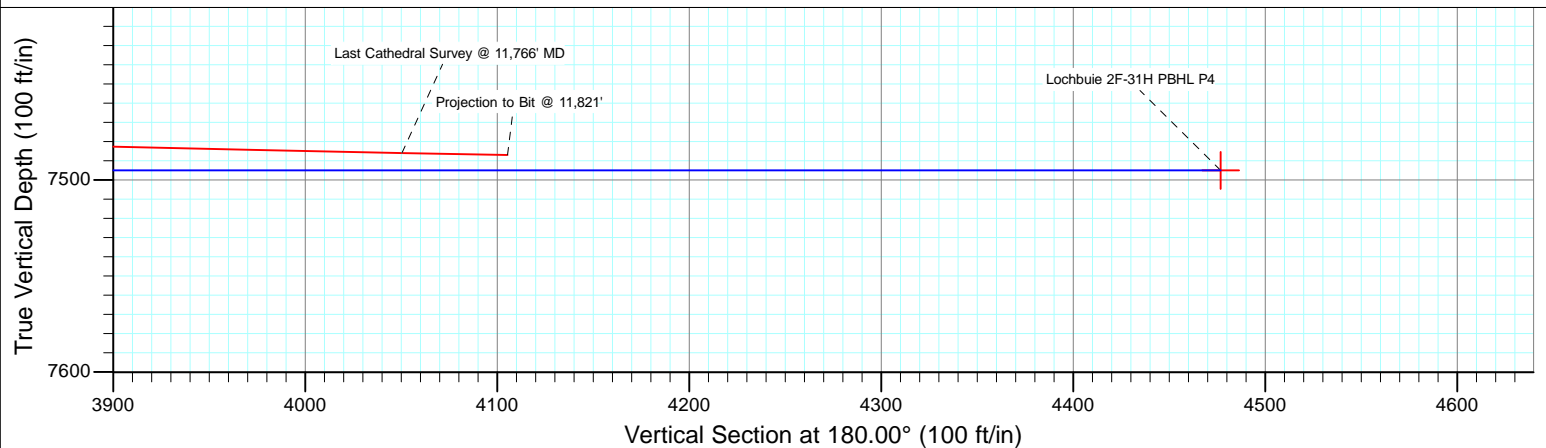
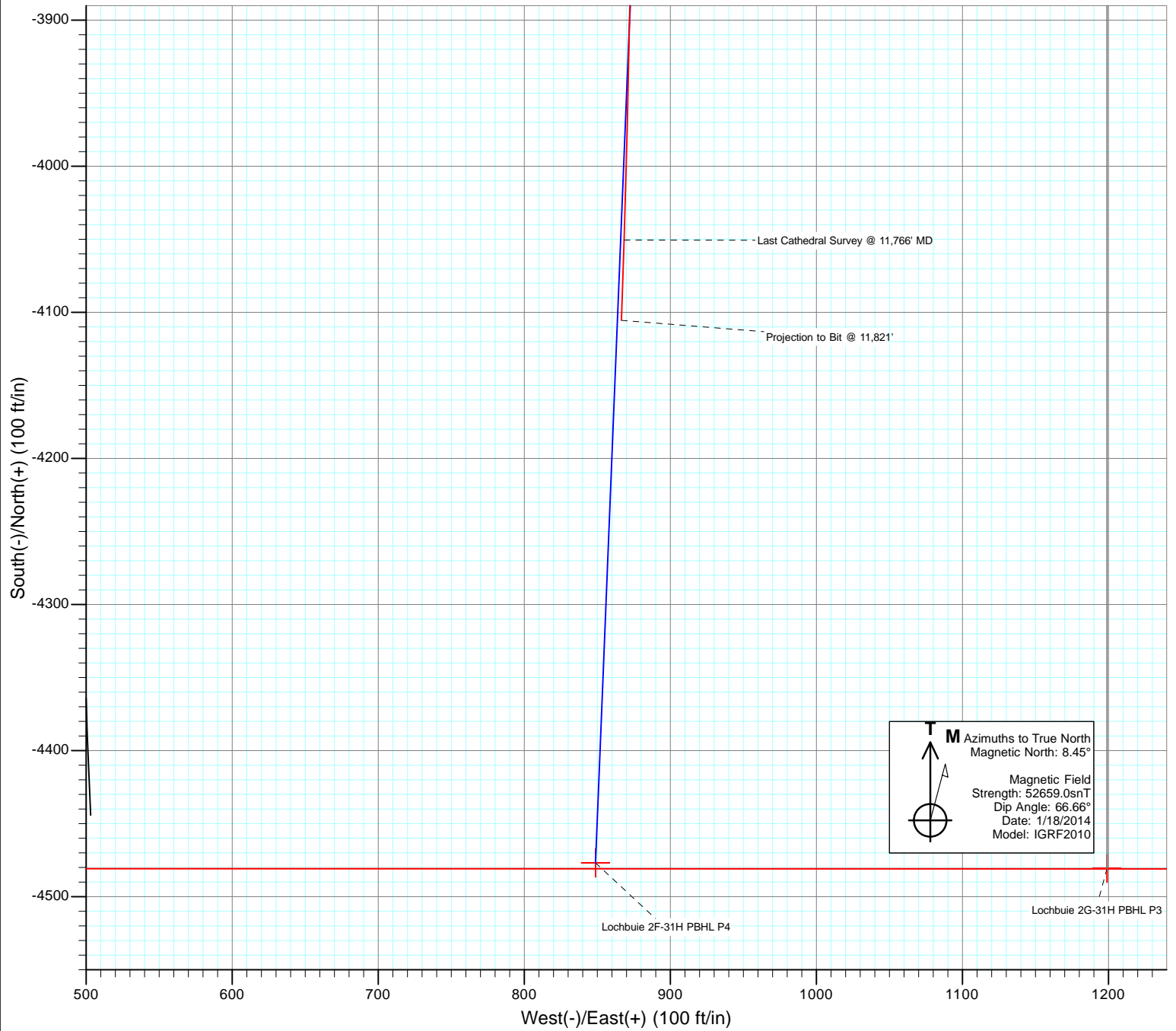




Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2F-31H
Wellbore: Hz
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	DJ Wattenberg		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S31-T1N-R65W (Lochbuie)			
Site Position:		Northing:	1,248,958.49 ft	Latitude:	40.014080
From:	Lat/Long	Easting:	3,220,662.97 ft	Longitude:	-104.712200
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.51 °

Well	Lochbuie 2F-31H					
Well Position	+N/-S	0.0 ft	Northing:	1,248,958.88 ft	Latitude:	40.014080
	+E/-W	0.0 ft	Easting:	3,220,713.39 ft	Longitude:	-104.712020
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,007.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/18/2014	8.45	66.66	52,659

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	180.00	

Survey Program	Date	2/3/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
259.0	11,821.0	Survey #1 (Hz)	Geolink 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	
259.0	0.50	324.60	259.0	0.9	-0.7	-0.9	0.19	0.19	
351.0	0.60	342.90	351.0	1.7	-1.0	-1.7	0.22	0.11	
443.0	1.00	345.60	443.0	2.9	-1.4	-2.9	0.44	0.43	
535.0	1.80	21.70	535.0	5.1	-1.0	-5.1	1.25	0.87	
627.0	3.30	45.10	626.9	8.3	1.4	-8.3	1.95	1.63	
719.0	4.00	39.10	718.7	12.6	5.3	-12.6	0.87	0.76	
811.0	6.20	58.40	810.3	17.7	11.5	-17.7	3.00	2.39	
842.0	6.20	59.90	841.1	19.4	14.4	-19.4	0.52	0.00	
873.0	6.30	66.90	872.0	21.0	17.4	-21.0	2.48	0.32	
903.0	6.30	70.30	901.8	22.2	20.5	-22.2	1.24	0.00	
965.0	6.40	76.00	963.4	24.1	27.0	-24.1	1.03	0.16	
995.0	6.50	77.50	993.2	24.9	30.3	-24.9	0.65	0.33	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	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
1,087.0	6.40	77.70	1,084.6	27.1	40.4	-27.1	0.11	-0.11	
1,179.0	6.70	77.30	1,176.0	29.4	50.7	-29.4	0.33	0.33	
1,271.0	7.10	72.60	1,267.4	32.3	61.3	-32.3	0.75	0.43	
1,363.0	7.80	72.90	1,358.6	35.8	72.7	-35.8	0.76	0.76	
1,455.0	9.00	74.10	1,449.6	39.6	85.6	-39.6	1.32	1.30	
1,547.0	11.00	75.50	1,540.2	43.8	101.0	-43.8	2.19	2.17	
1,642.0	12.90	70.20	1,633.1	49.7	119.8	-49.7	2.31	2.00	
1,736.0	13.10	69.00	1,724.7	57.0	139.6	-57.0	0.36	0.21	
1,830.0	13.10	66.10	1,816.3	65.2	159.3	-65.2	0.70	0.00	
1,925.0	13.10	64.50	1,908.8	74.2	178.8	-74.2	0.38	0.00	
2,019.0	14.40	70.20	2,000.1	82.7	199.4	-82.7	2.00	1.38	
2,114.0	14.50	68.30	2,092.1	91.1	221.6	-91.1	0.51	0.11	
2,208.0	13.80	71.60	2,183.2	99.0	243.2	-99.0	1.14	-0.74	
2,303.0	13.80	71.70	2,275.5	106.1	264.7	-106.1	0.03	0.00	
2,398.0	13.40	70.90	2,367.8	113.3	285.9	-113.3	0.47	-0.42	
2,492.0	13.20	70.50	2,459.3	120.4	306.3	-120.4	0.23	-0.21	
2,587.0	12.40	70.40	2,552.0	127.5	326.1	-127.5	0.84	-0.84	
2,681.0	14.40	68.70	2,643.4	135.1	346.5	-135.1	2.17	2.13	
2,776.0	13.70	69.70	2,735.6	143.3	368.1	-143.3	0.78	-0.74	
2,871.0	13.40	69.80	2,827.9	151.0	388.9	-151.0	0.32	-0.32	
2,965.0	12.40	72.20	2,919.5	157.9	408.8	-157.9	1.21	-1.06	
3,060.0	12.70	67.60	3,012.3	165.0	428.1	-165.0	1.10	0.32	
3,155.0	14.00	65.40	3,104.7	173.7	448.2	-173.7	1.47	1.37	
3,249.0	13.80	64.80	3,195.9	183.2	468.7	-183.2	0.26	-0.21	
3,344.0	14.60	66.10	3,288.0	192.9	489.9	-192.9	0.91	0.84	
3,438.0	14.10	67.00	3,379.1	202.2	511.3	-202.2	0.58	-0.53	
3,533.0	13.30	65.20	3,471.4	211.3	531.9	-211.3	0.95	-0.84	
3,627.0	14.10	71.60	3,562.7	219.4	552.5	-219.4	1.82	0.85	
3,722.0	13.60	71.00	3,655.0	226.7	574.1	-226.7	0.55	-0.53	
3,817.0	12.70	70.50	3,747.5	233.8	594.5	-233.8	0.95	-0.95	
3,911.0	13.50	70.30	3,839.0	241.0	614.6	-241.0	0.85	0.85	
4,006.0	13.00	69.90	3,931.5	248.4	635.0	-248.4	0.54	-0.53	
4,100.0	13.70	69.00	4,023.0	256.0	655.4	-256.0	0.78	0.74	
4,195.0	12.40	67.30	4,115.5	264.0	675.3	-264.0	1.43	-1.37	
4,290.0	11.70	66.00	4,208.4	271.8	693.5	-271.8	0.79	-0.74	
4,384.0	11.70	69.70	4,300.5	279.0	711.1	-279.0	0.80	0.00	
4,479.0	11.40	72.50	4,393.5	285.2	729.1	-285.2	0.67	-0.32	
4,574.0	11.10	71.60	4,486.7	290.9	746.7	-290.9	0.37	-0.32	
4,668.0	9.00	65.70	4,579.3	296.8	762.0	-296.8	2.49	-2.23	
4,763.0	7.70	64.40	4,673.3	302.6	774.5	-302.6	1.38	-1.37	
4,857.0	7.70	63.20	4,766.4	308.2	785.8	-308.2	0.17	0.00	
4,952.0	5.80	69.80	4,860.8	312.7	796.0	-312.7	2.16	-2.00	
5,046.0	5.10	68.40	4,954.3	315.9	804.4	-315.9	0.76	-0.74	
5,141.0	4.90	69.50	5,049.0	318.8	812.1	-318.8	0.23	-0.21	
5,235.0	4.70	68.00	5,142.6	321.7	819.4	-321.7	0.25	-0.21	
5,330.0	3.80	66.00	5,237.4	324.4	825.9	-324.4	0.96	-0.95	
5,424.0	2.70	69.40	5,331.2	326.5	830.8	-326.5	1.19	-1.17	
5,519.0	2.50	73.20	5,426.1	327.9	834.9	-327.9	0.28	-0.21	
5,614.0	2.20	81.80	5,521.0	328.7	838.7	-328.7	0.49	-0.32	
5,708.0	0.60	261.00	5,615.0	328.9	840.0	-328.9	2.98	-1.70	
5,803.0	0.80	278.70	5,710.0	328.9	838.9	-328.9	0.31	0.21	
5,897.0	0.80	275.70	5,804.0	329.1	837.6	-329.1	0.04	0.00	
