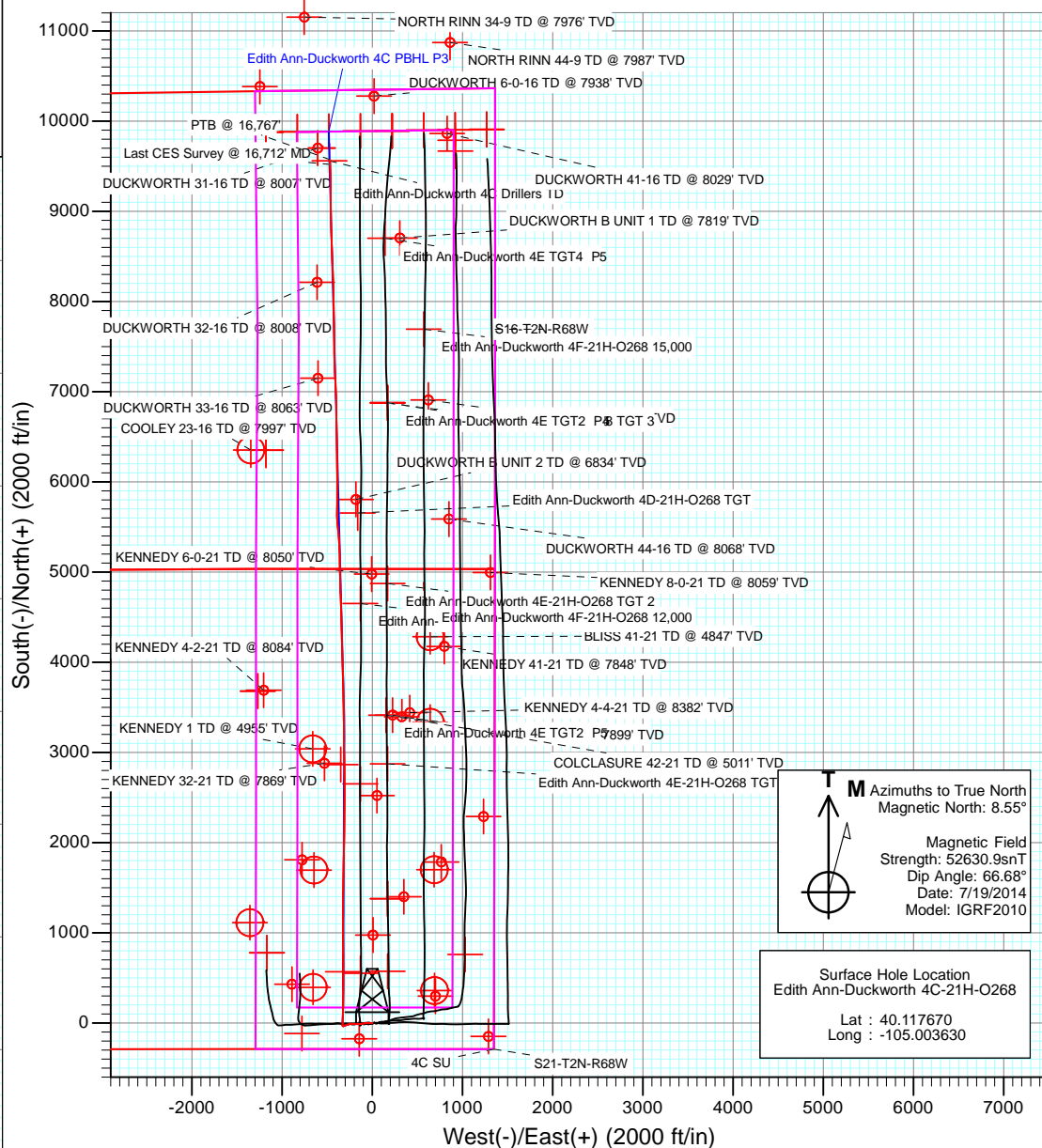
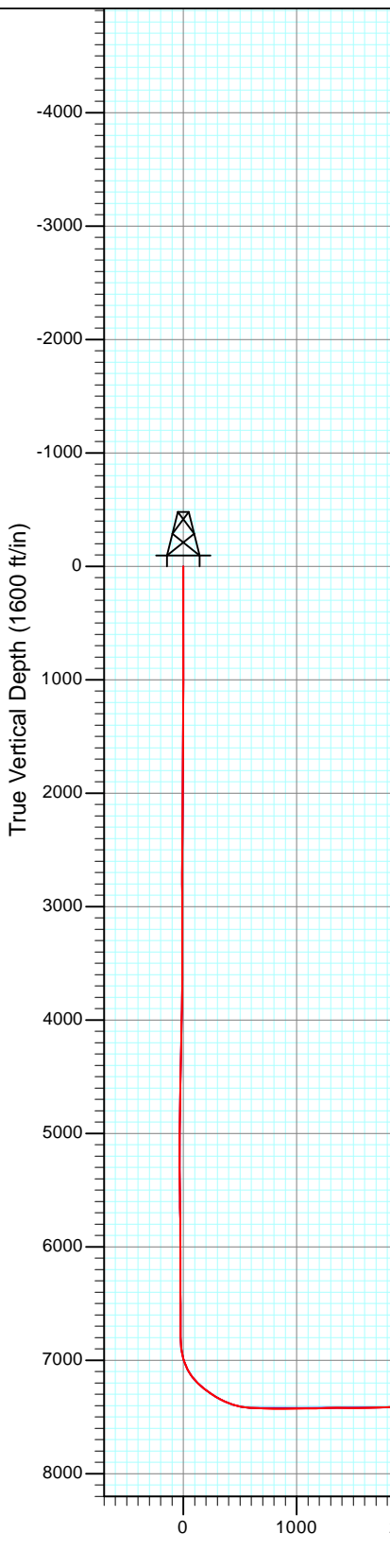




Project: DJ Wattenberg
Site: S21-T2N-R68W (Edith Ann-Duckworth)
Well: Edith Ann-Duckworth 4C-21H-O268
Vellbore: Hz
Design: FINAL



FINAL
Edith Ann-Duckworth 4C-21H-O268
305455 145098 306455 145231; LR
KB @ 4954.5ft (Patterson 272)
Ground Elevation @ 4926.0
North American Datum 1983
Well Edith Ann-Duckworth 4C-21H-O268, True North



M Azimuths to True North
Magnetic North: 8.55°

Magnetic Field
Strength: 52630.9nT
Dip Angle: 66.68°
Date: 7/19/2014
Model: IGRF2010

Surface Hole Location
Edith Ann-Duckworth 4C-21H-O268
Lat : 40.117670
Long : -105.003630

