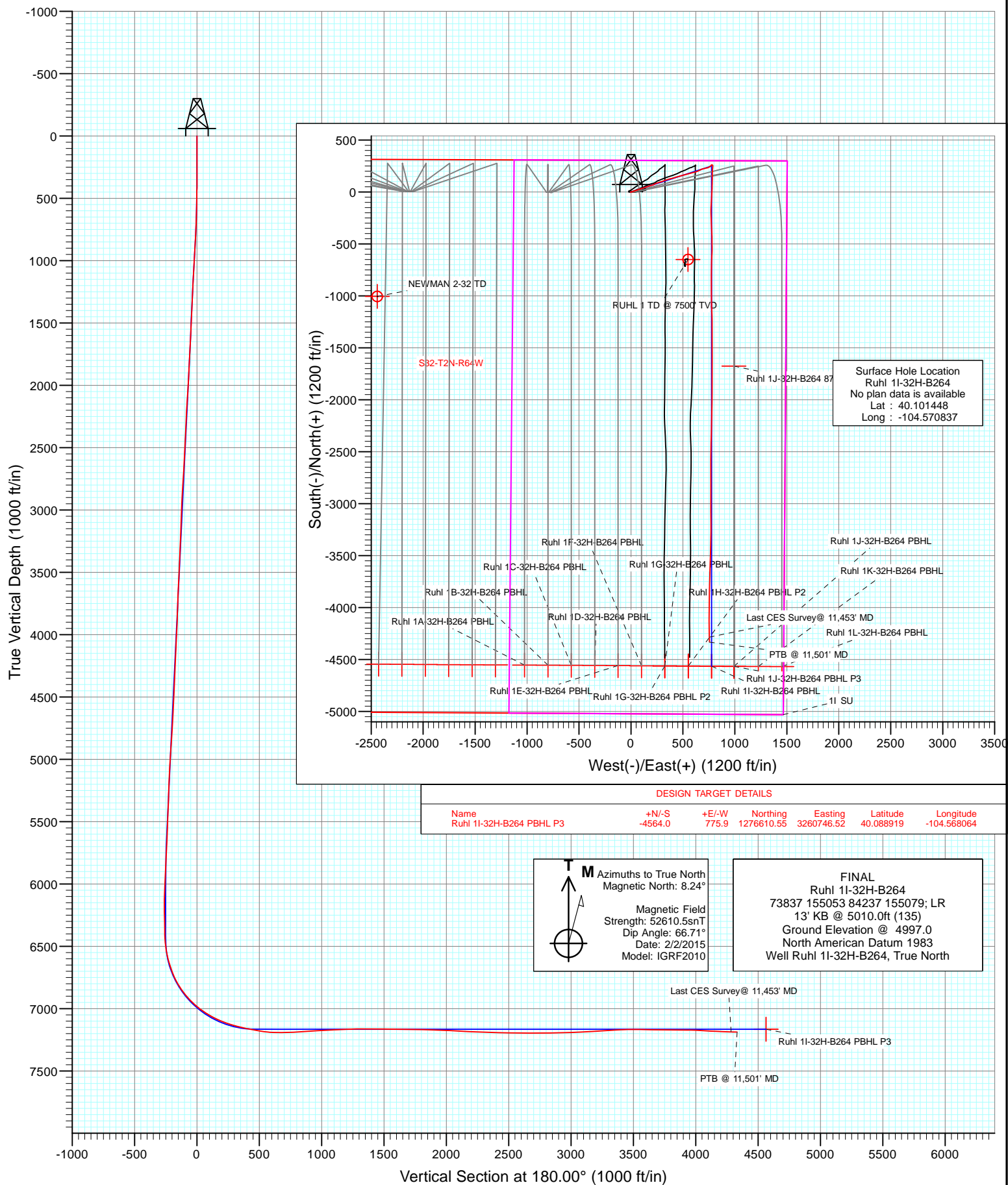




Project: DJ Wattenberg
Site: S32-T2N-R64W (Newman/Ruhl)
Well: Ruhl 1I-32H-B264
Wellbore: Hz
Design: FINAL



Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 11-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 11-32H-B264	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		S32-T2N-R64W (Newman/Ruhl)			
Site Position:		Northing:	1,281,150.65 ft	Latitude:	40.101468
From:	Lat/Long	Easting:	3,257,734.55 ft	Longitude:	-104.578660
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.60 °

Well	Ruhl 11-32H-B264					
Well Position	+N/-S	0.0 ft	Northing:	1,281,166.18 ft	Latitude:	40.101448
	+E/-W	0.0 ft	Easting:	3,259,922.89 ft	Longitude:	-104.570837
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,997.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/2/2015	8.25	66.71	52,610

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

Survey Program	Date	2/14/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
235.0	11,501.0	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		
235.0	0.50	266.00	235.0	-0.1	-1.0	0.1	0.21	0.21		
327.0	0.30	255.20	327.0	-0.2	-1.7	0.2	0.23	-0.22		
419.0	1.70	81.80	419.0	0.0	-0.5	0.0	2.17	1.52		
510.0	3.70	76.00	509.9	0.9	3.6	-0.9	2.22	2.20		
602.0	5.70	76.30	601.6	2.7	11.0	-2.7	2.17	2.17		
694.0	7.50	75.60	693.0	5.3	21.2	-5.3	1.96	1.96		
785.0	9.40	69.90	783.0	9.3	34.0	-9.3	2.28	2.09		
877.0	9.00	65.90	873.8	14.8	47.6	-14.8	0.82	-0.43		
969.0	9.40	72.60	964.6	20.0	61.3	-20.0	1.24	0.43		
1,061.0	8.70	69.90	1,055.5	24.6	75.0	-24.6	0.89	-0.76		
1,117.0	8.10	71.10	1,110.8	27.4	82.7	-27.4	1.12	-1.07		
1,211.0	7.90	68.80	1,203.9	31.8	95.0	-31.8	0.40	-0.21		
1,303.0	8.80	74.20	1,295.0	36.0	107.7	-36.0	1.30	0.98		

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 11-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 11-32H-B264	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
1,395.0	8.90	73.50	1,385.9	40.0	121.3	-40.0	0.16	0.11	
1,487.0	9.10	71.70	1,476.7	44.3	135.0	-44.3	0.38	0.22	
1,579.0	8.70	72.30	1,567.6	48.7	148.5	-48.7	0.45	-0.43	
1,671.0	8.50	71.40	1,658.6	53.0	161.6	-53.0	0.26	-0.22	
1,763.0	8.30	69.90	1,749.6	57.4	174.3	-57.4	0.32	-0.22	
1,855.0	9.20	75.70	1,840.5	61.5	187.7	-61.5	1.37	0.98	