5,992.0	0.50	267.60	5,899.0	329.1	836.5	-329.1	0.33	-0.32	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	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
6,087.0	0.20	240.00	5,994.0	329.0	835.9	-329.0	0.35	-0.32	
6,181.0	0.20	111.20	6,088.0	328.9	835.9	-328.9	0.38	0.00	
6,276.0	0.20	309.10	6,183.0	328.9	836.0	-328.9	0.42	0.00	
6,370.0	0.60	316.20	6,277.0	329.4	835.5	-329.4	0.43	0.43	
6,465.0	0.90	127.30	6,372.0	329.3	835.7	-329.3	1.57	0.32	
6,560.0	1.20	122.50	6,467.0	328.3	837.2	-328.3	0.33	0.32	
6,654.0	1.50	122.60	6,561.0	327.1	839.0	-327.1	0.32	0.32	
6,749.0	1.10	107.80	6,655.9	326.2	841.0	-326.2	0.55	-0.42	
6,843.0	1.00	79.80	6,749.9	326.0	842.6	-326.0	0.55	-0.11	
6,938.0	0.70	52.70	6,844.9	326.5	843.9	-326.5	0.52	-0.32	
7,035.0	1.30	156.90	6,941.9	325.9	844.8	-325.9	1.67	0.62	
7,082.0	8.20	172.00	6,988.7	322.1	845.5	-322.1	14.79	14.68	
7,129.0	11.50	170.60	7,035.0	314.1	846.7	-314.1	7.04	7.02	
7,176.0	14.50	171.40	7,080.8	303.7	848.4	-303.7	6.39	6.38	
7,224.0	14.50	178.30	7,127.3	291.7	849.4	-291.7	3.60	0.00	
7,271.0	13.80	179.30	7,172.9	280.2	849.7	-280.2	1.58	-1.49	
7,319.0	18.80	176.50	7,218.9	266.8	850.2	-266.8	10.54	10.42	
7,366.0	25.40	174.70	7,262.4	249.2	851.6	-249.2	14.11	14.04	
7,413.0	31.60	174.70	7,303.7	226.9	853.7	-226.9	13.19	13.19	
7,460.0	38.90	177.60	7,342.1	199.8	855.4	-199.8	15.93	15.53	
7,508.0	45.70	177.50	7,377.6	167.6	856.8	-167.6	14.17	14.17	
7,555.0	52.70	177.10	7,408.3	132.0	858.5	-132.0	14.91	14.89	
7,602.0	60.10	177.60	7,434.2	93.0	860.3	-93.0	15.77	15.74	
7,649.0	67.60	177.30	7,454.9	50.8	862.2	-50.8	15.97	15.96	
7,697.0	70.80	177.00	7,472.0	6.0	864.4	-6.0	6.69	6.67	
7,744.0	74.40	177.60	7,486.0	-38.8	866.5	38.8	7.76	7.66	
7,791.0	80.00	178.10	7,496.5	-84.5	868.2	84.5	11.96	11.91	
7,838.0	84.40	177.40	7,502.8	-131.1	870.1	131.1	9.48	9.36	
7,872.0	85.40	178.00	7,505.9	-164.9	871.4	164.9	3.43	2.94	
7,937.0	86.60	178.90	7,510.4	-229.7	873.2	229.7	2.31	1.85	
8,000.0	87.70	179.30	7,513.5	-292.6	874.2	292.6	1.86	1.75	
8,095.0	89.20	179.70	7,516.1	-387.6	875.0	387.6	1.63	1.58	
8,190.0	89.30	178.30	7,517.3	-482.6	876.7	482.6	1.48	0.11	
8,284.0	88.20	176.10	7,519.4	-576.4	881.3	576.4	2.62	-1.17	
8,378.0	87.20	173.20	7,523.2	-669.9	890.0	669.9	3.26	-1.06	
8,473.0	87.90	173.30	7,527.2	-764.2	901.2	764.2	0.74	0.74	
8,568.0	88.10	173.90	7,530.5	-858.5	911.7	858.5	0.67	0.21	
8,662.0	88.40	178.10	7,533.4	-952.2	918.3	952.2	4.48	0.32	
8,757.0	88.30	177.10	7,536.1	-1,047.1	922.3	1,047.1	1.06	-0.11	
8,851.0	91.60	177.00	7,536.2	-1,141.0	927.1	1,141.0	3.51	3.51	
8,946.0	91.60	175.50	7,533.6	-1,235.7	933.3	1,235.7	1.58	0.00	
9,041.0	91.70	176.90	7,530.8	-1,330.5	939.6	1,330.5	1.48	0.11	
9,135.0	92.00	176.10	7,527.8	-1,424.3	945.3	1,424.3	0.91	0.32	
9,230.0	92.30	176.80	7,524.2	-1,519.0	951.2	1,519.0	0.80	0.32	
9,324.0	90.70	177.10	7,521.8	-1,612.8	956.2	1,612.8	1.73	-1.70	
9,419.0	89.60	177.80	7,521.5	-1,707.7	960.5	1,707.7	1.37	-1.16	
9,513.0	89.80	177.80	7,522.0	-1,801.6	964.1	1,801.6	0.21	0.21	
9,608.0	91.30	178.30	7,521.1	-1,896.6	967.3	1,896.6	1.66	1.58	
9,702.0	92.40	179.70	7,518.1	-1,990.5	968.9	1,990.5	1.89	1.17	
9,797.0	92.60	178.80	7,513.9	-2,085.4	970.2	2,085.4	0.97	0.21	
9,892.0	91.30	180.50	7,510.7	-2,180.4	970.8	2,180.4	2.25	-1.37	
9,986.0	90.30	181.80	7,509.4	-2,274.3	968.9	2,274.3	1.74	-1.06	
10,081.0	90.30	184.20	7,508.9	-2,369.2	963.9	2,369.2	2.53	0.00	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	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
10,175.0	90.80	184.80	7,508.0	-2,462.9	956.5	2,462.9	0.83	0.53	
10,270.0	90.00	184.10	7,507.3	-2,557.6	949.2	2,557.6	1.12	-0.84	
10,365.0	92.40	184.80	7,505.3	-2,652.3	941.8	2,652.3	2.63	2.53	
10,459.0	91.70	184.20	7,502.0	-2,745.9	934.4	2,745.9	0.98	-0.74	
10,553.0	92.50	183.80	7,498.5	-2,839.6	927.9	2,839.6	0.95	0.85	
10,648.0	91.60	185.00	7,495.1	-2,934.3	920.6	2,934.3	1.58	-0.95	
10,743.0	91.80	184.00	7,492.3	-3,029.0	913.1	3,029.0	1.07	0.21	
10,837.0	92.00	184.70	7,489.2	-3,122.6	906.0	3,122.6	0.77	0.21	
10,932.0	91.60	183.40	7,486.2	-3,217.4	899.3	3,217.4	1.43	-0.42	
11,026.0	92.20	182.80	7,483.1	-3,311.2	894.2	3,311.2	0.90	0.64	
11,121.0	91.20	182.50	7,480.3	-3,406.0	889.8	3,406.0	1.10	-1.05	
11,215.0	90.80	182.50	7,478.6	-3,499.9	885.7	3,499.9	0.43	-0.43	
11,310.0	91.10	182.50	7,477.1	-3,594.8	881.6	3,594.8	0.32	0.32	
11,405.0	88.70	182.40	7,477.2	-3,689.7	877.5	3,689.7	2.53	-2.53	
11,499.0	88.40	181.10	7,479.6	-3,783.6	874.7	3,783.6	1.42	-0.32	
11,594.0	88.70	181.40	7,482.0	-3,878.6	872.6	3,878.6	0.45	0.32	
11,688.0	88.60	181.10	7,484.2	-3,972.5	870.5	3,972.5	0.34	-0.11	
11,766.0	88.90	182.00	7,485.9	-4,050.5	868.4	4,050.5	1.22	0.38	Last Cathedral Survey @ 11,766' MD
11,821.0	88.90	182.00	7,487.0	-4,105.5	866.5	4,105.5	0.00	0.00	Projection to Bit @ 11,821'