DESIGN TARGET DETAILS

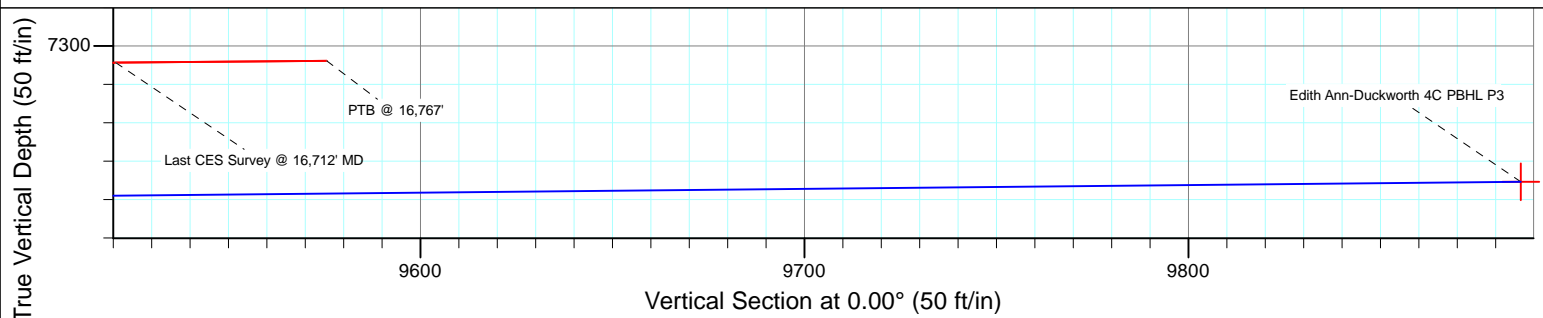
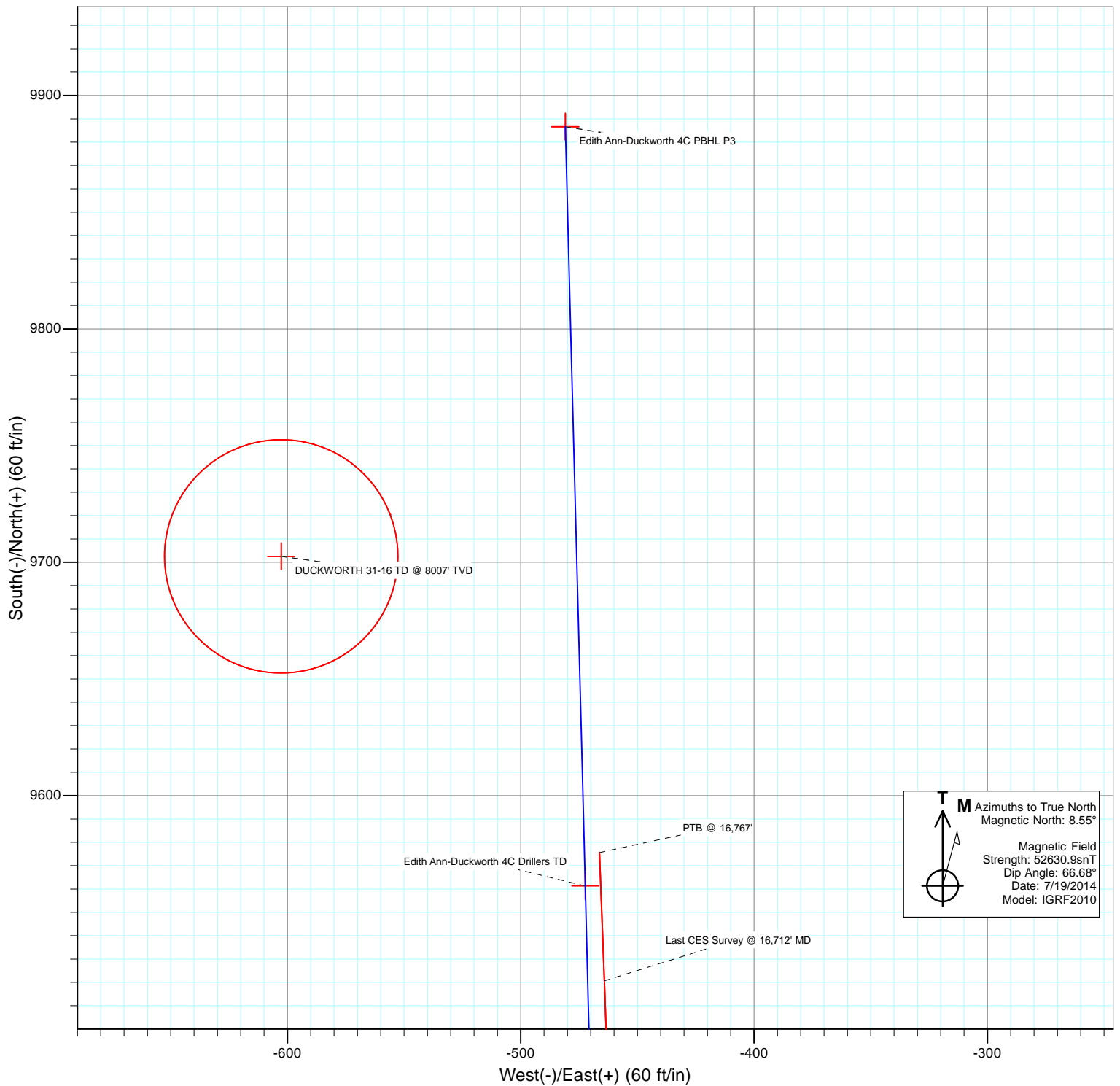
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Edith Ann-Duckworth 4C PBHL P3	9886.6	-480.8	1295986.04	3138289.28	40.144810	-105.005350

Last CES Survey @ 16,712' MD
PTB @ 16,767'
Edith Ann-Duckworth 4C PBHL P3

Vertical Section at 0.00° (1600 ft/in)



Project: DJ Wattenberg
Site: S21-T2N-R68W (Edith Ann-Duckworth)
Well: Edith Ann-Duckworth 4C-21H-O268
Vellbore: Hz
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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		S21-T2N-R68W (Edith Ann-Duckworth)			
Site Position:		Northing:	1,290,455.50 ft	Latitude:	40.129630
From:	Lat/Long	Easting:	3,138,171.93 ft	Longitude:	-105.005880
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.32 °

Well	Edith Ann-Duckworth 4C-21H-O268					
Well Position	+N/-S	0.0 ft	Northing:	1,286,102.30 ft	Latitude:	40.117670
	+E/-W	0.0 ft	Easting:	3,138,825.45 ft	Longitude:	-105.003630
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,926.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/19/2014	8.55	66.68	52,631

