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Cathedral Energy Services

Survey Report

Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook 102-2308 02H
Wellbore: Hz
Design: FINAL

Local Co-ordinate Reference: Well Lybrook 102-2308 02H
TVD Reference: WELL @ 6987.0usft (Aztec 950)
MD Reference: WELL @ 6987.0usft (Aztec 950)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

Project San Juan County, NM

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Western Zone

System Datum: Mean Sea Level

Site S2-T23N-R8W (Lybrook)

Site Position: Northing: 1,912,209.61 usft Latitude: 36° 15' 18.364 N
From: Lat/Long Easting: 2,778,742.78 usft Longitude: 107° 38' 40.481 W
Position Uncertainty: 0.0 usft Slot Radius: 13-3/16" Grid Convergence: 0.11 °

Well Lybrook 102-2308 02H

Well Position +N/-S 0.0 usft Northing: 1,912,209.61 usft Latitude: 36° 15' 18.364 N
 +E/-W 0.0 usft Easting: 2,778,742.78 usft Longitude: 107° 38' 40.481 W
Position Uncertainty 0.0 usft Wellhead Elevation: usft Ground Level: 6,971.0 usft

Wellbore Hz

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/10/2014	9.47	63.01	50,214

Design FINAL

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	89.79

Survey Program Date 1/24/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
111.0	10,800.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
111.0	0.50	279.50	111.0	0.1	-0.5	-0.5	0.45	0.45	
140.0	0.60	278.80	140.0	0.1	-0.8	-0.8	0.35	0.34	
170.0	0.70	278.70	170.0	0.2	-1.1	-1.1	0.33	0.33	
198.0	0.80	282.90	198.0	0.2	-1.4	-1.4	0.41	0.36	
229.0	0.80	279.60	229.0	0.3	-1.9	-1.9	0.15	0.00	
259.0	0.80	284.00	259.0	0.4	-2.3	-2.3	0.20	0.00	
289.0	0.80	279.20	289.0	0.5	-2.7	-2.7	0.22	0.00	
346.0	0.40	270.30	346.0	0.6	-3.3	-3.3	0.72	-0.70	
376.0	0.40	272.40	376.0	0.6	-3.5	-3.5	0.05	0.00	
438.0	0.40	272.50	438.0	0.6	-3.9	-3.9	0.00	0.00	
469.0	0.40	279.50	469.0	0.6	-4.1	-4.1	0.16	0.00	
559.0	0.80	265.30	559.0	0.6	-5.1	-5.1	0.47	0.44	

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621.0	0.90	270.10	621.0	0.6	-6.0	-6.0	0.20	0.16	
682.0	1.00	283.20	682.0	0.7	-7.0	-7.0	0.39	0.16	
743.0	0.20	86.00	743.0	0.8	-7.4	-7.4	1.95	-1.31	
805.0	0.40	89.20	805.0	0.8	-7.1	-7.1	0.32	0.32	
866.0	0.10	55.50	866.0	0.9	-6.8	-6.8	0.53	-0.49	
927.0	0.20	9.70	927.0	1.0	-6.8	-6.8	0.24	0.16	
988.0	0.20	19.10	988.0	1.2	-6.7	-6.7	0.05	0.00	
1,049.0	0.40	2.40	1,049.0	1.5	-6.7	-6.7	0.35	0.33	
1,110.0	0.40	346.70	1,110.0	1.9	-6.7	-6.7	0.18	0.00	
1,171.0	0.50	328.50	1,170.9	2.4	-6.9	-6.9	0.28	0.16	
1,232.0	0.10	20.60	1,231.9	2.7	-7.0	-7.0	0.73	-0.66	
1,293.0	0.30	99.50	1,292.9	2.7	-6.8	-6.8	0.49	0.33	
1,354.0	1.00	110.90	1,353.9	2.5	-6.2	-6.2	1.16	1.15	
1,416.0	1.10	114.90	1,415.9	2.0	-5.1	-5.1	0.20	0.16	
1,477.0	0.90	130.00	1,476.9	1.5	-4.2	-4.2	0.54	-0.33	
1,540.0	1.00	119.00	1,539.9	0.9	-3.4	-3.4	0.33	0.16	
1,603.0	1.00	121.50	1,602.9	0.3	-2.4	-2.4	0.07	0.00	
1,666.0	1.20	120.70	1,665.9	-0.3	-1.4	-1.4	0.32	0.32	
1,729.0	1.30	128.40	1,728.9	-1.1	-0.3	-0.3	0.31	0.16	
1,792.0	1.10	120.80	1,791.9	-1.8	0.8	0.8	0.41	-0.32	
1,855.0	1.50	118.80	1,854.8	-2.5	2.1	2.0	0.64	0.63	
1,917.0	1.50	122.90	1,916.8	-3.4	3.4	3.4	0.17	0.00	
1,981.0	1.60	136.60	1,980.8	-4.5	4.8	4.7	0.60	0.16	
2,043.0	0.90	190.80	2,042.8	-5.6	5.3	5.2	2.09	-1.13	
2,106.0	1.00	207.80	2,105.8	-6.6	4.9	4.9	0.47	0.16	
2,169.0	1.10	203.70	2,168.8	-7.6	4.4	4.4	0.20	0.16	
2,233.0	0.50	317.10	2,232.8	-8.0	4.0	4.0	2.15	-0.94	
2,296.0	1.30	357.10	2,295.8	-7.0	3.8	3.7	1.54	1.27	
2,359.0	1.40	345.30	2,358.7	-5.6	3.5	3.5	0.47	0.16	
2,422.0	1.10	333.50	2,421.7	-4.3	3.1	3.0	0.63	-0.48	
2,485.0	0.90	329.30	2,484.7	-3.3	2.5	2.5	0.34	-0.32	
2,548.0	0.70	327.90	2,547.7	-2.6	2.1	2.1	0.32	-0.32	
2,611.0	0.50	339.80	2,610.7	-2.0	1.8	1.8	0.37	-0.32	
2,674.0	0.50	312.70	2,673.7	-1.5	1.5	1.5	0.37	0.00	
2,737.0	0.60	302.60	2,736.7	-1.2	1.0	1.0	0.22	0.16	
2,800.0	0.90	299.70	2,799.7	-0.8	0.3	0.3	0.48	0.48	
2,864.0	0.80	288.80	2,863.7	-0.4	-0.6	-0.6	0.30	-0.16	
2,926.0	0.80	23.80	2,925.7	0.2	-0.8	-0.8	1.90	0.00	
2,989.0	0.30	358.60	2,988.7	0.7	-0.6	-0.6	0.86	-0.79	
3,053.0	0.20	351.30	3,052.7	1.0	-0.6	-0.6	0.16	-0.16	
3,116.0	0.20	274.50	3,115.7	1.1	-0.8	-0.8	0.39	0.00	
3,179.0	0.20	259.30	3,178.7	1.1	-1.0	-1.0	0.08	0.00	
3,242.0	0.40	181.00	3,241.7	0.9	-1.1	-1.1	0.65	0.32	
3,305.0	0.30	243.30	3,304.7	0.6	-1.2	-1.2	0.59	-0.16	
3,368.0	0.10	178.00	3,367.7	0.5	-1.4	-1.4	0.43	-0.32	
3,431.0	0.30	222.50	3,430.7	0.3	-1.5	-1.5	0.38	0.32	
3,494.0	0.60	211.40	3,493.7	-0.1	-1.8	-1.8	0.49	0.48	
3,557.0	0.70	177.30	3,556.7	-0.8	-1.9	-1.9	0.62	0.16	
3,620.0	0.60	171.30	3,619.7	-1.5	-1.9	-1.9	0.19	-0.16	
3,683.0	0.80	175.30	3,682.7	-2.3	-1.8	-1.8	0.33	0.32	
3,746.0	1.10	177.30	3,745.7	-3.3	-1.7	-1.7	0.48	0.48	
3,809.0	1.40	178.70	3,808.6	-4.7	-1.7	-1.7	0.48	0.48	
3,872.0	0.60	152.20	3,871.6	-5.7	-1.5	-1.5	1.43	-1.27	

