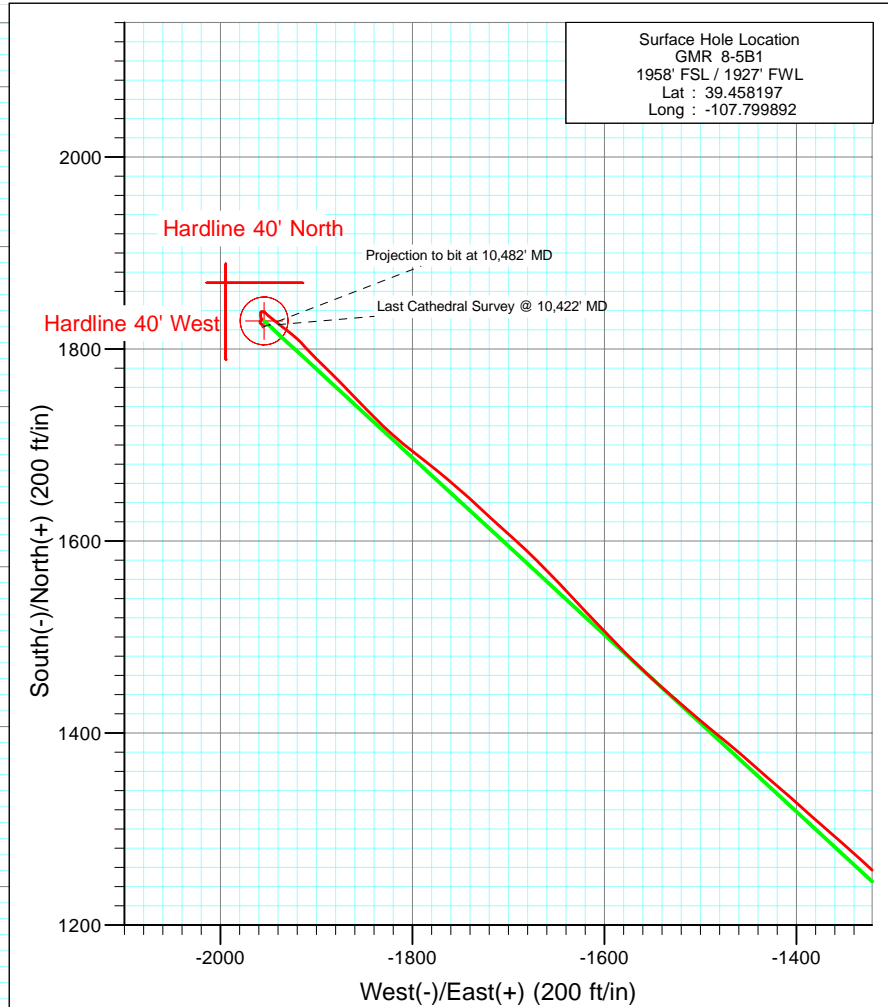
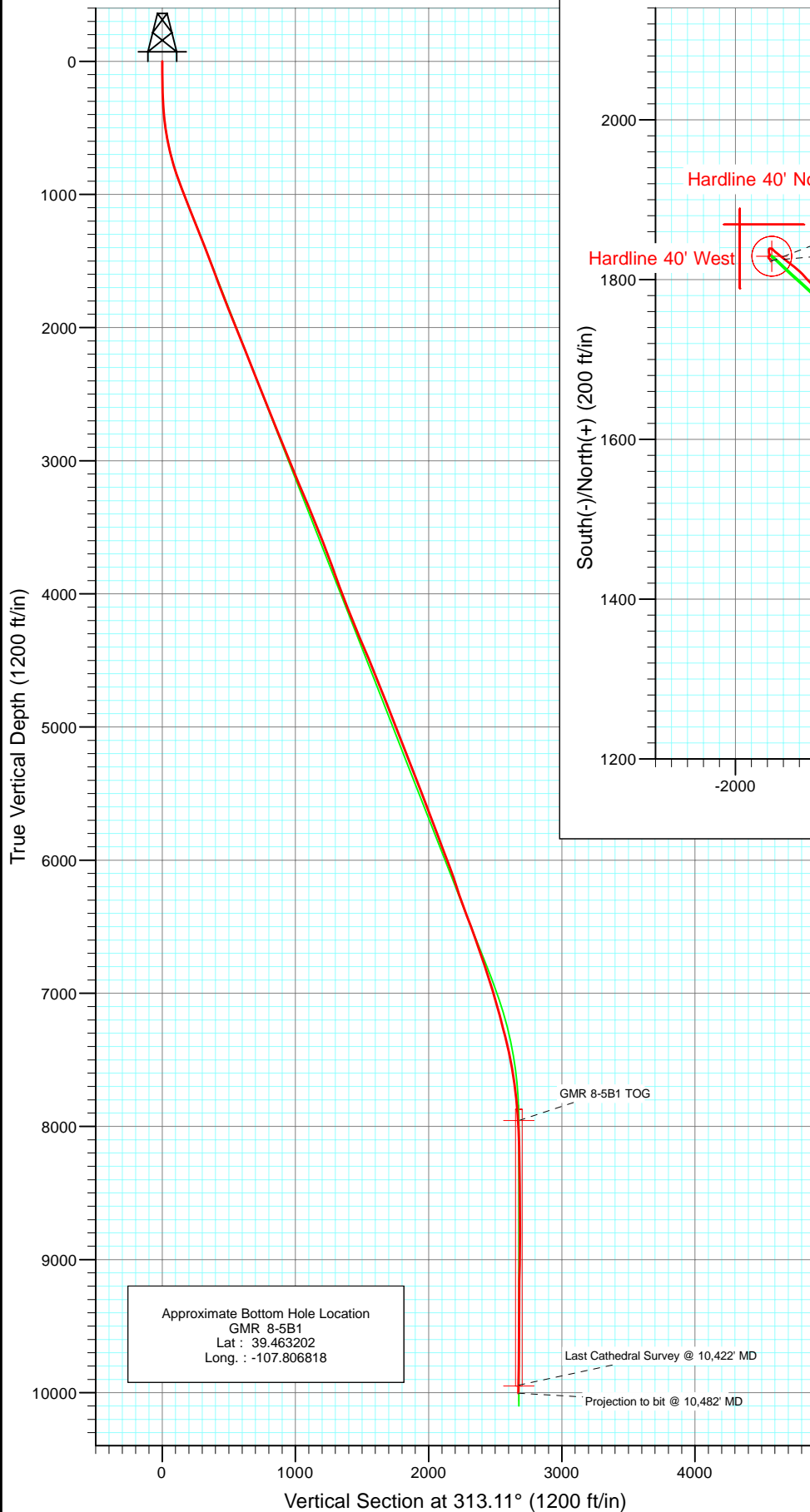




Project: Mamm Creek
 Site: NESW S8 T7S R93W (K8W Pad)
 Well: GMR 8-5B1
 Wellbore: Final
 Design: DD



Azimuths to True North
 Magnetic North: 10.35°
 Magnetic Field
 Strength: 52362.6snT
 Dip Angle: 65.78°
 Date: 7/15/2010
 Model: IGRF200510

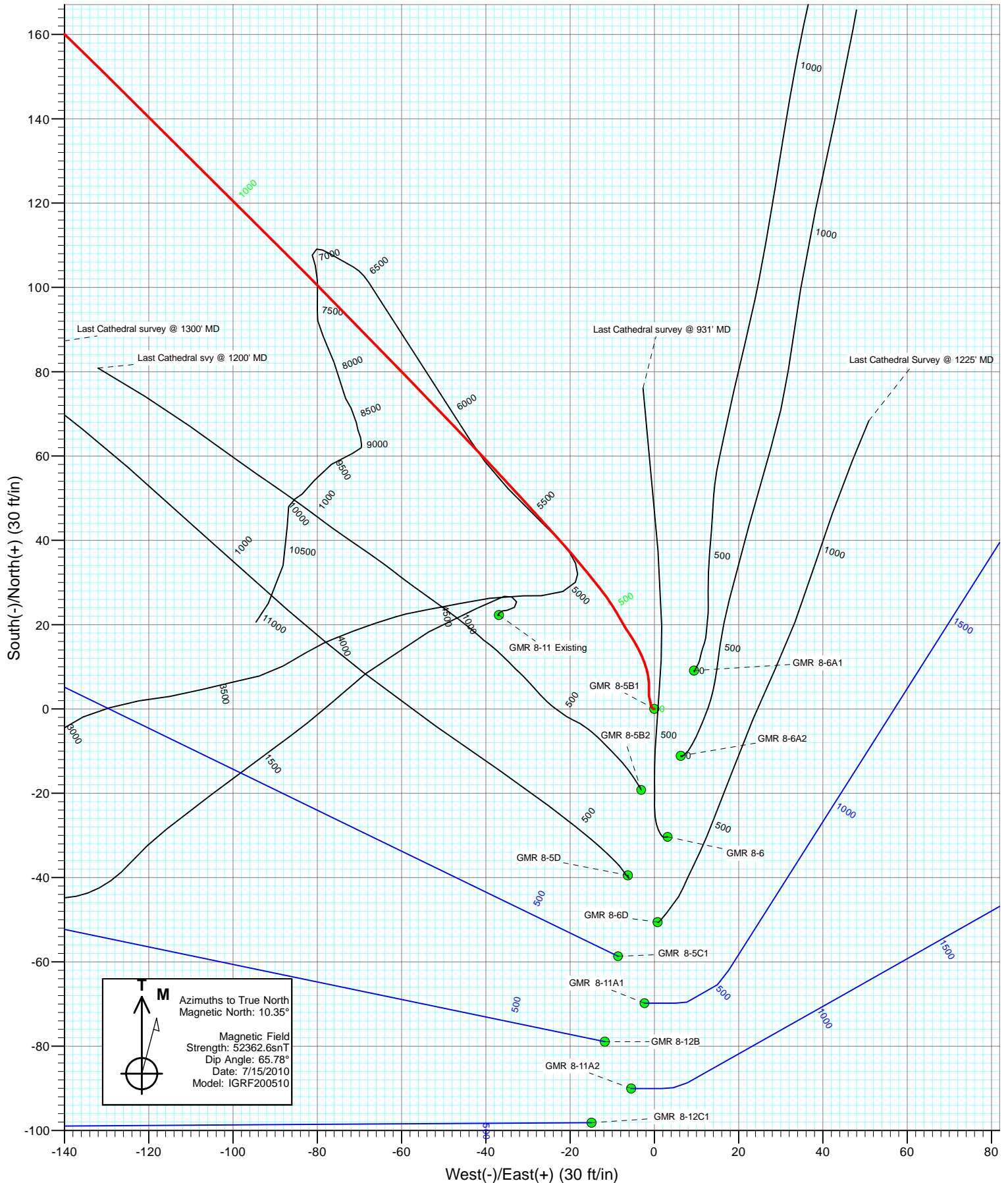
DESIGN DETAILS: DD

Job #105292 (SH) 105303 (MH): KR
 KBE @ 7848.0ft (Original Well Elev)

Target	Azimuth	Origin	N/S	E/W	From TVD
GMR 8-5B1 BHL	313.11	Slot	0.0	0.0	0.0

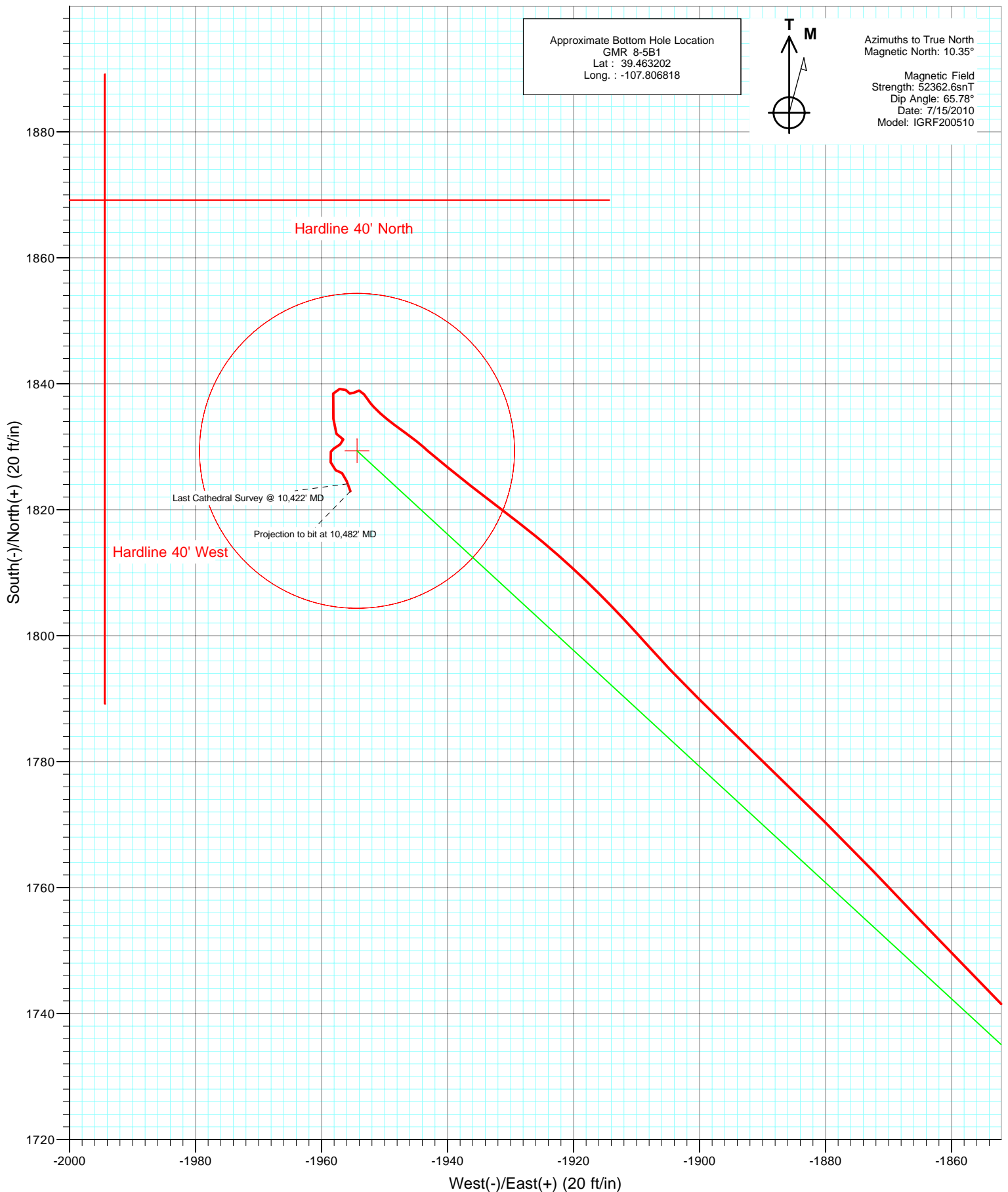


Project: Mamm Creek
Site: NESW S8 T7S R93W (K8W Pad)
Well: GMR 8-5B1
Wellbore: Final
Design: DD





Project: Mamm Creek
Site: NESW S8 T7S R93W (K8W Pad)
Well: GMR 8-5B1
Wellbore: Final
Design: DD



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GMR 8-5B1
Project:	Mamm Creek	TVD Reference:	KBE @ 7848.0ft (Original Well Elev)
Site:	NESW S8 T7S R93W (K8W Pad)	MD Reference:	KBE @ 7848.0ft (Original Well Elev)
Well:	GMR 8-5B1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US 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		NESW S8 T7S R93W (K8W Pad)			
Site Position:		Northing:	1,599,999.23 ft	Latitude:	39.458194
From:	Lat/Long	Easting:	2,350,698.86 ft	Longitude:	-107.799878
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.45 °

Well	GMR 8-5B1					
Well Position	+N/-S	0.0 ft	Northing:	1,600,000.33 ft	Latitude:	39.458197
	+E/-W	0.0 ft	Easting:	2,350,694.97 ft	Longitude:	-107.799892
