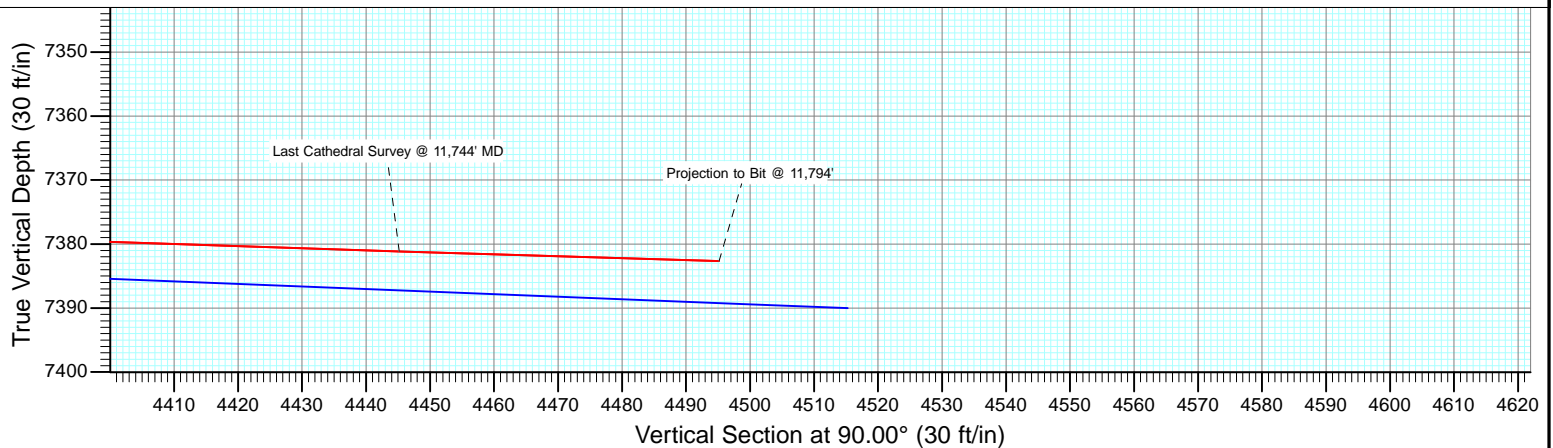
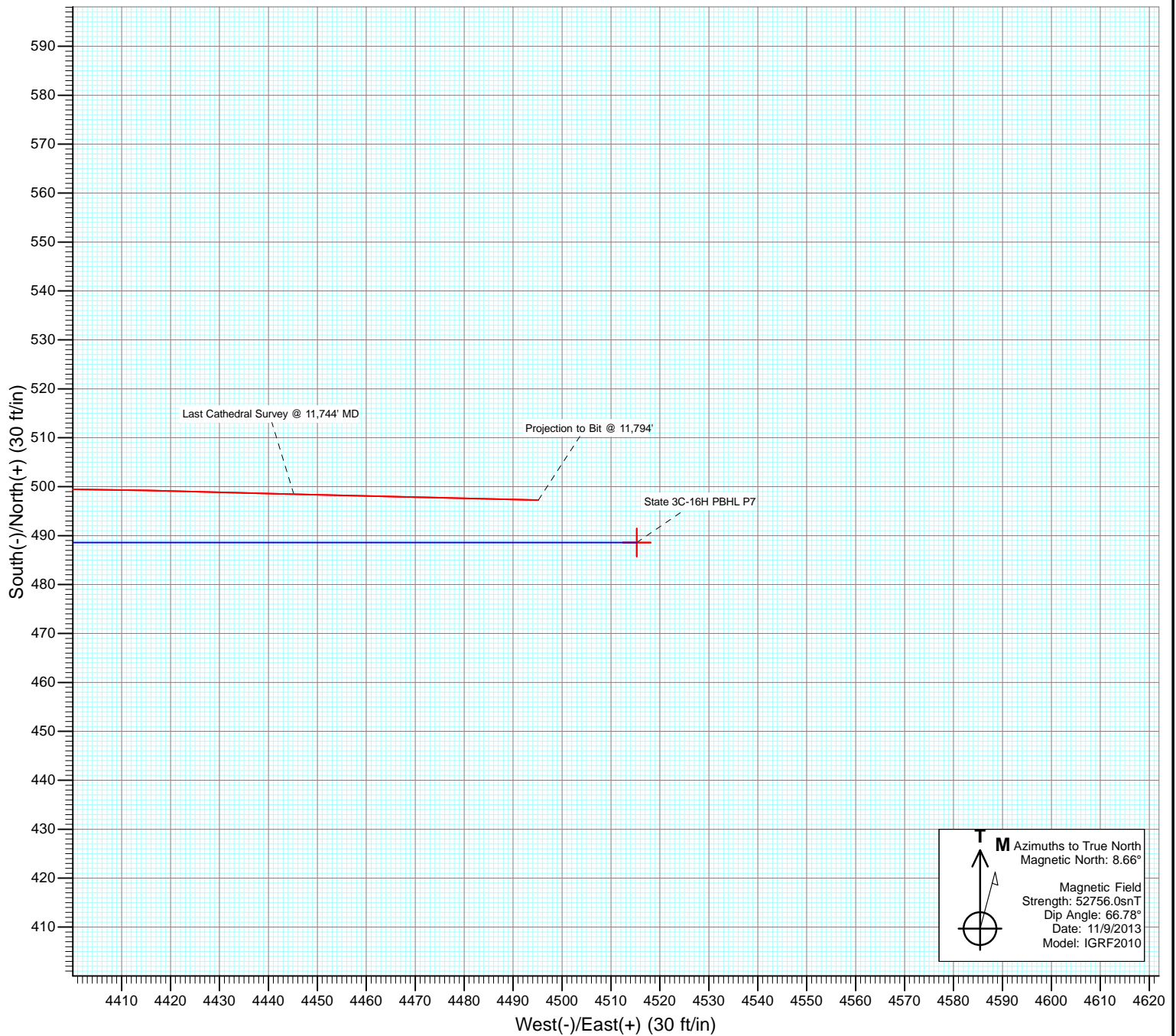




Project: DJ Wattenberg
Site: S16-T3N-R68W (State)
Well: State 3C-16H
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State 3C-16H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5084.0ft (H&P 278)
Site:	S16-T3N-R68W (State)	MD Reference:	KB @ 5084.0ft (H&P 278)
Well:	State 3C-16H	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		S16-T3N-R68W (State)			
Site Position:		Northing:	1,326,575.12 ft	Latitude:	40.228760
From:	Lat/Long	Easting:	3,139,542.66 ft	Longitude:	-105.000250
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.32 °

Well	State 3C-16H					
Well Position	+N/-S	0.0 ft	Northing:	1,324,160.55 ft	Latitude:	40.222200
	+E/-W	0.0 ft	Easting:	3,135,068.78 ft	Longitude:	-105.016320
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,059.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/9/2013	8.66	66.78	52,756

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	90.00	

Survey Program	Date	11/25/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
144.0	11,794.0	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		
144.0	0.50	270.10	144.0	0.0	-0.6	-0.6	0.35	0.35		
235.0	0.60	260.20	235.0	-0.1	-1.5	-1.5	0.15	0.11		
327.0	0.80	255.50	327.0	-0.3	-2.6	-2.6	0.23	0.22		
419.0	1.00	294.30	419.0	-0.2	-3.9	-3.9	0.68	0.22		
511.0	1.60	306.10	511.0	0.9	-5.7	-5.7	0.71	0.65		
603.0	1.90	326.60	602.9	3.0	-7.6	-7.6	0.75	0.33		
695.0	1.90	322.70	694.9	5.5	-9.4	-9.4	0.14	0.00		
787.0	2.50	343.60	786.8	8.6	-10.8	-10.8	1.08	0.65		
842.0	2.80	347.70	841.7	11.1	-11.5	-11.5	0.64	0.55		
918.0	2.90	345.90	917.6	14.7	-12.3	-12.3	0.18	0.13		
1,010.0	5.50	355.60	1,009.4	21.4	-13.2	-13.2	2.92	2.83		
1,102.0	7.80	352.50	1,100.8	32.0	-14.4	-14.4	2.53	2.50		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State 3C-16H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5084.0ft (H&P 278)
Site:	S16-T3N-R68W (State)	MD Reference:	KB @ 5084.0ft (H&P 278)
Well:	State 3C-16H	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
