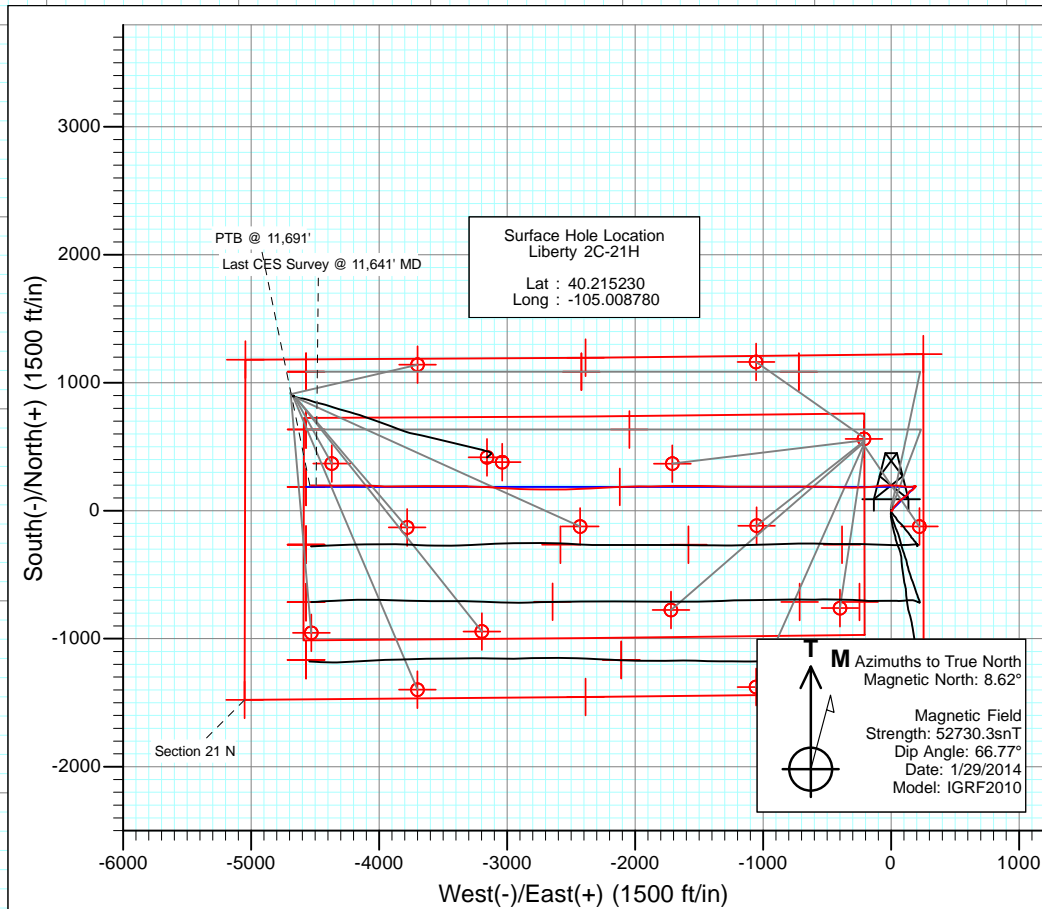
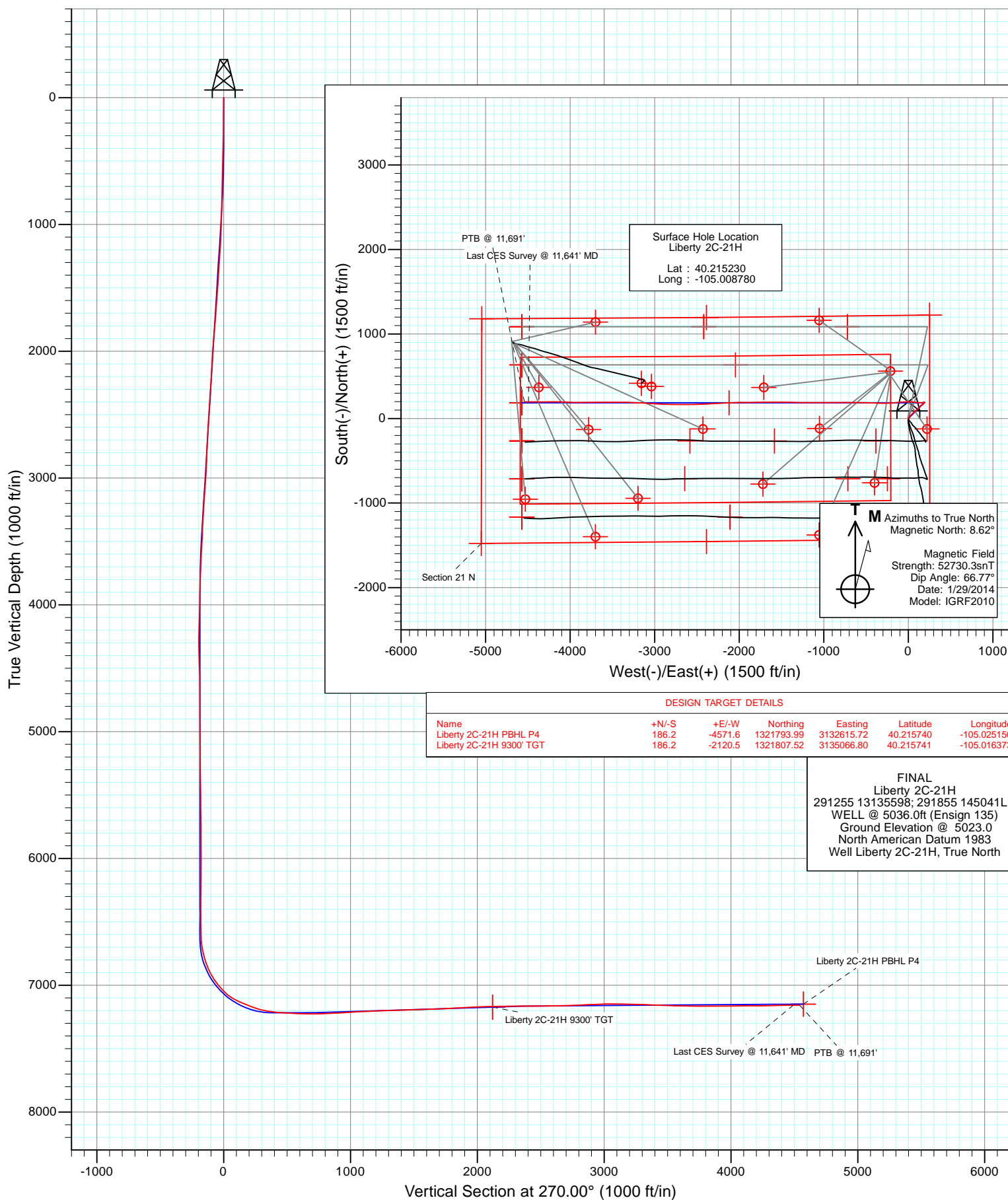




