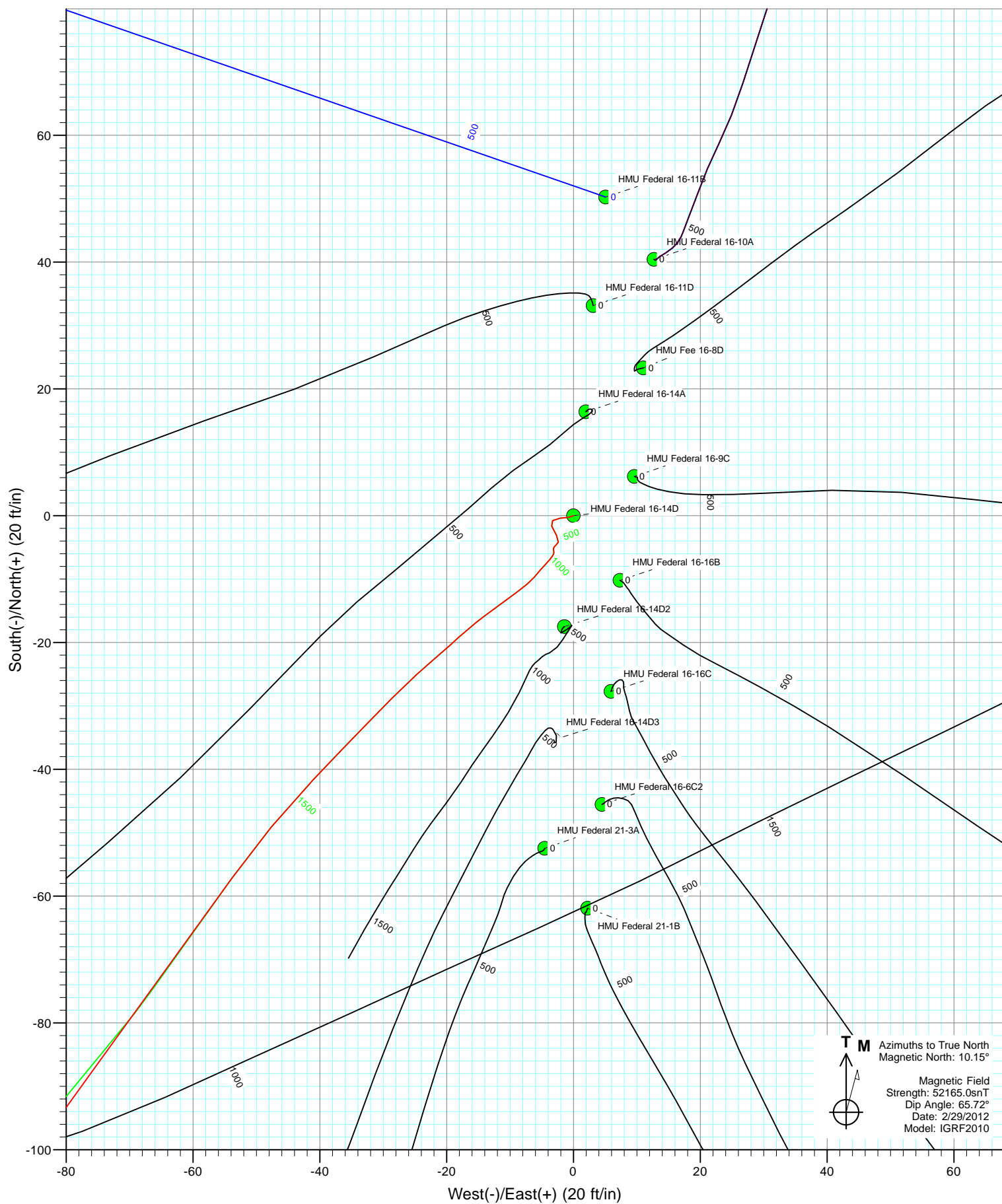
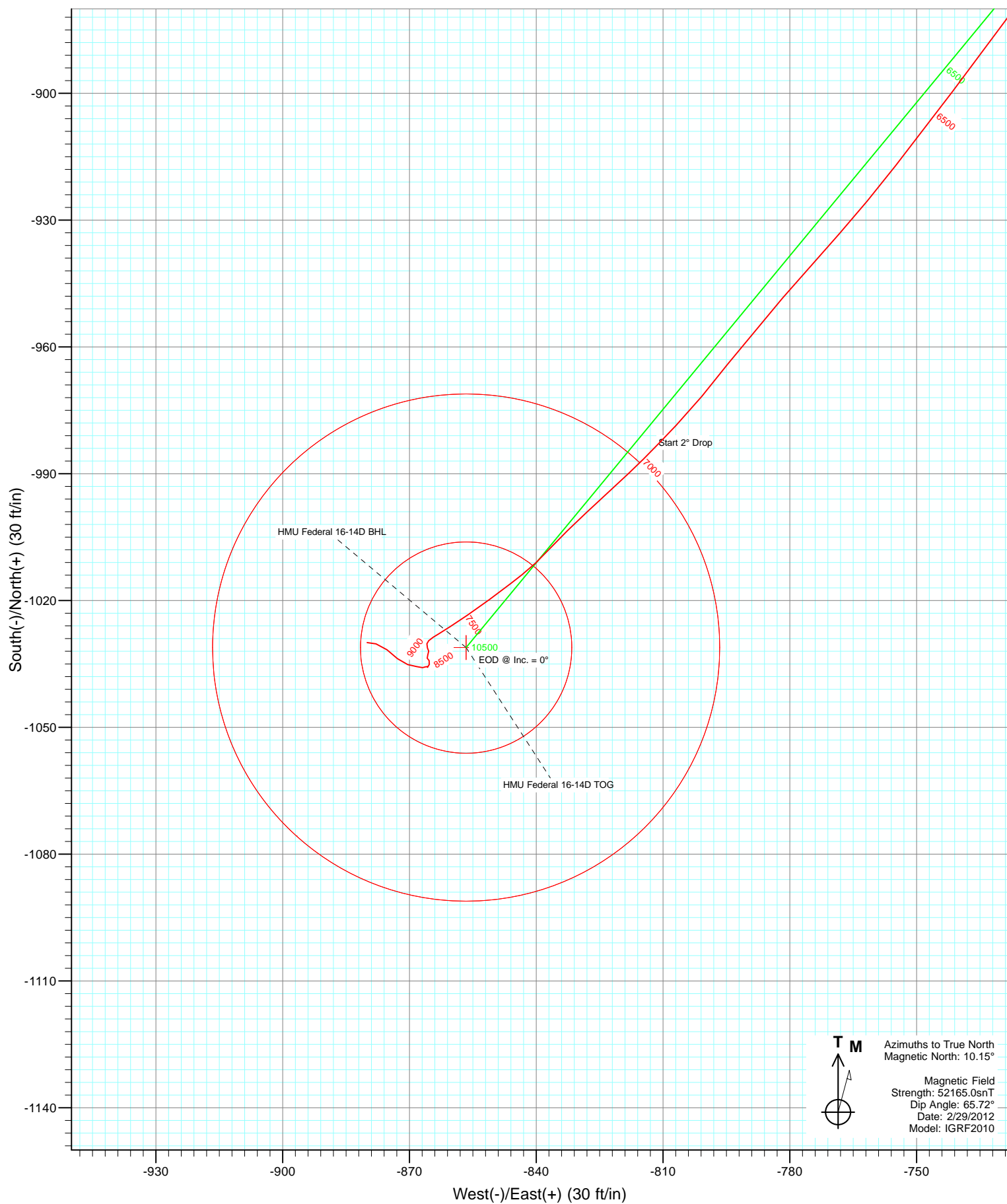


Azimuths to True North
 Magnetic North: 10.15°

Magnetic Field
 Strength: 52165.0snT
 Dip Angle: 65.72°
 Date: 2/29/2012
 Model: IGRF2010





Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	J16W Pad	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Well:	HMU Federal 16-14D	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 16-14D			
Well Position	+N/-S	0.0 ft	Northing:	1,594,336.94 ft
	+E/-W	0.0 ft	Easting:	2,357,385.51 ft
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	2/29/2012	10.15	65.72	52,165

Design	DD			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	219.72

Survey Program	Date	3/13/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
81.0	10,735.0	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	0.70	252.30	81.0	-0.2	-0.5	0.4	0.86	0.86	
112.0	0.70	260.20	112.0	-0.2	-0.8	0.7	0.31	0.00	
204.0	0.90	265.00	204.0	-0.4	-2.1	1.7	0.23	0.22	
295.0	0.70	235.90	295.0	-0.8	-3.3	2.7	0.49	-0.22	
387.0	0.80	147.90	387.0	-1.6	-3.4	3.4	1.14	0.11	
479.0	1.30	156.60	479.0	-3.1	-2.7	4.1	0.57	0.54	
571.0	0.20	251.20	570.9	-4.1	-2.4	4.7	1.45	-1.20	
662.0	0.50	203.10	661.9	-4.6	-2.7	5.2	0.43	0.33	
754.0	0.20	280.20	753.9	-4.9	-3.0	5.7	0.54	-0.33	
846.0	0.40	175.60	845.9	-5.2	-3.1	6.0	0.53	0.22	
937.0	0.30	173.80	936.9	-5.7	-3.1	6.4	0.11	-0.11	
968.0	0.70	186.50	967.9	-6.0	-3.1	6.6	1.33	1.29	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	J16W Pad	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Well:	HMU Federal 16-14D	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
999.0	0.90	226.00	998.9	-6.4	-3.3	7.0	1.85	0.65	