1,194.0	9.10	353.30	1,191.8	45.4	-16.1	-16.1	1.42	1.41	
1,286.0	8.40	342.40	1,282.7	59.0	-18.9	-18.9	1.95	-0.76	
1,378.0	8.90	335.80	1,373.7	71.9	-23.9	-23.9	1.21	0.54	
1,470.0	8.50	339.70	1,464.6	84.8	-29.2	-29.2	0.77	-0.43	
1,562.0	9.80	327.40	1,555.4	97.8	-35.7	-35.7	2.55	1.41	
1,654.0	10.40	335.10	1,646.0	111.9	-43.5	-43.5	1.60	0.65	
1,746.0	11.00	331.30	1,736.4	127.1	-51.2	-51.2	1.01	0.65	
1,837.0	10.50	325.80	1,825.8	141.6	-60.0	-60.0	1.25	-0.55	
1,929.0	10.70	321.20	1,916.2	155.2	-70.1	-70.1	0.94	0.22	
2,024.0	9.20	330.00	2,009.8	168.6	-79.4	-79.4	2.24	-1.58	
2,119.0	9.10	333.20	2,103.6	181.9	-86.6	-86.6	0.55	-0.11	
2,214.0	9.30	328.10	2,197.4	195.1	-94.0	-94.0	0.88	0.21	
2,309.0	9.00	333.30	2,291.2	208.3	-101.4	-101.4	0.93	-0.32	
2,404.0	8.80	332.40	2,385.0	221.4	-108.1	-108.1	0.26	-0.21	
2,499.0	10.00	340.50	2,478.8	235.6	-114.2	-114.2	1.88	1.26	
2,594.0	9.60	339.00	2,572.4	250.8	-119.8	-119.8	0.50	-0.42	
2,689.0	9.50	334.10	2,666.1	265.2	-126.1	-126.1	0.86	-0.11	
2,783.0	9.30	329.50	2,758.8	278.7	-133.3	-133.3	0.83	-0.21	
2,878.0	10.60	327.30	2,852.4	292.7	-142.0	-142.0	1.43	1.37	
2,973.0	11.40	337.30	2,945.6	308.7	-150.3	-150.3	2.17	0.84	
3,069.0	11.20	337.80	3,039.8	326.1	-157.5	-157.5	0.23	-0.21	
3,164.0	10.10	332.80	3,133.1	342.1	-164.8	-164.8	1.51	-1.16	
3,259.0	9.20	330.30	3,226.8	356.1	-172.3	-172.3	1.04	-0.95	
3,354.0	8.40	337.80	3,320.7	369.1	-178.7	-178.7	1.47	-0.84	
3,449.0	8.50	337.00	3,414.6	382.0	-184.1	-184.1	0.16	0.11	
3,544.0	10.00	334.70	3,508.4	395.9	-190.4	-190.4	1.63	1.58	
3,639.0	9.70	332.70	3,602.0	410.5	-197.6	-197.6	0.48	-0.32	
3,735.0	10.10	330.50	3,696.6	425.0	-205.4	-205.4	0.57	0.42	
3,830.0	9.90	329.10	3,790.1	439.2	-213.7	-213.7	0.33	-0.21	
3,925.0	8.10	331.30	3,884.0	452.1	-221.1	-221.1	1.93	-1.89	
4,020.0	7.30	327.30	3,978.1	463.1	-227.6	-227.6	1.01	-0.84	
4,115.0	6.60	339.30	4,072.4	473.2	-232.8	-232.8	1.69	-0.74	
4,210.0	5.10	342.20	4,166.9	482.4	-236.0	-236.0	1.61	-1.58	
4,304.0	3.50	352.00	4,260.6	489.2	-237.7	-237.7	1.87	-1.70	
4,400.0	1.80	343.30	4,356.5	493.5	-238.5	-238.5	1.81	-1.77	
