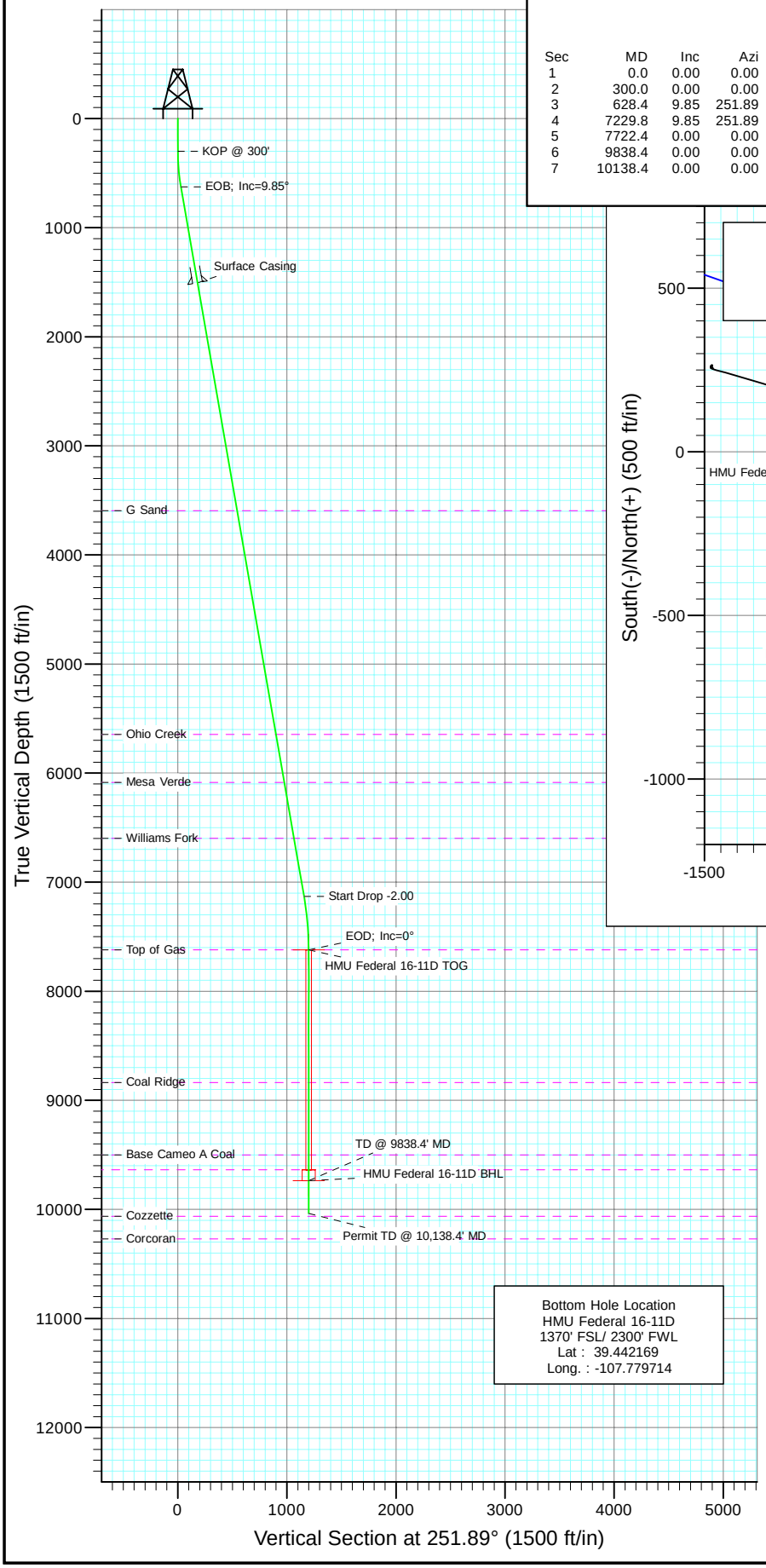
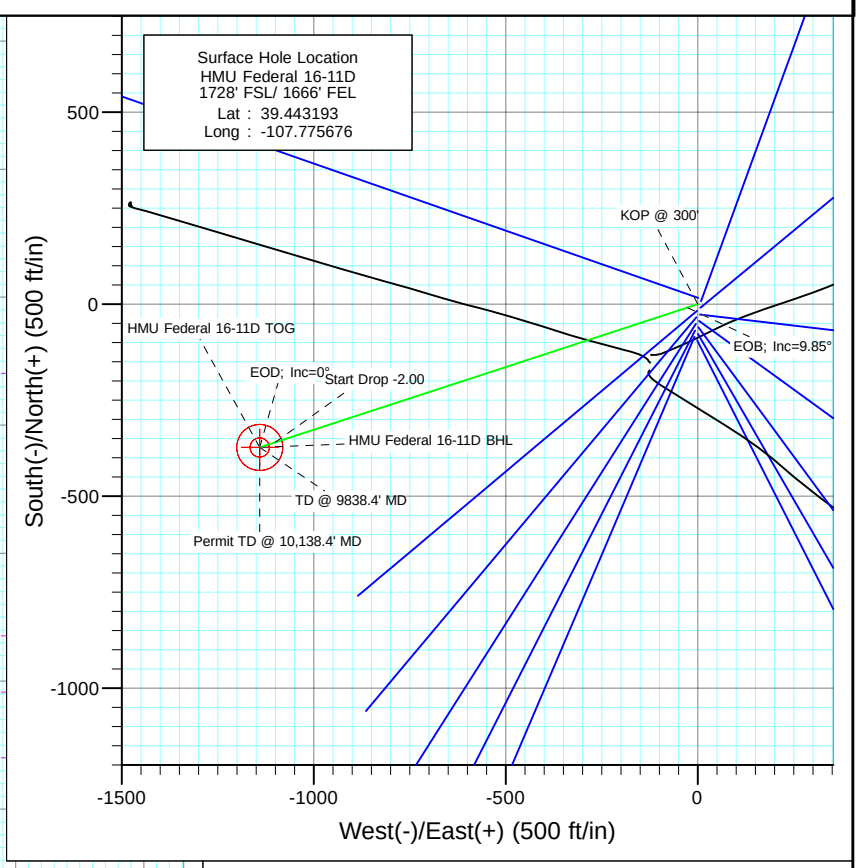
Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-11D
Wellbore: DD
Design: Plan #1

CATHEDRAL

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	
3	628.4	9.85	251.89	626.8	-8.8	-26.8	3.00	251.89	28.2	
4	7229.8	9.85	251.89	7130.9	-359.8	-1100.3	0.00	0.00	1157.6	
5	7722.4	0.00	0.00	7621.0	-372.9	-1140.4	2.00	180.00	1199.8	HMU Federal 16-11D TOG
6	9838.4	0.00	0.00	9737.0	-372.9	-1140.4	0.00	0.00	1199.8	HMU Federal 16-11D BHL
7	10138.4	0.00	0.00	10037.0	-372.9	-1140.4	0.00	0.00	1199.8	





Azimuths to True North
Magnetic North: 10.30°

Magnetic Field
Strength: 52331.8snT
Dip Angle: 65.77°
Date: 10/25/2010
Model: IGRF200510

FORMATION TOP DETAILS

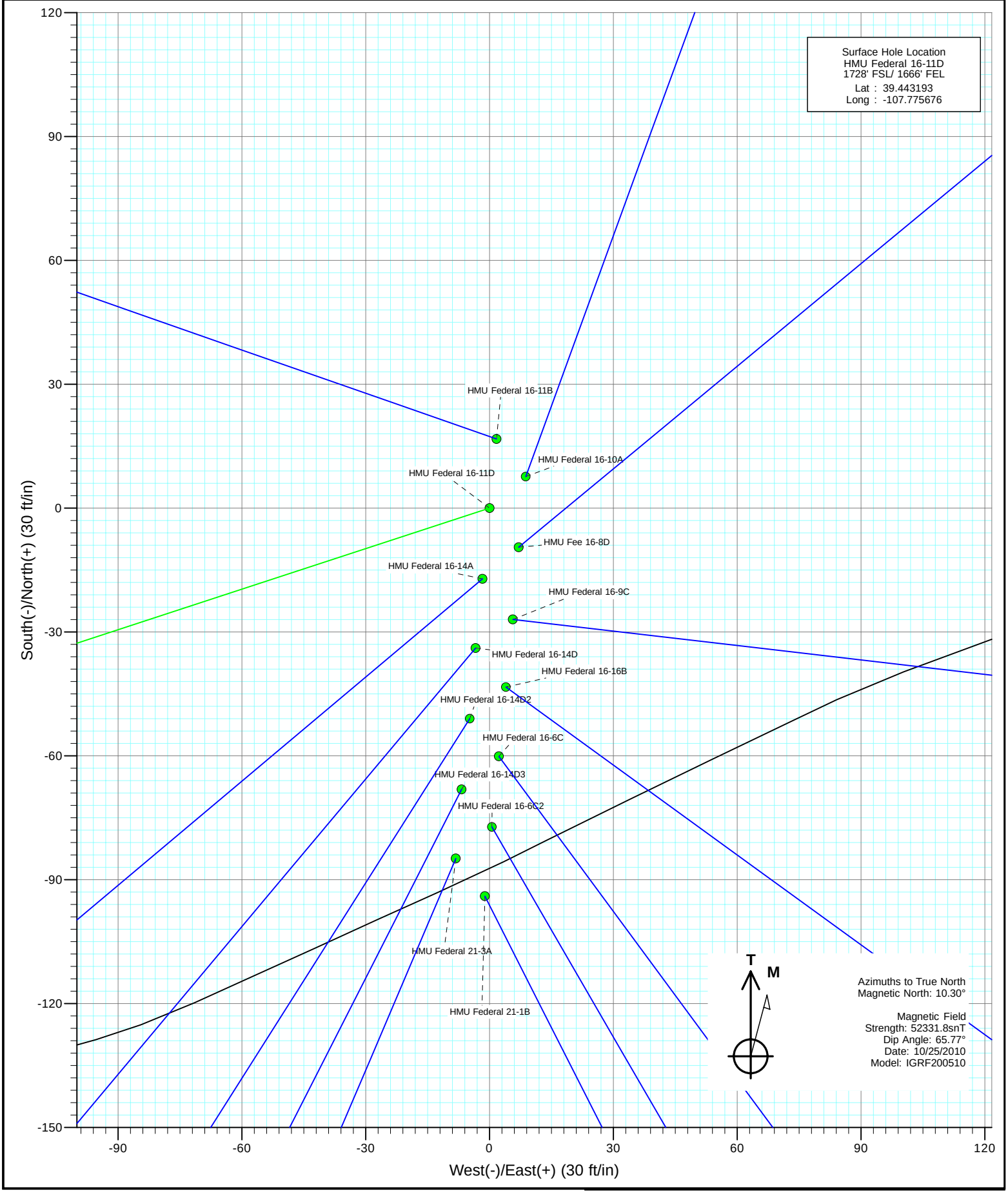
TVDPath	MDPath	Formation
3595.0	3641.0	G Sand
5645.0	5721.7	Ohio Creek
6086.0	6169.3	Mesa Verde
6598.0	6689.0	Williams Fork
7621.0	7722.4	Top of Gas
8837.0	8938.4	Coal Ridge
9501.0	9602.4	Base Cameo A Coal
9637.0	9738.4	Rollins

DESIGN DETAILS: Plan #1

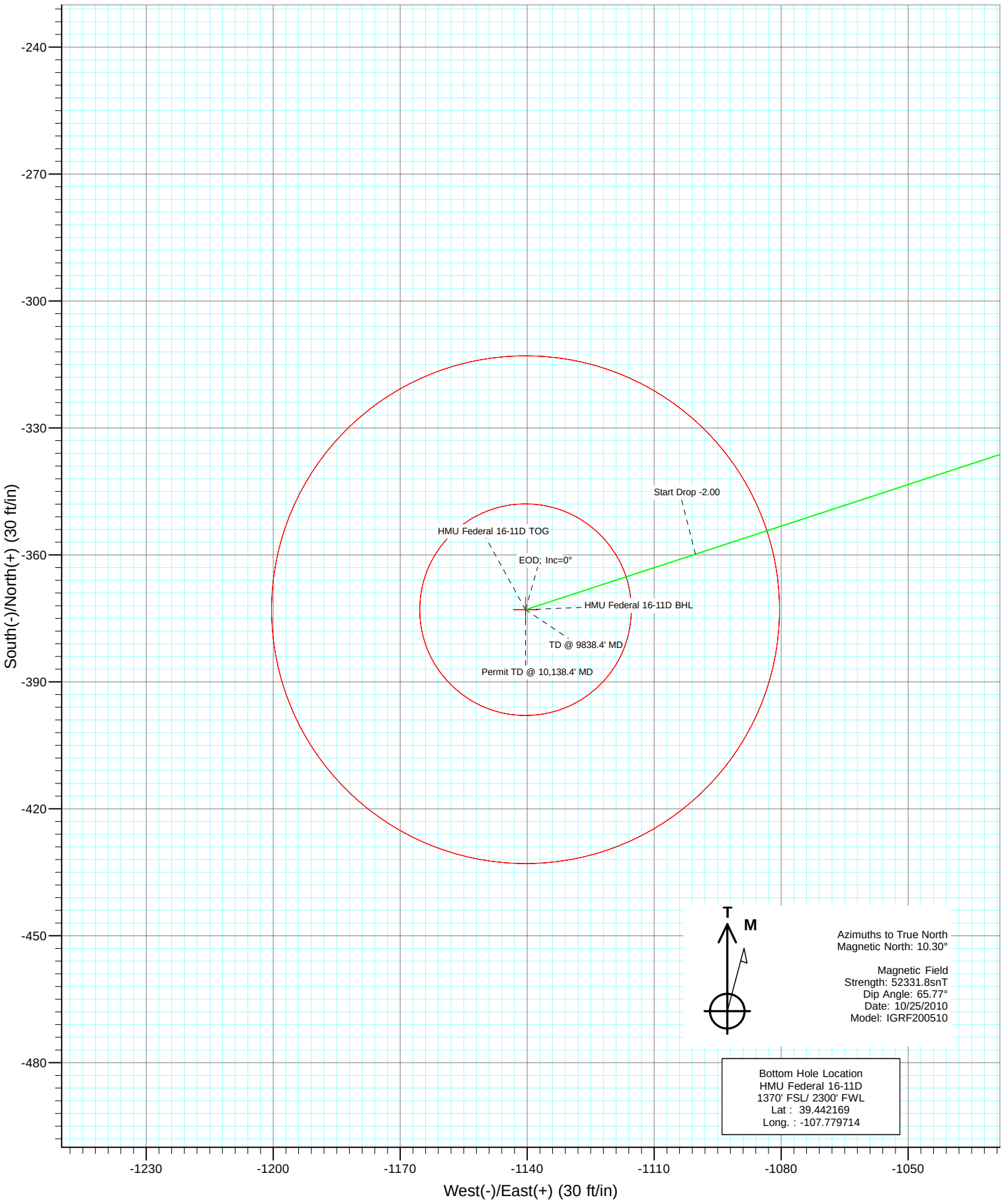
Job #10xxx: KR
WELL @ 7667.0ft (Original Well Elev)

Target	Azimuth	Origin	N/S	E/W	From TVD
HMU Federal 16-11D BHL	251.89	Slot	0.0	0.0	0.0

Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-11D
Wellbore: DD
Design: Plan #1



Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-11D
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 16-11D
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 16-11D	**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 16-11D

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,594,364.81 ft	**Latitude:**	39.443193
	+E/-W	0.0 ft	**Easting:**	2,357,393.27 ft	**Longitude:**	-107.775676
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	251.89

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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
628.4	9.85	251.89	626.8	-8.8	-26.8	3.00	3.00	0.00	251.89	
7,229.8	9.85	251.89	7,130.9	-359.8	-1,100.3	0.00	0.00	0.00	0.00	
7,722.4	0.00	0.00	7,621.0	-372.9	-1,140.4	2.00	-2.00	0.00	180.00	HMU Federal 16-11D
9,838.4	0.00	0.00	9,737.0	-372.9	-1,140.4	0.00	0.00	0.00	0.00	HMU Federal 16-11D
10,138.4	0.00	0.00	10,037.0	-372.9	-1,140.4	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 US Multi Users DB	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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Project:	Mamm Creek	**MD Reference:**	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	**North Reference:**	True
Well:	HMU Federal 16-11D	**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	KOP @ 300'
330.0	0.90	251.89	330.0	-0.1	-0.2	0.2	3.00	3.00	
360.0	1.80	251.89	360.0	-0.3	-0.9	0.9	3.00	3.00	
390.0	2.70	251.89	390.0	-0.7	-2.0	2.1	3.00	3.00	
420.0	3.60	251.89	419.9	-1.2	-3.6	3.8	3.00	3.00	
450.0	4.50	251.89	449.8	-1.8	-5.6	5.9	3.00	3.00	
480.0	5.40	251.89	479.7	-2.6	-8.1	8.5	3.00	3.00	
510.0	6.30	251.89	509.6	-3.6	-11.0	11.5	3.00	3.00	
540.0	7.20	251.89	539.4	-4.7	-14.3	15.1	3.00	3.00	
570.0	8.10	251.89	569.1	-5.9	-18.1	19.1	3.00	3.00	
600.0	9.00	251.89	598.8	-7.3	-22.3	23.5	3.00	3.00	
628.4	9.85	251.89	626.8	-8.8	-26.8	28.2	3.00	3.00	EOB; Inc=9.85°
630.0	9.85	251.89	628.4	-8.8	-27.0	28.4	0.00	0.00	
660.0	9.85	251.89	657.9	-10.4	-31.9	33.6	0.00	0.00	
690.0	9.85	251.89	687.5	-12.0	-36.8	38.7	0.00	0.00	
720.0	9.85	251.89	717.0	-13.6	-41.7	43.8	0.00	0.00	
750.0	9.85	251.89	746.6	-15.2	-46.5	49.0	0.00	0.00	
780.0	9.85	251.89	776.1	-16.8	-51.4	54.1	0.00	0.00	
810.0	9.85	251.89	805.7	-18.4	-56.3	59.2	0.00	0.00	
840.0	9.85	251.89	835.3	-20.0	-61.2	64.4	0.00	0.00	
870.0	9.85	251.89	864.8	-21.6	-66.1	69.5	0.00	0.00	
900.0	9.85	251.89	894.4	-23.2	-70.9	74.6	0.00	0.00	
930.0	9.85	251.89	923.9	-24.8	-75.8	79.8	0.00	0.00	
960.0	9.85	251.89	953.5	-26.4	-80.7	84.9	0.00	0.00	
990.0	9.85	251.89	983.1	-28.0	-85.6	90.0	0.00	0.00	
1,020.0	9.85	251.89	1,012.6	-29.6	-90.4	95.2	0.00	0.00	
1,050.0	9.85	251.89	1,042.2	-31.2	-95.3	100.3	0.00	0.00	
1,080.0	9.85	251.89	1,071.7	-32.8	-100.2	105.4	0.00	0.00	
1,110.0	9.85	251.89	1,101.3	-34.4	-105.1	110.6	0.00	0.00	
1,140.0	9.85	251.89	1,130.8	-36.0	-110.0	115.7	0.00	0.00	
1,170.0	9.85	251.89	1,160.4	-37.6	-114.8	120.8	0.00	0.00	
1,200.0	9.85	251.89	1,190.0	-39.2	-119.7	126.0	0.00	0.00	
1,230.0	9.85	251.89	1,219.5	-40.7	-124.6	131.1	0.00	0.00	
1,260.0	9.85	251.89	1,249.1	-42.3	-129.5	136.2	0.00	0.00	
1,290.0	9.85	251.89	1,278.6	-43.9	-134.4	141.4	0.00	0.00	
1,320.0	9.85	251.89	1,308.2	-45.5	-139.2	146.5	0.00	0.00	
1,350.0	9.85	251.89	1,337.7	-47.1	-144.1	151.6	0.00	0.00	
1,380.0	9.85	251.89	1,367.3	-48.7	-149.0	156.8	0.00	0.00	
1,410.0	9.85	251.89	1,396.9	-50.3	-153.9	161.9	0.00	0.00	
1,440.0	9.85	251.89	1,426.4	-51.9	-158.7	167.0	0.00	0.00	
1,470.0	9.85	251.89	1,456.0	-53.5	-163.6	172.2	0.00	0.00	
1,500.0	9.85	251.89	1,485.5	-55.1	-168.5	177.3	0.00	0.00	

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Project:	Mamm Creek	**MD Reference:**	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	**North Reference:**	True
Well:	HMU Federal 16-11D	**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
1,520.5	9.85	251.89	1,505.8	-56.2	-171.8	180.8	0.00	0.00	Surface Casing
1,530.0	9.85	251.89	1,515.1	-56.7	-173.4	182.4	0.00	0.00	
1,560.0	9.85	251.89	1,544.6	-58.3	-178.3	187.6	0.00	0.00	
1,590.0	9.85	251.89	1,574.2	-59.9	-183.1	192.7	0.00	0.00	
1,620.0	9.85	251.89	1,603.8	-61.5	-188.0	197.8	0.00	0.00	
1,650.0	9.85	251.89	1,633.3	-63.1	-192.9	202.9	0.00	0.00	
1,680.0	9.85	251.89	1,662.9	-64.7	-197.8	208.1	0.00	0.00	
1,710.0	9.85	251.89	1,692.4	-66.3	-202.7	213.2	0.00	0.00	
1,740.0	9.85	251.89	1,722.0	-67.9	-207.5	218.3	0.00	0.00	
1,770.0	9.85	251.89	1,751.6	-69.5	-212.4	223.5	0.00	0.00	
1,800.0	9.85	251.89	1,781.1	-71.1	-217.3	228.6	0.00	0.00	
1,830.0	9.85	251.89	1,810.7	-72.7	-222.2	233.7	0.00	0.00	
1,860.0	9.85	251.89	1,840.2	-74.3	-227.0	238.9	0.00	0.00	
1,890.0	9.85	251.89	1,869.8	-75.8	-231.9	244.0	0.00	0.00	
1,920.0	9.85	251.89	1,899.3	-77.4	-236.8	249.1	0.00	0.00	
1,950.0	9.85	251.89	1,928.9	-79.0	-241.7	254.3	0.00	0.00	
1,980.0	9.85	251.89	1,958.5	-80.6	-246.6	259.4	0.00	0.00	
2,010.0	9.85	251.89	1,988.0	-82.2	-251.4	264.5	0.00	0.00	
2,040.0	9.85	251.89	2,017.6	-83.8	-256.3	269.7	0.00	0.00	
2,070.0	9.85	251.89	2,047.1	-85.4	-261.2	274.8	0.00	0.00	
2,100.0	9.85	251.89	2,076.7	-87.0	-266.1	279.9	0.00	0.00	
2,130.0	9.85	251.89	2,106.2	-88.6	-271.0	285.1	0.00	0.00	
2,160.0	9.85	251.89	2,135.8	-90.2	-275.8	290.2	0.00	0.00	
2,190.0	9.85	251.89	2,165.4	-91.8	-280.7	295.3	0.00	0.00	
2,220.0	9.85	251.89	2,194.9	-93.4	-285.6	300.5	0.00	0.00	
2,250.0	9.85	251.89	2,224.5	-95.0	-290.5	305.6	0.00	0.00	
2,280.0	9.85	251.89	2,254.0	-96.6	-295.3	310.7	0.00	0.00	
2,310.0	9.85	251.89	2,283.6	-98.2	-300.2	315.9	0.00	0.00	
2,340.0	9.85	251.89	2,313.1	-99.8	-305.1	321.0	0.00	0.00	
2,370.0	9.85	251.89	2,342.7	-101.4	-310.0	326.1	0.00	0.00	
2,400.0	9.85	251.89	2,372.3	-103.0	-314.9	331.3	0.00	0.00	
2,430.0	9.85	251.89	2,401.8	-104.6	-319.7	336.4	0.00	0.00	
2,460.0	9.85	251.89	2,431.4	-106.2	-324.6	341.5	0.00	0.00	
2,490.0	9.85	251.89	2,460.9	-107.8	-329.5	346.7	0.00	0.00	

