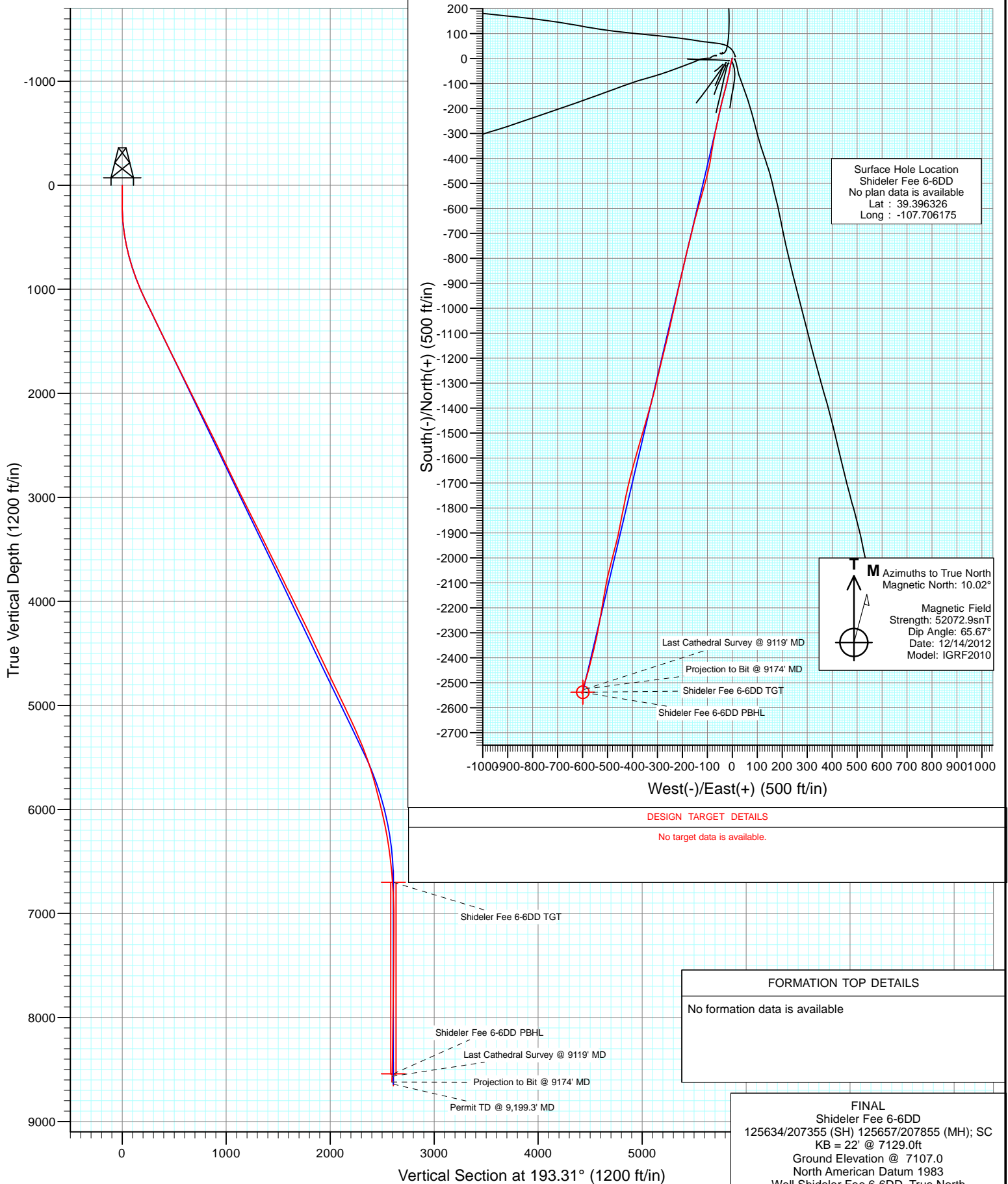


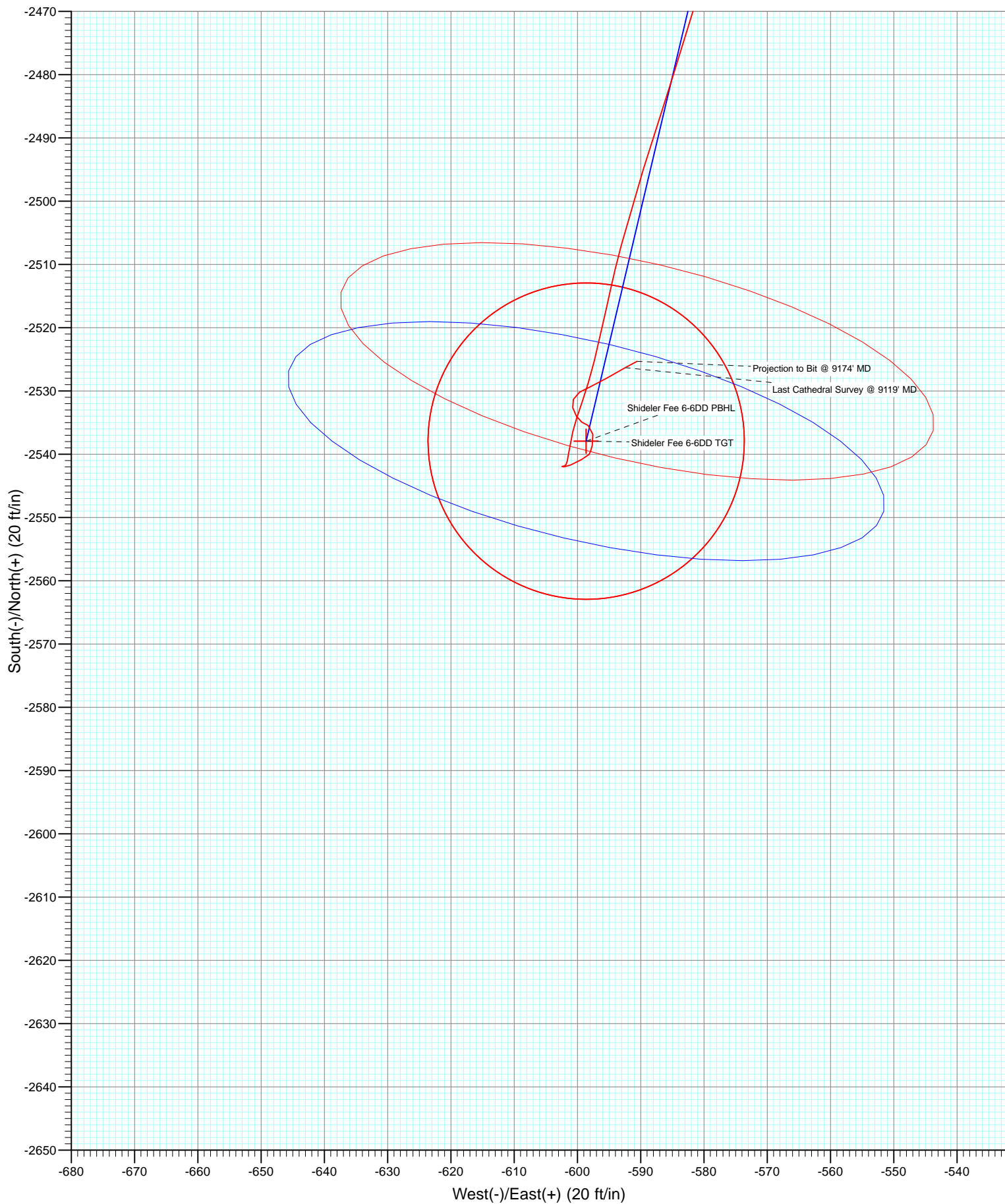


Project: Mamm Creek
Site: O31E Pad
Well: Shideler Fee 6-6DD
Wellbore: DD
Design: FINAL





Project: Mamm Creek
Site: O31E Pad
Well: Shideler Fee 6-6DD
Wellbore: DD
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Shideler Fee 6-6DD
Project:	Mamm Creek	TVD Reference:	KB = 22' @ 7129.0ft
Site:	O31E Pad	MD Reference:	KB = 22' @ 7129.0ft
Well:	Shideler Fee 6-6DD	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	O31E Pad				
Site Position:		Northing:	1,577,012.73 ft	Latitude:	39.396873
From:	Lat/Long	Easting:	2,376,675.10 ft	Longitude:	-107.705929
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.39 °

Well	Shideler Fee 6-6DD					
Well Position	+N/-S	0.0 ft	Northing:	1,576,815.22 ft	Latitude:	39.396326
	+E/-W	0.0 ft	Easting:	2,376,600.76 ft	Longitude:	-107.706175
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,107.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/14/2012	10.02	65.67	52,073

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	193.31	

Survey Program	Date	12/21/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
111.0	9,174.0	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		
111.0	0.20	78.20	111.0	0.0	0.2	-0.1	0.18	0.18		
141.0	0.00	237.70	141.0	0.1	0.2	-0.1	0.67	-0.67		
172.0	0.00	78.00	172.0	0.1	0.2	-0.1	0.00	0.00		
203.0	0.60	209.80	203.0	-0.1	0.2	0.1	1.94	1.94		
234.0	1.50	202.60	234.0	-0.6	-0.1	0.6	2.93	2.90		
265.0	2.20	203.20	265.0	-1.5	-0.5	1.6	2.26	2.26		
295.0	2.90	203.30	294.9	-2.8	-1.0	2.9	2.33	2.33		
326.0	4.00	189.10	325.9	-4.5	-1.5	4.8	4.47	3.55		