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,826.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	7/15/2010	10.35	65.78	52,363

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	313.11	

Survey Program	Date	7/28/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
103.0	10,482.0	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		
103.0	0.30	280.40	103.0	0.0	-0.3	0.2	0.29	0.29		
134.0	1.00	312.50	134.0	0.2	-0.5	0.6	2.46	2.26		
165.0	1.50	349.40	165.0	0.8	-0.8	1.2	2.98	1.61		
196.0	1.50	355.00	196.0	1.6	-0.9	1.8	0.47	0.00		
226.0	1.80	338.50	226.0	2.5	-1.1	2.5	1.86	1.00		
257.0	2.70	0.80	256.9	3.6	-1.3	3.4	4.00	2.90		
287.0	3.20	359.40	286.9	5.2	-1.3	4.5	1.68	1.67		
318.0	4.10	355.90	317.8	7.2	-1.4	5.9	2.99	2.90		
349.0	4.40	342.10	348.8	9.4	-1.8	7.8	3.43	0.97		
380.0	5.40	338.20	379.6	11.9	-2.7	10.1	3.40	3.23		
410.0	6.40	333.20	409.5	14.7	-4.0	13.0	3.74	3.33		
440.0	6.90	324.80	439.3	17.6	-5.8	16.3	3.64	1.67		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GMR 8-5B1
Project:	Mamm Creek	TVD Reference:	KBE @ 7848.0ft (Original Well Elev)
Site:	NESW S8 T7S R93W (K8W Pad)	MD Reference:	KBE @ 7848.0ft (Original Well Elev)
Well:	GMR 8-5B1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US 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
471.0	7.60	330.90	470.0	21.0	-7.9	20.1	3.35	2.26	
501.0	8.60	327.60	499.7	24.6	-10.1	24.1	3.67	3.33	
532.0	9.40	321.70	530.4	28.5	-12.9	28.9	3.94	2.58	
563.0	9.90	320.60	560.9	32.6	-16.1	34.0	1.72	1.61	
