





# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Drieth 1B-6H-A368
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Site:</b>	S6-T3N-R68W (Zisch/Drieth)	<b>MD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Well:</b>	Drieth 1B-6H-A368	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

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

Site		S6-T3N-R68W (Zisch/Drieth)			
Site Position:		Northing:	1,333,692.14 ft	Latitude:	40.248510
From:	Lat/Long	Easting:	3,124,995.76 ft	Longitude:	-105.052220
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.29 °

Well	Drieth 1B-6H-A368					
Well Position	+N/-S	0.0 ft	Northing:	1,337,956.17 ft	Latitude:	40.260160
	+E/-W	0.0 ft	Easting:	3,128,901.01 ft	Longitude:	-105.038150
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,087.0 ft

<b>Wellbore</b>	Hz				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	9/18/2014	8.56	66.78	52,684

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	270.00

<b>Survey Program</b>	<b>Date</b>	10/3/2014			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
143.0	11,617.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
143.0	0.20	40.90	143.0	0.2	0.2	-0.2	0.14	0.14	
235.0	0.50	26.20	235.0	0.7	0.4	-0.4	0.34	0.33	
326.0	0.90	352.50	326.0	1.7	0.5	-0.5	0.61	0.44	
418.0	1.10	45.90	418.0	3.1	1.1	-1.1	1.00	0.22	
510.0	2.20	59.60	509.9	4.6	3.2	-3.2	1.26	1.20	
601.0	2.90	63.50	600.9	6.5	6.8	-6.8	0.79	0.77	
692.0	4.00	59.20	691.7	9.1	11.6	-11.6	1.24	1.21	
798.0	5.20	62.90	797.3	13.2	19.0	-19.0	1.17	1.13	
914.0	5.10	59.40	912.9	18.2	28.1	-28.1	0.28	-0.09	
1,006.0	5.10	50.30	1,004.5	22.9	34.8	-34.8	0.88	0.00	
1,097.0	4.10	59.50	1,095.2	27.2	40.7	-40.7	1.36	-1.10	
1,188.0	4.00	66.20	1,186.0	30.1	46.4	-46.4	0.53	-0.11	

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<b>Site:</b>	S6-T3N-R68W (Zisch/Drieth)	<b>MD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Well:</b>	Drieth 1B-6H-A368	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
1,280.0	4.00	53.30	1,277.8	33.3	51.9	-51.9	0.98	0.00	
1,372.0	3.80	62.80	1,369.6	36.6	57.2	-57.2	0.73	-0.22	
1,464.0	4.10	76.10	1,461.3	38.8	63.1	-63.1	1.05	0.33	
1,556.0	4.20	60.60	1,553.1	41.3	69.3	-69.3	1.22	0.11	
1,647.0	5.20	72.20	1,643.8	44.1	76.1	-76.1	1.51	1.10	
1,739.0	4.80	62.90	1,735.4	47.2	83.5	-83.5	0.98	-0.43	
1,830.0	4.70	54.50	1,826.1	51.1	89.9	-89.9	0.77	-0.11	
1,922.0	4.80	66.60	1,917.8	54.8	96.5	-96.5	1.09	0.11	
2,014.0	3.80	60.60	2,009.6	57.8	102.7	-102.7	1.19	-1.09	
2,106.0	4.20	73.90	2,101.3	60.2	108.6	-108.6	1.09	0.43	
2,197.0	4.10	62.80	2,192.1	62.7	114.7	-114.7	0.89	-0.11	
2,289.0	4.00	77.90	2,283.9	64.8	120.8	-120.8	1.16	-0.11	
2,381.0	4.10	68.60	2,375.7	66.7	127.0	-127.0	0.72	0.11	
2,476.0	3.90	60.20	2,470.4	69.6	132.9	-132.9	0.65	-0.21	
2,570.0	3.20	66.90	2,564.2	72.2	138.1	-138.1	0.86	-0.74	
2,665.0	3.00	56.50	2,659.1	74.6	142.6	-142.6	0.63	-0.21	
2,759.0	2.40	57.80	2,753.0	77.0	146.3	-146.3	0.64	-0.64	
2,854.0	2.20	70.40	2,847.9	78.7	149.7	-149.7	0.57	-0.21	
2,948.0	2.90	69.60	2,941.8	80.1	153.7	-153.7	0.75	0.74	
3,043.0	3.70	64.10	3,036.7	82.3	158.7	-158.7	0.90	0.84	
3,137.0	3.30	49.40	3,130.5	85.4	163.5	-163.5	1.04	-0.43	
3,232.0	5.30	63.10	3,225.2	89.1	169.4	-169.4	2.35	2.11	
3,327.0	4.70	77.80	3,319.9	91.9	177.2	-177.2	1.48	-0.63	
3,421.0	3.70	70.20	3,413.6	93.8	183.8	-183.8	1.22	-1.06	
3,516.0	4.40	73.80	3,508.4	95.8	190.2	-190.2	0.78	0.74	
3,610.0	3.90	70.80	3,602.1	97.9	196.6	-196.6	0.58	-0.53	
3,705.0	3.40	61.30	3,696.9	100.3	202.2	-202.2	0.82	-0.53	
3,800.0	3.90	70.60	3,791.7	102.7	207.7	-207.7	0.81	0.53	
3,894.0	3.60	59.60	3,885.5	105.3	213.2	-213.2	0.83	-0.32	
3,989.0	4.40	59.40	3,980.3	108.6	219.0	-219.0	0.84	0.84	
4,084.0	4.10	60.20	4,075.1	112.2	225.0	-225.0	0.32	-0.32	
4,178.0	4.60	74.50	4,168.8	114.9	231.6	-231.6	1.27	0.53	
4,273.0	4.00	66.70	4,263.5	117.2	238.3	-238.3	0.88	-0.63	
4,368.0	3.10	65.10	4,358.3	119.6	243.7	-243.7	0.95	-0.95	
4,462.0	4.10	64.50	4,452.2	122.1	249.0	-249.0	1.06	1.06	
4,556.0	3.90	59.00	4,545.9	125.2	254.8	-254.8	0.46	-0.21	
4,651.0	4.70	70.80	4,640.7	128.1	261.2	-261.2	1.25	0.84	
4,745.0	4.20	66.20	4,734.4	130.8	268.0	-268.0	0.65	-0.53	
4,840.0	3.40	58.00	4,829.2	133.7	273.6	-273.6	1.02	-0.84	
4,934.0	3.80	65.60	4,923.0	136.5	278.8	-278.8	0.66	0.43	
5,029.0	3.40	54.30	5,017.8	139.4	283.9	-283.9	0.86	-0.42	
5,123.0	3.60	69.60	5,111.6	142.1	289.0	-289.0	1.01	0.21	
5,218.0	4.10	75.40	5,206.4	144.0	295.1	-295.1	0.67	0.53	
5,312.0	3.30	68.50	5,300.2	145.8	300.8	-300.8	0.97	-0.85	
5,407.0	4.40	79.80	5,395.0	147.4	307.0	-307.0	1.40	1.16	
5,501.0	4.30	74.90	5,488.7	149.0	313.9	-313.9	0.41	-0.11	
5,596.0	3.30	69.00	5,583.5	150.9	319.9	-319.9	1.13	-1.05	
5,690.0	3.60	56.20	5,677.3	153.5	324.9	-324.9	0.88	0.32	
5,785.0	4.40	53.20	5,772.1	157.4	330.3	-330.3	0.87	0.84	
5,880.0	3.40	42.80	5,866.9	161.6	335.1	-335.1	1.29	-1.05	
5,974.0	3.60	54.60	5,960.7	165.4	339.4	-339.4	0.79	0.21	
6,069.0	3.90	57.50	6,055.5	168.8	344.6	-344.6	0.37	0.32	
6,163.0	4.50	59.30	6,149.3	172.4	350.4	-350.4	0.65	0.64	

