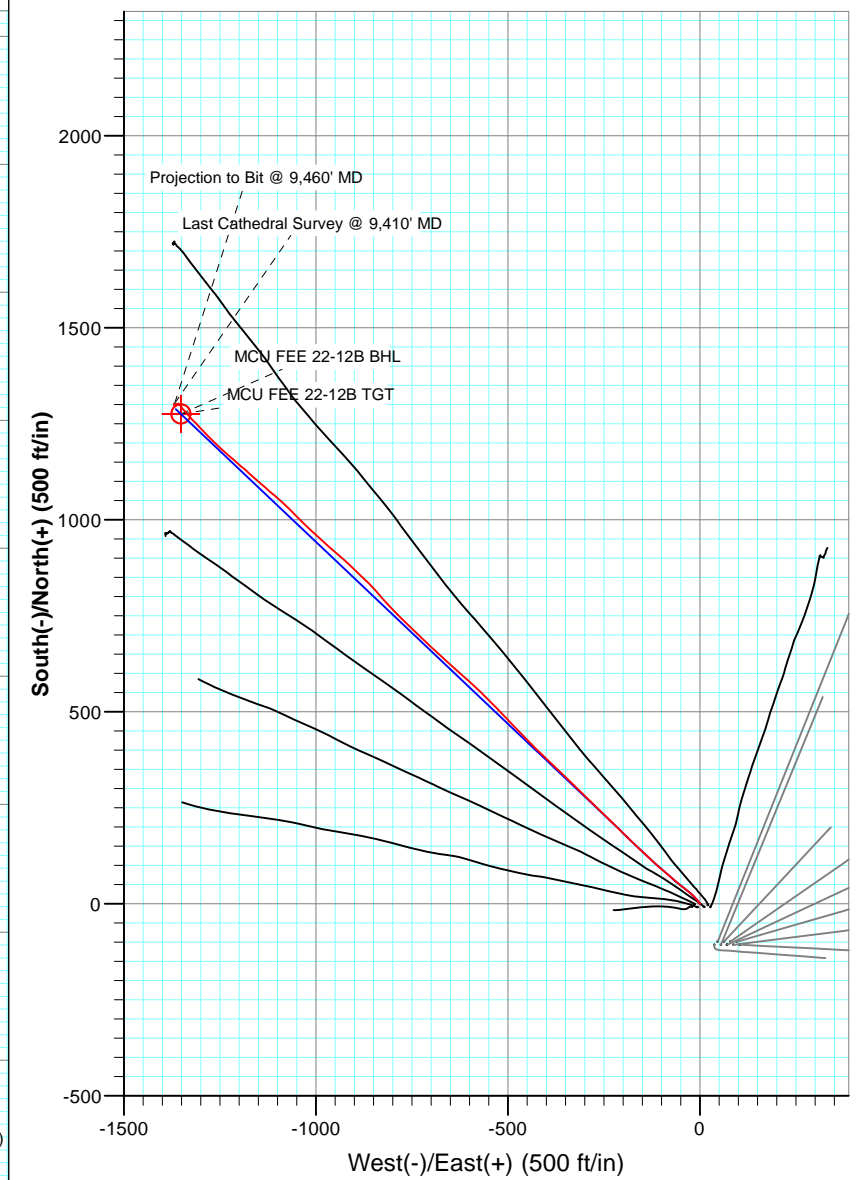