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3,935.0	1.00	94.20	3,934.6	-6.1	-0.8	-0.8	1.35	0.63	
3,998.0	0.90	105.80	3,997.6	-6.2	0.2	0.2	0.34	-0.16	
4,061.0	0.60	99.50	4,060.6	-6.4	1.0	1.0	0.49	-0.48	
4,124.0	0.90	100.30	4,123.6	-6.6	1.8	1.8	0.48	0.48	
4,187.0	1.20	88.60	4,186.6	-6.7	3.0	3.0	0.58	0.48	
4,251.0	1.40	92.90	4,250.6	-6.7	4.4	4.4	0.35	0.31	
4,314.0	0.70	99.50	4,313.6	-6.8	5.6	5.6	1.13	-1.11	
4,376.0	0.30	132.50	4,375.6	-7.0	6.1	6.0	0.77	-0.65	
4,440.0	0.60	161.70	4,439.6	-7.4	6.3	6.3	0.58	0.47	
4,503.0	0.40	275.40	4,502.6	-7.7	6.2	6.2	1.34	-0.32	
4,566.0	0.70	314.40	4,565.6	-7.4	5.7	5.7	0.74	0.48	
4,627.0	0.30	279.30	4,626.6	-7.1	5.3	5.2	0.80	-0.66	
4,675.0	0.20	303.90	4,674.5	-7.0	5.1	5.0	0.30	-0.21	
4,707.0	1.40	88.80	4,706.5	-7.0	5.4	5.4	4.90	3.75	
4,738.0	3.30	90.20	4,737.5	-7.0	6.7	6.7	6.13	6.13	
4,769.0	5.60	92.70	4,768.4	-7.1	9.1	9.1	7.44	7.42	
4,801.0	7.60	89.70	4,800.2	-7.1	12.8	12.7	6.34	6.25	
4,832.0	9.30	89.00	4,830.9	-7.1	17.3	17.3	5.49	5.48	
4,864.0	11.20	91.30	4,862.4	-7.1	23.0	23.0	6.07	5.94	
4,895.0	13.60	92.50	4,892.6	-7.3	29.7	29.6	7.79	7.74	
4,927.0	15.80	93.20	4,923.6	-7.7	37.8	37.7	6.90	6.88	
4,958.0	17.90	93.30	4,953.3	-8.2	46.7	46.7	6.77	6.77	
4,990.0	20.00	90.70	4,983.5	-8.6	57.1	57.1	7.07	6.56	
5,021.0	21.90	87.00	5,012.5	-8.4	68.2	68.2	7.47	6.13	
5,053.0	23.80	86.60	5,042.0	-7.7	80.6	80.6	5.96	5.94	
5,084.0	25.70	89.50	5,070.1	-7.2	93.6	93.6	7.27	6.13	
5,116.0	27.30	92.20	5,098.7	-7.4	107.9	107.8	6.26	5.00	
5,147.0	28.80	93.10	5,126.1	-8.1	122.4	122.4	5.03	4.84	
5,178.0	30.50	91.50	5,153.0	-8.7	137.7	137.7	6.05	5.48	
5,209.0	32.30	90.40	5,179.5	-9.0	153.9	153.9	6.09	5.81	
5,240.0	34.40	89.90	5,205.4	-9.0	170.9	170.9	6.83	6.77	
5,272.0	35.80	89.50	5,231.6	-8.9	189.3	189.3	4.43	4.38	
5,303.0	38.10	90.00	5,256.3	-8.9	208.0	207.9	7.48	7.42	
5,335.0	40.50	90.20	5,281.1	-8.9	228.2	228.2	7.51	7.50	
5,366.0	42.90	89.60	5,304.3	-8.9	248.9	248.8	7.85	7.74	
5,398.0	45.80	89.20	5,327.1	-8.6	271.2	271.2	9.10	9.06	
5,429.0	49.50	89.50	5,348.0	-8.4	294.1	294.1	11.96	11.94	
5,461.0	54.00	89.20	5,367.8	-8.1	319.2	319.2	14.08	14.06	
5,492.0	58.70	89.40	5,385.0	-7.8	345.0	345.0	15.17	15.16	
5,523.0	63.30	89.80	5,400.0	-7.6	372.1	372.1	14.88	14.84	
5,555.0	66.90	90.20	5,413.5	-7.6	401.2	401.1	11.31	11.25	
5,586.0	70.80	90.30	5,424.7	-7.7	430.1	430.0	12.58	12.58	
5,618.0	74.70	89.90	5,434.2	-7.8	460.6	460.6	12.25	12.19	
5,649.0	78.70	89.50	5,441.3	-7.6	490.8	490.8	12.96	12.90	
5,681.0	80.50	89.20	5,447.1	-7.2	522.3	522.2	5.70	5.62	
5,713.0	81.20	89.20	5,452.2	-6.8	553.8	553.8	2.19	2.19	
5,744.0	83.00	89.40	5,456.4	-6.4	584.6	584.5	5.84	5.81	
5,775.0	83.60	89.40	5,460.0	-6.1	615.3	615.3	1.94	1.94	
5,807.0	84.30	89.00	5,463.4	-5.7	647.2	647.1	2.52	2.19	
5,838.0	85.10	88.80	5,466.3	-5.1	678.0	678.0	2.66	2.58	
5,870.0	85.70	89.10	5,468.8	-4.5	709.9	709.9	2.09	1.87	
5,901.0	85.40	90.40	5,471.2	-4.3	740.8	740.8	4.29	-0.97	
5,933.0	85.90	90.60	5,473.7	-4.6	772.7	772.7	1.68	1.56	

