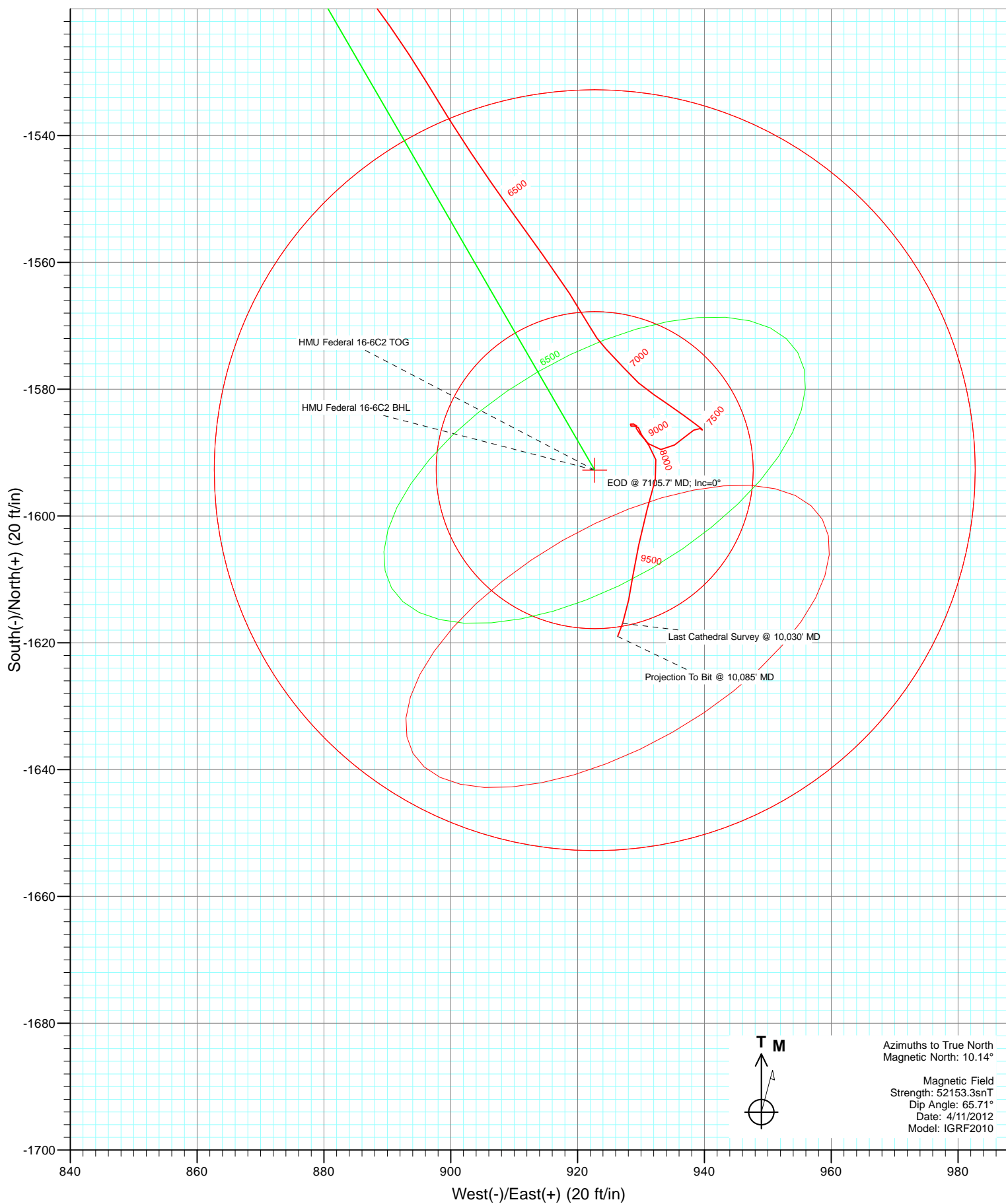


Azimuths to True North
 Magnetic North: 10.14°

Magnetic Field
 Strength: 52153.3snT
 Dip Angle: 65.71°
 Date: 4/11/2012
 Model: IGRF2010



Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-6C2
Project:	Mamm Creek	TVD Reference:	KBE @ 7667.0ft (Nabors M11)
Site:	J16W Pad	MD Reference:	KBE @ 7667.0ft (Nabors M11)
Well:	HMU Federal 16-6C2	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

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 Pad			
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 16-6C2					
Well Position	+N/-S	0.0 ft	Northing:	1,594,291.31 ft	Latitude:	39.442991
	+E/-W	0.0 ft	Easting:	2,357,388.89 ft	Longitude:	-107.775685
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)
	IGRF2010	4/11/2012	10.14	65.71	52,153

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	149.92	

Survey Program	Date	4/23/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
81.0	10,085.0	Survey #1 (DD)	MWD	Geolink MWD	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
81.0	1.10	54.00	81.0	0.5	0.6	-0.1	1.36	1.36		
112.0	1.20	64.80	112.0	0.8	1.2	-0.1	0.77	0.32		
143.0	1.40	76.70	143.0	1.0	1.8	0.1	1.08	0.65		
173.0	1.50	97.90	173.0	1.0	2.6	0.4	1.81	0.33		
204.0	1.50	100.20	204.0	0.9	3.4	0.9	0.19	0.00		
235.0	1.50	125.80	235.0	0.6	4.1	1.5	2.14	0.00		
265.0	1.70	149.80	264.9	0.0	4.6	2.3	2.31	0.67		
295.0	2.60	159.00	294.9	-1.0	5.1	3.5	3.20	3.00		
326.0	2.90	155.00	325.9	-2.4	5.7	4.9	1.15	0.97		
357.0	3.20	157.40	356.8	-3.9	6.4	6.6	1.05	0.97		
388.0	3.90	151.00	387.8	-5.6	7.2	8.5	2.59	2.26		
419.0	4.60	153.40	418.7	-7.7	8.3	10.8	2.33	2.26		

