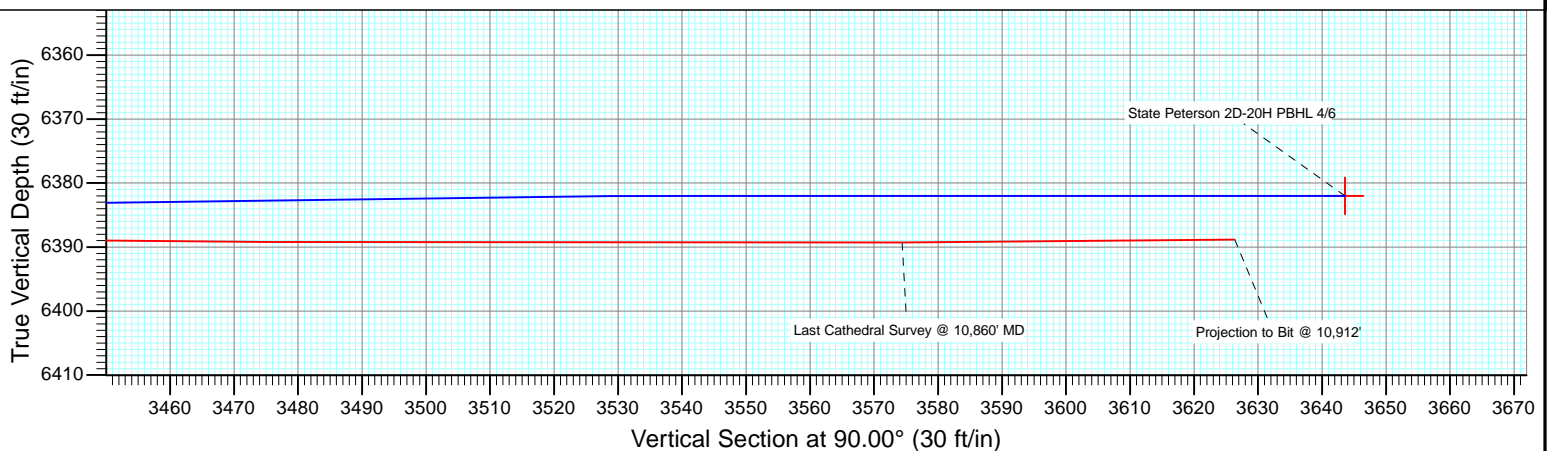
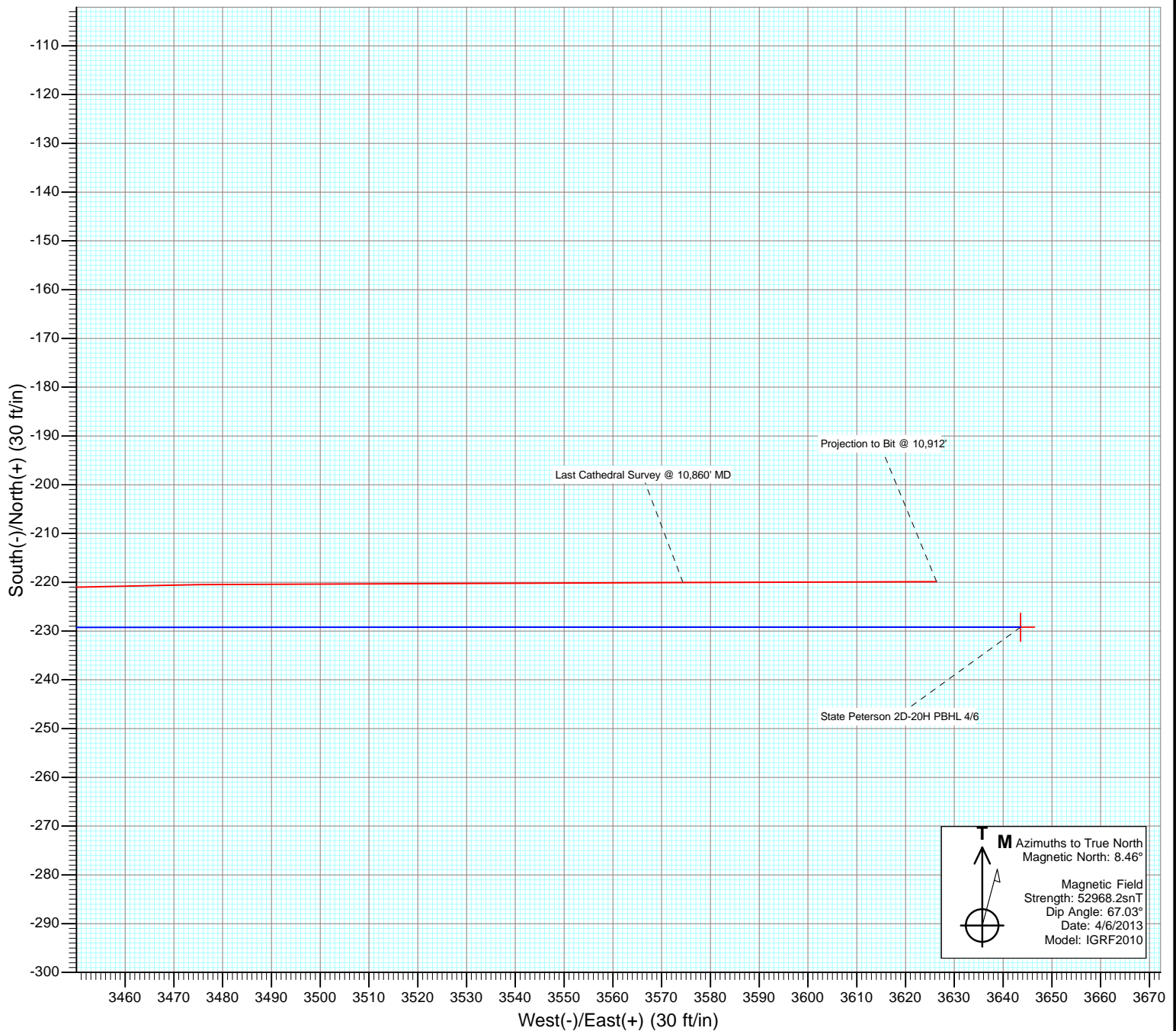




Project: DJ Wattenberg
Site: S20-T5N-R63W (State Peterson)
Wellbore: Hz
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State Peterson 2D-20H
Project:	DJ Wattenberg	TVD Reference:	Well @ 4592.0ft (Ensign 135)
Site:	S20-T5N-R63W (State Peterson)	MD Reference:	Well @ 4592.0ft (Ensign 135)
Well:	State Peterson 2D-20H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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		S20-T5N-R63W (State Peterson)			
Site Position:		Northing:	1,386,047.92 ft	Latitude:	40.388480
From:	Lat/Long	Easting:	3,288,215.31 ft	Longitude:	-104.465330
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.67 °

Well	State Peterson 2D-20H					
Well Position	+N/-S	0.0 ft	Northing:	1,386,018.76 ft	Latitude:	40.388400
	+E/-W	0.0 ft	Easting:	3,288,215.66 ft	Longitude:	-104.465330
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,579.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/6/2013	8.46	67.03	52,968

Design	SURVEYS			
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	4/15/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
228.0	10,912.0	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	
228.0	0.50	121.80	228.0	-0.5	0.8	0.8	0.22	0.22	
320.0	0.50	110.90	320.0	-0.9	1.6	1.6	0.10	0.00	
412.0	0.40	112.10	412.0	-1.1	2.2	2.2	0.11	-0.11	
504.0	0.70	126.50	504.0	-1.6	3.0	3.0	0.36	0.33	
595.0	0.40	214.30	595.0	-2.2	3.3	3.3	0.87	-0.33	
687.0	1.50	255.20	687.0	-2.8	1.9	1.9	1.33	1.20	
779.0	2.50	262.10	778.9	-3.3	-1.2	-1.2	1.12	1.09	
871.0	3.40	266.80	870.8	-3.8	-6.0	-6.0	1.01	0.98	
941.0	4.40	262.60	940.6	-4.2	-10.7	-10.7	1.48	1.43	
1,006.0	4.70	263.80	1,005.4	-4.8	-15.8	-15.8	0.48	0.46	
1,098.0	6.40	248.80	1,097.0	-7.1	-24.3	-24.3	2.41	1.85	
1,190.0	8.30	252.30	1,188.2	-11.0	-35.4	-35.4	2.12	2.07	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State Peterson 2D-20H
Project:	DJ Wattenberg	TVD Reference:	Well @ 4592.0ft (Ensign 135)
Site:	S20-T5N-R63W (State Peterson)	MD Reference:	Well @ 4592.0ft (Ensign 135)