356.0	4.90	193.80	355.8	-6.8	-1.9	7.1	3.23	3.00		
387.0	5.70	194.10	386.7	-9.6	-2.6	9.9	2.58	2.58		
418.0	6.70	192.40	417.5	-12.9	-3.4	13.3	3.28	3.23		
449.0	7.70	194.90	448.2	-16.6	-4.3	17.2	3.38	3.23		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Shideler Fee 6-6DD
Project:	Mamm Creek	TVD Reference:	KB = 22' @ 7129.0ft
Site:	O31E Pad	MD Reference:	KB = 22' @ 7129.0ft
Well:	Shideler Fee 6-6DD	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
479.0	8.70	194.90	477.9	-20.8	-5.4	21.5	3.33	3.33	
510.0	9.80	193.20	508.5	-25.6	-6.6	26.4	3.66	3.55	
571.0	11.40	189.20	568.5	-36.6	-8.8	37.6	2.89	2.62	
662.0	14.40	192.00	657.2	-56.6	-12.6	57.9	3.37	3.30	
753.0	16.90	191.70	744.8	-80.6	-17.6	82.5	2.75	2.75	
844.0	18.90	194.90	831.4	-107.8	-24.1	110.4	2.45	2.20	
937.0	20.80	194.50	918.9	-138.3	-32.1	142.0	2.05	2.04	
1,029.0	23.00	194.50	1,004.2	-171.5	-40.7	176.3	2.39	2.39	
1,121.0	26.00	192.80	1,087.9	-208.6	-49.6	214.4	3.35	3.26	
1,160.0	26.50	192.00	1,122.9	-225.5	-53.3	231.7	1.57	1.28	
1,242.0	26.20	192.10	1,196.4	-261.1	-60.9	268.1	0.37	-0.37	
1,334.0	26.20	191.30	1,278.9	-300.8	-69.2	308.7	0.38	0.00	
1,426.0	25.80	190.10	1,361.6	-340.5	-76.7	349.0	0.72	-0.43	
1,518.0	25.80	188.70	1,444.5	-380.0	-83.2	388.9	0.66	0.00	
1,609.0	26.10	190.80	1,526.3	-419.2	-90.0	428.7	1.06	0.33	
1,700.0	26.50	193.40	1,607.9	-458.6	-98.4	469.0	1.34	0.44	
1,792.0	26.20	196.10	1,690.3	-498.1	-108.8	509.8	1.34	-0.33	
1,883.0	26.00	194.70	1,772.0	-536.7	-119.4	549.8	0.71	-0.22	
1,974.0	26.90	196.50	1,853.5	-575.7	-130.3	590.3	1.32	0.99	
2,066.0	26.30	195.80	1,935.8	-615.3	-141.8	631.4	0.74	-0.65	
