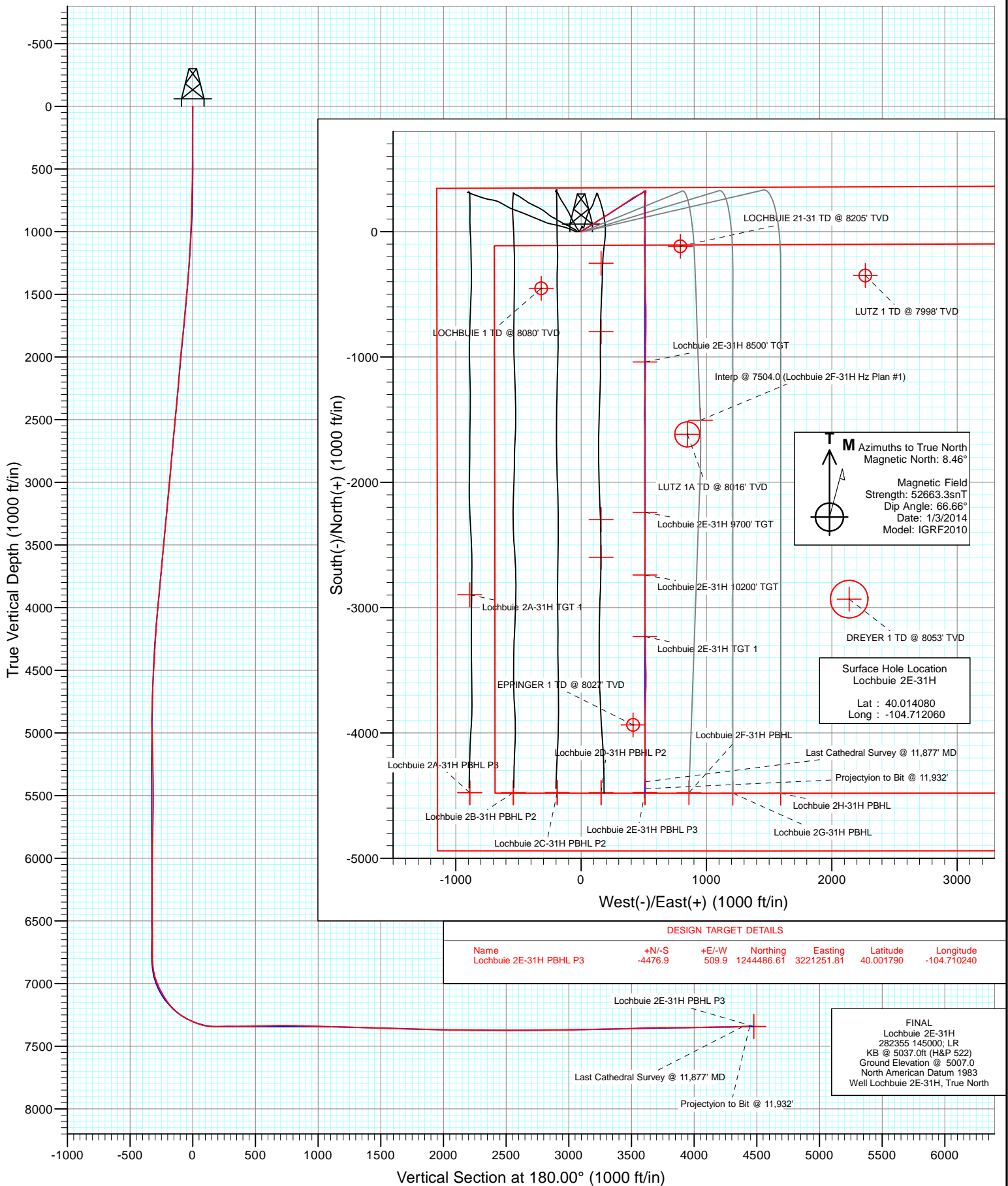


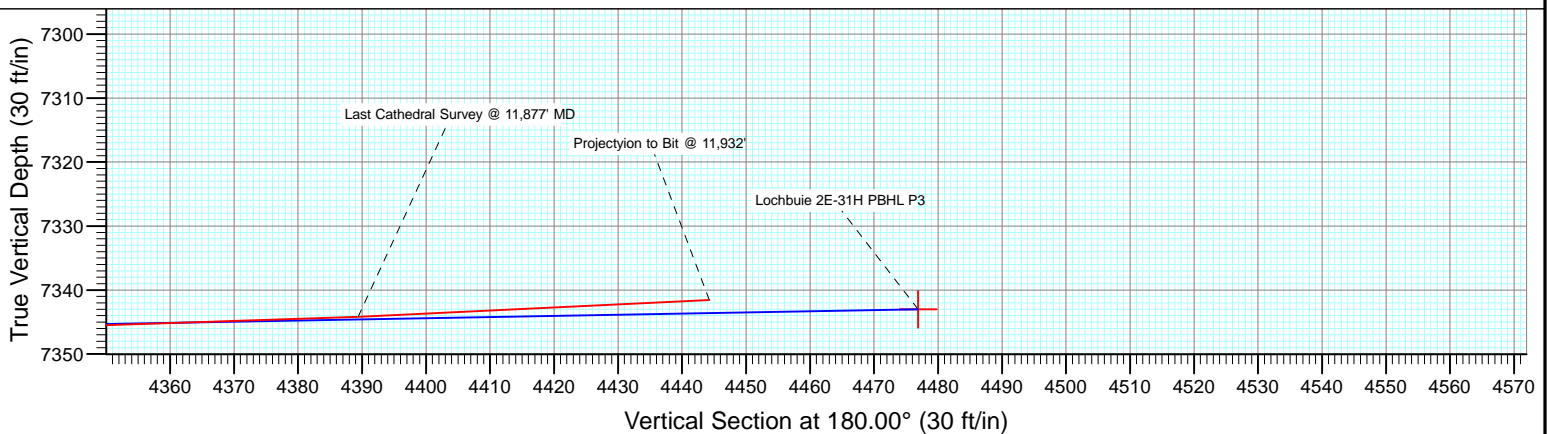
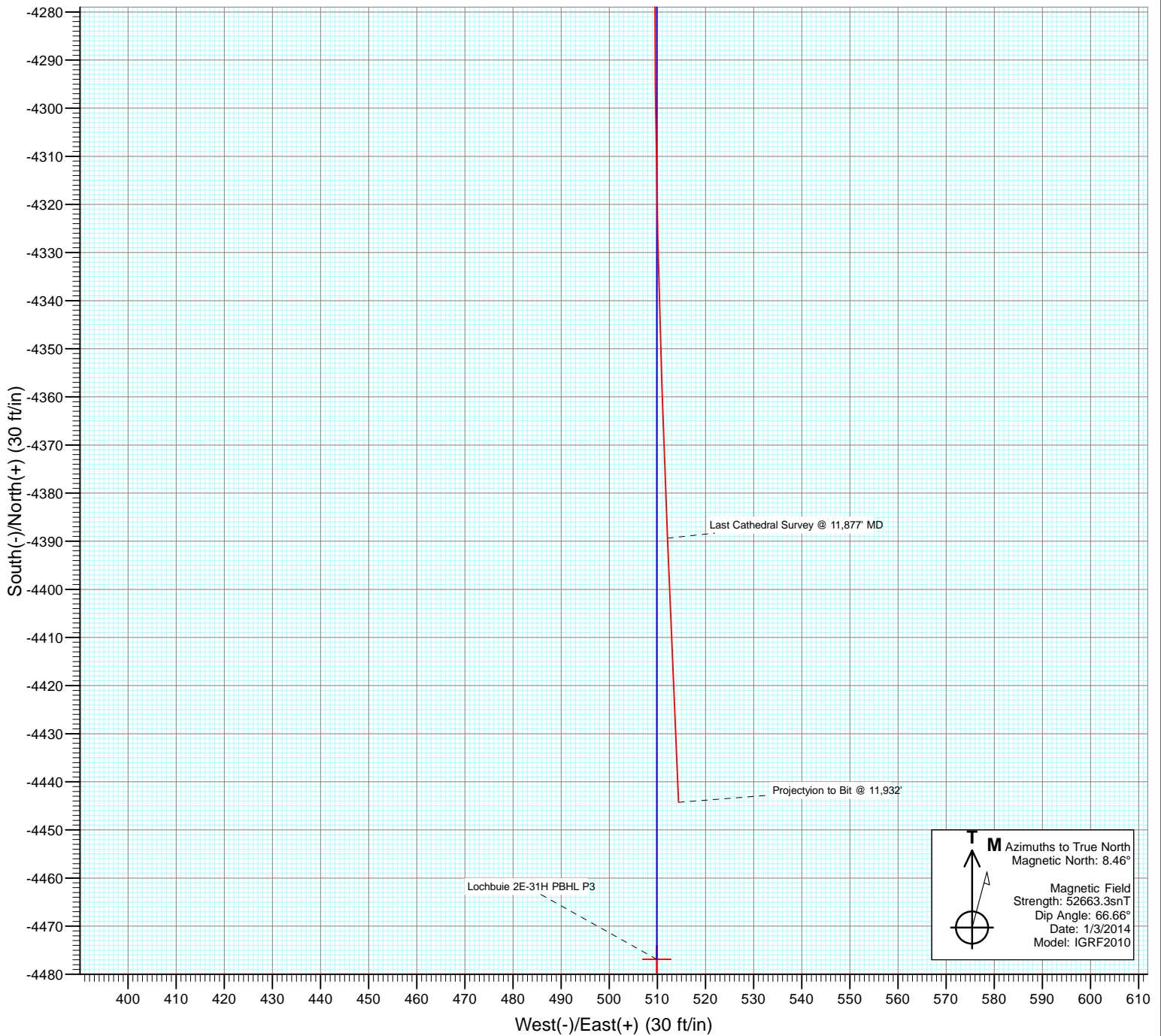


Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2E-31H
Wellbore: Hz
Design: FINAL





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



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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 2E-31H					
Well Position	+N/-S	0.0 ft	Northing:	1,248,958.79 ft	Latitude:	40.014080
	+E/-W	0.0 ft	Easting:	3,220,702.18 ft	Longitude:	-104.712060
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	1/3/2014	8.46	66.66	52,663

