.5	435.0	11.50	38.812			
2,900.0	2,862.3	2,834.8	2,726.5	8.3	13.8	-31.60	-712.3	-286.4	458.3	446.2	12.05	38.028			
3,000.0	2,960.0	2,934.0	2,820.9	8.7	14.4	-31.99	-740.4	-298.4	470.1	457.5	12.60	37.298			
3,100.0	3,057.7	3,033.3	2,915.4	9.1	14.9	-32.37	-768.5	-310.3	481.9	468.8	13.16	36.615			
3,200.0	3,155.4	3,132.5	3,009.8	9.5	15.5	-32.73	-796.5	-322.3	493.8	480.1	13.73	35.977			
3,300.0	3,253.1	3,231.8	3,104.3	9.9	16.1	-33.07	-824.6	-334.2	505.7	491.4	14.29	35.380			
3,400.0	3,350.7	3,331.0	3,198.7	10.3	16.6	-33.40	-852.7	-346.2	517.6	502.7	14.86	34.819			
3,500.0	3,448.4	3,430.3	3,293.2	10.7	17.2	-33.71	-880.7	-358.1	529.5	514.1	15.44	34.293			
3,600.0	3,546.1	3,529.5	3,387.6	11.1	17.7	-34.00	-908.8	-370.1	541.4	525.4	16.02	33.797			
3,700.0	3,643.8	3,628.8	3,482.1	11.5	18.3	-34.29	-936.8	-382.0	553.4	536.8	16.60	33.330			
3,800.0	3,741.5	3,728.0	3,576.5	11.9	18.9	-34.56	-964.9	-394.0	565.3	548.1	17.19	32.890			
3,900.0	3,839.2	3,827.3	3,670.9	12.4	19.4	-34.82	-993.0	-405.9	577.3	559.5	17.78	32.474			
4,000.0	3,936.8	3,926.5	3,765.4	12.8	20.0	-35.07	-1,021.0	-417.9	589.2	570.9	18.37	32.081			
4,100.0	4,034.5	4,025.8	3,859.8	13.2	20.6	-35.31	-1,049.1	-429.8	601.2	582.3	18.96	31.708			
4,200.0	4,132.2	4,125.0	3,954.3	13.6	21.1	-35.54	-1,077.2	-441.8	613.2	593.7	19.56	31.355			
4,300.0	4,229.9	4,224.3	4,048.7	14.0	21.7	-35.77	-1,105.2	-453.7	625.2	605.1	20.16	31.019			
4,400.0	4,327.6	4,323.5	4,143.2	14.4	22.2	-35.98	-1,133.3	-465.7	637.3	616.5	20.76	30.700			
4,500.0	4,425.2	4,422.8	4,237.6	14.8	22.8	-36.19	-1,161.3	-477.6	649.3	627.9	21.36	30.397			
4,600.0	4,522.9	4,522.0	4,332.1	15.2	23.4	-36.39	-1,189.4	-489.6	661.3	639.3	21.96	30.108			
4,700.0	4,620.6	4,621.3	4,426.5	15.7	23.9	-36.58	-1,217.5	-501.5	673.3	650.8	22.57	29.833			
4,800.0	4,718.3	4,720.5	4,521.0	16.1	24.5	-36.76	-1,245.5	-513.5	685.4	662.2	23.18	29.570			
4,900.0	4,816.0	4,819.8	4,615.4	16.5	25.1	-36.94	-1,273.6	-525.4	697.4	673.7	23.79	29.319			
5,000.0	4,913.7	4,919.0	4,709.8	16.9	25.6	-37.11	-1,301.7	-537.4	709.5	685.1	24.40	29.079			
5,100.0	5,011.3	5,018.2	4,804.3	17.3	26.2	-37.28	-1,329.7	-549.3	721.6	696.6	25.01	28.850			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 21-3A - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,200.0	5,109.0	5,117.5	4,898.7	17.7	26.8	-37.44	-1,357.8	-561.3	733.6	708.0	25.62	28.630		