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HMU Federal 16-11D TC	0.00	0.00	7,621.0	-372.9	-1,140.4	1,594,020.55	2,356,243.89	39.442169	-107.779714
- plan misses target center by 5230.1ft at 2490.0ft MD (2460.9 TVD, -107.8 N, -329.5 E)									
- Circle (radius 25.0)									
HMU Federal 16-11D BH	0.00	0.00	9,737.0	-372.9	-1,140.4	1,594,020.55	2,356,243.89	39.442169	-107.779714
- plan misses target center by 7325.9ft at 2490.0ft MD (2460.9 TVD, -107.8 N, -329.5 E)									
- Circle (radius 60.0)									

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Project:	Mamm Creek	**MD Reference:**	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	**North Reference:**	True
Well:	HMU Federal 16-11D	**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	9.85	251.89	2,470.8	-108.3	-331.1	348.4	0.00	0.00	
2,600.0	9.85	251.89	2,569.3	-113.6	-347.4	365.5	0.00	0.00	
2,700.0	9.85	251.89	2,667.8	-118.9	-363.6	382.6	0.00	0.00	
2,800.0	9.85	251.89	2,766.4	-124.2	-379.9	399.7	0.00	0.00	
2,900.0	9.85	251.89	2,864.9	-129.6	-396.2	416.8	0.00	0.00	
3,000.0	9.85	251.89	2,963.4	-134.9	-412.4	433.9	0.00	0.00	
3,100.0	9.85	251.89	3,061.9	-140.2	-428.7	451.0	0.00	0.00	
3,200.0	9.85	251.89	3,160.5	-145.5	-444.9	468.1	0.00	0.00	
3,300.0	9.85	251.89	3,259.0	-150.8	-461.2	485.2	0.00	0.00	
3,400.0	9.85	251.89	3,357.5	-156.1	-477.5	502.4	0.00	0.00	
3,500.0	9.85	251.89	3,456.0	-161.5	-493.7	519.5	0.00	0.00	
3,600.0	9.85	251.89	3,554.6	-166.8	-510.0	536.6	0.00	0.00	
3,641.0	9.85	251.89	3,595.0	-169.0	-516.7	543.6	0.00	0.00	G Sand
3,700.0	9.85	251.89	3,653.1	-172.1	-526.3	553.7	0.00	0.00	
3,800.0	9.85	251.89	3,751.6	-177.4	-542.5	570.8	0.00	0.00	
3,900.0	9.85	251.89	3,850.1	-182.7	-558.8	587.9	0.00	0.00	
4,000.0	9.85	251.89	3,948.7	-188.1	-575.0	605.0	0.00	0.00	
4,100.0	9.85	251.89	4,047.2	-193.4	-591.3	622.1	0.00	0.00	
4,200.0	9.85	251.89	4,145.7	-198.7	-607.6	639.2	0.00	0.00	
4,300.0	9.85	251.89	4,244.2	-204.0	-623.8	656.3	0.00	0.00	
4,400.0	9.85	251.89	4,342.8	-209.3	-640.1	673.4	0.00	0.00	
4,500.0	9.85	251.89	4,441.3	-214.6	-656.3	690.6	0.00	0.00	
4,600.0	9.85	251.89	4,539.8	-220.0	-672.6	707.7	0.00	0.00	
4,700.0	9.85	251.89	4,638.4	-225.3	-688.9	724.8	0.00	0.00	
4,800.0	9.85	251.89	4,736.9	-230.6	-705.1	741.9	0.00	0.00	
4,900.0	9.85	251.89	4,835.4	-235.9	-721.4	759.0	0.00	0.00	
5,000.0	9.85	251.89	4,933.9	-241.2	-737.7	776.1	0.00	0.00	
5,100.0	9.85	251.89	5,032.5	-246.6	-753.9	793.2	0.00	0.00	
5,200.0	9.85	251.89	5,131.0	-251.9	-770.2	810.3	0.00	0.00	
5,300.0	9.85	251.89	5,229.5	-257.2	-786.4	827.4	0.00	0.00	
5,400.0	9.85	251.89	5,328.0	-262.5	-802.7	844.5	0.00	0.00	
5,500.0	9.85	251.89	5,426.6	-267.8	-819.0	861.6	0.00	0.00	
5,600.0	9.85	251.89	5,525.1	-273.1	-835.2	878.7	0.00	0.00	
5,700.0	9.85	251.89	5,623.6	-278.5	-851.5	895.9	0.00	0.00	
5,721.7	9.85	251.89	5,645.0	-279.6	-855.0	899.6	0.00	0.00	Ohio Creek
5,800.0	9.85	251.89	5,722.1	-283.8	-867.7	913.0	0.00	0.00	
5,900.0	9.85	251.89	5,820.7	-289.1	-884.0	930.1	0.00	0.00	
6,000.0	9.85	251.89	5,919.2	-294.4	-900.3	947.2	0.00	0.00	
6,100.0	9.85	251.89	6,017.7	-299.7	-916.5	964.3	0.00	0.00	
6,169.3	9.85	251.89	6,086.0	-303.4	-927.8	976.2	0.00	0.00	Mesa Verde
6,200.0	9.85	251.89	6,116.2	-305.0	-932.8	981.4	0.00	0.00	
6,300.0	9.85	251.89	6,214.8	-310.4	-949.1	998.5	0.00	0.00	
6,400.0	9.85	251.89	6,313.3	-315.7	-965.3	1,015.6	0.00	0.00	
6,500.0	9.85	251.89	6,411.8	-321.0	-981.6	1,032.7	0.00	0.00	
6,600.0	9.85	251.89	6,510.3	-326.3	-997.8	1,049.8	0.00	0.00	
6,689.0	9.85	251.89	6,598.0	-331.1	-1,012.3	1,065.1	0.00	0.00	Williams Fork
6,700.0	9.85	251.89	6,608.9	-331.6	-1,014.1	1,066.9	0.00	0.00	
6,800.0	9.85	251.89	6,707.4	-337.0	-1,030.4	1,084.1	0.00	0.00	
6,900.0	9.85	251.89	6,805.9	-342.3	-1,046.6	1,101.2	0.00	0.00	
7,000.0	9.85	251.89	6,904.4	-347.6	-1,062.9	1,118.3	0.00	0.00	
7,100.0	9.85	251.89	7,003.0	-352.9	-1,079.1	1,135.4	0.00	0.00	
7,200.0	9.85	251.89	7,101.5	-358.2	-1,095.4	1,152.5	0.00	0.00	

Database:	EDM 5000.1 US Multi Users DB	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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
7,229.8	9.85	251.89	7,130.9	-359.8	-1,100.3	1,157.6	0.00	0.00	Start Drop -2.00
7,300.0	8.45	251.89	7,200.2	-363.3	-1,110.9	1,168.8	2.00	-2.00	
7,400.0	6.45	251.89	7,299.3	-367.3	-1,123.2	1,181.7	2.00	-2.00	
7,500.0	4.45	251.89	7,398.9	-370.3	-1,132.2	1,191.2	2.00	-2.00	
7,600.0	2.45	251.89	7,498.7	-372.1	-1,137.9	1,197.2	2.00	-2.00	
7,700.0	0.45	251.89	7,598.6	-372.9	-1,140.3	1,199.7	2.00	-2.00	
7,722.4	0.00	0.00	7,621.0	-372.9	-1,140.4	1,199.8	2.00	-2.00	EOD; Inc=0° - Top of Gas - HMU Federal 16-11
7,800.0	0.00	0.00	7,698.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
7,900.0	0.00	0.00	7,798.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,000.0	0.00	0.00	7,898.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,100.0	0.00	0.00	7,998.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,200.0	0.00	0.00	8,098.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,300.0	0.00	0.00	8,198.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,400.0	0.00	0.00	8,298.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,500.0	0.00	0.00	8,398.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,600.0	0.00	0.00	8,498.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,700.0	0.00	0.00	8,598.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,800.0	0.00	0.00	8,698.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,900.0	0.00	0.00	8,798.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
8,938.4	0.00	0.00	8,837.0	-372.9	-1,140.4	1,199.8	0.00	0.00	Coal Ridge
9,000.0	0.00	0.00	8,898.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,100.0	0.00	0.00	8,998.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,200.0	0.00	0.00	9,098.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,300.0	0.00	0.00	9,198.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,400.0	0.00	0.00	9,298.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,500.0	0.00	0.00	9,398.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,600.0	0.00	0.00	9,498.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,602.4	0.00	0.00	9,501.0	-372.9	-1,140.4	1,199.8	0.00	0.00	Base Cameo A Coal
9,700.0	0.00	0.00	9,598.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,738.4	0.00	0.00	9,637.0	-372.9	-1,140.4	1,199.8	0.00	0.00	Rollins
9,800.0	0.00	0.00	9,698.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
9,838.4	0.00	0.00	9,737.0	-372.9	-1,140.4	1,199.8	0.00	0.00	TD @ 9838.4' MD - HMU Federal 16-11D BHL
9,900.0	0.00	0.00	9,798.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
10,000.0	0.00	0.00	9,898.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
10,100.0	0.00	0.00	9,998.6	-372.9	-1,140.4	1,199.8	0.00	0.00	
10,138.4	0.00	0.00	10,037.0	-372.9	-1,140.4	1,199.8	0.00	0.00	Permit TD @ 10,138.4' MD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HMU Federal 16-11D TC - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,621.0	-372.9	-1,140.4	1,594,020.55	2,356,243.89	39.442169	-107.779714
HMU Federal 16-11D BH - plan hits target center - Circle (radius 60.0)	0.00	0.00	9,737.0	-372.9	-1,140.4	1,594,020.55	2,356,243.89	39.442169	-107.779714

Database:	EDM 5000.1 US Multi Users DB	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,520.5	1,505.8	Surface Casing	5.500	6.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,641.0	3,595.0	G Sand			
5,721.7	5,645.0	Ohio Creek			
6,169.3	6,086.0	Mesa Verde			
6,689.0	6,598.0	Williams Fork			
7,722.4	7,621.0	Top of Gas			
8,938.4	8,837.0	Coal Ridge			
9,602.4	9,501.0	Base Cameo A Coal			
9,738.4	9,637.0	Rollins			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
300.0	300.0	0.0	0.0	KOP @ 300'
628.4	626.8	-8.8	-26.8	EOB; Inc=9.85°
7,229.8	7,130.9	-359.8	-1,100.3	Start Drop -2.00
7,722.4	7,621.0	-372.9	-1,140.4	EOD; Inc=0°
9,838.4	9,737.0	-372.9	-1,140.4	TD @ 9838.4' MD
10,138.4	10,037.0	-372.9	-1,140.4	Permit TD @ 10,138.4' MD

EnCana Oil & Gas (USA) Inc

Mamm Creek
(J16W)
HMU Federal 16-11D
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 16-11D
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 16-11D	**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 1,213.8ft	**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	10,138.4	Plan #1 (DD)	MWD	Geolink MWD