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<b>Design:</b>	FINAL	<b>Database:</b>	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
6,258.0	4.10	62.20	6,244.0	175.9	356.6	-356.6	0.48	-0.42	
6,352.0	3.80	51.50	6,337.8	179.4	362.1	-362.1	0.85	-0.32	
6,447.0	2.80	38.50	6,432.6	183.2	366.0	-366.0	1.31	-1.05	
6,494.0	2.30	33.10	6,479.6	184.9	367.2	-367.2	1.18	-1.06	
6,542.0	1.90	1.50	6,527.5	186.5	367.7	-367.7	2.51	-0.83	
6,589.0	4.40	299.10	6,574.5	188.1	366.2	-366.2	8.30	5.32	
6,636.0	6.20	291.00	6,621.3	189.9	362.2	-362.2	4.14	3.83	
6,683.0	8.50	288.70	6,667.9	192.0	356.6	-356.6	4.93	4.89	
6,731.0	10.70	287.00	6,715.2	194.4	349.0	-349.0	4.62	4.58	
6,778.0	13.90	281.40	6,761.1	196.8	339.2	-339.2	7.26	6.81	
6,826.0	17.50	280.80	6,807.3	199.3	326.5	-326.5	7.51	7.50	
6,873.0	21.10	279.40	6,851.7	202.0	311.2	-311.2	7.72	7.66	
6,920.0	24.80	277.90	6,895.0	204.7	293.1	-293.1	7.97	7.87	
6,967.0	28.80	275.90	6,936.9	207.2	272.1	-272.1	8.72	8.51	
7,015.0	34.30	272.20	6,977.8	208.9	247.0	-247.0	12.14	11.46	
7,062.0	38.50	269.90	7,015.6	209.4	219.1	-219.1	9.39	8.94	
7,110.0	40.30	268.90	7,052.7	209.1	188.7	-188.7	3.98	3.75	
7,157.0	41.40	267.80	7,088.3	208.2	158.0	-158.0	2.80	2.34	
7,204.0	44.20	267.70	7,122.7	207.0	126.0	-126.0	5.96	5.96	
7,251.0	49.50	268.00	7,154.9	205.7	91.8	-91.8	11.29	11.28	
7,299.0	57.00	269.30	7,183.6	204.8	53.4	-53.4	15.77	15.62	
7,346.0	61.30	270.50	7,207.7	204.7	13.0	-13.0	9.41	9.15	
7,394.0	64.60	272.00	7,229.5	205.7	-29.7	29.7	7.42	6.87	
7,441.0	68.10	272.90	7,248.3	207.5	-72.7	72.7	7.65	7.45	
7,488.0	70.80	271.20	7,264.8	209.1	-116.7	116.7	6.67	5.74	
7,535.0	73.00	269.30	7,279.4	209.3	-161.4	161.4	6.06	4.68	
7,583.0	76.30	267.60	7,292.2	208.0	-207.6	207.6	7.68	6.87	
7,630.0	79.60	268.50	7,302.0	206.5	-253.5	253.5	7.27	7.02	
7,678.0	81.90	270.70	7,309.7	206.1	-300.9	300.9	6.59	4.79	
7,683.0	82.30	270.90	7,310.4	206.2	-305.9	305.9	8.93	8.00	
7,747.0	89.00	271.00	7,315.2	207.3	-369.6	369.6	10.47	10.47	
7,795.0	90.90	271.40	7,315.3	208.3	-417.6	417.6	4.05	3.96	
7,890.0	92.40	271.30	7,312.5	210.5	-512.6	512.6	1.58	1.58	
7,985.0	92.10	270.30	7,308.8	211.8	-607.5	607.5	1.10	-0.32	
8,079.0	92.80	269.30	7,304.8	211.5	-701.4	701.4	1.30	0.74	
8,174.0	92.20	269.50	7,300.6	210.5	-796.3	796.3	0.67	-0.63	
8,268.0	92.80	269.80	7,296.5	209.9	-890.2	890.2	0.71	0.64	
8,363.0	92.70	270.70	7,292.0	210.3	-985.1	985.1	0.95	-0.11	
8,458.0	92.90	269.90	7,287.3	210.8	-1,080.0	1,080.0	0.87	0.21	
8,553.0	93.00	270.90	7,282.4	211.5	-1,174.8	1,174.8	1.06	0.11	
8,647.0	91.30	271.00	7,278.9	213.1	-1,268.8	1,268.8	1.81	-1.81	
8,742.0	92.50	271.00	7,275.8	214.7	-1,363.7	1,363.7	1.26	1.26	
8,837.0	92.30	269.90	7,271.8	215.5	-1,458.6	1,458.6	1.18	-0.21	
8,931.0	91.00	268.90	7,269.1	214.5	-1,552.6	1,552.6	1.74	-1.38	
9,026.0	91.30	268.70	7,267.2	212.5	-1,647.5	1,647.5	0.38	0.32	
9,121.0	92.70	268.60	7,263.9	210.3	-1,742.4	1,742.4	1.48	1.47	
9,215.0	92.10	269.20	7,259.9	208.5	-1,836.3	1,836.3	0.90	-0.64	
9,310.0	93.80	268.90	7,255.0	206.9	-1,931.2	1,931.2	1.82	1.79	
9,373.0	95.70	271.40	7,249.8	207.0	-1,994.0	1,994.0	4.97	3.02	
9,436.0	94.80	272.30	7,244.1	209.1	-2,056.7	2,056.7	2.02	-1.43	
9,499.0	92.80	271.10	7,239.9	210.9	-2,119.5	2,119.5	3.70	-3.17	
9,593.0	91.60	270.20	7,236.3	212.0	-2,213.4	2,213.4	1.60	-1.28	
9,688.0	89.80	270.00	7,235.1	212.2	-2,308.4	2,308.4	1.91	-1.89	