Well:	State Peterson 2D-20H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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
1,282.0	10.50	254.80	1,279.0	-15.2	-49.9	-49.9	2.43	2.39	
1,374.0	11.60	258.30	1,369.3	-19.3	-67.0	-67.0	1.40	1.20	
1,466.0	12.90	260.10	1,459.2	-22.9	-86.2	-86.2	1.47	1.41	
1,558.0	14.40	258.20	1,548.6	-27.0	-107.5	-107.5	1.70	1.63	
1,650.0	15.60	257.60	1,637.5	-32.0	-130.8	-130.8	1.32	1.30	
1,742.0	16.20	260.40	1,725.9	-36.8	-155.5	-155.5	1.06	0.65	
1,834.0	15.80	256.80	1,814.4	-41.8	-180.4	-180.4	1.16	-0.43	
1,926.0	15.60	254.20	1,902.9	-48.0	-204.5	-204.5	0.79	-0.22	
2,020.0	16.10	259.70	1,993.4	-53.8	-229.5	-229.5	1.68	0.53	
2,115.0	15.40	257.50	2,084.8	-58.9	-254.7	-254.7	0.97	-0.74	
2,210.0	14.40	256.00	2,176.6	-64.5	-278.5	-278.5	1.13	-1.05	
2,304.0	15.50	255.20	2,267.4	-70.5	-302.0	-302.0	1.19	1.17	
2,399.0	13.80	257.50	2,359.3	-76.2	-325.3	-325.3	1.89	-1.79	
2,494.0	14.80	255.60	2,451.4	-81.7	-348.1	-348.1	1.16	1.05	
2,588.0	13.40	261.30	2,542.6	-86.3	-370.5	-370.5	2.10	-1.49	
2,683.0	15.40	263.00	2,634.6	-89.5	-393.9	-393.9	2.15	2.11	
2,778.0	15.70	262.20	2,726.1	-92.8	-419.2	-419.2	0.39	0.32	
2,872.0	14.90	261.30	2,816.8	-96.4	-443.7	-443.7	0.89	-0.85	
2,967.0	14.20	260.60	2,908.7	-100.1	-467.3	-467.3	0.76	-0.74	
3,061.0	12.90	257.80	3,000.1	-104.2	-488.9	-488.9	1.55	-1.38	
3,156.0	12.70	257.90	3,092.7	-108.6	-509.5	-509.5	0.21	-0.21	
3,251.0	13.20	258.40	3,185.3	-113.0	-530.4	-530.4	0.54	0.53	
3,345.0	15.00	260.40	3,276.5	-117.2	-552.9	-552.9	1.98	1.91	
3,440.0	15.50	257.20	3,368.1	-122.1	-577.4	-577.4	1.03	0.53	
3,534.0	15.80	256.80	3,458.7	-127.8	-602.1	-602.1	0.34	0.32	
3,629.0	16.10	254.90	3,550.0	-134.2	-627.4	-627.4	0.63	0.32	
3,724.0	16.50	253.90	3,641.2	-141.3	-653.1	-653.1	0.51	0.42	
3,818.0	16.20	252.40	3,731.4	-149.0	-678.4	-678.4	0.55	-0.32	
3,913.0	16.50	252.70	3,822.5	-157.0	-703.9	-703.9	0.33	0.32	
4,008.0	15.40	253.80	3,913.9	-164.5	-728.9	-728.9	1.20	-1.16	
4,103.0	15.10	260.20	4,005.5	-170.2	-753.2	-753.2	1.80	-0.32	
4,198.0	14.80	259.10	4,097.3	-174.6	-777.3	-777.3	0.43	-0.32	