4,495.0	1.70	337.50	4,451.5	496.3	-239.5	-239.5	0.21	-0.11	
4,590.0	1.00	73.30	4,546.5	497.8	-239.2	-239.2	2.17	-0.74	
4,684.0	0.90	71.80	4,640.5	498.3	-237.7	-237.7	0.11	-0.11	
4,780.0	0.70	37.80	4,736.5	499.0	-236.7	-236.7	0.53	-0.21	
4,874.0	0.90	25.90	4,830.5	500.1	-236.0	-236.0	0.28	0.21	
4,970.0	1.10	167.80	4,926.4	499.9	-235.5	-235.5	1.97	0.21	
5,064.0	0.80	158.70	5,020.4	498.4	-235.0	-235.0	0.36	-0.32	
5,159.0	1.00	174.20	5,115.4	496.9	-234.7	-234.7	0.33	0.21	
5,254.0	1.10	188.60	5,210.4	495.2	-234.8	-234.8	0.30	0.11	
5,348.0	1.00	214.10	5,304.4	493.6	-235.4	-235.4	0.50	-0.11	
5,443.0	0.70	266.30	5,399.4	492.9	-236.4	-236.4	0.84	-0.32	
5,538.0	0.90	270.40	5,494.4	492.9	-237.7	-237.7	0.22	0.21	
5,633.0	0.80	241.00	5,589.4	492.6	-239.1	-239.1	0.47	-0.11	
5,727.0	1.10	249.70	5,683.3	491.9	-240.5	-240.5	0.35	0.32	
5,822.0	1.00	240.90	5,778.3	491.2	-242.1	-242.1	0.20	-0.11	
5,917.0	1.00	237.70	5,873.3	490.4	-243.5	-243.5	0.06	0.00	
6,011.0	1.10	230.80	5,967.3	489.4	-244.9	-244.9	0.17	0.11	
6,106.0	1.20	232.80	6,062.3	488.2	-246.4	-246.4	0.11	0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State 3C-16H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5084.0ft (H&P 278)
Site:	S16-T3N-R68W (State)	MD Reference:	KB @ 5084.0ft (H&P 278)
Well:	State 3C-16H	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
6,201.0	1.10	242.00	6,157.3	487.1	-248.0	-248.0	0.22	-0.11	
6,295.0	1.20	27.70	6,251.3	487.6	-248.3	-248.3	2.34	0.11	
6,390.0	0.60	6.60	6,346.2	489.0	-247.8	-247.8	0.71	-0.63	
6,485.0	0.50	322.40	6,441.2	489.8	-248.0	-248.0	0.45	-0.11	
6,579.0	0.70	262.00	6,535.2	490.0	-248.8	-248.8	0.67	0.21	
6,673.0	0.80	260.10	6,629.2	489.8	-250.0	-250.0	0.11	0.11	
6,736.0	0.60	232.90	6,692.2	489.6	-250.7	-250.7	0.61	-0.32	
6,768.0	2.30	93.60	6,724.2	489.4	-250.2	-250.2	8.70	5.31	
6,799.0	8.00	94.20	6,755.1	489.2	-247.4	-247.4	18.39	18.39	
6,831.0	13.80	89.30	6,786.5	489.1	-241.4	-241.4	18.34	18.12	
6,862.0	18.30	90.50	6,816.3	489.1	-232.8	-232.8	14.55	14.52	
6,894.0	20.90	90.00	6,846.4	489.1	-222.1	-222.1	8.14	8.12	