1,947.0	9.00	71.00	1,931.4	65.7	201.6	-65.7	0.84	-0.22	
2,039.0	8.50	66.50	2,022.3	70.7	214.6	-70.7	0.92	-0.54	
2,131.0	8.10	61.90	2,113.3	76.5	226.6	-76.5	0.84	-0.43	
2,222.0	8.60	68.40	2,203.4	82.0	238.6	-82.0	1.17	0.55	
2,314.0	8.70	72.80	2,294.3	86.6	251.6	-86.6	0.73	0.11	
2,406.0	8.00	70.60	2,385.4	90.8	264.3	-90.8	0.84	-0.76	
2,501.0	9.90	76.10	2,479.2	95.0	278.5	-95.0	2.19	2.00	
2,595.0	10.10	72.20	2,571.8	99.4	294.2	-99.4	0.75	0.21	
2,690.0	9.60	70.10	2,665.4	104.7	309.5	-104.7	0.65	-0.53	
2,785.0	8.90	67.90	2,759.1	110.1	323.8	-110.1	0.83	-0.74	
2,879.0	9.50	70.60	2,851.9	115.4	337.8	-115.4	0.79	0.64	
2,974.0	9.40	71.60	2,945.6	120.5	352.6	-120.5	0.20	-0.11	
3,068.0	9.20	77.80	3,038.4	124.5	367.2	-124.5	1.09	-0.21	
3,163.0	8.80	75.90	3,132.2	127.9	381.7	-127.9	0.52	-0.42	
3,257.0	7.90	73.80	3,225.2	131.4	394.9	-131.4	1.01	-0.96	
3,352.0	7.90	76.10	3,319.3	134.8	407.5	-134.8	0.33	0.00	
3,447.0	8.70	73.10	3,413.3	138.5	420.7	-138.5	0.96	0.84	
3,542.0	9.70	71.90	3,507.1	143.0	435.2	-143.0	1.07	1.05	
3,636.0	7.60	71.30	3,600.0	147.5	448.6	-147.5	2.24	-2.23	
3,730.0	8.90	75.70	3,693.1	151.3	461.5	-151.3	1.54	1.38	
3,825.0	9.50	78.60	3,786.8	154.7	476.3	-154.7	0.80	0.63	
3,919.0	8.00	74.00	3,879.8	158.0	490.2	-158.0	1.76	-1.60	
4,014.0	9.60	74.20	3,973.6	162.0	504.2	-162.0	1.68	1.68	
4,108.0	8.40	69.30	4,066.5	166.5	518.2	-166.5	1.51	-1.28	
4,203.0	8.90	79.30	4,160.4	170.3	531.9	-170.3	1.67	0.53	
4,297.0	11.20	75.90	4,253.0	173.9	547.9	-173.9	2.53	2.45	
4,392.0	10.60	74.80	4,346.2	178.5	565.3	-178.5	0.67	-0.63	
4,486.0	8.80	74.30	4,438.9	182.7	580.5	-182.7	1.92	-1.91	
4,581.0	10.20	77.90	4,532.6	186.4	595.8	-186.4	1.60	1.47	
4,676.0	10.00	73.40	4,626.1	190.5	611.9	-190.5	0.86	-0.21	
4,770.0	10.20	71.90	4,718.7	195.4	627.6	-195.4	0.35	0.21	
4,865.0	9.90	68.70	4,812.2	201.0	643.2	-201.0	0.67	-0.32	
4,959.0	8.70	64.00	4,905.0	207.1	657.1	-207.1	1.51	-1.28	
5,054.0	7.60	58.20	4,999.0	213.5	668.9	-213.5	1.44	-1.16	
5,148.0	7.30	66.80	5,092.2	219.2	679.7	-219.2	1.23	-0.32	
5,243.0	8.80	78.30	5,186.3	223.0	692.4	-223.0	2.31	1.58	
5,338.0	8.30	75.80	5,280.2	226.2	706.1	-226.2	0.66	-0.53	
5,432.0	9.50	78.40	5,373.1	229.4	720.3	-229.4	1.35	1.28	
5,527.0	7.80	74.00	5,467.0	232.7	734.2	-232.7	1.92	-1.79	
5,621.0	5.80	66.20	5,560.3	236.4	744.7	-236.4	2.34	-2.13	