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
(J16W)						
Existing 16-11 - DD - DD	1,412.7	1,392.1	107.3	101.7	19.200	CC, ES
Existing 16-11 - DD - DD	9,600.0	9,648.0	712.2	660.9	13.883	SF
Existing 16-16 - DD - DD	994.2	976.6	179.1	175.0	43.949	CC
Existing 16-16 - DD - DD	1,000.0	982.0	179.1	175.0	43.580	ES
Existing 16-16 - DD - DD	1,300.0	1,256.3	210.5	204.7	36.363	SF
Existing 16-9 - DD - DD	1,021.5	1,019.0	90.2	85.5	19.215	CC, ES
Existing 16-9 - DD - DD	1,100.0	1,092.6	94.1	89.0	18.527	SF
HMU Federal 16-10A - DD - Plan #1	300.0	300.0	11.6	10.7	11.980	CC, ES
HMU Federal 16-10A - DD - Plan #1	400.0	400.0	14.1	12.8	10.668	SF
HMU Federal 16-11B - DD - Plan #1	200.0	200.0	16.8	16.2	27.110	CC, ES
HMU Federal 16-11B - DD - Plan #1	400.0	399.0	21.8	20.4	15.981	SF
HMU Federal 16-14A - DD - Plan #1	200.0	200.0	17.2	16.6	27.687	CC, ES
HMU Federal 16-14A - DD - Plan #1	10,138.4	10,129.3	463.3	409.5	8.612	SF
HMU Federal 16-14D - DD - Plan #1	529.3	528.8	31.1	29.3	16.910	CC, ES
HMU Federal 16-14D - DD - Plan #1	10,138.4	10,173.4	739.9	685.1	13.484	SF
HMU Federal 16-14D2 - DD - Plan #1	579.5	578.5	47.0	44.9	22.754	CC, ES
HMU Federal 16-14D2 - DD - Plan #1	2,300.0	2,287.2	234.5	221.7	18.432	SF
HMU Federal 16-14D3 - DD - Plan #1	556.3	554.0	64.1	62.2	32.779	CC, ES
HMU Federal 16-14D3 - DD - Plan #1	1,000.0	982.7	108.7	104.3	24.637	SF
HMU Federal 16-16B - DD - Plan #1	200.0	200.0	43.5	42.9	70.056	CC, ES
HMU Federal 16-16B - DD - Plan #1	500.0	492.0	62.6	60.9	36.303	SF
HMU Federal 16-6C - DD - Plan #1	300.0	300.0	60.1	59.2	61.975	CC, ES
HMU Federal 16-6C - DD - Plan #1	600.0	587.9	80.5	78.3	37.643	SF
HMU Federal 16-6C2 - DD - Plan #1	200.0	200.0	77.2	76.6	124.280	CC, ES
HMU Federal 16-6C2 - DD - Plan #1	600.0	579.2	112.7	110.6	52.865	SF
HMU Federal 16-9C - DD - Plan #1	300.0	300.0	27.5	26.6	28.379	CC, ES
HMU Federal 16-9C - DD - Plan #1	500.0	497.0	35.9	34.2	20.932	SF
HMU Federal 21-1B - DD - Plan #1	300.0	300.0	94.0	93.0	96.846	CC, ES
HMU Federal 21-1B - DD - Plan #1	700.0	674.7	128.6	126.0	49.518	SF
HMU Federal 21-3A - DD - Plan #1	200.0	200.0	85.3	84.6	137.222	CC, ES
HMU Federal 21-3A - DD - Plan #1	5,300.0	5,138.2	1,202.2	1,169.0	36.224	SF
HMU Fee 16-8D - DD - Plan #1	248.1	248.1	11.8	11.0	14.936	CC
HMU Fee 16-8D - DD - Plan #1	300.0	299.9	12.0	11.0	12.334	ES, SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-140.92	-152.3	-123.7	196.1				
100.0	100.0	99.9	99.9	0.1	0.2	-140.82	-152.1	-123.9	196.2	195.9	0.29	670.305	
200.0	200.0	199.8	199.8	0.3	0.3	-140.53	-151.5	-124.7	196.2	195.6	0.62	314.613	
300.0	300.0	300.9	300.9	0.5	0.5	-139.99	-150.2	-126.1	196.1	195.1	0.97	201.617	
400.0	400.0	402.5	402.5	0.7	0.7	-31.47	-147.5	-127.7	192.9	191.6	1.34	143.921	
500.0	499.6	501.0	500.9	0.9	0.9	-31.63	-144.3	-130.0	185.2	183.5	1.71	108.462	
600.0	598.8	598.8	598.5	1.1	1.1	-32.32	-140.7	-133.8	173.8	171.7	2.10	82.776	
700.0	697.3	695.9	695.4	1.5	1.3	-33.24	-137.1	-139.2	160.3	157.7	2.53	63.451	
800.0	795.9	793.6	792.8	1.8	1.5	-33.79	-133.6	-146.3	147.6	144.7	2.97	49.696	
900.0	894.4	891.3	889.9	2.1	1.7	-33.52	-129.3	-155.6	135.8	132.3	3.44	39.507	
1,000.0	992.9	987.9	985.8	2.5	2.0	-32.32	-125.3	-167.4	125.9	121.9	3.91	32.184	
1,100.0	1,091.4	1,085.1	1,081.6	2.8	2.3	-29.79	-121.2	-182.3	118.1	113.7	4.38	26.936	
1,200.0	1,190.0	1,183.1	1,177.8	3.1	2.6	-25.60	-116.7	-200.4	112.6	107.7	4.83	23.286	
1,300.0	1,288.5	1,281.3	1,273.8	3.5	3.0	-19.79	-111.0	-220.8	108.8	103.6	5.23	20.819	
1,400.0	1,387.0	1,379.6	1,369.4	3.8	3.4	-13.18	-105.1	-242.6	107.4	101.8	5.55	19.334	
1,412.7	1,399.5	1,392.1	1,381.6	3.9	3.5	-12.32	-104.3	-245.4	107.3	101.7	5.59	19.200	CC, ES
1,500.0	1,485.5	1,478.0	1,465.1	4.2	3.9	-6.32	-99.2	-265.2	108.2	102.4	5.84	18.543	
1,600.0	1,584.1	1,577.5	1,561.6	4.5	4.3	0.51	-93.2	-288.2	110.8	104.7	6.10	18.151	
1,700.0	1,682.6	1,677.1	1,658.3	4.9	4.7	7.18	-86.7	-311.0	114.6	108.2	6.39	17.920	
1,800.0	1,781.1	1,776.7	1,755.2	5.2	5.2	13.43	-79.9	-333.5	119.4	112.6	6.72	17.762	
1,900.0	1,879.6	1,876.8	1,852.6	5.6	5.6	19.12	-73.3	-355.1	124.6	117.5	7.10	17.540	
2,000.0	1,978.2	1,975.5	1,948.8	5.9	6.0	24.27	-66.6	-376.6	131.1	123.5	7.54	17.373	
2,100.0	2,076.7	2,075.1	2,045.8	6.2	6.4	29.12	-59.6	-397.8	138.1	130.0	8.05	17.156	
2,200.0	2,175.2	2,172.3	2,140.4	6.6	6.9	33.36	-52.6	-419.1	146.6	138.0	8.60	17.051	
2,300.0	2,273.7	2,270.2	2,235.4	6.9	7.3	36.91	-45.8	-442.0	157.2	148.0	9.18	17.116	
2,400.0	2,372.3	2,368.6	2,330.8	7.3	7.8	39.95	-39.2	-464.9	168.3	158.5	9.80	17.170	
2,500.0	2,470.8	2,466.0	2,425.0	7.6	8.3	42.54	-32.2	-488.8	181.0	170.5	10.43	17.347	
2,600.0	2,569.3	2,566.2	2,522.0	8.0	8.7	44.87	-25.1	-513.2	193.8	182.7	11.09	17.473	
2,700.0	2,667.8	2,665.5	2,618.1	8.3	9.2	46.88	-18.4	-536.8	206.3	194.5	11.76	17.540	
2,800.0	2,766.4	2,763.5	2,713.0	8.7	9.7	48.62	-11.7	-560.4	219.3	206.9	12.43	17.638	
2,900.0	2,864.9	2,863.3	2,809.6	9.0	10.2	50.03	-5.3	-584.9	232.6	219.5	13.10	17.755	
3,000.0	2,963.4	2,964.5	2,907.6	9.4	10.6	51.40	1.1	-608.9	245.4	231.6	13.79	17.793	
3,100.0	3,061.9	3,062.1	3,002.4	9.7	11.1	52.60	7.0	-631.8	257.8	243.3	14.47	17.818	
3,200.0	3,160.5	3,161.0	3,098.1	10.1	11.6	53.66	13.3	-655.5	271.0	255.9	15.15	17.891	
3,300.0	3,259.0	3,261.3	3,195.4	10.4	12.0	54.77	20.0	-679.0	284.0	268.2	15.85	17.919	
3,400.0	3,357.5	3,362.9	3,294.2	10.8	12.5	55.93	27.0	-701.8	296.4	279.9	16.57	17.888	
3,500.0	3,456.0	3,457.6	3,386.2	11.1	12.9	56.94	33.6	-723.1	309.1	291.8	17.28	17.892	
3,600.0	3,554.6	3,556.3	3,481.8	11.5	13.4	57.81	40.6	-746.5	322.8	304.8	17.98	17.955	
3,700.0	3,653.1	3,656.4	3,578.9	11.8	13.9	58.55	47.3	-770.2	336.4	317.7	18.68	18.006	
3,800.0	3,751.6	3,754.9	3,674.4	12.2	14.3	59.20	53.7	-793.6	349.9	330.5	19.37	18.062	
3,900.0	3,850.1	3,856.8	3,773.2	12.5	14.8	59.84	60.3	-817.4	363.1	343.0	20.08	18.087	
4,000.0	3,948.7	3,956.0	3,869.6	12.9	15.2	60.53	66.8	-839.8	375.9	355.1	20.78	18.089	
4,100.0	4,047.2	4,052.5	3,963.3	13.2	15.7	61.14	73.4	-862.0	389.2	367.7	21.48	18.119	
4,200.0	4,145.7	4,151.9	4,059.8	13.6	16.1	61.74	80.4	-884.9	402.7	380.5	22.19	18.148	
4,300.0	4,244.2	4,249.7	4,154.6	13.9	16.6	62.22	87.0	-907.9	416.4	393.6	22.88	18.198	
4,400.0	4,342.8	4,350.6	4,252.4	14.3	17.1	62.64	93.5	-931.7	430.1	406.5	23.58	18.239	
4,500.0	4,441.3	4,449.8	4,348.8	14.6	17.5	63.09	100.0	-954.7	443.4	419.1	24.28	18.262	
4,600.0	4,539.8	4,545.4	4,441.4	15.0	18.0	63.47	106.4	-977.1	457.1	432.1	24.96	18.313	
4,700.0	4,638.4	4,641.4	4,534.3	15.3	18.5	63.82	113.4	-1,000.4	471.8	446.1	25.64	18.400	
4,800.0	4,736.9	4,743.4	4,633.1	15.7	19.0	64.18	120.7	-1,024.9	486.3	459.9	26.34	18.460	
4,900.0	4,835.4	4,844.8	4,731.4	16.0	19.4	64.50	127.4	-1,048.9	500.1	473.1	27.04	18.497	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,000.0	4,933.9	4,943.7	4,827.3	16.4	19.9	64.84	134.1	-1,071.9	513.8	486.1	27.73	18.529	
5,100.0	5,032.5	5,042.3	4,922.9	16.7	20.4	65.20	141.1	-1,094.8	527.7	499.2	28.43	18.560	
5,200.0	5,131.0	5,141.6	5,019.3	17.1	20.8	65.55	148.1	-1,117.7	541.5	512.4	29.13	18.590	
5,300.0	5,229.5	5,242.1	5,117.0	17.4	21.3	65.92	155.4	-1,140.5	555.2	525.4	29.84	18.605	
5,400.0	5,328.0	5,344.2	5,216.1	17.8	21.7	66.29	162.6	-1,163.3	568.5	538.0	30.56	18.603	
5,500.0	5,426.6	5,445.8	5,315.0	18.1	22.2	66.63	169.2	-1,185.8	581.4	550.1	31.28	18.588	
5,600.0	5,525.1	5,547.3	5,413.9	18.5	22.6	66.97	175.6	-1,207.9	593.8	561.8	31.99	18.562	
5,700.0	5,623.6	5,640.4	5,504.6	18.8	23.0	67.27	181.6	-1,228.3	606.5	573.8	32.68	18.559	
5,800.0	5,722.1	5,739.2	5,600.6	19.2	23.5	67.52	188.3	-1,250.7	619.9	586.5	33.38	18.571	
5,900.0	5,820.7	5,838.7	5,697.2	19.5	24.0	67.77	194.8	-1,273.3	633.2	599.1	34.08	18.582	
6,000.0	5,919.2	5,942.1	5,797.8	19.8	24.4	68.03	201.5	-1,296.3	646.1	611.3	34.79	18.572	
6,100.0	6,017.7	6,042.4	5,895.5	20.2	24.9	68.31	207.9	-1,318.1	658.7	623.2	35.50	18.555	
6,200.0	6,116.2	6,145.3	5,995.9	20.5	25.3	68.62	214.4	-1,340.0	670.9	634.7	36.22	18.522	
6,300.0	6,214.8	6,248.4	6,096.5	20.9	25.7	68.94	220.6	-1,361.2	682.5	645.6	36.95	18.472	
6,400.0	6,313.3	6,352.5	6,198.4	21.2	26.1	69.30	226.8	-1,382.1	693.7	656.0	37.69	18.406	
6,500.0	6,411.8	6,459.6	6,303.3	21.6	26.5	69.72	232.8	-1,402.2	703.8	665.4	38.45	18.305	
6,600.0	6,510.3	6,566.3	6,408.3	21.9	26.9	70.17	238.3	-1,421.1	713.0	673.8	39.21	18.182	
6,700.0	6,608.9	6,683.6	6,523.9	22.3	27.3	70.75	243.6	-1,439.9	720.7	680.7	40.04	17.999	
6,800.0	6,707.4	6,798.5	6,637.6	22.6	27.6	71.45	247.5	-1,455.1	725.8	685.0	40.87	17.759	
6,900.0	6,805.9	6,911.3	6,749.8	23.0	27.9	72.31	251.0	-1,466.9	729.2	687.5	41.73	17.475	
7,000.0	6,904.4	7,027.4	6,865.5	23.3	28.1	73.35	253.9	-1,476.1	730.8	688.2	42.62	17.146	
7,100.0	7,003.0	7,152.5	6,990.5	23.7	28.2	74.77	256.3	-1,480.7	729.8	686.2	43.60	16.736	
7,200.0	7,101.5	7,255.9	7,093.9	24.0	28.3	76.16	257.5	-1,480.9	726.5	682.0	44.52	16.320	
7,300.0	7,200.2	7,356.7	7,194.7	24.4	28.4	77.43	258.6	-1,480.8	723.7	678.3	45.34	15.962	
7,400.0	7,299.3	7,457.0	7,294.9	24.6	28.5	78.45	259.6	-1,480.6	721.6	675.6	46.00	15.687	
7,500.0	7,398.9	7,555.8	7,393.7	24.8	28.6	79.21	260.4	-1,480.4	720.4	673.9	46.53	15.484	
7,600.0	7,498.7	7,658.1	7,496.0	25.0	28.6	79.69	261.0	-1,480.5	719.8	672.9	46.93	15.338	
7,638.3	7,536.9	7,695.2	7,533.2	25.0	28.7	79.80	261.1	-1,480.5	719.7	672.7	47.04	15.302	
7,700.0	7,598.6	7,755.5	7,593.5	25.1	28.7	79.91	261.6	-1,480.5	719.9	672.7	47.19	15.256	
7,800.0	7,698.6	7,857.0	7,695.0	25.2	28.8	-28.14	262.4	-1,480.3	720.5	673.1	47.40	15.201	
7,900.0	7,798.6	7,958.0	7,796.0	25.3	28.9	-28.07	263.2	-1,479.7	721.0	673.4	47.61	15.143	
8,000.0	7,898.6	8,058.7	7,896.7	25.4	29.0	-28.00	263.8	-1,479.0	721.2	673.4	47.83	15.080	
8,100.0	7,998.6	8,157.7	7,995.7	25.5	29.0	-27.96	264.5	-1,478.8	721.7	673.6	48.04	15.023	
8,200.0	8,098.6	8,259.9	8,097.9	25.6	29.1	-27.93	264.8	-1,478.6	721.9	673.6	48.25	14.961	
8,300.0	8,198.6	8,362.1	8,200.0	25.7	29.2	-27.91	265.0	-1,478.2	721.9	673.4	48.47	14.895	
8,400.0	8,298.6	8,464.4	8,302.3	25.8	29.3	-27.88	264.8	-1,477.7	721.5	672.8	48.68	14.821	
8,500.0	8,398.6	8,562.9	8,400.8	25.9	29.4	-27.83	264.6	-1,477.0	721.0	672.1	48.90	14.745	
8,600.0	8,498.6	8,661.7	8,499.7	26.0	29.5	-27.81	264.6	-1,476.7	720.8	671.7	49.11	14.677	
8,700.0	8,598.6	8,761.7	8,599.7	26.1	29.5	-27.81	264.5	-1,476.6	720.7	671.4	49.33	14.610	
8,800.0	8,698.6	8,861.2	8,699.2	26.2	29.6	-27.79	264.5	-1,476.4	720.6	671.0	49.54	14.544	
8,900.0	8,798.6	8,960.9	8,798.8	26.3	29.7	-27.75	264.7	-1,475.9	720.5	670.7	49.77	14.477	
9,000.0	8,898.6	9,061.1	8,899.1	26.4	29.8	-27.74	264.7	-1,475.8	720.5	670.5	49.99	14.412	
9,100.0	8,998.6	9,161.9	8,999.8	26.5	29.9	-27.76	264.5	-1,475.9	720.4	670.2	50.21	14.346	
9,200.0	9,098.6	9,264.0	9,102.0	26.6	30.0	-27.81	264.0	-1,476.3	720.1	669.6	50.43	14.277	
9,300.0	9,198.6	9,369.4	9,207.3	26.7	30.1	-27.89	262.7	-1,476.9	719.3	668.6	50.65	14.199	
9,400.0	9,298.6	9,480.1	9,318.0	26.8	30.2	-27.94	260.4	-1,476.3	717.2	666.3	50.88	14.095	
9,500.0	9,398.6	9,581.8	9,419.7	26.9	30.2	-27.93	257.9	-1,474.8	714.3	663.2	51.11	13.976	
9,587.2	9,485.8	9,648.0	9,485.8	27.0	30.3	-27.91	256.3	-1,473.7	712.1	660.8	51.28	13.885	
9,600.0	9,498.6	9,648.0	9,485.8	27.0	30.3	-27.91	256.3	-1,473.7	712.2	660.9	51.30	13.883	SF
9,700.0	9,598.6	9,648.0	9,485.8	27.1	30.3	-27.91	256.3	-1,473.7	720.9	669.5	51.41	14.024	
9,800.0	9,698.6	9,648.0	9,485.8	27.2	30.3	-27.91	256.3	-1,473.7	743.2	691.7	51.52	14.426	
9,900.0	9,798.6	9,648.0	9,485.8	27.3	30.3	-27.91	256.3	-1,473.7	777.7	726.1	51.63	15.064	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
10,000.0	9,898.6	9,648.0	9,485.8	27.4	30.3	-27.91	256.3	-1,473.7	823.1	771.3	51.74	15.908	
10,100.0	9,998.6	9,648.0	9,485.8	27.6	30.3	-27.91	256.3	-1,473.7	877.5	825.6	51.85	16.923	
10,138.4	10,037.0	9,648.0	9,485.8	27.6	30.3	-27.91	256.3	-1,473.7	900.5	848.6	51.90	17.352	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-144.02	-172.5	-125.2	213.2				
100.0	100.0	97.9	97.9	0.1	0.2	-144.01	-172.8	-125.5	213.6	213.3	0.29	730.412	
200.0	200.0	195.9	195.9	0.3	0.3	-143.98	-173.9	-126.5	215.1	214.5	0.62	345.048	
300.0	300.0	296.1	296.0	0.5	0.5	-143.97	-175.5	-127.7	217.0	216.1	0.97	223.306	
400.0	400.0	395.6	395.5	0.7	0.7	-36.42	-177.3	-128.2	216.8	215.5	1.31	165.002	
500.0	499.6	494.0	493.8	0.9	0.8	-38.29	-180.4	-127.9	212.9	211.2	1.68	127.086	
600.0	598.8	593.9	593.7	1.1	1.0	-41.71	-184.6	-126.3	205.6	203.5	2.07	99.138	
700.0	697.3	692.6	692.3	1.5	1.2	-46.45	-189.0	-123.2	195.8	193.3	2.52	77.842	
800.0	795.9	790.5	789.9	1.8	1.4	-52.08	-193.9	-118.6	187.4	184.4	3.00	62.396	
900.0	894.4	887.0	886.0	2.1	1.6	-58.86	-199.6	-111.7	181.2	177.7	3.54	51.233	
994.2	987.2	976.6	974.9	2.4	1.9	-66.28	-206.1	-102.7	179.1	175.0	4.08	43.949	CC
1,000.0	992.9	982.0	980.3	2.5	1.9	-66.76	-206.6	-102.1	179.1	175.0	4.11	43.580	ES
1,100.0	1,091.4	1,073.9	1,070.9	2.8	2.1	-75.40	-214.8	-89.6	182.7	178.0	4.70	38.854	
1,200.0	1,190.0	1,164.4	1,159.5	3.1	2.5	-84.31	-224.5	-73.8	193.4	188.1	5.27	36.668	
1,300.0	1,288.5	1,256.3	1,249.0	3.5	2.8	-92.67	-235.2	-56.1	210.5	204.7	5.79	36.363	SF
1,400.0	1,387.0	1,346.8	1,337.0	3.8	3.2	-99.73	-246.4	-38.1	232.8	226.5	6.24	37.291	
1,500.0	1,485.5	1,438.6	1,426.0	4.2	3.6	-105.69	-258.4	-19.3	259.1	252.4	6.66	38.928	
1,600.0	1,584.1	1,530.1	1,514.8	4.5	4.0	-110.59	-270.5	-0.3	288.0	281.0	7.04	40.891	
1,700.0	1,682.6	1,621.3	1,602.9	4.9	4.4	-114.71	-282.8	19.5	319.5	312.1	7.42	43.088	
1,800.0	1,781.1	1,715.5	1,694.0	5.2	4.8	-118.20	-295.3	39.7	352.0	344.2	7.78	45.230	
1,900.0	1,879.6	1,809.7	1,785.3	5.6	5.3	-121.08	-307.8	59.6	385.1	377.0	8.15	47.248	
2,000.0	1,978.2	1,904.7	1,877.5	5.9	5.7	-123.52	-320.1	79.1	418.5	410.0	8.52	49.100	
2,100.0	2,076.7	1,997.7	1,967.8	6.2	6.1	-125.56	-331.9	98.0	452.1	443.2	8.90	50.804	
2,200.0	2,175.2	2,091.8	2,059.1	6.6	6.5	-127.28	-344.4	117.0	486.4	477.1	9.28	52.391	
2,300.0	2,273.7	2,184.9	2,149.6	6.9	7.0	-128.73	-356.8	135.2	520.4	510.7	9.67	53.795	
2,400.0	2,372.3	2,275.7	2,237.5	7.3	7.4	-129.86	-370.0	153.0	555.3	545.2	10.07	55.142	
2,500.0	2,470.8	2,371.0	2,330.0	7.6	7.8	-130.92	-383.7	171.6	590.2	579.7	10.48	56.325	
2,600.0	2,569.3	2,461.8	2,418.1	8.0	8.2	-131.76	-397.2	188.9	625.2	614.3	10.89	57.417	
2,700.0	2,667.8	2,552.4	2,505.8	8.3	8.7	-132.44	-411.6	206.4	661.0	649.7	11.31	58.454	
2,800.0	2,766.4	2,650.6	2,601.0	8.7	9.1	-133.08	-427.4	224.9	696.4	684.7	11.74	59.303	
2,900.0	2,864.9	2,746.3	2,693.8	9.0	9.5	-133.65	-442.4	242.6	731.5	719.4	12.18	60.068	
3,000.0	2,963.4	2,837.2	2,782.1	9.4	10.0	-134.15	-456.5	259.3	766.5	753.9	12.61	60.796	
3,100.0	3,061.9	2,920.9	2,863.1	9.7	10.4	-134.59	-469.7	275.5	802.5	789.5	13.03	61.614	
3,200.0	3,160.5	3,014.7	2,953.9	10.1	10.8	-135.04	-484.6	294.0	838.8	825.4	13.46	62.317	
3,300.0	3,259.0	3,094.0	3,030.4	10.4	11.2	-135.42	-497.1	310.4	876.0	862.2	13.87	63.162	
3,400.0	3,357.5	3,188.8	3,121.8	10.8	11.7	-135.86	-512.0	330.6	913.9	899.6	14.31	63.885	
3,500.0	3,456.0	3,284.4	3,214.1	11.1	12.2	-136.27	-526.9	350.8	951.5	936.7	14.74	64.534	
3,600.0	3,554.6	3,376.4	3,302.9	11.5	12.6	-136.67	-540.7	370.3	989.0	973.8	15.17	65.191	
3,700.0	3,653.1	3,469.7	3,393.1	11.8	13.1	-137.09	-553.9	390.4	1,026.5	1,010.9	15.60	65.815	
3,800.0	3,751.6	3,565.1	3,485.4	12.2	13.5	-137.52	-567.1	411.0	1,063.9	1,047.9	16.02	66.390	
3,900.0	3,850.1	3,664.9	3,581.9	12.5	14.0	-137.95	-580.2	432.2	1,100.9	1,084.4	16.46	66.890	
4,000.0	3,948.7	3,762.4	3,676.5	12.9	14.4	-138.37	-592.5	452.6	1,137.4	1,120.5	16.89	67.360	
4,100.0	4,047.2	3,853.0	3,764.3	13.2	14.9	-138.72	-604.2	471.4	1,174.0	1,156.6	17.31	67.819	
4,200.0	4,145.7	3,940.4	3,849.0	13.6	15.3	-138.98	-616.6	489.4	1,210.8	1,193.1	17.74	68.257	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-137.42	-132.0	-121.3	179.3				
100.0	100.0	100.4	100.4	0.1	0.2	-137.37	-131.8	-121.4	179.2	178.9	0.29	614.623	
200.0	200.0	200.7	200.7	0.3	0.3	-137.23	-131.3	-121.5	178.9	178.3	0.62	287.340	
300.0	300.0	301.0	301.0	0.5	0.5	-137.24	-131.1	-121.2	178.5	177.5	0.97	183.549	
400.0	400.0	402.8	402.8	0.7	0.7	-30.22	-131.5	-119.1	175.2	173.8	1.33	131.986	
500.0	499.6	504.7	504.6	0.9	0.9	-32.98	-132.2	-114.9	166.3	164.6	1.70	98.108	
600.0	598.8	606.7	606.4	1.1	1.1	-37.88	-131.9	-108.4	151.7	149.6	2.10	72.150	
700.0	697.3	707.4	706.7	1.5	1.3	-45.17	-130.0	-99.9	132.9	130.4	2.58	51.584	
800.0	795.9	806.3	804.9	1.8	1.5	-55.58	-126.6	-88.7	114.2	111.1	3.15	36.228	
900.0	894.4	903.6	901.1	2.1	1.8	-70.17	-121.6	-75.5	98.7	94.9	3.84	25.675	
1,000.0	992.9	998.7	995.0	2.5	2.1	-88.78	-115.2	-61.3	90.4	85.9	4.56	19.845	
1,021.5	1,014.1	1,019.0	1,014.9	2.5	2.2	-93.12	-113.7	-58.1	90.2	85.5	4.69	19.215	CC, ES
1,100.0	1,091.4	1,092.6	1,087.4	2.8	2.4	-108.85	-108.3	-46.1	94.1	89.0	5.08	18.527	SF
1,200.0	1,190.0	1,186.9	1,180.1	3.1	2.7	-125.95	-101.2	-30.5	109.1	103.8	5.33	20.482	
1,300.0	1,288.5	1,280.1	1,271.8	3.5	3.1	-138.14	-94.4	-15.5	131.5	126.0	5.48	24.012	
1,400.0	1,387.0	1,373.8	1,363.9	3.8	3.4	-146.95	-87.2	0.3	158.8	153.1	5.62	28.229	
1,500.0	1,485.5	1,466.5	1,454.9	4.2	3.7	-153.35	-79.3	16.1	188.7	182.9	5.80	32.532	
1,600.0	1,584.1	1,558.4	1,545.0	4.5	4.1	-158.07	-71.3	32.4	220.9	214.9	6.01	36.759	
