



Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Billings 3D-18H
Project:	DJ Wattenberg	TVD Reference:	32' KB @ 5187.0ft (PATT 326)
Site:	S18-T3N-R68W (Billings)	MD Reference:	32' KB @ 5187.0ft (PATT 326)
Well:	Billings 3D-18H	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	S18-T3N-R68W (Billings)				
Site Position:		Northing:	1,326,724.18 ft	Latitude:	40.229390
From:	Lat/Long	Easting:	3,124,452.97 ft	Longitude:	-105.054290
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.29 °

Well	Billings 3D-18H					
Well Position	+N/-S	0.0 ft	Northing:	1,324,272.14 ft	Latitude:	40.222649
	+E/-W	0.0 ft	Easting:	3,125,177.09 ft	Longitude:	-105.051741
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,155.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/9/2013	8.79	66.81	52,839

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	11/25/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
192.0	14,175.0	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	
192.0	1.60	284.20	192.0	0.7	-2.6	-2.6	0.83	0.83	
240.0	2.20	279.50	239.9	1.0	-4.2	-4.2	1.29	1.25	
334.0	3.10	272.80	333.8	1.4	-8.5	-8.5	1.01	0.96	
429.0	4.00	264.60	428.7	1.2	-14.3	-14.3	1.09	0.95	
524.0	5.70	266.40	523.3	0.6	-22.3	-22.3	1.80	1.79	
619.0	7.40	266.30	617.7	-0.1	-33.2	-33.2	1.79	1.79	
714.0	9.20	265.60	711.7	-1.1	-46.8	-46.8	1.90	1.89	
808.0	9.60	265.50	804.4	-2.3	-62.1	-62.1	0.43	0.43	
840.0	9.70	265.70	836.0	-2.7	-67.5	-67.5	0.33	0.31	
905.0	9.80	263.90	900.0	-3.7	-78.5	-78.5	0.49	0.15	
1,000.0	9.60	262.40	993.7	-5.6	-94.3	-94.3	0.34	-0.21	
1,091.0	9.50	261.10	1,083.4	-7.7	-109.3	-109.3	0.26	-0.11	

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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
1,183.0	8.70	268.40	1,174.3	-9.1	-123.7	-123.7	1.53	-0.87	
1,275.0	8.80	271.20	1,265.2	-9.2	-137.7	-137.7	0.48	0.11	
1,367.0	8.50	270.70	1,356.2	-8.9	-151.6	-151.6	0.34	-0.33	
1,459.0	8.40	267.40	1,447.2	-9.1	-165.1	-165.1	0.54	-0.11	
1,551.0	8.40	267.60	1,538.2	-9.7	-178.5	-178.5	0.03	0.00	
1,642.0	10.00	270.80	1,628.0	-9.9	-193.1	-193.1	1.85	1.76	
1,734.0	10.20	266.60	1,718.6	-10.3	-209.2	-209.2	0.83	0.22	
1,826.0	10.30	264.20	1,809.1	-11.6	-225.5	-225.5	0.48	0.11	
1,918.0	10.00	254.30	1,899.7	-14.6	-241.4	-241.4	1.92	-0.33	
2,010.0	9.20	252.70	1,990.4	-18.9	-256.1	-256.1	0.92	-0.87	
2,102.0	9.20	252.10	2,081.2	-23.4	-270.1	-270.1	0.10	0.00	
2,194.0	8.70	262.10	2,172.1	-26.6	-284.0	-284.0	1.77	-0.54	
2,287.0	8.70	259.40	2,264.0	-28.9	-297.9	-297.9	0.44	0.00	
2,379.0	8.90	271.60	2,354.9	-29.9	-311.8	-311.8	2.04	0.22	
2,474.0	8.90	271.40	2,448.8	-29.6	-326.5	-326.5	0.03	0.00	
2,568.0	8.80	270.70	2,541.7	-29.3	-341.0	-341.0	0.16	-0.11	
2,663.0	8.40	270.20	2,635.6	-29.2	-355.2	-355.2	0.43	-0.42	
2,758.0	8.10	268.90	2,729.6	-29.3	-368.8	-368.8	0.37	-0.32	
2,852.0	9.20	270.90	2,822.6	-29.3	-382.9	-382.9	1.21	1.17	
2,947.0	8.90	268.90	2,916.4	-29.3	-397.9	-397.9	0.46	-0.32	
3,041.0	8.10	269.20	3,009.3	-29.5	-411.8	-411.8	0.85	-0.85	
3,136.0	9.50	266.90	3,103.2	-30.1	-426.3	-426.3	1.52	1.47	
3,230.0	8.90	263.60	3,196.0	-31.3	-441.3	-441.3	0.85	-0.64	
3,325.0	8.50	262.10	3,289.9	-33.1	-455.5	-455.5	0.48	-0.42	
3,419.0	9.90	266.40	3,382.7	-34.5	-470.5	-470.5	1.66	1.49	
3,514.0	10.40	266.20	3,476.2	-35.6	-487.2	-487.2	0.53	0.53	
3,608.0	10.40	266.40	3,568.7	-36.7	-504.1	-504.1	0.04	0.00	
3,703.0	9.80	266.90	3,662.2	-37.7	-520.7	-520.7	0.64	-0.63	
3,797.0	9.30	264.70	3,754.9	-38.8	-536.3	-536.3	0.66	-0.53	
3,892.0	8.70	263.40	3,848.7	-40.4	-551.1	-551.1	0.67	-0.63	
3,986.0	8.30	262.40	3,941.7	-42.1	-564.9	-564.9	0.45	-0.43	
4,081.0	8.10	261.90	4,035.7	-43.9	-578.3	-578.3	0.22	-0.21	
4,175.0	9.30	264.60	4,128.6	-45.6	-592.4	-592.4	1.35	1.28	
4,270.0	8.90	264.80	4,222.4	-47.0	-607.4	-607.4	0.42	-0.42	
4,364.0	8.40	264.90	4,315.4	-48.2	-621.4	-621.4	0.53	-0.53	
4,459.0	9.70	266.90	4,409.2	-49.3	-636.3	-636.3	1.41	1.37	
4,553.0	9.90	267.10	4,501.8	-50.1	-652.3	-652.3	0.22	0.21	
4,648.0	9.30	266.40	4,595.5	-51.0	-668.1	-668.1	0.64	-0.63	
4,742.0	8.40	264.90	4,688.4	-52.1	-682.6	-682.6	0.99	-0.96	
4,837.0	7.60	263.60	4,782.4	-53.4	-695.7	-695.7	0.86	-0.84	
4,931.0	9.30	264.20	4,875.4	-54.9	-709.4	-709.4	1.81	1.81	
5,026.0	10.30	267.60	4,969.0	-56.0	-725.6	-725.6	1.22	1.05	
5,121.0	9.50	267.10	5,062.6	-56.8	-741.9	-741.9	0.85	-0.84	
5,215.0	8.50	266.40	5,155.5	-57.6	-756.6	-756.6	1.07	-1.06	
5,310.0	9.50	267.90	5,249.3	-58.3	-771.4	-771.4	1.08	1.05	
5,404.0	9.00	264.90	5,342.1	-59.3	-786.5	-786.5	0.74	-0.53	
5,499.0	9.80	264.20	5,435.8	-60.7	-801.9	-801.9	0.85	0.84	
5,593.0	8.90	261.90	5,528.5	-62.6	-817.1	-817.1	1.04	-0.96	
5,688.0	10.80	265.60	5,622.1	-64.3	-833.2	-833.2	2.11	2.00	
5,783.0	9.40	262.90	5,715.7	-65.9	-849.8	-849.8	1.56	-1.47	
5,878.0	7.90	259.40	5,809.6	-68.1	-863.9	-863.9	1.67	-1.58	
5,972.0	6.80	256.60	5,902.8	-70.6	-875.7	-875.7	1.23	-1.17	
6,019.0	6.40	254.90	5,949.5	-71.9	-880.9	-880.9	0.95	-0.85	