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-6C2
Project:	Mamm Creek	TVD Reference:	KBE @ 7667.0ft (Nabors M11)
Site:	J16W Pad	MD Reference:	KBE @ 7667.0ft (Nabors M11)
Well:	HMU Federal 16-6C2	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
450.0	5.00	149.80	449.6	-10.0	9.5	13.4	1.61	1.29	
480.0	5.00	149.80	479.5	-12.2	10.8	16.0	0.00	0.00	
511.0	5.20	154.80	510.3	-14.7	12.1	18.7	1.57	0.65	
542.0	5.70	157.50	541.2	-17.3	13.3	21.7	1.81	1.61	
572.0	6.50	158.20	571.0	-20.3	14.5	24.8	2.68	2.67	
603.0	7.00	157.80	601.8	-23.7	15.9	28.4	1.62	1.61	
634.0	8.00	160.40	632.6	-27.5	17.3	32.4	3.41	3.23	
664.0	8.70	160.20	662.2	-31.6	18.8	36.7	2.34	2.33	
695.0	9.50	158.10	692.8	-36.1	20.5	41.6	2.79	2.58	
725.0	10.50	154.50	722.4	-40.9	22.6	46.7	3.93	3.33	
755.0	11.50	154.10	751.8	-46.1	25.1	52.4	3.34	3.33	
786.0	12.70	153.20	782.2	-51.9	28.0	58.9	3.92	3.87	
848.0	14.40	148.60	842.4	-64.5	35.1	73.4	3.24	2.74	
939.0	15.40	146.90	930.4	-84.3	47.6	96.8	1.20	1.10	
1,031.0	15.70	147.60	1,019.0	-105.1	60.9	121.4	0.38	0.33	
1,123.0	16.00	146.80	1,107.5	-126.2	74.5	146.5	0.40	0.33	
1,214.0	16.20	146.20	1,194.9	-147.2	88.4	171.7	0.29	0.22	
1,306.0	17.00	148.10	1,283.1	-169.3	102.7	198.0	1.05	0.87	
1,398.0	16.70	151.70	1,371.1	-192.4	116.1	224.6	1.18	-0.33	
1,490.0	17.20	150.90	1,459.2	-215.9	128.9	251.5	0.60	0.54	
1,567.0	17.90	151.40	1,532.6	-236.2	140.1	274.7	0.93	0.91	
1,646.0	17.90	150.70	1,607.7	-257.5	151.9	298.9	0.27	0.00	
1,741.0	17.20	150.80	1,698.3	-282.5	165.9	327.6	0.74	-0.74	
1,836.0	16.70	149.70	1,789.2	-306.5	179.6	355.3	0.63	-0.53	
1,931.0	17.30	151.10	1,880.0	-330.7	193.4	383.1	0.76	0.63	
2,026.0	17.80	150.60	1,970.6	-355.7	207.3	411.7	0.55	0.53	
2,122.0	17.70	151.10	2,062.1	-381.3	221.6	441.0	0.19	-0.10	
2,217.0	17.30	151.50	2,152.7	-406.3	235.3	469.5	0.44	-0.42	
2,313.0	19.00	148.70	2,243.9	-432.2	250.2	499.4	1.99	1.77	
2,408.0	18.20	148.80	2,333.9	-458.1	265.9	529.7	0.84	-0.84	
2,503.0	18.10	148.50	2,424.2	-483.4	281.3	559.3	0.14	-0.11	
2,599.0	18.00	147.90	2,515.5	-508.7	297.0	589.0	0.22	-0.10	
2,694.0	18.50	148.00	2,605.7	-533.9	312.8	618.8	0.53	0.53	
2,790.0	17.90	148.20	2,696.9	-559.3	328.6	648.7	0.63	-0.62	
2,885.0	17.60	147.90	2,787.4	-583.9	344.0	677.7	0.33	-0.32	
2,980.0	18.10	151.40	2,877.8	-609.0	358.7	706.8	1.25	0.53	
3,075.0	18.00	151.60	2,968.1	-634.9	372.7	736.2	0.12	-0.11	
3,171.0	17.90	150.50	3,059.4	-660.8	387.0	765.8	0.37	-0.10	
3,266.0	17.70	151.30	3,149.9	-686.2	401.1	794.8	0.33	-0.21	
3,361.0	18.10	151.90	3,240.3	-711.9	415.0	824.0	0.46	0.42	
3,457.0	19.00	148.30	3,331.3	-738.3	430.3	854.5	1.52	0.94	
3,552.0	17.80	149.50	3,421.5	-764.0	445.8	884.5	1.32	-1.26	
3,647.0	18.80	148.50	3,511.7	-789.5	461.1	914.3	1.10	1.05	
3,743.0	17.60	150.20	3,602.8	-815.3	476.4	944.3	1.37	-1.25	
3,838.0	19.00	150.20	3,693.0	-841.2	491.3	974.1	1.47	1.47	