6,925.0	22.80	90.70	6,875.2	489.0	-210.6	-210.6	6.19	6.13	
6,957.0	25.60	91.10	6,904.4	488.8	-197.4	-197.4	8.76	8.75	
6,989.0	28.00	90.70	6,932.9	488.6	-183.0	-183.0	7.52	7.50	
7,020.0	29.90	90.90	6,960.1	488.4	-168.0	-168.0	6.14	6.13	
7,052.0	31.40	91.30	6,987.6	488.0	-151.7	-151.7	4.73	4.69	
7,083.0	34.90	91.70	7,013.5	487.6	-134.8	-134.8	11.31	11.29	
7,115.0	39.50	91.60	7,039.0	487.0	-115.4	-115.4	14.38	14.37	
7,147.0	43.70	91.70	7,062.9	486.4	-94.2	-94.2	13.13	13.12	
7,178.0	47.00	91.10	7,084.7	485.9	-72.2	-72.2	10.73	10.65	
7,210.0	49.60	90.70	7,106.0	485.5	-48.3	-48.3	8.18	8.12	
7,241.0	52.30	90.30	7,125.5	485.3	-24.2	-24.2	8.77	8.71	
7,273.0	54.90	90.80	7,144.5	485.1	1.6	1.6	8.22	8.12	
7,304.0	57.70	90.70	7,161.7	484.7	27.3	27.3	9.04	9.03	
7,336.0	60.70	90.70	7,178.1	484.4	54.8	54.8	9.37	9.37	
7,368.0	63.50	90.80	7,193.1	484.0	83.1	83.1	8.75	8.75	
7,399.0	66.20	90.50	7,206.3	483.7	111.2	111.2	8.75	8.71	
7,431.0	69.10	90.20	7,218.4	483.5	140.7	140.7	9.10	9.06	
7,462.0	72.40	89.30	7,228.6	483.7	170.0	170.0	10.99	10.65	
7,494.0	75.10	89.30	7,237.6	484.0	200.7	200.7	8.44	8.44	
7,526.0	78.50	89.30	7,244.9	484.4	231.9	231.9	10.62	10.62	
7,565.0	84.70	89.10	7,250.6	484.9	270.4	270.4	15.91	15.90	
7,640.0	88.20	89.30	7,255.2	486.0	345.3	345.3	4.67	4.67	
7,735.0	87.50	90.50	7,258.8	486.2	440.2	440.2	1.46	-0.74	
7,829.0	84.10	88.40	7,265.7	487.1	533.9	533.9	4.25	-3.62	
7,924.0	89.90	88.80	7,270.7	489.4	628.7	628.7	6.12	6.11	
8,019.0	90.90	90.50	7,270.0	490.0	723.7	723.7	2.08	1.05	
8,113.0	89.90	91.60	7,269.3	488.2	817.7	817.7	1.58	-1.06	
8,208.0	89.90	91.70	7,269.5	485.5	912.7	912.7	0.11	0.00	
8,303.0	88.60	91.20	7,270.7	483.1	1,007.6	1,007.6	1.47	-1.37	
8,397.0	87.20	90.10	7,274.2	482.0	1,101.5	1,101.5	1.89	-1.49	
8,492.0	88.00	89.30	7,278.2	482.5	1,196.5	1,196.5	1.19	0.84	
8,587.0	88.40	87.70	7,281.2	485.0	1,291.4	1,291.4	1.74	0.42	
8,682.0	89.40	88.10	7,283.0	488.5	1,386.3	1,386.3	1.13	1.05	
8,777.0	88.70	89.10	7,284.6	490.8	1,481.2	1,481.2	1.28	-0.74	
8,871.0	89.00	88.20	7,286.4	493.0	1,575.2	1,575.2	1.01	0.32	