Project: DJ Wattenberg
 Site: S20-T3N-R68W (Liberty 2A-21H)
 Well: Liberty 2C-21H
 Wellbore: Hz
 Design: FINAL



DESIGN TARGET DETAILS

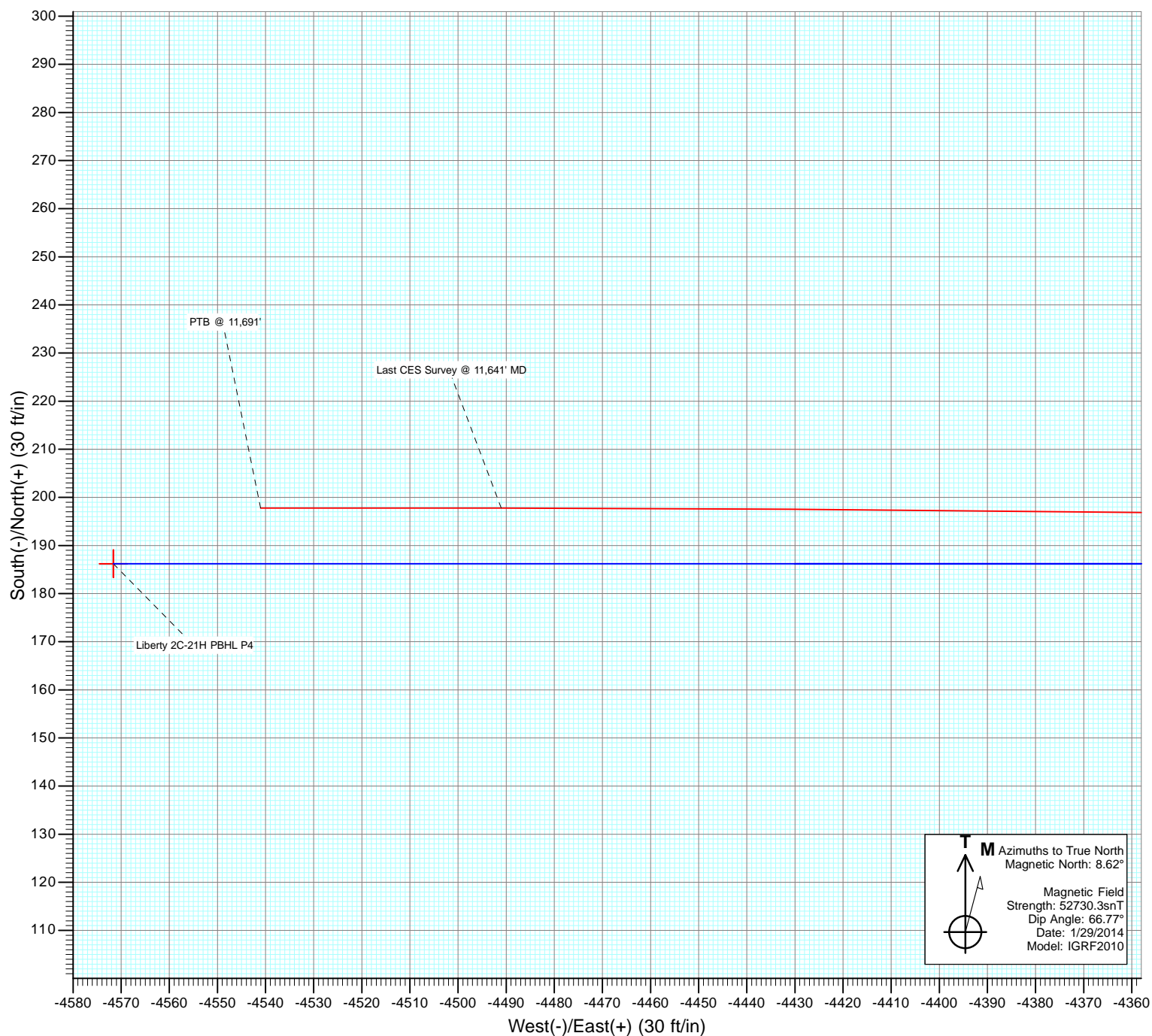
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Liberty 2C-21H PBHL P4	186.2	-4571.6	1321793.99	3132615.72	40.215740	-105.025150
Liberty 2C-21H 9300' TGT	186.2	-2120.5	1321807.52	3135066.80	40.215741	-105.016373

FINAL
 Liberty 2C-21H
 291255 13135598; 291855 145041LR
 WELL @ 5036.0ft (Ensign 135)
 Ground Elevation @ 5023.0
 North American Datum 1983
 Well Liberty 2C-21H, True North

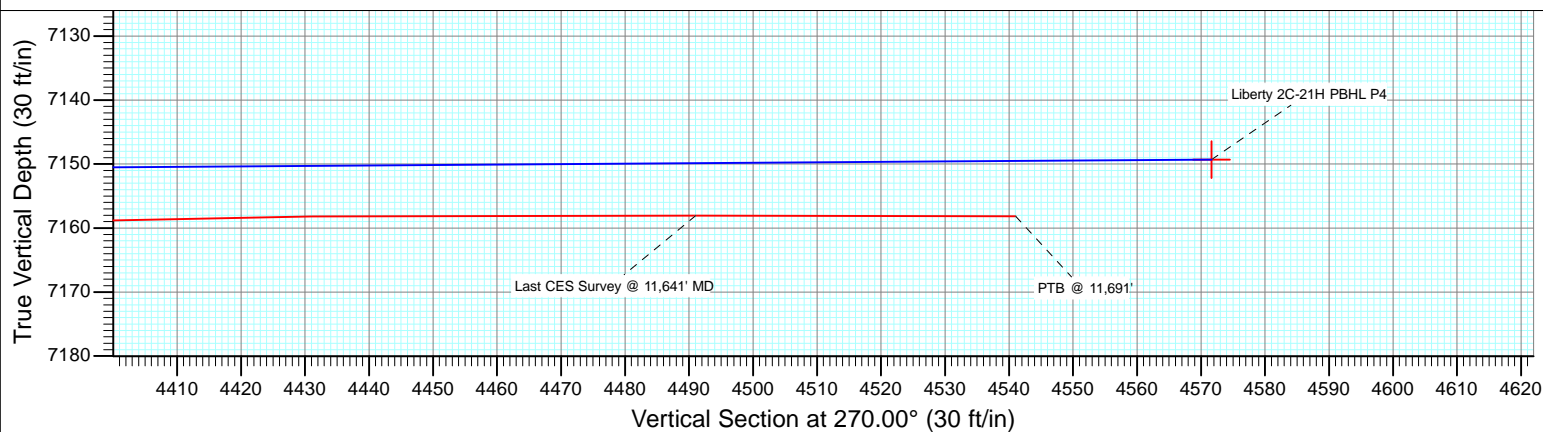
Liberty 2C-21H PBHL P4
 Liberty 2C-21H 9300' TGT
 Last CES Survey @ 11,641' MD
 PTB @ 11,691'