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<b>Site:</b>	S6-T3N-R68W (Zisch/Drieth)	<b>MD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Well:</b>	Drieth 1B-6H-A368	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
9,783.0	91.00	270.20	7,234.4	212.3	-2,403.4	2,403.4	1.28	1.26	
9,877.0	91.50	270.00	7,232.4	212.5	-2,497.4	2,497.4	0.57	0.53	
9,972.0	90.90	269.40	7,230.4	212.0	-2,592.4	2,592.4	0.89	-0.63	
10,066.0	91.80	270.90	7,228.2	212.2	-2,686.3	2,686.3	1.86	0.96	
10,161.0	90.90	270.60	7,226.0	213.5	-2,781.3	2,781.3	1.00	-0.95	
10,256.0	90.20	270.00	7,225.0	214.0	-2,876.3	2,876.3	0.97	-0.74	
10,350.0	89.20	269.20	7,225.5	213.3	-2,970.3	2,970.3	1.36	-1.06	
10,445.0	90.10	270.30	7,226.1	212.9	-3,065.3	3,065.3	1.50	0.95	
10,539.0	90.30	269.20	7,225.8	212.5	-3,159.3	3,159.3	1.19	0.21	
10,634.0	90.30	269.20	7,225.3	211.2	-3,254.3	3,254.3	0.00	0.00	
10,729.0	90.20	269.20	7,224.9	209.9	-3,349.2	3,349.2	0.11	-0.11	
10,823.0	90.50	269.90	7,224.3	209.1	-3,443.2	3,443.2	0.81	0.32	
10,918.0	91.90	267.20	7,222.3	206.7	-3,538.2	3,538.2	3.20	1.47	
11,012.0	92.90	266.10	7,218.4	201.2	-3,631.9	3,631.9	1.58	1.06	
11,107.0	91.30	266.00	7,214.9	194.7	-3,726.6	3,726.6	1.69	-1.68	
11,201.0	91.10	268.70	7,212.9	190.3	-3,820.5	3,820.5	2.88	-0.21	
11,296.0	91.00	271.50	7,211.2	190.5	-3,915.5	3,915.5	2.95	-0.11	
11,391.0	91.90	271.20	7,208.8	192.7	-4,010.4	4,010.4	1.00	0.95	
11,485.0	91.90	271.00	7,205.7	194.5	-4,104.4	4,104.4	0.21	0.00	
11,565.0	91.30	270.40	7,203.4	195.5	-4,184.3	4,184.3	1.06	-0.75	Last CES Survey @ 11,565' MD
11,617.0	91.30	270.40	7,202.2	195.9	-4,236.3	4,236.3	0.00	0.00	PTB @ 11,617'

