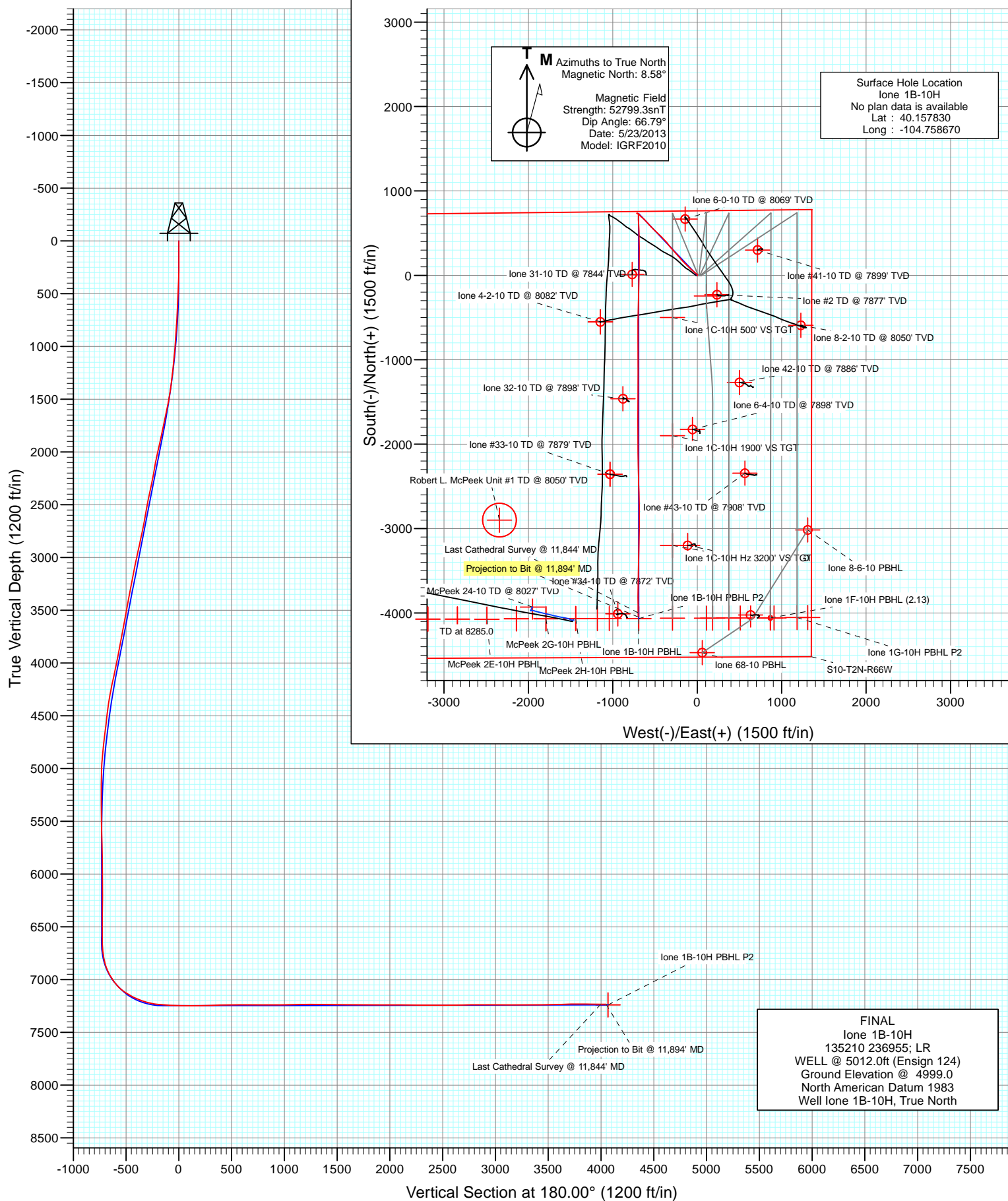


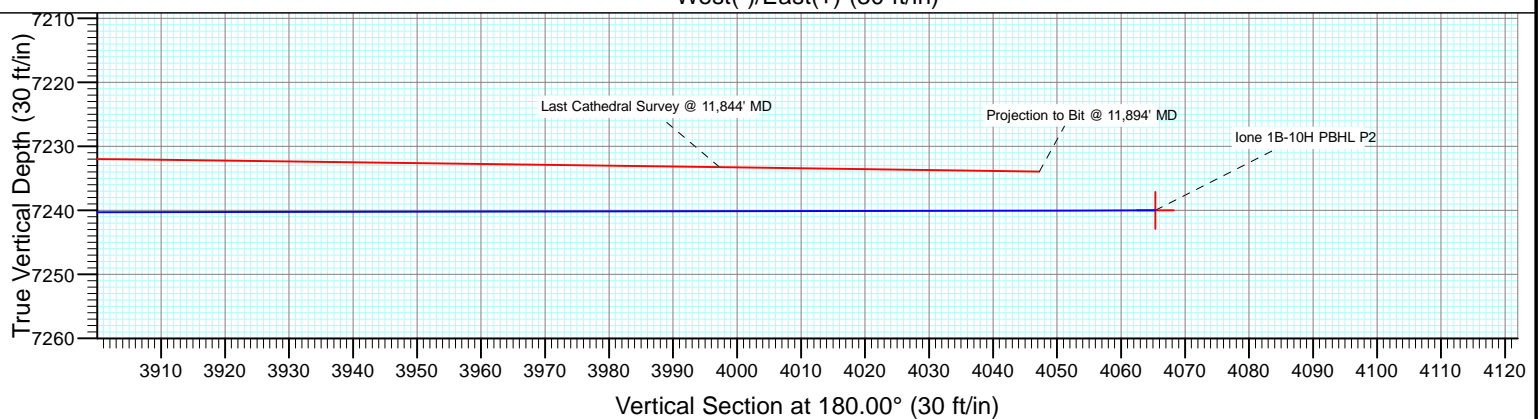
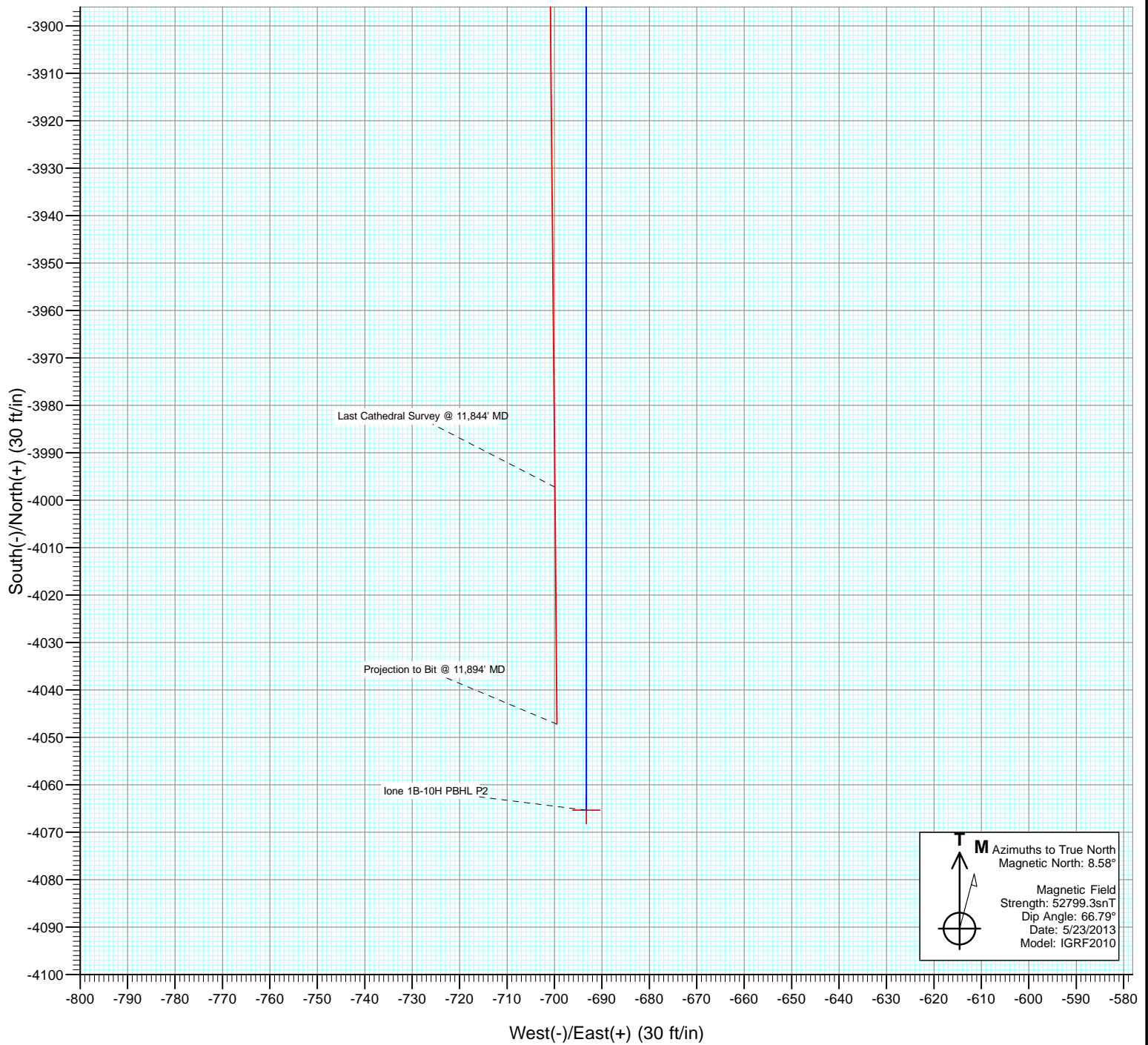


Project: DJ Wattenberg
Site: S10-T2N-R66W (Ione)
Well: Ione 1B-10H
Wellbore: Hz
Design: FINAL





Project: DJ Wattenberg
Site: S10-T2N-R66W (Ione)
Well: Ione 1B-10H
Wellbore: Hz
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well lone 1B-10H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5012.0ft (Ensign 124)
Site:	S10-T2N-R66W (lone)	MD Reference:	WELL @ 5012.0ft (Ensign 124)
Well:	lone 1B-10H	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		S10-T2N-R66W (lone)			
Site Position:		Northing:	1,297,164.02 ft	Latitude:	40.146710
From:	Lat/Long	Easting:	3,207,875.24 ft	Longitude:	-104.756410
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.48 °

Well	lone 1B-10H					
Well Position	+N/-S	0.0 ft	Northing:	1,301,209.40 ft	Latitude:	40.157830
	+E/-W	0.0 ft	Easting:	3,207,209.61 ft	Longitude:	-104.758670
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,999.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/23/2013	8.58	66.79	52,799

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

Survey Program	Date	6/2/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
141.0	11,894.0	Survey #1 (Hz)	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		
141.0	0.20	143.90	141.0	-0.2	0.1	0.2	0.14	0.14		
234.0	0.10	49.30	234.0	-0.3	0.3	0.3	0.25	-0.11		
327.0	1.20	13.70	327.0	0.7	0.6	-0.7	1.20	1.18		
420.0	2.20	344.60	420.0	3.4	0.4	-3.4	1.39	1.08		
513.0	3.30	334.80	512.8	7.5	-1.3	-7.5	1.28	1.18		
606.0	3.60	317.00	605.7	12.1	-4.4	-12.1	1.19	0.32		
699.0	4.90	311.60	698.4	16.9	-9.4	-16.9	1.46	1.40		