1,700.0	1,682.6	1,652.9	1,637.6	4.9	4.4	-161.67	-63.2	49.3	254.3	248.1	6.25	40.703	
1,800.0	1,781.1	1,748.3	1,731.2	5.2	4.8	-164.43	-55.1	65.7	287.8	281.3	6.51	44.207	
1,900.0	1,879.6	1,842.9	1,824.3	5.6	5.1	-166.51	-47.6	81.5	321.1	314.3	6.79	47.305	
2,000.0	1,978.2	1,935.3	1,915.1	5.9	5.5	-168.06	-40.9	97.0	354.8	347.7	7.08	50.149	
2,100.0	2,076.7	2,027.6	2,005.7	6.2	5.8	-169.21	-35.0	112.9	389.1	381.7	7.37	52.768	
2,200.0	2,175.2	2,119.2	2,095.7	6.6	6.2	-170.18	-29.0	129.2	423.9	416.2	7.68	55.211	
2,300.0	2,273.7	2,212.6	2,187.4	6.9	6.5	-171.03	-22.8	146.1	459.1	451.1	7.99	57.486	
2,400.0	2,372.3	2,307.6	2,280.7	7.3	6.9	-171.76	-16.6	162.9	494.1	485.8	8.30	59.523	
2,500.0	2,470.8	2,398.0	2,369.5	7.6	7.2	-172.33	-10.9	179.1	529.2	520.6	8.61	61.456	
2,600.0	2,569.3	2,490.6	2,460.2	8.0	7.6	-172.82	-5.2	196.2	564.9	556.0	8.93	63.276	
2,700.0	2,667.8	2,579.3	2,547.3	8.3	7.9	-173.26	0.5	212.7	600.8	591.6	9.24	65.028	
2,800.0	2,766.4	2,670.2	2,636.2	8.7	8.3	-173.65	6.4	230.5	637.6	628.1	9.56	66.729	
2,900.0	2,864.9	2,759.9	2,724.0	9.0	8.6	-173.99	12.1	248.0	674.4	664.5	9.87	68.316	
3,000.0	2,963.4	2,848.5	2,810.5	9.4	9.0	-174.32	18.4	266.0	712.1	701.9	10.19	69.907	
3,100.0	3,061.9	2,945.2	2,905.0	9.7	9.4	-174.67	25.3	285.4	749.7	739.2	10.51	71.297	
3,200.0	3,160.5	3,041.6	2,999.2	10.1	9.8	-174.98	32.2	304.3	786.7	775.9	10.84	72.557	
3,300.0	3,259.0	3,137.4	3,093.0	10.4	10.2	-175.28	39.1	322.7	823.5	812.3	11.17	73.712	
3,400.0	3,357.5	3,234.1	3,187.8	10.8	10.5	-175.54	46.0	340.9	859.9	848.4	11.50	74.760	
3,500.0	3,456.0	3,332.9	3,284.6	11.1	10.9	-175.79	52.8	359.0	895.8	883.9	11.84	75.684	
3,600.0	3,554.6	3,422.2	3,372.3	11.5	11.3	-175.99	58.7	375.1	931.3	919.2	12.15	76.621	
3,700.0	3,653.1	3,508.0	3,456.2	11.8	11.6	-176.14	64.3	391.5	967.9	955.5	12.47	77.627	
3,800.0	3,751.6	3,609.1	3,555.4	12.2	12.0	-176.31	70.9	410.7	1,004.3	991.5	12.81	78.413	
3,900.0	3,850.1	3,704.1	3,648.5	12.5	12.4	-176.45	76.7	428.0	1,040.1	1,026.9	13.14	79.164	
4,000.0	3,948.7	3,790.2	3,732.9	12.9	12.7	-176.57	82.2	444.2	1,076.3	1,062.8	13.45	79.994	
4,100.0	4,047.2	3,880.0	3,820.9	13.2	13.1	-176.71	88.3	461.4	1,113.0	1,099.2	13.78	80.785	
4,200.0	4,145.7	3,978.2	3,917.1	13.6	13.5	-176.86	95.2	480.1	1,149.6	1,135.5	14.11	81.458	
4,300.0	4,244.2	4,081.6	4,018.5	13.9	13.9	-177.01	102.3	498.9	1,185.4	1,171.0	14.46	81.998	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	48.86	7.6	8.8	11.6				
100.0	100.0	100.0	100.0	0.1	0.1	48.86	7.6	8.8	11.6	11.4	0.27	42.698	
200.0	200.0	200.0	200.0	0.3	0.3	48.86	7.6	8.8	11.6	11.0	0.62	18.710	
300.0	300.0	300.0	300.0	0.5	0.5	48.86	7.6	8.8	11.6	10.7	0.97	11.980	CC, ES
400.0	400.0	400.0	400.0	0.7	0.7	161.12	7.6	8.8	14.1	12.8	1.32	10.668	SF
500.0	499.6	499.6	499.6	0.9	0.8	167.80	7.6	8.8	21.6	20.0	1.67	12.999	
600.0	598.8	597.4	597.4	1.1	1.0	169.50	10.0	9.6	36.4	34.4	2.01	18.115	
700.0	697.3	693.1	692.8	1.5	1.2	167.58	16.8	12.1	58.6	56.2	2.36	24.790	
800.0	795.9	788.6	787.6	1.8	1.4	164.97	27.4	16.0	84.3	81.6	2.74	30.790	
900.0	894.4	885.0	883.3	2.1	1.6	163.41	38.6	20.0	110.5	107.4	3.12	35.398	
1,000.0	992.9	981.5	979.0	2.5	1.9	162.44	49.8	24.1	136.8	133.2	3.51	38.968	
1,100.0	1,091.4	1,078.0	1,074.8	2.8	2.1	161.79	60.9	28.2	163.0	159.1	3.90	41.803	
1,200.0	1,190.0	1,174.5	1,170.5	3.1	2.4	161.32	72.1	32.2	189.3	185.0	4.29	44.104	
1,300.0	1,288.5	1,270.9	1,266.3	3.5	2.6	160.96	83.3	36.3	215.6	210.9	4.69	46.007	
1,400.0	1,387.0	1,367.4	1,362.0	3.8	2.9	160.68	94.4	40.3	241.9	236.8	5.08	47.604	
1,500.0	1,485.5	1,463.9	1,457.7	4.2	3.2	160.46	105.6	44.4	268.2	262.7	5.48	48.964	
1,600.0	1,584.1	1,560.4	1,553.5	4.5	3.4	160.27	116.8	48.5	294.5	288.6	5.87	50.135	
1,700.0	1,682.6	1,656.8	1,649.2	4.9	3.7	160.12	127.9	52.5	320.8	314.5	6.27	51.153	
1,800.0	1,781.1	1,753.3	1,745.0	5.2	3.9	159.99	139.1	56.6	347.1	340.4	6.67	52.046	
1,900.0	1,879.6	1,849.8	1,840.7	5.6	4.2	159.88	150.3	60.7	373.4	366.4	7.07	52.836	
2,000.0	1,978.2	1,946.3	1,936.4	5.9	4.5	159.78	161.4	64.7	399.7	392.3	7.47	53.539	
2,100.0	2,076.7	2,042.7	2,032.2	6.2	4.7	159.69	172.6	68.8	426.1	418.2	7.87	54.169	
2,200.0	2,175.2	2,139.2	2,127.9	6.6	5.0	159.62	183.8	72.9	452.4	444.1	8.26	54.737	
2,300.0	2,273.7	2,235.7	2,223.7	6.9	5.3	159.55	194.9	76.9	478.7	470.0	8.66	55.251	
2,400.0	2,372.3	2,332.2	2,319.4	7.3	5.5	159.49	206.1	81.0	505.0	495.9	9.06	55.719	
2,500.0	2,470.8	2,428.6	2,415.1	7.6	5.8	159.44	217.3	85.1	531.3	521.8	9.46	56.146	
2,600.0	2,569.3	2,525.1	2,510.9	8.0	6.1	159.39	228.4	89.1	557.6	547.8	9.86	56.538	
2,700.0	2,667.8	2,621.6	2,606.6	8.3	6.3	159.34	239.6	93.2	583.9	573.7	10.26	56.899	
2,800.0	2,766.4	2,718.1	2,702.4	8.7	6.6	159.30	250.8	97.3	610.3	599.6	10.66	57.232	
2,900.0	2,864.9	2,814.5	2,798.1	9.0	6.9	159.26	261.9	101.3	636.6	625.5	11.06	57.541	
3,000.0	2,963.4	2,911.0	2,893.8	9.4	7.1	159.23	273.1	105.4	662.9	651.4	11.46	57.827	
3,100.0	3,061.9	3,007.5	2,989.6	9.7	7.4	159.20	284.3	109.5	689.2	677.3	11.86	58.094	
3,200.0	3,160.5	3,104.0	3,085.3	10.1	7.7	159.17	295.4	113.5	715.5	703.3	12.26	58.343	
3,300.0	3,259.0	3,200.4	3,181.1	10.4	7.9	159.14	306.6	117.6	741.8	729.2	12.66	58.577	
3,400.0	3,357.5	3,296.9	3,276.8	10.8	8.2	159.11	317.8	121.7	768.2	755.1	13.07	58.795	
3,500.0	3,456.0	3,393.4	3,372.5	11.1	8.5	159.09	328.9	125.7	794.5	781.0	13.47	59.000	
3,600.0	3,554.6	3,489.9	3,468.3	11.5	8.7	159.07	340.1	129.8	820.8	806.9	13.87	59.194	
3,700.0	3,653.1	3,586.3	3,564.0	11.8	9.0	159.05	351.3	133.9	847.1	832.8	14.27	59.376	
3,800.0	3,751.6	3,682.8	3,659.8	12.2	9.3	159.03	362.4	137.9	873.4	858.8	14.67	59.548	
3,900.0	3,850.1	3,779.3	3,755.5	12.5	9.5	159.01	373.6	142.0	899.7	884.7	15.07	59.711	
4,000.0	3,948.7	3,875.7	3,851.2	12.9	9.8	158.99	384.8	146.1	926.1	910.6	15.47	59.865	
4,100.0	4,047.2	3,972.2	3,947.0	13.2	10.1	158.97	395.9	150.1	952.4	936.5	15.87	60.012	
4,200.0	4,145.7	4,068.7	4,042.7	13.6	10.3	158.96	407.1	154.2	978.7	962.4	16.27	60.151	
4,300.0	4,244.2	4,165.2	4,138.5	13.9	10.6	158.94	418.3	158.3	1,005.0	988.4	16.67	60.283	
4,400.0	4,342.8	4,261.6	4,234.2	14.3	10.9	158.93	429.4	162.3	1,031.3	1,014.3	17.07	60.409	
4,500.0	4,441.3	4,358.1	4,329.9	14.6	11.1	158.92	440.6	166.4	1,057.7	1,040.2	17.47	60.529	
4,600.0	4,539.8	4,454.6	4,425.7	15.0	11.4	158.90	451.8	170.5	1,084.0	1,066.1	17.87	60.644	
4,700.0	4,638.4	4,551.1	4,521.4	15.3	11.7	158.89	462.9	174.5	1,110.3	1,092.0	18.28	60.753	
4,800.0	4,736.9	4,647.5	4,617.2	15.7	11.9	158.88	474.1	178.6	1,136.6	1,117.9	18.68	60.858	
4,900.0	4,835.4	4,744.0	4,712.9	16.0	12.2	158.87	485.3	182.7	1,162.9	1,143.9	19.08	60.958	
5,000.0	4,933.9	4,840.5	4,808.6	16.4	12.5	158.86	496.4	186.7	1,189.3	1,169.8	19.48	61.054	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
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	61.867	
200.0	200.0	200.0	200.0	0.3	0.3	5.77	16.8	1.7	16.8	16.2	0.62	27.110	CC, ES
300.0	300.0	299.7	299.7	0.5	0.5	-2.48	17.6	-0.8	17.6	16.7	0.97	18.183	
400.0	400.0	399.0	398.7	0.7	0.7	92.99	20.2	-8.1	21.8	20.4	1.36	15.981	SF
500.0	499.6	497.9	496.7	0.9	1.0	87.19	24.4	-20.2	29.6	27.8	1.81	16.398	
600.0	598.8	596.1	593.3	1.1	1.4	85.69	30.3	-36.9	40.7	38.3	2.36	17.248	
700.0	697.3	694.4	689.0	1.5	1.8	85.46	37.5	-57.8	54.4	51.4	2.98	18.228	
800.0	795.9	793.4	785.3	1.8	2.2	85.13	45.1	-79.5	68.5	64.9	3.63	18.858	
900.0	894.4	892.4	881.6	2.1	2.6	84.91	52.7	-101.2	82.7	78.4	4.30	19.239	
1,000.0	992.9	991.4	977.9	2.5	3.1	84.75	60.2	-122.8	96.8	91.9	4.97	19.487	
1,100.0	1,091.4	1,090.4	1,074.2	2.8	3.5	84.64	67.8	-144.5	111.0	105.3	5.64	19.659	
1,200.0	1,190.0	1,189.3	1,170.5	3.1	3.9	84.55	75.4	-166.2	125.1	118.8	6.32	19.784	
1,300.0	1,288.5	1,288.3	1,266.8	3.5	4.4	84.48	83.0	-187.9	139.3	132.3	7.01	19.878	
1,400.0	1,387.0	1,387.3	1,363.1	3.8	4.8	84.42	90.5	-209.5	153.4	145.7	7.69	19.950	
1,500.0	1,485.5	1,486.3	1,459.4	4.2	5.3	84.37	98.1	-231.2	167.6	159.2	8.38	20.008	
1,600.0	1,584.1	1,585.3	1,555.7	4.5	5.7	84.33	105.7	-252.9	181.7	172.7	9.06	20.055	
1,700.0	1,682.6	1,684.3	1,652.0	4.9	6.1	84.30	113.2	-274.5	195.9	186.1	9.75	20.093	
1,800.0	1,781.1	1,783.3	1,748.3	5.2	6.6	84.27	120.8	-296.2	210.0	199.6	10.44	20.125	
1,900.0	1,879.6	1,882.3	1,844.6	5.6	7.0	84.24	128.4	-317.9	224.2	213.0	11.12	20.152	
2,000.0	1,978.2	1,981.3	1,940.9	5.9	7.5	84.22	135.9	-339.5	238.3	226.5	11.81	20.176	
2,100.0	2,076.7	2,080.3	2,037.2	6.2	7.9	84.20	143.5	-361.2	252.5	240.0	12.50	20.196	
2,200.0	2,175.2	2,179.3	2,133.5	6.6	8.4	84.18	151.1	-382.9	266.6	253.4	13.19	20.213	
2,300.0	2,273.7	2,278.3	2,229.8	6.9	8.8	84.16	158.6	-404.5	280.8	266.9	13.88	20.229	
2,400.0	2,372.3	2,377.3	2,326.1	7.3	9.2	84.15	166.2	-426.2	294.9	280.4	14.57	20.243	
2,500.0	2,470.8	2,476.3	2,422.3	7.6	9.7	84.14	173.8	-447.9	309.1	293.8	15.26	20.255	
2,600.0	2,569.3	2,575.3	2,518.6	8.0	10.1	84.12	181.3	-469.6	323.2	307.3	15.95	20.266	
2,700.0	2,667.8	2,674.3	2,614.9	8.3	10.6	84.11	188.9	-491.2	337.4	320.7	16.64	20.276	
2,800.0	2,766.4	2,773.2	2,711.2	8.7	11.0	84.10	196.5	-512.9	351.5	334.2	17.33	20.285	
2,900.0	2,864.9	2,872.2	2,807.5	9.0	11.5	84.09	204.0	-534.6	365.7	347.7	18.02	20.293	
3,000.0	2,963.4	2,971.2	2,903.8	9.4	11.9	84.08	211.6	-556.2	379.8	361.1	18.71	20.300	
3,100.0	3,061.9	3,070.2	3,000.1	9.7	12.4	84.08	219.2	-577.9	394.0	374.6	19.40	20.307	
3,200.0	3,160.5	3,169.2	3,096.4	10.1	12.8	84.07	226.7	-599.6	408.1	388.0	20.09	20.313	
3,300.0	3,259.0	3,268.2	3,192.7	10.4	13.2	84.06	234.3	-621.2	422.3	401.5	20.78	20.319	
3,400.0	3,357.5	3,367.2	3,289.0	10.8	13.7	84.05	241.9	-642.9	436.4	415.0	21.47	20.324	
3,500.0	3,456.0	3,466.2	3,385.3	11.1	14.1	84.05	249.4	-664.6	450.6	428.4	22.16	20.329	
3,600.0	3,554.6	3,565.2	3,481.6	11.5	14.6	84.04	257.0	-686.2	464.7	441.9	22.86	20.334	
3,700.0	3,653.1	3,664.2	3,577.9	11.8	15.0	84.04	264.6	-707.9	478.9	455.3	23.55	20.338	
3,800.0	3,751.6	3,763.2	3,674.2	12.2	15.5	84.03	272.1	-729.6	493.0	468.8	24.24	20.342	
3,900.0	3,850.1	3,862.2	3,770.5	12.5	15.9	84.03	279.7	-751.3	507.2	482.3	24.93	20.346	
4,000.0	3,948.7	3,961.2	3,866.8	12.9	16.4	84.02	287.3	-772.9	521.3	495.7	25.62	20.349	
4,100.0	4,047.2	4,060.2	3,963.1	13.2	16.8	84.02	294.8	-794.6	535.5	509.2	26.31	20.352	
4,200.0	4,145.7	4,159.2	4,059.4	13.6	17.2	84.01	302.4	-816.3	549.6	522.6	27.00	20.356	
4,300.0	4,244.2	4,258.2	4,155.7	13.9	17.7	84.01	310.0	-837.9	563.8	536.1	27.69	20.358	
4,400.0	4,342.8	4,357.1	4,252.0	14.3	18.1	84.01	317.5	-859.6	577.9	549.6	28.38	20.361	
4,500.0	4,441.3	4,456.1	4,348.3	14.6	18.6	84.00	325.1	-881.3	592.1	563.0	29.08	20.364	
4,600.0	4,539.8	4,555.1	4,444.6	15.0	19.0	84.00	332.7	-902.9	606.2	576.5	29.77	20.366	
4,700.0	4,638.4	4,654.1	4,540.9	15.3	19.5	84.00	340.2	-924.6	620.4	589.9	30.46	20.369	
4,800.0	4,736.9	4,753.1	4,637.2	15.7	19.9	83.99	347.8	-946.3	634.5	603.4	31.15	20.371	
4,900.0	4,835.4	4,852.1	4,733.5	16.0	20.4	83.99	355.4	-967.9	648.7	616.8	31.84	20.373	
5,000.0	4,933.9	4,951.1	4,829.8	16.4	20.8	83.99	362.9	-989.6	662.8	630.3	32.53	20.375	
5,100.0	5,032.5	5,050.1	4,926.0	16.7	21.2	83.98	370.5	-1,011.3	677.0	643.8	33.22	20.377	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,131.0	5,149.1	5,022.3	17.1	21.7	83.98	378.1	-1,032.9	691.1	657.2	33.91	20.379	
5,300.0	5,229.5	5,248.1	5,118.6	17.4	22.1	83.98	385.6	-1,054.6	705.3	670.7	34.61	20.381	
5,400.0	5,328.0	5,347.1	5,214.9	17.8	22.6	83.98	393.2	-1,076.3	719.4	684.1	35.30	20.382	
5,500.0	5,426.6	5,446.1	5,311.2	18.1	23.0	83.97	400.8	-1,098.0	733.6	697.6	35.99	20.384	
5,600.0	5,525.1	5,545.1	5,407.5	18.5	23.5	83.97	408.3	-1,119.6	747.7	711.1	36.68	20.385	
5,700.0	5,623.6	5,644.1	5,503.8	18.8	23.9	83.97	415.9	-1,141.3	761.9	724.5	37.37	20.387	
5,800.0	5,722.1	5,743.1	5,600.1	19.2	24.4	83.97	423.5	-1,163.0	776.0	738.0	38.06	20.388	
5,900.0	5,820.7	5,842.1	5,696.4	19.5	24.8	83.97	431.0	-1,184.6	790.2	751.4	38.75	20.390	
6,000.0	5,919.2	5,941.0	5,792.7	19.8	25.3	83.96	438.6	-1,206.3	804.3	764.9	39.45	20.391	
6,100.0	6,017.7	6,040.0	5,889.0	20.2	25.7	83.96	446.2	-1,228.0	818.5	778.4	40.14	20.392	
6,200.0	6,116.2	6,139.0	5,985.3	20.5	26.1	83.96	453.7	-1,249.6	832.6	791.8	40.83	20.393	
6,300.0	6,214.8	6,238.0	6,081.6	20.9	26.6	83.96	461.3	-1,271.3	846.8	805.3	41.52	20.395	
6,400.0	6,313.3	6,337.0	6,177.9	21.2	27.0	83.96	468.9	-1,293.0	860.9	818.7	42.21	20.396	
6,500.0	6,411.8	6,436.0	6,274.2	21.6	27.5	83.95	476.4	-1,314.6	875.1	832.2	42.90	20.397	
6,600.0	6,510.3	6,535.0	6,370.5	21.9	27.9	83.95	484.0	-1,336.3	889.2	845.7	43.60	20.398	
6,700.0	6,608.9	6,634.0	6,466.8	22.3	28.4	83.95	491.6	-1,358.0	903.4	859.1	44.29	20.399	
6,800.0	6,707.4	6,733.0	6,563.1	22.6	28.8	83.95	499.1	-1,379.7	917.6	872.6	44.98	20.400	
6,900.0	6,805.9	6,832.0	6,659.4	23.0	29.3	83.95	506.7	-1,401.3	931.7	886.0	45.67	20.401	
7,000.0	6,904.4	6,931.0	6,755.7	23.3	29.7	83.95	514.3	-1,423.0	945.9	899.5	46.36	20.402	
7,100.0	7,003.0	7,030.0	6,852.0	23.7	30.1	83.95	521.8	-1,444.7	960.0	912.9	47.05	20.402	
7,200.0	7,101.5	7,129.0	6,948.3	24.0	30.6	83.94	529.4	-1,466.3	974.2	926.4	47.74	20.403	
7,300.0	7,200.2	7,252.4	7,068.7	24.4	31.1	84.14	538.2	-1,491.6	987.4	938.9	48.51	20.355	
7,400.0	7,299.3	7,382.3	7,196.7	24.6	31.5	84.36	545.7	-1,512.9	998.0	948.8	49.17	20.296	
7,500.0	7,398.9	7,513.0	7,326.3	24.8	31.8	84.52	551.2	-1,528.9	1,005.9	956.2	49.70	20.239	
7,600.0	7,498.7	7,644.2	7,457.0	25.0	32.1	84.61	554.9	-1,539.2	1,011.0	960.9	50.09	20.183	
7,700.0	7,598.6	7,775.7	7,588.4	25.1	32.2	84.63	556.5	-1,543.9	1,013.3	963.0	50.35	20.125	
7,800.0	7,698.6	7,886.0	7,698.6	25.2	32.3	-23.48	556.6	-1,544.2	1,013.5	962.9	50.55	20.050	
7,900.0	7,798.6	7,986.0	7,798.6	25.3	32.4	-23.48	556.6	-1,544.2	1,013.5	962.7	50.74	19.975	
8,000.0	7,898.6	8,086.0	7,898.6	25.4	32.4	-23.48	556.6	-1,544.2	1,013.5	962.5	50.93	19.900	
8,100.0	7,998.6	8,186.0	7,998.6	25.5	32.5	-23.48	556.6	-1,544.2	1,013.5	962.3	51.12	19.825	
8,200.0	8,098.6	8,286.0	8,098.6	25.6	32.6	-23.48	556.6	-1,544.2	1,013.5	962.2	51.32	19.750	
8,300.0	8,198.6	8,386.0	8,198.6	25.7	32.7	-23.48	556.6	-1,544.2	1,013.5	962.0	51.51	19.674	
8,400.0	8,298.6	8,486.0	8,298.6	25.8	32.7	-23.48	556.6	-1,544.2	1,013.5	961.8	51.71	19.599	
8,500.0	8,398.6	8,586.0	8,398.6	25.9	32.8	-23.48	556.6	-1,544.2	1,013.5	961.6	51.91	19.524	
8,600.0	8,498.6	8,686.0	8,498.6	26.0	32.9	-23.48	556.6	-1,544.2	1,013.5	961.4	52.11	19.449	
8,700.0	8,598.6	8,786.0	8,598.6	26.1	33.0	-23.48	556.6	-1,544.2	1,013.5	961.2	52.31	19.374	
8,800.0	8,698.6	8,886.0	8,698.6	26.2	33.1	-23.48	556.6	-1,544.2	1,013.5	961.0	52.52	19.298	
8,900.0	8,798.6	8,986.0	8,798.6	26.3	33.1	-23.48	556.6	-1,544.2	1,013.5	960.7	52.72	19.223	
9,000.0	8,898.6	9,086.0	8,898.6	26.4	33.2	-23.48	556.6	-1,544.2	1,013.5	960.5	52.93	19.148	
9,100.0	8,998.6	9,186.0	8,998.6	26.5	33.3	-23.48	556.6	-1,544.2	1,013.5	960.3	53.14	19.073	
9,200.0	9,098.6	9,286.0	9,098.6	26.6	33.4	-23.48	556.6	-1,544.2	1,013.5	960.1	53.35	18.998	
9,300.0	9,198.6	9,386.0	9,198.6	26.7	33.5	-23.48	556.6	-1,544.2	1,013.5	959.9	53.56	18.923	
9,400.0	9,298.6	9,486.0	9,298.6	26.8	33.6	-23.48	556.6	-1,544.2	1,013.5	959.7	53.77	18.848	
9,500.0	9,398.6	9,586.0	9,398.6	26.9	33.7	-23.48	556.6	-1,544.2	1,013.5	959.5	53.98	18.773	
9,600.0	9,498.6	9,686.0	9,498.6	27.0	33.7	-23.48	556.6	-1,544.2	1,013.5	959.3	54.20	18.699	
9,700.0	9,598.6	9,786.0	9,598.6	27.1	33.8	-23.48	556.6	-1,544.2	1,013.5	959.0	54.42	18.624	
9,800.0	9,698.6	9,886.0	9,698.6	27.2	33.9	-23.48	556.6	-1,544.2	1,013.5	958.8	54.64	18.550	
9,900.0	9,798.6	9,986.0	9,798.6	27.3	34.0	-23.48	556.6	-1,544.2	1,013.5	958.6	54.86	18.475	
10,000.0	9,898.6	10,086.0	9,898.6	27.4	34.1	-23.48	556.6	-1,544.2	1,013.5	958.4	55.08	18.401	
10,100.0	9,998.6	10,186.0	9,998.6	27.6	34.2	-23.48	556.6	-1,544.2	1,013.5	958.2	55.30	18.327	
10,138.4	10,037.0	10,224.3	10,037.0	27.6	34.2	-23.48	556.6	-1,544.2	1,013.5	958.1	55.38	18.299	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-174.35	-17.1	-1.7	17.2				
100.0	100.0	100.0	100.0	0.1	0.1	-174.35	-17.1	-1.7	17.2	16.9	0.27	63.182	
200.0	200.0	200.0	200.0	0.3	0.3	-174.35	-17.1	-1.7	17.2	16.6	0.62	27.687	CC, ES
300.0	300.0	299.3	299.2	0.5	0.5	-168.94	-18.8	-3.7	19.1	18.2	0.98	19.610	
400.0	400.0	398.2	397.9	0.7	0.7	-54.56	-23.7	-9.6	24.1	22.7	1.34	18.012	
500.0	499.6	496.8	495.6	0.9	1.0	-53.31	-31.9	-19.3	30.4	28.7	1.74	17.512	
600.0	598.8	596.4	593.9	1.1	1.3	-56.36	-42.3	-31.6	36.5	34.3	2.21	16.490	
700.0	697.3	696.2	692.4	1.5	1.6	-63.24	-52.7	-44.0	40.8	38.0	2.79	14.601	
800.0	795.9	796.0	790.9	1.8	1.9	-69.02	-63.1	-56.4	45.5	42.1	3.43	13.268	
900.0	894.4	895.8	889.4	2.1	2.3	-73.69	-73.5	-68.7	50.6	46.5	4.09	12.357	
1,000.0	992.9	995.6	987.8	2.5	2.6	-77.48	-83.9	-81.1	55.9	51.1	4.77	11.722	
1,100.0	1,091.4	1,095.4	1,086.3	2.8	2.9	-80.60	-94.2	-93.5	61.5	56.0	5.45	11.268	
1,200.0	1,190.0	1,195.2	1,184.8	3.1	3.3	-83.20	-104.6	-105.8	67.1	61.0	6.14	10.935	
1,300.0	1,288.5	1,295.0	1,283.3	3.5	3.6	-85.39	-115.0	-118.2	73.0	66.1	6.83	10.686	
1,400.0	1,387.0	1,394.8	1,381.7	3.8	3.9	-87.26	-125.4	-130.6	78.9	71.4	7.52	10.495	
1,500.0	1,485.5	1,494.6	1,480.2	4.2	4.2	-88.86	-135.8	-142.9	84.8	76.6	8.20	10.346	
1,600.0	1,584.1	1,594.4	1,578.7	4.5	4.6	-90.25	-146.2	-155.3	90.9	82.0	8.89	10.228	
1,700.0	1,682.6	1,694.2	1,677.2	4.9	4.9	-91.47	-156.6	-167.7	97.0	87.4	9.57	10.132	