4,292.0	15.30	261.50	4,188.1	-178.7	-801.4	-801.4	0.85	0.53	
4,387.0	14.50	260.80	4,279.9	-182.4	-825.5	-825.5	0.86	-0.84	
4,482.0	13.80	258.90	4,372.0	-186.5	-848.4	-848.4	0.88	-0.74	
4,576.0	14.60	258.90	4,463.2	-190.9	-871.0	-871.0	0.85	0.85	
4,671.0	13.00	255.10	4,555.4	-196.0	-893.1	-893.1	1.93	-1.68	
4,766.0	12.70	261.50	4,648.0	-200.3	-913.7	-913.7	1.53	-0.32	
4,861.0	14.80	258.20	4,740.3	-204.3	-935.9	-935.9	2.36	2.21	
4,956.0	14.20	256.00	4,832.3	-209.6	-959.1	-959.1	0.86	-0.63	
5,051.0	12.60	255.00	4,924.7	-215.1	-980.4	-980.4	1.70	-1.68	
5,145.0	11.20	250.30	5,016.7	-220.8	-998.9	-998.9	1.81	-1.49	
5,240.0	9.10	248.20	5,110.2	-226.7	-1,014.6	-1,014.6	2.24	-2.21	
5,335.0	7.00	255.60	5,204.2	-231.0	-1,027.2	-1,027.2	2.46	-2.21	
5,430.0	4.70	247.80	5,298.7	-233.9	-1,036.4	-1,036.4	2.56	-2.42	
5,524.0	3.10	264.10	5,392.5	-235.6	-1,042.5	-1,042.5	2.05	-1.70	
5,619.0	0.90	161.30	5,487.5	-236.6	-1,044.8	-1,044.8	3.59	-2.32	
5,714.0	0.70	146.40	5,582.5	-237.8	-1,044.2	-1,044.2	0.30	-0.21	
5,808.0	0.80	132.50	5,676.5	-238.7	-1,043.4	-1,043.4	0.22	0.11	
5,840.0	0.80	145.10	5,708.5	-239.0	-1,043.1	-1,043.1	0.55	0.00	
5,871.0	0.70	133.40	5,739.5	-239.3	-1,042.9	-1,042.9	0.59	-0.32	
5,903.0	3.10	96.40	5,771.4	-239.6	-1,041.9	-1,041.9	8.05	7.50	
5,935.0	7.90	94.10	5,803.3	-239.8	-1,038.8	-1,038.8	15.01	15.00	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State Peterson 2D-20H
Project:	DJ Wattenberg	TVD Reference:	Well @ 4592.0ft (Ensign 135)
Site:	S20-T5N-R63W (State Peterson)	MD Reference:	Well @ 4592.0ft (Ensign 135)
Well:	State Peterson 2D-20H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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
5,966.0	11.90	92.20	5,833.8	-240.1	-1,033.5	-1,033.5	12.94	12.90	
5,998.0	14.30	90.30	5,865.0	-240.2	-1,026.3	-1,026.3	7.62	7.50	
6,030.0	16.50	88.10	5,895.8	-240.1	-1,017.8	-1,017.8	7.11	6.87	
6,061.0	19.70	87.80	5,925.3	-239.8	-1,008.1	-1,008.1	10.33	10.32	
6,093.0	22.90	89.70	5,955.1	-239.5	-996.5	-996.5	10.23	10.00	
6,124.0	25.80	90.70	5,983.4	-239.6	-983.7	-983.7	9.45	9.35	