### 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									
Drieth 1B-6H-A368 10,000	0.00	0.00	7,224.4	211.5	-2,614.6	1,338,154.08	3,126,285.37	40.260740	-105.047518
- actual wellpath misses target center by 5.6ft at 9994.4ft MD (7230.0 TVD, 211.8 N, -2614.7 E)									
- Point									
Drieth 1B-6H-A368 7,600	0.00	0.00	7,320.0	211.3	-214.9	1,338,166.37	3,128,684.97	40.260740	-105.038920
- actual wellpath misses target center by 25.7ft at 7595.9ft MD (7295.1 TVD, 207.5 N, -220.1 E)									
- Point									
Drieth 1B-6H PBHL P3	0.00	0.00	7,209.6	211.7	-4,270.0	1,338,145.60	3,124,630.00	40.260740	-105.053450
- actual wellpath misses target center by 37.9ft at 11617.0ft MD (7202.2 TVD, 195.9 N, -4236.3 E)									
- Point									
Drieth 1B-6H PBHL	0.00	0.00	7,257.0	211.7	-4,270.0	1,338,145.60	3,124,630.00	40.260740	-105.053450
- actual wellpath misses target center by 66.2ft at 11617.0ft MD (7202.2 TVD, 195.9 N, -4236.3 E)									
- Point									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates	Comment
		+N/-S (ft)	+E/-W (ft)
11,565.0	7,203.4	195.5	-4,184.3
11,617.0	7,202.2	195.9	-4,236.3
			Last CES Survey @ 11,565' MD
			PTB @ 11,617'

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

# **EnCana Oil & Gas (USA) Inc**

**DJ Wattenberg**

**S6-T3N-R68W (Zisch/Drieth)**

**Drieth 1B-6H-A368**

**Hz**

**Design: FINAL**

## **Survey Report - Geographic**

**03 October, 2014**

# Cathedral Energy Services

## Survey Report - Geographic

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Drieth 1B-6H-A368
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Site:</b>	S6-T3N-R68W (Zisch/Drieth)	<b>MD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Well:</b>	Drieth 1B-6H-A368	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

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

Site	S6-T3N-R68W (Zisch/Drieth)				
Site Position:		Northing:	1,333,692.14 ft	Latitude:	40.248510
From:	Lat/Long	Easting:	3,124,995.76 ft	Longitude:	-105.052220
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.29 °

Well	Drieth 1B-6H-A368					
Well Position	+N/-S	0.0 ft	Northing:	1,337,956.17 ft	Latitude:	40.260160
	+E/-W	0.0 ft	Easting:	3,128,901.01 ft	Longitude:	-105.038150
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,087.0 ft

<b>Wellbore</b>	Hz				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	9/18/2014	8.56	66.78	52,684

<b>Design</b>	FINAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	270.00	

<b>Survey Program</b>	<b>Date</b>	10/3/2014			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
143.0	11,617.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Map Northing (ft)</b>	<b>Map Easting (ft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.0	0.00	0.00	0.0	0.0	0.0	1,337,956.17	3,128,901.01	40.260160	-105.038150	
143.0	0.20	40.90	143.0	0.2	0.2	1,337,956.36	3,128,901.17	40.260161	-105.038150	
235.0	0.50	26.20	235.0	0.7	0.4	1,337,956.85	3,128,901.45	40.260162	-105.038149	
326.0	0.90	352.50	326.0	1.7	0.5	1,337,957.91	3,128,901.53	40.260165	-105.038148	
418.0	1.10	45.90	418.0	3.1	1.1	1,337,959.24	3,128,902.06	40.260168	-105.038146	
510.0	2.20	59.60	509.9	4.6	3.2	1,337,960.76	3,128,904.21	40.260173	-105.038139	
601.0	2.90	63.50	600.9	6.5	6.8	1,337,962.69	3,128,907.77	40.260178	-105.038126	
692.0	4.00	59.20	691.7	9.1	11.6	1,337,965.37	3,128,912.54	40.260185	-105.038109	
798.0	5.20	62.90	797.3	13.2	19.0	1,337,969.49	3,128,919.97	40.260196	-105.038082	
914.0	5.10	59.40	912.9	18.2	28.1	1,337,974.56	3,128,929.06	40.260210	-105.038049	
1,006.0	5.10	50.30	1,004.5	22.9	34.8	1,337,979.29	3,128,935.70	40.260223	-105.038026	
1,097.0	4.10	59.50	1,095.2	27.2	40.7	1,337,983.55	3,128,941.60	40.260235	-105.038004	