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	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									
Lochbuie 2F-31H 11,10C	0.00	0.00	7,495.0	-3,379.2	893.2	1,245,587.72	3,221,636.55	40.004803	-104.708832
- actual wellpath misses target center by 14.3ft at 11093.7ft MD (7480.9 TVD, -3378.7 N, 891.0 E)									
- Point									
Lochbuie 2F-31H PBHL	0.00	0.00	7,504.0	-4,476.9	848.8	1,244,489.73	3,221,601.98	40.001790	-104.708990
- actual wellpath misses target center by 372.2ft at 11821.0ft MD (7487.0 TVD, -4105.5 N, 866.5 E)									
- Point									
Lochbuie 2F-31H 9300'	0.00	0.00	7,539.0	-1,580.5	944.1	1,247,386.88	3,221,671.48	40.009741	-104.708650
- actual wellpath misses target center by 19.7ft at 9290.6ft MD (7522.3 TVD, -1579.5 N, 954.5 E)									
- Point									
Lochbuie 2F-31H 8800'	0.00	0.00	7,539.0	-1,081.3	914.6	1,247,885.72	3,221,637.54	40.011111	-104.708755
- actual wellpath misses target center by 9.7ft at 8790.8ft MD (7536.8 TVD, -1080.8 N, 924.0 E)									
- Point									
Interp @ 7504.0 (Lochbuie)	0.00	0.00	7,504.0	-1,504.0	940.0	1,247,463.30	3,221,666.71	40.009951	-104.708664
- actual wellpath misses target center by 23.3ft at 9215.1ft MD (7524.8 TVD, -1504.1 N, 950.4 E)									
- Point									
Lochbuie 2F-31H PBHL	0.00	0.00	7,495.0	-4,476.9	848.8	1,244,489.73	3,221,601.98	40.001790	-104.708990
- actual wellpath misses target center by 371.9ft at 11821.0ft MD (7487.0 TVD, -4105.5 N, 866.5 E)									
- Point									