1,030.0	1.60	212.70	1,029.9	-6.9	-3.7	7.7	2.43	2.26	
1,060.0	2.20	228.90	1,059.9	-7.6	-4.4	8.7	2.67	2.00	
1,091.0	2.50	217.70	1,090.9	-8.6	-5.2	9.9	1.77	0.97	
1,122.0	2.80	220.60	1,121.9	-9.7	-6.1	11.4	1.06	0.97	
1,151.0	3.50	230.30	1,150.8	-10.8	-7.3	12.9	3.03	2.41	
1,182.0	4.10	233.30	1,181.7	-12.0	-8.9	15.0	2.04	1.94	
1,213.0	4.70	233.90	1,212.7	-13.5	-10.8	17.3	1.94	1.94	
1,244.0	5.20	233.50	1,243.5	-15.0	-13.0	19.9	1.62	1.61	
1,274.0	6.30	232.30	1,273.4	-16.9	-15.4	22.8	3.69	3.67	
1,304.0	7.00	227.00	1,303.2	-19.1	-18.0	26.2	3.10	2.33	
1,335.0	8.40	229.50	1,333.9	-21.9	-21.1	30.3	4.64	4.52	
1,366.0	9.60	227.80	1,364.5	-25.1	-24.7	35.1	3.96	3.87	
1,397.0	10.20	224.70	1,395.1	-28.8	-28.6	40.4	2.59	1.94	
1,488.0	12.50	223.50	1,484.3	-41.6	-41.0	58.2	2.54	2.53	
1,580.0	12.70	215.60	1,574.1	-57.1	-53.8	78.3	1.88	0.22	
1,742.0	12.70	216.20	1,732.1	-85.9	-74.7	113.8	0.08	0.00	
1,836.0	12.60	215.60	1,823.8	-102.6	-86.7	134.3	0.18	-0.11	
1,932.0	12.70	215.70	1,917.5	-119.7	-99.0	155.3	0.11	0.10	
2,027.0	12.50	215.10	2,010.2	-136.6	-111.0	176.0	0.25	-0.21	
2,123.0	12.30	214.30	2,104.0	-153.5	-122.7	196.5	0.27	-0.21	
2,218.0	13.00	218.80	2,196.7	-170.2	-135.1	217.3	1.27	0.74	
2,313.0	13.00	220.70	2,289.2	-186.6	-148.8	238.6	0.45	0.00	
2,408.0	13.20	218.00	2,381.8	-203.3	-162.4	260.2	0.68	0.21	
2,503.0	14.00	225.80	2,474.1	-219.8	-177.4	282.4	2.10	0.84	
2,599.0	14.00	222.60	2,567.2	-236.5	-193.5	305.6	0.81	0.00	
2,694.0	13.60	224.70	2,659.5	-252.9	-209.2	328.2	0.67	-0.42	
2,789.0	13.80	225.80	2,751.8	-268.7	-225.2	350.6	0.35	0.21	
2,884.0	13.80	225.60	2,844.1	-284.6	-241.4	373.1	0.05	0.00	
2,979.0	13.70	224.20	2,936.3	-300.5	-257.3	395.6	0.37	-0.11	