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	1/17/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
165.0	11,932.0	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	
165.0	0.50	318.00	165.0	0.5	-0.5	-0.5	0.30	0.30	
258.0	0.30	319.90	258.0	1.0	-0.9	-1.0	0.22	-0.22	
350.0	0.20	288.20	350.0	1.3	-1.2	-1.3	0.18	-0.11	
442.0	0.80	32.50	442.0	1.8	-1.0	-1.8	0.95	0.65	
534.0	0.70	30.50	534.0	2.9	-0.4	-2.9	0.11	-0.11	
626.0	1.00	46.80	626.0	3.9	0.5	-3.9	0.42	0.33	
718.0	1.90	53.80	717.9	5.4	2.3	-5.4	1.00	0.98	
810.0	3.30	59.30	809.8	7.6	5.8	-7.6	1.54	1.52	
902.0	4.00	60.50	901.7	10.5	10.9	-10.5	0.77	0.76	
994.0	5.10	59.60	993.4	14.2	17.2	-14.2	1.20	1.20	
1,086.0	5.90	58.60	1,084.9	18.7	24.8	-18.7	0.88	0.87	
1,178.0	7.00	61.00	1,176.4	23.9	33.7	-23.9	1.23	1.20	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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
1,269.0	7.60	58.70	1,266.6	29.7	43.7	-29.7	0.73	0.66	
1,361.0	8.70	60.10	1,357.7	36.4	54.9	-36.4	1.21	1.20	
1,457.0	9.30	59.00	1,452.5	44.0	67.9	-44.0	0.65	0.62	
1,549.0	9.70	57.90	1,543.3	51.9	80.8	-51.9	0.48	0.43	
1,645.0	9.40	57.60	1,637.9	60.4	94.3	-60.4	0.32	-0.31	
1,741.0	9.80	54.80	1,732.6	69.3	107.6	-69.3	0.64	0.42	
1,836.0	10.20	56.40	1,826.1	78.6	121.2	-78.6	0.51	0.42	
1,930.0	10.60	56.50	1,918.6	88.0	135.3	-88.0	0.43	0.43	
2,025.0	10.10	60.40	2,012.0	97.0	149.8	-97.0	0.91	-0.53	
2,116.0	8.90	60.80	2,101.8	104.3	162.9	-104.3	1.32	-1.32	
2,211.0	8.40	59.10	2,195.7	111.5	175.3	-111.5	0.59	-0.53	
2,305.0	9.50	60.40	2,288.6	118.8	187.9	-118.8	1.19	1.17	
2,400.0	9.60	54.10	2,382.3	127.4	201.2	-127.4	1.10	0.11	
2,495.0	8.90	52.50	2,476.0	136.5	213.4	-136.5	0.78	-0.74	
2,589.0	9.30	54.70	2,568.8	145.3	225.4	-145.3	0.56	0.43	
2,684.0	10.10	57.90	2,662.5	154.1	238.7	-154.1	1.02	0.84	
2,779.0	9.90	57.40	2,756.0	163.0	252.6	-163.0	0.23	-0.21	
2,873.0	8.70	56.20	2,848.8	171.3	265.4	-171.3	1.29	-1.28	
2,968.0	8.60	59.30	2,942.7	178.9	277.4	-178.9	0.50	-0.11	
3,063.0	9.30	57.40	3,036.6	186.7	290.0	-186.7	0.80	0.74	
3,157.0	9.90	57.20	3,129.2	195.1	303.2	-195.1	0.64	0.64	
3,252.0	10.50	52.50	3,222.7	204.8	316.9	-204.8	1.08	0.63	
3,346.0	9.70	57.90	3,315.3	214.3	330.4	-214.3	1.32	-0.85	
3,441.0	10.30	58.40	3,408.8	223.0	344.5	-223.0	0.64	0.63	
3,535.0	9.70	55.70	3,501.4	231.8	358.2	-231.8	0.81	-0.64	
3,630.0	9.40	55.90	3,595.1	240.7	371.2	-240.7	0.32	-0.32	
3,725.0	9.10	61.00	3,688.9	248.7	384.2	-248.7	0.92	-0.32	
3,819.0	9.70	53.10	3,781.6	257.0	397.0	-257.0	1.51	0.64	
3,914.0	9.80	53.20	3,875.2	266.7	409.9	-266.7	0.11	0.11	
4,008.0	9.80	61.80	3,967.9	275.3	423.3	-275.3	1.56	0.00	
4,103.0	11.00	65.30	4,061.3	282.9	438.7	-282.9	1.43	1.26	
4,198.0	9.60	62.80	4,154.8	290.3	454.0	-290.3	1.55	-1.47	
4,292.0	8.20	63.60	4,247.6	296.8	467.0	-296.8	1.50	-1.49	
4,387.0	6.80	61.50	4,341.8	302.5	478.0	-302.5	1.50	-1.47	
4,481.0	6.30	60.50	4,435.2	307.7	487.4	-307.7	0.55	-0.53	
4,576.0	5.60	59.00	4,529.7	312.7	495.9	-312.7	0.75	-0.74	
4,671.0	4.50	53.60	4,624.3	317.3	502.8	-317.3	1.26	-1.16	
4,765.0	3.60	52.10	4,718.1	321.3	508.1	-321.3	0.96	-0.96	
4,860.0	2.90	52.10	4,812.9	324.6	512.4	-324.6	0.74	-0.74	
4,954.0	1.90	83.40	4,906.9	326.2	515.8	-326.2	1.72	-1.06	
5,049.0	2.30	193.60	5,001.8	324.6	516.9	-324.6	3.63	0.42	
5,143.0	2.90	212.80	5,095.7	320.7	515.2	-320.7	1.12	0.64	
5,238.0	2.50	247.50	5,190.6	317.9	512.0	-317.9	1.74	-0.42	
5,332.0	2.60	240.80	5,284.5	316.1	508.2	-316.1	0.33	0.11	
5,427.0	0.40	279.30	5,379.5	315.1	506.0	-315.1	2.42	-2.32	
5,522.0	0.50	207.40	5,474.5	314.8	505.5	-314.8	0.56	0.11	
5,616.0	0.40	51.60	5,568.5	314.6	505.6	-314.6	0.94	-0.11	
5,711.0	1.10	1.90	5,663.5	315.7	505.9	-315.7	0.94	0.74	
5,805.0	1.20	351.10	5,757.5	317.6	505.7	-317.6	0.25	0.11	
5,900.0	1.50	6.50	5,852.4	319.8	505.7	-319.8	0.49	0.32	
5,994.0	0.40	50.60	5,946.4	321.3	506.1	-321.3	1.32	-1.17	
6,089.0	0.70	40.90	6,041.4	321.9	506.7	-321.9	0.33	0.32	
6,184.0	0.60	12.90	6,136.4	322.8	507.2	-322.8	0.35	-0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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
6,278.0	0.60	125.90	6,230.4	323.0	507.7	-323.0	1.06	0.00	
6,373.0	0.70	145.00	6,325.4	322.3	508.5	-322.3	0.25	0.11	
6,467.0	0.80	118.80	6,419.4	321.5	509.4	-321.5	0.38	0.11	
6,562.0	0.70	98.90	6,514.4	321.1	510.5	-321.1	0.29	-0.11	