6,156.0	28.10	91.10	6,011.9	-239.8	-969.2	-969.2	7.21	7.19	
6,188.0	29.40	92.00	6,039.9	-240.2	-953.9	-953.9	4.28	4.06	
6,219.0	31.40	93.30	6,066.7	-241.0	-938.2	-938.2	6.79	6.45	
6,251.0	34.50	95.00	6,093.5	-242.2	-920.8	-920.8	10.11	9.69	
6,283.0	37.90	94.30	6,119.3	-243.7	-902.0	-902.0	10.70	10.62	
6,314.0	39.50	93.50	6,143.5	-245.1	-882.7	-882.7	5.41	5.16	
6,346.0	41.00	91.50	6,168.0	-246.0	-862.0	-862.0	6.19	4.69	
6,377.0	43.10	90.50	6,191.0	-246.3	-841.2	-841.2	7.11	6.77	
6,409.0	45.30	91.70	6,213.9	-246.8	-818.9	-818.9	7.36	6.87	
6,441.0	47.90	92.60	6,235.9	-247.6	-795.7	-795.7	8.38	8.12	
6,472.0	50.60	92.30	6,256.1	-248.6	-772.3	-772.3	8.74	8.71	
6,504.0	53.20	91.80	6,275.9	-249.5	-747.1	-747.1	8.22	8.12	
6,535.0	55.40	90.70	6,294.0	-250.1	-721.9	-721.9	7.66	7.10	
6,567.0	56.10	89.70	6,312.0	-250.2	-695.5	-695.5	3.38	2.19	
6,599.0	57.30	89.70	6,329.5	-250.0	-668.7	-668.7	3.75	3.75	
6,630.0	60.40	89.80	6,345.6	-249.9	-642.2	-642.2	10.00	10.00	
6,662.0	65.30	90.20	6,360.2	-249.9	-613.7	-613.7	15.35	15.31	
6,693.0	69.80	89.80	6,372.0	-249.9	-585.1	-585.1	14.56	14.52	
6,725.0	72.70	89.10	6,382.3	-249.6	-554.8	-554.8	9.30	9.06	
6,757.0	75.30	88.40	6,391.1	-248.9	-524.1	-524.1	8.39	8.12	
6,788.0	77.40	88.50	6,398.4	-248.1	-493.9	-493.9	6.78	6.77	
6,820.0	79.00	88.90	6,405.0	-247.4	-462.6	-462.6	5.15	5.00	
6,851.0	80.50	89.00	6,410.5	-246.9	-432.1	-432.1	4.85	4.84	
6,883.0	81.00	88.90	6,415.6	-246.3	-400.6	-400.6	1.59	1.56	
6,915.0	81.10	89.20	6,420.6	-245.8	-368.9	-368.9	0.98	0.31	
6,946.0	83.40	89.40	6,424.8	-245.4	-338.2	-338.2	7.45	7.42	
6,969.0	86.30	89.60	6,426.8	-245.2	-315.3	-315.3	12.64	12.61	
7,067.0	88.70	88.80	6,431.1	-243.8	-217.4	-217.4	2.58	2.45	
7,161.0	89.60	89.10	6,432.5	-242.1	-123.5	-123.5	1.01	0.96	
7,256.0	90.50	89.10	6,432.4	-240.6	-28.5	-28.5	0.95	0.95	
7,350.0	91.00	88.80	6,431.2	-238.9	65.5	65.5	0.62	0.53	
7,445.0	91.70	88.30	6,429.0	-236.5	160.4	160.4	0.91	0.74	
7,540.0	91.90	89.10	6,426.0	-234.3	255.4	255.4	0.87	0.21	
7,635.0	91.10	89.10	6,423.5	-232.8	350.3	350.3	0.84	-0.84	
7,730.0	90.90	89.10	6,421.8	-231.3	445.3	445.3	0.21	-0.21	