5,300.0	5,206.7	5,216.7	4,993.2	18.1	27.3	-37.60	-1,385.9	-573.2	745.7	719.5	26.24	28.419		
5,400.0	5,304.4	5,316.0	5,087.6	18.5	27.9	-37.75	-1,413.9	-585.2	757.8	730.9	26.86	28.217		
5,500.0	5,402.1	5,415.2	5,182.1	19.0	28.4	-37.89	-1,442.0	-597.1	769.9	742.4	27.47	28.023		
5,600.0	5,499.8	5,514.5	5,276.5	19.4	29.0	-38.04	-1,470.0	-609.1	782.0	753.9	28.09	27.837		
5,700.0	5,597.4	5,613.7	5,371.0	19.8	29.6	-38.17	-1,498.1	-621.0	794.1	765.4	28.71	27.658		
5,800.0	5,695.1	5,713.0	5,465.4	20.2	30.1	-38.31	-1,526.2	-633.0	806.2	776.8	29.33	27.485		
5,900.0	5,792.8	5,812.2	5,559.8	20.6	30.7	-38.44	-1,554.2	-644.9	818.3	788.3	29.95	27.319		
6,000.0	5,890.5	5,911.5	5,654.3	21.0	31.3	-38.56	-1,582.3	-656.9	830.4	799.8	30.57	27.159		
6,100.0	5,988.2	6,010.7	5,748.7	21.4	31.8	-38.68	-1,610.4	-668.8	842.5	811.3	31.20	27.005		
6,200.0	6,085.8	6,110.0	5,843.2	21.9	32.4	-38.80	-1,638.4	-680.8	854.6	822.8	31.82	26.857		
6,300.0	6,183.5	6,209.2	5,937.6	22.3	32.9	-38.92	-1,666.5	-692.7	866.7	834.3	32.45	26.713		
6,400.0	6,281.2	6,308.5	6,032.1	22.7	33.5	-39.03	-1,694.5	-704.7	878.9	845.8	33.07	26.575		
6,500.0	6,378.9	6,407.7	6,126.5	23.1	34.1	-39.14	-1,722.6	-716.6	891.0	857.3	33.70	26.441		
6,600.0	6,476.6	6,507.0	6,221.0	23.5	34.6	-39.24	-1,750.7	-728.6	903.1	868.8	34.32	26.312		
6,700.0	6,574.3	6,606.2	6,315.4	23.9	35.2	-39.35	-1,778.7	-740.5	915.3	880.3	34.95	26.187		
6,800.0	6,671.9	6,705.5	6,409.8	24.3	35.8	-39.45	-1,806.8	-752.5	927.4	891.8	35.58	26.066		
6,900.0	6,769.6	6,804.7	6,504.3	24.8	36.3	-39.55	-1,834.9	-764.4	939.5	903.3	36.21	25.949		
7,000.0	6,867.3	6,904.0	6,598.7	25.2	36.9	-39.64	-1,862.9	-776.4	951.7	914.8	36.84	25.835		
7,100.0	6,965.0	7,003.2	6,693.2	25.6	37.5	-39.73	-1,891.0	-788.3	963.8	926.3	37.47	25.725		
7,200.0	7,062.8	7,112.9	6,797.6	26.0	38.1	-39.90	-1,921.8	-801.5	976.2	938.1	38.13	25.599		
7,300.0	7,161.1	7,257.8	6,937.1	26.3	38.8	-40.11	-1,958.1	-816.9	987.7	948.9	38.83	25.439		
7,400.0	7,260.1	7,403.7	7,079.3	26.6	39.3	-40.27	-1,988.0	-829.6	997.2	957.8	39.43	25.293		
7,500.0	7,359.5	7,550.4	7,223.7	26.8	39.8	-40.39	-2,011.3	-839.6	1,004.7	964.8	39.93	25.165		
7,600.0	7,459.2	7,697.7	7,370.0	27.0	40.1	-40.46	-2,027.8	-846.6	1,010.2	969.8	40.33	25.047		