792.0	5.50	308.90	791.0	22.3	-15.8	-22.3	0.70	0.65		
885.0	5.80	307.40	883.6	28.0	-23.0	-28.0	0.36	0.32		
978.0	6.70	310.30	976.0	34.3	-30.9	-34.3	1.03	0.97		
1,113.0	7.30	310.70	1,110.0	45.0	-43.4	-45.0	0.45	0.44		
1,206.0	9.30	314.10	1,202.0	54.1	-53.3	-54.1	2.21	2.15		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well lone 1B-10H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5012.0ft (Ensign 124)
Site:	S10-T2N-R66W (lone)	MD Reference:	WELL @ 5012.0ft (Ensign 124)
Well:	lone 1B-10H	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
1,299.0	10.30	310.80	1,293.7	64.7	-64.9	-64.7	1.23	1.08	
1,392.0	11.10	314.50	1,385.1	76.5	-77.6	-76.5	1.13	0.86	
1,485.0	14.10	314.70	1,475.8	90.7	-92.1	-90.7	3.23	3.23	
1,578.0	15.70	311.40	1,565.7	107.0	-109.6	-107.0	1.95	1.72	
1,671.0	17.50	315.90	1,654.8	125.4	-128.7	-125.4	2.38	1.94	
1,764.0	16.90	311.80	1,743.7	144.4	-148.5	-144.4	1.45	-0.65	
1,857.0	16.40	316.30	1,832.8	162.9	-167.7	-162.9	1.49	-0.54	
1,950.0	16.10	320.40	1,922.1	182.3	-185.0	-182.3	1.27	-0.32	
2,045.0	16.10	319.00	2,013.3	202.4	-202.0	-202.4	0.41	0.00	
2,139.0	15.20	317.50	2,103.8	221.4	-218.9	-221.4	1.05	-0.96	
2,234.0	13.70	315.70	2,195.8	238.6	-235.2	-238.6	1.65	-1.58	
2,330.0	14.00	320.30	2,289.0	255.7	-250.5	-255.7	1.19	0.31	
2,424.0	15.00	322.30	2,380.1	274.0	-265.2	-274.0	1.19	1.06	
2,519.0	16.00	317.50	2,471.6	293.4	-281.6	-293.4	1.71	1.05	
2,614.0	14.00	314.60	2,563.4	311.1	-298.6	-311.1	2.25	-2.11	
2,709.0	13.50	321.20	2,655.6	327.8	-313.7	-327.8	1.73	-0.53	
2,804.0	14.50	323.00	2,747.8	346.0	-327.9	-346.0	1.15	1.05	
2,899.0	14.80	320.30	2,839.7	364.8	-342.8	-364.8	0.79	0.32	
2,994.0	16.40	321.10	2,931.2	384.6	-358.9	-384.6	1.70	1.68	