6,657.0	1.20	99.30	6,609.4	320.8	512.1	-320.8	0.53	0.53	
6,751.0	1.10	105.30	6,703.4	320.4	513.9	-320.4	0.17	-0.11	
6,844.0	1.10	88.70	6,796.3	320.2	515.7	-320.2	0.34	0.00	
6,891.0	3.50	168.20	6,843.3	318.8	516.4	-318.8	7.39	5.11	
6,939.0	9.30	187.10	6,891.0	313.5	516.3	-313.5	12.70	12.08	
6,986.0	15.00	189.70	6,936.9	303.7	514.8	-303.7	12.18	12.13	
7,033.0	20.00	187.80	6,981.7	289.8	512.6	-289.8	10.71	10.64	
7,080.0	25.10	185.10	7,025.1	271.9	510.7	-271.9	11.07	10.85	
7,128.0	29.50	185.00	7,067.8	249.9	508.7	-249.9	9.17	9.17	
7,175.0	31.50	185.60	7,108.3	226.2	506.5	-226.2	4.30	4.26	
7,222.0	34.70	182.60	7,147.6	200.6	504.7	-200.6	7.65	6.81	
7,269.0	41.20	179.10	7,184.7	171.7	504.4	-171.7	14.56	13.83	
7,317.0	49.30	177.40	7,218.4	137.7	505.4	-137.7	17.06	16.87	
7,364.0	54.00	177.10	7,247.6	100.9	507.2	-100.9	10.01	10.00	
7,412.0	59.70	177.90	7,273.8	60.7	508.9	-60.7	11.96	11.87	
7,459.0	65.00	182.10	7,295.6	19.1	508.9	-19.1	13.77	11.28	
7,506.0	68.30	182.60	7,314.3	-24.0	507.1	24.0	7.09	7.02	
7,553.0	72.70	181.00	7,330.0	-68.2	505.8	68.2	9.90	9.36	
7,601.0	82.20	179.50	7,340.4	-115.0	505.6	115.0	20.02	19.79	
7,653.0	91.00	178.60	7,343.5	-166.9	506.4	166.9	17.01	16.92	
7,716.0	90.70	178.60	7,342.5	-229.9	508.0	229.9	0.48	-0.48	
7,811.0	91.10	179.10	7,341.0	-324.8	509.9	324.8	0.67	0.42	
7,905.0	89.80	179.10	7,340.3	-418.8	511.3	418.8	1.38	-1.38	
8,000.0	91.40	178.10	7,339.3	-513.8	513.7	513.8	1.99	1.68	
8,094.0	91.30	178.90	7,337.1	-607.7	516.1	607.7	0.86	-0.11	
8,189.0	90.10	179.80	7,335.9	-702.7	517.2	702.7	1.58	-1.26	
8,284.0	89.40	181.30	7,336.3	-797.7	516.3	797.7	1.74	-0.74	
8,378.0	88.40	180.60	7,338.1	-891.7	514.7	891.7	1.30	-1.06	
8,473.0	87.80	180.20	7,341.3	-986.6	514.1	986.6	0.76	-0.63	
8,567.0	88.90	179.70	7,344.0	-1,080.6	514.1	1,080.6	1.29	1.17	
8,662.0	89.00	182.30	7,345.7	-1,175.5	512.5	1,175.5	2.74	0.11	
8,756.0	88.20	182.00	7,348.0	-1,269.4	509.0	1,269.4	0.91	-0.85	
8,851.0	87.60	181.30	7,351.5	-1,364.3	506.2	1,364.3	0.97	-0.63	
8,945.0	88.10	179.30	7,355.0	-1,458.3	505.7	1,458.3	2.19	0.53	
9,040.0	88.00	178.90	7,358.3	-1,553.2	507.2	1,553.2	0.43	-0.11	
9,135.0	88.20	179.70	7,361.4	-1,648.1	508.4	1,648.1	0.87	0.21	
9,229.0	88.40	180.50	7,364.2	-1,742.1	508.2	1,742.1	0.88	0.21	
9,323.0	89.20	180.10	7,366.2	-1,836.1	507.7	1,836.1	0.95	0.85	
9,418.0	88.80	180.60	7,367.8	-1,931.1	507.2	1,931.1	0.67	-0.42	
9,513.0	88.10	179.90	7,370.4	-2,026.0	506.7	2,026.0	1.04	-0.74	
9,607.0	89.70	179.20	7,372.2	-2,120.0	507.5	2,120.0	1.86	1.70	
9,702.0	90.40	179.80	7,372.1	-2,215.0	508.3	2,215.0	0.97	0.74	
9,797.0	89.90	179.70	7,371.9	-2,310.0	508.7	2,310.0	0.54	-0.53	
9,891.0	89.20	179.00	7,372.6	-2,404.0	509.8	2,404.0	1.05	-0.74	
9,986.0	89.30	179.90	7,373.9	-2,499.0	510.7	2,499.0	0.95	0.11	
10,080.0	91.00	180.10	7,373.6	-2,593.0	510.7	2,593.0	1.82	1.81	
10,175.0	90.50	179.80	7,372.4	-2,688.0	510.8	2,688.0	0.61	-0.53	
10,270.0	89.50	180.10	7,372.4	-2,783.0	510.9	2,783.0	1.10	-1.05	
10,364.0	91.30	179.40	7,371.7	-2,877.0	511.3	2,877.0	2.05	1.91	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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
10,459.0	90.10	180.50	7,370.6	-2,971.9	511.4	2,971.9	1.71	-1.26	
10,553.0	91.60	180.50	7,369.2	-3,065.9	510.5	3,065.9	1.60	1.60	
10,648.0	90.90	179.00	7,367.1	-3,160.9	511.0	3,160.9	1.74	-0.74	
10,742.0	91.70	178.90	7,365.0	-3,254.8	512.7	3,254.8	0.86	0.85	
10,837.0	91.30	179.80	7,362.5	-3,349.8	513.8	3,349.8	1.04	-0.42	
10,932.0	91.20	178.10	7,360.4	-3,444.8	515.5	3,444.8	1.79	-0.11	
11,026.0	92.50	179.80	7,357.4	-3,538.7	517.2	3,538.7	2.28	1.38	
11,121.0	91.40	181.30	7,354.1	-3,633.6	516.3	3,633.6	1.96	-1.16	
11,215.0	90.50	181.70	7,352.6	-3,727.6	513.8	3,727.6	1.05	-0.96	
11,310.0	89.30	181.40	7,352.7	-3,822.5	511.3	3,822.5	1.30	-1.26	
11,404.0	90.10	180.50	7,353.2	-3,916.5	509.7	3,916.5	1.28	0.85	
11,499.0	91.70	180.20	7,351.7	-4,011.5	509.1	4,011.5	1.71	1.68	
11,594.0	91.20	179.50	7,349.3	-4,106.5	509.4	4,106.5	0.91	-0.53	
11,688.0	90.10	180.50	7,348.3	-4,200.5	509.4	4,200.5	1.58	-1.17	
11,783.0	91.10	179.30	7,347.3	-4,295.5	509.6	4,295.5	1.64	1.05	
11,877.0	92.70	177.60	7,344.2	-4,389.4	512.1	4,389.4	2.48	1.70	Last Cathedral Survey @ 11,877' MD
11,932.0	92.70	177.60	7,341.6	-4,444.3	514.4	4,444.3	0.00	0.00	Projectyion to Bit @ 11,932'

