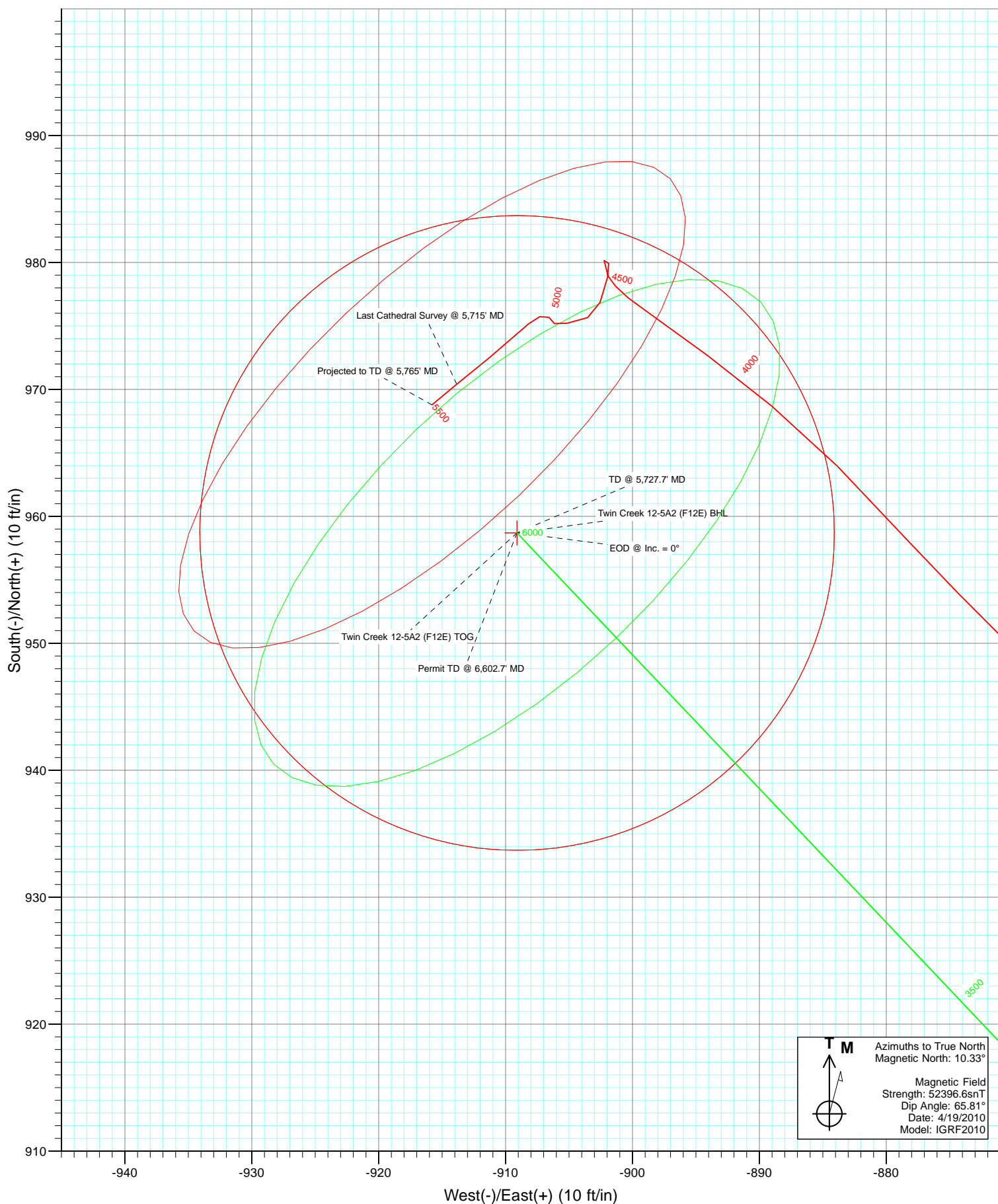


Azimuths to True North  
 Magnetic North: 10.33°

Magnetic Field  
 Strength: 52396.6snT  
 Dip Angle: 65.81°  
 Date: 4/19/2010  
 Model: IGRF2010



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Twin Creek 12-5A2 (F12E)
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 6167.0ft (Original Well Elev)
<b>Site:</b>	F12E Pad	<b>MD Reference:</b>	KBE @ 6167.0ft (Original Well Elev)
<b>Well:</b>	Twin Creek 12-5A2 (F12E)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<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		

Site		F12E Pad			
Site Position:		Northing:	1,600,159.70 ft	Latitude:	39.462050
From:	Lat/Long	Easting:	2,401,852.74 ft	Longitude:	-107.618770
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.34 °