1,800.0	1,781.1	1,794.0	1,775.7	5.2	5.2	-92.54	-167.0	-180.0	103.1	92.8	10.25	10.055	
1,900.0	1,879.6	1,893.8	1,874.1	5.6	5.6	-93.50	-177.4	-192.4	109.2	98.3	10.93	9.991	
2,000.0	1,978.2	1,993.5	1,972.6	5.9	5.9	-94.35	-187.8	-204.8	115.4	103.8	11.61	9.938	
2,100.0	2,076.7	2,093.3	2,071.1	6.2	6.2	-95.11	-198.2	-217.1	121.6	109.3	12.29	9.894	
2,200.0	2,175.2	2,193.1	2,169.6	6.6	6.6	-95.80	-208.6	-229.5	127.8	114.9	12.97	9.856	
2,300.0	2,273.7	2,292.9	2,268.1	6.9	6.9	-96.43	-219.0	-241.9	134.1	120.4	13.65	9.824	
2,400.0	2,372.3	2,392.7	2,366.5	7.3	7.2	-97.00	-229.4	-254.2	140.3	126.0	14.32	9.796	
2,500.0	2,470.8	2,492.5	2,465.0	7.6	7.6	-97.52	-239.8	-266.6	146.6	131.6	15.00	9.773	
2,600.0	2,569.3	2,592.3	2,563.5	8.0	7.9	-98.00	-250.2	-279.0	152.9	137.2	15.67	9.752	
2,700.0	2,667.8	2,692.1	2,662.0	8.3	8.2	-98.44	-260.6	-291.3	159.1	142.8	16.35	9.734	
2,800.0	2,766.4	2,791.9	2,760.4	8.7	8.6	-98.85	-271.0	-303.7	165.4	148.4	17.02	9.718	
2,900.0	2,864.9	2,891.7	2,858.9	9.0	8.9	-99.23	-281.4	-316.1	171.7	154.0	17.70	9.704	
3,000.0	2,963.4	2,991.5	2,957.4	9.4	9.2	-99.58	-291.8	-328.4	178.0	159.7	18.37	9.692	
3,100.0	3,061.9	3,091.3	3,055.9	9.7	9.6	-99.90	-302.2	-340.8	184.4	165.3	19.04	9.681	
3,200.0	3,160.5	3,191.1	3,154.4	10.1	9.9	-100.21	-312.6	-353.2	190.7	171.0	19.72	9.671	
3,300.0	3,259.0	3,290.9	3,252.8	10.4	10.2	-100.50	-322.9	-365.6	197.0	176.6	20.39	9.662	
3,400.0	3,357.5	3,390.7	3,351.3	10.8	10.6	-100.76	-333.3	-377.9	203.3	182.3	21.06	9.655	
3,500.0	3,456.0	3,490.5	3,449.8	11.1	10.9	-101.02	-343.7	-390.3	209.7	187.9	21.73	9.648	
3,600.0	3,554.6	3,590.3	3,548.3	11.5	11.2	-101.25	-354.1	-402.7	216.0	193.6	22.40	9.641	
3,700.0	3,653.1	3,690.1	3,646.8	11.8	11.6	-101.48	-364.5	-415.0	222.4	199.3	23.08	9.636	
3,800.0	3,751.6	3,789.9	3,745.2	12.2	11.9	-101.69	-374.9	-427.4	228.7	205.0	23.75	9.630	
3,900.0	3,850.1	3,889.7	3,843.7	12.5	12.2	-101.89	-385.3	-439.8	235.0	210.6	24.42	9.626	
4,000.0	3,948.7	3,989.4	3,942.2	12.9	12.6	-102.08	-395.7	-452.1	241.4	216.3	25.09	9.621	
4,100.0	4,047.2	4,089.2	4,040.7	13.2	12.9	-102.25	-406.1	-464.5	247.7	222.0	25.76	9.618	
4,200.0	4,145.7	4,189.0	4,139.1	13.6	13.2	-102.43	-416.5	-476.9	254.1	227.7	26.43	9.614	
4,300.0	4,244.2	4,288.8	4,237.6	13.9	13.6	-102.59	-426.9	-489.2	260.5	233.4	27.10	9.611	
4,400.0	4,342.8	4,388.6	4,336.1	14.3	13.9	-102.74	-437.3	-501.6	266.8	239.1	27.77	9.608	
4,500.0	4,441.3	4,488.4	4,434.6	14.6	14.2	-102.89	-447.7	-514.0	273.2	244.7	28.44	9.605	
4,600.0	4,539.8	4,588.2	4,533.1	15.0	14.6	-103.03	-458.1	-526.3	279.5	250.4	29.11	9.603	
4,700.0	4,638.4	4,688.0	4,631.5	15.3	14.9	-103.16	-468.5	-538.7	285.9	256.1	29.78	9.600	
4,800.0	4,736.9	4,787.8	4,730.0	15.7	15.2	-103.29	-478.9	-551.1	292.3	261.8	30.45	9.598	
4,900.0	4,835.4	4,887.6	4,828.5	16.0	15.6	-103.42	-489.3	-563.4	298.6	267.5	31.12	9.596	
5,000.0	4,933.9	4,987.4	4,927.0	16.4	15.9	-103.53	-499.7	-575.8	305.0	273.2	31.79	9.594	
5,100.0	5,032.5	5,087.2	5,025.5	16.7	16.2	-103.65	-510.1	-588.2	311.4	278.9	32.46	9.593	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,131.0	5,187.0	5,123.9	17.1	16.6	-103.75	-520.5	-600.5	317.8	284.6	33.13	9.591	
5,300.0	5,229.5	5,286.8	5,222.4	17.4	16.9	-103.86	-530.9	-612.9	324.1	290.3	33.80	9.590	
5,400.0	5,328.0	5,386.6	5,320.9	17.8	17.2	-103.96	-541.2	-625.3	330.5	296.0	34.47	9.588	
5,500.0	5,426.6	5,486.4	5,419.4	18.1	17.6	-104.06	-551.6	-637.6	336.9	301.7	35.14	9.587	
5,600.0	5,525.1	5,586.2	5,517.8	18.5	17.9	-104.15	-562.0	-650.0	343.2	307.4	35.81	9.586	
5,700.0	5,623.6	5,686.0	5,616.3	18.8	18.2	-104.24	-572.4	-662.4	349.6	313.1	36.48	9.585	
5,800.0	5,722.1	5,785.8	5,714.8	19.2	18.6	-104.32	-582.8	-674.7	356.0	318.9	37.15	9.584	
5,900.0	5,820.7	5,885.6	5,813.3	19.5	18.9	-104.41	-593.2	-687.1	362.4	324.6	37.81	9.583	
6,000.0	5,919.2	5,985.3	5,911.8	19.8	19.2	-104.49	-603.6	-699.5	368.8	330.3	38.48	9.582	
6,100.0	6,017.7	6,085.1	6,010.2	20.2	19.6	-104.56	-614.0	-711.8	375.1	336.0	39.15	9.581	
6,200.0	6,116.2	6,184.9	6,108.7	20.5	19.9	-104.64	-624.4	-724.2	381.5	341.7	39.82	9.581	
6,300.0	6,214.8	6,284.7	6,207.2	20.9	20.2	-104.71	-634.8	-736.6	387.9	347.4	40.49	9.580	
6,400.0	6,313.3	6,384.5	6,305.7	21.2	20.6	-104.78	-645.2	-749.0	394.3	353.1	41.16	9.579	
6,500.0	6,411.8	6,484.3	6,404.2	21.6	20.9	-104.85	-655.6	-761.3	400.7	358.8	41.83	9.579	
6,600.0	6,510.3	6,584.1	6,502.6	21.9	21.2	-104.92	-666.0	-773.7	407.0	364.5	42.50	9.578	
6,700.0	6,608.9	6,683.9	6,601.1	22.3	21.6	-104.98	-676.4	-786.1	413.4	370.3	43.16	9.578	
6,800.0	6,707.4	6,783.7	6,699.6	22.6	21.9	-105.04	-686.8	-798.4	419.8	376.0	43.83	9.577	
6,900.0	6,805.9	6,883.5	6,798.1	23.0	22.2	-105.10	-697.2	-810.8	426.2	381.7	44.50	9.577	
7,000.0	6,904.4	6,983.3	6,896.5	23.3	22.6	-105.16	-707.6	-823.2	432.6	387.4	45.17	9.576	
7,100.0	7,003.0	7,083.1	6,995.0	23.7	22.9	-105.22	-718.0	-835.5	439.0	393.1	45.84	9.576	
7,200.0	7,101.5	7,182.9	7,093.5	24.0	23.2	-105.27	-728.4	-847.9	445.3	398.8	46.51	9.576	
7,300.0	7,200.2	7,283.3	7,192.6	24.4	23.6	-105.33	-738.7	-860.2	451.5	404.3	47.15	9.575	
7,400.0	7,299.3	7,385.0	7,293.4	24.6	23.8	-105.34	-747.3	-870.4	456.4	408.7	47.68	9.572	
7,500.0	7,398.9	7,486.8	7,394.7	24.8	24.0	-105.36	-753.6	-878.0	460.0	411.9	48.10	9.563	
7,600.0	7,498.7	7,588.6	7,496.4	25.0	24.2	-105.36	-757.7	-882.7	462.3	413.9	48.42	9.547	
7,700.0	7,598.6	7,690.5	7,598.2	25.1	24.3	-105.37	-759.3	-884.8	463.3	414.7	48.64	9.525	
7,800.0	7,698.6	7,790.9	7,698.6	25.2	24.4	146.52	-759.4	-884.8	463.3	414.5	48.84	9.487	
7,900.0	7,798.6	7,890.9	7,798.6	25.3	24.5	146.52	-759.4	-884.8	463.3	414.3	49.03	9.450	
8,000.0	7,898.6	7,990.9	7,898.6	25.4	24.6	146.52	-759.4	-884.8	463.3	414.1	49.23	9.412	
8,100.0	7,998.6	8,090.9	7,998.6	25.5	24.7	146.52	-759.4	-884.8	463.3	413.9	49.43	9.374	
8,200.0	8,098.6	8,190.9	8,098.6	25.6	24.8	146.52	-759.4	-884.8	463.3	413.7	49.63	9.337	
8,300.0	8,198.6	8,290.9	8,198.6	25.7	24.9	146.52	-759.4	-884.8	463.3	413.5	49.83	9.299	
8,400.0	8,298.6	8,390.9	8,298.6	25.8	25.0	146.52	-759.4	-884.8	463.3	413.3	50.03	9.261	
8,500.0	8,398.6	8,490.9	8,398.6	25.9	25.1	146.52	-759.4	-884.8	463.3	413.1	50.23	9.223	
8,600.0	8,498.6	8,590.9	8,498.6	26.0	25.2	146.52	-759.4	-884.8	463.3	412.9	50.44	9.186	
8,700.0	8,598.6	8,690.9	8,598.6	26.1	25.3	146.52	-759.4	-884.8	463.3	412.7	50.65	9.148	
8,800.0	8,698.6	8,790.9	8,698.6	26.2	25.4	146.52	-759.4	-884.8	463.3	412.5	50.86	9.110	
8,900.0	8,798.6	8,890.9	8,798.6	26.3	25.5	146.52	-759.4	-884.8	463.3	412.3	51.07	9.073	
9,000.0	8,898.6	8,990.9	8,898.6	26.4	25.6	146.52	-759.4	-884.8	463.3	412.0	51.28	9.035	
9,100.0	8,998.6	9,090.9	8,998.6	26.5	25.7	146.52	-759.4	-884.8	463.3	411.8	51.50	8.997	
9,200.0	9,098.6	9,190.9	9,098.6	26.6	25.8	146.52	-759.4	-884.8	463.3	411.6	51.71	8.960	
9,300.0	9,198.6	9,290.9	9,198.6	26.7	26.0	146.52	-759.4	-884.8	463.3	411.4	51.93	8.923	
9,400.0	9,298.6	9,390.9	9,298.6	26.8	26.1	146.52	-759.4	-884.8	463.3	411.2	52.15	8.885	
9,500.0	9,398.6	9,490.9	9,398.6	26.9	26.2	146.52	-759.4	-884.8	463.3	411.0	52.37	8.848	
9,600.0	9,498.6	9,590.9	9,498.6	27.0	26.3	146.52	-759.4	-884.8	463.3	410.7	52.59	8.811	
9,700.0	9,598.6	9,690.9	9,598.6	27.1	26.4	146.52	-759.4	-884.8	463.3	410.5	52.81	8.774	
9,800.0	9,698.6	9,790.9	9,698.6	27.2	26.5	146.52	-759.4	-884.8	463.3	410.3	53.03	8.736	
9,900.0	9,798.6	9,890.9	9,798.6	27.3	26.6	146.52	-759.4	-884.8	463.3	410.1	53.26	8.700	
10,000.0	9,898.6	9,990.9	9,898.6	27.4	26.7	146.52	-759.4	-884.8	463.3	409.8	53.49	8.663	
10,100.0	9,998.6	10,090.9	9,998.6	27.6	26.8	146.52	-759.4	-884.8	463.3	409.6	53.71	8.626	
10,138.4	10,037.0	10,129.3	10,037.0	27.6	26.9	146.52	-759.4	-884.8	463.3	409.5	53.80	8.612 SF	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 16-14D - DD - Plan #1 — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-174.29	-33.9	-3.4	34.0				
100.0	100.0	100.0	100.0	0.1	0.1	-174.29	-33.9	-3.4	34.0	33.8	0.27	125.033	
200.0	200.0	200.0	200.0	0.3	0.3	-174.29	-33.9	-3.4	34.0	33.4	0.62	54.790	
300.0	300.0	300.0	300.0	0.5	0.5	-174.29	-33.9	-3.4	34.0	33.1	0.97	35.081	
400.0	400.0	400.0	400.0	0.7	0.7	-70.35	-33.9	-3.4	33.1	31.7	1.32	24.963	
500.0	499.6	499.6	499.6	0.9	0.8	-84.01	-33.9	-3.4	31.3	29.6	1.71	18.298	
529.3	528.8	528.8	528.8	1.0	0.9	-90.00	-33.9	-3.4	31.1	29.3	1.84	16.910	CC, ES
600.0	598.8	598.8	598.8	1.1	1.0	-107.21	-33.9	-3.4	32.6	30.5	2.14	15.228	
700.0	697.3	697.3	697.3	1.5	1.2	-130.15	-33.9	-3.4	41.0	38.5	2.52	16.249	
800.0	795.9	795.9	795.9	1.8	1.4	-144.17	-33.9	-3.4	53.7	50.9	2.86	18.805	
900.0	894.4	896.1	896.0	2.1	1.5	-150.90	-35.7	-4.9	67.2	64.0	3.20	20.979	
1,000.0	992.9	997.4	997.0	2.5	1.7	-152.11	-41.7	-9.9	78.5	74.9	3.60	21.802	
1,100.0	1,091.4	1,099.1	1,097.9	2.8	2.0	-149.97	-51.8	-18.4	87.2	83.1	4.07	21.396	
1,200.0	1,190.0	1,200.7	1,197.8	3.1	2.3	-145.27	-66.0	-30.3	93.7	89.0	4.67	20.068	
1,300.0	1,288.5	1,300.1	1,295.0	3.5	2.6	-139.94	-81.7	-43.5	99.9	94.5	5.34	18.696	
1,400.0	1,387.0	1,399.5	1,392.3	3.8	2.9	-135.27	-97.5	-56.8	106.9	100.8	6.06	17.635	
1,500.0	1,485.5	1,498.9	1,489.5	4.2	3.3	-131.18	-113.2	-70.0	114.5	107.7	6.80	16.828	
1,600.0	1,584.1	1,598.3	1,586.8	4.5	3.6	-127.62	-129.0	-83.2	122.6	115.0	7.56	16.220	
1,700.0	1,682.6	1,697.7	1,684.0	4.9	4.0	-124.51	-144.8	-96.4	131.1	122.8	8.32	15.762	
1,800.0	1,781.1	1,797.1	1,781.2	5.2	4.4	-121.78	-160.5	-109.7	140.0	130.9	9.08	15.417	
1,900.0	1,879.6	1,896.5	1,878.5	5.6	4.8	-119.38	-176.3	-122.9	149.1	139.3	9.84	15.156	
2,000.0	1,978.2	1,995.9	1,975.7	5.9	5.1	-117.26	-192.1	-136.1	158.5	147.9	10.59	14.960	
2,100.0	2,076.7	2,095.3	2,073.0	6.2	5.5	-115.38	-207.8	-149.3	168.0	156.7	11.34	14.812	
2,200.0	2,175.2	2,194.7	2,170.2	6.6	5.9	-113.70	-223.6	-162.6	177.8	165.7	12.09	14.700	
2,300.0	2,273.7	2,294.1	2,267.5	6.9	6.3	-112.20	-239.3	-175.8	187.6	174.8	12.84	14.617	
2,400.0	2,372.3	2,393.5	2,364.7	7.3	6.7	-110.85	-255.1	-189.0	197.6	184.0	13.57	14.555	
2,500.0	2,470.8	2,492.9	2,462.0	7.6	7.1	-109.62	-270.9	-202.2	207.7	193.3	14.31	14.511	
2,600.0	2,569.3	2,592.3	2,559.2	8.0	7.5	-108.52	-286.6	-215.5	217.8	202.8	15.04	14.480	
2,700.0	2,667.8	2,691.7	2,656.5	8.3	7.9	-107.51	-302.4	-228.7	228.0	212.3	15.77	14.459	
2,800.0	2,766.4	2,791.1	2,753.7	8.7	8.3	-106.58	-318.2	-241.9	238.3	221.8	16.50	14.446	
2,900.0	2,864.9	2,890.5	2,850.9	9.0	8.7	-105.74	-333.9	-255.1	248.7	231.5	17.22	14.440	
3,000.0	2,963.4	2,989.9	2,948.2	9.4	9.1	-104.96	-349.7	-268.4	259.1	241.1	17.94	14.439	
3,100.0	3,061.9	3,089.3	3,045.4	9.7	9.5	-104.24	-365.4	-281.6	269.5	250.9	18.66	14.442	
3,200.0	3,160.5	3,188.7	3,142.7	10.1	9.9	-103.58	-381.2	-294.8	280.0	260.6	19.38	14.448	
3,300.0	3,259.0	3,288.1	3,239.9	10.4	10.3	-102.96	-397.0	-308.0	290.5	270.4	20.10	14.456	
3,400.0	3,357.5	3,387.5	3,337.2	10.8	10.7	-102.38	-412.7	-321.3	301.1	280.3	20.81	14.467	
3,500.0	3,456.0	3,486.9	3,434.4	11.1	11.0	-101.85	-428.5	-334.5	311.7	290.1	21.52	14.479	
3,600.0	3,554.6	3,586.3	3,531.7	11.5	11.4	-101.35	-444.3	-347.7	322.3	300.0	22.24	14.492	
3,700.0	3,653.1	3,685.7	3,628.9	11.8	11.8	-100.88	-460.0	-360.9	332.9	309.9	22.95	14.506	
3,800.0	3,751.6	3,785.1	3,726.2	12.2	12.2	-100.44	-475.8	-374.2	343.5	319.9	23.66	14.521	
3,900.0	3,850.1	3,884.5	3,823.4	12.5	12.6	-100.03	-491.6	-387.4	354.2	329.8	24.37	14.537	
4,000.0	3,948.7	3,983.9	3,920.6	12.9	13.0	-99.64	-507.3	-400.6	364.9	339.8	25.07	14.552	
4,100.0	4,047.2	4,083.3	4,017.9	13.2	13.4	-99.28	-523.1	-413.8	375.6	349.8	25.78	14.568	
4,200.0	4,145.7	4,182.7	4,115.1	13.6	13.8	-98.93	-538.8	-427.1	386.3	359.8	26.49	14.584	
4,300.0	4,244.2	4,282.1	4,212.4	13.9	14.2	-98.60	-554.6	-440.3	397.0	369.8	27.19	14.601	
4,400.0	4,342.8	4,381.5	4,309.6	14.3	14.6	-98.29	-570.4	-453.5	407.7	379.8	27.90	14.617	
4,500.0	4,441.3	4,480.9	4,406.9	14.6	15.0	-98.00	-586.1	-466.8	418.5	389.9	28.60	14.633	
4,600.0	4,539.8	4,580.3	4,504.1	15.0	15.4	-97.72	-601.9	-480.0	429.2	399.9	29.30	14.648	
4,700.0	4,638.4	4,679.7	4,601.4	15.3	15.8	-97.45	-617.7	-493.2	440.0	410.0	30.01	14.664	
4,800.0	4,736.9	4,779.0	4,698.6	15.7	16.2	-97.20	-633.4	-506.4	450.8	420.1	30.71	14.679	
4,900.0	4,835.4	4,878.4	4,795.9	16.0	16.6	-96.96	-649.2	-519.7	461.6	430.2	31.41	14.695	
5,000.0	4,933.9	4,977.8	4,893.1	16.4	17.0	-96.73	-664.9	-532.9	472.4	440.3	32.11	14.710	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 16-14D - DD - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	5,032.5	5,077.2	4,990.3	16.7	17.4	-96.51	-680.7	-546.1	483.2	450.3	32.81	14.724	
5,200.0	5,131.0	5,176.6	5,087.6	17.1	17.8	-96.30	-696.5	-559.3	494.0	460.5	33.51	14.739	
5,300.0	5,229.5	5,276.0	5,184.8	17.4	18.2	-96.10	-712.2	-572.6	504.8	470.6	34.22	14.753	
5,400.0	5,328.0	5,375.4	5,282.1	17.8	18.6	-95.90	-728.0	-585.8	515.6	480.7	34.92	14.767	
5,500.0	5,426.6	5,474.8	5,379.3	18.1	19.0	-95.72	-743.8	-599.0	526.4	490.8	35.62	14.781	
5,600.0	5,525.1	5,574.2	5,476.6	18.5	19.4	-95.54	-759.5	-612.2	537.3	500.9	36.31	14.794	
5,700.0	5,623.6	5,673.6	5,573.8	18.8	19.8	-95.37	-775.3	-625.5	548.1	511.1	37.01	14.808	
5,800.0	5,722.1	5,773.0	5,671.1	19.2	20.2	-95.21	-791.0	-638.7	558.9	521.2	37.71	14.820	
5,900.0	5,820.7	5,872.4	5,768.3	19.5	20.6	-95.05	-806.8	-651.9	569.8	531.4	38.41	14.833	
6,000.0	5,919.2	5,971.8	5,865.6	19.8	21.0	-94.90	-822.6	-665.1	580.6	541.5	39.11	14.845	
6,100.0	6,017.7	6,071.2	5,962.8	20.2	21.4	-94.75	-838.3	-678.4	591.5	551.7	39.81	14.858	
6,200.0	6,116.2	6,170.6	6,060.0	20.5	21.8	-94.61	-854.1	-691.6	602.3	561.8	40.51	14.869	
6,300.0	6,214.8	6,270.0	6,157.3	20.9	22.2	-94.47	-869.9	-704.8	613.2	572.0	41.21	14.881	
6,400.0	6,313.3	6,369.4	6,254.5	21.2	22.6	-94.34	-885.6	-718.0	624.0	582.1	41.90	14.892	
6,500.0	6,411.8	6,468.8	6,351.8	21.6	23.0	-94.22	-901.4	-731.3	634.9	592.3	42.60	14.904	
6,600.0	6,510.3	6,568.2	6,449.0	21.9	23.4	-94.09	-917.1	-744.5	645.8	602.5	43.30	14.915	
6,700.0	6,608.9	6,667.6	6,546.3	22.3	23.9	-93.97	-932.9	-757.7	656.6	612.6	44.00	14.925	
6,800.0	6,707.4	6,767.0	6,643.5	22.6	24.3	-93.86	-948.7	-770.9	667.5	622.8	44.69	14.936	
6,900.0	6,805.9	6,866.4	6,740.8	23.0	24.7	-93.75	-964.4	-784.2	678.4	633.0	45.39	14.946	
7,000.0	6,904.4	6,965.8	6,838.0	23.3	25.1	-93.64	-980.2	-797.4	689.3	643.2	46.09	14.956	
7,100.0	7,003.0	7,065.2	6,935.3	23.7	25.5	-93.54	-996.0	-810.6	700.1	653.4	46.78	14.966	
7,200.0	7,101.5	7,164.7	7,032.6	24.0	25.9	-93.44	-1,011.7	-823.8	711.0	663.5	47.48	14.975	
7,300.0	7,200.2	7,277.4	7,143.3	24.4	26.2	-93.54	-1,027.9	-837.4	720.9	672.8	48.18	14.964	
7,400.0	7,299.3	7,390.5	7,255.1	24.6	26.6	-93.68	-1,040.8	-848.2	728.8	680.0	48.76	14.947	
7,500.0	7,398.9	7,504.0	7,367.9	24.8	26.8	-93.78	-1,050.3	-856.2	734.6	685.3	49.23	14.923	
7,600.0	7,498.7	7,617.6	7,481.3	25.0	27.0	-93.84	-1,056.4	-861.3	738.3	688.7	49.57	14.893	
7,700.0	7,598.6	7,731.4	7,595.0	25.1	27.1	-93.86	-1,059.1	-863.6	739.9	690.1	49.81	14.853	
7,800.0	7,698.6	7,835.0	7,698.6	25.2	27.2	158.04	-1,059.2	-863.7	739.9	689.9	50.00	14.798	
7,900.0	7,798.6	7,935.0	7,798.6	25.3	27.3	158.04	-1,059.2	-863.7	739.9	689.7	50.19	14.741	
8,000.0	7,898.6	8,035.0	7,898.6	25.4	27.4	158.04	-1,059.2	-863.7	739.9	689.5	50.39	14.685	
8,100.0	7,998.6	8,135.0	7,998.6	25.5	27.5	158.04	-1,059.2	-863.7	739.9	689.4	50.58	14.629	
8,200.0	8,098.6	8,235.0	8,098.6	25.6	27.6	158.04	-1,059.2	-863.7	739.9	689.2	50.78	14.572	
8,300.0	8,198.6	8,335.0	8,198.6	25.7	27.7	158.04	-1,059.2	-863.7	739.9	689.0	50.97	14.516	
8,400.0	8,298.6	8,435.0	8,298.6	25.8	27.8	158.04	-1,059.2	-863.7	739.9	688.8	51.17	14.459	
8,500.0	8,398.6	8,535.0	8,398.6	25.9	27.9	158.04	-1,059.2	-863.7	739.9	688.6	51.37	14.403	
8,600.0	8,498.6	8,635.0	8,498.6	26.0	28.0	158.04	-1,059.2	-863.7	739.9	688.4	51.58	14.346	
8,700.0	8,598.6	8,735.0	8,598.6	26.1	28.0	158.04	-1,059.2	-863.7	739.9	688.2	51.78	14.290	
8,800.0	8,698.6	8,835.0	8,698.6	26.2	28.1	158.04	-1,059.2	-863.7	739.9	687.9	51.99	14.233	
8,900.0	8,798.6	8,935.0	8,798.6	26.3	28.2	158.04	-1,059.2	-863.7	739.9	687.7	52.19	14.177	
9,000.0	8,898.6	9,035.0	8,898.6	26.4	28.3	158.04	-1,059.2	-863.7	739.9	687.5	52.40	14.121	
9,100.0	8,998.6	9,135.0	8,998.6	26.5	28.4	158.04	-1,059.2	-863.7	739.9	687.3	52.61	14.064	
9,200.0	9,098.6	9,235.0	9,098.6	26.6	28.5	158.04	-1,059.2	-863.7	739.9	687.1	52.82	14.008	
9,300.0	9,198.6	9,335.0	9,198.6	26.7	28.6	158.04	-1,059.2	-863.7	739.9	686.9	53.03	13.952	
9,400.0	9,298.6	9,435.0	9,298.6	26.8	28.7	158.04	-1,059.2	-863.7	739.9	686.7	53.25	13.896	
9,500.0	9,398.6	9,535.0	9,398.6	26.9	28.8	158.04	-1,059.2	-863.7	739.9	686.5	53.46	13.840	
9,600.0	9,498.6	9,635.0	9,498.6	27.0	28.9	158.04	-1,059.2	-863.7	739.9	686.2	53.68	13.784	
9,700.0	9,598.6	9,735.0	9,598.6	27.1	29.0	158.04	-1,059.2	-863.7	739.9	686.0	53.90	13.728	
9,800.0	9,698.6	9,835.0	9,698.6	27.2	29.1	158.04	-1,059.2	-863.7	739.9	685.8	54.12	13.672	
9,900.0	9,798.6	9,935.0	9,798.6	27.3	29.2	158.04	-1,059.2	-863.7	739.9	685.6	54.34	13.616	
10,000.0	9,898.6	10,035.0	9,898.6	27.4	29.3	158.04	-1,059.2	-863.7	739.9	685.4	54.56	13.561	
10,100.0	9,998.6	10,135.0	9,998.6	27.6	29.4	158.04	-1,059.2	-863.7	739.9	685.1	54.79	13.505	
10,138.4	10,037.0	10,173.4	10,037.0	27.6	29.5	158.04	-1,059.2	-863.7	739.9	685.1	54.87	13.484	SF