7,700.0	7,559.1	7,845.5	7,517.4	27.1	40.4	-40.48	-2,037.4	-850.7	1,013.6	972.9	40.63	24.944		
7,800.0	7,659.1	7,987.3	7,659.1	27.2	40.5	179.52	-2,040.1	-851.8	1,014.8	973.9	40.88	24.826		
7,900.0	7,759.1	8,087.3	7,759.1	27.3	40.5	179.52	-2,040.1	-851.8	1,014.8	973.7	41.11	24.684		
8,000.0	7,859.1	8,187.3	7,859.1	27.4	40.6	179.52	-2,040.1	-851.8	1,014.8	973.4	41.35	24.542		
8,100.0	7,959.1	8,287.3	7,959.1	27.5	40.6	179.52	-2,040.1	-851.8	1,014.8	973.2	41.59	24.402		
8,200.0	8,059.1	8,387.3	8,059.1	27.6	40.7	179.52	-2,040.1	-851.8	1,014.8	973.0	41.83	24.261		
8,300.0	8,159.1	8,487.3	8,159.1	27.7	40.8	179.52	-2,040.1	-851.8	1,014.8	972.7	42.07	24.122		
8,400.0	8,259.1	8,587.3	8,259.1	27.7	40.8	179.52	-2,040.1	-851.8	1,014.8	972.5	42.31	23.983		
8,500.0	8,359.1	8,687.3	8,359.1	27.8	40.9	179.52	-2,040.1	-851.8	1,014.8	972.2	42.56	23.846		
8,600.0	8,459.1	8,787.3	8,459.1	27.9	41.0	179.52	-2,040.1	-851.8	1,014.8	972.0	42.80	23.708		
8,700.0	8,559.1	8,887.3	8,559.1	28.0	41.0	179.52	-2,040.1	-851.8	1,014.8	971.7	43.05	23.572		
8,800.0	8,659.1	8,987.3	8,659.1	28.1	41.1	179.52	-2,040.1	-851.8	1,014.8	971.5	43.30	23.437		
8,900.0	8,759.1	9,087.3	8,759.1	28.2	41.2	179.52	-2,040.1	-851.8	1,014.8	971.2	43.55	23.302		
9,000.0	8,859.1	9,187.3	8,859.1	28.3	41.2	179.52	-2,040.1	-851.8	1,014.8	971.0	43.80	23.168		
9,100.0	8,959.1	9,287.3	8,959.1	28.4	41.3	179.52	-2,040.1	-851.8	1,014.8	970.7	44.05	23.035		
9,200.0	9,059.1	9,387.3	9,059.1	28.5	41.4	179.52	-2,040.1	-851.8	1,014.8	970.5	44.31	22.903		
9,300.0	9,159.1	9,487.3	9,159.1	28.6	41.4	179.52	-2,040.1	-851.8	1,014.8	970.2	44.56	22.771		
9,400.0	9,259.1	9,587.3	9,259.1	28.7	41.5	179.52	-2,040.1	-851.8	1,014.8	970.0	44.82	22.641		
9,500.0	9,359.1	9,687.3	9,359.1	28.8	41.6	179.52	-2,040.1	-851.8	1,014.8	969.7	45.08	22.511		
9,600.0	9,459.1	9,787.3	9,459.1	28.9	41.6	179.52	-2,040.1	-851.8	1,014.8	969.5	45.34	22.382		
9,700.0	9,559.1	9,887.3	9,559.1	29.0	41.7	179.52	-2,040.1	-851.8	1,014.8	969.2	45.60	22.255		
9,800.0	9,659.1	9,987.3	9,659.1	29.1	41.8	179.52	-2,040.1	-851.8	1,014.8	968.9	45.86	22.128		
9,900.0	9,759.1	10,087.3	9,759.1	29.2	41.9	179.52	-2,040.1	-851.8	1,014.8	968.7	46.12	22.001		
10,000.0	9,859.1	10,187.3	9,859.1	29.3	41.9	179.52	-2,040.1	-851.8	1,014.8	968.4	46.39	21.876		
10,100.0	9,959.1	10,287.3	9,959.1	29.4	42.0	179.52	-2,040.1	-851.8	1,014.8	968.1	46.65	21.752		