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	0.00	

Survey Program	Date	7/29/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
167.0	16,767.0	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		
167.0	0.60	246.70	167.0	-0.3	-0.8	-0.3	0.36	0.36		
261.0	0.90	262.30	261.0	-0.6	-2.0	-0.6	0.38	0.32		
355.0	1.10	271.80	355.0	-0.7	-3.6	-0.7	0.28	0.21		
449.0	1.20	269.60	449.0	-0.7	-5.5	-0.7	0.12	0.11		
542.0	1.40	267.80	541.9	-0.7	-7.6	-0.7	0.22	0.22		
636.0	1.50	271.20	635.9	-0.8	-10.0	-0.8	0.14	0.11		
729.0	1.60	274.60	728.9	-0.6	-12.5	-0.6	0.15	0.11		
823.0	2.40	270.20	822.8	-0.5	-15.8	-0.5	0.87	0.85		
890.0	3.60	266.60	889.7	-0.6	-19.3	-0.6	1.81	1.79		
1,013.0	4.40	267.80	1,012.4	-1.0	-27.9	-1.0	0.65	0.65		
1,106.0	4.50	269.40	1,105.1	-1.2	-35.1	-1.2	0.17	0.11		
1,200.0	4.40	269.80	1,198.9	-1.3	-42.4	-1.3	0.11	-0.11		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
1,294.0	4.40	270.70	1,292.6	-1.2	-49.6	-1.2	0.07	0.00	
1,387.0	4.40	271.40	1,385.3	-1.1	-56.7	-1.1	0.06	0.00	
1,481.0	4.20	268.10	1,479.0	-1.1	-63.7	-1.1	0.34	-0.21	
1,576.0	4.00	268.00	1,573.8	-1.4	-70.5	-1.4	0.21	-0.21	
1,671.0	3.80	270.20	1,668.6	-1.5	-77.0	-1.5	0.26	-0.21	
1,766.0	5.80	261.00	1,763.2	-2.2	-84.9	-2.2	2.25	2.11	
1,861.0	4.70	261.80	1,857.8	-3.5	-93.5	-3.5	1.16	-1.16	
1,956.0	4.80	262.40	1,952.5	-4.6	-101.3	-4.6	0.12	0.11	
2,051.0	4.90	262.20	2,047.2	-5.7	-109.2	-5.7	0.11	0.11	
2,147.0	4.80	260.10	2,142.8	-6.9	-117.3	-6.9	0.21	-0.10	
2,242.0	4.80	257.80	2,237.5	-8.4	-125.1	-8.4	0.20	0.00	
2,337.0	4.50	257.00	2,332.2	-10.1	-132.6	-10.1	0.32	-0.32	
2,432.0	4.20	268.80	2,426.9	-11.0	-139.7	-11.0	0.99	-0.32	
2,527.0	4.10	272.00	2,521.7	-11.0	-146.5	-11.0	0.27	-0.11	
2,622.0	3.90	269.60	2,616.4	-10.9	-153.2	-10.9	0.27	-0.21	
2,718.0	3.90	273.10	2,712.2	-10.7	-159.7	-10.7	0.25	0.00	
2,813.0	4.40	271.20	2,807.0	-10.5	-166.6	-10.5	0.55	0.53	
2,908.0	4.50	272.70	2,901.7	-10.2	-173.9	-10.2	0.16	0.11	
3,003.0	5.20	270.80	2,996.3	-10.0	-182.0	-10.0	0.76	0.74	
3,098.0	5.40	269.90	3,090.9	-9.9	-190.7	-9.9	0.23	0.21	
3,194.0	5.20	270.00	3,186.5	-10.0	-199.6	-10.0	0.21	-0.21	
3,289.0	5.00	271.80	3,281.1	-9.8	-208.0	-9.8	0.27	-0.21	
3,384.0	4.80	274.10	3,375.8	-9.4	-216.1	-9.4	0.30	-0.21	
3,479.0	4.40	279.00	3,470.5	-8.6	-223.7	-8.6	0.59	-0.42	
3,575.0	5.20	271.60	3,566.1	-7.9	-231.7	-7.9	1.05	0.83	
3,670.0	4.50	254.70	3,660.8	-8.7	-239.6	-8.7	1.67	-0.74	
3,765.0	3.90	257.40	3,755.6	-10.4	-246.3	-10.4	0.66	-0.63	
3,860.0	3.60	263.50	3,850.4	-11.5	-252.5	-11.5	0.53	-0.32	
3,956.0	4.60	251.60	3,946.1	-13.0	-259.1	-13.0	1.36	1.04	
4,051.0	4.40	252.80	4,040.8	-15.3	-266.2	-15.3	0.23	-0.21	
4,146.0	4.40	254.40	4,135.5	-17.3	-273.2	-17.3	0.13	0.00	
4,241.0	4.10	253.10	4,230.3	-19.3	-280.0	-19.3	0.33	-0.32	
4,336.0	3.60	252.90	4,325.1	-21.2	-286.1	-21.2	0.53	-0.53	
4,432.0	3.20	251.30	4,420.9	-22.9	-291.5	-22.9	0.43	-0.42	
4,527.0	3.10	252.40	4,515.7	-24.6	-296.4	-24.6	0.12	-0.11	
4,622.0	3.10	253.90	4,610.6	-26.0	-301.4	-26.0	0.09	0.00	
4,717.0	3.20	249.10	4,705.5	-27.7	-306.3	-27.7	0.30	0.11	
4,812.0	3.40	244.00	4,800.3	-29.9	-311.3	-29.9	0.37	0.21	
4,908.0	3.60	247.70	4,896.1	-32.3	-316.7	-32.3	0.31	0.21	
5,003.0	2.70	275.40	4,991.0	-33.2	-321.6	-33.2	1.83	-0.95	
5,098.0	2.40	280.20	5,085.9	-32.6	-325.8	-32.6	0.39	-0.32	
5,193.0	0.40	19.80	5,180.9	-32.0	-327.7	-32.0	2.63	-2.11	
5,288.0	0.40	18.10	5,275.9	-31.3	-327.5	-31.3	0.01	0.00	
5,383.0	0.40	6.90	5,370.9	-30.7	-327.3	-30.7	0.08	0.00	
5,478.0	0.40	352.20	5,465.9	-30.0	-327.3	-30.0	0.11	0.00	
5,573.0	0.30	0.10	5,560.9	-29.5	-327.4	-29.5	0.12	-0.11	
5,668.0	0.50	12.10	5,655.9	-28.8	-327.3	-28.8	0.23	0.21	
5,763.0	0.70	20.40	5,750.9	-27.9	-327.0	-27.9	0.23	0.21	
5,858.0	0.50	30.90	5,845.8	-27.0	-326.6	-27.0	0.24	-0.21	
5,953.0	0.20	312.20	5,940.8	-26.5	-326.5	-26.5	0.53	-0.32	
6,048.0	0.40	312.30	6,035.8	-26.2	-326.8	-26.2	0.21	0.21	
6,143.0	0.10	343.60	6,130.8	-25.9	-327.1	-25.9	0.34	-0.32	
6,239.0	0.30	314.80	6,226.8	-25.6	-327.3	-25.6	0.23	0.21	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
6,334.0	0.30	322.60	6,321.8	-25.2	-327.6	-25.2	0.04	0.00	
6,429.0	0.20	306.30	6,416.8	-24.9	-327.9	-24.9	0.13	-0.11	
6,524.0	0.30	291.10	6,511.8	-24.7	-328.3	-24.7	0.13	0.11	
6,619.0	0.30	322.40	6,606.8	-24.5	-328.7	-24.5	0.17	0.00	
6,714.0	0.30	335.40	6,701.8	-24.0	-328.9	-24.0	0.07	0.00	
6,809.0	0.20	334.40	6,796.8	-23.7	-329.1	-23.7	0.11	-0.11	
6,904.0	5.80	5.70	6,891.7	-18.7	-328.7	-18.7	5.93	5.89	
6,951.0	11.60	359.80	6,938.1	-11.6	-328.5	-11.6	12.47	12.34	
7,000.0	16.00	359.90	6,985.7	0.1	-328.5	0.1	8.98	8.98	
7,047.0	21.10	359.30	7,030.2	15.0	-328.6	15.0	10.86	10.85	
7,095.0	26.00	1.10	7,074.2	34.2	-328.5	34.2	10.32	10.21	
7,142.0	32.20	1.20	7,115.3	57.0	-328.1	57.0	13.19	13.19	
7,190.0	37.90	2.20	7,154.5	84.6	-327.2	84.6	11.93	11.87	
7,237.0	44.40	3.50	7,189.9	115.4	-325.7	115.4	13.95	13.83	
7,285.0	48.80	2.70	7,222.9	150.2	-323.8	150.2	9.25	9.17	
7,332.0	51.50	2.00	7,253.0	186.3	-322.3	186.3	5.86	5.74	
7,380.0	54.70	1.00	7,281.8	224.7	-321.3	224.7	6.87	6.67	
7,427.0	56.90	0.90	7,308.2	263.5	-320.7	263.5	4.68	4.68	
7,476.0	61.10	0.70	7,333.5	305.5	-320.1	305.5	8.58	8.57	
7,523.0	64.80	1.60	7,354.8	347.4	-319.3	347.4	8.05	7.87	
7,571.0	66.20	0.80	7,374.7	391.0	-318.3	391.0	3.29	2.92	
7,618.0	72.00	359.40	7,391.5	434.9	-318.3	434.9	12.65	12.34	
7,666.0	77.20	359.30	7,404.2	481.2	-318.8	481.2	10.84	10.83	
7,713.0	81.30	0.40	7,413.0	527.3	-318.9	527.3	9.02	8.72	
7,761.0	84.70	359.80	7,418.9	575.0	-318.8	575.0	7.19	7.08	
7,771.0	86.40	0.20	7,419.6	584.9	-318.8	584.9	17.46	17.00	
7,891.0	88.00	358.40	7,425.5	704.8	-320.3	704.8	2.01	1.33	
7,985.0	89.70	359.30	7,427.4	798.7	-322.2	798.7	2.05	1.81	
8,078.0	89.70	0.10	7,427.9	891.7	-322.7	891.7	0.86	0.00	
8,172.0	91.60	0.50	7,426.8	985.7	-322.2	985.7	2.07	2.02	
8,266.0	90.00	359.10	7,425.5	1,079.7	-322.5	1,079.7	2.26	-1.70	
8,360.0	91.60	0.30	7,424.2	1,173.7	-323.0	1,173.7	2.13	1.70	
8,453.0	91.70	359.60	7,421.5	1,266.6	-323.1	1,266.6	0.76	0.11	
8,547.0	89.80	0.50	7,420.3	1,360.6	-323.0	1,360.6	2.24	-2.02	
8,641.0	89.30	0.30	7,421.0	1,454.6	-322.3	1,454.6	0.57	-0.53	
8,734.0	90.10	0.50	7,421.5	1,547.6	-321.7	1,547.6	0.89	0.86	
8,828.0	91.40	2.30	7,420.3	1,641.6	-319.4	1,641.6	2.36	1.38	
8,921.0	91.90	0.90	7,417.6	1,734.5	-316.8	1,734.5	1.60	0.54	
9,014.0	92.40	0.90	7,414.1	1,827.4	-315.3	1,827.4	0.54	0.54	
9,108.0	90.80	0.40	7,411.5	1,921.4	-314.3	1,921.4	1.78	-1.70	
9,201.0	90.20	0.60	7,410.7	2,014.4	-313.5	2,014.4	0.68	-0.65	
9,295.0	91.60	1.90	7,409.2	2,108.3	-311.4	2,108.3	2.03	1.49	
9,389.0	92.00	1.80	7,406.2	2,202.2	-308.4	2,202.2	0.44	0.43	
9,482.0	90.50	1.20	7,404.2	2,295.2	-306.0	2,295.2	1.74	-1.61	
9,576.0	90.10	0.70	7,403.7	2,389.2	-304.4	2,389.2	0.68	-0.43	
9,669.0	91.10	0.60	7,402.7	2,482.2	-303.3	2,482.2	1.08	1.08	
9,763.0	90.40	358.30	7,401.5	2,576.1	-304.2	2,576.1	2.56	-0.74	
9,856.0	90.80	358.70	7,400.5	2,669.1	-306.7	2,669.1	0.61	0.43	
9,950.0	90.70	358.50	7,399.3	2,763.1	-309.0	2,763.1	0.24	-0.11	
10,044.0	91.20	359.80	7,397.7	2,857.0	-310.4	2,857.0	1.48	0.53	
10,139.0	91.30	359.50	7,395.7	2,952.0	-310.9	2,952.0	0.33	0.11	
10,233.0	90.90	358.80	7,393.9	3,046.0	-312.3	3,046.0	0.86	-0.43	
10,327.0	91.00	359.60	7,392.3	3,140.0	-313.7	3,140.0	0.86	0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
10,422.0	92.60	359.70	7,389.3	3,234.9	-314.2	3,234.9	1.69	1.68	
10,516.0	90.60	359.70	7,386.7	3,328.9	-314.7	3,328.9	2.13	-2.13	
10,611.0	90.70	359.40	7,385.6	3,423.9	-315.5	3,423.9	0.33	0.11	
10,705.0	91.60	359.50	7,383.7	3,517.8	-316.4	3,517.8	0.96	0.96	
10,799.0	91.50	359.00	7,381.2	3,611.8	-317.6	3,611.8	0.54	-0.11	
10,894.0	91.10	358.60	7,379.0	3,706.7	-319.6	3,706.7	0.60	-0.42	
10,988.0	90.70	357.90	7,377.6	3,800.7	-322.5	3,800.7	0.86	-0.43	
11,083.0	91.60	358.40	7,375.7	3,895.6	-325.5	3,895.6	1.08	0.95	
11,177.0	91.60	357.40	7,373.0	3,989.5	-329.0	3,989.5	1.06	0.00	
11,272.0	91.70	358.40	7,370.3	4,084.4	-332.5	4,084.4	1.06	0.11	
11,383.0	91.40	359.80	7,367.3	4,195.4	-334.2	4,195.4	1.29	-0.27	
11,477.0	91.00	359.40	7,365.3	4,289.3	-334.8	4,289.3	0.60	-0.43	
11,570.0	90.50	358.40	7,364.1	4,382.3	-336.6	4,382.3	1.20	-0.54	
11,664.0	89.90	357.90	7,363.8	4,476.3	-339.7	4,476.3	0.83	-0.64	
11,757.0	91.20	357.70	7,362.9	4,569.2	-343.2	4,569.2	1.41	1.40	
11,851.0	90.60	357.70	7,361.4	4,663.1	-347.0	4,663.1	0.64	-0.64	
11,944.0	89.90	357.50	7,361.0	4,756.0	-350.9	4,756.0	0.78	-0.75	
12,038.0	91.30	359.00	7,360.0	4,850.0	-353.8	4,850.0	2.18	1.49	
12,131.0	90.60	358.40	7,358.5	4,942.9	-355.9	4,942.9	0.99	-0.75	
12,225.0	91.20	358.30	7,357.0	5,036.9	-358.6	5,036.9	0.65	0.64	
12,318.0	91.80	359.80	7,354.6	5,129.8	-360.1	5,129.8	1.74	0.65	
12,412.0	90.90	358.70	7,352.4	5,223.8	-361.4	5,223.8	1.51	-0.96	
12,505.0	90.30	356.70	7,351.4	5,316.7	-365.1	5,316.7	2.25	-0.65	
12,599.0	89.50	354.60	7,351.5	5,410.4	-372.2	5,410.4	2.39	-0.85	
12,692.0	89.50	353.70	7,352.4	5,502.9	-381.7	5,502.9	0.97	0.00	
12,786.0	90.70	357.40	7,352.2	5,596.6	-389.0	5,596.6	4.14	1.28	
12,879.0	91.00	0.30	7,350.8	5,689.6	-390.9	5,689.6	3.13	0.32	
12,973.0	92.40	1.50	7,348.0	5,783.5	-389.4	5,783.5	1.96	1.49	
13,067.0	92.00	1.00	7,344.4	5,877.4	-387.3	5,877.4	0.68	-0.43	
13,162.0	91.80	359.90	7,341.3	5,972.4	-386.6	5,972.4	1.18	-0.21	
13,256.0	91.30	359.60	7,338.7	6,066.3	-387.0	6,066.3	0.62	-0.53	
13,351.0	90.90	358.20	7,336.9	6,161.3	-388.8	6,161.3	1.53	-0.42	
13,447.0	91.20	0.00	7,335.1	6,257.3	-390.3	6,257.3	1.90	0.31	
13,541.0	91.20	359.50	7,333.2	6,351.3	-390.7	6,351.3	0.53	0.00	
13,636.0	91.00	359.10	7,331.3	6,446.2	-391.9	6,446.2	0.47	-0.21	
13,730.0	90.60	358.20	7,330.0	6,540.2	-394.1	6,540.2	1.05	-0.43	
13,825.0	91.00	359.40	7,328.7	6,635.2	-396.1	6,635.2	1.33	0.42	
13,919.0	89.80	359.60	7,328.1	6,729.2	-396.9	6,729.2	1.29	-1.28	
14,014.0	90.10	359.30	7,328.1	6,824.2	-397.8	6,824.2	0.45	0.32	
14,108.0	90.20	358.30	7,327.9	6,918.1	-399.8	6,918.1	1.07	0.11	
14,203.0	90.20	357.70	7,327.6	7,013.1	-403.1	7,013.1	0.63	0.00	
14,297.0	90.60	357.20	7,326.9	7,107.0	-407.3	7,107.0	0.68	0.43	
14,392.0	90.10	356.20	7,326.3	7,201.8	-412.8	7,201.8	1.18	-0.53	
14,486.0	90.70	357.80	7,325.7	7,295.7	-417.7	7,295.7	1.82	0.64	
14,581.0	91.90	0.20	7,323.5	7,390.6	-419.4	7,390.6	2.82	1.26	
14,675.0	92.40	358.90	7,320.0	7,484.6	-420.1	7,484.6	1.48	0.53	
14,770.0	91.30	359.40	7,316.9	7,579.5	-421.5	7,579.5	1.27	-1.16	
14,864.0	90.90	359.50	7,315.1	7,673.5	-422.4	7,673.5	0.44	-0.43	
14,959.0	90.80	0.00	7,313.7	7,768.5	-422.8	7,768.5	0.54	-0.11	
15,053.0	89.20	358.70	7,313.7	7,862.5	-423.9	7,862.5	2.19	-1.70	
15,148.0	89.40	358.60	7,314.9	7,957.4	-426.1	7,957.4	0.24	0.21	
15,243.0	91.00	359.10	7,314.5	8,052.4	-428.0	8,052.4	1.76	1.68	
15,337.0	90.50	359.40	7,313.3	8,146.4	-429.3	8,146.4	0.62	-0.53	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
15,431.0	90.40	358.00	7,312.6	8,240.4	-431.4	8,240.4	1.49	-0.11	
15,526.0	90.50	357.50	7,311.8	8,335.3	-435.1	8,335.3	0.54	0.11	
15,621.0	90.40	356.20	7,311.1	8,430.1	-440.3	8,430.1	1.37	-0.11	
15,715.0	89.50	357.50	7,311.2	8,524.0	-445.5	8,524.0	1.68	-0.96	
15,811.0	90.30	357.70	7,311.3	8,619.9	-449.5	8,619.9	0.86	0.83	
15,906.0	90.80	358.10	7,310.4	8,714.8	-453.0	8,714.8	0.67	0.53	
16,000.0	90.90	358.70	7,309.0	8,808.8	-455.6	8,808.8	0.65	0.11	
16,095.0	90.50	359.80	7,307.9	8,903.8	-456.9	8,903.8	1.23	-0.42	
16,189.0	90.50	359.20	7,307.0	8,997.8	-457.7	8,997.8	0.64	0.00	
16,284.0	90.30	0.10	7,306.4	9,092.8	-458.3	9,092.8	0.97	-0.21	
16,378.0	89.70	359.30	7,306.4	9,186.8	-458.8	9,186.8	1.06	-0.64	
16,473.0	90.40	359.80	7,306.3	9,281.8	-459.5	9,281.8	0.91	0.74	
16,567.0	90.50	359.20	7,305.5	9,375.8	-460.3	9,375.8	0.65	0.11	
16,661.0	90.50	358.30	7,304.7	9,469.7	-462.4	9,469.7	0.96	0.00	
16,712.0	90.50	357.80	7,304.3	9,520.7	-464.1	9,520.7	0.98	0.00	Last CES Survey @ 16,712' MD
16,767.0	90.50	357.80	7,303.8	9,575.6	-466.2	9,575.6	0.00	0.00	PTB @ 16,767'