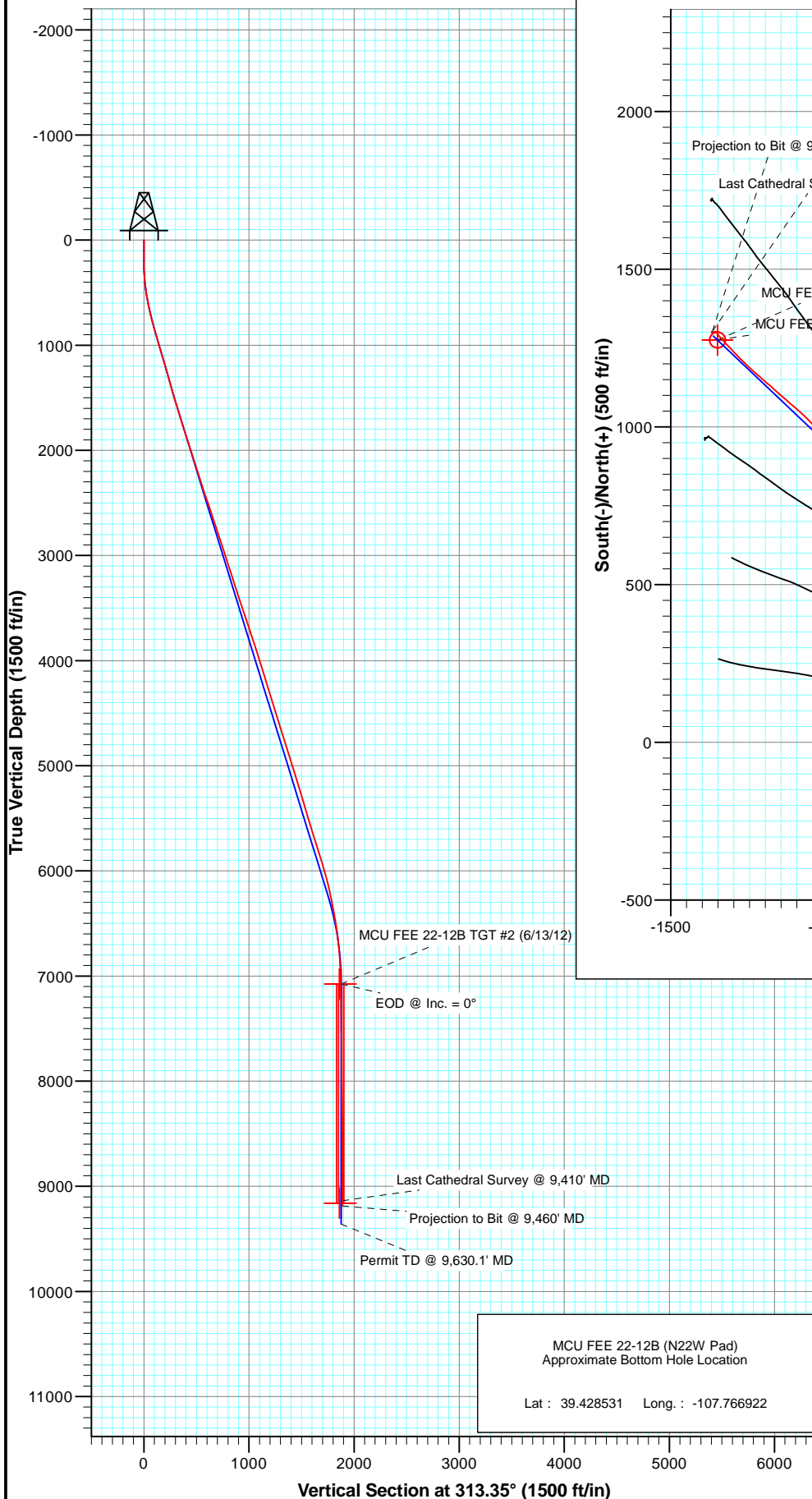