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5,962.0	86.70	90.60	5,475.5	-4.9	801.6	801.6	2.76	2.76	
5,988.0	88.60	93.80	5,476.6	-5.9	827.6	827.6	14.30	7.30	
6,019.0	89.20	93.50	5,477.2	-7.9	858.5	858.5	2.16	1.94	
6,051.0	90.40	91.90	5,477.3	-9.4	890.5	890.5	6.25	3.75	
6,114.0	90.70	89.20	5,476.7	-10.0	953.5	953.5	4.31	0.48	
6,177.0	89.00	88.40	5,476.9	-8.7	1,016.5	1,016.4	2.98	-2.70	
6,240.0	88.60	87.80	5,478.2	-6.6	1,079.4	1,079.4	1.14	-0.63	
6,303.0	88.10	86.90	5,480.0	-3.7	1,142.3	1,142.3	1.63	-0.79	
6,366.0	88.60	87.20	5,481.8	-0.5	1,205.2	1,205.2	0.93	0.79	
6,429.0	88.30	89.20	5,483.5	1.5	1,268.2	1,268.2	3.21	-0.48	
6,492.0	88.50	90.60	5,485.3	1.6	1,331.1	1,331.1	2.24	0.32	
6,555.0	90.40	91.40	5,485.9	0.5	1,394.1	1,394.1	3.27	3.02	
6,617.0	92.00	90.30	5,484.6	-0.4	1,456.1	1,456.1	3.13	2.58	
6,680.0	90.70	89.10	5,483.1	-0.1	1,519.1	1,519.1	2.81	-2.06	
6,744.0	90.30	88.00	5,482.6	1.6	1,583.1	1,583.1	1.83	-0.62	
6,807.0	89.00	86.80	5,482.9	4.4	1,646.0	1,646.0	2.81	-2.06	
6,869.0	88.10	87.70	5,484.5	7.4	1,707.9	1,707.9	2.05	-1.45	
6,932.0	89.30	89.40	5,485.9	9.0	1,770.9	1,770.9	3.30	1.90	
6,995.0	90.30	90.90	5,486.2	8.8	1,833.9	1,833.9	2.86	1.59	
7,059.0	90.90	91.00	5,485.5	7.8	1,897.8	1,897.9	0.95	0.94	
7,121.0	88.50	89.20	5,485.8	7.7	1,959.8	1,959.8	4.84	-3.87	
7,184.0	89.70	90.20	5,486.8	8.0	2,022.8	2,022.8	2.48	1.90	
7,247.0	89.30	91.00	5,487.3	7.3	2,085.8	2,085.8	1.42	-0.64	
7,310.0	90.40	90.60	5,487.5	6.4	2,148.8	2,148.8	1.86	1.75	
7,373.0	89.90	89.90	5,487.3	6.2	2,211.8	2,211.8	1.37	-0.79	
7,436.0	92.10	91.40	5,486.2	5.5	2,274.8	2,274.8	4.23	3.49	
7,499.0	91.30	89.50	5,484.4	5.0	2,337.7	2,337.7	3.27	-1.27	
7,562.0	90.10	89.20	5,483.6	5.7	2,400.7	2,400.7	1.96	-1.90	
7,625.0	89.30	88.50	5,483.9	6.9	2,463.7	2,463.7	1.69	-1.27	
7,688.0	89.70	88.00	5,484.5	8.9	2,526.7	2,526.7	1.02	0.63	
7,751.0	89.90	88.00	5,484.7	11.1	2,589.6	2,589.7	0.32	0.32	
7,814.0	90.70	88.80	5,484.4	12.8	2,652.6	2,652.6	1.80	1.27	
7,877.0	91.50	88.80	5,483.2	14.1	2,715.6	2,715.6	1.27	1.27	
7,940.0	89.30	88.20	5,482.7	15.8	2,778.6	2,778.6	3.62	-3.49	
8,003.0	90.00	89.40	5,483.1	17.1	2,841.5	2,841.6	2.21	1.11	
8,066.0	90.90	89.70	5,482.6	17.6	2,904.5	2,904.6	1.51	1.43	
8,129.0	90.10	90.30	5,482.1	17.6	2,967.5	2,967.6	1.59	-1.27	
8,192.0	90.70	90.10	5,481.6	17.4	3,030.5	3,030.6	1.00	0.95	
8,255.0	90.20	91.20	5,481.1	16.7	3,093.5	3,093.6	1.92	-0.79	
8,318.0	90.90	91.00	5,480.5	15.5	3,156.5	3,156.6	1.16	1.11	
8,381.0	89.60	91.20	5,480.3	14.3	3,219.5	3,219.5	2.09	-2.06	
8,444.0	90.20	91.20	5,480.4	12.9	3,282.5	3,282.5	0.95	0.95	
8,507.0	90.40	90.70	5,480.0	11.9	3,345.5	3,345.5	0.85	0.32	
8,570.0	89.50	90.20	5,480.1	11.4	3,408.5	3,408.5	1.63	-1.43	
8,633.0	90.20	89.90	5,480.3	11.3	3,471.5	3,471.5	1.21	1.11	
8,696.0	89.30	90.80	5,480.5	11.0	3,534.5	3,534.5	2.02	-1.43	
8,759.0	89.70	90.40	5,481.1	10.3	3,597.5	3,597.5	0.90	0.63	
8,823.0	90.40	90.60	5,481.0	9.7	3,661.5	3,661.5	1.14	1.09	
8,886.0	90.50	90.50	5,480.5	9.1	3,724.5	3,724.5	0.22	0.16	
8,949.0	87.20	88.90	5,481.8	9.5	3,787.4	3,787.4	5.82	-5.24	
9,012.0	89.80	90.40	5,483.4	9.8	3,850.4	3,850.4	4.76	4.13	
9,075.0	88.60	88.40	5,484.3	10.5	3,913.4	3,913.4	3.70	-1.90	
9,138.0	90.80	89.80	5,484.7	11.5	3,976.4	3,976.4	4.14	3.49	