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									
Edith Ann-Duckworth 4C	0.00	0.00	7,428.5	568.4	-326.0	1,286,668.83	3,138,496.28	40.119230	-105.004796
- survey misses target center by 12.5ft at 7755.6ft MD (7418.3 TVD, 569.6 N, -318.8 E)									
- Point									
Edith Ann-Duckworth 4C	0.00	0.00	7,338.5	9,561.3	-472.3	1,295,660.82	3,138,299.61	40.143917	-105.005320
- survey misses target center by 35.2ft at 16752.6ft MD (7303.9 TVD, 9561.3 N, -465.7 E)									
- Point									
Edith Ann-Duckworth 4C	0.00	0.00	7,405.5	2,868.0	-349.2	1,288,968.26	3,138,460.23	40.125543	-105.004879
- survey misses target center by 39.6ft at 10055.0ft MD (7397.5 TVD, 2868.0 N, -310.4 E)									
- Point									
Edith Ann-Duckworth 4C	0.00	0.00	7,347.5	9,886.6	-480.8	1,295,986.04	3,138,289.28	40.144810	-105.005350
- survey misses target center by 314.3ft at 16767.0ft MD (7303.8 TVD, 9575.6 N, -466.2 E)									
- Point									
Edith Ann-Duckworth 4C	0.00	0.00	7,335.3	9,886.6	-480.8	1,295,986.04	3,138,289.28	40.144810	-105.005350
- survey misses target center by 312.9ft at 16767.0ft MD (7303.8 TVD, 9575.6 N, -466.2 E)									
- Point									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
16,712.0	7,304.3	9,520.7	-464.1	Last CES Survey @ 16,712' MD
16,767.0	7,303.8	9,575.6	-466.2	PTB @ 16,767'