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
11,766.0	7,485.9	-4,050.5	868.4	Last Cathedral Survey @ 11,766' MD
11,821.0	7,487.0	-4,105.5	866.5	Projection to Bit @ 11,821'

Checked By: _____ Approved By: _____ Date: _____

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S31-T1N-R65W (Lochbuie)

Lochbuie 2F-31H

Hz

Design: FINAL

Survey Report - Geographic

03 February, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	DJ Wattenberg		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	S31-T1N-R65W (Lochbuie)				
Site Position:		Northing:	1,248,958.49 ft	Latitude:	40.014080
From:	Lat/Long	Easting:	3,220,662.97 ft	Longitude:	-104.712200
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.51 °

Well		Lochbuie 2F-31H				
Well Position	+N/-S	0.0 ft	Northing:	1,248,958.88 ft	Latitude:	40.014080
	+E/-W	0.0 ft	Easting:	3,220,713.39 ft	Longitude:	-104.712020
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,007.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/18/2014	8.45	66.66	52,659

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	180.00	

Survey Program	Date	2/3/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
259.0	11,821.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
0.0	0.00	0.00	0.0	0.0	0.0	1,248,958.88	3,220,713.39	40.014080	-104.712020	
259.0	0.50	324.60	259.0	0.9	-0.7	1,248,959.80	3,220,712.73	40.014082	-104.712023	
351.0	0.60	342.90	351.0	1.7	-1.0	1,248,960.58	3,220,712.35	40.014085	-104.712024	
443.0	1.00	345.60	443.0	2.9	-1.4	1,248,961.82	3,220,711.99	40.014088	-104.712025	
535.0	1.80	21.70	535.0	5.1	-1.0	1,248,963.94	3,220,712.31	40.014094	-104.712024	
627.0	3.30	45.10	626.9	8.3	1.4	1,248,967.17	3,220,714.69	40.014103	-104.712015	
719.0	4.00	39.10	718.7	12.6	5.3	1,248,971.57	3,220,718.55	40.014115	-104.712001	
811.0	6.20	58.40	810.3	17.7	11.5	1,248,976.72	3,220,724.76	40.014129	-104.711979	
842.0	6.20	59.90	841.1	19.4	14.4	1,248,978.46	3,220,727.62	40.014133	-104.711969	
873.0	6.30	66.90	872.0	21.0	17.4	1,248,979.99	3,220,730.62	40.014137	-104.711958	
903.0	6.30	70.30	901.8	22.2	20.5	1,248,981.22	3,220,733.67	40.014141	-104.711947	
965.0	6.40	76.00	963.4	24.1	27.0	1,248,983.26	3,220,740.21	40.014146	-104.711924	