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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
6,067.0	5.80	255.00	5,997.2	-73.2	-885.9	-885.9	1.25	-1.25	
6,114.0	4.60	263.60	6,044.0	-74.0	-890.0	-890.0	3.04	-2.55	
6,161.0	3.40	278.90	6,090.9	-74.0	-893.3	-893.3	3.40	-2.55	
6,208.0	2.20	301.40	6,137.9	-73.3	-895.4	-895.4	3.42	-2.55	
6,256.0	0.80	47.50	6,185.8	-72.6	-896.0	-896.0	5.29	-2.92	
6,303.0	3.10	80.30	6,232.8	-72.2	-894.5	-894.5	5.25	4.89	
6,350.0	5.50	88.80	6,279.7	-71.9	-891.0	-891.0	5.27	5.11	
6,397.0	8.00	88.10	6,326.4	-71.8	-885.4	-885.4	5.32	5.32	
6,445.0	10.30	88.60	6,373.7	-71.6	-877.8	-877.8	4.79	4.79	
6,492.0	11.90	87.00	6,419.9	-71.2	-868.8	-868.8	3.47	3.40	
6,540.0	14.60	85.10	6,466.6	-70.4	-857.8	-857.8	5.70	5.62	
6,587.0	16.30	87.10	6,511.9	-69.6	-845.3	-845.3	3.79	3.62	
6,634.0	18.50	90.20	6,556.7	-69.3	-831.3	-831.3	5.08	4.68	
6,681.0	20.70	90.00	6,601.0	-69.3	-815.5	-815.5	4.68	4.68	
6,729.0	23.40	87.50	6,645.5	-68.9	-797.5	-797.5	5.95	5.62	
6,776.0	27.40	87.60	6,687.9	-68.0	-777.3	-777.3	8.51	8.51	
6,824.0	31.70	89.60	6,729.7	-67.5	-753.7	-753.7	9.19	8.96	
6,871.0	35.70	89.50	6,768.8	-67.3	-727.6	-727.6	8.51	8.51	
6,918.0	38.50	89.60	6,806.3	-67.1	-699.3	-699.3	5.96	5.96	
6,965.0	40.60	90.00	6,842.5	-67.0	-669.3	-669.3	4.50	4.47	
7,013.0	43.60	89.10	6,878.1	-66.7	-637.2	-637.2	6.38	6.25	
7,060.0	46.80	89.50	6,911.2	-66.3	-603.8	-603.8	6.84	6.81	
7,107.0	48.40	89.80	6,942.9	-66.1	-569.1	-569.1	3.44	3.40	
7,154.0	51.80	90.80	6,973.1	-66.3	-533.1	-533.1	7.42	7.23	
7,202.0	54.90	90.60	7,001.7	-66.7	-494.6	-494.6	6.47	6.46	
7,249.0	57.00	90.00	7,028.0	-67.0	-455.6	-455.6	4.59	4.47	
7,296.0	59.70	90.30	7,052.7	-67.1	-415.6	-415.6	5.77	5.74	
7,343.0	62.50	90.50	7,075.4	-67.3	-374.5	-374.5	5.97	5.96	
7,391.0	64.30	90.60	7,096.9	-67.8	-331.6	-331.6	3.75	3.75	
7,438.0	66.70	90.60	7,116.4	-68.2	-288.8	-288.8	5.11	5.11	
7,485.0	69.30	90.20	7,134.0	-68.5	-245.2	-245.2	5.59	5.53	
7,532.0	73.90	89.00	7,148.8	-68.2	-200.7	-200.7	10.08	9.79	
7,580.0	78.60	88.80	7,160.2	-67.3	-154.0	-154.0	9.80	9.79	
7,610.0	81.80	88.80	7,165.3	-66.7	-124.5	-124.5	10.67	10.67	
7,651.0	85.80	88.40	7,169.7	-65.7	-83.8	-83.8	9.80	9.76	
7,743.0	90.60	90.50	7,172.6	-64.8	8.2	8.2	5.69	5.22	
7,834.0	90.50	89.90	7,171.8	-65.1	99.2	99.2	0.67	-0.11	
7,926.0	90.80	91.50	7,170.7	-66.2	191.1	191.1	1.77	0.33	
8,018.0	91.30	91.10	7,169.0	-68.3	283.1	283.1	0.70	0.54	
8,110.0	91.50	91.30	7,166.8	-70.3	375.1	375.1	0.31	0.22	
8,202.0	90.30	90.90	7,165.3	-72.0	467.0	467.0	1.37	-1.30	
8,294.0	90.50	90.60	7,164.7	-73.2	559.0	559.0	0.39	0.22	
8,386.0	90.40	90.40	7,164.0	-74.0	651.0	651.0	0.24	-0.11	
8,479.0	89.10	89.40	7,164.4	-73.9	744.0	744.0	1.76	-1.40	
8,571.0	87.90	88.60	7,166.8	-72.3	836.0	836.0	1.57	-1.30	
8,666.0	87.90	90.20	7,170.3	-71.3	930.9	930.9	1.68	0.00	
8,760.0	90.90	89.80	7,171.3	-71.3	1,024.9	1,024.9	3.22	3.19	
8,855.0	90.70	89.20	7,169.9	-70.4	1,119.9	1,119.9	0.67	-0.21	
8,949.0	87.10	87.20	7,171.7	-67.5	1,213.8	1,213.8	4.38	-3.83	
9,044.0	88.40	88.70	7,175.5	-64.1	1,308.6	1,308.6	2.09	1.37	
9,138.0	89.00	90.60	7,177.6	-63.5	1,402.6	1,402.6	2.12	0.64	
9,233.0	88.90	90.90	7,179.3	-64.8	1,497.6	1,497.6	0.33	-0.11	
9,328.0	89.30	90.80	7,180.8	-66.2	1,592.6	1,592.6	0.43	0.42	