594.0	10.80	319.60	591.4	36.9	-19.7	39.6	2.96	2.90	
624.0	12.00	318.40	620.8	41.3	-23.6	45.5	4.08	4.00	
655.0	12.50	317.10	651.1	46.2	-28.0	52.0	1.84	1.61	
685.0	13.40	316.70	680.3	51.1	-32.6	58.7	3.01	3.00	
716.0	14.20	317.40	710.5	56.5	-37.6	66.1	2.64	2.58	
747.0	15.20	316.90	740.4	62.3	-43.0	73.9	3.25	3.23	
778.0	16.60	316.10	770.3	68.4	-48.8	82.4	4.57	4.52	
839.0	18.30	316.10	828.4	81.6	-61.5	100.7	2.79	2.79	
931.0	20.20	315.20	915.3	103.3	-82.7	131.0	2.09	2.07	
1,026.0	21.40	314.50	1,004.1	127.1	-106.7	164.7	1.29	1.26	
1,120.0	21.80	315.10	1,091.5	151.5	-131.2	199.3	0.49	0.43	
1,215.0	21.70	311.90	1,179.7	175.7	-156.7	234.5	1.25	-0.11	
1,238.0	21.40	310.70	1,201.1	181.3	-163.1	242.9	2.32	-1.30	
1,313.0	21.40	310.70	1,271.0	199.1	-183.8	270.3	0.00	0.00	
1,346.0	21.10	308.20	1,301.7	206.7	-193.1	282.2	2.89	-0.91	
1,441.0	21.70	310.80	1,390.2	228.8	-219.8	316.8	1.18	0.63	
1,536.0	20.80	309.40	1,478.7	250.9	-246.1	351.2	1.09	-0.95	
1,631.0	20.40	310.50	1,567.6	272.4	-271.7	384.5	0.59	-0.42	
1,727.0	20.70	308.70	1,657.5	293.9	-297.7	418.2	0.73	0.31	
1,823.0	21.20	309.60	1,747.2	315.6	-324.3	452.4	0.62	0.52	
1,918.0	21.80	313.30	1,835.6	338.6	-350.4	487.2	1.56	0.63	
2,014.0	22.50	313.90	1,924.5	363.6	-376.6	523.4	0.77	0.73	
2,109.0	21.40	310.80	2,012.6	387.5	-402.8	558.9	1.68	-1.16	
2,205.0	21.90	314.30	2,101.8	411.4	-428.9	594.3	1.44	0.52	
2,300.0	21.30	312.90	2,190.2	435.6	-454.2	629.3	0.83	-0.63	
2,396.0	22.00	313.70	2,279.4	459.9	-480.0	664.7	0.79	0.73	
2,491.0	22.70	315.20	2,367.3	485.2	-505.8	700.8	0.95	0.74	