Project: Mamm Creek  
Site: N22W Pad  
Well: MCU FEE 22-12B (N22W Pad)  
Wellbore: DD  
Plan: FINAL



#### FORMATION TOP DETAILS

No formation data is available



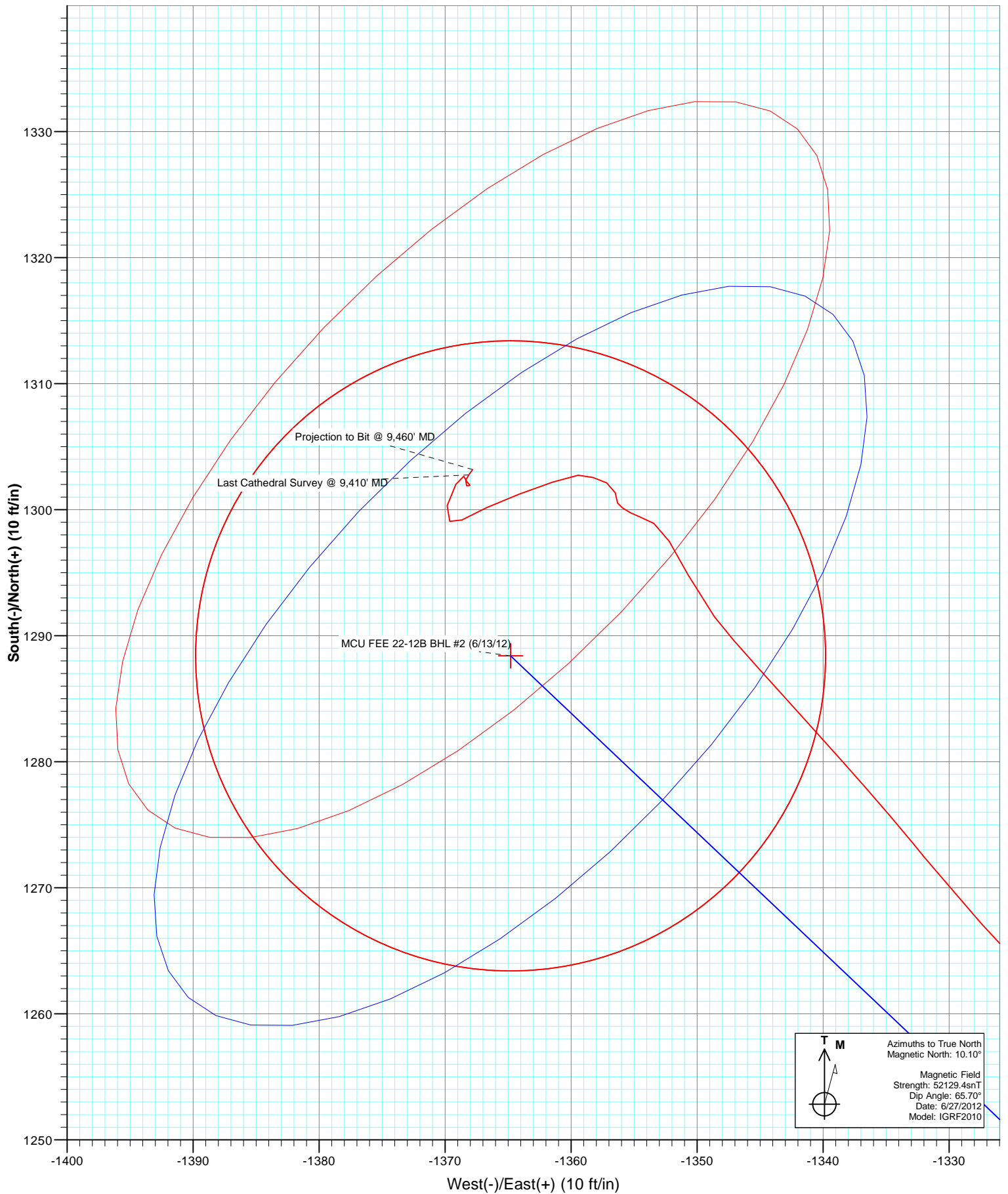
Azimuths to True North  
Magnetic North: 10.10°

Magnetic Field  
Strength: 52129.4snT  
Dip Angle: 65.70°  
Date: 6/27/2012  
Model: IGRF2010

#### DESIGN DETAILS: FINAL

125330/167455 (SH) 125386/168055 (MH); SC  
KBE @ 7048.0ft (Nabors M15)

Target	MCU FEE 22-12B BHL	313.35 Azimuth	Origin Type Slot	N/S 0.0	E/W 0.0



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well MCU FEE 22-12B (N22W Pad)
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Site:</b>	N22W Pad	<b>MD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Well:</b>	MCU FEE 22-12B (N22W Pad)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