Well	Twin Creek 12-5A2 (F12E)					
Well Position	+N/-S	0.0 ft	Northing:	1,600,138.04 ft	Latitude:	39.461988
	+E/-W	0.0 ft	Easting:	2,401,812.69 ft	Longitude:	-107.618910
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,145.0 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	4/19/2010	10.33	65.81	52,397

<b>Design</b>	DD				
<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)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	316.52	

<b>Survey Program</b>	<b>Date</b>	2/20/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
154.0	5,765.0	Survey #1 (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	0.90	271.70	154.0	0.0	-1.2	0.9	0.58	0.58		
185.0	1.00	291.30	185.0	0.1	-1.7	1.3	1.09	0.32		
216.0	1.20	307.40	216.0	0.4	-2.2	1.8	1.18	0.65		
247.0	1.70	309.10	247.0	0.9	-2.8	2.6	1.62	1.61		
277.0	2.70	318.50	277.0	1.7	-3.6	3.8	3.53	3.33		
308.0	3.30	319.30	307.9	3.0	-4.7	5.4	1.94	1.94		
338.0	4.00	317.00	337.8	4.4	-6.0	7.3	2.38	2.33		
369.0	4.80	316.20	368.8	6.1	-7.6	9.7	2.59	2.58		
400.0	5.80	320.40	399.6	8.2	-9.5	12.5	3.46	3.23		
430.0	6.70	319.50	429.4	10.7	-11.6	15.8	3.02	3.00		
461.0	7.40	316.80	460.2	13.6	-14.2	19.6	2.50	2.26		
492.0	8.60	316.80	490.9	16.7	-17.1	23.9	3.87	3.87		