2,586.0	21.30	313.00	2,455.3	509.9	-531.3	736.4	1.71	-1.47	
2,680.0	21.50	313.00	2,542.9	533.3	-556.4	770.7	0.21	0.21	
2,776.0	21.80	312.80	2,632.1	557.4	-582.3	806.1	0.32	0.31	
2,871.0	21.80	313.40	2,720.3	581.5	-608.1	841.4	0.23	0.00	
2,967.0	22.40	315.70	2,809.2	606.9	-633.8	877.5	1.10	0.62	
3,062.0	21.80	313.80	2,897.3	632.0	-659.2	913.2	0.98	-0.63	
3,158.0	22.20	314.00	2,986.3	657.0	-685.1	949.1	0.42	0.42	
3,253.0	21.80	312.70	3,074.4	681.4	-711.0	984.7	0.66	-0.42	
3,348.0	22.70	314.00	3,162.3	706.1	-737.1	1,020.7	1.08	0.95	
3,444.0	23.70	314.50	3,250.5	732.5	-764.2	1,058.5	1.06	1.04	
3,539.0	23.00	314.50	3,337.7	758.9	-791.1	1,096.2	0.74	-0.74	
3,635.0	21.90	312.90	3,426.5	784.2	-817.6	1,132.8	1.31	-1.15	
3,730.0	21.80	313.30	3,514.6	808.4	-843.4	1,168.2	0.19	-0.11	
3,825.0	21.30	313.60	3,603.0	832.4	-868.7	1,203.1	0.54	-0.53	
3,920.0	20.70	313.20	3,691.7	855.8	-893.5	1,237.1	0.65	-0.63	
4,016.0	19.80	310.20	3,781.8	877.9	-918.2	1,270.3	1.43	-0.94	
4,111.0	20.70	311.00	3,870.9	899.3	-943.2	1,303.2	0.99	0.95	
4,206.0	20.40	311.70	3,959.8	921.3	-968.2	1,336.5	0.41	-0.32	
4,302.0	20.30	309.90	4,049.8	943.1	-993.5	1,369.8	0.66	-0.10	
4,397.0	21.40	310.50	4,138.6	965.0	-1,019.3	1,403.6	1.18	1.16	
4,493.0	22.60	314.80	4,227.6	989.3	-1,045.7	1,439.5	2.09	1.25	
4,588.0	22.60	314.70	4,315.3	1,015.0	-1,071.7	1,476.0	0.04	0.00	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GMR 8-5B1
Project:	Mamm Creek	TVD Reference:	KBE @ 7848.0ft (Original Well Elev)