2,157.0	26.50	193.90	2,017.3	-654.4	-152.2	671.8	0.95	0.22	
2,249.0	25.90	193.60	2,099.8	-693.8	-161.8	712.5	0.67	-0.65	
2,341.0	27.10	193.90	2,182.2	-733.7	-171.6	753.5	1.31	1.30	
2,433.0	26.50	194.00	2,264.3	-774.0	-181.6	795.0	0.65	-0.65	
2,524.0	25.80	193.40	2,346.0	-812.9	-191.1	835.1	0.82	-0.77	
2,616.0	26.40	193.30	2,428.6	-852.3	-200.4	875.6	0.65	0.65	
2,708.0	26.20	192.10	2,511.1	-892.1	-209.4	916.3	0.62	-0.22	
2,799.0	25.00	191.40	2,593.1	-930.6	-217.4	955.6	1.36	-1.32	
2,891.0	24.70	192.50	2,676.6	-968.4	-225.4	994.3	0.60	-0.33	
2,982.0	25.60	193.80	2,759.0	-1,006.1	-234.2	1,033.0	1.16	0.99	
3,073.0	26.50	193.40	2,840.7	-1,044.9	-243.6	1,072.9	1.01	0.99	
3,165.0	26.00	192.20	2,923.2	-1,084.6	-252.6	1,113.6	0.79	-0.54	
3,257.0	26.30	193.20	3,005.8	-1,124.1	-261.5	1,154.1	0.58	0.33	
3,348.0	27.30	194.50	3,087.1	-1,164.0	-271.4	1,195.2	1.27	1.10	
3,440.0	26.60	193.50	3,169.1	-1,204.4	-281.5	1,236.9	0.91	-0.76	
3,531.0	26.10	192.50	3,250.6	-1,243.8	-290.6	1,277.3	0.73	-0.55	
3,623.0	26.70	194.60	3,333.0	-1,283.5	-300.1	1,318.2	1.21	0.65	
3,714.0	26.00	193.30	3,414.6	-1,322.7	-309.9	1,358.5	1.00	-0.77	
3,806.0	26.50	195.80	3,497.1	-1,362.1	-320.1	1,399.2	1.32	0.54	
3,898.0	26.00	194.70	3,579.6	-1,401.4	-330.8	1,439.9	0.76	-0.54	
3,989.0	27.20	196.50	3,661.0	-1,440.6	-341.8	1,480.6	1.59	1.32	
4,081.0	26.40	196.80	3,743.1	-1,480.3	-353.7	1,522.0	0.88	-0.87	
4,172.0	25.60	195.60	3,824.9	-1,518.6	-364.8	1,561.8	1.05	-0.88	
4,264.0	27.00	195.60	3,907.3	-1,557.9	-375.8	1,602.6	1.52	1.52	
4,356.0	26.20	196.40	3,989.6	-1,597.5	-387.1	1,643.7	0.95	-0.87	