10,200.0	10,059.1	10,387.3	10,059.1	29.5	42.1	179.52	-2,040.1	-851.8	1,014.8	967.9	46.92	21.629		
10,300.0	10,159.1	10,487.3	10,159.1	29.6	42.2	179.52	-2,040.1	-851.8	1,014.8	967.6	47.19	21.506		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 21-3A - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
10,400.0	10,259.1	10,587.3	10,259.1	29.7	42.2	179.52	-2,040.1	-851.8	1,014.8	967.3	47.45	21.384		
10,500.0	10,359.1	10,687.3	10,359.1	29.8	42.3	179.52	-2,040.1	-851.8	1,014.8	967.1	47.72	21.264		
10,600.0	10,459.1	10,787.3	10,459.1	29.9	42.4	179.52	-2,040.1	-851.8	1,014.8	966.8	47.99	21.144		
10,700.0	10,559.1	10,887.3	10,559.1	30.1	42.5	179.52	-2,040.1	-851.8	1,014.8	966.5	48.27	21.025		
10,800.0	10,659.1	10,987.3	10,659.1	30.2	42.5	179.52	-2,040.1	-851.8	1,014.8	966.3	48.54	20.907		
10,900.0	10,759.1	11,087.3	10,759.1	30.3	42.6	179.52	-2,040.1	-851.8	1,014.8	966.0	48.81	20.790		
10,916.9	10,776.0	11,104.2	10,776.0	30.3	42.6	179.52	-2,040.1	-851.8	1,014.8	965.9	48.86	20.770 SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Fee 16-8D - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	23.18	24.4	10.4	26.5					
100.0	100.0	100.0	100.0	0.1	0.1	23.18	24.4	10.4	26.5	26.3	0.27	97.486		
200.0	200.0	200.0	200.0	0.3	0.3	23.18	24.4	10.4	26.5	25.9	0.62	42.719 CC, ES		
300.0	300.0	298.7	298.6	0.5	0.5	25.50	26.0	12.4	28.9	27.9	0.98	29.605		
400.0	400.0	396.9	396.5	0.7	0.7	30.60	30.9	18.3	36.0	34.7	1.35	26.606 SF		
500.0	500.0	494.0	492.8	0.8	1.0	35.66	38.8	27.8	48.3	46.5	1.77	27.342		
600.0	600.0	589.6	586.9	1.0	1.3	39.51	49.7	41.0	65.7	63.5	2.21	29.696		
700.0	700.0	686.0	681.0	1.2	1.7	42.17	63.0	57.1	87.1	84.4	2.67	32.601		
800.0	800.0	783.6	776.2	1.4	2.1	43.82	76.7	73.6	108.9	105.7	3.14	34.707		
900.0	900.0	881.1	871.4	1.5	2.5	44.92	90.3	90.1	130.8	127.1	3.61	36.269		
1,000.0	1,000.0	978.7	966.6	1.7	2.9	45.70	104.0	106.6	152.6	148.6	4.07	37.471		
1,100.0	1,100.0	1,075.6	1,061.1	1.9	3.3	-173.72	117.6	123.0	177.1	173.4	3.71	47.693		
1,200.0	1,199.6	1,171.2	1,154.3	2.1	3.7	-173.42	131.0	139.2	206.6	202.5	4.03	51.233		
1,300.0	1,298.8	1,265.1	1,245.9	2.3	4.1	-173.30	144.2	155.1	241.0	236.6	4.34	55.542		
1,400.0	1,397.1	1,357.0	1,335.6	2.6	4.5	-173.29	157.1	170.7	280.2	275.6	4.63	60.494		
1,500.0	1,494.8	1,447.7	1,424.1	2.9	4.9	-173.44	169.8	186.0	322.3	317.4	4.96	65.024		