Project: DJ Wattenberg
Site: S20-T3N-R68W (Liberty 2A-21H)
Well: Liberty 2C-21H
Wellbore: Hz
Design: FINAL



M Azimuths to True North
Magnetic North: 8.62°
Magnetic Field
Strength: 52730.3snT
Dip Angle: 66.77°
Date: 1/29/2014
Model: IGRF2010



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	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	S20-T3N-R68W (Liberty 2A-21H)				
Site Position:		Northing:	1,322,254.59 ft	Latitude:	40.216940
From:	Lat/Long	Easting:	3,136,925.14 ft	Longitude:	-105.009710
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.32 °

Well	Liberty 2C-21H					
Well Position	+N/-S	0.0 ft	Northing:	1,321,633.10 ft	Latitude:	40.215230
	+E/-W	0.0 ft	Easting:	3,137,188.30 ft	Longitude:	-105.008780
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,023.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/29/2014	8.63	66.77	52,730

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	270.00

Survey Program	Date	2/6/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
145.0	11,691.0	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	
145.0	0.30	95.50	145.0	0.0	0.4	-0.4	0.21	0.21	
237.0	0.40	110.80	237.0	-0.2	0.9	-0.9	0.15	0.11	
298.0	1.40	114.20	298.0	-0.6	1.8	-1.8	1.64	1.64	
360.0	1.60	108.70	360.0	-1.1	3.3	-3.3	0.40	0.32	
421.0	1.60	117.50	420.9	-1.8	4.9	-4.9	0.40	0.00	
513.0	1.60	66.50	512.9	-1.9	7.2	-7.2	1.50	0.00	
605.0	2.40	32.40	604.9	0.2	9.4	-9.4	1.52	0.87	
696.0	2.60	20.60	695.8	3.8	11.1	-11.1	0.61	0.22	
788.0	3.40	15.50	787.6	8.4	12.6	-12.6	0.92	0.87	
862.0	4.00	29.70	861.5	12.7	14.5	-14.5	1.47	0.81	
1,005.0	4.00	24.40	1,004.1	21.6	19.0	-19.0	0.26	0.00	
1,097.0	4.90	27.20	1,095.9	28.0	22.1	-22.1	1.01	0.98	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	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
1,189.0	6.00	39.40	1,187.5	35.2	27.0	-27.0	1.73	1.20	
1,280.0	5.50	54.20	1,278.0	41.5	33.5	-33.5	1.71	-0.55	
1,372.0	4.70	38.20	1,369.6	47.0	39.4	-39.4	1.77	-0.87	
1,464.0	5.70	44.80	1,461.3	53.2	45.0	-45.0	1.26	1.09	
1,556.0	5.60	37.30	1,552.8	60.0	50.9	-50.9	0.81	-0.11	
1,648.0	6.60	40.30	1,644.3	67.6	57.1	-57.1	1.14	1.09	
1,740.0	6.20	53.00	1,735.7	74.6	64.5	-64.5	1.60	-0.43	
1,831.0	6.50	43.00	1,826.2	81.4	71.9	-71.9	1.26	0.33	
1,923.0	5.80	61.40	1,917.6	87.4	79.5	-79.5	2.26	-0.76	
2,017.0	4.60	52.00	2,011.3	92.0	86.7	-86.7	1.56	-1.28	
2,112.0	3.90	36.10	2,106.0	97.0	91.6	-91.6	1.44	-0.74	
2,207.0	4.60	59.10	2,200.7	101.5	96.7	-96.7	1.92	0.74	
2,301.0	3.90	52.60	2,294.5	105.4	102.5	-102.5	0.90	-0.74	
2,396.0	5.20	59.60	2,389.2	109.5	108.8	-108.8	1.49	1.37	
2,491.0	4.00	50.70	2,483.9	113.8	115.1	-115.1	1.47	-1.26	
2,586.0	5.40	43.90	2,578.6	119.1	120.7	-120.7	1.58	1.47	
2,680.0	4.10	35.50	2,672.2	125.1	125.8	-125.8	1.56	-1.38	
2,774.0	4.90	37.90	2,765.9	131.0	130.2	-130.2	0.87	0.85	
2,869.0	4.90	27.90	2,860.6	137.7	134.6	-134.6	0.90	0.00	
2,963.0	6.20	27.00	2,954.2	145.8	138.8	-138.8	1.39	1.38	
3,057.0	4.70	56.10	3,047.7	152.5	144.3	-144.3	3.29	-1.60	
3,152.0	4.50	76.10	3,142.4	155.6	151.1	-151.1	1.69	-0.21	
3,247.0	3.30	74.00	3,237.2	157.2	157.3	-157.3	1.27	-1.26	
3,341.0	3.80	62.00	3,331.0	159.4	162.7	-162.7	0.95	0.53	
3,436.0	2.70	45.10	3,425.9	162.5	167.1	-167.1	1.52	-1.16	
3,531.0	4.30	50.60	3,520.7	166.3	171.4	-171.4	1.72	1.68	
3,625.0	3.80	47.20	3,614.5	170.7	176.4	-176.4	0.59	-0.53	
3,720.0	3.80	45.00	3,709.3	175.0	180.9	-180.9	0.15	0.00	
3,815.0	3.20	34.60	3,804.1	179.4	184.7	-184.7	0.92	-0.63	
3,910.0	2.80	19.40	3,899.0	183.8	187.0	-187.0	0.93	-0.42	
4,004.0	2.90	22.50	3,992.8	188.2	188.6	-188.6	0.20	0.11	
4,099.0	2.40	42.00	4,087.7	191.9	190.9	-190.9	1.08	-0.53	
4,194.0	1.70	132.40	4,182.7	192.4	193.2	-193.2	3.11	-0.74	
4,288.0	1.60	135.30	4,276.7	190.5	195.2	-195.2	0.14	-0.11	
4,383.0	1.80	277.70	4,371.7	189.8	194.7	-194.7	3.39	0.21	
4,478.0	1.90	272.00	4,466.6	190.0	191.6	-191.6	0.22	0.11	
4,572.0	1.80	274.90	4,560.6	190.2	188.6	-188.6	0.15	-0.11	
4,666.0	0.60	99.70	4,654.5	190.3	187.6	-187.6	2.55	-1.28	
4,760.0	0.10	132.20	4,748.5	190.1	188.1	-188.1	0.55	-0.53	
4,855.0	0.40	282.00	4,843.5	190.1	187.9	-187.9	0.51	0.32	
4,949.0	0.70	267.60	4,937.5	190.2	187.0	-187.0	0.35	0.32	
5,044.0	1.00	265.90	5,032.5	190.1	185.6	-185.6	0.32	0.32	
5,139.0	0.50	144.50	5,127.5	189.7	185.0	-185.0	1.40	-0.53	
5,233.0	0.40	218.20	5,221.5	189.1	185.0	-185.0	0.58	-0.11	
5,328.0	0.90	240.20	5,316.5	188.5	184.2	-184.2	0.58	0.53	
5,423.0	1.80	261.80	5,411.5	187.9	182.0	-182.0	1.07	0.95	
5,518.0	0.40	136.40	5,506.5	187.4	180.8	-180.8	2.17	-1.47	
5,613.0	0.80	304.90	5,601.5	187.6	180.5	-180.5	1.26	0.42	
5,707.0	1.00	309.70	5,695.5	188.5	179.3	-179.3	0.23	0.21	
5,802.0	0.40	10.40	5,790.4	189.3	178.7	-178.7	0.92	-0.63	
5,897.0	0.90	306.70	5,885.4	190.1	178.2	-178.2	0.85	0.53	
5,992.0	0.40	103.60	5,980.4	190.5	177.9	-177.9	1.34	-0.53	
6,086.0	0.60	341.20	6,074.4	190.9	178.1	-178.1	0.94	0.21	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	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