3,090.0	15.60	319.20	3,023.5	404.9	-375.9	-404.9	1.00	-0.83	
3,184.0	14.50	317.40	3,114.3	423.1	-392.1	-423.1	1.27	-1.17	
3,279.0	15.20	314.40	3,206.1	440.6	-409.1	-440.6	1.09	0.74	
3,374.0	15.50	313.70	3,297.7	458.1	-427.1	-458.1	0.37	0.32	
3,469.0	16.20	314.90	3,389.1	476.2	-445.7	-476.2	0.81	0.74	
3,564.0	13.60	309.60	3,480.9	492.7	-463.7	-492.7	3.09	-2.74	
3,659.0	14.40	315.50	3,573.1	508.2	-480.6	-508.2	1.72	0.84	
3,753.0	15.20	312.90	3,664.0	525.0	-497.8	-525.0	1.11	0.85	
3,848.0	15.20	316.50	3,755.7	542.5	-515.5	-542.5	0.99	0.00	
3,943.0	15.60	316.50	3,847.2	560.8	-532.9	-560.8	0.42	0.42	
4,038.0	16.30	316.00	3,938.6	579.6	-550.9	-579.6	0.75	0.74	
4,133.0	14.20	314.30	4,030.2	597.4	-568.5	-597.4	2.26	-2.21	
4,228.0	16.20	320.20	4,121.9	615.7	-585.3	-615.7	2.66	2.11	
4,323.0	15.60	318.00	4,213.3	635.4	-602.4	-635.4	0.90	-0.63	
4,418.0	14.00	316.00	4,305.1	653.1	-618.9	-653.1	1.77	-1.68	
4,512.0	11.90	313.40	4,396.7	668.0	-633.8	-668.0	2.32	-2.23	
4,607.0	9.80	307.90	4,490.0	679.7	-647.3	-679.7	2.46	-2.21	
4,702.0	10.20	311.20	4,583.6	690.2	-660.1	-690.2	0.74	0.42	
4,797.0	9.60	319.40	4,677.2	701.7	-671.5	-701.7	1.61	-0.63	
4,892.0	9.00	314.30	4,770.9	712.9	-682.0	-712.9	1.07	-0.63	
4,988.0	7.40	315.50	4,866.0	722.6	-691.7	-722.6	1.68	-1.67	
5,082.0	4.50	316.80	4,959.4	729.6	-698.5	-729.6	3.09	-3.09	
5,177.0	2.50	301.40	5,054.3	733.4	-702.8	-733.4	2.31	-2.11	
5,272.0	3.60	282.40	5,149.1	735.1	-707.5	-735.1	1.56	1.16	
5,368.0	3.30	274.00	5,245.0	736.0	-713.2	-736.0	0.61	-0.31	
5,463.0	0.60	249.40	5,339.9	736.0	-716.4	-736.0	2.91	-2.84	
5,557.0	2.50	120.10	5,433.9	734.8	-715.1	-734.8	3.10	2.02	
5,652.0	2.40	118.40	5,528.8	732.8	-711.5	-732.8	0.13	-0.11	