Cathedral Energy Services

Survey Report

Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook 102-2308 02H
Wellbore: Hz
Design: FINAL

Local Co-ordinate Reference: Well Lybrook 102-2308 02H
TVD Reference: WELL @ 6987.0usft (Aztec 950)
MD Reference: WELL @ 6987.0usft (Aztec 950)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
9,201.0	91.20	90.10	5,483.6	11.5	4,039.4	4,039.4	0.79	0.63	
9,264.0	91.50	90.80	5,482.1	11.1	4,102.4	4,102.4	1.21	0.48	
9,327.0	91.20	90.10	5,480.6	10.6	4,165.3	4,165.4	1.21	-0.48	
9,389.0	88.90	90.10	5,480.5	10.5	4,227.3	4,227.3	3.71	-3.71	
9,452.0	89.80	91.50	5,481.2	9.6	4,290.3	4,290.3	2.64	1.43	
9,515.0	90.50	91.30	5,481.1	8.0	4,353.3	4,353.3	1.16	1.11	
9,578.0	91.00	90.20	5,480.3	7.2	4,416.3	4,416.3	1.92	0.79	
9,641.0	90.50	90.20	5,479.4	7.0	4,479.3	4,479.3	0.79	-0.79	
9,704.0	90.10	89.60	5,479.1	7.1	4,542.3	4,542.3	1.14	-0.63	
9,767.0	89.20	89.50	5,479.5	7.6	4,605.3	4,605.3	1.44	-1.43	
9,830.0	89.00	90.60	5,480.5	7.5	4,668.3	4,668.3	1.77	-0.32	
9,893.0	90.70	91.20	5,480.6	6.5	4,731.3	4,731.3	2.86	2.70	
9,956.0	90.70	89.90	5,479.9	5.9	4,794.3	4,794.2	2.06	0.00	
10,019.0	90.10	89.40	5,479.4	6.3	4,857.3	4,857.2	1.24	-0.95	
10,082.0	90.40	89.20	5,479.2	7.1	4,920.2	4,920.2	0.57	0.48	
10,145.0	90.90	88.80	5,478.4	8.2	4,983.2	4,983.2	1.02	0.79	
10,208.0	90.50	89.50	5,477.7	9.1	5,046.2	5,046.2	1.28	-0.63	
10,271.0	90.50	89.40	5,477.1	9.7	5,109.2	5,109.2	0.16	0.00	
10,334.0	89.60	89.50	5,477.1	10.3	5,172.2	5,172.2	1.44	-1.43	
10,397.0	90.10	89.50	5,477.2	10.9	5,235.2	5,235.2	0.79	0.79	
10,460.0	91.00	89.40	5,476.6	11.5	5,298.2	5,298.2	1.44	1.43	
10,523.0	90.50	89.80	5,475.8	11.9	5,361.2	5,361.2	1.02	-0.79	
10,586.0	90.00	89.80	5,475.5	12.2	5,424.2	5,424.2	0.79	-0.79	
10,649.0	90.40	89.60	5,475.3	12.5	5,487.2	5,487.2	0.71	0.63	
10,712.0	91.10	89.40	5,474.5	13.0	5,550.2	5,550.2	1.16	1.11	
10,755.0	91.10	89.00	5,473.7	13.6	5,593.2	5,593.2	0.93	0.00	Last Cathedral Survey @ 10,755' MD Projection to Bit @ 10,800'
10,800.0	91.10	89.00	5,472.8	14.4	5,638.1	5,638.1	0.00	0.00	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook I02-2308 02H
Project:	San Juan County, NM	TVD Reference:	WELL @ 6987.0usft (Aztec 950)
Site:	S2-T23N-R8W (Lybrook)	MD Reference:	WELL @ 6987.0usft (Aztec 950)
Well:	Lybrook I02-2308 02H	North Reference:	True
Wellbore:	H2	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets

Target Name

hit/miss target Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lybrook I02-2308 02H P - actual wellpath misses target center by 27.8usft at 10800.0usft MD (5472.8 TVD, 14.4 N, 5638.1 E) - Point	0.00	0.00	5,481.1	15.8	5,664.6	1,912,236.49	2,784,407.36	36° 15' 18.515 N	107° 37' 31.314 W
Lybrook I02-2308 02H P - actual wellpath misses target center by 26.9usft at 10800.0usft MD (5472.8 TVD, 14.4 N, 5638.1 E) - Point	0.00	0.00	5,468.3	15.8	5,664.6	1,912,236.49	2,784,407.36	36° 15' 18.515 N	107° 37' 31.314 W
Lybrook I02-2308 02H P - actual wellpath misses target center by 16.9usft at 6191.5usft MD (5477.1 TVD, -8.3 N, 1031.0 E) - Point	0.00	0.00	5,492.6	-1.4	1,030.4	1,912,210.18	2,779,773.22	36° 15' 18.349 N	107° 38' 27.899 W
Lybrook I02-2308 02H 1 - actual wellpath misses target center by 14.4usft at 5962.0usft MD (5475.5 TVD, -4.9 N, 801.6 E) - Point	0.00	0.00	5,489.6	-1.9	801.0	1,912,209.24	2,779,543.78	36° 15' 18.344 N	107° 38' 30.700 W
Lybrook I02-2308 02H P - actual wellpath misses target center by 26.7usft at 10800.0usft MD (5472.8 TVD, 14.4 N, 5638.1 E) - Point	0.00	0.00	5,476.1	15.8	5,664.6	1,912,236.49	2,784,407.36	36° 15' 18.515 N	107° 37' 31.314 W
Lybrook I02-2308 02H P - actual wellpath misses target center by 34.1usft at 10800.0usft MD (5472.8 TVD, 14.4 N, 5638.1 E) - Point	0.00	0.00	5,451.3	15.8	5,664.6	1,912,236.49	2,784,407.36	36° 15' 18.515 N	107° 37' 31.314 W
Lybrook I02-2308 02H P - actual wellpath misses target center by 27.4usft at 10800.0usft MD (5472.8 TVD, 14.4 N, 5638.1 E) - Point	0.00	0.00	5,466.1	15.8	5,664.6	1,912,236.49	2,784,407.36	36° 15' 18.515 N	107° 37' 31.314 W
Lybrook I02-2308 02H P - actual wellpath misses target center by 7.0usft at 6191.2usft MD (5477.1 TVD, -8.3 N, 1030.6 E) - Point	0.00	0.00	5,475.6	-1.4	1,030.4	1,912,210.18	2,779,773.22	36° 15' 18.349 N	107° 38' 27.899 W

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,755.0	5,473.7	13.6	5,593.2	Last Cathedral Survey @ 10,755' MD
10,800.0	5,472.8	14.4	5,638.1	Projection to Bit @ 10,800'

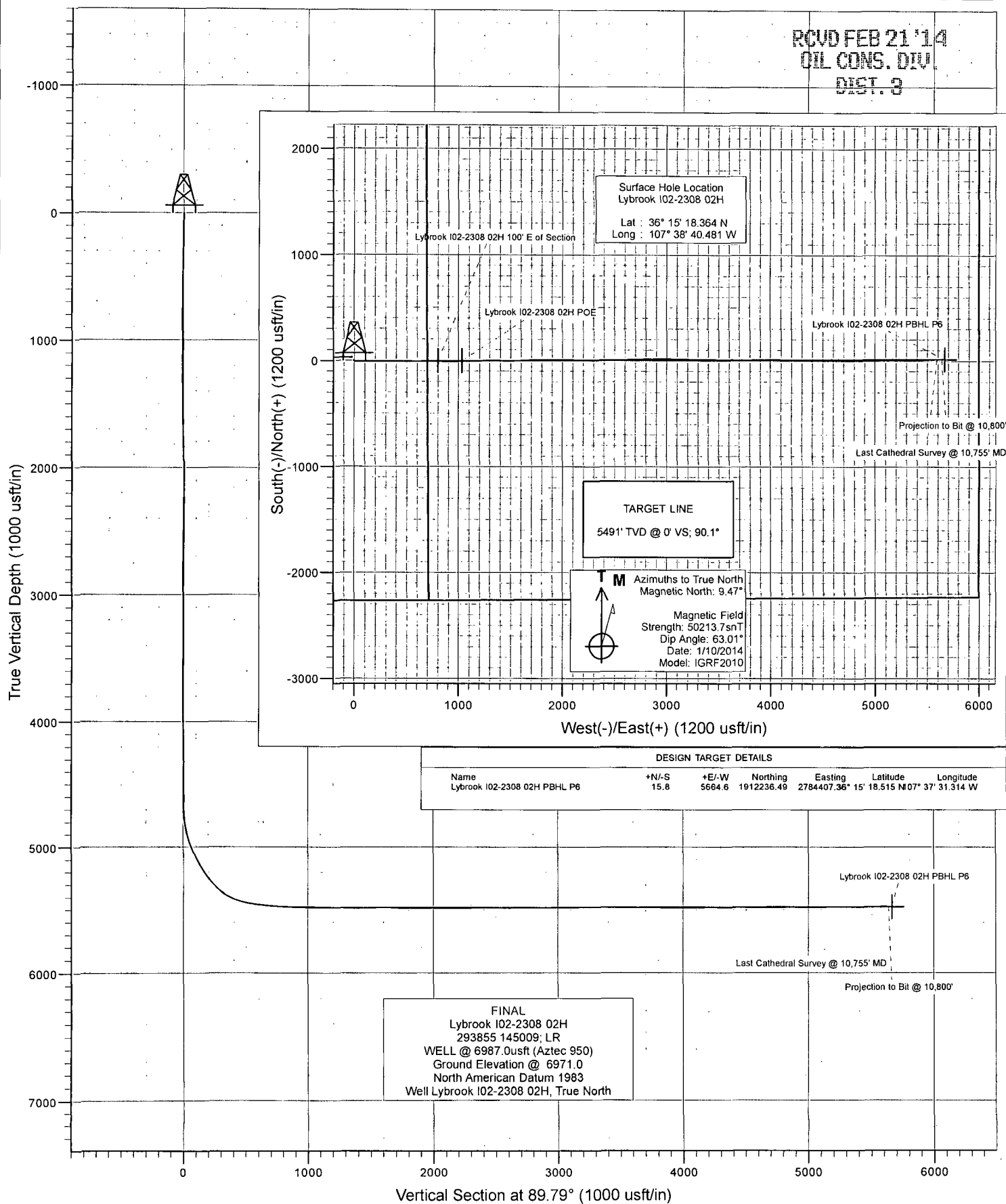
Checked By: _____ Approved By: _____ Date: _____



Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook 102-2308 02H
 Wellbore: Hz
 Design: FINAL