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
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	
300.0	300.0	300.0	300.0	0.5	0.5	-174.62	-51.0	-4.8	51.2	50.2	0.97	52.781	
400.0	400.0	400.0	400.0	0.7	0.7	-69.28	-51.0	-4.8	50.2	48.9	1.32	37.918	
500.0	499.6	499.6	499.6	0.9	0.8	-78.10	-51.0	-4.8	48.0	46.3	1.71	28.081	
579.5	578.5	578.5	578.5	1.1	1.0	-90.00	-51.0	-4.8	47.0	44.9	2.06	22.754	CC, ES
600.0	598.8	598.8	598.8	1.1	1.0	-93.73	-51.0	-4.8	47.1	44.9	2.16	21.843	
700.0	697.3	697.3	697.3	1.5	1.2	-112.76	-51.0	-4.8	51.1	48.5	2.60	19.658	
800.0	795.9	795.9	795.9	1.8	1.4	-127.90	-51.0	-4.8	59.9	56.9	2.98	20.089	
900.0	894.4	894.4	894.4	2.1	1.5	-138.67	-51.0	-4.8	71.7	68.4	3.32	21.591	
1,000.0	992.9	992.9	992.9	2.5	1.7	-146.24	-51.0	-4.8	85.4	81.8	3.65	23.403	
1,100.0	1,091.4	1,093.2	1,093.2	2.8	1.9	-150.53	-52.9	-6.0	99.3	95.3	3.99	24.859	
1,200.0	1,190.0	1,194.5	1,194.2	3.1	2.1	-151.27	-59.4	-10.1	111.5	107.2	4.40	25.376	
1,300.0	1,288.5	1,296.2	1,295.0	3.5	2.3	-149.51	-70.4	-17.1	121.9	117.0	4.87	24.999	
1,400.0	1,387.0	1,397.6	1,394.8	3.8	2.6	-145.79	-85.8	-26.9	130.7	125.2	5.47	23.904	
1,500.0	1,485.5	1,498.2	1,492.5	4.2	2.9	-140.45	-105.6	-39.4	138.8	132.6	6.20	22.386	
1,600.0	1,584.1	1,596.8	1,587.9	4.5	3.3	-134.92	-126.8	-52.9	147.7	140.7	7.01	21.085	
1,700.0	1,682.6	1,695.4	1,683.2	4.9	3.7	-130.04	-148.1	-66.4	157.9	150.0	7.84	20.146	
1,800.0	1,781.1	1,794.1	1,778.6	5.2	4.1	-125.78	-169.4	-79.9	169.0	160.3	8.67	19.488	
1,900.0	1,879.6	1,892.7	1,874.0	5.6	4.5	-122.05	-190.7	-93.4	181.0	171.5	9.50	19.042	
2,000.0	1,978.2	1,991.3	1,969.3	5.9	5.0	-118.79	-212.0	-106.8	193.6	183.3	10.33	18.749	
2,100.0	2,076.7	2,089.9	2,064.7	6.2	5.4	-115.93	-233.3	-120.3	206.8	195.7	11.14	18.570	
2,200.0	2,175.2	2,188.6	2,160.0	6.6	5.8	-113.42	-254.6	-133.8	220.5	208.5	11.93	18.471	
2,300.0	2,273.7	2,287.2	2,255.4	6.9	6.3	-111.20	-275.8	-147.3	234.5	221.7	12.72	18.432	SF
2,400.0	2,372.3	2,385.8	2,350.7	7.3	6.8	-109.24	-297.1	-160.8	248.8	235.3	13.50	18.435	
2,500.0	2,470.8	2,484.4	2,446.1	7.6	7.2	-107.48	-318.4	-174.3	263.4	249.1	14.26	18.468	
2,600.0	2,569.3	2,583.1	2,541.4	8.0	7.7	-105.91	-339.7	-187.8	278.1	263.1	15.02	18.523	
2,700.0	2,667.8	2,681.7	2,636.8	8.3	8.1	-104.51	-361.0	-201.3	293.1	277.4	15.76	18.594	
2,800.0	2,766.4	2,780.3	2,732.1	8.7	8.6	-103.23	-382.3	-214.8	308.2	291.7	16.51	18.675	
2,900.0	2,864.9	2,878.9	2,827.5	9.0	9.1	-102.08	-403.6	-228.3	323.5	306.3	17.24	18.764	
3,000.0	2,963.4	2,977.6	2,922.8	9.4	9.5	-101.03	-424.8	-241.8	338.9	320.9	17.97	18.857	
3,100.0	3,061.9	3,076.2	3,018.2	9.7	10.0	-100.07	-446.1	-255.3	354.4	335.7	18.70	18.954	
3,200.0	3,160.5	3,174.8	3,113.5	10.1	10.5	-99.19	-467.4	-268.8	370.0	350.5	19.42	19.051	
3,300.0	3,259.0	3,273.5	3,208.9	10.4	10.9	-98.39	-488.7	-282.3	385.6	365.5	20.14	19.149	
3,400.0	3,357.5	3,372.1	3,304.2	10.8	11.4	-97.64	-510.0	-295.7	401.3	380.5	20.85	19.246	
3,500.0	3,456.0	3,470.7	3,399.6	11.1	11.9	-96.95	-531.3	-309.2	417.1	395.5	21.56	19.342	
3,600.0	3,554.6	3,569.3	3,494.9	11.5	12.3	-96.31	-552.6	-322.7	433.0	410.7	22.27	19.437	
3,700.0	3,653.1	3,668.0	3,590.3	11.8	12.8	-95.72	-573.8	-336.2	448.8	425.9	22.98	19.530	
3,800.0	3,751.6	3,766.6	3,685.7	12.2	13.3	-95.17	-595.1	-349.7	464.8	441.1	23.69	19.621	
3,900.0	3,850.1	3,865.2	3,781.0	12.5	13.8	-94.65	-616.4	-363.2	480.7	456.3	24.39	19.709	
4,000.0	3,948.7	3,963.8	3,876.4	12.9	14.2	-94.17	-637.7	-376.7	496.7	471.6	25.09	19.795	
4,100.0	4,047.2	4,062.5	3,971.7	13.2	14.7	-93.72	-659.0	-390.2	512.8	487.0	25.79	19.879	
4,200.0	4,145.7	4,161.1	4,067.1	13.6	15.2	-93.29	-680.3	-403.7	528.8	502.4	26.49	19.961	
4,300.0	4,244.2	4,259.7	4,162.4	13.9	15.6	-92.89	-701.6	-417.2	544.9	517.7	27.19	20.040	
4,400.0	4,342.8	4,358.4	4,257.8	14.3	16.1	-92.51	-722.9	-430.7	561.1	533.2	27.89	20.117	
4,500.0	4,441.3	4,457.0	4,353.1	14.6	16.6	-92.16	-744.1	-444.2	577.2	548.6	28.59	20.192	
4,600.0	4,539.8	4,555.6	4,448.5	15.0	17.1	-91.82	-765.4	-457.7	593.4	564.1	29.28	20.264	
4,700.0	4,638.4	4,654.2	4,543.8	15.3	17.5	-91.50	-786.7	-471.2	609.5	579.6	29.98	20.335	
4,800.0	4,736.9	4,752.9	4,639.2	15.7	18.0	-91.20	-808.0	-484.6	625.7	595.1	30.67	20.403	
4,900.0	4,835.4	4,851.5	4,734.5	16.0	18.5	-90.91	-829.3	-498.1	641.9	610.6	31.36	20.469	
5,000.0	4,933.9	4,950.1	4,829.9	16.4	19.0	-90.64	-850.6	-511.6	658.2	626.1	32.05	20.533	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	5,032.5	5,048.7	4,925.2	16.7	19.4	-90.38	-871.9	-525.1	674.4	641.7	32.75	20.595	
5,200.0	5,131.0	5,147.4	5,020.6	17.1	19.9	-90.13	-893.1	-538.6	690.7	657.2	33.44	20.656	
5,300.0	5,229.5	5,246.0	5,115.9	17.4	20.4	-89.90	-914.4	-552.1	706.9	672.8	34.13	20.714	
5,400.0	5,328.0	5,344.6	5,211.3	17.8	20.9	-89.67	-935.7	-565.6	723.2	688.4	34.82	20.771	
5,500.0	5,426.6	5,443.3	5,306.6	18.1	21.3	-89.45	-957.0	-579.1	739.5	704.0	35.51	20.827	
5,600.0	5,525.1	5,541.9	5,402.0	18.5	21.8	-89.25	-978.3	-592.6	755.8	719.6	36.20	20.880	
5,700.0	5,623.6	5,640.5	5,497.4	18.8	22.3	-89.05	-999.6	-606.1	772.1	735.2	36.89	20.932	
5,800.0	5,722.1	5,739.1	5,592.7	19.2	22.7	-88.86	-1,020.9	-619.6	788.4	750.9	37.57	20.983	
5,900.0	5,820.7	5,837.8	5,688.1	19.5	23.2	-88.68	-1,042.1	-633.1	804.8	766.5	38.26	21.032	
6,000.0	5,919.2	5,936.4	5,783.4	19.8	23.7	-88.50	-1,063.4	-646.6	821.1	782.1	38.95	21.080	
6,100.0	6,017.7	6,035.0	5,878.8	20.2	24.2	-88.34	-1,084.7	-660.1	837.4	797.8	39.64	21.126	
6,200.0	6,116.2	6,133.6	5,974.1	20.5	24.6	-88.17	-1,106.0	-673.5	853.8	813.4	40.33	21.172	
6,300.0	6,214.8	6,232.3	6,069.5	20.9	25.1	-88.02	-1,127.3	-687.0	870.1	829.1	41.01	21.216	
6,400.0	6,313.3	6,330.9	6,164.8	21.2	25.6	-87.87	-1,148.6	-700.5	886.5	844.8	41.70	21.259	
6,500.0	6,411.8	6,429.5	6,260.2	21.6	26.1	-87.73	-1,169.9	-714.0	902.8	860.5	42.39	21.300	
6,600.0	6,510.3	6,528.1	6,355.5	21.9	26.5	-87.59	-1,191.1	-727.5	919.2	876.1	43.07	21.341	
6,700.0	6,608.9	6,626.8	6,450.9	22.3	27.0	-87.45	-1,212.4	-741.0	935.6	891.8	43.76	21.380	
6,800.0	6,707.4	6,725.4	6,546.2	22.6	27.5	-87.32	-1,233.7	-754.5	952.0	907.5	44.45	21.419	
6,900.0	6,805.9	6,824.0	6,641.6	23.0	28.0	-87.20	-1,255.0	-768.0	968.4	923.2	45.13	21.456	
7,000.0	6,904.4	6,922.7	6,736.9	23.3	28.4	-87.08	-1,276.3	-781.5	984.7	938.9	45.82	21.493	
7,100.0	7,003.0	7,021.3	6,832.3	23.7	28.9	-86.96	-1,297.6	-795.0	1,001.1	954.6	46.50	21.529	
7,200.0	7,101.5	7,127.5	6,935.1	24.0	29.4	-86.84	-1,320.4	-809.4	1,017.4	970.2	47.21	21.554	
7,300.0	7,200.2	7,257.6	7,061.9	24.4	29.9	-87.02	-1,344.8	-824.9	1,031.6	983.7	47.98	21.500	
7,400.0	7,299.3	7,388.8	7,190.9	24.6	30.4	-87.22	-1,364.5	-837.4	1,043.0	994.3	48.65	21.438	
7,500.0	7,398.9	7,520.7	7,321.6	24.8	30.7	-87.37	-1,379.3	-846.8	1,051.5	1,002.3	49.18	21.378	
7,600.0	7,498.7	7,653.1	7,453.6	25.0	30.9	-87.44	-1,389.0	-852.9	1,057.0	1,007.4	49.58	21.318	
7,700.0	7,598.6	7,786.0	7,586.3	25.1	31.1	-87.46	-1,393.5	-855.8	1,059.6	1,009.8	49.85	21.255	
7,800.0	7,698.6	7,898.3	7,698.6	25.2	31.2	164.44	-1,393.9	-856.0	1,059.8	1,009.8	50.05	21.174	
7,900.0	7,798.6	7,998.3	7,798.6	25.3	31.3	164.44	-1,393.9	-856.0	1,059.8	1,009.6	50.24	21.094	
8,000.0	7,898.6	8,098.3	7,898.6	25.4	31.3	164.44	-1,393.9	-856.0	1,059.8	1,009.4	50.44	21.013	
8,100.0	7,998.6	8,198.3	7,998.6	25.5	31.4	164.44	-1,393.9	-856.0	1,059.8	1,009.2	50.63	20.932	
8,200.0	8,098.6	8,298.3	8,098.6	25.6	31.5	164.44	-1,393.9	-856.0	1,059.8	1,009.0	50.83	20.851	
8,300.0	8,198.6	8,398.3	8,198.6	25.7	31.6	164.44	-1,393.9	-856.0	1,059.8	1,008.8	51.03	20.770	
8,400.0	8,298.6	8,498.3	8,298.6	25.8	31.7	164.44	-1,393.9	-856.0	1,059.8	1,008.6	51.23	20.689	
8,500.0	8,398.6	8,598.3	8,398.6	25.9	31.7	164.44	-1,393.9	-856.0	1,059.8	1,008.4	51.43	20.608	
8,600.0	8,498.6	8,698.3	8,498.6	26.0	31.8	164.44	-1,393.9	-856.0	1,059.8	1,008.2	51.63	20.527	
8,700.0	8,598.6	8,798.3	8,598.6	26.1	31.9	164.44	-1,393.9	-856.0	1,059.8	1,008.0	51.83	20.447	
8,800.0	8,698.6	8,898.3	8,698.6	26.2	32.0	164.44	-1,393.9	-856.0	1,059.8	1,007.8	52.04	20.366	
8,900.0	8,798.6	8,998.3	8,798.6	26.3	32.1	164.44	-1,393.9	-856.0	1,059.8	1,007.6	52.25	20.285	
9,000.0	8,898.6	9,098.3	8,898.6	26.4	32.2	164.44	-1,393.9	-856.0	1,059.8	1,007.4	52.46	20.204	
9,100.0	8,998.6	9,198.3	8,998.6	26.5	32.3	164.44	-1,393.9	-856.0	1,059.8	1,007.2	52.67	20.123	
9,200.0	9,098.6	9,298.3	9,098.6	26.6	32.3	164.44	-1,393.9	-856.0	1,059.8	1,006.9	52.88	20.043	
9,300.0	9,198.6	9,398.3	9,198.6	26.7	32.4	164.44	-1,393.9	-856.0	1,059.8	1,006.7	53.09	19.962	
9,400.0	9,298.6	9,498.3	9,298.6	26.8	32.5	164.44	-1,393.9	-856.0	1,059.8	1,006.5	53.31	19.882	
9,500.0	9,398.6	9,598.3	9,398.6	26.9	32.6	164.44	-1,393.9	-856.0	1,059.8	1,006.3	53.52	19.801	
9,600.0	9,498.6	9,698.3	9,498.6	27.0	32.7	164.44	-1,393.9	-856.0	1,059.8	1,006.1	53.74	19.721	
9,700.0	9,598.6	9,798.3	9,598.6	27.1	32.8	164.44	-1,393.9	-856.0	1,059.8	1,005.9	53.96	19.641	
9,800.0	9,698.6	9,898.3	9,698.6	27.2	32.9	164.44	-1,393.9	-856.0	1,059.8	1,005.6	54.18	19.561	
9,900.0	9,798.6	9,998.3	9,798.6	27.3	33.0	164.44	-1,393.9	-856.0	1,059.8	1,005.4	54.40	19.482	
10,000.0	9,898.6	10,098.3	9,898.6	27.4	33.1	164.44	-1,393.9	-856.0	1,059.8	1,005.2	54.62	19.402	
10,100.0	9,998.6	10,198.3	9,998.6	27.6	33.2	164.44	-1,393.9	-856.0	1,059.8	1,005.0	54.85	19.323	
10,138.4	10,037.0	10,236.7	10,037.0	27.6	33.2	164.44	-1,393.9	-856.0	1,059.8	1,004.9	54.94	19.292	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-174.32	-68.1	-6.8	68.4				
100.0	100.0	100.0	100.0	0.1	0.1	-174.32	-68.1	-6.8	68.4	68.2	0.27	251.397	
200.0	200.0	200.0	200.0	0.3	0.3	-174.32	-68.1	-6.8	68.4	67.8	0.62	110.163	
300.0	300.0	300.0	300.0	0.5	0.5	-174.32	-68.1	-6.8	68.4	67.5	0.97	70.536	
400.0	400.0	400.0	400.0	0.7	0.7	-68.27	-68.1	-6.8	67.4	66.1	1.32	50.906	
500.0	499.6	499.6	499.6	0.9	0.8	-74.77	-68.1	-6.8	64.9	63.2	1.71	38.005	
556.3	555.5	554.0	554.0	1.0	0.9	-80.05	-68.8	-7.1	64.1	62.2	1.96	32.779	CC, ES
600.0	598.8	596.3	596.3	1.1	1.0	-84.55	-70.3	-7.9	64.7	62.5	2.15	30.047	
700.0	697.3	693.1	692.8	1.5	1.2	-94.14	-76.8	-11.2	69.9	67.3	2.65	26.433	
800.0	795.9	790.1	789.0	1.8	1.4	-99.41	-87.7	-16.7	79.8	76.6	3.18	25.100	
900.0	894.4	886.8	884.1	2.1	1.7	-100.89	-102.9	-24.5	92.8	89.1	3.77	24.650	
1,000.0	992.9	982.7	977.5	2.5	2.1	-99.82	-122.2	-34.3	108.7	104.3	4.41	24.637	SF
1,100.0	1,091.4	1,078.4	1,069.7	2.8	2.5	-97.29	-145.4	-46.1	127.4	122.3	5.09	25.036	
1,200.0	1,190.0	1,176.3	1,163.5	3.1	3.0	-94.99	-170.2	-58.7	147.0	141.2	5.78	25.450	
1,300.0	1,288.5	1,274.2	1,257.4	3.5	3.5	-93.23	-195.0	-71.3	166.8	160.3	6.46	25.806	
1,400.0	1,387.0	1,372.1	1,351.3	3.8	4.0	-91.84	-219.8	-83.9	186.7	179.5	7.15	26.114	
1,500.0	1,485.5	1,470.0	1,445.2	4.2	4.5	-90.72	-244.6	-96.5	206.7	198.9	7.83	26.382	
1,600.0	1,584.1	1,567.9	1,539.0	4.5	5.0	-89.80	-269.4	-109.1	226.7	218.2	8.52	26.618	
1,700.0	1,682.6	1,665.9	1,632.9	4.9	5.5	-89.03	-294.2	-121.6	246.9	237.7	9.20	26.827	
1,800.0	1,781.1	1,763.8	1,726.8	5.2	6.0	-88.37	-318.9	-134.2	267.0	257.1	9.88	27.012	
1,900.0	1,879.6	1,861.7	1,820.7	5.6	6.5	-87.81	-343.7	-146.8	287.2	276.6	10.57	27.178	
2,000.0	1,978.2	1,959.6	1,914.5	5.9	7.0	-87.32	-368.5	-159.4	307.4	296.1	11.25	27.327	
2,100.0	2,076.7	2,057.5	2,008.4	6.2	7.5	-86.89	-393.3	-172.0	327.6	315.7	11.93	27.462	
2,200.0	2,175.2	2,155.4	2,102.3	6.6	8.1	-86.51	-418.1	-184.6	347.8	335.2	12.61	27.585	
2,300.0	2,273.7	2,253.3	2,196.2	6.9	8.6	-86.17	-442.9	-197.2	368.1	354.8	13.29	27.697	
2,400.0	2,372.3	2,351.2	2,290.1	7.3	9.1	-85.87	-467.7	-209.8	388.3	374.4	13.97	27.799	
2,500.0	2,470.8	2,449.1	2,383.9	7.6	9.6	-85.60	-492.5	-222.4	408.6	393.9	14.65	27.893	
2,600.0	2,569.3	2,547.0	2,477.8	8.0	10.1	-85.35	-517.3	-235.0	428.9	413.5	15.33	27.979	
2,700.0	2,667.8	2,644.9	2,571.7	8.3	10.6	-85.12	-542.0	-247.6	449.2	433.1	16.01	28.059	
2,800.0	2,766.4	2,742.8	2,665.6	8.7	11.1	-84.92	-566.8	-260.2	469.4	452.8	16.69	28.133	
2,900.0	2,864.9	2,840.7	2,759.4	9.0	11.7	-84.73	-591.6	-272.8	489.7	472.4	17.36	28.202	
3,000.0	2,963.4	2,938.6	2,853.3	9.4	12.2	-84.56	-616.4	-285.4	510.0	492.0	18.04	28.267	
3,100.0	3,061.9	3,036.6	2,947.2	9.7	12.7	-84.40	-641.2	-298.0	530.3	511.6	18.72	28.327	
3,200.0	3,160.5	3,134.5	3,041.1	10.1	13.2	-84.25	-666.0	-310.6	550.6	531.2	19.40	28.383	
3,300.0	3,259.0	3,232.4	3,134.9	10.4	13.7	-84.11	-690.8	-323.2	570.9	550.9	20.08	28.435	
3,400.0	3,357.5	3,330.3	3,228.8	10.8	14.2	-83.98	-715.6	-335.8	591.3	570.5	20.76	28.485	
3,500.0	3,456.0	3,428.2	3,322.7	11.1	14.8	-83.86	-740.4	-348.4	611.6	590.1	21.43	28.531	
3,600.0	3,554.6	3,526.1	3,416.6	11.5	15.3	-83.75	-765.1	-361.0	631.9	609.8	22.11	28.575	
3,700.0	3,653.1	3,624.0	3,510.4	11.8	15.8	-83.65	-789.9	-373.6	652.2	629.4	22.79	28.617	
3,800.0	3,751.6	3,721.9	3,604.3	12.2	16.3	-83.55	-814.7	-386.2	672.5	649.1	23.47	28.656	
3,900.0	3,850.1	3,819.8	3,698.2	12.5	16.8	-83.46	-839.5	-398.8	692.8	668.7	24.15	28.693	
4,000.0	3,948.7	3,917.7	3,792.1	12.9	17.3	-83.37	-864.3	-411.4	713.2	688.3	24.82	28.729	
4,100.0	4,047.2	4,015.6	3,885.9	13.2	17.9	-83.29	-889.1	-424.0	733.5	708.0	25.50	28.762	
4,200.0	4,145.7	4,113.5	3,979.8	13.6	18.4	-83.21	-913.9	-436.6	753.8	727.6	26.18	28.794	
4,300.0	4,244.2	4,211.4	4,073.7	13.9	18.9	-83.13	-938.7	-449.2	774.1	747.3	26.86	28.825	
4,400.0	4,342.8	4,309.3	4,167.6	14.3	19.4	-83.06	-963.5	-461.8	794.5	766.9	27.53	28.854	
4,500.0	4,441.3	4,407.3	4,261.4	14.6	19.9	-83.00	-988.2	-474.4	814.8	786.6	28.21	28.881	
4,600.0	4,539.8	4,505.2	4,355.3	15.0	20.4	-82.93	-1,013.0	-487.0	835.1	806.3	28.89	28.908	
4,700.0	4,638.4	4,603.1	4,449.2	15.3	21.0	-82.87	-1,037.8	-499.6	855.5	825.9	29.57	28.933	
4,800.0	4,736.9	4,701.0	4,543.1	15.7	21.5	-82.81	-1,062.6	-512.2	875.8	845.6	30.24	28.957	
4,900.0	4,835.4	4,798.9	4,636.9	16.0	22.0	-82.76	-1,087.4	-524.8	896.1	865.2	30.92	28.980	
5,000.0	4,933.9	4,896.8	4,730.8	16.4	22.5	-82.71	-1,112.2	-537.4	916.5	884.9	31.60	29.003	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	5,032.5	4,994.7	4,824.7	16.7	23.0	-82.66	-1,137.0	-550.0	936.8	904.5	32.28	29.024	
5,200.0	5,131.0	5,092.6	4,918.6	17.1	23.5	-82.61	-1,161.8	-562.6	957.1	924.2	32.95	29.044	
5,300.0	5,229.5	5,190.5	5,012.4	17.4	24.1	-82.56	-1,186.6	-575.2	977.5	943.8	33.63	29.064	
5,400.0	5,328.0	5,288.4	5,106.3	17.8	24.6	-82.52	-1,211.3	-587.8	997.8	963.5	34.31	29.083	
5,500.0	5,426.6	5,386.3	5,200.2	18.1	25.1	-82.48	-1,236.1	-600.3	1,018.2	983.2	34.99	29.102	
5,600.0	5,525.1	5,484.2	5,294.1	18.5	25.6	-82.43	-1,260.9	-612.9	1,038.5	1,002.8	35.66	29.119	
5,700.0	5,623.6	5,582.1	5,388.0	18.8	26.1	-82.39	-1,285.7	-625.5	1,058.8	1,022.5	36.34	29.136	
5,800.0	5,722.1	5,680.1	5,481.8	19.2	26.7	-82.36	-1,310.5	-638.1	1,079.2	1,042.2	37.02	29.153	
5,900.0	5,820.7	5,778.0	5,575.7	19.5	27.2	-82.32	-1,335.3	-650.7	1,099.5	1,061.8	37.70	29.168	
6,000.0	5,919.2	5,875.9	5,669.6	19.8	27.7	-82.29	-1,360.1	-663.3	1,119.9	1,081.5	38.37	29.184	
6,100.0	6,017.7	5,973.8	5,763.5	20.2	28.2	-82.25	-1,384.9	-675.9	1,140.2	1,101.1	39.05	29.198	
6,200.0	6,116.2	6,071.7	5,857.3	20.5	28.7	-82.22	-1,409.7	-688.5	1,160.5	1,120.8	39.73	29.213	
6,300.0	6,214.8	6,169.6	5,951.2	20.9	29.2	-82.19	-1,434.4	-701.1	1,180.9	1,140.5	40.40	29.227	
6,400.0	6,313.3	6,267.5	6,045.1	21.2	29.8	-82.16	-1,459.2	-713.7	1,201.2	1,160.1	41.08	29.240	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
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	159.871	
200.0	200.0	200.0	200.0	0.3	0.3	174.79	-43.3	4.0	43.5	42.9	0.62	70.056	CC, ES
300.0	300.0	298.4	298.4	0.5	0.5	172.37	-44.8	6.0	45.3	44.3	0.97	46.701	
400.0	400.0	396.2	395.8	0.7	0.7	-88.41	-49.3	12.1	50.8	49.4	1.34	37.899	
500.0	499.6	492.0	490.8	0.9	1.0	-101.98	-56.4	22.0	62.6	60.9	1.73	36.303	SF
600.0	598.8	588.2	585.8	1.1	1.3	-114.62	-65.4	34.4	82.2	80.1	2.12	38.738	
700.0	697.3	683.9	680.3	1.5	1.6	-124.19	-74.4	46.8	106.6	104.1	2.52	42.262	
800.0	795.9	779.5	774.7	1.8	1.9	-130.34	-83.4	59.1	133.0	130.1	2.93	45.423	
900.0	894.4	875.2	869.2	2.1	2.2	-134.45	-92.3	71.5	160.3	157.0	3.34	48.035	
1,000.0	992.9	970.9	963.6	2.5	2.5	-137.36	-101.3	83.9	188.2	184.4	3.75	50.175	
1,100.0	1,091.4	1,066.5	1,058.0	2.8	2.8	-139.52	-110.3	96.2	216.4	212.2	4.17	51.941	
1,200.0	1,190.0	1,162.2	1,152.4	3.1	3.1	-141.19	-119.2	108.6	244.8	240.3	4.58	53.413	
1,300.0	1,288.5	1,257.8	1,246.9	3.5	3.4	-142.51	-128.2	121.0	273.4	268.4	5.00	54.656	
1,400.0	1,387.0	1,353.5	1,341.3	3.8	3.8	-143.57	-137.2	133.3	302.1	296.7	5.42	55.718	
1,500.0	1,485.5	1,449.2	1,435.7	4.2	4.1	-144.46	-146.1	145.7	330.9	325.0	5.84	56.633	
1,600.0	1,584.1	1,544.8	1,530.2	4.5	4.4	-145.20	-155.1	158.1	359.7	353.5	6.26	57.431	
1,700.0	1,682.6	1,640.5	1,624.6	4.9	4.7	-145.83	-164.1	170.4	388.6	381.9	6.68	58.131	
1,800.0	1,781.1	1,736.1	1,719.0	5.2	5.0	-146.38	-173.1	182.8	417.5	410.4	7.11	58.751	
1,900.0	1,879.6	1,831.8	1,813.5	5.6	5.3	-146.85	-182.0	195.2	446.5	438.9	7.53	59.303	
2,000.0	1,978.2	1,927.4	1,907.9	5.9	5.6	-147.27	-191.0	207.5	475.4	467.5	7.95	59.798	
2,100.0	2,076.7	2,023.1	2,002.3	6.2	6.0	-147.64	-200.0	219.9	504.4	496.1	8.37	60.244	
2,200.0	2,175.2	2,118.8	2,096.7	6.6	6.3	-147.97	-208.9	232.3	533.4	524.6	8.80	60.648	
2,300.0	2,273.7	2,214.4	2,191.2	6.9	6.6	-148.26	-217.9	244.6	562.5	553.2	9.22	61.015	
2,400.0	2,372.3	2,310.1	2,285.6	7.3	6.9	-148.53	-226.9	257.0	591.5	581.9	9.64	61.351	
2,500.0	2,470.8	2,405.7	2,380.0	7.6	7.2	-148.77	-235.8	269.4	620.5	610.5	10.06	61.659	
2,600.0	2,569.3	2,501.4	2,474.5	8.0	7.5	-148.99	-244.8	281.7	649.6	639.1	10.49	61.943	
2,700.0	2,667.8	2,597.0	2,568.9	8.3	7.9	-149.19	-253.8	294.1	678.7	667.8	10.91	62.205	
2,800.0	2,766.4	2,692.7	2,663.3	8.7	8.2	-149.37	-262.8	306.5	707.7	696.4	11.33	62.447	
2,900.0	2,864.9	2,788.4	2,757.7	9.0	8.5	-149.54	-271.7	318.8	736.8	725.1	11.76	62.673	
3,000.0	2,963.4	2,884.0	2,852.2	9.4	8.8	-149.70	-280.7	331.2	765.9	753.7	12.18	62.883	
3,100.0	3,061.9	2,979.7	2,946.6	9.7	9.1	-149.84	-289.7	343.6	795.0	782.4	12.60	63.079	
3,200.0	3,160.5	3,075.3	3,041.0	10.1	9.4	-149.98	-298.6	355.9	824.1	811.1	13.03	63.262	
3,300.0	3,259.0	3,171.0	3,135.5	10.4	9.8	-150.10	-307.6	368.3	853.2	839.7	13.45	63.434	
3,400.0	3,357.5	3,266.6	3,229.9	10.8	10.1	-150.22	-316.6	380.7	882.3	868.4	13.87	63.595	
3,500.0	3,456.0	3,362.3	3,324.3	11.1	10.4	-150.33	-325.5	393.0	911.4	897.1	14.30	63.747	
3,600.0	3,554.6	3,458.0	3,418.8	11.5	10.7	-150.44	-334.5	405.4	940.5	925.8	14.72	63.891	
3,700.0	3,653.1	3,553.6	3,513.2	11.8	11.0	-150.53	-343.5	417.8	969.6	954.4	15.14	64.026	
3,800.0	3,751.6	3,649.3	3,607.6	12.2	11.3	-150.62	-352.4	430.1	998.7	983.1	15.57	64.154	
3,900.0	3,850.1	3,744.9	3,702.0	12.5	11.7	-150.71	-361.4	442.5	1,027.8	1,011.8	15.99	64.275	
4,000.0	3,948.7	3,840.6	3,796.5	12.9	12.0	-150.79	-370.4	454.9	1,056.9	1,040.5	16.41	64.391	
4,100.0	4,047.2	3,936.2	3,890.9	13.2	12.3	-150.87	-379.4	467.2	1,086.0	1,069.2	16.84	64.500	
4,200.0	4,145.7	4,031.9	3,985.3	13.6	12.6	-150.94	-388.3	479.6	1,115.2	1,097.9	17.26	64.604	
4,300.0	4,244.2	4,127.6	4,079.8	13.9	12.9	-151.01	-397.3	492.0	1,144.3	1,126.6	17.69	64.703	
4,400.0	4,342.8	4,223.2	4,174.2	14.3	13.2	-151.08	-406.3	504.3	1,173.4	1,155.3	18.11	64.798	
4,500.0	4,441.3	4,318.9	4,268.6	14.6	13.6	-151.14	-415.2	516.7	1,202.5	1,184.0	18.53	64.888	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
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	397.3	397.3	0.7	0.7	-77.57	-62.1	3.7	61.7	60.3	1.32	46.623	
500.0	499.6	493.6	493.2	0.9	0.9	-86.90	-68.0	8.1	67.5	65.8	1.71	39.539	
600.0	598.8	587.9	586.8	1.1	1.1	-98.52	-77.5	15.1	80.5	78.3	2.14	37.643	SF
700.0	697.3	679.7	677.2	1.5	1.4	-108.74	-90.4	24.6	102.1	99.5	2.58	39.609	
800.0	795.9	770.7	766.0	1.8	1.8	-115.27	-106.4	36.4	130.5	127.5	3.02	43.220	
900.0	894.4	865.3	858.0	2.1	2.2	-119.57	-124.1	49.5	161.2	157.8	3.48	46.343	
1,000.0	992.9	959.9	950.0	2.5	2.6	-122.49	-141.7	62.5	192.5	188.6	3.95	48.759	
1,100.0	1,091.4	1,054.4	1,042.0	2.8	3.0	-124.60	-159.4	75.5	224.2	219.7	4.43	50.634	
1,200.0	1,190.0	1,149.0	1,134.0	3.1	3.4	-126.19	-177.0	88.6	256.0	251.1	4.91	52.114	
1,300.0	1,288.5	1,243.6	1,226.0	3.5	3.8	-127.42	-194.7	101.6	288.0	282.5	5.40	53.303	
1,400.0	1,387.0	1,338.2	1,318.0	3.8	4.2	-128.41	-212.4	114.6	320.0	314.1	5.90	54.274	
1,500.0	1,485.5	1,432.8	1,410.0	4.2	4.6	-129.22	-230.0	127.7	352.1	345.8	6.39	55.080	
1,600.0	1,584.1	1,527.4	1,502.0	4.5	5.0	-129.90	-247.7	140.7	384.3	377.4	6.89	55.758	
1,700.0	1,682.6	1,622.0	1,594.0	4.9	5.5	-130.47	-265.3	153.7	416.6	409.2	7.39	56.336	
1,800.0	1,781.1	1,716.6	1,686.0	5.2	5.9	-130.96	-283.0	166.7	448.8	440.9	7.90	56.833	
1,900.0	1,879.6	1,811.2	1,778.1	5.6	6.3	-131.38	-300.7	179.8	481.1	472.7	8.40	57.265	
2,000.0	1,978.2	1,905.8	1,870.1	5.9	6.7	-131.75	-318.3	192.8	513.4	504.5	8.91	57.644	
2,100.0	2,076.7	2,000.3	1,962.1	6.2	7.1	-132.08	-336.0	205.8	545.7	536.3	9.41	57.979	
2,200.0	2,175.2	2,094.9	2,054.1	6.6	7.5	-132.37	-353.6	218.9	578.1	568.1	9.92	58.276	
2,300.0	2,273.7	2,189.5	2,146.1	6.9	8.0	-132.63	-371.3	231.9	610.4	600.0	10.43	58.543	
2,400.0	2,372.3	2,284.1	2,238.1	7.3	8.4	-132.86	-388.9	244.9	642.8	631.8	10.93	58.782	
2,500.0	2,470.8	2,378.7	2,330.1	7.6	8.8	-133.07	-406.6	258.0	675.1	663.7	11.44	58.999	
2,600.0	2,569.3	2,473.3	2,422.1	8.0	9.2	-133.26	-424.3	271.0	707.5	695.5	11.95	59.196	
2,700.0	2,667.8	2,567.9	2,514.1	8.3	9.6	-133.44	-441.9	284.0	739.9	727.4	12.46	59.376	
2,800.0	2,766.4	2,662.5	2,606.1	8.7	10.1	-133.60	-459.6	297.0	772.3	759.3	12.97	59.541	
2,900.0	2,864.9	2,757.1	2,698.1	9.0	10.5	-133.74	-477.2	310.1	804.7	791.2	13.48	59.692	
3,000.0	2,963.4	2,851.7	2,790.2	9.4	10.9	-133.88	-494.9	323.1	837.0	823.1	13.99	59.832	
3,100.0	3,061.9	2,946.2	2,882.2	9.7	11.3	-134.00	-512.5	336.1	869.4	854.9	14.50	59.962	
3,200.0	3,160.5	3,040.8	2,974.2	10.1	11.7	-134.12	-530.2	349.2	901.8	886.8	15.01	60.082	
3,300.0	3,259.0	3,135.4	3,066.2	10.4	12.2	-134.23	-547.9	362.2	934.2	918.7	15.52	60.193	
3,400.0	3,357.5	3,230.0	3,158.2	10.8	12.6	-134.33	-565.5	375.2	966.7	950.6	16.03	60.297	
3,500.0	3,456.0	3,324.6	3,250.2	11.1	13.0	-134.43	-583.2	388.3	999.1	982.5	16.54	60.395	
3,600.0	3,554.6	3,419.2	3,342.2	11.5	13.4	-134.51	-600.8	401.3	1,031.5	1,014.4	17.05	60.486	
3,700.0	3,653.1	3,513.8	3,434.2	11.8	13.8	-134.60	-618.5	414.3	1,063.9	1,046.3	17.56	60.572	
3,800.0	3,751.6	3,608.4	3,526.2	12.2	14.2	-134.68	-636.2	427.4	1,096.3	1,078.2	18.08	60.652	
3,900.0	3,850.1	3,703.0	3,618.2	12.5	14.7	-134.75	-653.8	440.4	1,128.7	1,110.1	18.59	60.728	
4,000.0	3,948.7	3,797.6	3,710.2	12.9	15.1	-134.82	-671.5	453.4	1,161.1	1,142.0	19.10	60.800	
4,100.0	4,047.2	3,892.1	3,802.3	13.2	15.5	-134.89	-689.1	466.4	1,193.6	1,174.0	19.61	60.868	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.58	-77.2	0.6	77.2				
100.0	100.0	100.0	100.0	0.1	0.1	179.58	-77.2	0.6	77.2	76.9	0.27	283.613	
200.0	200.0	200.0	200.0	0.3	0.3	179.58	-77.2	0.6	77.2	76.6	0.62	124.280	CC, ES
300.0	300.0	296.5	296.5	0.5	0.5	178.71	-79.3	1.8	79.4	78.5	0.97	82.030	
400.0	400.0	392.5	392.1	0.7	0.7	-76.97	-85.6	5.4	85.5	84.2	1.32	64.693	
500.0	499.6	487.0	485.9	0.9	1.0	-84.00	-95.8	11.3	96.0	94.3	1.71	56.294	
600.0	598.8	579.2	576.7	1.1	1.3	-92.22	-109.7	19.4	112.7	110.6	2.13	52.865	SF
700.0	697.3	668.8	664.1	1.5	1.7	-99.93	-126.8	29.2	136.8	134.3	2.58	53.036	
800.0	795.9	760.4	752.6	1.8	2.1	-105.61	-147.2	41.1	166.6	163.6	3.04	54.763	
900.0	894.4	854.6	843.5	2.1	2.5	-109.68	-168.5	53.4	197.9	194.3	3.52	56.137	
1,000.0	992.9	948.8	934.4	2.5	3.0	-112.65	-189.8	65.7	229.8	225.8	4.02	57.151	
1,100.0	1,091.4	1,042.9	1,025.3	2.8	3.4	-114.90	-211.1	78.0	262.1	257.6	4.53	57.896	
1,200.0	1,190.0	1,137.1	1,116.3	3.1	3.9	-116.65	-232.3	90.3	294.7	289.7	5.04	58.452	
1,300.0	1,288.5	1,231.3	1,207.2	3.5	4.4	-118.06	-253.6	102.7	327.6	322.0	5.56	58.876	
1,400.0	1,387.0	1,325.5	1,298.1	3.8	4.8	-119.21	-274.9	115.0	360.5	354.5	6.09	59.205	
1,500.0	1,485.5	1,419.7	1,389.0	4.2	5.3	-120.17	-296.2	127.3	393.6	387.0	6.62	59.466	
1,600.0	1,584.1	1,513.8	1,479.9	4.5	5.7	-120.98	-317.5	139.6	426.8	419.6	7.15	59.677	
1,700.0	1,682.6	1,608.0	1,570.8	4.9	6.2	-121.67	-338.8	151.9	460.0	452.3	7.69	59.850	
1,800.0	1,781.1	1,702.2	1,661.7	5.2	6.7	-122.27	-360.1	164.2	493.3	485.1	8.22	59.994	
1,900.0	1,879.6	1,796.4	1,752.6	5.6	7.1	-122.80	-381.4	176.6	526.6	517.9	8.76	60.116	
2,000.0	1,978.2	1,890.6	1,843.6	5.9	7.6	-123.26	-402.6	188.9	560.0	550.7	9.30	60.220	
2,100.0	2,076.7	1,984.7	1,934.5	6.2	8.0	-123.67	-423.9	201.2	593.4	583.5	9.84	60.309	
2,200.0	2,175.2	2,078.9	2,025.4	6.6	8.5	-124.04	-445.2	213.5	626.8	616.4	10.38	60.387	
2,300.0	2,273.7	2,173.1	2,116.3	6.9	9.0	-124.37	-466.5	225.8	660.2	649.3	10.92	60.456	
2,400.0	2,372.3	2,267.3	2,207.2	7.3	9.4	-124.66	-487.8	238.2	693.7	682.2	11.46	60.517	
2,500.0	2,470.8	2,361.5	2,298.1	7.6	9.9	-124.93	-509.1	250.5	727.1	715.1	12.00	60.570	
2,600.0	2,569.3	2,455.7	2,389.0	8.0	10.4	-125.18	-530.4	262.8	760.6	748.1	12.55	60.619	
2,700.0	2,667.8	2,549.8	2,480.0	8.3	10.8	-125.41	-551.7	275.1	794.1	781.0	13.09	60.662	
2,800.0	2,766.4	2,644.0	2,570.9	8.7	11.3	-125.61	-573.0	287.4	827.6	814.0	13.63	60.702	
2,900.0	2,864.9	2,738.2	2,661.8	9.0	11.7	-125.81	-594.2	299.8	861.1	846.9	14.18	60.737	
3,000.0	2,963.4	2,832.4	2,752.7	9.4	12.2	-125.98	-615.5	312.1	894.6	879.9	14.72	60.770	
3,100.0	3,061.9	2,926.6	2,843.6	9.7	12.7	-126.15	-636.8	324.4	928.1	912.9	15.27	60.800	
3,200.0	3,160.5	3,020.7	2,934.5	10.1	13.1	-126.30	-658.1	336.7	961.7	945.9	15.81	60.828	
3,300.0	3,259.0	3,114.9	3,025.4	10.4	13.6	-126.44	-679.4	349.0	995.2	978.8	16.35	60.853	
3,400.0	3,357.5	3,209.1	3,116.3	10.8	14.1	-126.58	-700.7	361.3	1,028.7	1,011.8	16.90	60.876	
3,500.0	3,456.0	3,303.3	3,207.3	11.1	14.5	-126.70	-722.0	373.7	1,062.3	1,044.8	17.44	60.898	
3,600.0	3,554.6	3,397.5	3,298.2	11.5	15.0	-126.82	-743.3	386.0	1,095.8	1,077.8	17.99	60.918	
3,700.0	3,653.1	3,491.7	3,389.1	11.8	15.4	-126.93	-764.5	398.3	1,129.4	1,110.8	18.53	60.937	
3,800.0	3,751.6	3,585.8	3,480.0	12.2	15.9	-127.03	-785.8	410.6	1,162.9	1,143.9	19.08	60.955	
3,900.0	3,850.1	3,680.0	3,570.9	12.5	16.4	-127.13	-807.1	422.9	1,196.5	1,176.9	19.62	60.972	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	168.16	-27.0	5.6	27.5				
100.0	100.0	100.0	100.0	0.1	0.1	168.16	-27.0	5.6	27.5	27.3	0.27	101.145	
200.0	200.0	200.0	200.0	0.3	0.3	168.16	-27.0	5.6	27.5	26.9	0.62	44.322	
300.0	300.0	300.0	300.0	0.5	0.5	168.16	-27.0	5.6	27.5	26.6	0.97	28.379	CC, ES
400.0	400.0	399.3	399.2	0.7	0.7	-93.84	-27.3	8.2	28.5	27.2	1.33	21.461	
500.0	499.6	497.0	496.7	0.9	0.9	-117.24	-28.1	15.7	35.9	34.2	1.71	20.932	SF
600.0	598.8	593.4	592.4	1.1	1.1	-136.69	-29.4	27.1	54.5	52.5	2.08	26.252	
700.0	697.3	689.4	687.6	1.5	1.3	-147.56	-30.8	38.7	79.8	77.4	2.42	32.985	
800.0	795.9	785.3	782.8	1.8	1.6	-153.27	-32.2	50.4	106.8	104.0	2.77	38.618	
900.0	894.4	881.2	878.0	2.1	1.9	-156.67	-33.5	62.0	134.3	131.2	3.11	43.164	
1,000.0	992.9	977.1	973.2	2.5	2.1	-158.92	-34.9	73.6	162.1	158.7	3.46	46.862	
1,100.0	1,091.4	1,073.0	1,068.3	2.8	2.4	-160.50	-36.2	85.2	190.1	186.3	3.81	49.911	
1,200.0	1,190.0	1,168.8	1,163.5	3.1	2.6	-161.68	-37.6	96.9	218.2	214.1	4.16	52.461	
1,300.0	1,288.5	1,264.7	1,258.7	3.5	2.9	-162.59	-38.9	108.5	246.4	241.9	4.51	54.621	
1,400.0	1,387.0	1,360.6	1,353.9	3.8	3.2	-163.32	-40.3	120.1	274.6	269.7	4.86	56.474	
1,500.0	1,485.5	1,456.5	1,449.0	4.2	3.4	-163.91	-41.6	131.8	302.8	297.6	5.21	58.079	
1,600.0	1,584.1	1,552.4	1,544.2	4.5	3.7	-164.40	-43.0	143.4	331.0	325.5	5.57	59.482	
1,700.0	1,682.6	1,648.3	1,639.4	4.9	3.9	-164.81	-44.3	155.0	359.3	353.4	5.92	60.719	
1,800.0	1,781.1	1,744.2	1,734.5	5.2	4.2	-165.16	-45.7	166.7	387.6	381.3	6.27	61.818	
1,900.0	1,879.6	1,840.1	1,829.7	5.6	4.5	-165.46	-47.0	178.3	415.9	409.3	6.62	62.799	
2,000.0	1,978.2	1,936.0	1,924.9	5.9	4.7	-165.73	-48.4	189.9	444.2	437.2	6.98	63.682	
2,100.0	2,076.7	2,031.9	2,020.1	6.2	5.0	-165.96	-49.7	201.6	472.5	465.2	7.33	64.479	
2,200.0	2,175.2	2,127.7	2,115.2	6.6	5.3	-166.17	-51.1	213.2	500.9	493.2	7.68	65.204	
2,300.0	2,273.7	2,223.6	2,210.4	6.9	5.5	-166.36	-52.4	224.8	529.2	521.2	8.03	65.864	
2,400.0	2,372.3	2,319.5	2,305.6	7.3	5.8	-166.52	-53.8	236.5	557.5	549.1	8.39	66.469	
2,500.0	2,470.8	2,415.4	2,400.7	7.6	6.1	-166.67	-55.1	248.1	585.9	577.1	8.74	67.025	
2,600.0	2,569.3	2,511.3	2,495.9	8.0	6.3	-166.81	-56.5	259.7	614.2	605.1	9.09	67.538	
2,700.0	2,667.8	2,607.2	2,591.1	8.3	6.6	-166.93	-57.8	271.4	642.5	633.1	9.45	68.012	
2,800.0	2,766.4	2,703.1	2,686.3	8.7	6.9	-167.05	-59.2	283.0	670.9	661.1	9.80	68.452	
2,900.0	2,864.9	2,799.0	2,781.4	9.0	7.1	-167.15	-60.5	294.6	699.2	689.1	10.15	68.861	
3,000.0	2,963.4	2,894.9	2,876.6	9.4	7.4	-167.25	-61.9	306.3	727.6	717.1	10.51	69.243	
3,100.0	3,061.9	2,990.8	2,971.8	9.7	7.6	-167.34	-63.3	317.9	755.9	745.1	10.86	69.600	
3,200.0	3,160.5	3,086.6	3,067.0	10.1	7.9	-167.42	-64.6	329.5	784.3	773.1	11.21	69.934	
3,300.0	3,259.0	3,182.5	3,162.1	10.4	8.2	-167.50	-66.0	341.2	812.6	801.1	11.57	70.248	
3,400.0	3,357.5	3,278.4	3,257.3	10.8	8.4	-167.57	-67.3	352.8	841.0	829.1	11.92	70.543	
3,500.0	3,456.0	3,374.3	3,352.5	11.1	8.7	-167.63	-68.7	364.4	869.4	857.1	12.28	70.821	
3,600.0	3,554.6	3,470.2	3,447.6	11.5	9.0	-167.70	-70.0	376.1	897.7	885.1	12.63	71.084	
3,700.0	3,653.1	3,566.1	3,542.8	11.8	9.2	-167.76	-71.4	387.7	926.1	913.1	12.98	71.332	
3,800.0	3,751.6	3,662.0	3,638.0	12.2	9.5	-167.81	-72.7	399.3	954.4	941.1	13.34	71.567	
3,900.0	3,850.1	3,757.9	3,733.2	12.5	9.8	-167.86	-74.1	411.0	982.8	969.1	13.69	71.790	
4,000.0	3,948.7	3,853.8	3,828.3	12.9	10.0	-167.91	-75.4	422.6	1,011.2	997.1	14.04	72.002	
4,100.0	4,047.2	3,949.7	3,923.5	13.2	10.3	-167.96	-76.8	434.2	1,039.5	1,025.1	14.40	72.203	
4,200.0	4,145.7	4,045.6	4,018.7	13.6	10.6	-168.00	-78.1	445.9	1,067.9	1,053.1	14.75	72.394	
4,300.0	4,244.2	4,141.4	4,113.9	13.9	10.8	-168.05	-79.5	457.5	1,096.2	1,081.1	15.10	72.577	
4,400.0	4,342.8	4,237.3	4,209.0	14.3	11.1	-168.09	-80.8	469.1	1,124.6	1,109.1	15.46	72.751	
4,500.0	4,441.3	4,333.2	4,304.2	14.6	11.4	-168.12	-82.2	480.8	1,153.0	1,137.2	15.81	72.918	
4,600.0	4,539.8	4,429.1	4,399.4	15.0	11.6	-168.16	-83.5	492.4	1,181.3	1,165.2	16.17	73.077	
4,700.0	4,638.4	4,525.0	4,494.5	15.3	11.9	-168.19	-84.9	504.0	1,209.7	1,193.2	16.52	73.229	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-179.31	-94.0	-1.1	94.0				
100.0	100.0	100.0	100.0	0.1	0.1	-179.31	-94.0	-1.1	94.0	93.7	0.27	345.168	
200.0	200.0	200.0	200.0	0.3	0.3	-179.31	-94.0	-1.1	94.0	93.4	0.62	151.253	
300.0	300.0	300.0	300.0	0.5	0.5	-179.31	-94.0	-1.1	94.0	93.0	0.97	96.846	CC, ES
400.0	400.0	395.7	395.6	0.7	0.7	-73.25	-96.1	0.0	95.4	94.1	1.32	72.359	
500.0	499.6	490.5	490.2	0.9	0.9	-78.92	-102.4	3.2	100.5	98.8	1.70	59.141	
600.0	598.8	583.7	582.6	1.1	1.1	-86.84	-112.7	8.4	111.0	108.9	2.14	51.977	
700.0	697.3	674.7	672.3	1.5	1.4	-95.11	-126.7	15.4	128.6	126.0	2.60	49.518	SF
800.0	795.9	763.7	759.2	1.8	1.8	-101.35	-143.9	24.2	153.2	150.1	3.06	50.009	
900.0	894.4	850.5	842.9	2.1	2.2	-105.64	-164.3	34.5	183.5	179.9	3.53	51.932	
1,000.0	992.9	938.7	926.9	2.5	2.7	-108.62	-188.0	46.5	218.3	214.3	4.02	54.365	
1,100.0	1,091.4	1,031.5	1,015.3	2.8	3.2	-110.87	-213.7	59.5	254.4	249.8	4.52	56.251	
1,200.0	1,190.0	1,124.4	1,103.6	3.1	3.7	-112.57	-239.3	72.5	290.6	285.6	5.04	57.676	
1,300.0	1,288.5	1,217.3	1,191.9	3.5	4.2	-113.89	-265.0	85.5	327.1	321.5	5.57	58.767	
1,400.0	1,387.0	1,310.2	1,280.3	3.8	4.7	-114.95	-290.6	98.4	363.6	357.5	6.10	59.618	
1,500.0	1,485.5	1,403.1	1,368.6	4.2	5.2	-115.82	-316.2	111.4	400.3	393.6	6.64	60.291	
1,600.0	1,584.1	1,496.0	1,456.9	4.5	5.8	-116.54	-341.9	124.4	437.0	429.8	7.18	60.833	
1,700.0	1,682.6	1,588.9	1,545.2	4.9	6.3	-117.15	-367.5	137.4	473.8	466.0	7.73	61.276	
1,800.0	1,781.1	1,681.7	1,633.6	5.2	6.8	-117.67	-393.1	150.4	510.6	502.3	8.28	61.642	
1,900.0	1,879.6	1,774.6	1,721.9	5.6	7.3	-118.12	-418.8	163.4	547.4	538.6	8.84	61.950	
2,000.0	1,978.2	1,867.5	1,810.2	5.9	7.9	-118.51	-444.4	176.4	584.3	574.9	9.39	62.211	
2,100.0	2,076.7	1,960.4	1,898.5	6.2	8.4	-118.86	-470.1	189.3	621.2	611.2	9.95	62.434	
2,200.0	2,175.2	2,053.3	1,986.9	6.6	8.9	-119.17	-495.7	202.3	658.1	647.6	10.51	62.627	
2,300.0	2,273.7	2,146.2	2,075.2	6.9	9.5	-119.45	-521.3	215.3	695.0	683.9	11.07	62.794	
2,400.0	2,372.3	2,239.1	2,163.5	7.3	10.0	-119.69	-547.0	228.3	731.9	720.3	11.63	62.942	
2,500.0	2,470.8	2,331.9	2,251.9	7.6	10.5	-119.92	-572.6	241.3	768.9	756.7	12.19	63.072	
2,600.0	2,569.3	2,424.8	2,340.2	8.0	11.1	-120.12	-598.3	254.3	805.8	793.1	12.75	63.187	
2,700.0	2,667.8	2,517.7	2,428.5	8.3	11.6	-120.31	-623.9	267.2	842.8	829.5	13.32	63.290	
2,800.0	2,766.4	2,610.6	2,516.8	8.7	12.1	-120.48	-649.5	280.2	879.8	865.9	13.88	63.383	
2,900.0	2,864.9	2,703.5	2,605.2	9.0	12.6	-120.64	-675.2	293.2	916.7	902.3	14.44	63.467	
3,000.0	2,963.4	2,796.4	2,693.5	9.4	13.2	-120.78	-700.8	306.2	953.7	938.7	15.01	63.542	
3,100.0	3,061.9	2,889.3	2,781.8	9.7	13.7	-120.91	-726.5	319.2	990.7	975.1	15.57	63.611	
3,200.0	3,160.5	2,982.1	2,870.2	10.1	14.2	-121.04	-752.1	332.2	1,027.7	1,011.5	16.14	63.674	
3,300.0	3,259.0	3,075.0	2,958.5	10.4	14.8	-121.15	-777.7	345.2	1,064.7	1,048.0	16.71	63.732	
3,400.0	3,357.5	3,167.9	3,046.8	10.8	15.3	-121.26	-803.4	358.1	1,101.7	1,084.4	17.27	63.785	
3,500.0	3,456.0	3,260.8	3,135.1	11.1	15.8	-121.36	-829.0	371.1	1,138.7	1,120.8	17.84	63.834	
3,600.0	3,554.6	3,353.7	3,223.5	11.5	16.4	-121.46	-854.7	384.1	1,175.7	1,157.3	18.40	63.879	
3,700.0	3,653.1	3,446.6	3,311.8	11.8	16.9	-121.54	-880.3	397.1	1,212.7	1,193.7	18.97	63.921	