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Lochbuie 2E-31H PBHL	0.00	0.00	7,276.0	-4,476.9	509.9	1,244,486.61	3,221,251.81	40.001790	-104.710240
- actual wellpath misses target center by 73.4ft at 11932.0ft MD (7341.6 TVD, -4444.3 N, 514.4 E)									
- Point									
Lochbuie 2E-31H PBHL	0.00	0.00	7,284.0	-4,476.9	509.9	1,244,486.61	3,221,251.81	40.001790	-104.710240
- actual wellpath misses target center by 66.3ft at 11932.0ft MD (7341.6 TVD, -4444.3 N, 514.4 E)									
- Point									
Lochbuie 2E-31H 8500'	0.00	0.00	7,345.0	-1,039.1	509.9	1,247,924.30	3,221,221.29	40.011227	-104.710240
- actual wellpath misses target center by 4.6ft at 8525.5ft MD (7343.0 TVD, -1039.1 N, 514.0 E)									
- Point									
Lochbuie 2E-31H 10200	0.00	0.00	7,374.0	-2,739.1	509.9	1,246,224.37	3,221,236.37	40.006561	-104.710240
- actual wellpath misses target center by 2.1ft at 10226.1ft MD (7372.2 TVD, -2739.1 N, 510.9 E)									
- Point									
Lochbuie 2E-31H TGT 1	0.00	0.00	7,294.0	-3,230.6	509.9	1,245,732.81	3,221,240.74	40.005211	-104.710240
- actual wellpath misses target center by 71.7ft at 10719.4ft MD (7365.6 TVD, -3232.2 N, 512.2 E)									
- Point									
Lochbuie 2E-31H 9700'	0.00	0.00	7,374.0	-2,239.1	509.9	1,246,724.35	3,221,231.94	40.007933	-104.710240
- actual wellpath misses target center by 2.5ft at 9726.1ft MD (7372.0 TVD, -2239.1 N, 508.4 E)									
- Point									
Lochbuie 2E-31H PBHL	0.00	0.00	7,343.0	-4,476.9	509.9	1,244,486.61	3,221,251.81	40.001790	-104.710240
- actual wellpath misses target center by 33.0ft at 11932.0ft MD (7341.6 TVD, -4444.3 N, 514.4 E)									
- Point									