6,181.0	0.90	102.50	6,169.4	191.2	178.6	-178.6	1.38	0.32	
6,276.0	0.60	1.90	6,264.4	191.5	179.4	-179.4	1.23	-0.32	
6,371.0	1.50	148.10	6,359.4	191.0	180.1	-180.1	2.13	0.95	
6,465.0	0.40	227.40	6,453.4	189.7	180.5	-180.5	1.57	-1.17	
6,560.0	1.10	256.90	6,548.4	189.3	179.3	-179.3	0.82	0.74	
6,591.0	1.40	265.10	6,579.4	189.2	178.7	-178.7	1.12	0.97	
6,623.0	1.60	259.60	6,611.4	189.0	177.8	-177.8	0.77	0.62	
6,654.0	3.60	256.30	6,642.3	188.7	176.5	-176.5	6.47	6.45	
6,701.0	9.30	267.90	6,689.0	188.2	171.2	-171.2	12.38	12.13	
6,749.0	11.60	263.90	6,736.2	187.6	162.6	-162.6	5.02	4.79	
6,796.0	14.90	267.00	6,782.0	186.8	151.8	-151.8	7.18	7.02	
6,843.0	19.20	272.10	6,826.9	186.7	138.1	-138.1	9.68	9.15	
6,890.0	23.50	272.30	6,870.7	187.4	121.0	-121.0	9.15	9.15	
6,938.0	29.50	277.80	6,913.6	189.4	99.7	-99.7	13.49	12.50	
6,985.0	33.50	278.60	6,953.7	192.9	75.4	-75.4	8.56	8.51	
7,033.0	37.20	275.30	6,992.8	196.2	47.8	-47.8	8.67	7.71	
7,080.0	42.20	271.40	7,029.0	197.9	17.9	-17.9	11.88	10.64	
7,128.0	48.00	268.40	7,062.9	197.8	-16.1	16.1	12.87	12.08	
7,175.0	55.60	266.10	7,091.9	196.0	-53.0	53.0	16.62	16.17	
7,223.0	62.70	264.50	7,116.5	192.6	-94.0	94.0	15.07	14.79	
7,270.0	66.80	264.50	7,136.5	188.5	-136.3	136.3	8.72	8.72	
7,318.0	68.30	266.00	7,154.9	184.9	-180.5	180.5	4.26	3.12	
7,365.0	69.40	267.60	7,171.8	182.4	-224.3	224.3	3.94	2.34	
7,412.0	73.10	268.60	7,186.9	180.9	-268.8	268.8	8.13	7.87	
7,459.0	77.20	270.20	7,199.0	180.5	-314.2	314.2	9.32	8.72	
7,483.0	80.80	272.00	7,203.6	180.9	-337.7	337.7	16.71	15.00	
7,542.0	83.90	273.10	7,211.4	183.5	-396.1	396.1	5.57	5.25	
7,604.0	85.40	272.20	7,217.2	186.4	-457.8	457.8	2.82	2.42	
7,668.0	86.50	271.30	7,221.7	188.3	-521.6	521.6	2.22	1.72	
7,731.0	88.50	271.30	7,224.5	189.8	-584.5	584.5	3.17	3.17	
7,794.0	89.10	270.00	7,225.8	190.5	-647.5	647.5	2.27	0.95	
7,857.0	90.10	269.00	7,226.2	189.9	-710.5	710.5	2.24	1.59	
7,921.0	92.00	269.20	7,225.1	188.9	-774.5	774.5	2.99	2.97	
7,984.0	92.70	270.50	7,222.5	188.8	-837.4	837.4	2.34	1.11	
8,015.0	93.00	271.00	7,220.9	189.2	-868.4	868.4	1.88	0.97	
8,079.0	91.60	269.40	7,218.4	189.4	-932.3	932.3	3.32	-2.19	
8,173.0	94.00	269.80	7,213.8	188.7	-1,026.2	1,026.2	2.59	2.55	
8,268.0	93.40	270.40	7,207.6	188.9	-1,121.0	1,121.0	0.89	-0.63	
8,363.0	92.70	270.60	7,202.6	189.7	-1,215.9	1,215.9	0.77	-0.74	
8,457.0	91.80	270.90	7,198.9	191.0	-1,309.8	1,309.8	1.01	-0.96	
8,552.0	91.20	270.20	7,196.4	191.9	-1,404.8	1,404.8	0.97	-0.63	
8,647.0	91.30	270.70	7,194.3	192.6	-1,499.7	1,499.7	0.54	0.11	
8,741.0	92.50	270.20	7,191.2	193.4	-1,593.7	1,593.7	1.38	1.28	
8,836.0	92.00	269.20	7,187.5	192.9	-1,688.6	1,688.6	1.18	-0.53	
8,931.0	92.90	269.50	7,183.4	191.8	-1,783.5	1,783.5	1.00	0.95	
9,025.0	93.10	269.30	7,178.5	190.8	-1,877.4	1,877.4	0.30	0.21	
9,120.0	92.40	269.30	7,173.9	189.6	-1,972.3	1,972.3	0.74	-0.74	
9,215.0	92.20	268.50	7,170.1	187.8	-2,067.2	2,067.2	0.87	-0.21	
9,309.0	91.90	267.90	7,166.8	184.9	-2,161.1	2,161.1	0.71	-0.32	
9,404.0	89.40	265.50	7,165.7	179.4	-2,255.9	2,255.9	3.65	-2.63	
9,499.0	91.30	267.50	7,165.1	173.6	-2,350.7	2,350.7	2.90	2.00	
9,593.0	89.80	267.90	7,164.2	169.8	-2,444.6	2,444.6	1.65	-1.60	
9,688.0	90.20	268.60	7,164.2	166.9	-2,539.6	2,539.6	0.85	0.42	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
9,783.0	91.30	270.20	7,163.0	165.9	-2,634.5	2,634.5	2.04	1.16	
9,877.0	92.30	270.90	7,160.0	166.8	-2,728.5	2,728.5	1.30	1.06	
9,972.0	92.30	270.40	7,156.2	167.9	-2,823.4	2,823.4	0.53	0.00	
10,035.0	92.20	271.60	7,153.7	169.0	-2,886.4	2,886.4	1.91	-0.16	
10,098.0	92.60	272.60	7,151.1	171.3	-2,949.3	2,949.3	1.71	0.63	
10,161.0	91.50	273.60	7,148.8	174.7	-3,012.1	3,012.1	2.36	-1.75	
10,208.0	90.10	274.10	7,148.2	177.9	-3,059.0	3,059.0	3.16	-2.98	
10,256.0	88.70	273.40	7,148.7	181.0	-3,106.9	3,106.9	3.26	-2.92	
10,303.0	88.60	273.00	7,149.8	183.6	-3,153.8	3,153.8	0.88	-0.21	
10,350.0	88.70	273.20	7,150.9	186.2	-3,200.7	3,200.7	0.48	0.21	
10,445.0	88.90	272.40	7,152.9	190.8	-3,295.6	3,295.6	0.87	0.21	
10,539.0	87.20	269.50	7,156.1	192.4	-3,389.5	3,389.5	3.57	-1.81	
10,634.0	88.40	270.00	7,159.7	192.0	-3,484.4	3,484.4	1.37	1.26	
10,729.0	87.90	269.50	7,162.8	191.5	-3,579.4	3,579.4	0.74	-0.53	
10,823.0	89.80	270.20	7,164.7	191.3	-3,673.4	3,673.4	2.15	2.02	
10,918.0	89.80	269.80	7,165.0	191.3	-3,768.4	3,768.4	0.42	0.00	
11,013.0	89.30	269.10	7,165.8	190.4	-3,863.4	3,863.4	0.91	-0.53	
11,107.0	91.10	271.20	7,165.4	190.6	-3,957.4	3,957.4	2.94	1.91	
11,202.0	92.30	273.20	7,162.6	194.3	-4,052.2	4,052.2	2.45	1.26	
11,297.0	87.80	270.60	7,162.5	197.4	-4,147.2	4,147.2	5.47	-4.74	
11,392.0	91.60	269.00	7,163.0	197.1	-4,242.1	4,242.1	4.34	4.00	
11,486.0	92.00	270.50	7,160.1	196.7	-4,336.1	4,336.1	1.65	0.43	
11,581.0	90.30	270.50	7,158.2	197.5	-4,431.0	4,431.0	1.79	-1.79	
11,641.0	89.90	270.00	7,158.1	197.8	-4,491.0	4,491.0	1.07	-0.67	Last CES Survey @ 11,641' MD
11,691.0	89.90	270.00	7,158.2	197.8	-4,541.0	4,541.0	0.00	0.00	PTB @ 11,691'

