

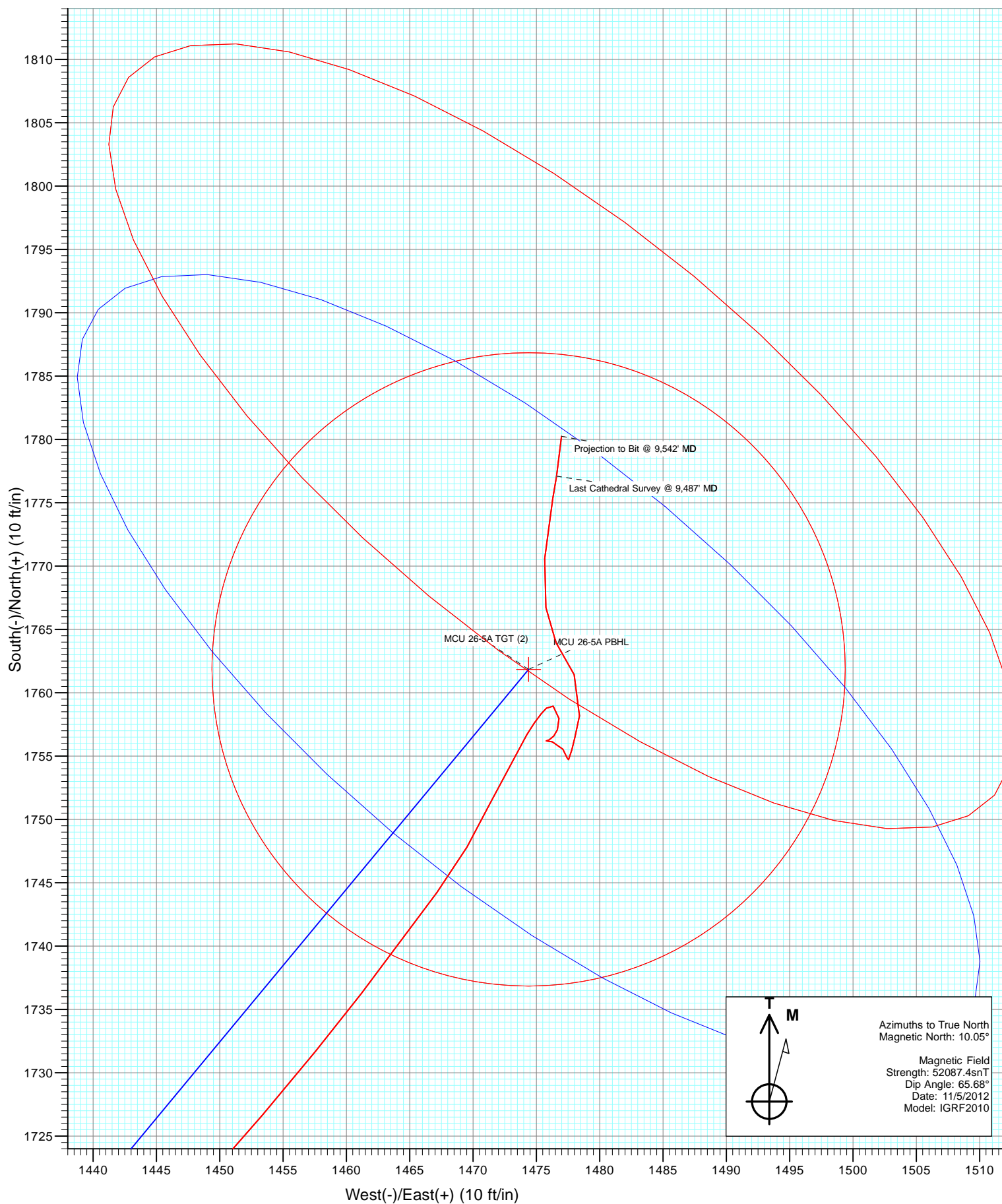
FORMATION TOP DETAILS

No formation data is available



Azimuths to True North
 Magnetic North: 10.05°

Magnetic Field
 Strength: 52087.4snT
 Dip Angle: 65.68°
 Date: 11/5/2012
 Model: IGRF2010



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 26-5A (I27W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7223.0ft (Original Well Elev)
Site:	I27W	MD Reference:	KBE @ 7223.0ft (Original Well Elev)
Well:	MCU 26-5A (I27W Pad)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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		I27W			
Site Position:		Northing:	1,584,160.49 ft	Latitude:	39.415612
From:	Lat/Long	Easting:	2,363,622.14 ft	Longitude:	-107.752731
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.42 °

Well	MCU 26-5A (I27W Pad)					
Well Position	+N/-S	0.0 ft	Northing:	1,584,157.43 ft	Latitude:	39.415602
	+E/-W	0.0 ft	Easting:	2,363,598.04 ft	Longitude:	-107.752816
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,201.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/5/2012	10.05	65.68	52,087