# Cathedral Energy Services

## Survey Report - Geographic

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Drieth 1B-6H-A368
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Site:</b>	S6-T3N-R68W (Zisch/Drieth)	<b>MD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Well:</b>	Drieth 1B-6H-A368	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
1,188.0	4.00	66.20	1,186.0	30.1	46.4	1,337,986.51	3,128,947.29	40.260243	-105.037984
1,280.0	4.00	53.30	1,277.8	33.3	51.9	1,337,989.75	3,128,952.78	40.260251	-105.037964
1,372.0	3.80	62.80	1,369.6	36.6	57.2	1,337,993.09	3,128,958.05	40.260261	-105.037945
1,464.0	4.10	76.10	1,461.3	38.8	63.1	1,337,995.31	3,128,963.94	40.260267	-105.037924
1,556.0	4.20	60.60	1,553.1	41.3	69.3	1,337,997.78	3,128,970.06	40.260273	-105.037902
1,647.0	5.20	72.20	1,643.8	44.1	76.1	1,338,000.72	3,128,976.87	40.260281	-105.037878
1,739.0	4.80	62.90	1,735.4	47.2	83.5	1,338,003.78	3,128,984.25	40.260290	-105.037851
1,830.0	4.70	54.50	1,826.1	51.1	89.9	1,338,007.71	3,128,990.66	40.260300	-105.037828
1,922.0	4.80	66.60	1,917.8	54.8	96.5	1,338,011.47	3,128,997.24	40.260310	-105.037804
2,014.0	3.80	60.60	2,009.6	57.8	102.7	1,338,014.52	3,129,003.41	40.260319	-105.037782
2,106.0	4.20	73.90	2,101.3	60.2	108.6	1,338,016.99	3,129,009.29	40.260325	-105.037761
2,197.0	4.10	62.80	2,192.1	62.7	114.7	1,338,019.43	3,129,015.37	40.260332	-105.037739
2,289.0	4.00	77.90	2,283.9	64.8	120.8	1,338,021.64	3,129,021.42	40.260338	-105.037718
2,381.0	4.10	68.60	2,375.7	66.7	127.0	1,338,023.54	3,129,027.61	40.260343	-105.037695
2,476.0	3.90	60.20	2,470.4	69.6	132.9	1,338,026.42	3,129,033.56	40.260351	-105.037674
2,570.0	3.20	66.90	2,564.2	72.2	138.1	1,338,029.06	3,129,038.74	40.260358	-105.037655
2,665.0	3.00	56.50	2,659.1	74.6	142.6	1,338,031.50	3,129,043.24	40.260365	-105.037639
2,759.0	2.40	57.80	2,753.0	77.0	146.3	1,338,033.92	3,129,046.94	40.260371	-105.037626
2,854.0	2.20	70.40	2,847.9	78.7	149.7	1,338,035.61	3,129,050.33	40.260376	-105.037614
2,948.0	2.90	69.60	2,941.8	80.1	153.7	1,338,037.07	3,129,054.25	40.260380	-105.037600
3,043.0	3.70	64.10	3,036.7	82.3	158.7	1,338,039.27	3,129,059.25	40.260386	-105.037582
3,137.0	3.30	49.40	3,130.5	85.4	163.5	1,338,042.38	3,129,064.02	40.260394	-105.037565
3,232.0	5.30	63.10	3,225.2	89.1	169.4	1,338,046.18	3,129,069.99	40.260405	-105.037543
3,327.0	4.70	77.80	3,319.9	91.9	177.2	1,338,049.02	3,129,077.69	40.260412	-105.037515
3,421.0	3.70	70.20	3,413.6	93.8	183.8	1,338,050.90	3,129,084.30	40.260417	-105.037492
3,516.0	4.40	73.80	3,508.4	95.8	190.2	1,338,052.99	3,129,090.67	40.260423	-105.037469
3,610.0	3.90	70.80	3,602.1	97.9	196.6	1,338,055.08	3,129,097.14	40.260429	-105.037446
3,705.0	3.40	61.30	3,696.9	100.3	202.2	1,338,057.52	3,129,102.65	40.260435	-105.037426
3,800.0	3.90	70.60	3,791.7	102.7	207.7	1,338,059.98	3,129,108.16	40.260442	-105.037406
3,894.0	3.60	59.60	3,885.5	105.3	213.2	1,338,062.56	3,129,113.71	40.260449	-105.037386
3,989.0	4.40	59.40	3,980.3	108.6	219.0	1,338,065.96	3,129,119.40	40.260458	-105.037366
4,084.0	4.10	60.20	4,075.1	112.2	225.0	1,338,069.53	3,129,125.46	40.260468	-105.037344
4,178.0	4.60	74.50	4,168.8	114.9	231.6	1,338,072.24	3,129,132.00	40.260475	-105.037320
4,273.0	4.00	66.70	4,263.5	117.2	238.3	1,338,074.61	3,129,138.70	40.260482	-105.037296
4,368.0	3.10	65.10	4,358.3	119.6	243.7	1,338,077.03	3,129,144.06	40.260488	-105.037277
4,462.0	4.10	64.50	4,452.2	122.1	249.0	1,338,079.57	3,129,149.39	40.260495	-105.037258
4,556.0	3.90	59.00	4,545.9	125.2	254.8	1,338,082.69	3,129,155.14	40.260504	-105.037237
4,651.0	4.70	70.80	4,640.7	128.1	261.2	1,338,085.67	3,129,161.57	40.260512	-105.037214
4,745.0	4.20	66.20	4,734.4	130.8	268.0	1,338,088.36	3,129,168.35	40.260519	-105.037190
4,840.0	3.40	58.00	4,829.2	133.7	273.6	1,338,091.29	3,129,173.90	40.260527	-105.037170
4,934.0	3.80	65.60	4,923.0	136.5	278.8	1,338,094.08	3,129,179.09	40.260535	-105.037151
5,029.0	3.40	54.30	5,017.8	139.4	283.9	1,338,097.05	3,129,184.23	40.260543	-105.037133
5,123.0	3.60	69.60	5,111.6	142.1	289.0	1,338,099.73	3,129,189.24	40.260550	-105.037115
5,218.0	4.10	75.40	5,206.4	144.0	295.1	1,338,101.66	3,129,195.32	40.260555	-105.037093
5,312.0	3.30	68.50	5,300.2	145.8	300.8	1,338,103.53	3,129,201.08	40.260560	-105.037072
5,407.0	4.40	79.80	5,395.0	147.4	307.0	1,338,105.21	3,129,207.20	40.260565	-105.037050
5,501.0	4.30	74.90	5,488.7	149.0	313.9	1,338,106.80	3,129,214.14	40.260569	-105.037025
5,596.0	3.30	69.00	5,583.5	150.9	319.9	1,338,108.74	3,129,220.12	40.260574	-105.037004
5,690.0	3.60	56.20	5,677.3	153.5	324.9	1,338,111.38	3,129,225.09	40.260581	-105.036986
5,785.0	4.40	53.20	5,772.1	157.4	330.3	1,338,115.25	3,129,230.46	40.260592	-105.036967
5,880.0	3.40	42.80	5,866.9	161.6	335.1	1,338,119.52	3,129,235.27	40.260604	-105.036950
5,974.0	3.60	54.60	5,960.7	165.4	339.4	1,338,123.30	3,129,239.55	40.260614	-105.036934
6,069.0	3.90	57.50	6,055.5	168.8	344.6	1,338,126.79	3,129,244.69	40.260623	-105.036916
6,163.0	4.50	59.30	6,149.3	172.4	350.4	1,338,130.42	3,129,250.54	40.260633	-105.036895
6,258.0	4.10	62.20	6,244.0	175.9	356.6	1,338,133.94	3,129,256.73	40.260643	-105.036872