5,747.0	2.20	122.20	5,623.7	730.9	-708.2	-730.9	0.26	-0.21	
5,843.0	2.70	119.80	5,719.6	728.8	-704.7	-728.8	0.53	0.52	
5,937.0	2.60	116.70	5,813.5	726.7	-700.9	-726.7	0.19	-0.11	
6,032.0	2.50	114.00	5,908.4	724.9	-697.1	-724.9	0.16	-0.11	
6,127.0	1.80	123.70	6,003.4	723.2	-693.9	-723.2	0.83	-0.74	
6,222.0	0.90	307.20	6,098.3	722.8	-693.3	-722.8	2.84	-0.95	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well lone 1B-10H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5012.0ft (Ensign 124)
Site:	S10-T2N-R66W (lone)	MD Reference:	WELL @ 5012.0ft (Ensign 124)
Well:	lone 1B-10H	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
6,317.0	0.60	292.70	6,193.3	723.5	-694.3	-723.5	0.37	-0.32	
6,412.0	0.70	358.40	6,288.3	724.3	-694.8	-724.3	0.75	0.11	
6,508.0	0.40	279.80	6,384.3	724.9	-695.2	-724.9	0.76	-0.31	
6,602.0	0.50	255.80	6,478.3	724.9	-695.9	-724.9	0.22	0.11	
6,697.0	0.40	272.30	6,573.3	724.8	-696.6	-724.8	0.17	-0.11	
6,728.0	0.60	272.40	6,604.3	724.8	-696.9	-724.8	0.65	0.65	
6,760.0	0.60	252.40	6,636.3	724.7	-697.2	-724.7	0.65	0.00	
6,792.0	1.40	190.40	6,668.3	724.3	-697.4	-724.3	3.87	2.50	
6,823.0	3.60	188.50	6,699.3	723.0	-697.7	-723.0	7.10	7.10	
6,855.0	6.00	179.30	6,731.2	720.3	-697.8	-720.3	7.85	7.50	
6,887.0	8.90	179.30	6,762.9	716.2	-697.7	-716.2	9.06	9.06	
6,918.0	10.90	177.60	6,793.4	710.8	-697.6	-710.8	6.52	6.45	
6,950.0	12.60	179.10	6,824.8	704.3	-697.4	-704.3	5.40	5.31	
6,982.0	15.70	180.10	6,855.8	696.5	-697.4	-696.5	9.72	9.69	
7,013.0	19.90	180.50	6,885.3	687.0	-697.4	-687.0	13.55	13.55	
7,045.0	24.20	179.80	6,914.9	675.0	-697.4	-675.0	13.46	13.44	
7,077.0	28.10	178.80	6,943.7	660.9	-697.3	-660.9	12.26	12.19	
7,108.0	30.90	178.60	6,970.6	645.6	-696.9	-645.6	9.04	9.03	