CC - Min centre to center distance or covergent 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 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-174.49	-84.9	-8.2	85.3				
100.0	100.0	100.0	100.0	0.1	0.1	-174.49	-84.9	-8.2	85.3	85.0	0.27	313.147	
200.0	200.0	200.0	200.0	0.3	0.3	-174.49	-84.9	-8.2	85.3	84.6	0.62	137.222	CC, ES
300.0	300.0	295.8	295.8	0.5	0.5	-174.01	-87.1	-9.1	87.7	86.7	0.97	90.252	
400.0	400.0	391.3	391.0	0.7	0.7	-65.84	-93.7	-11.9	93.8	92.5	1.31	71.352	
500.0	499.6	486.2	485.2	0.9	1.0	-67.46	-104.6	-16.6	102.6	100.9	1.70	60.360	
600.0	598.8	580.4	577.9	1.1	1.3	-70.21	-119.6	-23.0	114.2	112.1	2.16	52.951	
700.0	697.3	673.5	668.7	1.5	1.7	-73.30	-138.6	-31.1	129.5	126.8	2.69	48.131	
800.0	795.9	765.5	757.3	1.8	2.2	-75.07	-161.3	-40.8	149.2	145.9	3.27	45.685	
900.0	894.4	860.5	847.8	2.1	2.7	-75.90	-188.0	-52.1	172.3	168.4	3.87	44.502	
1,000.0	992.9	957.8	940.3	2.5	3.2	-76.52	-215.5	-63.8	195.6	191.1	4.50	43.491	
1,100.0	1,091.4	1,055.0	1,032.8	2.8	3.7	-77.00	-243.0	-75.5	219.0	213.8	5.14	42.641	
1,200.0	1,190.0	1,152.2	1,125.3	3.1	4.3	-77.39	-270.5	-87.2	242.3	236.6	5.78	41.927	
1,300.0	1,288.5	1,249.4	1,217.9	3.5	4.8	-77.71	-297.9	-98.9	265.7	259.3	6.43	41.323	
1,400.0	1,387.0	1,346.6	1,310.4	3.8	5.4	-77.98	-325.4	-110.6	289.1	282.0	7.08	40.808	
1,500.0	1,485.5	1,443.9	1,402.9	4.2	5.9	-78.20	-352.9	-122.3	312.5	304.8	7.74	40.365	
1,600.0	1,584.1	1,541.1	1,495.4	4.5	6.5	-78.40	-380.4	-134.0	335.9	327.5	8.40	39.980	
1,700.0	1,682.6	1,638.3	1,587.9	4.9	7.0	-78.57	-407.9	-145.8	359.3	350.2	9.06	39.644	
1,800.0	1,781.1	1,735.5	1,680.4	5.2	7.6	-78.72	-435.4	-157.5	382.7	373.0	9.73	39.347	
1,900.0	1,879.6	1,832.7	1,772.9	5.6	8.1	-78.85	-462.9	-169.2	406.1	395.7	10.39	39.084	
2,000.0	1,978.2	1,930.0	1,865.5	5.9	8.7	-78.97	-490.4	-180.9	429.5	418.4	11.06	38.849	
2,100.0	2,076.7	2,027.2	1,958.0	6.2	9.2	-79.08	-517.9	-192.6	452.9	441.2	11.72	38.638	
2,200.0	2,175.2	2,124.4	2,050.5	6.6	9.8	-79.17	-545.3	-204.3	476.3	463.9	12.39	38.447	
2,300.0	2,273.7	2,221.6	2,143.0	6.9	10.3	-79.26	-572.8	-216.0	499.7	486.7	13.06	38.274	
2,400.0	2,372.3	2,318.8	2,235.5	7.3	10.9	-79.34	-600.3	-227.7	523.1	509.4	13.72	38.117	
2,500.0	2,470.8	2,416.1	2,328.0	7.6	11.4	-79.41	-627.8	-239.4	546.5	532.1	14.39	37.973	
2,600.0	2,569.3	2,513.3	2,420.5	8.0	12.0	-79.48	-655.3	-251.1	570.0	554.9	15.06	37.841	
2,700.0	2,667.8	2,610.5	2,513.1	8.3	12.5	-79.54	-682.8	-262.8	593.4	577.6	15.73	37.719	
2,800.0	2,766.4	2,707.7	2,605.6	8.7	13.1	-79.59	-710.3	-274.5	616.8	600.4	16.40	37.607	
2,900.0	2,864.9	2,804.9	2,698.1	9.0	13.6	-79.65	-737.8	-286.2	640.2	623.1	17.07	37.502	
3,000.0	2,963.4	2,902.1	2,790.6	9.4	14.2	-79.70	-765.3	-297.9	663.6	645.9	17.74	37.406	
3,100.0	3,061.9	2,999.4	2,883.1	9.7	14.7	-79.74	-792.7	-309.6	687.0	668.6	18.41	37.315	
3,200.0	3,160.5	3,096.6	2,975.6	10.1	15.3	-79.78	-820.2	-321.3	710.4	691.3	19.08	37.231	
3,300.0	3,259.0	3,193.8	3,068.1	10.4	15.8	-79.82	-847.7	-333.0	733.8	714.1	19.75	37.152	
3,400.0	3,357.5	3,291.0	3,160.6	10.8	16.4	-79.86	-875.2	-344.8	757.3	736.8	20.42	37.078	
3,500.0	3,456.0	3,388.2	3,253.2	11.1	16.9	-79.89	-902.7	-356.5	780.7	759.6	21.09	37.009	
3,600.0	3,554.6	3,485.5	3,345.7	11.5	17.5	-79.93	-930.2	-368.2	804.1	782.3	21.77	36.944	
3,700.0	3,653.1	3,582.7	3,438.2	11.8	18.0	-79.96	-957.7	-379.9	827.5	805.1	22.44	36.882	
3,800.0	3,751.6	3,679.9	3,530.7	12.2	18.6	-79.99	-985.2	-391.6	850.9	827.8	23.11	36.824	
3,900.0	3,850.1	3,777.1	3,623.2	12.5	19.1	-80.02	-1,012.7	-403.3	874.3	850.6	23.78	36.769	
4,000.0	3,948.7	3,874.3	3,715.7	12.9	19.7	-80.04	-1,040.2	-415.0	897.7	873.3	24.45	36.716	
4,100.0	4,047.2	3,971.6	3,808.2	13.2	20.2	-80.07	-1,067.6	-426.7	921.2	896.0	25.12	36.667	
4,200.0	4,145.7	4,068.8	3,900.8	13.6	20.8	-80.09	-1,095.1	-438.4	944.6	918.8	25.79	36.620	
4,300.0	4,244.2	4,166.0	3,993.3	13.9	21.4	-80.11	-1,122.6	-450.1	968.0	941.5	26.47	36.575	
4,400.0	4,342.8	4,263.2	4,085.8	14.3	21.9	-80.13	-1,150.1	-461.8	991.4	964.3	27.14	36.532	
4,500.0	4,441.3	4,360.4	4,178.3	14.6	22.5	-80.16	-1,177.6	-473.5	1,014.8	987.0	27.81	36.492	
4,600.0	4,539.8	4,457.7	4,270.8	15.0	23.0	-80.17	-1,205.1	-485.2	1,038.2	1,009.8	28.48	36.453	
4,700.0	4,638.4	4,554.9	4,363.3	15.3	23.6	-80.19	-1,232.6	-496.9	1,061.7	1,032.5	29.15	36.416	
4,800.0	4,736.9	4,652.1	4,455.8	15.7	24.1	-80.21	-1,260.1	-508.6	1,085.1	1,055.3	29.83	36.380	
4,900.0	4,835.4	4,749.3	4,548.4	16.0	24.7	-80.23	-1,287.6	-520.3	1,108.5	1,078.0	30.50	36.346	
5,000.0	4,933.9	4,846.5	4,640.9	16.4	25.2	-80.25	-1,315.0	-532.1	1,131.9	1,100.7	31.17	36.314	
5,100.0	5,032.5	4,943.7	4,733.4	16.7	25.8	-80.26	-1,342.5	-543.8	1,155.3	1,123.5	31.84	36.283	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,131.0	5,041.0	4,825.9	17.1	26.3	-80.28	-1,370.0	-555.5	1,178.7	1,146.2	32.51	36.253	
5,300.0	5,229.5	5,138.2	4,918.4	17.4	26.9	-80.29	-1,397.5	-567.2	1,202.2	1,169.0	33.19	36.224	SF