Targets

Target Name	- hit/miss target	- Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Liberty 2C-21H 9300' TC			0.00	0.00	7,173.0	186.2	-2,120.5	1,321,807.52	3,135,066.80	40.215741	-105.016373
	- actual wellpath misses target center by 4.8ft at 9268.2ft MD (7168.2 TVD, 186.3 N, -2120.3 E)										
	- Point										
Liberty 2C-21H PBHL			0.00	0.00	7,155.2	186.2	-4,571.6	1,321,793.99	3,132,615.72	40.215740	-105.025150
	- actual wellpath misses target center by 32.8ft at 11691.0ft MD (7158.2 TVD, 197.8 N, -4541.0 E)										
	- Point										
Liberty 2C-21H PBHL P4			0.00	0.00	7,149.3	186.2	-4,571.6	1,321,793.99	3,132,615.72	40.215740	-105.025150
	- actual wellpath misses target center by 33.9ft at 11691.0ft MD (7158.2 TVD, 197.8 N, -4541.0 E)										
	- Point										

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
11,641.0	7,158.1	197.8	-4,491.0	Last CES Survey @ 11,641' MD
11,691.0	7,158.2	197.8	-4,541.0	PTB @ 11,691'

Checked By: _____ Approved By: _____ Date: _____

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S20-T3N-R68W (Liberty 2A-21H)

Liberty 2C-21H

Hz

Design: FINAL

Survey Report - Geographic

06 February, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	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	S20-T3N-R68W (Liberty 2A-21H)				
Site Position:		Northing:	1,322,254.59 ft	Latitude:	40.216940
From:	Lat/Long	Easting:	3,136,925.14 ft	Longitude:	-105.009710
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.32 °

Well	Liberty 2C-21H					
Well Position	+N/-S	0.0 ft	Northing:	1,321,633.10 ft	Latitude:	40.215230
	+E/-W	0.0 ft	Easting:	3,137,188.30 ft	Longitude:	-105.008780
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,023.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/29/2014	8.63	66.77	52,730

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	270.00	

Survey Program	Date	2/6/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
145.0	11,691.0	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	1,321,633.10	3,137,188.30	40.215230	-105.008780	
145.0	0.30	95.50	145.0	0.0	0.4	1,321,633.06	3,137,188.68	40.215230	-105.008779	
237.0	0.40	110.80	237.0	-0.2	0.9	1,321,632.93	3,137,189.22	40.215230	-105.008777	
298.0	1.40	114.20	298.0	-0.6	1.8	1,321,632.55	3,137,190.10	40.215229	-105.008774	
360.0	1.60	108.70	360.0	-1.1	3.3	1,321,631.97	3,137,191.61	40.215227	-105.008768	
421.0	1.60	117.50	420.9	-1.8	4.9	1,321,631.31	3,137,193.18	40.215225	-105.008763	
513.0	1.60	66.50	512.9	-1.9	7.2	1,321,631.25	3,137,195.50	40.215225	-105.008755	
605.0	2.40	32.40	604.9	0.2	9.4	1,321,633.40	3,137,197.69	40.215231	-105.008747	
696.0	2.60	20.60	695.8	3.8	11.1	1,321,636.95	3,137,199.42	40.215240	-105.008740	
788.0	3.40	15.50	787.6	8.4	12.6	1,321,641.54	3,137,200.86	40.215253	-105.008735	
862.0	4.00	29.70	861.5	12.7	14.5	1,321,645.90	3,137,202.70	40.215265	-105.008728	
1,005.0	4.00	24.40	1,004.1	21.6	19.0	1,321,654.80	3,137,207.18	40.215289	-105.008712	