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Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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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
9,422.0	89.70	90.60	7,181.6	-67.3	1,686.5	1,686.5	0.48	0.43	
9,517.0	87.90	89.40	7,183.6	-67.3	1,781.5	1,781.5	2.28	-1.89	
9,611.0	88.10	89.10	7,186.9	-66.1	1,875.5	1,875.5	0.38	0.21	
9,706.0	88.70	88.70	7,189.6	-64.3	1,970.4	1,970.4	0.76	0.63	
9,800.0	87.90	90.90	7,192.4	-63.9	2,064.3	2,064.3	2.49	-0.85	
9,895.0	87.60	90.30	7,196.1	-64.9	2,159.3	2,159.3	0.71	-0.32	
9,989.0	88.00	91.40	7,199.7	-66.3	2,253.2	2,253.2	1.24	0.43	
10,084.0	88.40	91.90	7,202.7	-69.1	2,348.1	2,348.1	0.67	0.42	
10,178.0	88.10	89.90	7,205.6	-70.5	2,442.0	2,442.0	2.15	-0.32	
10,273.0	90.80	90.00	7,206.5	-70.5	2,537.0	2,537.0	2.84	2.84	
10,367.0	91.20	90.10	7,204.8	-70.5	2,631.0	2,631.0	0.44	0.43	
10,462.0	89.80	90.60	7,204.0	-71.1	2,726.0	2,726.0	1.56	-1.47	
10,556.0	90.30	90.40	7,203.9	-71.9	2,820.0	2,820.0	0.57	0.53	
10,651.0	89.20	89.90	7,204.3	-72.2	2,915.0	2,915.0	1.27	-1.16	
10,745.0	89.70	89.60	7,205.2	-71.8	3,009.0	3,009.0	0.62	0.53	
10,840.0	89.20	88.50	7,206.1	-70.2	3,104.0	3,104.0	1.27	-0.53	
10,934.0	87.80	88.10	7,208.6	-67.4	3,197.9	3,197.9	1.55	-1.49	
11,029.0	88.80	88.60	7,211.4	-64.7	3,292.8	3,292.8	1.18	1.05	
11,123.0	89.70	89.30	7,212.7	-63.0	3,386.8	3,386.8	1.21	0.96	
11,218.0	88.50	89.80	7,214.1	-62.2	3,481.8	3,481.8	1.37	-1.26	
11,312.0	88.60	88.50	7,216.5	-60.8	3,575.7	3,575.7	1.39	0.11	
11,407.0	87.90	89.10	7,219.4	-58.8	3,670.7	3,670.7	0.97	-0.74	
11,501.0	86.90	90.40	7,223.7	-58.4	3,764.6	3,764.6	1.74	-1.06	
11,596.0	87.90	91.30	7,228.0	-59.8	3,859.5	3,859.5	1.42	1.05	
11,690.0	88.40	91.20	7,231.0	-61.9	3,953.4	3,953.4	0.54	0.53	
11,785.0	87.30	91.20	7,234.6	-63.9	4,048.3	4,048.3	1.16	-1.16	
11,879.0	88.10	91.00	7,238.4	-65.7	4,142.2	4,142.2	0.88	0.85	
11,974.0	86.10	90.90	7,243.2	-67.2	4,237.1	4,237.1	2.11	-2.11	
12,068.0	87.10	90.60	7,248.8	-68.5	4,330.9	4,330.9	1.11	1.06	
12,163.0	86.40	90.60	7,254.1	-69.5	4,425.7	4,425.7	0.74	-0.74	
12,257.0	87.30	91.00	7,259.3	-70.8	4,519.6	4,519.6	1.05	0.96	
12,352.0	86.00	90.60	7,264.9	-72.1	4,614.4	4,614.4	1.43	-1.37	
12,446.0	86.90	89.90	7,270.7	-72.5	4,708.2	4,708.2	1.21	0.96	
12,541.0	87.50	90.10	7,275.3	-72.5	4,803.1	4,803.1	0.67	0.63	
12,635.0	88.60	89.20	7,278.5	-71.9	4,897.0	4,897.0	1.51	1.17	
12,730.0	88.50	88.90	7,280.9	-70.4	4,992.0	4,992.0	0.33	-0.11	
12,825.0	87.60	88.70	7,284.1	-68.4	5,086.9	5,086.9	0.97	-0.95	
12,919.0	88.60	91.30	7,287.3	-68.4	5,180.9	5,180.9	2.96	1.06	
13,014.0	88.70	90.70	7,289.5	-70.0	5,275.8	5,275.8	0.64	0.11	
13,108.0	88.10	90.70	7,292.1	-71.2	5,369.8	5,369.8	0.64	-0.64	
13,202.0	88.50	89.00	7,294.9	-70.9	5,463.7	5,463.7	1.86	0.43	
13,297.0	89.30	89.00	7,296.7	-69.3	5,558.7	5,558.7	0.84	0.84	
13,391.0	89.30	89.80	7,297.9	-68.3	5,652.7	5,652.7	0.85	0.00	
13,486.0	89.40	89.90	7,299.0	-68.0	5,747.7	5,747.7	0.15	0.11	
13,580.0	89.50	90.60	7,299.9	-68.4	5,841.7	5,841.7	0.75	0.11	
13,675.0	89.10	90.50	7,301.0	-69.4	5,936.7	5,936.7	0.43	-0.42	
13,769.0	88.70	91.00	7,302.8	-70.6	6,030.6	6,030.6	0.68	-0.43	
13,864.0	90.00	90.30	7,303.9	-71.7	6,125.6	6,125.6	1.55	1.37	
13,958.0	89.20	90.00	7,304.6	-71.9	6,219.6	6,219.6	0.91	-0.85	
14,053.0	90.10	89.20	7,305.1	-71.2	6,314.6	6,314.6	1.27	0.95	
14,125.0	89.50	88.70	7,305.4	-69.9	6,386.6	6,386.6	1.08	-0.83	Last CES Survey @ 14,125' MD
14,175.0	89.50	88.70	7,305.8	-68.8	6,436.6	6,436.6	0.00	0.00	PTB @ 14,175'