# Cathedral Energy Services

## Survey Report - Geographic

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Drieth 1B-6H-A368
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Site:</b>	S6-T3N-R68W (Zisch/Drieth)	<b>MD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Well:</b>	Drieth 1B-6H-A368	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
6,352.0	3.80	51.50	6,337.8	179.4	362.1	1,338,137.47	3,129,262.12	40.260653	-105.036853
6,447.0	2.80	38.50	6,432.6	183.2	366.0	1,338,141.27	3,129,266.01	40.260663	-105.036839
6,494.0	2.30	33.10	6,479.6	184.9	367.2	1,338,142.96	3,129,267.23	40.260668	-105.036835
6,542.0	1.90	1.50	6,527.5	186.5	367.7	1,338,144.57	3,129,267.77	40.260672	-105.036833
6,589.0	4.40	299.10	6,574.5	188.1	366.2	1,338,146.22	3,129,266.21	40.260677	-105.036838
6,636.0	6.20	291.00	6,621.3	189.9	362.2	1,338,147.98	3,129,262.25	40.260681	-105.036852
6,683.0	8.50	288.70	6,667.9	192.0	356.6	1,338,149.98	3,129,256.58	40.260687	-105.036873
6,731.0	10.70	287.00	6,715.2	194.4	349.0	1,338,152.38	3,129,248.95	40.260694	-105.036900
6,778.0	13.90	281.40	6,761.1	196.8	339.2	1,338,154.72	3,129,239.22	40.260700	-105.036935
6,826.0	17.50	280.80	6,807.3	199.3	326.5	1,338,157.15	3,129,226.47	40.260707	-105.036980
6,873.0	21.10	279.40	6,851.7	202.0	311.2	1,338,159.77	3,129,211.16	40.260715	-105.037035
6,920.0	24.80	277.90	6,895.0	204.7	293.1	1,338,162.42	3,129,193.03	40.260722	-105.037100
6,967.0	28.80	275.90	6,936.9	207.2	272.1	1,338,164.83	3,129,171.98	40.260729	-105.037175
7,015.0	34.30	272.20	6,977.8	208.9	247.0	1,338,166.41	3,129,146.94	40.260734	-105.037265
7,062.0	38.50	269.90	7,015.6	209.4	219.1	1,338,166.74	3,129,119.06	40.260735	-105.037365
7,110.0	40.30	268.90	7,052.7	209.1	188.7	1,338,166.26	3,129,088.60	40.260734	-105.037474
7,157.0	41.40	267.80	7,088.3	208.2	158.0	1,338,165.21	3,129,057.87	40.260732	-105.037584
7,204.0	44.20	267.70	7,122.7	207.0	126.0	1,338,163.79	3,129,025.98	40.260728	-105.037699
7,251.0	49.50	268.00	7,154.9	205.7	91.8	1,338,162.33	3,128,991.73	40.260725	-105.037821
7,299.0	57.00	269.30	7,183.6	204.8	53.4	1,338,161.25	3,128,953.31	40.260722	-105.037959
7,346.0	61.30	270.50	7,207.7	204.7	13.0	1,338,160.98	3,128,912.97	40.260722	-105.038104
7,394.0	64.60	272.00	7,229.5	205.7	-29.7	1,338,161.69	3,128,870.24	40.260725	-105.038257
7,441.0	68.10	272.90	7,248.3	207.5	-72.7	1,338,163.31	3,128,827.22	40.260730	-105.038411
7,488.0	70.80	271.20	7,264.8	209.1	-116.7	1,338,164.65	3,128,783.24	40.260734	-105.038568
7,535.0	73.00	269.30	7,279.4	209.3	-161.4	1,338,164.61	3,128,738.57	40.260735	-105.038728
7,583.0	76.30	267.60	7,292.2	208.0	-207.6	1,338,163.11	3,128,692.32	40.260731	-105.038894
