





Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Shideler Fee 6-3DD
Project:	Mamm Creek	TVD Reference:	KB = 22' @ 7129.0ft
Site:	O31E Pad	MD Reference:	KB = 22' @ 7129.0ft
Well:	Shideler Fee 6-3DD	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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 6-3DD					
Well Position	+N/-S	0.0 ft	Northing:	1,576,788.55 ft	Latitude:	39.396251
	+E/-W	0.0 ft	Easting:	2,376,573.82 ft	Longitude:	-107.706268
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	1/15/2013	10.00	65.67	52,064

Design	DD				
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	199.92	

Survey Program	Date	1/20/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
111.0	8,700.0	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	0.30	155.90	111.0	-0.3	0.1	0.2	0.27	0.27		
141.0	0.50	165.60	141.0	-0.5	0.2	0.4	0.70	0.67		
172.0	0.80	163.00	172.0	-0.8	0.3	0.7	0.97	0.97		
203.0	0.80	174.20	203.0	-1.2	0.4	1.0	0.50	0.00		
234.0	1.50	191.40	234.0	-1.8	0.3	1.6	2.49	2.26		
265.0	2.10	198.40	265.0	-2.8	0.0	2.6	2.06	1.94		
295.0	2.90	197.30	294.9	-4.0	-0.4	3.9	2.67	2.67		
326.0	3.60	202.60	325.9	-5.7	-1.0	5.7	2.45	2.26		
356.0	4.40	201.40	355.8	-7.6	-1.7	7.7	2.68	2.67		
387.0	5.20	201.30	386.7	-10.0	-2.7	10.3	2.58	2.58		
479.0	7.70	200.90	478.1	-19.7	-6.4	20.7	2.72	2.72		
571.0	9.40	202.50	569.1	-32.4	-11.5	34.3	1.87	1.85		