5,716.0	4.40	56.10	5,655.0	240.4	752.1	-240.4	1.75	-1.47	
5,810.0	5.20	54.20	5,748.6	244.9	758.5	-244.9	0.87	0.85	
5,905.0	3.90	50.30	5,843.3	249.5	764.5	-249.5	1.41	-1.37	
5,999.0	3.40	42.30	5,937.1	253.6	768.8	-253.6	0.76	-0.53	
6,094.0	3.20	34.20	6,032.0	257.9	772.2	-257.9	0.53	-0.21	
6,188.0	2.90	70.60	6,125.9	260.8	776.0	-260.8	2.05	-0.32	
6,283.0	2.90	110.90	6,220.8	260.8	780.5	-260.8	2.10	0.00	
6,377.0	2.20	126.80	6,314.7	258.8	784.1	-258.8	1.05	-0.74	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 1I-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 1I-32H-B264	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
6,440.0	1.60	120.50	6,377.6	257.7	785.9	-257.7	1.01	-0.95	
6,472.0	1.70	127.70	6,409.6	257.1	786.6	-257.1	0.72	0.31	
6,504.0	3.20	170.80	6,441.6	256.0	787.1	-256.0	7.12	4.69	
6,535.0	5.50	177.20	6,472.5	253.6	787.3	-253.6	7.57	7.42	
6,567.0	7.60	180.90	6,504.3	250.0	787.4	-250.0	6.69	6.56	
6,598.0	9.60	185.00	6,534.9	245.4	787.1	-245.4	6.74	6.45	
6,630.0	11.40	185.90	6,566.4	239.6	786.6	-239.6	5.65	5.62	
6,661.0	13.80	183.80	6,596.6	232.8	786.0	-232.8	7.88	7.74	
6,693.0	16.70	184.10	6,627.5	224.4	785.4	-224.4	9.07	9.06	
6,724.0	18.90	184.20	6,657.0	215.0	784.7	-215.0	7.10	7.10	
6,756.0	19.80	185.30	6,687.2	204.4	783.9	-204.4	3.03	2.81	
6,788.0	21.60	183.10	6,717.2	193.1	783.0	-193.1	6.13	5.62	
6,819.0	24.00	181.60	6,745.7	181.1	782.6	-181.1	7.97	7.74	
6,851.0	27.20	179.20	6,774.6	167.3	782.5	-167.3	10.51	10.00	
6,882.0	30.60	178.50	6,801.7	152.3	782.8	-152.3	11.02	10.97	
6,914.0	33.30	181.20	6,828.9	135.4	782.8	-135.4	9.54	8.44	
6,945.0	35.00	182.60	6,854.5	118.0	782.2	-118.0	6.04	5.48	
6,977.0	37.40	182.00	6,880.4	99.1	781.5	-99.1	7.58	7.50	
7,008.0	40.70	181.00	6,904.4	79.6	781.0	-79.6	10.84	10.65	
7,040.0	43.70	180.90	6,928.1	58.1	780.6	-58.1	9.38	9.37	
7,072.0	45.90	181.60	6,950.8	35.6	780.1	-35.6	7.05	6.87	
7,103.0	48.80	182.50	6,971.8	12.8	779.3	-12.8	9.60	9.35	
7,135.0	51.70	183.00	6,992.3	-11.8	778.1	11.8	9.14	9.06	
7,166.0	53.70	183.20	7,011.1	-36.4	776.8	36.4	6.47	6.45	
7,198.0	56.40	183.30	7,029.4	-62.6	775.3	62.6	8.44	8.44	
7,229.0	59.20	183.80	7,045.9	-88.8	773.7	88.8	9.13	9.03	
7,261.0	61.10	183.40	7,061.9	-116.5	771.9	116.5	6.04	5.94	