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	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)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
995.0	6.50	77.50	993.2	24.9	30.3	1,248,984.06	3,220,743.48	40.014148	-104.711912
1,087.0	6.40	77.70	1,084.6	27.1	40.4	1,248,986.37	3,220,753.56	40.014154	-104.711876
1,179.0	6.70	77.30	1,176.0	29.4	50.7	1,248,988.73	3,220,763.78	40.014161	-104.711839
1,271.0	7.10	72.60	1,267.4	32.3	61.3	1,248,991.71	3,220,774.42	40.014169	-104.711801
1,363.0	7.80	72.90	1,358.6	35.8	72.7	1,248,995.35	3,220,785.78	40.014178	-104.711761
1,455.0	9.00	74.10	1,449.6	39.6	85.6	1,248,999.27	3,220,798.63	40.014189	-104.711715
1,547.0	11.00	75.50	1,540.2	43.8	101.0	1,249,003.57	3,220,814.01	40.014200	-104.711660
1,642.0	12.90	70.20	1,633.1	49.7	119.8	1,249,009.60	3,220,832.71	40.014216	-104.711593
1,736.0	13.10	69.00	1,724.7	57.0	139.6	1,249,017.15	3,220,852.47	40.014237	-104.711522
1,830.0	13.10	66.10	1,816.3	65.2	159.3	1,249,025.46	3,220,872.08	40.014259	-104.711452
1,925.0	13.10	64.50	1,908.8	74.2	178.8	1,249,034.63	3,220,891.56	40.014284	-104.711382
2,019.0	14.40	70.20	2,000.1	82.7	199.4	1,249,043.36	3,220,912.09	40.014307	-104.711308
2,114.0	14.50	68.30	2,092.1	91.1	221.6	1,249,051.95	3,220,934.18	40.014330	-104.711229
2,208.0	13.80	71.60	2,183.2	99.0	243.2	1,249,060.03	3,220,955.68	40.014352	-104.711152
2,303.0	13.80	71.70	2,275.5	106.1	264.7	1,249,067.36	3,220,977.13	40.014371	-104.711075
2,398.0	13.40	70.90	2,367.8	113.3	285.9	1,249,074.71	3,220,998.22	40.014391	-104.711000
2,492.0	13.20	70.50	2,459.3	120.4	306.3	1,249,082.03	3,221,018.57	40.014411	-104.710927
2,587.0	12.40	70.40	2,552.0	127.5	326.1	1,249,089.25	3,221,038.34	40.014430	-104.710856
2,681.0	14.40	68.70	2,643.4	135.1	346.5	1,249,097.07	3,221,058.67	40.014451	-104.710783
2,776.0	13.70	69.70	2,735.6	143.3	368.1	1,249,105.45	3,221,080.15	40.014473	-104.710706
2,871.0	13.40	69.80	2,827.9	151.0	388.9	1,249,113.34	3,221,100.97	40.014494	-104.710632
2,965.0	12.40	72.20	2,919.5	157.9	408.8	1,249,120.36	3,221,120.74	40.014513	-104.710561
3,060.0	12.70	67.60	3,012.3	165.0	428.1	1,249,127.63	3,221,140.04	40.014533	-104.710492
3,155.0	14.00	65.40	3,104.7	173.7	448.2	1,249,136.57	3,221,160.07	40.014557	-104.710420
3,249.0	13.80	64.80	3,195.9	183.2	468.7	1,249,146.26	3,221,180.46	40.014583	-104.710347
3,344.0	14.60	66.10	3,288.0	192.9	489.9	1,249,156.13	3,221,201.58	40.014609	-104.710271
3,438.0	14.10	67.00	3,379.1	202.2	511.3	1,249,165.59	3,221,222.86	40.014635	-104.710195
3,533.0	13.30	65.20	3,471.4	211.3	531.9	1,249,174.88	3,221,243.35	40.014660	-104.710121
3,627.0	14.10	71.60	3,562.7	219.4	552.5	1,249,183.21	3,221,263.96	40.014682	-104.710048
3,722.0	13.60	71.00	3,655.0	226.7	574.1	1,249,190.69	3,221,285.44	40.014702	-104.709971
3,817.0	12.70	70.50	3,747.5	233.8	594.5	1,249,197.99	3,221,305.78	40.014722	-104.709898
3,911.0	13.50	70.30	3,839.0	241.0	614.6	1,249,205.32	3,221,325.78	40.014741	-104.709826
4,006.0	13.00	69.90	3,931.5	248.4	635.0	1,249,212.91	3,221,346.19	40.014762	-104.709753
4,100.0	13.70	69.00	4,023.0	256.0	655.4	1,249,220.71	3,221,366.44	40.014783	-104.709680
4,195.0	12.40	67.30	4,115.5	264.0	675.3	1,249,228.86	3,221,386.29	40.014805	-104.709609
4,290.0	11.70	66.00	4,208.4	271.8	693.5	1,249,236.87	3,221,404.43	40.014826	-104.709544
4,384.0	11.70	69.70	4,300.5	279.0	711.1	1,249,244.21	3,221,422.01	40.014846	-104.709481
4,479.0	11.40	72.50	4,393.5	285.2	729.1	1,249,250.54	3,221,439.94	40.014863	-104.709417
4,574.0	11.10	71.60	4,486.7	290.9	746.7	1,249,256.41	3,221,457.52	40.014878	-104.709354
4,668.0	9.00	65.70	4,579.3	296.8	762.0	1,249,262.42	3,221,472.76	40.014895	-104.709300
4,763.0	7.70	64.40	4,673.3	302.6	774.5	1,249,268.34	3,221,485.22	40.014911	-104.709255
4,857.0	7.70	63.20	4,766.4	308.2	785.8	1,249,274.00	3,221,496.47	40.014926	-104.709215
4,952.0	5.80	69.80	4,860.8	312.7	796.0	1,249,278.62	3,221,506.61	40.014938	-104.709178
5,046.0	5.10	68.40	4,954.3	315.9	804.4	1,249,281.87	3,221,514.93	40.014947	-104.709148
5,141.0	4.90	69.50	5,049.0	318.8	812.1	1,249,284.92	3,221,522.63	40.014955	-104.709121
5,235.0	4.70	68.00	5,142.6	321.7	819.4	1,249,287.83	3,221,529.93	40.014963	-104.709095
5,330.0	3.80	66.00	5,237.4	324.4	825.9	1,249,290.63	3,221,536.39	40.014970	-104.709072
5,424.0	2.70	69.40	5,331.2	326.5	830.8	1,249,292.72	3,221,541.29	40.014976	-104.709054
5,519.0	2.50	73.20	5,426.1	327.9	834.9	1,249,294.14	3,221,545.36	40.014980	-104.709039
5,614.0	2.20	81.80	5,521.0	328.7	838.7	1,249,295.03	3,221,549.14	40.014982	-104.709026
5,708.0	0.60	261.00	5,615.0	328.9	840.0	1,249,295.22	3,221,550.44	40.014983	-104.709021
5,803.0	0.80	278.70	5,710.0	328.9	838.9	1,249,295.24	3,221,549.29	40.014983	-104.709025
5,897.0	0.80	275.70	5,804.0	329.1	837.6	1,249,295.39	3,221,547.99	40.014983	-104.709030
5,992.0	0.50	267.60	5,899.0	329.1	836.5	1,249,295.43	3,221,546.91	40.014983	-104.709034
6,087.0	0.20	240.00	5,994.0	329.0	835.9	1,249,295.32	3,221,546.35	40.014983	-104.709036