Site:	NESW S8 T7S R93W (K8W Pad)	MD Reference:	KBE @ 7848.0ft (Original Well Elev)
Well:	GMR 8-5B1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US 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
4,684.0	23.80	317.00	4,403.6	1,042.2	-1,098.0	1,513.8	1.57	1.25	
4,779.0	22.80	315.70	4,490.8	1,069.4	-1,123.9	1,551.3	1.18	-1.05	
4,874.0	21.50	313.30	4,578.8	1,094.5	-1,149.5	1,587.1	1.67	-1.37	
4,969.0	21.80	316.20	4,667.1	1,119.2	-1,174.3	1,622.1	1.17	0.32	
5,065.0	22.50	315.20	4,756.0	1,145.1	-1,199.6	1,658.3	0.83	0.73	
5,160.0	21.00	313.60	4,844.3	1,169.7	-1,224.8	1,693.5	1.70	-1.58	
5,255.0	21.20	312.10	4,932.9	1,192.9	-1,249.8	1,727.7	0.61	0.21	
5,351.0	21.70	311.60	5,022.2	1,216.4	-1,276.0	1,762.8	0.55	0.52	
5,446.0	21.50	312.50	5,110.6	1,239.8	-1,301.9	1,797.7	0.41	-0.21	
5,541.0	21.60	312.80	5,198.9	1,263.4	-1,327.6	1,832.6	0.16	0.11	
5,636.0	20.40	310.50	5,287.6	1,286.1	-1,353.0	1,866.7	1.53	-1.26	
5,732.0	21.30	312.40	5,377.3	1,308.7	-1,378.6	1,900.8	1.17	0.94	
5,827.0	21.70	310.60	5,465.7	1,331.8	-1,404.7	1,935.6	0.81	0.42	
5,923.0	21.20	311.10	5,555.1	1,354.7	-1,431.3	1,970.7	0.55	-0.52	
6,018.0	21.00	311.40	5,643.7	1,377.3	-1,457.0	2,004.9	0.24	-0.21	
6,113.0	19.70	308.40	5,732.8	1,398.5	-1,482.3	2,037.9	1.75	-1.37	
6,208.0	21.20	310.90	5,821.8	1,419.7	-1,507.8	2,071.0	1.83	1.58	
6,303.0	20.80	310.70	5,910.5	1,441.9	-1,533.6	2,105.0	0.43	-0.42	
6,399.0	20.70	313.80	6,000.3	1,464.8	-1,558.8	2,139.0	1.15	-0.10	
6,494.0	19.40	315.20	6,089.5	1,487.6	-1,582.0	2,171.6	1.46	-1.37	