4,447.0	26.10	195.10	4,071.3	-1,636.1	-398.0	1,683.8	0.64	-0.11	
4,539.0	26.50	193.50	4,153.8	-1,675.6	-408.1	1,724.5	0.88	0.43	
4,630.0	26.50	193.80	4,235.2	-1,715.0	-417.7	1,765.1	0.15	0.00	
4,722.0	25.90	191.40	4,317.8	-1,754.7	-426.5	1,805.7	1.32	-0.65	
4,813.0	25.60	191.70	4,399.7	-1,793.4	-434.4	1,845.3	0.36	-0.33	
4,905.0	24.80	191.10	4,483.0	-1,831.8	-442.2	1,884.4	0.91	-0.87	
4,997.0	24.70	191.00	4,566.5	-1,869.6	-449.6	1,922.9	0.12	-0.11	
5,088.0	25.80	192.00	4,648.8	-1,907.6	-457.3	1,961.7	1.30	1.21	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Shideler Fee 6-6DD
Project:	Mamm Creek	TVD Reference:	KB = 22' @ 7129.0ft
Site:	O31E Pad	MD Reference:	KB = 22' @ 7129.0ft
Well:	Shideler Fee 6-6DD	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
5,180.0	26.50	194.90	4,731.4	-1,947.1	-466.7	2,002.2	1.58	0.76	
5,271.0	25.90	194.60	4,813.1	-1,985.9	-477.0	2,042.4	0.68	-0.66	
5,363.0	26.40	193.70	4,895.6	-2,025.2	-486.9	2,082.9	0.69	0.54	
5,454.0	24.80	194.30	4,977.7	-2,063.4	-496.4	2,122.2	1.78	-1.76	
5,546.0	25.80	190.40	5,060.9	-2,101.8	-504.8	2,161.5	2.11	1.09	
5,638.0	25.30	189.70	5,143.9	-2,140.8	-511.7	2,201.1	0.63	-0.54	
5,730.0	23.40	189.60	5,227.7	-2,178.2	-518.1	2,239.0	2.07	-2.07	
5,821.0	22.80	190.20	5,311.4	-2,213.4	-524.2	2,274.6	0.71	-0.66	
5,913.0	22.00	190.30	5,396.5	-2,247.9	-530.4	2,309.6	0.87	-0.87	
6,004.0	21.60	190.00	5,480.9	-2,281.2	-536.4	2,343.4	0.46	-0.44	
6,096.0	17.70	192.90	5,567.6	-2,311.5	-542.5	2,374.3	4.37	-4.24	
6,188.0	16.10	192.50	5,655.6	-2,337.6	-548.3	2,401.0	1.74	-1.74	
6,279.0	15.60	193.40	5,743.1	-2,361.8	-553.9	2,425.9	0.61	-0.55	