8,966.0	87.20	85.70	7,289.6	498.1	1,670.0	1,670.0	3.24	-1.89	
9,061.0	88.30	85.90	7,293.3	505.0	1,764.7	1,764.7	1.18	1.16	
9,155.0	92.00	90.40	7,293.1	508.1	1,858.6	1,858.6	6.20	3.94	
9,250.0	91.20	92.10	7,290.4	506.0	1,953.5	1,953.5	1.98	-0.84	
9,345.0	88.30	90.00	7,290.8	504.2	2,048.5	2,048.5	3.77	-3.05	
9,439.0	88.40	89.90	7,293.5	504.3	2,142.5	2,142.5	0.15	0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State 3C-16H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5084.0ft (H&P 278)
Site:	S16-T3N-R68W (State)	MD Reference:	KB @ 5084.0ft (H&P 278)
Well:	State 3C-16H	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
9,534.0	88.50	90.20	7,296.1	504.2	2,237.4	2,237.4	0.33	0.11	
9,629.0	87.10	91.10	7,299.8	503.2	2,332.3	2,332.3	1.75	-1.47	
9,724.0	86.50	90.70	7,305.1	501.7	2,427.2	2,427.2	0.76	-0.63	
9,818.0	87.70	91.60	7,309.8	499.8	2,521.0	2,521.0	1.59	1.28	
9,913.0	86.70	90.70	7,314.5	497.9	2,615.9	2,615.9	1.42	-1.05	
10,008.0	87.40	90.80	7,319.3	496.6	2,710.8	2,710.8	0.74	0.74	
10,103.0	86.90	90.50	7,324.1	495.6	2,805.6	2,805.6	0.61	-0.53	
10,198.0	87.80	90.40	7,328.5	494.8	2,900.5	2,900.5	0.95	0.95	
10,293.0	89.20	90.40	7,330.9	494.2	2,995.5	2,995.5	1.47	1.47	
10,387.0	89.20	89.90	7,332.3	493.9	3,089.5	3,089.5	0.53	0.00	
10,482.0	88.90	88.80	7,333.8	495.0	3,184.5	3,184.5	1.20	-0.32	
10,577.0	89.10	89.10	7,335.5	496.7	3,279.4	3,279.4	0.38	0.21	
10,671.0	87.00	88.80	7,338.7	498.5	3,373.4	3,373.4	2.26	-2.23	
10,766.0	85.40	88.70	7,345.0	500.5	3,468.1	3,468.1	1.69	-1.68	
10,861.0	85.90	89.00	7,352.2	502.4	3,562.8	3,562.8	0.61	0.53	
10,956.0	87.90	90.40	7,357.3	502.9	3,657.7	3,657.7	2.57	2.11	
11,050.0	88.30	90.50	7,360.4	502.2	3,751.6	3,751.6	0.44	0.43	
11,145.0	86.90	88.00	7,364.4	503.4	3,846.5	3,846.5	3.01	-1.47	
11,240.0	88.10	89.60	7,368.6	505.4	3,941.4	3,941.4	2.10	1.26	
11,335.0	88.40	91.00	7,371.5	504.9	4,036.4	4,036.4	1.51	0.32	
11,430.0	89.10	90.00	7,373.5	504.1	4,131.3	4,131.3	1.28	0.74	
11,524.0	89.10	92.00	7,375.0	502.4	4,225.3	4,225.3	2.13	0.00	
11,619.0	88.40	90.20	7,377.1	500.6	4,320.3	4,320.3	2.03	-0.74	