7,140.0	33.10	177.20	6,997.8	628.7	-696.3	-628.7	7.25	6.87	
7,171.0	36.50	175.80	7,023.2	611.0	-695.2	-611.0	11.27	10.97	
7,203.0	40.70	175.90	7,048.2	591.1	-693.7	-591.1	13.13	13.12	
7,235.0	45.50	175.80	7,071.6	569.3	-692.2	-569.3	15.00	15.00	
7,267.0	50.90	177.20	7,092.9	545.5	-690.7	-545.5	17.19	16.87	
7,298.0	54.40	179.80	7,111.7	520.9	-690.1	-520.9	13.11	11.29	
7,330.0	57.60	179.40	7,129.6	494.4	-689.9	-494.4	10.05	10.00	
7,362.0	59.60	179.40	7,146.3	467.1	-689.6	-467.1	6.25	6.25	
7,393.0	62.00	179.30	7,161.4	440.0	-689.3	-440.0	7.75	7.74	
7,425.0	65.30	179.50	7,175.6	411.3	-689.0	-411.3	10.33	10.31	
7,457.0	68.40	179.40	7,188.2	381.9	-688.7	-381.9	9.69	9.69	
7,488.0	70.20	180.00	7,199.1	352.9	-688.6	-352.9	6.08	5.81	
7,520.0	72.40	179.80	7,209.4	322.6	-688.5	-322.6	6.90	6.87	
7,551.0	75.60	179.20	7,217.9	292.8	-688.3	-292.8	10.49	10.32	
7,583.0	79.20	179.50	7,224.9	261.6	-687.9	-261.6	11.29	11.25	
7,615.0	81.50	179.30	7,230.3	230.1	-687.6	-230.1	7.21	7.19	
7,646.0	83.20	179.60	7,234.4	199.3	-687.3	-199.3	5.57	5.48	
7,664.0	84.60	180.10	7,236.3	181.4	-687.2	-181.4	8.25	7.78	
7,765.0	87.30	181.20	7,243.5	80.7	-688.4	-80.7	2.89	2.67	
7,860.0	88.90	181.20	7,246.6	-14.2	-690.4	14.2	1.68	1.68	
7,955.0	89.90	181.20	7,247.6	-109.2	-692.4	109.2	1.05	1.05	
8,050.0	91.00	181.50	7,246.9	-204.2	-694.6	204.2	1.20	1.16	
8,145.0	91.70	180.90	7,244.6	-299.1	-696.6	299.1	0.97	0.74	
8,239.0	91.30	181.20	7,242.2	-393.1	-698.3	393.1	0.53	-0.43	
8,334.0	91.30	181.60	7,240.0	-488.0	-700.6	488.0	0.42	0.00	
8,429.0	91.10	180.20	7,238.0	-583.0	-702.1	583.0	1.49	-0.21	
8,524.0	89.00	180.00	7,237.9	-678.0	-702.3	678.0	2.22	-2.21	
8,619.0	89.30	180.10	7,239.3	-773.0	-702.4	773.0	0.33	0.32	