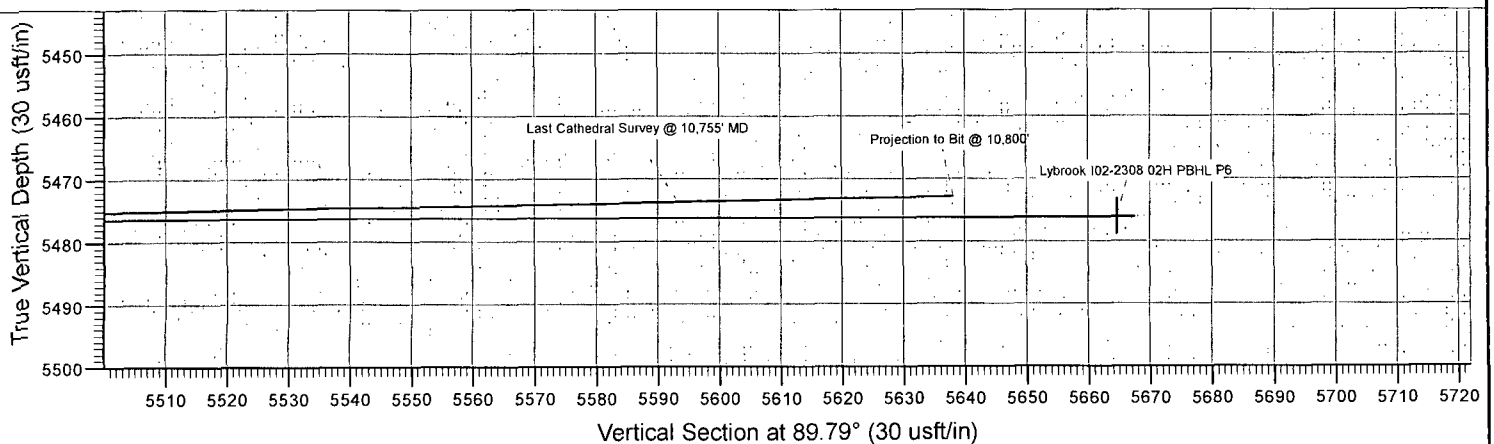
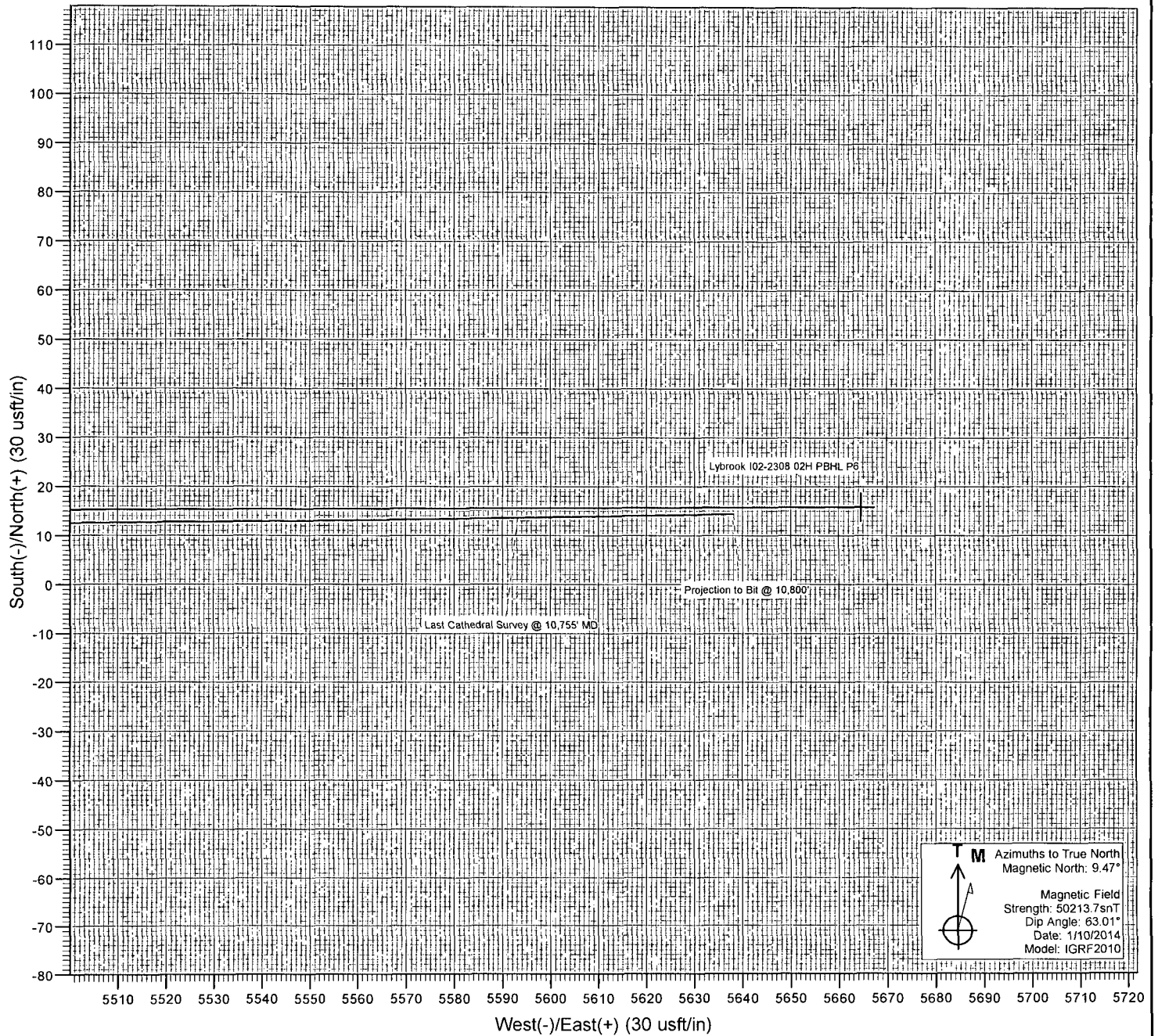


RCVD FEB 21 '14
 OIL CONS. DIV.
 DIST. 3





Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook 102-2308 02H
Wellbore: Hz
Design: FINAL



RCVD FEB 21 '14
OIL CONS. DIV.
DIST. 3

EnCana Oil & Gas (USA) Inc

San Juan County, NM

S2-T23N-R8W (Lybrook)