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

<b>Site</b>	N22W Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,587,870.64 ft	<b>Latitude:</b> 39.425629
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,361,187.41 ft	<b>Longitude:</b> -107.761673
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> -1.43 °

<b>Well</b>	MCU FEE 22-12B (N22W Pad)			
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	1,587,979.52 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	2,361,086.14 ft
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	ft
			<b>Ground Level:</b>	7,026.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	6/27/2012	10.10	65.70	52,129

<b>Design</b>	FINAL			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b> 0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	313.35

<b>Survey Program</b>	<b>Date</b>	8/6/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
154.0	1,411.0	Survey #1 (DD)	MWD	Geolink MWD	
1,549.0	9,460.0	Survey #2 (DD)	MWD	Geolink MWD	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
154.0	0.30	295.30	154.0	0.2	-0.4	0.4	0.19	0.19	
185.0	0.30	348.90	185.0	0.3	-0.5	0.5	0.87	0.00	
215.0	0.60	349.50	215.0	0.5	-0.5	0.7	1.00	1.00	
246.0	0.80	348.30	246.0	0.9	-0.6	1.0	0.65	0.65	
277.0	1.20	327.20	277.0	1.4	-0.8	1.5	1.73	1.29	
307.0	2.20	323.70	307.0	2.1	-1.3	2.4	3.35	3.33	
338.0	3.20	322.80	337.9	3.3	-2.2	3.8	3.23	3.23	
369.0	4.60	326.50	368.9	5.0	-3.4	5.9	4.59	4.52	
399.0	5.90	321.70	398.7	7.2	-5.0	8.6	4.57	4.33	
430.0	7.00	321.90	429.5	9.9	-7.2	12.0	3.55	3.55	
460.0	7.70	319.30	459.3	12.9	-9.6	15.8	2.58	2.33	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well MCU FEE 22-12B (N22W Pad)
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Site:</b>	N22W Pad	<b>MD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Well:</b>	MCU FEE 22-12B (N22W Pad)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
491.0	8.60	319.10	490.0	16.2	-12.5	20.2	2.90	2.90	
521.0	9.50	313.80	519.6	19.6	-15.7	24.9	4.09	3.00	
552.0	10.00	313.40	550.2	23.3	-19.5	30.2	1.63	1.61	
583.0	10.50	312.50	580.7	27.0	-23.6	35.7	1.69	1.61	
613.0	11.30	309.60	610.1	30.7	-27.8	41.4	3.23	2.67	
644.0	11.70	308.20	640.5	34.6	-32.7	47.5	1.57	1.29	
674.0	12.20	308.30	669.9	38.5	-37.5	53.7	1.67	1.67	
705.0	12.90	308.00	700.1	42.6	-42.8	60.4	2.27	2.26	
736.0	13.70	307.00	730.3	47.0	-48.5	67.5	2.69	2.58	
767.0	15.00	308.10	760.3	51.7	-54.6	75.1	4.28	4.19	
859.0	17.50	311.40	848.6	68.2	-74.3	100.8	2.90	2.72	
949.0	16.30	311.60	934.7	85.5	-93.9	127.0	1.33	-1.33	
1,041.0	16.10	310.40	1,023.1	102.3	-113.3	152.6	0.42	-0.22	
1,132.0	16.00	314.60	1,110.6	119.3	-131.8	177.8	1.28	-0.11	
1,223.0	16.00	312.50	1,198.0	136.6	-150.0	202.8	0.64	0.00	
1,316.0	15.70	313.30	1,287.5	153.9	-168.6	228.2	0.40	-0.32	
1,411.0	15.90	314.60	1,378.9	171.8	-187.2	254.1	0.43	0.21	
1,549.0	15.90	315.00	1,511.6	198.5	-214.1	291.9	0.08	0.00	