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Billings 3D-18H
Project:	DJ Wattenberg	TVD Reference:	32' KB @ 5187.0ft (PATT 326)
Site:	S18-T3N-R68W (Billings)	MD Reference:	32' KB @ 5187.0ft (PATT 326)
Well:	Billings 3D-18H	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)		
11200 MD Tgt	0.00	0.00	7,210.0	-73.3	3,412.9	1,324,216.06	3,128,590.31	40.222447	-105.039519
- survey misses target center by 11.0ft at 11149.0ft MD (7212.9 TVD, -62.7 N, 3412.8 E)									
- Point									
Billings 3D-18H PBHL 4	0.00	0.00	7,316.0	-73.5	6,485.6	1,324,231.42	3,131,662.98	40.222445	-105.028515
- survey misses target center by 50.3ft at 14175.0ft MD (7305.8 TVD, -68.8 N, 6436.6 E)									
- Point									
8800 MD Tgt	0.00	0.00	7,165.0	-73.2	1,013.3	1,324,204.03	3,126,190.70	40.222448	-105.048112
- survey misses target center by 6.7ft at 8748.3ft MD (7171.4 TVD, -71.3 N, 1013.2 E)									
- Point									
13100 MD Tgt	0.00	0.00	7,304.0	-73.4	5,312.6	1,324,225.59	3,130,489.99	40.222446	-105.032716
- survey misses target center by 13.9ft at 13051.2ft MD (7290.4 TVD, -70.5 N, 5313.0 E)									
- Point									
Interp @ 7359.0 (Billings)	0.00	0.00	7,359.0	-73.5	6,485.6	1,324,231.47	3,131,663.01	40.222445	-105.028515
- survey misses target center by 72.5ft at 14175.0ft MD (7305.8 TVD, -68.8 N, 6436.6 E)									
- Point									
10600 MD Tgt	0.00	0.00	7,210.0	-73.3	2,813.0	1,324,213.05	3,127,990.40	40.222447	-105.041667
- survey misses target center by 6.2ft at 10549.0ft MD (7203.9 TVD, -71.9 N, 2813.0 E)									
- Point									
7715 MD Tgt	0.00	0.00	7,165.0	-73.2	-71.6	1,324,198.59	3,125,105.88	40.222448	-105.051997
- survey misses target center by 9.6ft at 7663.0ft MD (7170.6 TVD, -65.4 N, -71.8 E)									
- Point									
Billings 3D-18H PBHL 2	0.00	0.00	7,359.0	-73.5	6,485.6	1,324,231.47	3,131,663.01	40.222445	-105.028515
- survey misses target center by 72.5ft at 14175.0ft MD (7305.8 TVD, -68.8 N, 6436.6 E)									
- Point									
Billings 3D-18H PBHL	0.00	0.00	7,359.0	-75.3	6,487.0	1,324,229.66	3,131,664.42	40.222440	-105.028510
- survey misses target center by 73.6ft at 14175.0ft MD (7305.8 TVD, -68.8 N, 6436.6 E)									
- Point									
Interp @ 6914.2 (Billings)	0.00	0.00	6,914.2	-69.8	-564.7	1,324,199.46	3,124,612.70	40.222457	-105.053763
- survey misses target center by 24.5ft at 7090.9ft MD (6932.2 TVD, -66.1 N, -581.1 E)									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
14,125.0	7,305.4	-69.9	6,386.6	Last CES Survey @ 14,125' MD
14,175.0	7,305.8	-68.8	6,436.6	PTB @ 14,175'

Checked By: _____	Approved By: _____	Date: _____
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EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S18-T3N-R68W (Billings)

Billings 3D-18H

Hz

Survey: Survey #1

Survey Report - Geographic

25 November, 2014

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Billings 3D-18H
Project:	DJ Wattenberg	TVD Reference:	32' KB @ 5187.0ft (PATT 326)
Site:	S18-T3N-R68W (Billings)	MD Reference:	32' KB @ 5187.0ft (PATT 326)
Well:	Billings 3D-18H	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	S18-T3N-R68W (Billings)				
Site Position:		Northing:	1,326,724.18 ft	Latitude:	40.229390
From:	Lat/Long	Easting:	3,124,452.97 ft	Longitude:	-105.054290
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.29 °

Well	Billings 3D-18H					
Well Position	+N-S	0.0 ft	Northing:	1,324,272.14 ft	Latitude:	40.222649
	+E-W	0.0 ft	Easting:	3,125,177.09 ft	Longitude:	-105.051741
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,155.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/9/2013	8.79	66.81	52,839

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	90.00	

Survey Program	Date	11/25/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
192.0	14,175.0	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	1,324,272.14	3,125,177.09	40.222649	-105.051741	
192.0	1.60	284.20	192.0	0.7	-2.6	1,324,272.78	3,125,174.48	40.222651	-105.051751	
240.0	2.20	279.50	239.9	1.0	-4.2	1,324,273.09	3,125,172.92	40.222652	-105.051756	
334.0	3.10	272.80	333.8	1.4	-8.5	1,324,273.49	3,125,168.60	40.222653	-105.051772	
429.0	4.00	264.60	428.7	1.2	-14.3	1,324,273.27	3,125,162.74	40.222652	-105.051793	
524.0	5.70	266.40	523.3	0.6	-22.3	1,324,272.62	3,125,154.74	40.222651	-105.051821	
619.0	7.40	266.30	617.7	-0.1	-33.2	1,324,271.88	3,125,143.93	40.222649	-105.051860	
714.0	9.20	265.60	711.7	-1.1	-46.8	1,324,270.83	3,125,130.25	40.222646	-105.051909	
808.0	9.60	265.50	804.4	-2.3	-62.1	1,324,269.56	3,125,114.95	40.222643	-105.051964	
840.0	9.70	265.70	836.0	-2.7	-67.5	1,324,269.12	3,125,109.61	40.222642	-105.051983	
905.0	9.80	263.90	900.0	-3.7	-78.5	1,324,268.07	3,125,098.65	40.222639	-105.052022	
1,000.0	9.60	262.40	993.7	-5.6	-94.3	1,324,266.08	3,125,082.77	40.222634	-105.052079	