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	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
1,097.0	4.90	27.20	1,095.9	28.0	22.1	1,321,661.24	3,137,210.27	40.215307	-105.008701
1,189.0	6.00	39.40	1,187.5	35.2	27.0	1,321,668.48	3,137,215.08	40.215327	-105.008684
1,280.0	5.50	54.20	1,278.0	41.5	33.5	1,321,674.74	3,137,221.60	40.215344	-105.008660
1,372.0	4.70	38.20	1,369.6	47.0	39.4	1,321,680.31	3,137,227.47	40.215359	-105.008639
1,464.0	5.70	44.80	1,461.3	53.2	45.0	1,321,686.55	3,137,232.99	40.215376	-105.008619
1,556.0	5.60	37.30	1,552.8	60.0	50.9	1,321,693.39	3,137,238.89	40.215395	-105.008598
1,648.0	6.60	40.30	1,644.3	67.6	57.1	1,321,701.03	3,137,244.99	40.215416	-105.008576
1,740.0	6.20	53.00	1,735.7	74.6	64.5	1,321,708.09	3,137,252.34	40.215435	-105.008549
1,831.0	6.50	43.00	1,826.2	81.4	71.9	1,321,714.86	3,137,259.74	40.215453	-105.008523
1,923.0	5.80	61.40	1,917.6	87.4	79.5	1,321,720.93	3,137,267.34	40.215470	-105.008496
2,017.0	4.60	52.00	2,011.3	92.0	86.7	1,321,725.57	3,137,274.45	40.215483	-105.008470
2,112.0	3.90	36.10	2,106.0	97.0	91.6	1,321,730.55	3,137,279.33	40.215496	-105.008452
2,207.0	4.60	59.10	2,200.7	101.5	96.7	1,321,735.15	3,137,284.48	40.215509	-105.008434
2,301.0	3.90	52.60	2,294.5	105.4	102.5	1,321,739.06	3,137,290.23	40.215519	-105.008413
2,396.0	5.20	59.60	2,389.2	109.5	108.8	1,321,743.23	3,137,296.49	40.215531	-105.008391
2,491.0	4.00	50.70	2,483.9	113.8	115.1	1,321,747.54	3,137,302.74	40.215542	-105.008368
2,586.0	5.40	43.90	2,578.6	119.1	120.7	1,321,752.90	3,137,308.38	40.215557	-105.008348
2,680.0	4.10	35.50	2,672.2	125.1	125.8	1,321,758.85	3,137,313.36	40.215573	-105.008330
2,774.0	4.90	37.90	2,765.9	131.0	130.2	1,321,764.77	3,137,317.75	40.215590	-105.008314
2,869.0	4.90	27.90	2,860.6	137.7	134.6	1,321,771.59	3,137,322.10	40.215608	-105.008298
2,963.0	6.20	27.00	2,954.2	145.8	138.8	1,321,779.68	3,137,326.24	40.215630	-105.008283
3,057.0	4.70	56.10	3,047.7	152.5	144.3	1,321,786.38	3,137,331.70	40.215649	-105.008264
3,152.0	4.50	76.10	3,142.4	155.6	151.1	1,321,789.49	3,137,338.54	40.215657	-105.008239
3,247.0	3.30	74.00	3,237.2	157.2	157.3	1,321,791.17	3,137,344.77	40.215662	-105.008217
3,341.0	3.80	62.00	3,331.0	159.4	162.7	1,321,793.41	3,137,350.11	40.215668	-105.008198
3,436.0	2.70	45.10	3,425.9	162.5	167.1	1,321,796.49	3,137,354.46	40.215676	-105.008182
3,531.0	4.30	50.60	3,520.7	166.3	171.4	1,321,800.35	3,137,358.78	40.215687	-105.008167
3,625.0	3.80	47.20	3,614.5	170.7	176.4	1,321,804.74	3,137,363.76	40.215699	-105.008149
3,720.0	3.80	45.00	3,709.3	175.0	180.9	1,321,809.13	3,137,368.27	40.215711	-105.008132
3,815.0	3.20	34.60	3,804.1	179.4	184.7	1,321,813.55	3,137,371.98	40.215723	-105.008119
3,910.0	2.80	19.40	3,899.0	183.8	187.0	1,321,817.94	3,137,374.23	40.215735	-105.008111
4,004.0	2.90	22.50	3,992.8	188.2	188.6	1,321,822.31	3,137,375.88	40.215747	-105.008105
4,099.0	2.40	42.00	4,087.7	191.9	190.9	1,321,826.02	3,137,378.11	40.215757	-105.008097
4,194.0	1.70	132.40	4,182.7	192.4	193.2	1,321,826.56	3,137,380.48	40.215758	-105.008088
4,288.0	1.60	135.30	4,276.7	190.5	195.2	1,321,824.70	3,137,382.44	40.215753	-105.008081
4,383.0	1.80	277.70	4,371.7	189.8	194.7	1,321,823.95	3,137,381.90	40.215751	-105.008083
4,478.0	1.90	272.00	4,466.6	190.0	191.6	1,321,824.19	3,137,378.85	40.215752	-105.008094
4,572.0	1.80	274.90	4,560.6	190.2	188.6	1,321,824.36	3,137,375.82	40.215752	-105.008105
4,666.0	0.60	99.70	4,654.5	190.3	187.6	1,321,824.39	3,137,374.83	40.215752	-105.008109
4,760.0	0.10	132.20	4,748.5	190.1	188.1	1,321,824.26	3,137,375.38	40.215752	-105.008107
4,855.0	0.40	282.00	4,843.5	190.1	187.9	1,321,824.27	3,137,375.11	40.215752	-105.008108
4,949.0	0.70	267.60	4,937.5	190.2	187.0	1,321,824.31	3,137,374.22	40.215752	-105.008111
5,044.0	1.00	265.90	5,032.5	190.1	185.6	1,321,824.22	3,137,372.81	40.215752	-105.008116
5,139.0	0.50	144.50	5,127.5	189.7	185.0	1,321,823.82	3,137,372.23	40.215751	-105.008118
5,233.0	0.40	218.20	5,221.5	189.1	185.0	1,321,823.23	3,137,372.27	40.215749	-105.008118
5,328.0	0.90	240.20	5,316.5	188.5	184.2	1,321,822.59	3,137,371.42	40.215747	-105.008121
5,423.0	1.80	261.80	5,411.5	187.9	182.0	1,321,822.00	3,137,369.30	40.215746	-105.008128
5,518.0	0.40	136.40	5,506.5	187.4	180.8	1,321,821.54	3,137,368.05	40.215745	-105.008133
5,613.0	0.80	304.90	5,601.5	187.6	180.5	1,321,821.67	3,137,367.74	40.215745	-105.008134
5,707.0	1.00	309.70	5,695.5	188.5	179.3	1,321,822.57	3,137,366.56	40.215747	-105.008138
5,802.0	0.40	10.40	5,790.4	189.3	178.7	1,321,823.42	3,137,365.98	40.215750	-105.008140
5,897.0	0.90	306.70	5,885.4	190.1	178.2	1,321,824.19	3,137,365.44	40.215752	-105.008142
5,992.0	0.40	103.60	5,980.4	190.5	177.9	1,321,824.55	3,137,365.16	40.215753	-105.008143
6,086.0	0.60	341.20	6,074.4	190.9	178.1	1,321,824.94	3,137,365.32	40.215754	-105.008143
6,181.0	0.90	102.50	6,169.4	191.2	178.6	1,321,825.26	3,137,365.88	40.215755	-105.008141