1,645.0	17.40	312.30	1,603.6	217.4	-234.0	319.4	1.76	1.56	
1,740.0	17.40	314.30	1,694.2	236.9	-254.7	347.8	0.63	0.00	
1,836.0	17.30	314.90	1,785.9	257.0	-275.0	376.4	0.21	-0.10	
1,931.0	18.20	314.90	1,876.4	277.5	-295.5	405.4	0.95	0.95	
2,026.0	18.10	315.10	1,966.6	298.4	-316.5	435.0	0.12	-0.11	
2,122.0	17.30	313.90	2,058.1	318.8	-337.3	464.1	0.92	-0.83	
2,216.0	18.00	312.80	2,147.7	338.4	-358.0	492.6	0.82	0.74	
2,312.0	17.90	312.80	2,239.0	358.5	-379.7	522.2	0.10	-0.10	
2,407.0	17.70	314.40	2,329.4	378.5	-400.8	551.3	0.56	-0.21	
2,503.0	18.80	315.30	2,420.6	399.7	-422.1	581.3	1.18	1.15	
2,598.0	18.70	314.60	2,510.6	421.3	-443.7	611.8	0.26	-0.11	
2,694.0	18.60	315.00	2,601.5	442.9	-465.5	642.5	0.17	-0.10	
2,789.0	18.20	316.60	2,691.7	464.4	-486.4	672.5	0.68	-0.42	
2,884.0	18.40	316.60	2,781.9	486.1	-506.9	702.3	0.21	0.21	
2,980.0	18.20	316.00	2,873.0	507.9	-527.7	732.4	0.29	-0.21	
3,075.0	18.20	315.60	2,963.3	529.2	-548.4	762.0	0.13	0.00	
3,171.0	17.10	314.70	3,054.7	549.8	-568.9	791.1	1.18	-1.15	
3,266.0	18.20	311.40	3,145.3	569.4	-589.9	819.9	1.56	1.16	
3,362.0	18.50	312.80	3,236.4	589.7	-612.4	850.1	0.56	0.31	
3,457.0	18.20	311.60	3,326.6	609.8	-634.5	880.0	0.51	-0.32	
3,552.0	18.10	311.80	3,416.8	629.5	-656.6	909.6	0.12	-0.11	
3,648.0	18.20	312.50	3,508.1	649.6	-678.8	939.5	0.25	0.10	
3,743.0	18.40	313.20	3,598.2	669.8	-700.7	969.3	0.31	0.21	
3,837.0	18.60	313.90	3,687.4	690.4	-722.3	999.1	0.32	0.21	
3,933.0	18.30	313.70	3,778.5	711.4	-744.2	1,029.5	0.32	-0.31	
4,028.0	17.80	314.20	3,868.8	731.8	-765.4	1,059.0	0.55	-0.53	
4,123.0	17.90	315.00	3,959.2	752.3	-786.1	1,088.1	0.28	0.11	
4,218.0	17.10	316.60	4,049.8	772.8	-806.0	1,116.6	0.98	-0.84	
4,314.0	17.40	317.50	4,141.5	793.6	-825.4	1,145.0	0.42	0.31	
4,410.0	17.30	319.80	4,233.1	815.1	-844.4	1,173.5	0.72	-0.10	
4,505.0	16.80	314.60	4,324.0	835.5	-863.2	1,201.3	1.69	-0.53	
4,600.0	17.10	313.10	4,414.8	854.7	-883.2	1,229.0	0.56	0.32	
4,695.0	17.00	314.70	4,505.7	874.0	-903.3	1,256.8	0.50	-0.11	
4,791.0	17.40	311.80	4,597.4	893.5	-924.0	1,285.2	0.99	0.42	
4,886.0	17.40	310.40	4,688.0	912.1	-945.4	1,313.6	0.44	0.00	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well MCU FEE 22-12B (N22W Pad)
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Site:</b>	N22W Pad	<b>MD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Well:</b>	MCU FEE 22-12B (N22W Pad)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
4,982.0	17.60	311.50	4,779.6	931.0	-967.2	1,342.4	0.40	0.21	
5,078.0	18.20	313.20	4,870.9	950.9	-989.0	1,371.9	0.83	0.62	
5,173.0	17.10	312.30	4,961.5	970.5	-1,010.1	1,400.7	1.19	-1.16	
5,269.0	17.10	314.40	5,053.2	989.9	-1,030.6	1,428.9	0.64	0.00	
5,365.0	17.10	316.00	5,145.0	1,009.9	-1,050.5	1,457.2	0.49	0.00	
5,460.0	17.00	313.80	5,235.8	1,029.5	-1,070.3	1,485.0	0.69	-0.11	
5,556.0	16.30	312.00	5,327.8	1,048.3	-1,090.4	1,512.5	0.91	-0.73	