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Twin Creek 12-5A2 (F12E)
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 6167.0ft (Original Well Elev)
<b>Site:</b>	F12E Pad	<b>MD Reference:</b>	KBE @ 6167.0ft (Original Well Elev)
<b>Well:</b>	Twin Creek 12-5A2 (F12E)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<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
523.0	9.70	316.90	521.5	20.3	-20.5	28.8	3.55	3.55	
553.0	10.70	315.40	551.0	24.1	-24.2	34.2	3.45	3.33	
584.0	11.90	316.10	581.4	28.5	-28.4	40.2	3.90	3.87	
614.0	13.00	317.20	610.7	33.2	-32.8	46.7	3.75	3.67	
645.0	14.30	318.00	640.9	38.6	-37.8	54.0	4.24	4.19	
676.0	15.60	318.30	670.8	44.6	-43.1	62.0	4.20	4.19	
768.0	19.60	317.40	758.5	65.2	-61.8	89.8	4.36	4.35	
860.0	22.80	316.30	844.2	89.4	-84.6	123.1	3.50	3.48	
951.0	23.80	315.00	927.8	115.2	-109.7	159.1	1.24	1.10	
1,044.0	24.80	314.80	1,012.6	142.2	-136.8	197.3	1.08	1.08	
1,110.0	25.80	314.80	1,072.3	162.0	-156.8	225.5	1.52	1.52	
1,258.0	26.30	314.20	1,205.2	207.6	-203.2	290.5	0.38	0.34	
1,354.0	27.00	316.40	1,291.0	238.2	-233.5	333.5	1.26	0.73	
1,450.0	26.70	318.20	1,376.7	270.1	-262.9	376.8	0.90	-0.31	
1,545.0	27.40	317.90	1,461.3	302.2	-291.8	420.0	0.75	0.74	
1,640.0	27.60	317.40	1,545.5	334.6	-321.3	463.9	0.32	0.21	
1,734.0	26.30	318.20	1,629.3	366.2	-349.9	506.5	1.44	-1.38	
1,829.0	24.70	318.50	1,715.1	396.7	-377.1	547.4	1.69	-1.68	
1,925.0	25.30	317.90	1,802.1	427.0	-404.2	587.9	0.68	0.62	
2,020.0	25.10	319.10	1,888.0	457.3	-431.0	628.3	0.58	-0.21	
2,115.0	24.50	320.10	1,974.3	487.6	-456.8	668.1	0.77	-0.63	
2,211.0	23.00	318.60	2,062.1	516.9	-482.0	706.7	1.68	-1.56	
2,306.0	22.90	318.50	2,149.6	544.7	-506.5	743.8	0.11	-0.11	
2,401.0	23.30	318.30	2,237.0	572.6	-531.2	781.0	0.43	0.42	
2,496.0	22.90	317.30	2,324.4	600.2	-556.3	818.3	0.59	-0.42	
2,591.0	22.60	316.00	2,412.0	626.9	-581.5	855.0	0.62	-0.32	
2,685.0	23.00	316.00	2,498.7	653.1	-606.8	891.4	0.43	0.43	
2,781.0	24.90	316.50	2,586.4	681.3	-633.7	930.4	1.99	1.98	
2,876.0	24.50	316.00	2,672.7	709.9	-661.2	970.1	0.48	-0.42	
2,971.0	23.60	317.20	2,759.5	738.1	-687.8	1,008.8	1.08	-0.95	
3,067.0	22.40	318.70	2,847.8	765.9	-712.9	1,046.3	1.39	-1.25	
3,162.0	21.40	317.20	2,936.0	792.2	-736.6	1,081.7	1.21	-1.05	
3,257.0	20.90	316.70	3,024.6	817.3	-760.0	1,116.0	0.56	-0.53	
3,352.0	20.00	316.50	3,113.6	841.4	-782.8	1,149.2	0.95	-0.95	
3,448.0	18.90	319.10	3,204.1	865.0	-804.3	1,181.1	1.46	-1.15	
3,543.0	17.60	322.80	3,294.3	888.1	-823.1	1,210.8	1.83	-1.37	
3,638.0	14.90	325.60	3,385.5	909.6	-838.7	1,237.1	2.96	-2.84	
3,733.0	11.40	327.40	3,478.0	927.6	-850.6	1,258.4	3.71	-3.68	
3,828.0	8.40	314.40	3,571.6	940.4	-860.6	1,274.6	3.92	-3.16	
3,923.0	7.70	314.70	3,665.7	949.7	-870.1	1,287.9	0.74	-0.74	
4,019.0	5.90	316.80	3,761.0	957.9	-878.1	1,299.2	1.89	-1.87	
4,113.0	4.40	316.30	3,854.6	964.0	-883.9	1,307.7	1.60	-1.60	
4,196.3	4.13	309.43	3,937.7	968.2	-888.4	1,313.8	0.69	-0.32	Twin Creek 12-5A2 (F12E) TOG
4,208.0	4.10	308.40	3,949.3	968.7	-889.1	1,314.7	0.69	-0.28	
4,303.0	3.60	307.90	4,044.1	972.7	-894.1	1,321.0	0.53	-0.53	
4,398.0	3.60	304.00	4,138.9	976.2	-898.9	1,326.9	0.26	0.00	
4,493.0	1.50	333.70	4,233.8	978.9	-901.9	1,331.0	2.54	-2.21	
4,588.0	0.30	69.90	4,328.8	980.2	-902.2	1,332.0	1.64	-1.26	
4,682.0	0.40	155.60	4,422.8	979.9	-901.9	1,331.6	0.51	0.11	
4,777.0	1.00	196.50	4,517.8	978.8	-902.0	1,330.9	0.78	0.63	
4,872.0	1.50	196.50	4,612.8	976.9	-902.6	1,329.9	0.53	0.53	
4,967.0	0.75	270.70	4,707.8	975.7	-903.5	1,329.7	1.56	-0.79	
5,062.0	1.30	245.50	4,802.8	975.2	-905.1	1,330.5	0.74	0.58	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Twin Creek 12-5A2 (F12E)
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 6167.0ft (Original Well Elev)
<b>Site:</b>	F12E Pad	<b>MD Reference:</b>	KBE @ 6167.0ft (Original Well Elev)
<b>Well:</b>	Twin Creek 12-5A2 (F12E)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<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
5,157.0	0.50	355.60	4,897.8	975.2	-906.1	1,331.1	1.63	-0.84	
5,252.0	0.50	282.10	4,992.8	975.7	-906.6	1,331.8	0.63	0.00	
5,347.0	0.40	262.40	5,087.8	975.7	-907.3	1,332.3	0.19	-0.11	
5,442.0	0.90	225.60	5,182.7	975.2	-908.2	1,332.5	0.66	0.53	
5,632.0	1.60	231.40	5,372.7	972.5	-911.3	1,332.7	0.37	0.37	
5,715.0	2.90	230.40	5,455.6	970.4	-913.8	1,333.0	1.57	1.57	Last Cathedral Survey @ 5,715' MD - Twin Creel Projected to TD @ 5,765' MD
5,765.0	2.90	230.40	5,505.6	968.8	-915.8	1,333.1	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
- hit/miss target									
- Shape									
Twin Creek 12-5A2 (F12	0.00	0.00	3,937.0	958.7	-909.1	1,601,117.68	2,400,926.21	39.464620	-107.622130
- actual wellpath misses target center by 22.8ft at 4196.4ft MD (3937.7 TVD, 968.2 N, -888.4 E)									
- Point									
Twin Creek 12-5A2 (F12	0.00	0.00	5,467.0	958.7	-909.1	1,601,117.68	2,400,926.21	39.464620	-107.622130
- actual wellpath misses target center by 17.0ft at 5715.0ft MD (5455.6 TVD, 970.4 N, -913.8 E)									
- Circle (radius 25.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
5,715.0	5,455.6	970.4	-913.8	Last Cathedral Survey @ 5,715' MD	
5,765.0	5,505.6	968.8	-915.8	Projected to TD @ 5,765' MD	

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