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	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)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
6,181.0	0.20	111.20	6,088.0	328.9	835.9	1,249,295.18	3,221,546.37	40.014983	-104.709036
6,276.0	0.20	309.10	6,183.0	328.9	836.0	1,249,295.23	3,221,546.39	40.014983	-104.709036
6,370.0	0.60	316.20	6,277.0	329.4	835.5	1,249,295.68	3,221,545.92	40.014984	-104.709037
6,465.0	0.90	127.30	6,372.0	329.3	835.7	1,249,295.59	3,221,546.17	40.014984	-104.709036
6,560.0	1.20	122.50	6,467.0	328.3	837.2	1,249,294.62	3,221,547.61	40.014981	-104.709031
6,654.0	1.50	122.60	6,561.0	327.1	839.0	1,249,293.44	3,221,549.49	40.014978	-104.709025
6,749.0	1.10	107.80	6,655.9	326.2	841.0	1,249,292.51	3,221,551.41	40.014975	-104.709018
6,843.0	1.00	79.80	6,749.9	326.0	842.6	1,249,292.39	3,221,553.08	40.014975	-104.709012
6,938.0	0.70	52.70	6,844.9	326.5	843.9	1,249,292.90	3,221,554.35	40.014976	-104.709007
7,035.0	1.30	156.90	6,941.9	325.9	844.8	1,249,292.26	3,221,555.26	40.014975	-104.709004
7,082.0	8.20	172.00	6,988.7	322.1	845.5	1,249,288.45	3,221,555.97	40.014964	-104.709002
7,129.0	11.50	170.60	7,035.0	314.1	846.7	1,249,280.52	3,221,557.27	40.014942	-104.708997
7,176.0	14.50	171.40	7,080.8	303.7	848.4	1,249,270.09	3,221,559.01	40.014914	-104.708991
7,224.0	14.50	178.30	7,127.3	291.7	849.4	1,249,258.15	3,221,560.20	40.014881	-104.708988
7,271.0	13.80	179.30	7,172.9	280.2	849.7	1,249,246.67	3,221,560.54	40.014849	-104.708987
7,319.0	18.80	176.50	7,218.9	266.8	850.2	1,249,233.22	3,221,561.20	40.014812	-104.708985
7,366.0	25.40	174.70	7,262.4	249.2	851.6	1,249,215.62	3,221,562.75	40.014764	-104.708980
7,413.0	31.60	174.70	7,303.7	226.9	853.7	1,249,193.32	3,221,565.02	40.014703	-104.708972
7,460.0	38.90	177.60	7,342.1	199.8	855.4	1,249,166.29	3,221,567.02	40.014628	-104.708966
7,508.0	45.70	177.50	7,377.6	167.6	856.8	1,249,134.05	3,221,568.69	40.014540	-104.708961
7,555.0	52.70	177.10	7,408.3	132.0	858.5	1,249,098.55	3,221,570.69	40.014442	-104.708955
7,602.0	60.10	177.60	7,434.2	93.0	860.3	1,249,059.49	3,221,572.84	40.014335	-104.708949
7,649.0	67.60	177.30	7,454.9	50.8	862.2	1,249,017.39	3,221,575.09	40.014219	-104.708942
7,697.0	70.80	177.00	7,472.0	6.0	864.4	1,248,972.60	3,221,577.72	40.014096	-104.708934
7,744.0	74.40	177.60	7,486.0	-38.8	866.5	1,248,927.83	3,221,580.23	40.013974	-104.708927
7,791.0	80.00	178.10	7,496.5	-84.5	868.2	1,248,882.06	3,221,582.35	40.013848	-104.708920
7,838.0	84.40	177.40	7,502.8	-131.1	870.1	1,248,835.56	3,221,584.59	40.013720	-104.708914
7,872.0	85.40	178.00	7,505.9	-164.9	871.4	1,248,801.74	3,221,586.25	40.013627	-104.708909
7,937.0	86.60	178.90	7,510.4	-229.7	873.2	1,248,736.96	3,221,588.58	40.013449	-104.708903
8,000.0	87.70	179.30	7,513.5	-292.6	874.2	1,248,674.04	3,221,590.13	40.013277	-104.708899
8,095.0	89.20	179.70	7,516.1	-387.6	875.0	1,248,579.09	3,221,591.80	40.013016	-104.708896
8,190.0	89.30	178.30	7,517.3	-482.6	876.7	1,248,484.13	3,221,594.30	40.012755	-104.708890
8,284.0	88.20	176.10	7,519.4	-576.4	881.3	1,248,390.32	3,221,599.73	40.012498	-104.708874
8,378.0	87.20	173.20	7,523.2	-669.9	890.0	1,248,296.90	3,221,609.31	40.012241	-104.708843
8,473.0	87.90	173.30	7,527.2	-764.2	901.2	1,248,202.74	3,221,621.31	40.011982	-104.708803
8,568.0	88.10	173.90	7,530.5	-858.5	911.7	1,248,108.49	3,221,632.73	40.011723	-104.708765
8,662.0	88.40	178.10	7,533.4	-952.2	918.3	1,248,014.85	3,221,640.11	40.011466	-104.708742
8,757.0	88.30	177.10	7,536.1	-1,047.1	922.3	1,247,920.01	3,221,644.93	40.011205	-104.708728
8,851.0	91.60	177.00	7,536.2	-1,141.0	927.1	1,247,826.19	3,221,650.60	40.010948	-104.708710
8,946.0	91.60	175.50	7,533.6	-1,235.7	933.3	1,247,731.50	3,221,657.65	40.010688	-104.708688
9,041.0	91.70	176.90	7,530.8	-1,330.5	939.6	1,247,636.81	3,221,664.79	40.010428	-104.708666
9,135.0	92.00	176.10	7,527.8	-1,424.3	945.3	1,247,543.09	3,221,671.36	40.010170	-104.708645
9,230.0	92.30	176.80	7,524.2	-1,519.0	951.2	1,247,448.39	3,221,678.08	40.009910	-104.708624
9,324.0	90.70	177.10	7,521.8	-1,612.8	956.2	1,247,354.63	3,221,683.91	40.009652	-104.708607
9,419.0	89.60	177.80	7,521.5	-1,707.7	960.5	1,247,259.76	3,221,688.98	40.009392	-104.708591
9,513.0	89.80	177.80	7,522.0	-1,801.6	964.1	1,247,165.87	3,221,693.42	40.009134	-104.708579
9,608.0	91.30	178.30	7,521.1	-1,896.6	967.3	1,247,070.97	3,221,697.50	40.008873	-104.708567
9,702.0	92.40	179.70	7,518.1	-1,990.5	968.9	1,246,977.05	3,221,699.97	40.008616	-104.708561
9,797.0	92.60	178.80	7,513.9	-2,085.4	970.2	1,246,882.17	3,221,702.06	40.008355	-104.708557
9,892.0	91.30	180.50	7,510.7	-2,180.4	970.8	1,246,787.24	3,221,703.48	40.008094	-104.708555
9,986.0	90.30	181.80	7,509.4	-2,274.3	968.9	1,246,693.25	3,221,702.43	40.007836	-104.708562
10,081.0	90.30	184.20	7,508.9	-2,369.2	963.9	1,246,598.35	3,221,698.30	40.007576	-104.708579
10,175.0	90.80	184.80	7,508.0	-2,462.9	956.5	1,246,504.59	3,221,691.76	40.007319	-104.708606
10,270.0	90.00	184.10	7,507.3	-2,557.6	949.2	1,246,409.81	3,221,685.23	40.007059	-104.708632
10,365.0	92.40	184.80	7,505.3	-2,652.3	941.8	1,246,315.07	3,221,678.70	40.006799	-104.708658