6,590.0	18.40	316.10	6,180.3	1,509.8	-1,603.7	2,202.6	1.08	-1.04	
6,685.0	18.80	317.40	6,270.4	1,531.9	-1,624.5	2,232.9	0.61	0.42	
6,781.0	20.50	316.60	6,360.8	1,555.5	-1,646.5	2,265.1	1.79	1.77	
6,876.0	20.70	314.60	6,449.7	1,579.4	-1,669.9	2,298.4	0.77	0.21	
6,972.0	19.70	311.70	6,539.8	1,602.0	-1,694.1	2,331.6	1.47	-1.04	
7,067.0	19.50	313.00	6,629.3	1,623.5	-1,717.6	2,363.4	0.50	-0.21	
7,163.0	19.30	312.30	6,719.8	1,645.1	-1,741.1	2,395.3	0.32	-0.21	
7,258.0	18.90	309.80	6,809.6	1,665.5	-1,764.5	2,426.4	0.96	-0.42	
7,354.0	17.20	307.20	6,900.9	1,684.1	-1,787.8	2,456.0	1.96	-1.77	
7,449.0	16.70	309.50	6,991.8	1,701.2	-1,809.5	2,483.6	0.88	-0.53	
7,545.0	15.60	314.00	7,084.0	1,719.0	-1,829.4	2,510.3	1.73	-1.15	
7,640.0	15.20	315.10	7,175.6	1,736.7	-1,847.4	2,535.5	0.52	-0.42	
7,735.0	14.60	316.70	7,267.4	1,754.2	-1,864.4	2,559.9	0.77	-0.63	
7,831.0	13.10	315.00	7,360.6	1,770.7	-1,880.4	2,582.9	1.62	-1.56	
7,926.0	12.60	313.60	7,453.2	1,785.5	-1,895.5	2,604.0	0.62	-0.53	
8,022.0	10.40	318.30	7,547.3	1,799.2	-1,908.9	2,623.1	2.49	-2.29	
8,117.0	8.40	312.70	7,641.0	1,810.3	-1,919.7	2,638.6	2.31	-2.11	
8,212.0	5.80	306.90	7,735.2	1,817.9	-1,928.6	2,650.3	2.84	-2.74	
8,307.0	5.90	308.30	7,829.8	1,823.8	-1,936.3	2,659.9	0.18	0.11	
8,403.0	4.80	310.10	7,925.3	1,829.4	-1,943.2	2,668.9	1.16	-1.15	
8,498.0	2.90	305.70	8,020.1	1,833.4	-1,948.2	2,675.2	2.02	-2.00	
8,593.0	1.00	314.60	8,115.1	1,835.4	-1,950.7	2,678.4	2.02	-2.00	
8,689.0	1.50	317.60	8,211.0	1,836.9	-1,952.2	2,680.5	0.53	0.52	