11,714.0	87.90	91.50	7,380.2	499.2	4,415.2	4,415.2	1.47	-0.53	
11,744.0	88.30	91.40	7,381.2	498.5	4,445.2	4,445.2	1.37	1.33	Last Cathedral Survey @ 11,744' MD
11,794.0	88.30	91.40	7,382.6	497.2	4,495.1	4,495.1	0.00	0.00	Projection to Bit @ 11,794'

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State 3C-16H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5084.0ft (H&P 278)
Site:	S16-T3N-R68W (State)	MD Reference:	KB @ 5084.0ft (H&P 278)
Well:	State 3C-16H	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)		
State 3C-16H 2060' VS	0.00	0.00	7,293.0	488.6	2,060.0	1,324,660.37	3,137,126.07	40.223541	-105.008943
- survey misses target center by 15.8ft at 9356.5ft MD (7291.2 TVD, 504.2 N, 2060.0 E)									
- Point									
State 3C-16H PBHL P6	0.00	0.00	7,390.0	488.6	4,515.2	1,324,673.74	3,139,581.30	40.223540	-105.000150
- survey misses target center by 23.1ft at 11794.0ft MD (7382.6 TVD, 497.2 N, 4495.1 E)									
- Point									
State 3C-16H 2060' VS I	0.00	0.00	7,288.0	488.6	2,060.0	1,324,660.37	3,137,126.07	40.223541	-105.008943
- survey misses target center by 16.0ft at 9356.4ft MD (7291.2 TVD, 504.2 N, 2059.9 E)									
- Point									
State 3C-16H PBHL P7	0.00	0.00	7,385.0	488.6	4,515.2	1,324,673.74	3,139,581.30	40.223540	-105.000150
- survey misses target center by 22.0ft at 11794.0ft MD (7382.6 TVD, 497.2 N, 4495.1 E)									
- Point									
State 3C-16H 300' VS	0.00	0.00	7,265.0	488.6	300.0	1,324,650.79	3,135,366.12	40.223541	-105.015246
- survey misses target center by 12.4ft at 7595.5ft MD (7253.0 TVD, 485.4 N, 300.8 E)									
- Point									
State 3C-16H PBHL	0.00	0.00	7,404.0	488.6	4,515.2	1,324,673.74	3,139,581.30	40.223540	-105.000150
- survey misses target center by 30.6ft at 11794.0ft MD (7382.6 TVD, 497.2 N, 4495.1 E)									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
11,744.0	7,381.2	498.5	4,445.2	Last Cathedral Survey @ 11,744' MD
11,794.0	7,382.6	497.2	4,495.1	Projection to Bit @ 11,794'

Checked By: _____ Approved By: _____ Date: _____