7,292.0	63.10	182.10	7,076.4	-143.8	770.6	143.8	7.44	6.45	
7,324.0	65.30	180.80	7,090.3	-172.6	769.9	172.6	7.79	6.87	
7,355.0	67.30	179.00	7,102.7	-201.0	769.9	201.0	8.36	6.45	
7,387.0	70.20	178.30	7,114.3	-230.8	770.7	230.8	9.29	9.06	
7,418.0	72.70	177.90	7,124.2	-260.2	771.6	260.2	8.16	8.06	
7,450.0	74.20	177.30	7,133.3	-290.8	772.9	290.8	5.02	4.69	
7,481.0	75.00	177.10	7,141.5	-320.7	774.4	320.7	2.65	2.58	
7,512.0	76.00	177.60	7,149.3	-350.7	775.8	350.7	3.58	3.23	
7,544.0	78.00	177.60	7,156.5	-381.8	777.1	381.8	6.25	6.25	
7,557.0	78.90	178.10	7,159.1	-394.6	777.5	394.6	7.88	6.92	
7,631.0	79.80	179.30	7,172.8	-467.3	779.2	467.3	2.00	1.22	
7,662.0	79.40	179.20	7,178.4	-497.7	779.6	497.7	1.33	-1.29	
7,694.0	81.20	179.60	7,183.8	-529.3	779.9	529.3	5.76	5.62	
7,725.0	84.10	180.60	7,187.7	-560.0	779.9	560.0	9.89	9.35	
7,757.0	87.00	181.30	7,190.2	-591.9	779.3	591.9	9.32	9.06	
7,788.0	87.40	182.20	7,191.7	-622.9	778.4	622.9	3.17	1.29	
7,820.0	88.80	183.20	7,192.8	-654.8	776.9	654.8	5.38	4.37	
7,883.0	92.80	181.00	7,191.9	-717.7	774.6	717.7	7.25	6.35	
7,978.0	93.10	180.50	7,187.0	-812.6	773.3	812.6	0.61	0.32	
8,073.0	93.50	179.70	7,181.6	-907.5	773.2	907.5	0.94	0.42	
8,167.0	93.50	179.50	7,175.8	-1,001.3	773.8	1,001.3	0.21	0.00	
8,262.0	93.10	178.00	7,170.4	-1,096.1	775.9	1,096.1	1.63	-0.42	
8,356.0	92.20	178.30	7,166.0	-1,189.9	778.9	1,189.9	1.01	-0.96	
8,451.0	90.80	179.50	7,163.5	-1,284.9	780.7	1,284.9	1.94	-1.47	
8,545.0	89.50	180.40	7,163.3	-1,378.9	780.8	1,378.9	1.68	-1.38	
8,640.0	89.50	180.20	7,164.1	-1,473.9	780.3	1,473.9	0.21	0.00	
8,734.0	89.60	179.80	7,164.8	-1,567.9	780.3	1,567.9	0.44	0.11	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 11-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 11-32H-B264	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
8,829.0	89.30	179.50	7,165.8	-1,662.9	780.9	1,662.9	0.45	-0.32	
8,923.0	88.60	180.40	7,167.5	-1,756.9	781.0	1,756.9	1.21	-0.74	
9,018.0	88.70	180.10	7,169.7	-1,851.8	780.6	1,851.8	0.33	0.11	
9,112.0	87.80	180.60	7,172.6	-1,945.8	780.0	1,945.8	1.10	-0.96	
9,207.0	86.60	180.20	7,177.2	-2,040.7	779.3	2,040.7	1.33	-1.26	
9,302.0	87.00	181.30	7,182.5	-2,135.5	778.1	2,135.5	1.23	0.42	
9,396.0	88.40	181.60	7,186.3	-2,229.4	775.7	2,229.4	1.52	1.49	
9,491.0	87.80	181.90	7,189.5	-2,324.3	772.8	2,324.3	0.71	-0.63	