3,074.0	13.40	225.50	3,028.7	-316.3	-273.0	417.8	0.45	-0.32	
3,170.0	13.60	226.20	3,122.0	-331.9	-289.1	440.1	0.27	0.21	
3,265.0	13.00	219.30	3,214.5	-347.9	-303.9	461.8	1.78	-0.63	
3,360.0	12.80	219.90	3,307.1	-364.3	-317.4	483.0	0.25	-0.21	
3,455.0	13.20	218.90	3,399.7	-380.8	-331.0	504.4	0.48	0.42	
3,551.0	11.30	216.90	3,493.5	-396.8	-343.5	524.8	2.03	-1.98	
3,646.0	10.50	217.80	3,586.8	-411.1	-354.4	542.7	0.86	-0.84	
3,741.0	11.80	213.80	3,680.0	-426.0	-365.1	561.0	1.59	1.37	
3,835.0	11.60	217.10	3,772.0	-441.6	-376.2	580.0	0.74	-0.21	
3,930.0	12.90	215.00	3,864.9	-457.9	-388.0	600.1	1.45	1.37	
4,026.0	12.70	214.30	3,958.5	-475.4	-400.1	621.3	0.26	-0.21	
4,121.0	12.10	215.80	4,051.2	-492.1	-411.8	641.7	0.72	-0.63	
4,217.0	11.60	215.80	4,145.2	-508.1	-423.4	661.3	0.52	-0.52	
4,312.0	11.70	218.10	4,238.2	-523.4	-434.9	680.5	0.50	0.11	
4,408.0	12.80	220.60	4,332.1	-539.1	-447.8	700.8	1.27	1.15	
4,502.0	12.60	219.70	4,423.8	-554.9	-461.1	721.5	0.30	-0.21	
4,598.0	12.40	221.70	4,517.5	-570.7	-474.7	742.3	0.50	-0.21	
4,693.0	11.50	219.30	4,610.4	-585.6	-487.5	761.9	1.08	-0.95	
4,789.0	12.40	222.60	4,704.3	-600.6	-500.5	781.8	1.18	0.94	
4,884.0	12.30	219.80	4,797.1	-615.9	-513.9	802.1	0.64	-0.11	
4,980.0	11.80	220.60	4,891.0	-631.2	-526.8	822.2	0.55	-0.52	
5,075.0	11.40	220.70	4,984.1	-645.7	-539.3	841.3	0.42	-0.42	
5,170.0	13.50	217.90	5,076.9	-661.6	-552.2	861.7	2.30	2.21	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-14D
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	J16W Pad	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Well:	HMU Federal 16-14D	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