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Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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
662.0	12.30	203.80	658.5	-48.1	-18.2	51.4	3.20	3.19	
753.0	13.10	204.40	747.2	-66.4	-26.4	71.4	0.89	0.88	
844.0	12.60	201.80	836.0	-85.0	-34.3	91.6	0.84	-0.55	
937.0	12.60	200.00	926.7	-103.9	-41.6	111.9	0.42	0.00	
995.0	12.60	199.20	983.3	-115.8	-45.8	124.5	0.30	0.00	
1,156.0	13.30	197.90	1,140.2	-150.0	-57.3	160.6	0.47	0.43	
1,248.0	13.30	197.90	1,229.8	-170.2	-63.8	181.7	0.00	0.00	
1,339.0	13.50	198.00	1,318.3	-190.3	-70.3	202.8	0.22	0.22	
1,431.0	13.20	195.50	1,407.8	-210.6	-76.4	224.0	0.71	-0.33	
1,522.0	12.70	200.70	1,496.5	-230.0	-82.7	244.4	1.39	-0.55	
1,614.0	12.30	201.30	1,586.3	-248.5	-89.9	264.3	0.46	-0.43	
1,705.0	13.90	199.20	1,674.9	-267.9	-97.0	284.9	1.83	1.76	
1,797.0	14.10	198.90	1,764.2	-288.9	-104.3	307.2	0.23	0.22	
1,888.0	14.20	196.60	1,852.4	-310.1	-111.0	329.4	0.63	0.11	
1,979.0	13.90	199.30	1,940.7	-331.1	-117.8	351.5	0.79	-0.33	
2,070.0	13.90	199.80	2,029.0	-351.7	-125.1	373.3	0.13	0.00	
2,162.0	13.90	199.00	2,118.4	-372.6	-132.5	395.4	0.21	0.00	
2,254.0	13.90	200.60	2,207.7	-393.4	-140.0	417.5	0.42	0.00	
2,345.0	14.00	199.20	2,296.0	-414.0	-147.4	439.5	0.39	0.11	
2,436.0	13.80	204.40	2,384.3	-434.3	-155.5	461.3	1.39	-0.22	
2,528.0	13.80	203.70	2,473.7	-454.3	-164.5	483.2	0.18	0.00	
2,620.0	13.30	201.90	2,563.1	-474.2	-172.8	504.7	0.71	-0.54	
2,711.0	12.90	199.10	2,651.7	-493.5	-180.1	525.3	0.82	-0.44	
2,803.0	12.70	197.00	2,741.4	-512.9	-186.4	545.7	0.55	-0.22	
2,895.0	13.60	200.20	2,831.0	-532.7	-193.1	566.6	1.26	0.98	
2,986.0	13.70	198.40	2,919.5	-553.0	-200.2	588.1	0.48	0.11	
3,077.0	13.60	203.20	3,007.9	-573.0	-207.8	609.5	1.25	-0.11	
3,169.0	13.10	202.70	3,097.4	-592.6	-216.1	630.7	0.56	-0.54	
3,260.0	12.50	200.20	3,186.2	-611.3	-223.5	650.9	0.90	-0.66	
3,352.0	12.00	199.20	3,276.1	-629.7	-230.0	670.4	0.59	-0.54	
3,444.0	12.50	200.50	3,366.0	-648.1	-236.7	689.9	0.62	0.54	
3,536.0	12.30	200.50	3,455.8	-666.6	-243.6	709.7	0.22	-0.22	
3,627.0	13.10	202.40	3,544.6	-685.2	-250.9	729.7	0.99	0.88	
3,719.0	12.80	200.50	3,634.2	-704.4	-258.5	750.3	0.57	-0.33	
3,810.0	12.20	199.40	3,723.1	-722.9	-265.2	770.0	0.71	-0.66	
3,902.0	13.50	204.00	3,812.8	-741.9	-272.8	790.4	1.80	1.41	
3,993.0	13.10	202.80	3,901.3	-761.1	-281.1	811.3	0.53	-0.44	
4,085.0	12.90	202.70	3,991.0	-780.2	-289.1	832.0	0.22	-0.22	
4,177.0	12.70	202.80	4,080.7	-799.0	-297.0	852.3	0.22	-0.22	
4,268.0	12.50	203.70	4,169.5	-817.2	-304.8	872.2	0.31	-0.22	
4,359.0	12.30	203.70	4,258.4	-835.1	-312.7	891.7	0.22	-0.22	
4,451.0	11.20	202.90	4,348.5	-852.3	-320.1	910.4	1.21	-1.20	
4,543.0	11.90	197.40	4,438.6	-869.6	-326.4	928.8	1.42	0.76	
4,635.0	11.70	195.00	4,528.7	-887.6	-331.7	947.5	0.58	-0.22	
4,726.0	12.50	201.20	4,617.6	-905.7	-337.6	966.6	1.68	0.88	
4,818.0	11.70	197.70	4,707.6	-923.9	-344.0	985.8	1.18	-0.87	
4,909.0	12.40	198.50	4,796.6	-942.0	-349.9	1,004.8	0.79	0.77	
5,001.0	12.10	199.70	4,886.5	-960.4	-356.3	1,024.3	0.43	-0.33	
5,093.0	11.70	198.90	4,976.5	-978.3	-362.6	1,043.3	0.47	-0.43	
5,185.0	13.20	198.70	5,066.3	-997.1	-369.0	1,063.1	1.63	1.63	
5,276.0	12.10	195.20	5,155.1	-1,016.1	-374.8	1,083.0	1.47	-1.21	
5,368.0	13.00	196.80	5,244.9	-1,035.3	-380.3	1,103.0	1.05	0.98	
5,460.0	12.50	197.30	5,334.7	-1,054.8	-386.3	1,123.3	0.56	-0.54	

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Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