8,784.0	0.70	338.40	8,306.0	1,838.3	-1,953.2	2,682.3	0.93	-0.84	
8,879.0	0.70	274.40	8,401.0	1,838.9	-1,954.0	2,683.3	0.78	0.00	
8,975.0	0.60	218.00	8,497.0	1,838.6	-1,954.9	2,683.7	0.65	-0.10	
9,070.0	0.50	315.10	8,592.0	1,838.5	-1,955.5	2,684.0	0.87	-0.11	
9,163.0	0.50	307.60	8,685.0	1,839.0	-1,956.1	2,684.8	0.07	0.00	
9,259.0	0.80	263.40	8,781.0	1,839.2	-1,957.1	2,685.7	0.59	0.31	
9,354.0	0.90	209.00	8,876.0	1,838.5	-1,958.2	2,685.9	0.82	0.11	
9,449.0	1.10	155.20	8,971.0	1,837.0	-1,958.1	2,684.9	0.97	0.21	
9,544.0	2.10	191.60	9,065.9	1,834.4	-1,958.1	2,683.2	1.45	1.05	
9,638.0	1.30	130.00	9,159.9	1,832.1	-1,957.6	2,681.2	1.99	-0.85	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GMR 8-5B1
Project:	Mamm Creek	TVD Reference:	KBE @ 7848.0ft (Original Well Elev)
Site:	NESW S8 T7S R93W (K8W Pad)	MD Reference:	KBE @ 7848.0ft (Original Well Elev)
Well:	GMR 8-5B1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US 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
9,733.0	0.40	126.80	9,254.9	1,831.2	-1,956.5	2,679.8	0.95	-0.95	
9,828.0	1.20	232.10	9,349.9	1,830.4	-1,957.1	2,679.6	1.43	0.84	
9,924.0	0.20	264.10	9,445.9	1,829.7	-1,958.0	2,679.9	1.08	-1.04	
10,019.0	0.70	213.80	9,540.9	1,829.2	-1,958.5	2,679.9	0.62	0.53	
10,114.0	1.50	166.70	9,635.9	1,827.5	-1,958.5	2,678.8	1.20	0.84	
10,210.0	0.60	93.80	9,731.8	1,826.3	-1,957.8	2,677.3	1.50	-0.94	
10,305.0	0.80	129.20	9,826.8	1,825.8	-1,956.7	2,676.3	0.49	0.21	
10,400.0	1.10	164.40	9,921.8	1,824.5	-1,956.0	2,674.8	0.68	0.32	