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2F-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2F-31H	North Reference:	True
Wellbore:	Hz	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)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
10,459.0	91.70	184.20	7,502.0	-2,745.9	934.4	1,246,221.36	3,221,672.17	40.006542	-104.708685	
10,553.0	92.50	183.80	7,498.5	-2,839.6	927.9	1,246,127.59	3,221,666.45	40.006285	-104.708708	
10,648.0	91.60	185.00	7,495.1	-2,934.3	920.6	1,246,032.88	3,221,660.00	40.006025	-104.708734	
10,743.0	91.80	184.00	7,492.3	-3,029.0	913.1	1,245,938.15	3,221,653.40	40.005765	-104.708761	
10,837.0	92.00	184.70	7,489.2	-3,122.6	906.0	1,245,844.41	3,221,647.10	40.005508	-104.708786	
10,932.0	91.60	183.40	7,486.2	-3,217.4	899.3	1,245,749.64	3,221,641.24	40.005248	-104.708810	
11,026.0	92.20	182.80	7,483.1	-3,311.2	894.2	1,245,655.79	3,221,636.99	40.004990	-104.708828	
11,121.0	91.20	182.50	7,480.3	-3,406.0	889.8	1,245,560.90	3,221,633.44	40.004730	-104.708844	
11,215.0	90.80	182.50	7,478.6	-3,499.9	885.7	1,245,466.97	3,221,630.18	40.004472	-104.708858	
11,310.0	91.10	182.50	7,477.1	-3,594.8	881.6	1,245,372.04	3,221,626.88	40.004211	-104.708873	
11,405.0	88.70	182.40	7,477.2	-3,689.7	877.5	1,245,277.10	3,221,623.66	40.003951	-104.708888	
11,499.0	88.40	181.10	7,479.6	-3,783.6	874.7	1,245,183.16	3,221,621.63	40.003693	-104.708898	
11,594.0	88.70	181.40	7,482.0	-3,878.6	872.6	1,245,088.20	3,221,620.40	40.003432	-104.708905	
11,688.0	88.60	181.10	7,484.2	-3,972.5	870.5	1,244,994.23	3,221,619.18	40.003175	-104.708913	
11,766.0	88.90	182.00	7,485.9	-4,050.5	868.4	1,244,916.26	3,221,617.77	40.002961	-104.708920	
Last Cathedral Survey @ 11,766' MD										
11,821.0	88.90	182.00	7,487.0	-4,105.5	866.5	1,244,861.29	3,221,616.34	40.002810	-104.708927	
Projection to Bit @ 11,821'										

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	Latitude	Longitude
Lochbuie 2F-31H PBHL	0.00	0.00	7,495.0	-4,476.9	848.8	1,244,489.73	3,221,601.98	40.001790	-104.708990
- actual wellpath misses target center by 371.9ft at 11821.0ft MD (7487.0 TVD, -4105.5 N, 866.5 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
11,766.0	7,485.9	-4,050.5	868.4	Last Cathedral Survey @ 11,766' MD	
11,821.0	7,487.0	-4,105.5	866.5	Projection to Bit @ 11,821'	

Checked By: _____ Approved By: _____ Date: _____