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Billings 3D-18H
Project:	DJ Wattenberg	TVD Reference:	32' KB @ 5187.0ft (PATT 326)
Site:	S18-T3N-R68W (Billings)	MD Reference:	32' KB @ 5187.0ft (PATT 326)
Well:	Billings 3D-18H	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
1,091.0	9.50	261.10	1,083.4	-7.7	-109.3	1,324,263.84	3,125,067.84	40.222628	-105.052133
1,183.0	8.70	268.40	1,174.3	-9.1	-123.7	1,324,262.40	3,125,053.39	40.222624	-105.052184
1,275.0	8.80	271.20	1,265.2	-9.2	-137.7	1,324,262.28	3,125,039.40	40.222624	-105.052235
1,367.0	8.50	270.70	1,356.2	-8.9	-151.6	1,324,262.44	3,125,025.56	40.222625	-105.052284
1,459.0	8.40	267.40	1,447.2	-9.1	-165.1	1,324,262.15	3,125,012.05	40.222624	-105.052332
1,551.0	8.40	267.60	1,538.2	-9.7	-178.5	1,324,261.50	3,124,998.63	40.222622	-105.052381
1,642.0	10.00	270.80	1,628.0	-9.9	-193.1	1,324,261.26	3,124,984.09	40.222622	-105.052433
1,734.0	10.20	266.60	1,718.6	-10.3	-209.2	1,324,260.81	3,124,967.97	40.222621	-105.052490
1,826.0	10.30	264.20	1,809.1	-11.6	-225.5	1,324,259.41	3,124,951.66	40.222617	-105.052549
1,918.0	10.00	254.30	1,899.7	-14.6	-241.4	1,324,256.34	3,124,935.81	40.222609	-105.052606
2,010.0	9.20	252.70	1,990.4	-18.9	-256.1	1,324,251.91	3,124,921.12	40.222597	-105.052658
2,102.0	9.20	252.10	2,081.2	-23.4	-270.1	1,324,247.39	3,124,907.12	40.222585	-105.052708
2,194.0	8.70	262.10	2,172.1	-26.6	-284.0	1,324,244.11	3,124,893.24	40.222576	-105.052758
2,287.0	8.70	259.40	2,264.0	-28.9	-297.9	1,324,241.78	3,124,879.37	40.222570	-105.052808
2,379.0	8.90	271.60	2,354.9	-29.9	-311.8	1,324,240.62	3,124,865.43	40.222567	-105.052858
2,474.0	8.90	271.40	2,448.8	-29.6	-326.5	1,324,240.93	3,124,850.73	40.222568	-105.052911
2,568.0	8.80	270.70	2,541.7	-29.3	-341.0	1,324,241.13	3,124,836.27	40.222569	-105.052962
2,663.0	8.40	270.20	2,635.6	-29.2	-355.2	1,324,241.17	3,124,822.07	40.222569	-105.053013
2,758.0	8.10	268.90	2,729.6	-29.3	-368.8	1,324,241.00	3,124,808.44	40.222569	-105.053062
2,852.0	9.20	270.90	2,822.6	-29.3	-382.9	1,324,240.91	3,124,794.30	40.222569	-105.053113
2,947.0	8.90	268.90	2,916.4	-29.3	-397.9	1,324,240.82	3,124,779.36	40.222569	-105.053166
3,041.0	8.10	269.20	3,009.3	-29.5	-411.8	1,324,240.52	3,124,765.47	40.222568	-105.053216
3,136.0	9.50	266.90	3,103.2	-30.1	-426.3	1,324,239.92	3,124,750.95	40.222567	-105.053268
3,230.0	8.90	263.60	3,196.0	-31.3	-441.3	1,324,238.62	3,124,735.99	40.222563	-105.053322
3,325.0	8.50	262.10	3,289.9	-33.1	-455.5	1,324,236.76	3,124,721.74	40.222558	-105.053373
3,419.0	9.90	266.40	3,382.7	-34.5	-470.5	1,324,235.22	3,124,706.80	40.222554	-105.053426
3,514.0	10.40	266.20	3,476.2	-35.6	-487.2	1,324,234.06	3,124,690.10	40.222551	-105.053486
3,608.0	10.40	266.40	3,568.7	-36.7	-504.1	1,324,232.88	3,124,673.17	40.222548	-105.053547
3,703.0	9.80	266.90	3,662.2	-37.7	-520.7	1,324,231.82	3,124,656.54	40.222546	-105.053606
3,797.0	9.30	264.70	3,754.9	-38.8	-536.3	1,324,230.61	3,124,641.00	40.222542	-105.053662
3,892.0	8.70	263.40	3,848.7	-40.4	-551.1	1,324,229.00	3,124,626.23	40.222538	-105.053715
3,986.0	8.30	262.40	3,941.7	-42.1	-564.9	1,324,227.21	3,124,612.45	40.222534	-105.053764
4,081.0	8.10	261.90	4,035.7	-43.9	-578.3	1,324,225.29	3,124,599.03	40.222528	-105.053812
4,175.0	9.30	264.60	4,128.6	-45.6	-592.4	1,324,223.58	3,124,584.92	40.222524	-105.053863
4,270.0	8.90	264.80	4,222.4	-47.0	-607.4	1,324,222.11	3,124,569.97	40.222520	-105.053916
4,364.0	8.40	264.90	4,315.4	-48.2	-621.4	1,324,220.77	3,124,555.90	40.222517	-105.053967
4,459.0	9.70	266.90	4,409.2	-49.3	-636.3	1,324,219.65	3,124,541.00	40.222514	-105.054020
4,553.0	9.90	267.10	4,501.8	-50.1	-652.3	1,324,218.73	3,124,525.03	40.222511	-105.054077
4,648.0	9.30	266.40	4,595.5	-51.0	-668.1	1,324,217.75	3,124,509.21	40.222509	-105.054134
4,742.0	8.40	264.90	4,688.4	-52.1	-682.6	1,324,216.59	3,124,494.80	40.222506	-105.054186
4,837.0	7.60	263.60	4,782.4	-53.4	-695.7	1,324,215.21	3,124,481.65	40.222502	-105.054233
4,931.0	9.30	264.20	4,875.4	-54.9	-709.4	1,324,213.68	3,124,467.92	40.222498	-105.054282
5,026.0	10.30	267.60	4,969.0	-56.0	-725.6	1,324,212.47	3,124,451.81	40.222495	-105.054340
5,121.0	9.50	267.10	5,062.6	-56.8	-741.9	1,324,211.63	3,124,435.50	40.222493	-105.054398
5,215.0	8.50	266.40	5,155.5	-57.6	-756.6	1,324,210.73	3,124,420.82	40.222491	-105.054451
5,310.0	9.50	267.90	5,249.3	-58.3	-771.4	1,324,209.93	3,124,405.98	40.222489	-105.054504
5,404.0	9.00	264.90	5,342.1	-59.3	-786.5	1,324,208.91	3,124,390.91	40.222486	-105.054558
5,499.0	9.80	264.20	5,435.8	-60.7	-801.9	1,324,207.36	3,124,375.47	40.222482	-105.054613
5,593.0	8.90	261.90	5,528.5	-62.6	-817.1	1,324,205.45	3,124,360.32	40.222477	-105.054667
5,688.0	10.80	265.60	5,622.1	-64.3	-833.2	1,324,203.65	3,124,344.18	40.222473	-105.054725
5,783.0	9.40	262.90	5,715.7	-65.9	-849.8	1,324,201.92	3,124,327.62	40.222468	-105.054785
5,878.0	7.90	259.40	5,809.6	-68.1	-863.9	1,324,199.69	3,124,313.51	40.222462	-105.054835
5,972.0	6.80	256.60	5,902.8	-70.6	-875.7	1,324,197.15	3,124,301.76	40.222455	-105.054877
6,019.0	6.40	254.90	5,949.5	-71.9	-880.9	1,324,195.80	3,124,296.53	40.222452	-105.054896
6,067.0	5.80	255.00	5,997.2	-73.2	-885.9	1,324,194.45	3,124,291.61	40.222448	-105.054914