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
11,877.0	7,344.2	-4,389.4	512.1	Last Cathedral Survey @ 11,877' MD
11,932.0	7,341.6	-4,444.3	514.4	Projection to Bit @ 11,932'

Checked By: _____ Approved By: _____ Date: _____

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S31-T1N-R65W (Lochbuie)

Lochbuie 2E-31H

Hz

Design: FINAL

Survey Report - Geographic

17 January, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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 2E-31H					
Well Position	+N/-S	0.0 ft	Northing:	1,248,958.79 ft	Latitude:	40.014080
	+E/-W	0.0 ft	Easting:	3,220,702.19 ft	Longitude:	-104.712060
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	1/3/2014	8.46	66.66	52,663

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	1/17/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
165.0	11,932.0	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	1,248,958.79	3,220,702.19	40.014080	-104.712060	
165.0	0.50	318.00	165.0	0.5	-0.5	1,248,959.32	3,220,701.70	40.014081	-104.712062	
258.0	0.30	319.90	258.0	1.0	-0.9	1,248,959.81	3,220,701.27	40.014083	-104.712064	
350.0	0.20	288.20	350.0	1.3	-1.2	1,248,960.04	3,220,700.96	40.014083	-104.712065	
442.0	0.80	32.50	442.0	1.8	-1.0	1,248,960.63	3,220,701.14	40.014085	-104.712064	
534.0	0.70	30.50	534.0	2.9	-0.4	1,248,961.66	3,220,701.77	40.014088	-104.712062	
626.0	1.00	46.80	626.0	3.9	0.5	1,248,962.70	3,220,702.63	40.014091	-104.712059	
718.0	1.90	53.80	717.9	5.4	2.3	1,248,964.17	3,220,704.43	40.014095	-104.712052	
810.0	3.30	59.30	809.8	7.6	5.8	1,248,966.45	3,220,707.92	40.014101	-104.712040	
902.0	4.00	60.50	901.7	10.5	10.9	1,248,969.43	3,220,712.96	40.014109	-104.712021	
994.0	5.10	59.60	993.4	14.2	17.2	1,248,973.14	3,220,719.25	40.014119	-104.711999	
1,086.0	5.90	58.60	1,084.9	18.7	24.8	1,248,977.74	3,220,726.77	40.014131	-104.711972	