8,714.0	89.80	180.10	7,240.1	-868.0	-702.5	868.0	0.53	0.53	
8,809.0	90.60	179.60	7,239.8	-962.9	-702.3	962.9	0.99	0.84	
8,904.0	91.60	179.70	7,237.9	-1,057.9	-701.7	1,057.9	1.06	1.05	
8,999.0	90.70	180.00	7,236.0	-1,152.9	-701.5	1,152.9	1.00	-0.95	
9,093.0	90.40	179.40	7,235.1	-1,246.9	-701.0	1,246.9	0.71	-0.32	
9,189.0	88.80	180.00	7,235.8	-1,342.9	-700.5	1,342.9	1.78	-1.67	
9,284.0	89.30	180.20	7,237.4	-1,437.9	-700.6	1,437.9	0.57	0.53	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well lone 1B-10H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5012.0ft (Ensign 124)
Site:	S10-T2N-R66W (lone)	MD Reference:	WELL @ 5012.0ft (Ensign 124)
Well:	lone 1B-10H	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
9,379.0	90.90	180.90	7,237.2	-1,532.9	-701.5	1,532.9	1.84	1.68	
9,474.0	89.00	180.50	7,237.3	-1,627.9	-702.7	1,627.9	2.04	-2.00	
9,569.0	89.90	180.50	7,238.2	-1,722.9	-703.5	1,722.9	0.95	0.95	
9,664.0	89.80	180.00	7,238.4	-1,817.9	-703.9	1,817.9	0.54	-0.11	
9,759.0	89.10	179.40	7,239.4	-1,912.8	-703.4	1,912.8	0.97	-0.74	
9,853.0	90.30	179.20	7,239.9	-2,006.8	-702.3	2,006.8	1.29	1.28	
9,948.0	89.20	179.40	7,240.3	-2,101.8	-701.1	2,101.8	1.18	-1.16	
10,044.0	90.30	179.90	7,240.7	-2,197.8	-700.5	2,197.8	1.26	1.15	
10,139.0	88.90	178.50	7,241.3	-2,292.8	-699.2	2,292.8	2.08	-1.47	
10,234.0	88.60	178.10	7,243.4	-2,387.7	-696.4	2,387.7	0.53	-0.32	
10,329.0	90.90	178.70	7,243.8	-2,482.7	-693.8	2,482.7	2.50	2.42	
10,424.0	91.60	179.10	7,241.8	-2,577.7	-691.9	2,577.7	0.85	0.74	
10,519.0	91.20	179.00	7,239.4	-2,672.6	-690.4	2,672.6	0.43	-0.42	
10,614.0	90.10	179.10	7,238.4	-2,767.6	-688.8	2,767.6	1.16	-1.16	