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	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
6,276.0	0.60	1.90	6,264.4	191.5	179.4	1,321,825.60	3,137,366.63	40.215756	-105.008138
6,371.0	1.50	148.10	6,359.4	191.0	180.1	1,321,825.04	3,137,367.30	40.215754	-105.008135
6,465.0	0.40	227.40	6,453.4	189.7	180.5	1,321,823.78	3,137,367.72	40.215751	-105.008134
6,560.0	1.10	256.90	6,548.4	189.3	179.3	1,321,823.34	3,137,366.59	40.215750	-105.008138
6,591.0	1.40	265.10	6,579.4	189.2	178.7	1,321,823.24	3,137,365.92	40.215749	-105.008140
6,623.0	1.60	259.60	6,611.4	189.0	177.8	1,321,823.12	3,137,365.09	40.215749	-105.008143
6,654.0	3.60	256.30	6,642.3	188.7	176.5	1,321,822.80	3,137,363.72	40.215748	-105.008148
6,701.0	9.30	267.90	6,689.0	188.2	171.2	1,321,822.28	3,137,358.49	40.215747	-105.008167
6,749.0	11.60	263.90	6,736.2	187.6	162.6	1,321,821.58	3,137,349.82	40.215745	-105.008198
6,796.0	14.90	267.00	6,782.0	186.8	151.8	1,321,820.70	3,137,339.09	40.215743	-105.008237
6,843.0	19.20	272.10	6,826.9	186.7	138.1	1,321,820.59	3,137,325.33	40.215743	-105.008286
6,890.0	23.50	272.30	6,870.7	187.4	121.0	1,321,821.16	3,137,308.23	40.215744	-105.008347
6,938.0	29.50	277.80	6,913.6	189.4	99.7	1,321,823.03	3,137,286.92	40.215750	-105.008423
6,985.0	33.50	278.60	6,953.7	192.9	75.4	1,321,826.41	3,137,262.61	40.215760	-105.008510
7,033.0	37.20	275.30	6,992.8	196.2	47.8	1,321,829.58	3,137,235.03	40.215769	-105.008609
7,080.0	42.20	271.40	7,029.0	197.9	17.9	1,321,831.11	3,137,205.07	40.215773	-105.008716
7,128.0	48.00	268.40	7,062.9	197.8	-16.1	1,321,830.82	3,137,171.09	40.215773	-105.008838
7,175.0	55.60	266.10	7,091.9	196.0	-53.0	1,321,828.80	3,137,134.24	40.215768	-105.008970
7,223.0	62.70	264.50	7,116.5	192.6	-94.0	1,321,825.18	3,137,093.22	40.215759	-105.009117
7,270.0	66.80	264.50	7,136.5	188.5	-136.3	1,321,820.87	3,137,050.94	40.215748	-105.009268
7,318.0	68.30	266.00	7,154.9	184.9	-180.5	1,321,816.96	3,137,006.75	40.215738	-105.009427
7,365.0	69.40	267.60	7,171.8	182.4	-224.3	1,321,814.27	3,136,963.01	40.215731	-105.009583
7,412.0	73.10	268.60	7,186.9	180.9	-268.8	1,321,812.55	3,136,918.54	40.215727	-105.009743
7,459.0	77.20	270.20	7,199.0	180.5	-314.2	1,321,811.83	3,136,873.13	40.215725	-105.009905
7,483.0	80.80	272.00	7,203.6	180.9	-337.7	1,321,812.16	3,136,849.58	40.215727	-105.009990
7,542.0	83.90	273.10	7,211.4	183.5	-396.1	1,321,814.44	3,136,791.14	40.215734	-105.010199
7,604.0	85.40	272.20	7,217.2	186.4	-457.8	1,321,816.95	3,136,729.46	40.215742	-105.010420
7,668.0	86.50	271.30	7,221.7	188.3	-521.6	1,321,818.54	3,136,665.64	40.215747	-105.010648
7,731.0	88.50	271.30	7,224.5	189.8	-584.5	1,321,819.62	3,136,602.72	40.215751	-105.010873
7,794.0	89.10	270.00	7,225.8	190.5	-647.5	1,321,819.99	3,136,539.73	40.215753	-105.011099
7,857.0	90.10	269.00	7,226.2	189.9	-710.5	1,321,819.09	3,136,476.74	40.215751	-105.011324
7,921.0	92.00	269.20	7,225.1	188.9	-774.5	1,321,817.73	3,136,412.77	40.215749	-105.011554
7,984.0	92.70	270.50	7,222.5	188.8	-837.4	1,321,817.22	3,136,349.83	40.215748	-105.011779
8,015.0	93.00	271.00	7,220.9	189.2	-868.4	1,321,817.45	3,136,318.87	40.215749	-105.011890
8,079.0	91.60	269.40	7,218.4	189.4	-932.3	1,321,817.32	3,136,254.92	40.215750	-105.012119
8,173.0	94.00	269.80	7,213.8	188.7	-1,026.2	1,321,816.14	3,136,161.05	40.215748	-105.012455
8,268.0	93.40	270.40	7,207.6	188.9	-1,121.0	1,321,815.78	3,136,066.25	40.215749	-105.012794
8,363.0	92.70	270.60	7,202.6	189.7	-1,215.9	1,321,816.09	3,135,971.38	40.215751	-105.013134
8,457.0	91.80	270.90	7,198.9	191.0	-1,309.8	1,321,816.80	3,135,877.46	40.215754	-105.013470
8,552.0	91.20	270.20	7,196.4	191.9	-1,404.8	1,321,817.18	3,135,782.49	40.215757	-105.013810
8,647.0	91.30	270.70	7,194.3	192.6	-1,499.7	1,321,817.40	3,135,687.52	40.215759	-105.014151
8,741.0	92.50	270.20	7,191.2	193.4	-1,593.7	1,321,817.62	3,135,593.57	40.215761	-105.014487
8,836.0	92.00	269.20	7,187.5	192.9	-1,688.6	1,321,816.60	3,135,498.65	40.215759	-105.014827
8,931.0	92.90	269.50	7,183.4	191.8	-1,783.5	1,321,814.99	3,135,403.75	40.215756	-105.015167
9,025.0	93.10	269.30	7,178.5	190.8	-1,877.4	1,321,813.49	3,135,309.89	40.215754	-105.015503
9,120.0	92.40	269.30	7,173.9	189.6	-1,972.3	1,321,811.81	3,135,215.02	40.215750	-105.015843
9,215.0	92.20	268.50	7,170.1	187.8	-2,067.2	1,321,809.46	3,135,120.12	40.215745	-105.016182
9,309.0	91.90	267.90	7,166.8	184.9	-2,161.1	1,321,805.99	3,135,026.25	40.215737	-105.016519
9,404.0	89.40	265.50	7,165.7	179.4	-2,255.9	1,321,799.99	3,134,931.46	40.215722	-105.016858
9,499.0	91.30	267.50	7,165.1	173.6	-2,350.7	1,321,793.67	3,134,836.68	40.215706	-105.017198
9,593.0	89.80	267.90	7,164.2	169.8	-2,444.6	1,321,789.38	3,134,742.78	40.215696	-105.017534
9,688.0	90.20	268.60	7,164.2	166.9	-2,539.6	1,321,785.95	3,134,647.85	40.215688	-105.017874
9,783.0	91.30	270.20	7,163.0	165.9	-2,634.5	1,321,784.43	3,134,552.87	40.215685	-105.018214
9,877.0	92.30	270.90	7,160.0	166.8	-2,728.5	1,321,784.81	3,134,458.92	40.215688	-105.018550
9,972.0	92.30	270.40	7,156.2	167.9	-2,823.4	1,321,785.36	3,134,364.00	40.215691	-105.018890