Checked By: _____ Approved By: _____ Date: _____

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S21-T2N-R68W (Edith Ann-Duckworth)

Edith Ann-Duckworth 4C-21H-O268

Hz

Survey: Survey #1

Survey Report - Geographic

29 July, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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	S21-T2N-R68W (Edith Ann-Duckworth)				
Site Position:		Northing:	1,290,455.49 ft	Latitude:	40.129630
From:	Lat/Long	Easting:	3,138,171.93 ft	Longitude:	-105.005880
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.32 °

Well	Edith Ann-Duckworth 4C-21H-O268					
Well Position	+N/-S	0.0 ft	Northing:	1,286,102.30 ft	Latitude:	40.117670
	+E/-W	0.0 ft	Easting:	3,138,825.45 ft	Longitude:	-105.003630
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,926.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/19/2014	8.55	66.68	52,631

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	0.00	

Survey Program	Date	7/29/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
167.0	16,767.0	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	1,286,102.30	3,138,825.45	40.117670	-105.003630	
167.0	0.60	246.70	167.0	-0.3	-0.8	1,286,101.95	3,138,824.65	40.117669	-105.003633	
261.0	0.90	262.30	261.0	-0.6	-2.0	1,286,101.65	3,138,823.47	40.117668	-105.003637	
355.0	1.10	271.80	355.0	-0.7	-3.6	1,286,101.57	3,138,821.84	40.117668	-105.003643	
449.0	1.20	269.60	449.0	-0.7	-5.5	1,286,101.58	3,138,819.95	40.117668	-105.003650	
542.0	1.40	267.80	541.9	-0.7	-7.6	1,286,101.52	3,138,817.84	40.117668	-105.003657	
636.0	1.50	271.20	635.9	-0.8	-10.0	1,286,101.49	3,138,815.46	40.117668	-105.003666	
729.0	1.60	274.60	728.9	-0.6	-12.5	1,286,101.60	3,138,812.95	40.117668	-105.003675	
823.0	2.40	270.20	822.8	-0.5	-15.8	1,286,101.70	3,138,809.67	40.117669	-105.003687	
890.0	3.60	266.60	889.7	-0.6	-19.3	1,286,101.56	3,138,806.17	40.117668	-105.003699	
1,013.0	4.40	267.80	1,012.4	-1.0	-27.9	1,286,101.10	3,138,797.61	40.117667	-105.003730	
1,106.0	4.50	269.40	1,105.1	-1.2	-35.1	1,286,100.89	3,138,790.39	40.117667	-105.003756	