1,600.0	1,592.5	1,538.4	1,512.6	3.2	5.3	-173.58	182.5	201.4	364.5	359.2	5.29	68.931		
1,700.0	1,690.1	1,629.1	1,601.0	3.6	5.7	-173.69	195.2	216.7	406.7	401.1	5.62	72.378		
1,800.0	1,787.8	1,719.7	1,689.5	3.9	6.0	-173.77	207.9	232.1	448.9	442.9	5.95	75.440		
1,900.0	1,885.5	1,810.4	1,777.9	4.3	6.4	-173.85	220.6	247.4	491.1	484.8	6.28	78.179		
2,000.0	1,983.2	1,901.1	1,866.4	4.7	6.8	-173.91	233.3	262.8	533.2	526.6	6.61	80.644		
2,100.0	2,080.9	1,991.7	1,954.8	5.1	7.2	-173.96	246.0	278.1	575.4	568.5	6.94	82.874		
2,200.0	2,178.5	2,082.4	2,043.3	5.5	7.6	-174.00	258.7	293.5	617.6	610.3	7.27	84.900		
2,300.0	2,276.2	2,173.1	2,131.7	5.9	8.0	-174.04	271.4	308.8	659.8	652.2	7.61	86.750		
2,400.0	2,373.9	2,263.7	2,220.1	6.3	8.4	-174.08	284.2	324.1	702.0	694.0	7.94	88.446		
2,500.0	2,471.6	2,354.4	2,308.6	6.7	8.7	-174.11	296.9	339.5	744.2	735.9	8.27	90.005		
2,600.0	2,569.3	2,445.1	2,397.0	7.1	9.1	-174.13	309.6	354.8	786.3	777.7	8.60	91.445		
2,700.0	2,667.0	2,535.7	2,485.5	7.5	9.5	-174.16	322.3	370.2	828.5	819.6	8.93	92.778		
2,800.0	2,764.6	2,626.4	2,573.9	7.9	9.9	-174.18	335.0	385.5	870.7	861.5	9.26	94.015		
2,900.0	2,862.3	2,717.1	2,662.4	8.3	10.3	-174.20	347.7	400.9	912.9	903.3	9.59	95.167		
3,000.0	2,960.0	2,807.7	2,750.8	8.7	10.7	-174.22	360.4	416.2	955.1	945.2	9.92	96.242		
3,100.0	3,057.7	2,898.4	2,839.3	9.1	11.1	-174.24	373.1	431.6	997.3	987.0	10.25	97.248		
3,200.0	3,155.4	2,989.1	2,927.7	9.5	11.4	-174.25	385.8	446.9	1,039.5	1,028.9	10.59	98.191		
3,300.0	3,253.1	3,079.7	3,016.2	9.9	11.8	-174.27	398.5	462.3	1,081.6	1,070.7	10.92	99.076		
3,400.0	3,350.7	3,170.4	3,104.6	10.3	12.2	-174.28	411.3	477.6	1,123.8	1,112.6	11.25	99.909		
3,500.0	3,448.4	3,261.0	3,193.1	10.7	12.6	-174.29	424.0	493.0	1,166.0	1,154.4	11.58	100.695		
3,600.0	3,546.1	3,351.7	3,281.5	11.1	13.0	-174.30	436.7	508.3	1,208.2	1,196.3	11.91	101.437		
3,700.0	3,643.8	3,442.4	3,370.0	11.5	13.4	-174.31	449.4	523.7	1,250.4	1,238.2	12.24	102.139		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
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Reference Well:	HMU Federal 16-14D	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 7667.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: HMU Federal 16-14D
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.44°