10,709.0	90.10	178.90	7,238.2	-2,862.6	-687.1	2,862.6	0.21	0.00	
10,804.0	89.50	179.50	7,238.5	-2,957.5	-685.8	2,957.5	0.89	-0.63	
10,898.0	89.90	181.60	7,239.0	-3,051.5	-686.7	3,051.5	2.27	0.43	
10,993.0	89.80	181.20	7,239.3	-3,146.5	-689.0	3,146.5	0.43	-0.11	
11,088.0	89.70	181.50	7,239.7	-3,241.5	-691.3	3,241.5	0.33	-0.11	
11,183.0	89.60	181.10	7,240.3	-3,336.5	-693.4	3,336.5	0.43	-0.11	
11,278.0	91.20	181.60	7,239.6	-3,431.4	-695.6	3,431.4	1.76	1.68	
11,373.0	92.00	181.40	7,237.0	-3,526.4	-698.1	3,526.4	0.87	0.84	
11,468.0	92.10	180.80	7,233.6	-3,621.3	-700.0	3,621.3	0.64	0.11	
11,563.0	89.90	180.30	7,231.9	-3,716.2	-700.9	3,716.2	2.37	-2.32	
11,658.0	90.30	180.10	7,231.7	-3,811.2	-701.2	3,811.2	0.47	0.42	
11,753.0	89.30	179.40	7,232.1	-3,906.2	-700.8	3,906.2	1.28	-1.05	
11,844.0	89.20	179.50	7,233.3	-3,997.2	-699.9	3,997.2	0.16	-0.11	Last Cathedral Survey @ 11,844' MD Projection to Bit @ 11,894' MD
11,894.0	89.20	179.50	7,234.0	-4,047.2	-699.5	4,047.2	0.00	0.00	

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									
lone 1B-10H PBHL P2	0.00	0.00	7,240.0	-4,065.3	-693.3	1,297,138.39	3,206,550.33	40.146670	-104.761150
- actual wellpath misses target center by 20.1ft at 11894.0ft MD (7234.0 TVD, -4047.2 N, -699.5 E)									
- Point									
lone 1B-10H PBHL	0.00	0.00	7,247.0	-4,065.3	-693.3	1,297,138.39	3,206,550.33	40.146670	-104.761150
- actual wellpath misses target center by 23.2ft at 11894.0ft MD (7234.0 TVD, -4047.2 N, -699.5 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
11,844.0	7,233.3	-3,997.2	-699.9	Last Cathedral Survey @ 11,844' MD	
11,894.0	7,234.0	-4,047.2	-699.5	Projection to Bit @ 11,894' MD	

Checked By: _____ Approved By: _____ Date: _____