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Billings 3D-18H
Project:	DJ Wattenberg	TVD Reference:	32' KB @ 5187.0ft (PATT 326)
Site:	S18-T3N-R68W (Billings)	MD Reference:	32' KB @ 5187.0ft (PATT 326)
Well:	Billings 3D-18H	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
6,114.0	4.60	263.60	6,044.0	-74.0	-890.0	1,324,193.60	3,124,287.45	40.222446	-105.054929
6,161.0	3.40	278.90	6,090.9	-74.0	-893.3	1,324,193.59	3,124,284.20	40.222446	-105.054940
6,208.0	2.20	301.40	6,137.9	-73.3	-895.4	1,324,194.27	3,124,282.05	40.222448	-105.054948
6,256.0	0.80	47.50	6,185.8	-72.6	-896.0	1,324,194.97	3,124,281.51	40.222450	-105.054950
6,303.0	3.10	80.30	6,232.8	-72.2	-894.5	1,324,195.41	3,124,283.00	40.222451	-105.054944
6,350.0	5.50	88.80	6,279.7	-71.9	-891.0	1,324,195.69	3,124,286.50	40.222452	-105.054932
6,397.0	8.00	88.10	6,326.4	-71.8	-885.4	1,324,195.88	3,124,292.02	40.222452	-105.054912
6,445.0	10.30	88.60	6,373.7	-71.6	-877.8	1,324,196.13	3,124,299.65	40.222453	-105.054885
6,492.0	11.90	87.00	6,419.9	-71.2	-868.8	1,324,196.53	3,124,308.69	40.222454	-105.054852
6,540.0	14.60	85.10	6,466.6	-70.4	-857.8	1,324,197.36	3,124,319.66	40.222456	-105.054813
6,587.0	16.30	87.10	6,511.9	-69.6	-845.3	1,324,198.27	3,124,332.14	40.222458	-105.054768
6,634.0	18.50	90.20	6,556.7	-69.3	-831.3	1,324,198.64	3,124,346.19	40.222459	-105.054718
6,681.0	20.70	90.00	6,601.0	-69.3	-815.5	1,324,198.70	3,124,361.95	40.222459	-105.054662
6,729.0	23.40	87.50	6,645.5	-68.9	-797.5	1,324,199.21	3,124,379.96	40.222460	-105.054597
6,776.0	27.40	87.60	6,687.9	-68.0	-777.3	1,324,200.17	3,124,400.09	40.222462	-105.054525
6,824.0	31.70	89.60	6,729.7	-67.5	-753.7	1,324,200.84	3,124,423.75	40.222464	-105.054440
6,871.0	35.70	89.50	6,768.8	-67.3	-727.6	1,324,201.18	3,124,449.82	40.222464	-105.054347
6,918.0	38.50	89.60	6,806.3	-67.1	-699.3	1,324,201.54	3,124,478.16	40.222465	-105.054245
6,965.0	40.60	90.00	6,842.5	-67.0	-669.3	1,324,201.79	3,124,508.09	40.222465	-105.054138
7,013.0	43.60	89.10	6,878.1	-66.7	-637.2	1,324,202.22	3,124,540.26	40.222466	-105.054023
7,060.0	46.80	89.50	6,911.2	-66.3	-603.8	1,324,202.79	3,124,573.60	40.222467	-105.053904
7,107.0	48.40	89.80	6,942.9	-66.1	-569.1	1,324,203.18	3,124,608.30	40.222468	-105.053779
7,154.0	51.80	90.80	6,973.1	-66.3	-533.1	1,324,203.16	3,124,644.36	40.222467	-105.053650
7,202.0	54.90	90.60	7,001.7	-66.7	-494.6	1,324,202.89	3,124,682.86	40.222466	-105.053512
7,249.0	57.00	90.00	7,028.0	-67.0	-455.6	1,324,202.88	3,124,721.80	40.222465	-105.053373
7,296.0	59.70	90.30	7,052.7	-67.1	-415.6	1,324,202.98	3,124,761.80	40.222465	-105.053230
7,343.0	62.50	90.50	7,075.4	-67.3	-374.5	1,324,202.90	3,124,802.95	40.222464	-105.053082
7,391.0	64.30	90.60	7,096.9	-67.8	-331.6	1,324,202.70	3,124,845.86	40.222463	-105.052929
7,438.0	66.70	90.60	7,116.4	-68.2	-288.8	1,324,202.47	3,124,888.63	40.222462	-105.052776
7,485.0	69.30	90.20	7,134.0	-68.5	-245.2	1,324,202.39	3,124,932.20	40.222461	-105.052619
7,532.0	73.90	89.00	7,148.8	-68.2	-200.7	1,324,202.93	3,124,976.78	40.222462	-105.052460
7,580.0	78.60	88.80	7,160.2	-67.3	-154.0	1,324,204.06	3,125,023.38	40.222464	-105.052293
7,610.0	81.80	88.80	7,165.3	-66.7	-124.5	1,324,204.83	3,125,052.93	40.222466	-105.052187
7,651.0	85.80	88.40	7,169.7	-65.7	-83.8	1,324,206.03	3,125,093.66	40.222469	-105.052041
7,743.0	90.60	90.50	7,172.6	-64.8	8.2	1,324,207.38	3,125,185.58	40.222471	-105.051712
7,834.0	90.50	89.90	7,171.8	-65.1	99.2	1,324,207.52	3,125,276.57	40.222470	-105.051386
7,926.0	90.80	91.50	7,170.7	-66.2	191.1	1,324,206.86	3,125,368.56	40.222467	-105.051057
8,018.0	91.30	91.10	7,169.0	-68.3	283.1	1,324,205.24	3,125,460.53	40.222461	-105.050727
8,110.0	91.50	91.30	7,166.8	-70.3	375.1	1,324,203.78	3,125,552.49	40.222456	-105.050398
8,202.0	90.30	90.90	7,165.3	-72.0	467.0	1,324,202.48	3,125,644.47	40.222451	-105.050069
8,294.0	90.50	90.60	7,164.7	-73.2	559.0	1,324,201.74	3,125,736.46	40.222448	-105.049739
8,386.0	90.40	90.40	7,164.0	-74.0	651.0	1,324,201.40	3,125,828.46	40.222446	-105.049410
8,479.0	89.10	89.40	7,164.4	-73.9	744.0	1,324,202.03	3,125,921.45	40.222446	-105.049077
8,571.0	87.90	88.60	7,166.8	-72.3	836.0	1,324,204.10	3,126,013.40	40.222451	-105.048748
8,666.0	87.90	90.20	7,170.3	-71.3	930.9	1,324,205.58	3,126,108.32	40.222453	-105.048408
8,760.0	90.90	89.80	7,171.3	-71.3	1,024.9	1,324,206.05	3,126,202.30	40.222453	-105.048071
8,855.0	90.70	89.20	7,169.9	-70.4	1,119.9	1,324,207.36	3,126,297.28	40.222456	-105.047731
8,949.0	87.10	87.20	7,171.7	-67.5	1,213.8	1,324,210.79	3,126,391.18	40.222464	-105.047395
9,044.0	88.40	88.70	7,175.5	-64.1	1,308.6	1,324,214.66	3,126,486.02	40.222473	-105.047055
9,138.0	89.00	90.60	7,177.6	-63.5	1,402.6	1,324,215.71	3,126,579.99	40.222475	-105.046718
9,233.0	88.90	90.90	7,179.3	-64.8	1,497.6	1,324,214.95	3,126,674.97	40.222471	-105.046378
9,328.0	89.30	90.80	7,180.8	-66.2	1,592.6	1,324,214.02	3,126,769.95	40.222467	-105.046038
9,422.0	89.70	90.60	7,181.6	-67.3	1,686.5	1,324,213.34	3,126,863.95	40.222464	-105.045702
9,517.0	87.90	89.40	7,183.6	-67.3	1,781.5	1,324,213.82	3,126,958.92	40.222464	-105.045361
9,611.0	88.10	89.10	7,186.9	-66.1	1,875.5	1,324,215.53	3,127,052.85	40.222467	-105.045025