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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
5,552.0	12.60	199.80	5,424.5	-1,073.7	-392.7	1,143.2	0.60	0.11	
5,643.0	11.30	199.80	5,513.5	-1,091.4	-399.0	1,162.1	1.43	-1.43	
5,735.0	11.80	198.40	5,603.6	-1,108.8	-405.1	1,180.5	0.62	0.54	
5,827.0	12.00	203.40	5,693.7	-1,126.5	-411.8	1,199.5	1.14	0.22	
5,918.0	11.10	200.60	5,782.8	-1,143.4	-418.7	1,217.7	1.16	-0.99	
6,009.0	9.90	198.40	5,872.3	-1,159.0	-424.2	1,234.2	1.39	-1.32	
6,101.0	8.90	197.00	5,963.1	-1,173.4	-428.8	1,249.2	1.11	-1.09	
6,193.0	7.80	194.20	6,054.1	-1,186.2	-432.4	1,262.6	1.27	-1.20	
6,284.0	7.40	207.70	6,144.3	-1,197.4	-436.6	1,274.5	2.01	-0.44	
6,376.0	6.20	200.90	6,235.6	-1,207.3	-441.2	1,285.4	1.57	-1.30	
6,468.0	5.10	195.80	6,327.2	-1,215.9	-444.1	1,294.4	1.31	-1.20	
6,559.0	4.30	206.80	6,417.9	-1,222.8	-446.7	1,301.8	1.32	-0.88	
6,651.0	4.00	207.20	6,509.6	-1,228.7	-449.7	1,308.4	0.33	-0.33	
6,743.0	2.20	221.80	6,601.5	-1,232.9	-452.4	1,313.3	2.12	-1.96	
6,835.0	1.70	207.30	6,693.5	-1,235.4	-454.2	1,316.2	0.76	-0.54	
6,926.0	1.80	192.80	6,784.4	-1,238.0	-455.1	1,319.0	0.50	0.11	
7,018.0	1.80	176.70	6,876.4	-1,240.9	-455.3	1,321.8	0.55	0.00	
7,109.0	2.10	64.40	6,967.3	-1,241.6	-453.8	1,321.9	3.56	0.33	
7,201.0	2.90	65.60	7,059.3	-1,239.9	-450.1	1,319.1	0.87	0.87	
7,292.0	1.30	68.90	7,150.2	-1,238.6	-447.1	1,316.8	1.76	-1.76	
7,384.0	1.50	66.30	7,242.2	-1,237.7	-445.0	1,315.3	0.23	0.22	
7,476.0	1.00	350.40	7,334.1	-1,236.4	-444.0	1,313.7	1.73	-0.54	
7,568.0	0.90	25.20	7,426.1	-1,235.0	-443.8	1,312.3	0.63	-0.11	
7,659.0	0.90	43.40	7,517.1	-1,233.8	-443.0	1,310.9	0.31	0.00	
7,751.0	1.40	249.30	7,609.1	-1,233.7	-443.6	1,311.0	2.44	0.54	
7,843.0	0.90	249.80	7,701.1	-1,234.3	-445.3	1,312.2	0.54	-0.54	
7,935.0	0.70	268.50	7,793.1	-1,234.6	-446.6	1,312.9	0.35	-0.22	
8,026.0	0.50	280.00	7,884.1	-1,234.5	-447.5	1,313.2	0.26	-0.22	
8,118.0	0.20	248.60	7,976.1	-1,234.5	-448.1	1,313.3	0.38	-0.33	
8,209.0	0.60	177.10	8,067.1	-1,235.1	-448.2	1,313.9	0.63	0.44	
8,301.0	1.40	128.90	8,159.1	-1,236.3	-447.3	1,314.7	1.19	0.87	
8,393.0	1.30	116.40	8,251.0	-1,237.4	-445.5	1,315.2	0.34	-0.11	
8,484.0	1.70	102.20	8,342.0	-1,238.2	-443.2	1,315.1	0.60	0.44	
8,576.0	1.70	101.40	8,434.0	-1,238.7	-440.6	1,314.7	0.03	0.00	
8,645.0	1.90	101.20	8,502.9	-1,239.2	-438.4	1,314.4	0.29	0.29	Last Cathedral Survey @ 8645' MD Projection to Bit @ 8700' MD
8,700.0	1.90	101.20	8,557.9	-1,239.5	-436.6	1,314.1	0.00	0.00	

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Site:	O31E Pad	MD Reference:	KB = 22' @ 7129.0ft
Well:	Shideler Fee 6-3DD	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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 6-3DD TG1	0.00	0.00	6,632.0	-1,227.8	-444.8	1,575,571.92	2,376,099.30	39.392880	-107.707842
- survey misses target center by 10.2ft at 6773.2ft MD (6631.7 TVD, -1233.7 N, -453.1 E)									
- Point									
Shideler Fee 6-3DD PB1	0.00	0.00	8,520.0	-1,227.8	-444.8	1,575,571.92	2,376,099.30	39.392880	-107.707842
- survey misses target center by 21.5ft at 8645.0ft MD (8502.9 TVD, -1239.2 N, -438.4 E)									
- Circle (radius 25.0)									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
8,645.0	8,502.9	-1,239.2	-438.4	Last Cathedral Survey @ 8645' MD
8,700.0	8,557.9	-1,239.5	-436.6	Projection to Bit @ 8700' MD

Checked By: _____ Approved By: _____ Date: _____