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Liberty 2C-21H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5036.0ft (Ensign 135)
Site:	S20-T3N-R68W (Liberty 2A-21H)	MD Reference:	WELL @ 5036.0ft (Ensign 135)
Well:	Liberty 2C-21H	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
10,035.0	92.20	271.60	7,153.7	169.0	-2,886.4	1,321,786.11	3,134,301.05	40.215694	-105.019116
10,098.0	92.60	272.60	7,151.1	171.3	-2,949.3	1,321,788.07	3,134,238.14	40.215700	-105.019341
10,161.0	91.50	273.60	7,148.8	174.7	-3,012.1	1,321,791.13	3,134,175.25	40.215709	-105.019566
10,208.0	90.10	274.10	7,148.2	177.9	-3,059.0	1,321,794.02	3,134,128.35	40.215718	-105.019734
10,256.0	88.70	273.40	7,148.7	181.0	-3,106.9	1,321,796.89	3,134,080.44	40.215726	-105.019905
10,303.0	88.60	273.00	7,149.8	183.6	-3,153.8	1,321,799.26	3,134,033.51	40.215734	-105.020073
10,350.0	88.70	273.20	7,150.9	186.2	-3,200.7	1,321,801.54	3,133,986.58	40.215741	-105.020241
10,445.0	88.90	272.40	7,152.9	190.8	-3,295.6	1,321,805.65	3,133,891.69	40.215753	-105.020581
10,539.0	87.20	269.50	7,156.1	192.4	-3,389.5	1,321,806.69	3,133,797.76	40.215758	-105.020917
10,634.0	88.40	270.00	7,159.7	192.0	-3,484.4	1,321,805.75	3,133,702.84	40.215756	-105.021257
10,729.0	87.90	269.50	7,162.8	191.5	-3,579.4	1,321,804.81	3,133,607.90	40.215755	-105.021597
10,823.0	89.80	270.20	7,164.7	191.3	-3,673.4	1,321,804.04	3,133,513.92	40.215754	-105.021934
10,918.0	89.80	269.80	7,165.0	191.3	-3,768.4	1,321,803.52	3,133,418.92	40.215754	-105.022274
11,013.0	89.30	269.10	7,165.8	190.4	-3,863.4	1,321,802.08	3,133,323.94	40.215752	-105.022614
11,107.0	91.10	271.20	7,165.4	190.6	-3,957.4	1,321,801.81	3,133,229.95	40.215753	-105.022951
11,202.0	92.30	273.20	7,162.6	194.3	-4,052.2	1,321,804.92	3,133,135.05	40.215762	-105.023290
11,297.0	87.80	270.60	7,162.5	197.4	-4,147.2	1,321,807.55	3,133,040.12	40.215771	-105.023630
11,392.0	91.60	269.00	7,163.0	197.1	-4,242.1	1,321,806.69	3,132,945.17	40.215770	-105.023970
11,486.0	92.00	270.50	7,160.1	196.7	-4,336.1	1,321,805.76	3,132,851.22	40.215769	-105.024307
11,581.0	90.30	270.50	7,158.2	197.5	-4,431.0	1,321,806.06	3,132,756.24	40.215771	-105.024647
11,641.0	89.90	270.00	7,158.1	197.8	-4,491.0	1,321,805.99	3,132,696.24	40.215772	-105.024862
Last CES Survey @ 11,641' MD									
11,691.0	89.90	270.00	7,158.2	197.8	-4,541.0	1,321,805.71	3,132,646.24	40.215772	-105.025041
PTB @ 11,691'									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Liberty 2C-21H PBHL P ₂	0.00	0.00	7,149.3	186.2	-4,571.6	1,321,793.99	3,132,615.72	40.215740	-105.025150
- hit/miss target									
- Shape									
- actual wellpath misses target center by 33.9ft at 11691.0ft MD (7158.2 TVD, 197.8 N, -4541.0 E)									
- Point									
Liberty 2C-21H 9300' TC	0.00	0.00	7,173.0	186.2	-2,120.5	1,321,807.52	3,135,066.80	40.215741	-105.016373
- actual wellpath misses target center by 4.8ft at 9268.2ft MD (7168.2 TVD, 186.3 N, -2120.3 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
11,641.0	7,158.1	197.8	-4,491.0	Last CES Survey @ 11,641' MD	
11,691.0	7,158.2	197.8	-4,541.0	PTB @ 11,691'	

Checked By: _____ Approved By: _____ Date: _____