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Billings 3D-18H
Project:	DJ Wattenberg	TVD Reference:	32' KB @ 5187.0ft (PATT 326)
Site:	S18-T3N-R68W (Billings)	MD Reference:	32' KB @ 5187.0ft (PATT 326)
Well:	Billings 3D-18H	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
9,706.0	88.70	88.70	7,189.6	-64.3	1,970.4	1,324,217.83	3,127,147.78	40.222472	-105.044685
9,800.0	87.90	90.90	7,192.4	-63.9	2,064.3	1,324,218.63	3,127,241.73	40.222473	-105.044349
9,895.0	87.60	90.30	7,196.1	-64.9	2,159.3	1,324,218.12	3,127,336.66	40.222471	-105.044009
9,989.0	88.00	91.40	7,199.7	-66.3	2,253.2	1,324,217.20	3,127,430.58	40.222467	-105.043672
10,084.0	88.40	91.90	7,202.7	-69.1	2,348.1	1,324,214.95	3,127,525.51	40.222459	-105.043332
10,178.0	88.10	89.90	7,205.6	-70.5	2,442.0	1,324,213.95	3,127,619.45	40.222455	-105.042996
10,273.0	90.80	90.00	7,206.5	-70.5	2,537.0	1,324,214.51	3,127,714.44	40.222455	-105.042656
10,367.0	91.20	90.10	7,204.8	-70.5	2,631.0	1,324,214.90	3,127,808.42	40.222455	-105.042319
10,462.0	89.80	90.60	7,204.0	-71.1	2,726.0	1,324,214.80	3,127,903.42	40.222453	-105.041979
10,556.0	90.30	90.40	7,203.9	-71.9	2,820.0	1,324,214.46	3,127,997.41	40.222451	-105.041642
10,651.0	89.20	89.90	7,204.3	-72.2	2,915.0	1,324,214.69	3,128,092.41	40.222450	-105.041302
10,745.0	89.70	89.60	7,205.2	-71.8	3,009.0	1,324,215.57	3,128,186.40	40.222452	-105.040966
10,840.0	89.20	88.50	7,206.1	-70.2	3,104.0	1,324,217.63	3,128,281.37	40.222456	-105.040625
10,934.0	87.80	88.10	7,208.6	-67.4	3,197.9	1,324,220.89	3,128,375.28	40.222463	-105.040289
11,029.0	88.80	88.60	7,211.4	-64.7	3,292.8	1,324,224.11	3,128,470.19	40.222471	-105.039949
11,123.0	89.70	89.30	7,212.7	-63.0	3,386.8	1,324,226.30	3,128,564.15	40.222476	-105.039613
11,218.0	88.50	89.80	7,214.1	-62.2	3,481.8	1,324,227.53	3,128,659.13	40.222478	-105.039273
11,312.0	88.60	88.50	7,216.5	-60.8	3,575.7	1,324,229.40	3,128,753.08	40.222481	-105.038936
11,407.0	87.90	89.10	7,219.4	-58.8	3,670.7	1,324,231.87	3,128,848.00	40.222487	-105.038596
11,501.0	86.90	90.40	7,223.7	-58.4	3,764.6	1,324,232.75	3,128,941.90	40.222488	-105.038260
11,596.0	87.90	91.30	7,228.0	-59.8	3,859.5	1,324,231.82	3,129,036.79	40.222484	-105.037920
11,690.0	88.40	91.20	7,231.0	-61.9	3,953.4	1,324,230.25	3,129,130.73	40.222478	-105.037584
11,785.0	87.30	91.20	7,234.6	-63.9	4,048.3	1,324,228.74	3,129,225.65	40.222473	-105.037244
11,879.0	88.10	91.00	7,238.4	-65.7	4,142.2	1,324,227.41	3,129,319.56	40.222468	-105.036907
11,974.0	86.10	90.90	7,243.2	-67.2	4,237.1	1,324,226.32	3,129,414.43	40.222463	-105.036568
12,068.0	87.10	90.60	7,248.8	-68.5	4,330.9	1,324,225.56	3,129,508.26	40.222460	-105.036232
12,163.0	86.40	90.60	7,254.1	-69.5	4,425.7	1,324,225.05	3,129,603.11	40.222457	-105.035892
12,257.0	87.30	91.00	7,259.3	-70.8	4,519.6	1,324,224.21	3,129,696.96	40.222454	-105.035556