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
1,200.0	4.40	269.80	1,198.9	-1.3	-42.4	1,286,100.79	3,138,783.10	40.117667	-105.003782
1,294.0	4.40	270.70	1,292.6	-1.2	-49.6	1,286,100.78	3,138,775.89	40.117667	-105.003808
1,387.0	4.40	271.40	1,385.3	-1.1	-56.7	1,286,100.87	3,138,768.76	40.117667	-105.003833
1,481.0	4.20	268.10	1,479.0	-1.1	-63.7	1,286,100.81	3,138,761.71	40.117667	-105.003858
1,576.0	4.00	268.00	1,573.8	-1.4	-70.5	1,286,100.54	3,138,754.92	40.117666	-105.003882
1,671.0	3.80	270.20	1,668.6	-1.5	-77.0	1,286,100.40	3,138,748.46	40.117666	-105.003906
1,766.0	5.80	261.00	1,763.2	-2.2	-84.9	1,286,099.62	3,138,740.58	40.117664	-105.003934
1,861.0	4.70	261.80	1,857.8	-3.5	-93.5	1,286,098.26	3,138,731.99	40.117660	-105.003965
1,956.0	4.80	262.40	1,952.5	-4.6	-101.3	1,286,097.14	3,138,724.21	40.117657	-105.003992
2,051.0	4.90	262.20	2,047.2	-5.7	-109.2	1,286,096.02	3,138,716.25	40.117654	-105.004021
2,147.0	4.80	260.10	2,142.8	-6.9	-117.3	1,286,094.72	3,138,708.24	40.117651	-105.004050
2,242.0	4.80	257.80	2,237.5	-8.4	-125.1	1,286,093.16	3,138,700.45	40.117647	-105.004077
2,337.0	4.50	257.00	2,332.2	-10.1	-132.6	1,286,091.44	3,138,692.94	40.117642	-105.004104
2,432.0	4.20	268.80	2,426.9	-11.0	-139.7	1,286,090.49	3,138,685.84	40.117640	-105.004130
2,527.0	4.10	272.00	2,521.7	-11.0	-146.5	1,286,090.49	3,138,678.97	40.117640	-105.004154
2,622.0	3.90	269.60	2,616.4	-10.9	-153.2	1,286,090.55	3,138,672.34	40.117640	-105.004178
2,718.0	3.90	273.10	2,712.2	-10.7	-159.7	1,286,090.67	3,138,665.82	40.117641	-105.004201
2,813.0	4.40	271.20	2,807.0	-10.5	-166.6	1,286,090.88	3,138,658.95	40.117641	-105.004226
2,908.0	4.50	272.70	2,901.7	-10.2	-173.9	1,286,091.09	3,138,651.58	40.117642	-105.004252
3,003.0	5.20	270.80	2,996.3	-10.0	-182.0	1,286,091.28	3,138,643.55	40.117643	-105.004281
3,098.0	5.40	269.90	3,090.9	-9.9	-190.7	1,286,091.29	3,138,634.77	40.117643	-105.004312
3,194.0	5.20	270.00	3,186.5	-10.0	-199.6	1,286,091.23	3,138,625.91	40.117643	-105.004344
3,289.0	5.00	271.80	3,281.1	-9.8	-208.0	1,286,091.31	3,138,617.46	40.117643	-105.004374
3,384.0	4.80	274.10	3,375.8	-9.4	-216.1	1,286,091.68	3,138,609.36	40.117644	-105.004403
3,479.0	4.40	279.00	3,470.5	-8.6	-223.7	1,286,092.49	3,138,601.79	40.117647	-105.004430
3,575.0	5.20	271.60	3,566.1	-7.9	-231.7	1,286,093.15	3,138,593.80	40.117648	-105.004459
3,670.0	4.50	254.70	3,660.8	-8.7	-239.6	1,286,092.24	3,138,585.91	40.117646	-105.004487
3,765.0	3.90	257.40	3,755.6	-10.4	-246.3	1,286,090.51	3,138,579.17	40.117641	-105.004511
3,860.0	3.60	263.50	3,850.4	-11.5	-252.5	1,286,089.44	3,138,573.06	40.117639	-105.004533
3,956.0	4.60	251.60	3,946.1	-13.0	-259.1	1,286,087.84	3,138,566.42	40.117634	-105.004557
4,051.0	4.40	252.80	4,040.8	-15.3	-266.2	1,286,085.52	3,138,559.34	40.117628	-105.004582
4,146.0	4.40	254.40	4,135.5	-17.3	-273.2	1,286,083.43	3,138,552.36	40.117622	-105.004607
4,241.0	4.10	253.10	4,230.3	-19.3	-280.0	1,286,081.42	3,138,545.61	40.117617	-105.004631
4,336.0	3.60	252.90	4,325.1	-21.2	-286.1	1,286,079.52	3,138,539.52	40.117612	-105.004653
4,432.0	3.20	251.30	4,420.9	-22.9	-291.5	1,286,077.75	3,138,534.11	40.117607	-105.004672
4,527.0	3.10	252.40	4,515.7	-24.6	-296.4	1,286,076.09	3,138,529.16	40.117603	-105.004690
4,622.0	3.10	253.90	4,610.6	-26.0	-301.4	1,286,074.58	3,138,524.25	40.117599	-105.004708
4,717.0	3.20	249.10	4,705.5	-27.7	-306.3	1,286,072.89	3,138,519.32	40.117594	-105.004725
4,812.0	3.40	244.00	4,800.3	-29.9	-311.3	1,286,070.68	3,138,514.32	40.117588	-105.004743
4,908.0	3.60	247.70	4,896.1	-32.3	-316.7	1,286,068.26	3,138,508.99	40.117581	-105.004762
5,003.0	2.70	275.40	4,991.0	-33.2	-321.6	1,286,067.31	3,138,504.00	40.117579	-105.004780
5,098.0	2.40	280.20	5,085.9	-32.6	-325.8	1,286,067.85	3,138,499.81	40.117580	-105.004795
5,193.0	0.40	19.80	5,180.9	-32.0	-327.7	1,286,068.50	3,138,497.97	40.117582	-105.004802
5,288.0	0.40	18.10	5,275.9	-31.3	-327.5	1,286,069.13	3,138,498.18	40.117584	-105.004801
5,383.0	0.40	6.90	5,370.9	-30.7	-327.3	1,286,069.78	3,138,498.32	40.117586	-105.004801
5,478.0	0.40	352.20	5,465.9	-30.0	-327.3	1,286,070.43	3,138,498.31	40.117588	-105.004801
5,573.0	0.30	0.10	5,560.9	-29.5	-327.4	1,286,071.01	3,138,498.26	40.117589	-105.004801
5,668.0	0.50	12.10	5,655.9	-28.8	-327.3	1,286,071.67	3,138,498.34	40.117591	-105.004800
5,763.0	0.70	20.40	5,750.9	-27.9	-327.0	1,286,072.62	3,138,498.63	40.117594	-105.004799
5,858.0	0.50	30.90	5,845.8	-27.0	-326.6	1,286,073.52	3,138,499.04	40.117596	-105.004798
5,953.0	0.20	312.20	5,940.8	-26.5	-326.5	1,286,073.99	3,138,499.13	40.117597	-105.004798
6,048.0	0.40	312.30	6,035.8	-26.2	-326.8	1,286,074.32	3,138,498.76	40.117598	-105.004799
6,143.0	0.10	343.60	6,130.8	-25.9	-327.1	1,286,074.62	3,138,498.48	40.117599	-105.004800
6,239.0	0.30	314.80	6,226.8	-25.6	-327.3	1,286,074.88	3,138,498.28	40.117600	-105.004801
6,334.0	0.30	322.60	6,321.8	-25.2	-327.6	1,286,075.25	3,138,497.95	40.117601	-105.004802