5,651.0	16.10	309.90	5,419.0	1,065.6	-1,110.4	1,539.0	0.65	-0.21	
5,747.0	17.50	311.50	5,510.9	1,083.7	-1,131.4	1,566.7	1.54	1.46	
5,842.0	16.60	311.00	5,601.7	1,102.1	-1,152.4	1,594.5	0.96	-0.95	
5,937.0	18.20	312.00	5,692.4	1,120.9	-1,173.6	1,622.9	1.71	1.68	
6,031.0	17.00	310.50	5,782.0	1,139.7	-1,195.0	1,651.3	1.36	-1.28	
6,127.0	17.10	310.70	5,873.8	1,158.0	-1,216.4	1,679.4	0.12	0.10	
6,223.0	16.60	311.50	5,965.6	1,176.3	-1,237.3	1,707.2	0.57	-0.52	
6,318.0	14.80	314.80	6,057.1	1,193.8	-1,256.1	1,732.9	2.11	-1.89	
6,413.0	13.40	315.60	6,149.2	1,210.3	-1,272.4	1,756.1	1.49	-1.47	
6,508.0	11.70	312.90	6,241.9	1,224.7	-1,287.2	1,776.7	1.89	-1.79	
6,603.0	11.00	317.30	6,335.1	1,237.9	-1,300.4	1,795.4	1.17	-0.74	
6,698.0	9.80	317.70	6,428.5	1,250.5	-1,312.0	1,812.5	1.27	-1.26	
6,793.0	9.00	316.30	6,522.3	1,261.9	-1,322.6	1,828.0	0.88	-0.84	
6,888.0	8.00	320.40	6,616.2	1,272.4	-1,331.9	1,841.9	1.23	-1.05	
6,984.0	5.90	317.90	6,711.5	1,281.2	-1,339.5	1,853.5	2.21	-2.19	
7,079.0	4.10	317.60	6,806.1	1,287.3	-1,345.0	1,861.7	1.89	-1.89	
7,175.0	2.50	323.00	6,902.0	1,291.5	-1,348.6	1,867.2	1.70	-1.67	
7,271.0	2.20	333.10	6,997.9	1,294.8	-1,350.7	1,871.0	0.53	-0.31	
7,348.1	1.63	328.62	7,075.0	1,297.1	-1,351.9	1,873.5	0.76	-0.74	MCU FEE 22-12B TGT #2 (6/13/12)
7,366.0	1.50	327.10	7,092.8	1,297.5	-1,352.2	1,874.0	0.76	-0.73	
7,461.0	0.80	304.20	7,187.8	1,298.9	-1,353.4	1,875.8	0.87	-0.74	
7,557.0	0.60	284.00	7,283.8	1,299.4	-1,354.5	1,876.9	0.33	-0.21	
7,652.0	0.50	305.40	7,378.8	1,299.8	-1,355.3	1,877.8	0.24	-0.11	
7,747.0	0.40	295.60	7,473.8	1,300.2	-1,355.9	1,878.5	0.13	-0.11	
7,843.0	0.30	342.40	7,569.8	1,300.5	-1,356.3	1,879.0	0.30	-0.10	
7,938.0	0.70	348.20	7,664.8	1,301.3	-1,356.5	1,879.7	0.42	0.42	
8,034.0	0.70	290.80	7,760.8	1,302.1	-1,357.2	1,880.7	0.70	0.00	
8,129.0	0.70	293.00	7,855.8	1,302.6	-1,358.2	1,881.8	0.03	0.00	
8,224.0	0.80	265.30	7,950.8	1,302.7	-1,359.4	1,882.8	0.39	0.11	
8,320.0	1.70	250.20	8,046.8	1,302.2	-1,361.4	1,883.9	0.99	0.94	
8,415.0	1.70	250.30	8,141.7	1,301.2	-1,364.1	1,885.2	0.00	0.00	
8,511.0	1.70	244.70	8,237.7	1,300.2	-1,366.7	1,886.3	0.17	0.00	
8,606.0	0.90	240.60	8,332.6	1,299.2	-1,368.7	1,887.1	0.85	-0.84	
8,701.0	0.50	308.30	8,427.6	1,299.1	-1,369.6	1,887.7	0.89	-0.42	
8,796.0	1.20	6.80	8,522.6	1,300.3	-1,369.8	1,888.7	1.09	0.74	
8,891.0	1.10	39.00	8,617.6	1,302.0	-1,369.1	1,889.4	0.68	-0.11	
8,986.0	0.10	141.60	8,712.6	1,302.7	-1,368.5	1,889.4	1.19	-1.05	
9,082.0	0.50	151.20	8,808.6	1,302.2	-1,368.3	1,888.9	0.42	0.42	
9,177.0	0.10	37.40	8,903.6	1,301.9	-1,368.0	1,888.5	0.58	-0.42	
9,272.0	0.40	254.40	8,998.6	1,301.9	-1,368.3	1,888.7	0.51	0.32	
9,367.0	0.70	25.20	9,093.6	1,302.3	-1,368.4	1,889.0	1.06	0.32	
9,410.0	0.60	36.10	9,136.6	1,302.8	-1,368.1	1,889.1	0.37	-0.23	Last Cathedral Survey @ 9,410' MD - MCU FEE :
9,460.0	0.60	36.10	9,186.6	1,303.2	-1,367.8	1,889.2	0.00	0.00	Projection to Bit @ 9,460' MD