5,266.0	13.50	219.30	5,170.2	-679.1	-566.2	884.1	0.34	0.00	
5,361.0	13.00	217.90	5,262.7	-696.1	-579.8	905.9	0.63	-0.53	
5,457.0	12.70	218.60	5,356.3	-712.9	-593.0	927.3	0.35	-0.31	
5,552.0	12.20	221.00	5,449.0	-728.6	-606.1	947.7	0.76	-0.53	
5,646.0	12.40	222.50	5,540.9	-743.5	-619.4	967.7	0.40	0.21	
5,742.0	11.60	219.60	5,634.8	-758.6	-632.5	987.7	1.04	-0.83	
5,838.0	11.40	218.80	5,728.9	-773.4	-644.6	1,006.8	0.27	-0.21	
5,933.0	10.70	219.10	5,822.1	-787.6	-656.1	1,025.0	0.74	-0.74	
6,029.0	12.60	216.30	5,916.1	-802.9	-667.9	1,044.4	2.06	1.98	
6,124.0	11.30	215.30	6,009.1	-818.9	-679.4	1,064.0	1.39	-1.37	
6,220.0	11.70	218.40	6,103.1	-834.2	-690.9	1,083.1	0.77	0.42	
6,316.0	13.00	218.70	6,196.9	-850.2	-703.7	1,103.7	1.36	1.35	
6,411.0	12.40	218.10	6,289.6	-866.6	-716.7	1,124.5	0.65	-0.63	
6,507.0	12.00	216.30	6,383.4	-882.7	-728.9	1,144.8	0.57	-0.42	
6,602.0	13.70	217.10	6,476.0	-899.7	-741.6	1,165.9	1.80	1.79	
6,697.0	13.10	218.00	6,568.4	-917.1	-755.0	1,187.9	0.67	-0.63	
6,793.0	12.20	221.20	6,662.1	-933.3	-768.4	1,208.9	1.19	-0.94	
6,888.0	12.30	221.80	6,755.0	-948.4	-781.7	1,229.1	0.17	0.11	
6,984.0	12.20	217.60	6,848.8	-964.1	-794.7	1,249.4	0.93	-0.10	
7,079.0	10.80	223.00	6,941.9	-978.6	-806.9	1,268.3	1.86	-1.47	
7,174.0	8.70	226.70	7,035.5	-990.0	-818.2	1,284.4	2.31	-2.21	
7,270.0	7.70	227.60	7,130.5	-999.3	-828.3	1,297.9	1.05	-1.04	
7,365.0	6.50	222.80	7,224.8	-1,007.5	-836.6	1,309.6	1.41	-1.26	
7,460.0	4.90	232.50	7,319.3	-1,014.0	-843.5	1,318.9	1.96	-1.68	
7,555.0	5.00	232.70	7,413.9	-1,018.9	-850.0	1,326.9	0.11	0.11	
7,650.0	4.20	236.00	7,508.6	-1,023.4	-856.2	1,334.3	0.89	-0.84	
7,745.0	2.80	238.50	7,603.5	-1,026.6	-861.0	1,339.8	1.48	-1.47	