3,933.0	17.80	150.20	3,783.2	-867.2	506.2	1,004.1	1.26	-1.26	
4,029.0	18.40	151.60	3,874.4	-893.3	520.7	1,033.9	0.77	0.62	
4,124.0	17.70	151.10	3,964.8	-919.1	534.8	1,063.4	0.75	-0.74	
4,220.0	17.80	152.10	4,056.2	-944.9	548.7	1,092.6	0.33	0.10	
4,315.0	18.50	150.90	4,146.5	-970.9	562.8	1,122.2	0.84	0.74	
4,411.0	17.40	150.20	4,237.8	-996.6	577.4	1,151.8	1.17	-1.15	
4,506.0	17.80	149.10	4,328.3	-1,021.4	591.9	1,180.5	0.55	0.42	
4,601.0	18.60	149.50	4,418.6	-1,046.9	607.0	1,210.2	0.85	0.84	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-6C2
Project:	Mamm Creek	TVD Reference:	KBE @ 7667.0ft (Nabors M11)
Site:	J16W Pad	MD Reference:	KBE @ 7667.0ft (Nabors M11)
Well:	HMU Federal 16-6C2	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
4,697.0	17.90	148.60	4,509.7	-1,072.7	622.5	1,240.2	0.79	-0.73	
4,792.0	18.70	153.20	4,599.9	-1,098.8	636.9	1,270.0	1.74	0.84	
4,887.0	18.00	151.80	4,690.1	-1,125.3	650.7	1,299.9	0.87	-0.74	
4,982.0	19.10	150.20	4,780.2	-1,151.7	665.4	1,330.1	1.28	1.16	
5,078.0	18.50	149.50	4,871.1	-1,178.5	680.9	1,361.1	0.67	-0.62	
5,172.0	18.50	152.70	4,960.2	-1,204.6	695.4	1,390.9	1.08	0.00	
5,267.0	17.70	153.20	5,050.5	-1,230.9	708.8	1,420.3	0.86	-0.84	
5,362.0	18.70	149.30	5,140.8	-1,256.9	723.1	1,450.0	1.66	1.05	
5,458.0	18.70	153.40	5,231.7	-1,283.8	737.8	1,480.7	1.37	0.00	
5,553.0	18.10	150.30	5,321.8	-1,310.3	751.9	1,510.7	1.21	-0.63	
5,648.0	18.40	148.00	5,412.1	-1,335.8	767.2	1,540.4	0.82	0.32	
5,743.0	18.20	148.30	5,502.3	-1,361.2	782.9	1,570.3	0.23	-0.21	
5,839.0	17.70	146.90	5,593.6	-1,386.1	798.8	1,599.8	0.69	-0.52	
5,933.0	17.40	145.90	5,683.2	-1,409.7	814.5	1,628.1	0.45	-0.32	
6,028.0	15.80	148.40	5,774.2	-1,432.5	829.2	1,655.2	1.84	-1.68	
6,123.0	13.50	146.50	5,866.1	-1,452.8	842.1	1,679.2	2.47	-2.42	
6,218.0	12.70	144.90	5,958.7	-1,470.6	854.2	1,700.7	0.92	-0.84	
6,313.0	11.60	145.70	6,051.5	-1,487.0	865.6	1,720.6	1.17	-1.16	
6,408.0	11.50	146.10	6,144.6	-1,502.8	876.3	1,739.6	0.13	-0.11	
6,504.0	10.90	143.60	6,238.8	-1,518.0	887.0	1,758.2	0.80	-0.62	
6,599.0	8.80	148.90	6,332.4	-1,531.5	896.1	1,774.4	2.41	-2.21	
6,694.0	7.20	146.40	6,426.5	-1,542.7	903.1	1,787.6	1.72	-1.68	
6,790.0	5.50	143.90	6,521.9	-1,551.4	909.2	1,798.1	1.79	-1.77	
6,885.0	5.40	144.90	6,616.4	-1,558.7	914.4	1,807.1	0.15	-0.11	
6,980.0	3.70	145.60	6,711.1	-1,564.9	918.7	1,814.6	1.79	-1.79	
7,076.0	3.20	151.90	6,807.0	-1,569.8	921.8	1,820.4	0.65	-0.52	
7,171.0	2.60	135.30	6,901.8	-1,573.7	924.5	1,825.1	1.08	-0.63	
7,265.0	2.10	138.00	6,995.8	-1,576.5	927.2	1,828.9	0.54	-0.53	
7,361.0	2.10	133.30	7,091.7	-1,579.0	929.6	1,832.3	0.18	0.00	
7,456.0	1.60	120.40	7,186.7	-1,580.9	932.0	1,835.1	0.68	-0.53	
7,551.0	1.20	127.90	7,281.6	-1,582.1	934.0	1,837.2	0.46	-0.42	
7,647.0	2.70	125.00	7,377.6	-1,584.1	936.6	1,840.2	1.57	1.56	
7,742.0	1.00	128.20	7,472.5	-1,585.9	939.1	1,843.0	1.79	-1.79	