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
6,429.0	0.20	306.30	6,416.8	-24.9	-327.9	1,286,075.54	3,138,497.67	40.117602	-105.004803
6,524.0	0.30	291.10	6,511.8	-24.7	-328.3	1,286,075.73	3,138,497.30	40.117602	-105.004804
6,619.0	0.30	322.40	6,606.8	-24.5	-328.7	1,286,076.01	3,138,496.91	40.117603	-105.004806
6,714.0	0.30	335.40	6,701.8	-24.0	-328.9	1,286,076.43	3,138,496.66	40.117604	-105.004806
6,809.0	0.20	334.40	6,796.8	-23.7	-329.1	1,286,076.81	3,138,496.48	40.117605	-105.004807
6,904.0	5.80	5.70	6,891.7	-18.7	-328.7	1,286,081.74	3,138,496.86	40.117619	-105.004806
6,951.0	11.60	359.80	6,938.1	-11.6	-328.5	1,286,088.84	3,138,497.04	40.117638	-105.004805
7,000.0	16.00	359.90	6,985.7	0.1	-328.5	1,286,100.52	3,138,496.94	40.117670	-105.004805
7,047.0	21.10	359.30	7,030.2	15.0	-328.6	1,286,115.47	3,138,496.74	40.117711	-105.004805
7,095.0	26.00	1.10	7,074.2	34.2	-328.5	1,286,134.64	3,138,496.73	40.117764	-105.004805
7,142.0	32.20	1.20	7,115.3	57.0	-328.1	1,286,157.48	3,138,497.07	40.117827	-105.004803
7,190.0	37.90	2.20	7,154.5	84.6	-327.2	1,286,185.03	3,138,497.75	40.117902	-105.004800
7,237.0	44.40	3.50	7,189.9	115.4	-325.7	1,286,215.90	3,138,499.13	40.117987	-105.004795
7,285.0	48.80	2.70	7,222.9	150.2	-323.8	1,286,250.73	3,138,500.81	40.118082	-105.004788
7,332.0	51.50	2.00	7,253.0	186.3	-322.3	1,286,286.79	3,138,502.09	40.118181	-105.004783
7,380.0	54.70	1.00	7,281.8	224.7	-321.3	1,286,325.16	3,138,502.87	40.118287	-105.004779
7,427.0	56.90	0.90	7,308.2	263.5	-320.7	1,286,364.03	3,138,503.30	40.118393	-105.004777
7,476.0	61.10	0.70	7,333.5	305.5	-320.1	1,286,406.02	3,138,503.65	40.118509	-105.004775
7,523.0	64.80	1.60	7,354.8	347.4	-319.3	1,286,447.86	3,138,504.26	40.118624	-105.004772
7,571.0	66.20	0.80	7,374.7	391.0	-318.3	1,286,491.53	3,138,504.93	40.118743	-105.004769
7,618.0	72.00	359.40	7,391.5	434.9	-318.3	1,286,535.44	3,138,504.75	40.118864	-105.004768
7,666.0	77.20	359.30	7,404.2	481.2	-318.8	1,286,581.69	3,138,503.96	40.118991	-105.004770
7,713.0	81.30	0.40	7,413.0	527.3	-318.9	1,286,627.85	3,138,503.59	40.119118	-105.004771
7,761.0	84.70	359.80	7,418.9	575.0	-318.8	1,286,675.49	3,138,503.40	40.119248	-105.004770
7,771.0	86.40	0.20	7,419.6	584.9	-318.8	1,286,685.46	3,138,503.35	40.119276	-105.004770
7,891.0	88.00	358.40	7,425.5	704.8	-320.3	1,286,805.27	3,138,501.21	40.119605	-105.004776
7,985.0	89.70	359.30	7,427.4	798.7	-322.2	1,286,899.22	3,138,498.80	40.119863	-105.004782
8,078.0	89.70	0.10	7,427.9	891.7	-322.7	1,286,992.21	3,138,497.79	40.120118	-105.004784
8,172.0	91.60	0.50	7,426.8	985.7	-322.2	1,287,086.20	3,138,497.76	40.120376	-105.004782
8,266.0	90.00	359.10	7,425.5	1,079.7	-322.5	1,287,180.18	3,138,496.90	40.120634	-105.004783
8,360.0	91.60	0.30	7,424.2	1,173.7	-323.0	1,287,274.16	3,138,495.88	40.120892	-105.004785
8,453.0	91.70	359.60	7,421.5	1,266.6	-323.1	1,287,367.12	3,138,495.28	40.121147	-105.004786
8,547.0	89.80	0.50	7,420.3	1,360.6	-323.0	1,287,461.10	3,138,494.84	40.121405	-105.004785
8,641.0	89.30	0.30	7,421.0	1,454.6	-322.3	1,287,555.10	3,138,494.97	40.121663	-105.004783
8,734.0	90.10	0.50	7,421.5	1,547.6	-321.7	1,287,648.10	3,138,495.10	40.121918	-105.004781
8,828.0	91.40	2.30	7,420.3	1,641.6	-319.4	1,287,742.07	3,138,496.87	40.122176	-105.004772
8,921.0	91.90	0.90	7,417.6	1,734.5	-316.8	1,287,835.00	3,138,498.94	40.122432	-105.004763
9,014.0	92.40	0.90	7,414.1	1,827.4	-315.3	1,287,927.93	3,138,499.88	40.122687	-105.004758
9,108.0	90.80	0.40	7,411.5	1,921.4	-314.3	1,288,021.89	3,138,500.42	40.122945	-105.004754
9,201.0	90.20	0.60	7,410.7	2,014.4	-313.5	1,288,114.89	3,138,500.71	40.123200	-105.004751
9,295.0	91.60	1.90	7,409.2	2,108.3	-311.4	1,288,208.86	3,138,502.24	40.123458	-105.004744
9,389.0	92.00	1.80	7,406.2	2,202.2	-308.4	1,288,302.78	3,138,504.74	40.123716	-105.004733
9,482.0	90.50	1.20	7,404.2	2,295.2	-306.0	1,288,395.73	3,138,506.66	40.123971	-105.004724
9,576.0	90.10	0.70	7,403.7	2,389.2	-304.4	1,288,489.73	3,138,507.69	40.124229	-105.004719
9,669.0	91.10	0.60	7,402.7	2,482.2	-303.3	1,288,582.72	3,138,508.22	40.124484	-105.004715
9,763.0	90.40	358.30	7,401.5	2,576.1	-304.2	1,288,676.69	3,138,506.80	40.124742	-105.004718
9,856.0	90.80	358.70	7,400.5	2,669.1	-306.7	1,288,769.64	3,138,503.84	40.124997	-105.004727
9,950.0	90.70	358.50	7,399.3	2,763.1	-309.0	1,288,863.59	3,138,501.02	40.125255	-105.004735
10,044.0	91.20	359.80	7,397.7	2,857.0	-310.4	1,288,957.56	3,138,499.10	40.125513	-105.004740
10,139.0	91.30	359.50	7,395.7	2,952.0	-310.9	1,289,052.53	3,138,497.99	40.125774	-105.004742
10,233.0	90.90	358.80	7,393.9	3,046.0	-312.3	1,289,146.49	3,138,496.07	40.126032	-105.004747
10,327.0	91.00	359.60	7,392.3	3,140.0	-313.7	1,289,240.46	3,138,494.23	40.126290	-105.004752
10,422.0	92.60	359.70	7,389.3	3,234.9	-314.2	1,289,335.40	3,138,493.12	40.126550	-105.004754
10,516.0	90.60	359.70	7,386.7	3,328.9	-314.7	1,289,429.35	3,138,492.10	40.126808	-105.004756
10,611.0	90.70	359.40	7,385.6	3,423.9	-315.5	1,289,524.34	3,138,490.82	40.127069	-105.004758