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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
1,178.0	7.00	61.00	1,176.4	23.9	33.7	1,248,983.00	3,220,735.66	40.014146	-104.711940
1,269.0	7.60	58.70	1,266.6	29.7	43.7	1,248,988.90	3,220,745.60	40.014162	-104.711904
1,361.0	8.70	60.10	1,357.7	36.4	54.9	1,248,995.63	3,220,756.77	40.014180	-104.711864
1,457.0	9.30	59.00	1,452.5	44.0	67.9	1,249,003.36	3,220,769.65	40.014201	-104.711818
1,549.0	9.70	57.90	1,543.3	51.9	80.8	1,249,011.42	3,220,782.52	40.014222	-104.711772
1,645.0	9.40	57.60	1,637.9	60.4	94.3	1,249,020.04	3,220,795.91	40.014246	-104.711724
1,741.0	9.80	54.80	1,732.6	69.3	107.6	1,249,029.07	3,220,809.13	40.014270	-104.711676
1,836.0	10.20	56.40	1,826.1	78.6	121.2	1,249,038.50	3,220,822.66	40.014296	-104.711628
1,930.0	10.60	56.50	1,918.6	88.0	135.3	1,249,048.01	3,220,836.71	40.014322	-104.711577
2,025.0	10.10	60.40	2,012.0	97.0	149.8	1,249,057.07	3,220,851.16	40.014346	-104.711525
2,116.0	8.90	60.80	2,101.8	104.3	162.9	1,249,064.56	3,220,864.18	40.014366	-104.711479
2,211.0	8.40	59.10	2,195.7	111.5	175.3	1,249,071.82	3,220,876.49	40.014386	-104.711434
2,305.0	9.50	60.40	2,288.6	118.8	187.9	1,249,079.29	3,220,889.06	40.014406	-104.711389
2,400.0	9.60	54.10	2,382.3	127.4	201.2	1,249,087.93	3,220,902.21	40.014430	-104.711342
2,495.0	8.90	52.50	2,476.0	136.5	213.4	1,249,097.15	3,220,914.38	40.014455	-104.711298
2,589.0	9.30	54.70	2,568.8	145.3	225.4	1,249,106.08	3,220,926.27	40.014479	-104.711256
2,684.0	10.10	57.90	2,662.5	154.1	238.7	1,249,115.06	3,220,939.51	40.014503	-104.711208
2,779.0	9.90	57.40	2,756.0	163.0	252.6	1,249,124.01	3,220,953.37	40.014527	-104.711158
2,873.0	8.70	56.20	2,848.8	171.3	265.4	1,249,132.43	3,220,966.01	40.014550	-104.711113
2,968.0	8.60	59.30	2,942.7	178.9	277.4	1,249,140.16	3,220,978.02	40.014571	-104.711070
3,063.0	9.30	57.40	3,036.6	186.7	290.0	1,249,148.03	3,220,990.52	40.014592	-104.711025
3,157.0	9.90	57.20	3,129.2	195.1	303.2	1,249,156.62	3,221,003.64	40.014616	-104.710978
3,252.0	10.50	52.50	3,222.7	204.8	316.9	1,249,166.43	3,221,017.29	40.014642	-104.710929
3,346.0	9.70	57.90	3,315.3	214.3	330.4	1,249,175.98	3,221,030.71	40.014668	-104.710881
3,441.0	10.30	58.40	3,408.8	223.0	344.5	1,249,184.80	3,221,044.64	40.014692	-104.710830
3,535.0	9.70	55.70	3,501.4	231.8	358.2	1,249,193.79	3,221,058.26	40.014716	-104.710782
3,630.0	9.40	55.90	3,595.1	240.7	371.2	1,249,202.77	3,221,071.22	40.014741	-104.710735
3,725.0	9.10	61.00	3,688.9	248.7	384.2	1,249,210.87	3,221,084.14	40.014763	-104.710689
3,819.0	9.70	53.10	3,781.6	257.0	397.0	1,249,219.34	3,221,096.90	40.014786	-104.710643
3,914.0	9.80	53.20	3,875.2	266.7	409.9	1,249,229.11	3,221,109.69	40.014812	-104.710597
4,008.0	9.80	61.80	3,967.9	275.3	423.3	1,249,237.80	3,221,123.07	40.014836	-104.710549
4,103.0	11.00	65.30	4,061.3	282.9	438.7	1,249,245.54	3,221,138.36	40.014856	-104.710494
4,198.0	9.60	62.80	4,154.8	290.3	454.0	1,249,253.09	3,221,153.58	40.014877	-104.710439
4,292.0	8.20	63.60	4,247.6	296.8	467.0	1,249,259.77	3,221,166.49	40.014895	-104.710393
4,387.0	6.80	61.50	4,341.8	302.5	478.0	1,249,265.56	3,221,177.45	40.014910	-104.710354
4,481.0	6.30	60.50	4,435.2	307.7	487.4	1,249,270.84	3,221,186.79	40.014925	-104.710320
4,576.0	5.60	59.00	4,529.7	312.7	495.9	1,249,275.87	3,221,195.25	40.014938	-104.710290
4,671.0	4.50	53.60	4,624.3	317.3	502.8	1,249,280.53	3,221,202.18	40.014951	-104.710265
4,765.0	3.60	52.10	4,718.1	321.3	508.1	1,249,284.58	3,221,207.44	40.014962	-104.710246
4,860.0	2.90	52.10	4,812.9	324.6	512.4	1,249,287.92	3,221,211.66	40.014971	-104.710231
4,954.0	1.90	83.40	4,906.9	326.2	515.8	1,249,289.59	3,221,215.07	40.014976	-104.710219
5,049.0	2.30	193.60	5,001.8	324.6	516.9	1,249,287.93	3,221,216.21	40.014971	-104.710215
5,143.0	2.90	212.80	5,095.7	320.7	515.2	1,249,284.08	3,221,214.51	40.014960	-104.710221
5,238.0	2.50	247.50	5,190.6	317.9	512.0	1,249,281.24	3,221,211.32	40.014953	-104.710232
5,332.0	2.60	240.80	5,284.5	316.1	508.2	1,249,279.38	3,221,207.58	40.014948	-104.710246
5,427.0	0.40	279.30	5,379.5	315.1	506.0	1,249,278.37	3,221,205.38	40.014945	-104.710254
5,522.0	0.50	207.40	5,474.5	314.8	505.5	1,249,278.05	3,221,204.86	40.014944	-104.710256
5,616.0	0.40	51.60	5,568.5	314.6	505.6	1,249,277.89	3,221,204.93	40.014944	-104.710255
5,711.0	1.10	1.90	5,663.5	315.7	505.9	1,249,279.01	3,221,205.21	40.014947	-104.710254
5,805.0	1.20	351.10	5,757.5	317.6	505.7	1,249,280.88	3,221,205.07	40.014952	-104.710255
5,900.0	1.50	6.50	5,852.4	319.8	505.7	1,249,283.10	3,221,205.04	40.014958	-104.710255
5,994.0	0.40	50.60	5,946.4	321.3	506.1	1,249,284.53	3,221,205.42	40.014962	-104.710253
6,089.0	0.70	40.90	6,041.4	321.9	506.7	1,249,285.19	3,221,206.05	40.014964	-104.710251
6,184.0	0.60	12.90	6,136.4	322.8	507.2	1,249,286.12	3,221,206.54	40.014966	-104.710249
6,278.0	0.60	125.90	6,230.4	323.0	507.7	1,249,286.31	3,221,207.04	40.014967	-104.710247