7,630.0	79.60	268.50	7,302.0	206.5	-253.5	1,338,161.31	3,128,646.39	40.260727	-105.039059
7,678.0	81.90	270.70	7,309.7	206.1	-300.9	1,338,160.74	3,128,599.03	40.260726	-105.039228
7,683.0	82.30	270.90	7,310.4	206.2	-305.9	1,338,160.78	3,128,594.08	40.260726	-105.039246
7,747.0	89.00	271.00	7,315.2	207.3	-369.6	1,338,161.51	3,128,530.30	40.260729	-105.039475
7,795.0	90.90	271.40	7,315.3	208.3	-417.6	1,338,162.26	3,128,482.31	40.260732	-105.039647
7,890.0	92.40	271.30	7,312.5	210.5	-512.6	1,338,164.01	3,128,387.37	40.260738	-105.039987
7,985.0	92.10	270.30	7,308.8	211.8	-607.5	1,338,164.84	3,128,292.44	40.260742	-105.040327
8,079.0	92.80	269.30	7,304.8	211.5	-701.4	1,338,164.02	3,128,198.54	40.260741	-105.040663
8,174.0	92.20	269.50	7,300.6	210.5	-796.3	1,338,162.53	3,128,103.64	40.260738	-105.041003
8,268.0	92.80	269.80	7,296.5	209.9	-890.2	1,338,161.47	3,128,009.73	40.260736	-105.041340
8,363.0	92.70	270.70	7,292.0	210.3	-985.1	1,338,161.39	3,127,914.84	40.260737	-105.041680
8,458.0	92.90	269.90	7,287.3	210.8	-1,080.0	1,338,161.39	3,127,819.96	40.260739	-105.042020
8,553.0	93.00	270.90	7,282.4	211.5	-1,174.8	1,338,161.56	3,127,725.09	40.260741	-105.042360
8,647.0	91.30	271.00	7,278.9	213.1	-1,268.8	1,338,162.63	3,127,631.16	40.260745	-105.042696
8,742.0	92.50	271.00	7,275.8	214.7	-1,363.7	1,338,163.79	3,127,536.22	40.260749	-105.043037
8,837.0	92.30	269.90	7,271.8	215.5	-1,458.6	1,338,164.04	3,127,441.31	40.260751	-105.043377
8,931.0	91.00	268.90	7,269.1	214.5	-1,552.6	1,338,162.57	3,127,347.36	40.260749	-105.043713
9,026.0	91.30	268.70	7,267.2	212.5	-1,647.5	1,338,160.08	3,127,252.41	40.260743	-105.044054
9,121.0	92.70	268.60	7,263.9	210.3	-1,742.4	1,338,157.35	3,127,157.51	40.260737	-105.044394
9,215.0	92.10	269.20	7,259.9	208.5	-1,836.3	1,338,155.06	3,127,063.62	40.260732	-105.044730
9,310.0	93.80	268.90	7,255.0	206.9	-1,931.2	1,338,152.99	3,126,968.77	40.260728	-105.045070
9,373.0	95.70	271.40	7,249.8	207.0	-1,994.0	1,338,152.83	3,126,906.00	40.260728	-105.045295
9,436.0	94.80	272.30	7,244.1	209.1	-2,056.7	1,338,154.53	3,126,843.29	40.260734	-105.045520
9,499.0	92.80	271.10	7,239.9	210.9	-2,119.5	1,338,156.07	3,126,780.45	40.260739	-105.045745
9,593.0	91.60	270.20	7,236.3	212.0	-2,213.4	1,338,156.64	3,126,686.52	40.260742	-105.046081
9,688.0	89.80	270.00	7,235.1	212.2	-2,308.4	1,338,156.31	3,126,591.53	40.260742	-105.046422
9,783.0	91.00	270.20	7,234.4	212.3	-2,403.4	1,338,155.98	3,126,496.54	40.260743	-105.046762
9,877.0	91.50	270.00	7,232.4	212.5	-2,497.4	1,338,155.66	3,126,402.56	40.260743	-105.047099
9,972.0	90.90	269.40	7,230.4	212.0	-2,592.4	1,338,154.67	3,126,307.59	40.260742	-105.047439