6,371.0	14.30	192.40	5,832.0	-2,384.9	-559.2	2,449.6	1.44	-1.41	
6,463.0	14.70	195.40	5,921.1	-2,407.3	-564.8	2,472.6	0.92	0.43	
6,555.0	13.20	194.20	6,010.4	-2,428.7	-570.4	2,494.8	1.66	-1.63	
6,646.0	12.40	194.90	6,099.1	-2,448.2	-575.5	2,515.0	0.90	-0.88	
6,738.0	10.60	196.70	6,189.3	-2,465.9	-580.5	2,533.3	1.99	-1.96	
6,829.0	9.90	197.70	6,278.8	-2,481.4	-585.2	2,549.4	0.79	-0.77	
6,920.0	8.10	197.70	6,368.7	-2,494.9	-589.6	2,563.6	1.98	-1.98	
7,012.0	7.60	194.50	6,459.8	-2,507.0	-593.1	2,576.2	0.72	-0.54	
7,103.0	5.50	191.50	6,550.2	-2,517.1	-595.4	2,586.6	2.34	-2.31	
7,195.0	4.90	194.50	6,641.8	-2,525.2	-597.3	2,594.9	0.72	-0.65	
7,254.9	4.11	197.47	6,701.6	-2,529.7	-598.6	2,599.6	1.38	-1.32	Shideler Fee 6-6DD TGT
7,286.0	3.70	199.50	6,732.6	-2,531.7	-599.3	2,601.7	1.38	-1.31	
7,378.0	2.40	194.10	6,824.5	-2,536.4	-600.7	2,606.6	1.45	-1.41	
7,470.0	2.20	187.40	6,916.4	-2,540.0	-601.4	2,610.3	0.36	-0.22	
7,561.0	0.50	258.10	7,007.4	-2,541.8	-602.0	2,612.2	2.30	-1.87	
7,653.0	0.00	219.60	7,099.4	-2,541.9	-602.4	2,612.3	0.54	-0.54	
7,744.0	0.40	101.10	7,190.4	-2,542.0	-602.1	2,612.3	0.44	0.44	
7,836.0	1.00	63.20	7,282.3	-2,541.7	-601.1	2,611.8	0.79	0.65	
7,928.0	1.40	65.20	7,374.3	-2,540.9	-599.3	2,610.6	0.44	0.43	
8,020.0	0.50	26.00	7,466.3	-2,540.0	-598.1	2,609.5	1.15	-0.98	
8,111.0	0.30	19.00	7,557.3	-2,539.4	-597.9	2,608.9	0.23	-0.22	
8,202.0	0.80	15.00	7,648.3	-2,538.6	-597.7	2,608.0	0.55	0.55	
8,294.0	1.40	356.50	7,740.3	-2,536.9	-597.6	2,606.3	0.75	0.65	
8,386.0	0.90	292.70	7,832.3	-2,535.5	-598.3	2,605.1	1.40	-0.54	
8,477.0	0.60	307.60	7,923.3	-2,534.9	-599.3	2,604.8	0.39	-0.33	