9,586.0	87.40	181.10	7,193.4	-2,419.2	770.3	2,419.2	0.94	-0.42	
9,680.0	89.90	180.80	7,195.6	-2,513.1	768.8	2,513.1	2.68	2.66	
9,775.0	90.30	180.20	7,195.5	-2,608.1	768.0	2,608.1	0.76	0.42	
9,869.0	90.10	180.20	7,195.2	-2,702.1	767.6	2,702.1	0.21	-0.21	
9,964.0	89.50	179.60	7,195.5	-2,797.1	767.8	2,797.1	0.89	-0.63	
10,059.0	90.70	180.50	7,195.3	-2,892.1	767.7	2,892.1	1.58	1.26	
10,153.0	92.30	179.40	7,192.9	-2,986.1	767.8	2,986.1	2.07	1.70	
10,248.0	92.90	179.60	7,188.5	-3,081.0	768.6	3,081.0	0.67	0.63	
10,343.0	93.20	179.60	7,183.5	-3,175.8	769.3	3,175.8	0.32	0.32	
10,437.0	94.30	179.60	7,177.3	-3,269.6	769.9	3,269.6	1.17	1.17	
10,532.0	93.20	180.80	7,171.1	-3,364.4	769.6	3,364.4	1.71	-1.16	
10,627.0	90.80	183.10	7,167.8	-3,459.3	766.4	3,459.3	3.50	-2.53	
10,721.0	89.00	182.20	7,168.0	-3,553.2	762.0	3,553.2	2.14	-1.91	
10,816.0	89.40	181.40	7,169.3	-3,648.1	759.0	3,648.1	0.94	0.42	
10,910.0	89.40	180.60	7,170.3	-3,742.1	757.4	3,742.1	0.85	0.00	
11,005.0	89.40	181.10	7,171.3	-3,837.1	756.0	3,837.1	0.53	0.00	
11,100.0	89.50	181.00	7,172.2	-3,932.1	754.3	3,932.1	0.15	0.11	
11,194.0	87.10	181.20	7,175.0	-4,026.0	752.5	4,026.0	2.56	-2.55	
11,289.0	86.80	179.50	7,180.0	-4,120.9	751.9	4,120.9	1.81	-0.32	
11,384.0	87.80	179.30	7,184.5	-4,215.8	752.9	4,215.8	1.07	1.05	
11,453.0	87.90	178.70	7,187.1	-4,284.7	754.1	4,284.7	0.88	0.14	Last CES Survey@ 11,453' MD
11,501.0	88.30	178.70	7,188.7	-4,332.7	755.2	4,332.7	0.83	0.83	PTB @ 11,501' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Ruhl 11-32H-B264 PBHL - hit/miss target - Shape	0.00	0.00	7,173.0	-4,564.0	775.9	1,276,610.55	3,260,746.52	40.088919	-104.568064
- actual wellpath misses target center by 232.8ft at 11501.0ft MD (7188.7 TVD, -4332.7 N, 755.2 E)									
- Point									
Ruhl 11-32H-B264 PBHL - actual wellpath misses target center by 233.5ft at 11501.0ft MD (7188.7 TVD, -4332.7 N, 755.2 E)	0.00	0.00	7,165.0	-4,564.0	775.9	1,276,610.55	3,260,746.52	40.088919	-104.568064
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
11,453.0	7,187.1	-4,284.7	754.1	Last CES Survey@ 11,453' MD	
11,501.0	7,188.7	-4,332.7	755.2	PTB @ 11,501' MD	

Checked By: _____	Approved By: _____	Date: _____
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