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	43.24	

Survey Program	Date	11/20/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
154.0	9,542.0	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		
154.0	0.20	165.10	154.0	-0.3	0.1	-0.1	0.13	0.13		
184.0	0.30	77.00	184.0	-0.3	0.2	-0.1	1.18	0.33		
215.0	0.90	65.00	215.0	-0.2	0.5	0.2	1.97	1.94		
245.0	1.90	60.50	245.0	0.2	1.1	0.9	3.35	3.33		
276.0	2.90	68.40	276.0	0.7	2.3	2.1	3.39	3.23		
306.0	3.70	63.10	305.9	1.4	3.9	3.7	2.85	2.67		
336.0	4.20	60.60	335.8	2.4	5.7	5.6	1.76	1.67		
367.0	4.60	51.20	366.7	3.7	7.6	8.0	2.66	1.29		
397.0	5.10	51.70	396.6	5.3	9.6	10.5	1.67	1.67		
428.0	5.50	42.90	427.5	7.3	11.7	13.3	2.92	1.29		
458.0	6.20	43.80	457.4	9.5	13.8	16.4	2.35	2.33		
489.0	7.00	48.30	488.1	12.0	16.4	19.9	3.07	2.58		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 26-5A (I27W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7223.0ft (Original Well Elev)
Site:	I27W	MD Reference:	KBE @ 7223.0ft (Original Well Elev)
Well:	MCU 26-5A (I27W Pad)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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
581.0	10.00	53.30	579.1	20.5	27.0	33.4	3.36	3.26	
672.0	13.60	50.50	668.2	32.0	41.6	51.8	4.00	3.96	
763.0	15.60	45.10	756.3	47.4	58.5	74.6	2.66	2.20	
854.0	17.80	41.70	843.4	66.5	76.4	100.8	2.64	2.42	
946.0	20.50	36.20	930.3	90.0	95.3	130.8	3.53	2.93	
1,039.0	21.80	36.10	1,017.1	117.1	115.1	164.1	1.40	1.40	
1,135.0	21.10	38.50	1,106.4	145.0	136.3	199.0	1.17	-0.73	
1,230.0	22.10	39.30	1,194.7	172.2	158.3	233.9	1.10	1.05	
1,326.0	23.40	40.00	1,283.3	200.8	182.0	270.9	1.38	1.35	
1,420.0	21.50	39.90	1,370.1	228.3	205.0	306.8	2.02	-2.02	
1,430.0	21.50	39.90	1,379.4	231.1	207.4	310.4	0.00	0.00	
1,549.0	22.10	39.40	1,489.9	265.1	235.6	354.5	0.53	0.50	
1,644.0	20.90	40.30	1,578.3	291.9	257.9	389.3	1.31	-1.26	
1,740.0	20.50	39.60	1,668.1	317.9	279.7	423.2	0.49	-0.42	
1,835.0	20.20	38.20	1,757.2	343.6	300.4	456.1	0.60	-0.32	
1,930.0	20.10	38.20	1,846.4	369.3	320.7	488.7	0.11	-0.11	
2,025.0	19.80	38.00	1,935.7	394.8	340.7	521.0	0.32	-0.32	
2,121.0	19.70	41.50	2,026.0	419.7	361.4	553.4	1.24	-0.10	
2,216.0	19.80	41.30	2,115.4	443.8	382.6	585.4	0.13	0.11	
2,311.0	20.00	41.00	2,204.8	468.2	403.9	617.8	0.24	0.21	
2,406.0	20.00	39.10	2,294.0	493.0	424.8	650.2	0.68	0.00	
2,502.0	19.40	39.10	2,384.4	518.2	445.2	682.5	0.62	-0.62	
2,597.0	19.10	37.40	2,474.1	542.7	464.6	713.7	0.67	-0.32	
2,692.0	18.60	39.10	2,564.0	566.9	483.6	744.2	0.78	-0.53	
2,787.0	18.90	40.20	2,654.0	590.4	503.1	774.7	0.49	0.32	
2,883.0	18.20	38.40	2,745.0	614.0	522.4	805.2	0.94	-0.73	
2,978.0	18.10	40.30	2,835.3	636.9	541.2	834.7	0.63	-0.11	
3,073.0	17.30	38.90	2,925.8	659.1	559.6	863.5	0.95	-0.84	
3,169.0	18.20	41.30	3,017.2	681.5	578.5	892.8	1.21	0.94	
3,264.0	18.50	41.50	3,107.4	703.9	598.3	922.6	0.32	0.32	
3,359.0	18.70	42.00	3,197.4	726.5	618.4	952.9	0.27	0.21	
3,454.0	19.70	42.80	3,287.1	749.6	639.5	984.2	1.09	1.05	
3,549.0	20.40	42.40	3,376.4	773.6	661.6	1,016.7	0.75	0.74	
3,644.0	21.00	41.80	3,465.2	798.5	684.1	1,050.3	0.67	0.63	
3,739.0	21.60	40.20	3,553.7	824.5	706.7	1,084.8	0.88	0.63	
3,834.0	21.10	40.00	3,642.2	851.0	729.0	1,119.3	0.53	-0.53	
3,929.0	21.00	39.10	3,730.9	877.3	750.7	1,153.4	0.36	-0.11	
4,024.0	20.40	39.10	3,819.7	903.4	771.9	1,186.9	0.63	-0.63	
4,119.0	19.60	38.10	3,909.0	928.7	792.2	1,219.3	0.92	-0.84	
4,214.0	18.60	39.10	3,998.8	953.0	811.5	1,250.2	1.11	-1.05	
4,310.0	17.90	38.40	4,090.0	976.5	830.4	1,280.2	0.76	-0.73	
4,405.0	17.60	38.80	4,180.4	999.1	848.4	1,309.1	0.34	-0.32	
4,501.0	17.90	38.40	4,271.9	1,022.0	866.7	1,338.2	0.34	0.31	
4,597.0	18.20	39.80	4,363.1	1,045.1	885.4	1,367.9	0.55	0.31	
4,692.0	19.40	39.40	4,453.1	1,068.7	905.0	1,398.5	1.27	1.26	
4,787.0	20.40	41.00	4,542.4	1,093.4	925.8	1,430.8	1.20	1.05	