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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
6,373.0	0.70	145.00	6,325.4	322.3	508.5	1,249,285.55	3,221,207.78	40.014965	-104.710245
6,467.0	0.80	118.80	6,419.4	321.5	509.4	1,249,284.77	3,221,208.70	40.014962	-104.710242
6,562.0	0.70	98.90	6,514.4	321.1	510.5	1,249,284.37	3,221,209.85	40.014961	-104.710238
6,657.0	1.20	99.30	6,609.4	320.8	512.1	1,249,284.14	3,221,211.41	40.014961	-104.710232
6,751.0	1.10	105.30	6,703.4	320.4	513.9	1,249,283.76	3,221,213.26	40.014960	-104.710225
6,844.0	1.10	88.70	6,796.3	320.2	515.7	1,249,283.56	3,221,215.01	40.014959	-104.710219
6,891.0	3.50	168.20	6,843.3	318.8	516.4	1,249,282.17	3,221,215.77	40.014955	-104.710216
6,939.0	9.30	187.10	6,891.0	313.5	516.3	1,249,276.88	3,221,215.64	40.014941	-104.710217
6,986.0	15.00	189.70	6,936.9	303.7	514.8	1,249,267.09	3,221,214.23	40.014914	-104.710222
7,033.0	20.00	187.80	6,981.7	289.8	512.6	1,249,253.11	3,221,212.23	40.014875	-104.710230
7,080.0	25.10	185.10	7,025.1	271.9	510.7	1,249,235.19	3,221,210.42	40.014826	-104.710237
7,128.0	29.50	185.00	7,067.8	249.9	508.7	1,249,213.25	3,221,208.67	40.014766	-104.710244
7,175.0	31.50	185.60	7,108.3	226.2	506.5	1,249,189.48	3,221,206.68	40.014701	-104.710252
7,222.0	34.70	182.60	7,147.6	200.6	504.7	1,249,163.87	3,221,205.10	40.014631	-104.710258
7,269.0	41.20	179.10	7,184.7	171.7	504.4	1,249,134.99	3,221,204.99	40.014551	-104.710260
7,317.0	49.30	177.40	7,218.4	137.7	505.4	1,249,100.96	3,221,206.37	40.014458	-104.710256
7,364.0	54.00	177.10	7,247.6	100.9	507.2	1,249,064.17	3,221,208.47	40.014357	-104.710249
7,412.0	59.70	177.90	7,273.8	60.7	508.9	1,249,024.06	3,221,210.57	40.014247	-104.710243
7,459.0	65.00	182.10	7,295.6	19.1	508.9	1,248,982.45	3,221,210.90	40.014133	-104.710243
7,506.0	68.30	182.60	7,314.3	-24.0	507.1	1,248,939.33	3,221,209.51	40.014014	-104.710250
7,553.0	72.70	181.00	7,330.0	-68.2	505.8	1,248,895.05	3,221,208.52	40.013893	-104.710255
7,601.0	82.20	179.50	7,340.4	-115.0	505.6	1,248,848.25	3,221,208.75	40.013764	-104.710255
7,653.0	91.00	178.60	7,343.5	-166.9	506.4	1,248,796.41	3,221,210.07	40.013622	-104.710252
7,716.0	90.70	178.60	7,342.5	-229.9	508.0	1,248,733.44	3,221,212.17	40.013449	-104.710247
7,811.0	91.10	179.10	7,341.0	-324.8	509.9	1,248,638.49	3,221,214.92	40.013188	-104.710240
7,905.0	89.80	179.10	7,340.3	-418.8	511.3	1,248,544.52	3,221,217.23	40.012930	-104.710235
8,000.0	91.40	178.10	7,339.3	-513.8	513.7	1,248,449.59	3,221,220.39	40.012670	-104.710226
8,094.0	91.30	178.90	7,337.1	-607.7	516.1	1,248,355.67	3,221,223.69	40.012412	-104.710218
8,189.0	90.10	179.80	7,335.9	-702.7	517.2	1,248,260.70	3,221,225.61	40.012151	-104.710214
8,284.0	89.40	181.30	7,336.3	-797.7	516.3	1,248,165.70	3,221,225.54	40.011890	-104.710217
8,378.0	88.40	180.60	7,338.1	-891.7	514.7	1,248,071.73	3,221,224.82	40.011632	-104.710223
8,473.0	87.80	180.20	7,341.3	-986.6	514.1	1,247,976.78	3,221,225.00	40.011372	-104.710225
8,567.0	88.90	179.70	7,344.0	-1,080.6	514.1	1,247,882.82	3,221,225.92	40.011114	-104.710225
8,662.0	89.00	182.30	7,345.7	-1,175.5	512.5	1,247,787.85	3,221,225.10	40.010853	-104.710231
8,756.0	88.20	182.00	7,348.0	-1,269.4	509.0	1,247,693.92	3,221,222.41	40.010595	-104.710243
8,851.0	87.60	181.30	7,351.5	-1,364.3	506.2	1,247,599.00	3,221,220.52	40.010335	-104.710253
8,945.0	88.10	179.30	7,355.0	-1,458.3	505.7	1,247,505.07	3,221,220.86	40.010077	-104.710255
9,040.0	88.00	178.90	7,358.3	-1,553.2	507.2	1,247,410.16	3,221,223.20	40.009816	-104.710249
9,135.0	88.20	179.70	7,361.4	-1,648.1	508.4	1,247,315.23	3,221,225.20	40.009556	-104.710245
9,229.0	88.40	180.50	7,364.2	-1,742.1	508.2	1,247,221.28	3,221,225.87	40.009298	-104.710246
9,323.0	89.20	180.10	7,366.2	-1,836.1	507.7	1,247,127.30	3,221,226.22	40.009040	-104.710248
9,418.0	88.80	180.60	7,367.8	-1,931.1	507.2	1,247,032.31	3,221,226.48	40.008779	-104.710250
9,513.0	88.10	179.90	7,370.4	-2,026.0	506.7	1,246,937.35	3,221,226.91	40.008518	-104.710251
9,607.0	89.70	179.20	7,372.2	-2,120.0	507.5	1,246,843.38	3,221,228.48	40.008260	-104.710249
9,702.0	90.40	179.80	7,372.1	-2,215.0	508.3	1,246,748.40	3,221,230.16	40.007999	-104.710246
9,797.0	89.90	179.70	7,371.9	-2,310.0	508.7	1,246,653.41	3,221,231.41	40.007739	-104.710244
9,891.0	89.20	179.00	7,372.6	-2,404.0	509.8	1,246,559.43	3,221,233.32	40.007481	-104.710240
9,986.0	89.30	179.90	7,373.9	-2,499.0	510.7	1,246,464.46	3,221,235.07	40.007220	-104.710237
10,080.0	91.00	180.10	7,373.6	-2,593.0	510.7	1,246,370.46	3,221,235.91	40.006962	-104.710237
10,175.0	90.50	179.80	7,372.4	-2,688.0	510.8	1,246,275.48	3,221,236.83	40.006701	-104.710237
10,270.0	89.50	180.10	7,372.4	-2,783.0	510.9	1,246,180.48	3,221,237.76	40.006440	-104.710237
10,364.0	91.30	179.40	7,371.7	-2,877.0	511.3	1,246,086.50	3,221,239.01	40.006182	-104.710235
10,459.0	90.10	180.50	7,370.6	-2,971.9	511.4	1,245,991.51	3,221,239.93	40.005921	-104.710235
10,553.0	91.60	180.50	7,369.2	-3,065.9	510.5	1,245,897.55	3,221,239.95	40.005664	-104.710238
10,648.0	90.90	179.00	7,367.1	-3,160.9	511.0	1,245,802.58	3,221,241.21	40.005403	-104.710236