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	143.31	-9.5	7.1	11.8				
100.0	100.0	100.0	100.0	0.1	0.1	143.31	-9.5	7.1	11.8	11.5	0.27	43.397	
200.0	200.0	200.0	200.0	0.3	0.3	143.31	-9.5	7.1	11.8	11.2	0.62	19.017	
248.1	248.1	248.1	248.1	0.4	0.4	140.37	-9.1	7.5	11.8	11.0	0.79	14.936	CC
300.0	300.0	299.9	299.9	0.5	0.5	130.71	-7.8	9.1	12.0	11.0	0.97	12.334	ES, SF
400.0	400.0	399.0	398.7	0.7	0.7	-155.09	-2.9	15.0	17.7	16.3	1.35	13.139	
500.0	499.6	495.8	494.6	0.9	1.0	-175.38	5.1	24.7	36.0	34.3	1.69	21.304	
600.0	598.8	588.9	586.2	1.1	1.3	176.94	15.7	37.5	65.3	63.3	2.02	32.352	
700.0	697.3	680.5	675.6	1.5	1.7	173.61	28.3	52.7	102.2	99.9	2.35	43.445	
800.0	795.9	773.1	766.0	1.8	2.1	172.01	41.3	68.4	139.8	137.1	2.70	51.834	
900.0	894.4	865.7	856.3	2.1	2.4	171.08	54.3	84.1	177.4	174.4	3.04	58.311	
1,000.0	992.9	958.3	946.7	2.5	2.8	170.48	67.3	99.8	215.1	211.7	3.39	63.450	
1,100.0	1,091.4	1,051.0	1,037.0	2.8	3.2	170.06	80.3	115.4	252.8	249.0	3.74	67.624	
1,200.0	1,190.0	1,143.6	1,127.4	3.1	3.6	169.75	93.3	131.1	290.5	286.4	4.09	71.079	
1,300.0	1,288.5	1,236.2	1,217.8	3.5	4.0	169.51	106.2	146.8	328.2	323.7	4.44	73.985	
1,400.0	1,387.0	1,328.8	1,308.1	3.8	4.4	169.32	119.2	162.5	365.8	361.1	4.78	76.463	
1,500.0	1,485.5	1,421.4	1,398.5	4.2	4.8	169.16	132.2	178.2	403.5	398.4	5.13	78.601	
1,600.0	1,584.1	1,514.0	1,488.8	4.5	5.2	169.03	145.2	193.8	441.2	435.8	5.48	80.463	
1,700.0	1,682.6	1,606.7	1,579.2	4.9	5.6	168.92	158.2	209.5	478.9	473.1	5.83	82.100	
1,800.0	1,781.1	1,699.3	1,669.5	5.2	6.0	168.83	171.2	225.2	516.6	510.5	6.18	83.550	
1,900.0	1,879.6	1,791.9	1,759.9	5.6	6.4	168.75	184.1	240.9	554.3	547.8	6.53	84.844	
2,000.0	1,978.2	1,884.5	1,850.2	5.9	6.7	168.68	197.1	256.6	592.1	585.2	6.88	86.005	
2,100.0	2,076.7	1,977.1	1,940.6	6.2	7.1	168.62	210.1	272.2	629.8	622.5	7.23	87.052	
2,200.0	2,175.2	2,069.8	2,030.9	6.6	7.5	168.57	223.1	287.9	667.5	659.9	7.58	88.002	
2,300.0	2,273.7	2,162.4	2,121.3	6.9	7.9	168.52	236.1	303.6	705.2	697.2	7.93	88.868	
2,400.0	2,372.3	2,255.0	2,211.6	7.3	8.3	168.47	249.1	319.3	742.9	734.6	8.29	89.660	
2,500.0	2,470.8	2,347.6	2,302.0	7.6	8.7	168.43	262.0	335.0	780.6	771.9	8.64	90.387	
2,600.0	2,569.3	2,440.2	2,392.3	8.0	9.1	168.40	275.0	350.6	818.3	809.3	8.99	91.058	
2,700.0	2,667.8	2,532.8	2,482.7	8.3	9.5	168.37	288.0	366.3	856.0	846.7	9.34	91.677	
2,800.0	2,766.4	2,625.5	2,573.0	8.7	9.9	168.34	301.0	382.0	893.7	884.0	9.69	92.252	
2,900.0	2,864.9	2,718.1	2,663.4	9.0	10.3	168.31	314.0	397.7	931.4	921.4	10.04	92.786	
3,000.0	2,963.4	2,810.7	2,753.7	9.4	10.7	168.28	327.0	413.4	969.1	958.7	10.39	93.284	
3,100.0	3,061.9	2,903.3	2,844.1	9.7	11.1	168.26	339.9	429.0	1,006.8	996.1	10.74	93.749	
3,200.0	3,160.5	2,995.9	2,934.4	10.1	11.5	168.24	352.9	444.7	1,044.5	1,033.4	11.09	94.185	
3,300.0	3,259.0	3,088.5	3,024.8	10.4	11.9	168.22	365.9	460.4	1,082.2	1,070.8	11.44	94.594	
3,400.0	3,357.5	3,181.2	3,115.2	10.8	12.3	168.20	378.9	476.1	1,119.9	1,108.1	11.79	94.978	
3,500.0	3,456.0	3,273.8	3,205.5	11.1	12.7	168.18	391.9	491.8	1,157.6	1,145.5	12.14	95.340	
3,600.0	3,554.6	3,366.4	3,295.9	11.5	13.1	168.16	404.9	507.4	1,195.4	1,182.9	12.49	95.682	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well HMU Federal 16-11D
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 16-11D	**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 16-11D
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.44°