12,352.0	86.00	90.60	7,264.9	-72.1	4,614.4	1,324,223.37	3,129,791.79	40.222450	-105.035216
12,446.0	86.90	89.90	7,270.7	-72.5	4,708.2	1,324,223.43	3,129,885.61	40.222449	-105.034880
12,541.0	87.50	90.10	7,275.3	-72.5	4,803.1	1,324,223.91	3,129,980.49	40.222449	-105.034541
12,635.0	88.60	89.20	7,278.5	-71.9	4,897.0	1,324,224.96	3,130,074.43	40.222450	-105.034204
12,730.0	88.50	88.90	7,280.9	-70.4	4,992.0	1,324,227.02	3,130,169.38	40.222455	-105.033864
12,825.0	87.60	88.70	7,284.1	-68.4	5,086.9	1,324,229.49	3,130,264.29	40.222460	-105.033524
12,919.0	88.60	91.30	7,287.3	-68.4	5,180.9	1,324,229.96	3,130,358.23	40.222460	-105.033188
13,014.0	88.70	90.70	7,289.5	-70.0	5,275.8	1,324,228.78	3,130,453.19	40.222455	-105.032848
13,108.0	88.10	90.70	7,292.1	-71.2	5,369.8	1,324,228.11	3,130,547.15	40.222452	-105.032511
13,202.0	88.50	89.00	7,294.9	-70.9	5,463.7	1,324,228.83	3,130,641.11	40.222453	-105.032175
13,297.0	89.30	89.00	7,296.7	-69.3	5,558.7	1,324,230.97	3,130,736.06	40.222457	-105.031835
13,391.0	89.30	89.80	7,297.9	-68.3	5,652.7	1,324,232.43	3,130,830.04	40.222460	-105.031498
13,486.0	89.40	89.90	7,299.0	-68.0	5,747.7	1,324,233.16	3,130,925.04	40.222460	-105.031158
13,580.0	89.50	90.60	7,299.9	-68.4	5,841.7	1,324,233.22	3,131,019.03	40.222459	-105.030821
13,675.0	89.10	90.50	7,301.0	-69.4	5,936.7	1,324,232.79	3,131,114.02	40.222457	-105.030481
13,769.0	88.70	91.00	7,302.8	-70.6	6,030.6	1,324,232.03	3,131,208.00	40.222453	-105.030145
13,864.0	90.00	90.30	7,303.9	-71.7	6,125.6	1,324,231.44	3,131,302.99	40.222450	-105.029805
13,958.0	89.20	90.00	7,304.6	-71.9	6,219.6	1,324,231.67	3,131,396.99	40.222450	-105.029468
14,053.0	90.10	89.20	7,305.1	-71.2	6,314.6	1,324,232.81	3,131,491.98	40.222451	-105.029128
14,125.0	89.50	88.70	7,305.4	-69.9	6,386.6	1,324,234.49	3,131,563.96	40.222455	-105.028870
Last CES Survey @ 14,125' MD									
14,175.0	89.50	88.70	7,305.8	-68.8	6,436.6	1,324,235.88	3,131,613.94	40.222458	-105.028691
PTB @ 14,175'									

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Billings 3D-18H
Project:	DJ Wattenberg	TVD Reference:	32' KB @ 5187.0ft (PATT 326)
Site:	S18-T3N-R68W (Billings)	MD Reference:	32' KB @ 5187.0ft (PATT 326)
Well:	Billings 3D-18H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Design 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									
Billings 3D-18H PBHL 4	0.00	0.00	7,316.0	-73.5	6,485.6	1,324,231.42	3,131,662.98	40.222445	-105.028515
- survey misses target center by 50.3ft at 14175.0ft MD (7305.8 TVD, -68.8 N, 6436.6 E)									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
14,125.0	7,305.4	-69.9	6,386.6	Last CES Survey @ 14,125' MD
14,175.0	7,305.8	-68.8	6,436.6	PTB @ 14,175'

Checked By: _____	Approved By: _____	Date: _____
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