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2E-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 2E-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
10,742.0	91.70	178.90	7,365.0	-3,254.8	512.7	1,245,708.64	3,221,243.76	40.005145	-104.710230
10,837.0	91.30	179.80	7,362.5	-3,349.8	513.8	1,245,613.69	3,221,245.68	40.004884	-104.710226
10,932.0	91.20	178.10	7,360.4	-3,444.8	515.5	1,245,518.75	3,221,248.27	40.004623	-104.710220
11,026.0	92.50	179.80	7,357.4	-3,538.7	517.2	1,245,424.84	3,221,250.83	40.004366	-104.710214
11,121.0	91.40	181.30	7,354.1	-3,633.6	516.3	1,245,329.90	3,221,250.76	40.004105	-104.710217
11,215.0	90.50	181.70	7,352.6	-3,727.6	513.8	1,245,235.93	3,221,249.13	40.003847	-104.710226
11,310.0	89.30	181.40	7,352.7	-3,822.5	511.3	1,245,140.95	3,221,247.41	40.003586	-104.710235
11,404.0	90.10	180.50	7,353.2	-3,916.5	509.7	1,245,046.95	3,221,246.68	40.003328	-104.710241
11,499.0	91.70	180.20	7,351.7	-4,011.5	509.1	1,244,951.97	3,221,246.95	40.003068	-104.710243
11,594.0	91.20	179.50	7,349.3	-4,106.5	509.4	1,244,857.01	3,221,248.04	40.002807	-104.710242
11,688.0	90.10	180.50	7,348.3	-4,200.5	509.4	1,244,763.02	3,221,248.87	40.002549	-104.710242
11,783.0	91.10	179.30	7,347.3	-4,295.5	509.6	1,244,668.03	3,221,249.88	40.002288	-104.710241
11,877.0	92.70	177.60	7,344.2	-4,389.4	512.1	1,244,574.15	3,221,253.26	40.002030	-104.710232
Last Cathedral Survey @ 11,877' MD									
11,932.0	92.70	177.60	7,341.6	-4,444.3	514.4	1,244,519.28	3,221,256.05	40.001880	-104.710224
Projectyion to Bit @ 11,932'									

Design 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									
Lochbuie 2E-31H PBHL	0.00	0.00	7,343.0	-4,476.9	509.9	1,244,486.61	3,221,251.81	40.001790	-104.710240
- actual wellpath misses target center by 33.0ft at 11932.0ft MD (7341.6 TVD, -4444.3 N, 514.4 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
11,877.0	7,344.2	-4,389.4	512.1	Last Cathedral Survey @ 11,877' MD	
11,932.0	7,341.6	-4,444.3	514.4	Projectyion to Bit @ 11,932'	

Checked By: _____ Approved By: _____ Date: _____