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well MCU FEE 22-12B (N22W Pad)
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Site:</b>	N22W Pad	<b>MD Reference:</b>	KBE @ 7048.0ft (Nabors M15)
<b>Well:</b>	MCU FEE 22-12B (N22W Pad)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
MCU FEE 22-12B BHL #	0.00	0.00	9,160.0	1,288.4	-1,364.8	1,589,301.50	2,359,753.84	39.429458	-107.766873
- actual wellpath misses target center by 27.7ft at 9410.0ft MD (9136.6 TVD, 1302.8 N, -1368.1 E)									
- Circle (radius 25.0)									
MCU FEE 22-12B TGT #	0.00	0.00	7,075.0	1,288.4	-1,364.8	1,589,301.50	2,359,753.84	39.429458	-107.766873
- actual wellpath misses target center by 15.5ft at 7348.1ft MD (7075.0 TVD, 1297.1 N, -1351.9 E)									
- Point									
MCU FEE 22-12B BHL	0.00	0.00	9,160.0	1,276.0	-1,351.6	1,589,288.76	2,359,766.72	39.429424	-107.766826
- actual wellpath misses target center by 39.2ft at 9410.0ft MD (9136.6 TVD, 1302.8 N, -1368.1 E)									
- Circle (radius 25.0)									
MCU FEE 22-12B TGT	0.00	0.00	7,075.0	1,276.0	-1,351.6	1,589,288.76	2,359,766.72	39.429424	-107.766826
- actual wellpath misses target center by 21.1ft at 7347.5ft MD (7074.4 TVD, 1297.1 N, -1351.9 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	Comment	
9,410.0	9,136.6	1,302.8	-1,368.1	Last Cathedral Survey @ 9,410' MD	
9,460.0	9,186.6	1,303.2	-1,367.8	Projection to Bit @ 9,460' MD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_