Lybrook I02-2308 02H

Hz

Design: FINAL

Survey Report - Geographic

24 January, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook I02-2308 02H
Project:	San Juan County, NM	TVD Reference:	WELL @ 6987.0ft (Aztec 950)
Site:	S2-T23N-R8W (Lybrook)	MD Reference:	WELL @ 6987.0ft (Aztec 950)
Well:	Lybrook I02-2308 02H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	San Juan County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site		S2-T23N-R8W (Lybrook)			
Site Position:		Northing:	1,912,213.43 ft	Latitude:	36° 15' 18.36 N
From:	Lat/Long	Easting:	2,778,748.34 ft	Longitude:	107° 38' 40.48 W
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.11 °

Well	Lybrook I02-2308 02H					
Well Position	+N/-S	0.0 ft	Northing:	1,912,213.43 ft	Latitude:	36° 15' 18.36 N
	+E/-W	0.0 ft	Easting:	2,778,748.34 ft	Longitude:	107° 38' 40.48 W
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,971.0 ft	

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/10/2014	9.47	63.01	50,214

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	89.79	

Survey Program		Date	1/24/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
111.0	10,800.0	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	1,912,213.43	2,778,748.34	36° 15' 18.36 N	107° 38' 40.48 W
111.0	0.50	279.50	111.0	0.1	-0.5	1,912,213.51	2,778,747.86	36° 15' 18.36 N	107° 38' 40.49 W
140.0	0.60	278.80	140.0	0.1	-0.8	1,912,213.56	2,778,747.58	36° 15' 18.36 N	107° 38' 40.49 W
170.0	0.70	278.70	170.0	0.2	-1.1	1,912,213.61	2,778,747.25	36° 15' 18.37 N	107° 38' 40.49 W
198.0	0.80	282.90	198.0	0.2	-1.4	1,912,213.68	2,778,746.89	36° 15' 18.37 N	107° 38' 40.50 W
229.0	0.80	279.60	229.0	0.3	-1.9	1,912,213.76	2,778,746.46	36° 15' 18.37 N	107° 38' 40.50 W
259.0	0.80	284.00	259.0	0.4	-2.3	1,912,213.84	2,778,746.05	36° 15' 18.37 N	107° 38' 40.51 W
289.0	0.80	279.20	289.0	0.5	-2.7	1,912,213.93	2,778,745.64	36° 15' 18.37 N	107° 38' 40.51 W
346.0	0.40	270.30	346.0	0.6	-3.3	1,912,213.99	2,778,745.05	36° 15' 18.37 N	107° 38' 40.52 W
376.0	0.40	272.40	376.0	0.6	-3.5	1,912,213.99	2,778,744.84	36° 15' 18.37 N	107° 38' 40.52 W
438.0	0.40	272.50	438.0	0.6	-3.9	1,912,214.01	2,778,744.41	36° 15' 18.37 N	107° 38' 40.53 W
469.0	0.40	279.50	469.0	0.6	-4.1	1,912,214.03	2,778,744.19	36° 15' 18.37 N	107° 38' 40.53 W

Cathedral Energy Services

Survey Report - Geographic

Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook 102-2308 02H
Wellbore: Hz
Design: FINAL