# Cathedral Energy Services

## Survey Report - Geographic

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Drieth 1B-6H-A368
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Site:</b>	S6-T3N-R68W (Zisch/Drieth)	<b>MD Reference:</b>	WELL @ 5100.0ft (Ensign 135)
<b>Well:</b>	Drieth 1B-6H-A368	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
10,066.0	91.80	270.90	7,228.2	212.2	-2,686.3	1,338,154.42	3,126,213.62	40.260742	-105.047776
10,161.0	90.90	270.60	7,226.0	213.5	-2,781.3	1,338,155.17	3,126,118.65	40.260746	-105.048116
10,256.0	90.20	270.00	7,225.0	214.0	-2,876.3	1,338,155.17	3,126,023.65	40.260747	-105.048456
10,350.0	89.20	269.20	7,225.5	213.3	-2,970.3	1,338,154.03	3,125,929.66	40.260745	-105.048793
10,445.0	90.10	270.30	7,226.1	212.9	-3,065.3	1,338,153.12	3,125,834.67	40.260744	-105.049134
10,539.0	90.30	269.20	7,225.8	212.5	-3,159.3	1,338,152.22	3,125,740.68	40.260743	-105.049470
10,634.0	90.30	269.20	7,225.3	211.2	-3,254.3	1,338,150.40	3,125,645.70	40.260739	-105.049811
10,729.0	90.20	269.20	7,224.9	209.9	-3,349.2	1,338,148.58	3,125,550.71	40.260735	-105.050151
10,823.0	90.50	269.90	7,224.3	209.1	-3,443.2	1,338,147.35	3,125,456.72	40.260733	-105.050488
10,918.0	91.90	267.20	7,222.3	206.7	-3,538.2	1,338,144.45	3,125,361.80	40.260727	-105.050828
11,012.0	92.90	266.10	7,218.4	201.2	-3,631.9	1,338,138.48	3,125,268.08	40.260712	-105.051164
11,107.0	91.30	266.00	7,214.9	194.7	-3,726.6	1,338,131.44	3,125,173.40	40.260694	-105.051503
11,201.0	91.10	268.70	7,212.9	190.3	-3,820.5	1,338,126.61	3,125,079.56	40.260682	-105.051840
11,296.0	91.00	271.50	7,211.2	190.5	-3,915.5	1,338,126.28	3,124,984.58	40.260682	-105.052180
11,391.0	91.90	271.20	7,208.8	192.7	-4,010.4	1,338,128.02	3,124,889.63	40.260688	-105.052520
11,485.0	91.90	271.00	7,205.7	194.5	-4,104.4	1,338,129.34	3,124,795.69	40.260693	-105.052857
11,565.0	91.30	270.40	7,203.4	195.5	-4,184.3	1,338,129.90	3,124,715.75	40.260696	-105.053143
Last CES Survey @ 11,565' MD									
11,617.0	91.30	270.40	7,202.2	195.9	-4,236.3	1,338,129.99	3,124,663.76	40.260697	-105.053330
PTB @ 11,617'									

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									
Drieth 1B-6H PBHL P3	0.00	0.00	7,209.6	211.7	-4,270.0	1,338,145.60	3,124,630.00	40.260740	-105.053450
- actual wellpath misses target center by 37.9ft at 11617.0ft MD (7202.2 TVD, 195.9 N, -4236.3 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
11,565.0	7,203.4	195.5	-4,184.3	Last CES Survey @ 11,565' MD	
11,617.0	7,202.2	195.9	-4,236.3	PTB @ 11,617'	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_