7,824.0	91.40	90.70	6,419.9	-231.2	539.3	539.3	1.78	0.53	
7,919.0	92.20	90.30	6,417.0	-232.0	634.2	634.2	0.94	0.84	
8,014.0	91.00	90.00	6,414.3	-232.3	729.2	729.2	1.30	-1.26	
8,109.0	90.20	89.40	6,413.3	-231.8	824.2	824.2	1.05	-0.84	
8,204.0	91.30	90.50	6,412.1	-231.7	919.2	919.2	1.64	1.16	
8,298.0	90.40	89.30	6,410.7	-231.5	1,013.1	1,013.1	1.60	-0.96	
8,393.0	90.40	89.30	6,410.0	-230.3	1,108.1	1,108.1	0.00	0.00	
8,488.0	89.80	89.40	6,409.8	-229.3	1,203.1	1,203.1	0.64	-0.63	
8,582.0	90.40	90.30	6,409.7	-229.0	1,297.1	1,297.1	1.15	0.64	
8,677.0	90.90	89.90	6,408.6	-229.2	1,392.1	1,392.1	0.67	0.53	
8,772.0	91.40	91.00	6,406.7	-229.9	1,487.1	1,487.1	1.27	0.53	
8,866.0	92.10	90.50	6,403.8	-231.2	1,581.0	1,581.0	0.91	0.74	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State Peterson 2D-20H
Project:	DJ Wattenberg	TVD Reference:	Well @ 4592.0ft (Ensign 135)
Site:	S20-T5N-R63W (State Peterson)	MD Reference:	Well @ 4592.0ft (Ensign 135)
Well:	State Peterson 2D-20H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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
8,961.0	91.40	89.90	6,400.9	-231.5	1,676.0	1,676.0	0.97	-0.74	
9,056.0	91.20	89.50	6,398.8	-231.0	1,771.0	1,771.0	0.47	-0.21	
9,151.0	92.70	89.80	6,395.5	-230.4	1,865.9	1,865.9	1.61	1.58	
9,246.0	92.50	89.20	6,391.2	-229.6	1,960.8	1,960.8	0.67	-0.21	
9,341.0	91.20	89.10	6,388.2	-228.2	2,055.8	2,055.8	1.37	-1.37	
9,435.0	91.20	89.00	6,386.2	-226.6	2,149.7	2,149.7	0.11	0.00	
9,499.0	90.30	89.10	6,385.4	-225.6	2,213.7	2,213.7	1.41	-1.41	
9,562.0	89.40	90.00	6,385.5	-225.1	2,276.7	2,276.7	2.02	-1.43	
9,625.0	89.00	90.70	6,386.4	-225.5	2,339.7	2,339.7	1.28	-0.63	
9,720.0	88.80	91.20	6,388.2	-227.0	2,434.7	2,434.7	0.57	-0.21	
9,814.0	90.20	90.80	6,389.0	-228.7	2,528.6	2,528.6	1.55	1.49	
9,909.0	89.70	91.50	6,389.1	-230.6	2,623.6	2,623.6	0.91	-0.53	
10,004.0	90.10	91.60	6,389.3	-233.1	2,718.6	2,718.6	0.43	0.42	
10,098.0	90.80	90.30	6,388.6	-234.7	2,812.6	2,812.6	1.57	0.74	
10,193.0	90.20	89.30	6,387.7	-234.4	2,907.6	2,907.6	1.23	-0.63	