4,882.0	21.50	41.10	4,631.1	1,119.0	948.1	1,464.7	1.16	1.16	
4,977.0	20.40	40.90	4,719.8	1,144.6	970.4	1,498.6	1.16	-1.16	
5,072.0	19.30	39.80	4,809.2	1,169.2	991.3	1,530.9	1.22	-1.16	
5,167.0	17.80	39.60	4,899.2	1,192.4	1,010.6	1,561.0	1.58	-1.58	
5,262.0	19.80	39.60	4,989.2	1,216.0	1,030.1	1,591.6	2.11	2.11	
5,357.0	19.60	39.70	5,078.6	1,240.7	1,050.6	1,623.5	0.21	-0.21	
5,452.0	19.00	39.10	5,168.3	1,264.9	1,070.5	1,654.9	0.67	-0.63	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 26-5A (I27W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7223.0ft (Original Well Elev)
Site:	I27W	MD Reference:	KBE @ 7223.0ft (Original Well Elev)
Well:	MCU 26-5A (I27W Pad)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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
5,547.0	18.80	39.40	5,258.2	1,288.8	1,090.0	1,685.6	0.23	-0.21	
5,642.0	17.90	38.50	5,348.3	1,312.0	1,108.8	1,715.4	0.99	-0.95	
5,738.0	18.50	39.80	5,439.5	1,335.3	1,127.7	1,745.3	0.75	0.62	
5,833.0	19.20	37.20	5,529.4	1,359.3	1,146.8	1,775.9	1.15	0.74	
5,927.0	18.50	42.00	5,618.4	1,382.7	1,166.1	1,806.1	1.81	-0.74	
6,022.0	19.60	41.20	5,708.2	1,405.9	1,186.7	1,837.1	1.19	1.16	
6,117.0	18.70	41.70	5,797.9	1,429.2	1,207.3	1,868.3	0.96	-0.95	
6,212.0	20.00	39.70	5,887.6	1,453.1	1,227.8	1,899.7	1.54	1.37	
6,307.0	18.90	40.40	5,977.1	1,477.3	1,248.2	1,931.3	1.18	-1.16	
6,403.0	19.50	38.80	6,067.8	1,501.7	1,268.3	1,962.8	0.83	0.62	
6,498.0	18.40	40.10	6,157.6	1,525.5	1,287.9	1,993.6	1.24	-1.16	
6,594.0	19.00	39.10	6,248.6	1,549.2	1,307.5	2,024.3	0.71	0.62	
6,689.0	19.60	40.60	6,338.2	1,573.3	1,327.6	2,055.7	0.82	0.63	
6,784.0	20.00	39.10	6,427.6	1,598.0	1,348.3	2,087.8	0.68	0.42	
6,879.0	18.40	39.10	6,517.3	1,622.3	1,368.0	2,118.9	1.68	-1.68	
6,975.0	17.10	40.60	6,608.8	1,644.7	1,386.7	2,148.1	1.44	-1.35	
7,070.0	15.50	38.90	6,699.9	1,665.2	1,403.8	2,174.8	1.76	-1.68	
7,163.0	14.00	36.90	6,789.9	1,683.9	1,418.3	2,198.3	1.70	-1.61	
7,258.0	12.10	37.20	6,882.4	1,701.0	1,431.2	2,219.7	2.00	-2.00	
7,354.0	10.10	43.10	6,976.6	1,715.2	1,443.1	2,238.1	2.39	-2.08	
7,450.0	8.40	40.30	7,071.4	1,726.7	1,453.4	2,253.5	1.83	-1.77	
7,545.0	6.50	37.70	7,165.6	1,736.2	1,461.2	2,265.8	2.03	-2.00	
7,640.0	5.60	35.70	7,260.0	1,744.2	1,467.1	2,275.7	0.97	-0.95	
7,736.0	3.90	24.20	7,355.7	1,751.0	1,471.2	2,283.5	2.02	-1.77	
7,832.0	3.80	32.00	7,451.5	1,756.7	1,474.2	2,289.7	0.55	-0.10	
7,841.2	3.42	33.11	7,460.7	1,757.2	1,474.6	2,290.2	4.23	-4.16	MCU 26-5A TGT (2)
7,927.0	0.70	134.90	7,546.4	1,758.9	1,476.3	2,292.7	4.23	-3.17	
8,022.0	0.70	174.90	7,641.4	1,758.0	1,476.8	2,292.3	0.50	0.00	
8,118.0	0.40	209.70	7,737.4	1,757.1	1,476.7	2,291.6	0.45	-0.31	
8,213.0	0.30	210.70	7,832.4	1,756.6	1,476.4	2,291.1	0.11	-0.11	
8,308.0	0.30	251.30	7,927.4	1,756.3	1,476.0	2,290.6	0.22	0.00	
8,404.0	0.00	237.60	8,023.4	1,756.2	1,475.8	2,290.4	0.31	-0.31	
8,499.0	0.60	100.10	8,118.4	1,756.1	1,476.3	2,290.6	0.63	0.63	
8,595.0	0.70	145.70	8,214.4	1,755.5	1,477.1	2,290.8	0.53	0.10	
8,690.0	0.30	174.50	8,309.4	1,754.8	1,477.4	2,290.5	0.48	-0.42	
8,786.0	0.20	28.70	8,405.4	1,754.7	1,477.5	2,290.5	0.50	-0.10	
8,881.0	0.80	15.70	8,500.4	1,755.5	1,477.8	2,291.3	0.64	0.63	
8,976.0	2.50	11.70	8,595.4	1,758.2	1,478.4	2,293.6	1.79	1.79	
9,071.0	1.80	325.50	8,690.3	1,761.4	1,478.0	2,295.7	1.90	-0.74	
9,167.0	1.70	335.90	8,786.2	1,764.0	1,476.5	2,296.6	0.35	-0.10	
9,262.0	1.80	351.60	8,881.2	1,766.7	1,475.8	2,298.0	0.51	0.11	
9,357.0	2.90	3.20	8,976.1	1,770.6	1,475.7	2,300.8	1.26	1.16	
9,453.0	2.80	12.10	9,072.0	1,775.3	1,476.3	2,304.7	0.47	-0.10	
9,487.0	3.30	7.20	9,105.9	1,777.1	1,476.6	2,306.2	1.66	1.47	Last Cathedral Survey @ 9,487' MD
9,542.0	3.30	7.20	9,160.9	1,780.3	1,477.0	2,308.7	0.00	0.00	Projection to Bit @ 9,542' MD - MCU 26-5A PBH