7,766.5	2.62	238.20	7,624.9	-1,027.1	-861.9	1,340.8	0.85	-0.85	HMU Federal 16-14D TOG
7,839.0	2.00	236.80	7,697.4	-1,028.7	-864.4	1,343.6	0.85	-0.85	
7,934.0	0.80	189.70	7,792.3	-1,030.2	-865.9	1,345.7	1.65	-1.26	
8,030.0	0.50	145.60	7,888.3	-1,031.2	-865.7	1,346.4	0.59	-0.31	
8,125.0	0.50	171.50	7,983.3	-1,032.0	-865.4	1,346.8	0.24	0.00	
8,221.0	0.70	212.10	8,079.3	-1,032.9	-865.7	1,347.7	0.48	0.21	
8,316.0	0.40	147.00	8,174.3	-1,033.7	-865.8	1,348.4	0.68	-0.32	
8,409.0	0.50	134.60	8,267.3	-1,034.2	-865.4	1,348.5	0.15	0.11	
8,504.0	0.80	202.70	8,362.3	-1,035.1	-865.3	1,349.2	0.81	0.32	
8,600.0	0.20	242.20	8,458.3	-1,035.8	-865.7	1,349.9	0.69	-0.62	
8,695.0	0.30	25.20	8,553.3	-1,035.7	-865.8	1,349.9	0.50	0.11	
8,791.0	0.50	235.70	8,649.3	-1,035.7	-866.0	1,350.0	0.81	0.21	
8,886.0	0.70	274.50	8,744.3	-1,035.9	-866.9	1,350.8	0.46	0.21	
8,981.0	1.00	282.10	8,839.3	-1,035.6	-868.3	1,351.5	0.34	0.32	
9,077.0	1.60	283.20	8,935.3	-1,035.2	-870.4	1,352.5	0.63	0.62	
9,172.0	1.90	315.00	9,030.2	-1,033.7	-872.8	1,352.9	1.05	0.32	
9,268.0	2.00	306.40	9,126.2	-1,031.6	-875.3	1,352.9	0.32	0.10	
9,363.0	1.60	286.40	9,221.1	-1,030.3	-877.9	1,353.5	0.78	-0.42	
9,458.0	1.00	265.40	9,316.1	-1,030.0	-880.0	1,354.6	0.80	-0.63	
9,554.0	0.30	53.10	9,412.1	-1,029.9	-880.7	1,354.9	1.32	-0.73	
9,649.0	2.80	56.90	9,507.1	-1,028.5	-878.5	1,352.5	2.63	2.63	
9,744.0	3.10	53.80	9,601.9	-1,025.7	-874.5	1,347.8	0.36	0.32	
9,840.0	3.00	61.80	9,697.8	-1,022.9	-870.2	1,342.9	0.46	-0.10	
9,935.0	2.30	56.30	9,792.7	-1,020.7	-866.4	1,338.8	0.78	-0.74	
10,030.0	2.30	63.00	9,887.6	-1,018.8	-863.1	1,335.2	0.28	0.00	
10,125.0	1.30	60.60	9,982.6	-1,017.4	-860.5	1,332.4	1.06	-1.05	