10,288.0	89.50	88.90	6,388.0	-232.9	3,002.5	3,002.5	0.85	-0.74	
10,382.0	89.50	88.70	6,388.8	-230.9	3,096.5	3,096.5	0.21	0.00	
10,477.0	90.70	88.50	6,388.6	-228.6	3,191.5	3,191.5	1.28	1.26	
10,572.0	89.90	87.90	6,388.1	-225.6	3,286.4	3,286.4	1.05	-0.84	
10,667.0	89.70	88.10	6,388.5	-222.3	3,381.4	3,381.4	0.30	-0.21	
10,761.0	89.40	89.70	6,389.2	-220.5	3,475.4	3,475.4	1.73	-0.32	
10,860.0	90.50	89.80	6,389.3	-220.1	3,574.4	3,574.4	1.12	1.11	Last Cathedral Survey @ 10,860' MD
10,912.0	90.50	89.80	6,388.8	-219.9	3,626.4	3,626.4	0.00	0.00	Projection to Bit @ 10,912' - State Peterson 2D-

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well State Peterson 2D-20H
Project:	DJ Wattenberg	TVD Reference:	Well @ 4592.0ft (Ensign 135)
Site:	S20-T5N-R63W (State Peterson)	MD Reference:	Well @ 4592.0ft (Ensign 135)
Well:	State Peterson 2D-20H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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									
Stat Peterson 2D-20H V	0.00	0.00	6,181.0	-229.2	-1,235.1	1,385,775.17	3,286,983.31	40.387771	-104.469764
- actual wellpath misses target center by 314.5ft at 6176.3ft MD (6029.7 TVD, -240.0 N, -959.5 E)									
- Point									
State Peterson 2D-20H I	0.00	0.00	6,448.0	-229.2	3,643.6	1,385,832.07	3,291,861.66	40.387770	-104.452250
- actual wellpath misses target center by 62.3ft at 10912.0ft MD (6388.8 TVD, -219.9 N, 3626.4 E)									
- Point									
State Peterson 2D-20H I	0.00	0.00	6,382.0	-229.2	3,643.6	1,385,832.07	3,291,861.66	40.387770	-104.452250
- actual wellpath misses target center by 20.8ft at 10912.0ft MD (6388.8 TVD, -219.9 N, 3626.4 E)									
- Point									
State Peterson 2D-20H I	0.00	0.00	7,181.0	-229.2	3,643.6	1,385,832.07	3,291,861.66	40.387770	-104.452250
- actual wellpath misses target center by 792.4ft at 10912.0ft MD (6388.8 TVD, -219.9 N, 3626.4 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)	Comment	
10,860.0	6,389.3	-220.1	3,574.4	Last Cathedral Survey @ 10,860' MD	
10,912.0	6,388.8	-219.9	3,626.4	Projection to Bit @ 10,912'	

Checked By: _____ Approved By: _____ Date: _____