10,422.0	1.20	159.30	9,943.8	1,824.1	-1,955.8	2,674.5	0.65	0.45	
10,482.0	1.20	159.30	10,003.8	1,822.9	-1,955.4	2,673.3	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									
GMR 8-5B1 BHL	0.00	0.00	9,949.0	1,829.4	-1,954.4	1,601,878.58	2,348,787.53	39.463219	-107.806814
- actual wellpath misses target center by 7.5ft at 10422.0ft MD (9943.8 TVD, 1824.1 N, -1955.8 E)									
- Circle (radius 25.0)									
Hardline 40' West	0.00	0.00	-10,857.0	1,829.2	-1,954.4	1,601,878.42	2,348,787.50	39.463219	-107.806814
- actual wellpath misses target center by 11182.1ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			-10,857.0	60.0	-40.0	1,601,939.41	2,348,749.03		
Point 2			-10,857.0	-40.0	-40.0	1,601,839.44	2,348,746.50		
Hardline 40' North	0.00	0.00	-9,954.0	1,829.2	-1,954.4	1,601,878.42	2,348,787.50	39.463219	-107.806814
- actual wellpath misses target center by 10307.7ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			-9,954.0	40.0	-60.0	1,601,919.92	2,348,728.53		
Point 2			-9,954.0	40.0	40.0	1,601,917.39	2,348,828.50		
GMR 8-5B1 TOG	0.00	0.00	7,955.0	1,829.4	-1,954.4	1,601,878.58	2,348,787.53	39.463219	-107.806814
- actual wellpath misses target center by 9.5ft at 8433.2ft MD (7955.4 TVD, 1830.9 N, -1945.0 E)									
- Point									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
10,422.0	9,943.8	1,824.1	-1,955.8	Last Cathedral Survey @ 10,422' MD
10,482.0	10,003.8	1,822.9	-1,955.4	Projection to bit at 10,482' MD

Checked By: _____ Approved By: _____ Date: _____