7,837.0	0.10	228.50	7,567.5	-1,586.4	939.7	1,843.8	1.08	-0.95	
7,890.5	0.29	301.96	7,621.1	-1,586.4	939.5	1,843.6	0.52	0.35	HMU Federal 16-6C2 TOG
7,933.0	0.50	310.70	7,663.5	-1,586.2	939.3	1,843.4	0.52	0.50	
8,028.0	1.00	231.50	7,758.5	-1,586.5	938.3	1,843.1	1.09	0.53	
8,125.0	1.10	233.90	7,855.5	-1,587.5	936.9	1,843.3	0.11	0.10	
8,220.0	1.40	231.20	7,950.5	-1,588.8	935.3	1,843.6	0.32	0.32	
8,315.0	1.50	270.20	8,045.4	-1,589.5	933.1	1,843.2	1.02	0.11	
8,410.0	1.40	322.50	8,140.4	-1,588.6	931.2	1,841.4	1.35	-0.11	
8,505.0	1.10	314.00	8,235.4	-1,587.0	929.8	1,839.3	0.37	-0.32	
8,601.0	0.30	26.60	8,331.4	-1,586.2	929.3	1,838.3	1.09	-0.83	
8,696.0	0.20	348.30	8,426.4	-1,585.8	929.4	1,838.0	0.20	-0.11	
8,791.0	0.60	287.00	8,521.4	-1,585.5	928.8	1,837.5	0.56	0.42	
8,887.0	0.20	185.40	8,617.4	-1,585.5	928.4	1,837.3	0.70	-0.42	
8,982.0	0.20	149.30	8,712.4	-1,585.8	928.4	1,837.6	0.13	0.00	
9,077.0	0.60	74.00	8,807.4	-1,585.8	929.0	1,837.9	0.61	0.42	
9,173.0	0.50	162.90	8,903.4	-1,586.1	929.6	1,838.4	0.81	-0.10	
9,268.0	1.00	150.90	8,998.4	-1,587.2	930.1	1,839.6	0.55	0.53	
9,364.0	1.40	141.40	9,094.3	-1,588.8	931.3	1,841.6	0.46	0.42	
9,459.0	1.70	164.30	9,189.3	-1,591.1	932.4	1,844.1	0.72	0.32	
9,555.0	2.20	194.80	9,285.2	-1,594.3	932.3	1,846.8	1.18	0.52	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-6C2
Project:	Mamm Creek	TVD Reference:	KBE @ 7667.0ft (Nabors M11)
Site:	J16W Pad	MD Reference:	KBE @ 7667.0ft (Nabors M11)
Well:	HMU Federal 16-6C2	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
9,650.0	3.60	195.80	9,380.1	-1,598.9	931.0	1,850.2	1.47	1.47	
9,745.0	3.50	190.80	9,474.9	-1,604.6	929.6	1,854.5	0.34	-0.11	
9,840.0	2.40	190.60	9,569.8	-1,609.4	928.7	1,858.2	1.16	-1.16	
9,935.0	2.30	188.70	9,664.7	-1,613.3	928.1	1,861.2	0.13	-0.11	
10,030.0	2.30	200.80	9,759.7	-1,616.9	927.1	1,863.8	0.51	0.00	Last Cathedral Survey @ 10,030' MD - HMU Fed Projection To Bit @ 10,085' MD
10,085.0	2.30	200.80	9,814.6	-1,619.0	926.3	1,865.2	0.00	0.00	

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HMU Federal 16-6C2 TC - hit/miss target - Shape	0.00	0.00	7,621.0	-1,592.8	922.7	1,592,675.93	2,358,271.41	39.438618	-107.772418
- actual wellpath misses target center by 18.0ft at 7890.6ft MD (7621.1 TVD, -1586.4 N, 939.5 E)									
- Circle (radius 25.0)									
HMU Federal 16-6C2 Bt - hit/miss target - Shape	0.00	0.00	9,787.0	-1,592.8	922.7	1,592,675.93	2,358,271.41	39.438618	-107.772418
- actual wellpath misses target center by 36.7ft at 10030.0ft MD (9759.7 TVD, -1616.9 N, 927.1 E)									
- Circle (radius 60.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
10,030.0	9,759.7	-1,616.9	927.1	Last Cathedral Survey @ 10,030' MD	
10,085.0	9,814.6	-1,619.0	926.3	Projection To Bit @ 10,085' MD	

Checked By: _____ Approved By: _____ Date: _____