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 26-5A (I27W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7223.0ft (Original Well Elev)
Site:	I27W	MD Reference:	KBE @ 7223.0ft (Original Well Elev)
Well:	MCU 26-5A (I27W Pad)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	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 26-5A TGT (2)	0.00	358.58	7,460.6	1,761.8	1,474.4	1,585,882.18	2,365,115.66	39.420439	-107.747597
- survey misses target center by 4.7ft at 7841.2ft MD (7460.7 TVD, 1757.2 N, 1474.6 E)									
- Point									
MCU 26-5A PBHL	0.00	358.58	9,176.0	1,761.8	1,474.4	1,585,882.18	2,365,115.66	39.420439	-107.747597
- survey misses target center by 24.0ft at 9542.0ft MD (9160.9 TVD, 1780.3 N, 1477.0 E)									
- Circle (radius 25.0)									
MCU 26-5A TGT	0.00	358.58	7,626.5	1,761.8	1,474.4	1,585,882.18	2,365,115.66	39.420439	-107.747597
- survey misses target center by 4.4ft at 8007.0ft MD (7626.4 TVD, 1758.1 N, 1476.8 E)									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
9,487.0	9,105.9	1,777.1	1,476.6	Last Cathedral Survey @ 9,487' MD
9,542.0	9,160.9	1,780.3	1,477.0	Projection to Bit @ 9,542' MD

Checked By: _____ Approved By: _____ Date: _____