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
10,705.0	91.60	359.50	7,383.7	3,517.8	-316.4	1,289,618.31	3,138,489.39	40.127327	-105.004762
10,799.0	91.50	359.00	7,381.2	3,611.8	-317.6	1,289,712.26	3,138,487.64	40.127585	-105.004766
10,894.0	91.10	358.60	7,379.0	3,706.7	-319.6	1,289,807.20	3,138,485.12	40.127846	-105.004773
10,988.0	90.70	357.90	7,377.6	3,800.7	-322.5	1,289,901.13	3,138,481.72	40.128103	-105.004783
11,083.0	91.60	358.40	7,375.7	3,895.6	-325.5	1,289,996.04	3,138,478.12	40.128364	-105.004794
11,177.0	91.60	357.40	7,373.0	3,989.5	-329.0	1,290,089.91	3,138,474.15	40.128622	-105.004807
11,272.0	91.70	358.40	7,370.3	4,084.4	-332.5	1,290,184.79	3,138,470.14	40.128882	-105.004819
11,383.0	91.40	359.80	7,367.3	4,195.4	-334.2	1,290,295.72	3,138,467.78	40.129187	-105.004825
11,477.0	91.00	359.40	7,365.3	4,289.3	-334.8	1,290,389.69	3,138,466.60	40.129445	-105.004828
11,570.0	90.50	358.40	7,364.1	4,382.3	-336.6	1,290,482.65	3,138,464.29	40.129700	-105.004834
11,664.0	89.90	357.90	7,363.8	4,476.3	-339.7	1,290,576.59	3,138,460.73	40.129958	-105.004845
11,757.0	91.20	357.70	7,362.9	4,569.2	-343.2	1,290,669.49	3,138,456.64	40.130213	-105.004858
11,851.0	90.60	357.70	7,361.4	4,663.1	-347.0	1,290,763.38	3,138,452.34	40.130471	-105.004871
11,944.0	89.90	357.50	7,361.0	4,756.0	-350.9	1,290,856.27	3,138,447.93	40.130726	-105.004885
12,038.0	91.30	359.00	7,360.0	4,850.0	-353.8	1,290,950.20	3,138,444.53	40.130984	-105.004895
12,131.0	90.60	358.40	7,358.5	4,942.9	-355.9	1,291,043.15	3,138,441.90	40.131239	-105.004903
12,225.0	91.20	358.30	7,357.0	5,036.9	-358.6	1,291,137.08	3,138,438.67	40.131497	-105.004913
12,318.0	91.80	359.80	7,354.6	5,129.8	-360.1	1,291,230.02	3,138,436.61	40.131752	-105.004918
12,412.0	90.90	358.70	7,352.4	5,223.8	-361.4	1,291,323.98	3,138,434.85	40.132010	-105.004923
12,505.0	90.30	356.70	7,351.4	5,316.7	-365.1	1,291,416.87	3,138,430.60	40.132265	-105.004936
12,599.0	89.50	354.60	7,351.5	5,410.4	-372.2	1,291,510.55	3,138,422.95	40.132522	-105.004961
12,692.0	89.50	353.70	7,352.4	5,502.9	-381.7	1,291,603.01	3,138,412.95	40.132776	-105.004995
12,786.0	90.70	357.40	7,352.2	5,596.6	-389.0	1,291,696.67	3,138,405.13	40.133034	-105.005021
12,879.0	91.00	0.30	7,350.8	5,689.6	-390.9	1,291,789.62	3,138,402.75	40.133289	-105.005028
12,973.0	92.40	1.50	7,348.0	5,783.5	-389.4	1,291,883.57	3,138,403.70	40.133547	-105.005023
13,067.0	92.00	1.00	7,344.4	5,877.4	-387.3	1,291,977.48	3,138,405.22	40.133804	-105.005016
13,162.0	91.80	359.90	7,341.3	5,972.4	-386.6	1,292,072.43	3,138,405.44	40.134065	-105.005013
13,256.0	91.30	359.60	7,338.7	6,066.3	-387.0	1,292,166.39	3,138,404.50	40.134323	-105.005014
13,351.0	90.90	358.20	7,336.9	6,161.3	-388.8	1,292,261.34	3,138,402.14	40.134584	-105.005021
13,447.0	91.20	0.00	7,335.1	6,257.3	-390.3	1,292,357.30	3,138,400.10	40.134847	-105.005026
13,541.0	91.20	359.50	7,333.2	6,351.3	-390.7	1,292,451.27	3,138,399.16	40.135105	-105.005028
13,636.0	91.00	359.10	7,331.3	6,446.2	-391.9	1,292,546.24	3,138,397.47	40.135366	-105.005032
13,730.0	90.60	358.20	7,330.0	6,540.2	-394.1	1,292,640.19	3,138,394.73	40.135624	-105.005040
13,825.0	91.00	359.40	7,328.7	6,635.2	-396.1	1,292,735.15	3,138,392.21	40.135885	-105.005047
13,919.0	89.80	359.60	7,328.1	6,729.2	-396.9	1,292,829.13	3,138,390.86	40.136143	-105.005050
14,014.0	90.10	359.30	7,328.1	6,824.2	-397.8	1,292,924.12	3,138,389.42	40.136403	-105.005053
14,108.0	90.20	358.30	7,327.9	6,918.1	-399.8	1,293,018.09	3,138,386.93	40.136661	-105.005060
14,203.0	90.20	357.70	7,327.6	7,013.1	-403.1	1,293,113.01	3,138,383.08	40.136922	-105.005072
14,297.0	90.60	357.20	7,326.9	7,107.0	-407.3	1,293,206.89	3,138,378.37	40.137180	-105.005087
14,392.0	90.10	356.20	7,326.3	7,201.8	-412.8	1,293,301.69	3,138,372.37	40.137440	-105.005107
14,486.0	90.70	357.80	7,325.7	7,295.7	-417.7	1,293,395.53	3,138,366.93	40.137698	-105.005124
14,581.0	91.90	0.20	7,323.5	7,390.6	-419.4	1,293,490.47	3,138,364.74	40.137958	-105.005130
14,675.0	92.40	358.90	7,320.0	7,484.6	-420.1	1,293,584.39	3,138,363.47	40.138216	-105.005133
14,770.0	91.30	359.40	7,316.9	7,579.5	-421.5	1,293,679.32	3,138,361.53	40.138477	-105.005138
14,864.0	90.90	359.50	7,315.1	7,673.5	-422.4	1,293,773.30	3,138,360.11	40.138735	-105.005141
14,959.0	90.80	0.00	7,313.7	7,768.5	-422.8	1,293,868.28	3,138,359.16	40.138996	-105.005143
15,053.0	89.20	358.70	7,313.7	7,862.5	-423.9	1,293,962.26	3,138,357.57	40.139254	-105.005146
15,148.0	89.40	358.60	7,314.9	7,957.4	-426.1	1,294,057.21	3,138,354.80	40.139514	-105.005154
15,243.0	91.00	359.10	7,314.5	8,052.4	-428.0	1,294,152.18	3,138,352.36	40.139775	-105.005161
15,337.0	90.50	359.40	7,313.3	8,146.4	-429.3	1,294,246.15	3,138,350.60	40.140033	-105.005166
15,431.0	90.40	358.00	7,312.6	8,240.4	-431.4	1,294,340.11	3,138,347.95	40.140291	-105.005173
15,526.0	90.50	357.50	7,311.8	8,335.3	-435.1	1,294,435.01	3,138,343.68	40.140552	-105.005187
15,621.0	90.40	356.20	7,311.1	8,430.1	-440.3	1,294,529.83	3,138,337.93	40.140812	-105.005205
15,715.0	89.50	357.50	7,311.2	8,524.0	-445.5	1,294,623.66	3,138,332.24	40.141070	-105.005224
15,811.0	90.30	357.70	7,311.3	8,619.9	-449.5	1,294,719.55	3,138,327.69	40.141333	-105.005238

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4C-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4C-21H-O268	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
15,906.0	90.80	358.10	7,310.4	8,714.8	-453.0	1,294,814.46	3,138,323.67	40.141593	-105.005251
16,000.0	90.90	358.70	7,309.0	8,808.8	-455.6	1,294,908.39	3,138,320.52	40.141851	-105.005260
16,095.0	90.50	359.80	7,307.9	8,903.8	-456.9	1,295,003.40	3,138,318.75	40.142112	-105.005264
16,189.0	90.50	359.20	7,307.0	8,997.8	-457.7	1,295,097.39	3,138,317.40	40.142370	-105.005267
16,284.0	90.30	0.10	7,306.4	9,092.8	-458.3	1,295,192.38	3,138,316.29	40.142631	-105.005269
16,378.0	89.70	359.30	7,306.4	9,186.8	-458.8	1,295,286.37	3,138,315.27	40.142889	-105.005271
16,473.0	90.40	359.80	7,306.3	9,281.8	-459.5	1,295,381.36	3,138,313.99	40.143150	-105.005274
16,567.0	90.50	359.20	7,305.5	9,375.8	-460.3	1,295,475.35	3,138,312.65	40.143408	-105.005277
16,661.0	90.50	358.30	7,304.7	9,469.7	-462.4	1,295,569.31	3,138,310.07	40.143666	-105.005284
16,712.0	90.50	357.80	7,304.3	9,520.7	-464.1	1,295,620.23	3,138,308.05	40.143806	-105.005290
Last CES Survey @ 16,712' MD									
16,767.0	90.50	357.80	7,303.8	9,575.6	-466.2	1,295,675.18	3,138,305.63	40.143957	-105.005298
PTB @ 16,767'									

Design 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									
Edith Ann-Duckworth 4C	0.00	0.00	7,335.3	9,886.6	-480.8	1,295,986.04	3,138,289.28	40.144810	-105.005350
- survey misses target center by 312.9ft at 16767.0ft MD (7303.8 TVD, 9575.6 N, -466.2 E)									
- Point									

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
16,712.0	7,304.3	9,520.7	-464.1	Last CES Survey @ 16,712' MD	
16,767.0	7,303.8	9,575.6	-466.2	PTB @ 16,767'	

Checked By: _____ Approved By: _____ Date: _____