8,569.0	1.00	324.80	8,015.3	-2,533.9	-600.2	2,604.0	0.50	0.43	
8,661.0	0.80	351.00	8,107.3	-2,532.7	-600.7	2,602.9	0.49	-0.22	
8,752.0	0.90	16.10	8,198.3	-2,531.3	-600.6	2,601.6	0.42	0.11	
8,844.0	1.10	59.10	8,290.2	-2,530.2	-599.7	2,600.3	0.82	0.22	
8,936.0	1.60	66.30	8,382.2	-2,529.2	-597.7	2,598.9	0.57	0.54	
9,027.0	1.90	58.60	8,473.2	-2,527.9	-595.3	2,597.1	0.42	0.33	
9,094.5	2.12	61.26	8,540.6	-2,526.7	-593.2	2,595.4	0.35	0.33	Shideler Fee 6-6DD PBHL (2334' FNL & 2521' FE
9,119.0	2.20	62.10	8,565.1	-2,526.3	-592.4	2,594.8	0.35	0.33	Last Cathedral Survey @ 9119' MD
9,174.0	2.20	62.10	8,620.1	-2,525.3	-590.6	2,593.4	0.00	0.00	Projection to Bit @ 9174' MD

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Shideler Fee 6-6DD
Project:	Mamm Creek	TVD Reference:	KB = 22' @ 7129.0ft
Site:	O31E Pad	MD Reference:	KB = 22' @ 7129.0ft
Well:	Shideler Fee 6-6DD	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
Shideler Fee 6-6DD PBI	0.00	0.00	8,541.0	-2,537.9	-598.6	1,574,292.58	2,375,940.70	39.389358	-107.708293
- actual wellpath misses target center by 12.4ft at 9094.5ft MD (8540.6 TVD, -2526.7 N, -593.2 E)									
- Circle (radius 25.0)									
Shideler Fee 6-6DD TG1	0.00	0.00	6,701.0	-2,537.9	-598.6	1,574,292.58	2,375,940.70	39.389358	-107.708293
- actual wellpath misses target center by 8.2ft at 7254.9ft MD (6701.6 TVD, -2529.7 N, -598.6 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
		(ft)	(ft)	Comment	
9,119.0	8,565.1	-2,526.3	-592.4	Last Cathedral Survey @ 9119' MD	
9,174.0	8,620.1	-2,525.3	-590.6	Projection to Bit @ 9174' MD	

Checked By: _____ Approved By: _____ Date: _____