Survey Report

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Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	J16W Pad	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Well:	HMU Federal 16-14D	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
10,220.0	1.20	52.50	10,077.6	-1,016.3	-858.8	1,330.5	0.21	-0.11	
10,315.0	1.30	69.10	10,172.5	-1,015.3	-857.0	1,328.6	0.39	0.11	
10,411.0	0.70	87.20	10,268.5	-1,014.9	-855.4	1,327.2	0.70	-0.62	
10,506.0	0.60	47.50	10,363.5	-1,014.5	-854.4	1,326.3	0.48	-0.11	
10,601.0	0.90	45.80	10,458.5	-1,013.6	-853.5	1,325.1	0.32	0.32	
10,618.3	0.92	45.42	10,475.8	-1,013.4	-853.3	1,324.8	0.13	0.13	HMU Federal 16-14D BHL
10,680.0	1.00	44.20	10,537.5	-1,012.7	-852.6	1,323.8	0.13	0.13	Last Cathedral Survey @ 10,680' MD
10,735.0	1.00	44.20	10,592.5	-1,012.0	-851.9	1,322.8	0.00	0.00	PTB @ 10,735' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HMU Federal 16-14D TC - hit/miss target - Shape	0.00	0.00	7,625.0	-1,031.1	-856.6	1,593,327.60	2,356,503.36	39.440285	-107.778734
- actual wellpath misses target center by 6.7ft at 7766.5ft MD (7624.9 TVD, -1027.1 N, -861.9 E)									
- Circle (radius 25.0)									
HMU Federal 16-14D BHL - hit/miss target - Shape	0.00	0.00	10,476.0	-1,031.1	-856.6	1,593,327.60	2,356,503.36	39.440285	-107.778734
- actual wellpath misses target center by 18.0ft at 10618.3ft MD (10475.8 TVD, -1013.4 N, -853.3 E)									
- Circle (radius 60.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
10,680.0	10,537.5	-1,012.7	-852.6	Last Cathedral Survey @ 10,680' MD	
10,735.0	10,592.5	-1,012.0	-851.9	PTB @ 10,735' MD	

Checked By: _____ Approved By: _____ Date: _____