Local Co-ordinate Reference: Well Lybrook 102-2308 02H
TVD Reference: WELL @ 6987.0ft (Aztec 950)
MD Reference: WELL @ 6987.0ft (Aztec 950)
North Reference: True
Survey Calculation Method: Minimum Curvature
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
559.0	0.80	265.30	559.0	0.6	-5.1	1,912,214.03	2,778,743.26	36° 15' 18.37 N	107° 38' 40.54 W
621.0	0.90	270.10	621.0	0.6	-6.0	1,912,214.00	2,778,742.34	36° 15' 18.37 N	107° 38' 40.55 W
682.0	1.00	283.20	682.0	0.7	-7.0	1,912,214.12	2,778,741.34	36° 15' 18.37 N	107° 38' 40.57 W
743.0	0.20	86.00	743.0	0.8	-7.4	1,912,214.25	2,778,740.93	36° 15' 18.37 N	107° 38' 40.57 W
805.0	0.40	89.20	805.0	0.8	-7.1	1,912,214.26	2,778,741.25	36° 15' 18.37 N	107° 38' 40.57 W
866.0	0.10	55.50	866.0	0.9	-6.8	1,912,214.29	2,778,741.51	36° 15' 18.37 N	107° 38' 40.56 W
927.0	0.20	9.70	927.0	1.0	-6.8	1,912,214.43	2,778,741.57	36° 15' 18.37 N	107° 38' 40.56 W
988.0	0.20	19.10	988.0	1.2	-6.7	1,912,214.63	2,778,741.63	36° 15' 18.38 N	107° 38' 40.56 W
1,049.0	0.40	2.40	1,049.0	1.5	-6.7	1,912,214.94	2,778,741.67	36° 15' 18.38 N	107° 38' 40.56 W
1,110.0	0.40	346.70	1,110.0	1.9	-6.7	1,912,215.36	2,778,741.63	36° 15' 18.38 N	107° 38' 40.56 W
1,171.0	0.50	328.50	1,171.0	2.4	-6.9	1,912,215.80	2,778,741.44	36° 15' 18.39 N	107° 38' 40.56 W
1,232.0	0.10	20.60	1,232.0	2.7	-7.0	1,912,216.07	2,778,741.32	36° 15' 18.39 N	107° 38' 40.57 W
1,293.0	0.30	99.50	1,293.0	2.7	-6.8	1,912,216.10	2,778,741.49	36° 15' 18.39 N	107° 38' 40.56 W
1,354.0	1.00	110.90	1,353.9	2.5	-6.2	1,912,215.88	2,778,742.15	36° 15' 18.39 N	107° 38' 40.56 W
1,416.0	1.10	114.90	1,415.9	2.0	-5.1	1,912,215.44	2,778,743.20	36° 15' 18.38 N	107° 38' 40.54 W
1,477.0	0.90	130.00	1,476.9	1.5	-4.2	1,912,214.89	2,778,744.09	36° 15' 18.38 N	107° 38' 40.53 W
1,540.0	1.00	119.00	1,539.9	0.9	-3.4	1,912,214.31	2,778,744.96	36° 15' 18.37 N	107° 38' 40.52 W
1,603.0	1.00	121.50	1,602.9	0.3	-2.4	1,912,213.75	2,778,745.91	36° 15' 18.37 N	107° 38' 40.51 W
1,666.0	1.20	120.70	1,665.9	-0.3	-1.4	1,912,213.13	2,778,746.94	36° 15' 18.36 N	107° 38' 40.50 W
1,729.0	1.30	128.40	1,728.9	-1.1	-0.3	1,912,212.35	2,778,748.07	36° 15' 18.35 N	107° 38' 40.48 W
1,792.0	1.10	120.80	1,791.9	-1.8	0.8	1,912,211.60	2,778,749.15	36° 15' 18.35 N	107° 38' 40.47 W
1,855.0	1.50	118.80	1,854.9	-2.5	2.1	1,912,210.90	2,778,750.40	36° 15' 18.34 N	107° 38' 40.46 W
1,917.0	1.50	122.90	1,916.8	-3.4	3.4	1,912,210.07	2,778,751.79	36° 15' 18.33 N	107° 38' 40.44 W
1,981.0	1.60	136.60	1,980.8	-4.5	4.8	1,912,208.97	2,778,753.11	36° 15' 18.32 N	107° 38' 40.42 W
2,043.0	0.90	190.80	2,042.8	-5.6	5.3	1,912,207.86	2,778,753.62	36° 15' 18.31 N	107° 38' 40.42 W
2,106.0	1.00	207.80	2,105.8	-6.6	4.9	1,912,206.89	2,778,753.27	36° 15' 18.30 N	107° 38' 40.42 W
2,169.0	1.10	203.70	2,168.8	-7.6	4.4	1,912,205.85	2,778,752.77	36° 15' 18.29 N	107° 38' 40.43 W
2,233.0	0.50	317.10	2,232.8	-8.0	4.0	1,912,205.49	2,778,752.33	36° 15' 18.28 N	107° 38' 40.43 W
2,296.0	1.30	357.10	2,295.8	-7.0	3.8	1,912,206.40	2,778,752.11	36° 15' 18.29 N	107° 38' 40.43 W
2,359.0	1.40	345.30	2,358.7	-5.6	3.5	1,912,207.86	2,778,751.88	36° 15' 18.31 N	107° 38' 40.44 W
2,422.0	1.10	333.50	2,421.7	-4.3	3.1	1,912,209.15	2,778,751.41	36° 15' 18.32 N	107° 38' 40.44 W
2,485.0	0.90	329.30	2,484.7	-3.3	2.5	1,912,210.11	2,778,750.88	36° 15' 18.33 N	107° 38' 40.45 W
2,548.0	0.70	327.90	2,547.7	-2.6	2.1	1,912,210.86	2,778,750.42	36° 15' 18.34 N	107° 38' 40.46 W
2,611.0	0.50	339.80	2,610.7	-2.0	1.8	1,912,211.45	2,778,750.12	36° 15' 18.34 N	107° 38' 40.46 W
2,674.0	0.50	312.70	2,673.7	-1.5	1.5	1,912,211.89	2,778,749.83	36° 15' 18.35 N	107° 38' 40.46 W
2,737.0	0.60	302.60	2,736.7	-1.2	1.0	1,912,212.25	2,778,749.35	36° 15' 18.35 N	107° 38' 40.47 W
2,800.0	0.90	299.70	2,799.7	-0.8	0.3	1,912,212.67	2,778,748.64	36° 15' 18.36 N	107° 38' 40.48 W
2,864.0	0.80	288.80	2,863.7	-0.4	-0.6	1,912,213.06	2,778,747.78	36° 15' 18.36 N	107° 38' 40.49 W
2,926.0	0.80	23.80	2,925.7	0.2	-0.8	1,912,213.60	2,778,747.54	36° 15' 18.37 N	107° 38' 40.49 W
2,989.0	0.30	358.60	2,988.7	0.7	-0.6	1,912,214.17	2,778,747.71	36° 15' 18.37 N	107° 38' 40.49 W
3,053.0	0.20	351.30	3,052.7	1.0	-0.6	1,912,214.45	2,778,747.69	36° 15' 18.37 N	107° 38' 40.49 W
3,116.0	0.20	274.50	3,115.7	1.1	-0.8	1,912,214.56	2,778,747.57	36° 15' 18.37 N	107° 38' 40.49 W
3,179.0	0.20	259.30	3,178.7	1.1	-1.0	1,912,214.55	2,778,747.35	36° 15' 18.37 N	107° 38' 40.49 W
3,242.0	0.40	181.00	3,241.7	0.9	-1.1	1,912,214.31	2,778,747.24	36° 15' 18.37 N	107° 38' 40.49 W
3,305.0	0.30	243.30	3,304.7	0.6	-1.2	1,912,214.02	2,778,747.09	36° 15' 18.37 N	107° 38' 40.50 W
3,368.0	0.10	178.00	3,367.7	0.5	-1.4	1,912,213.89	2,778,746.94	36° 15' 18.37 N	107° 38' 40.50 W
3,431.0	0.30	222.50	3,430.7	0.3	-1.5	1,912,213.71	2,778,746.83	36° 15' 18.37 N	107° 38' 40.50 W
3,494.0	0.60	211.40	3,493.7	-0.1	-1.8	1,912,213.31	2,778,746.55	36° 15' 18.36 N	107° 38' 40.50 W
3,557.0	0.70	177.30	3,556.7	-0.8	-1.9	1,912,212.64	2,778,746.40	36° 15' 18.36 N	107° 38' 40.50 W
3,620.0	0.60	171.30	3,619.7	-1.5	-1.9	1,912,211.93	2,778,746.47	36° 15' 18.35 N	107° 38' 40.50 W
3,683.0	0.80	175.30	3,682.7	-2.3	-1.8	1,912,211.16	2,778,746.55	36° 15' 18.34 N	107° 38' 40.50 W
3,746.0	1.10	177.30	3,745.7	-3.3	-1.7	1,912,210.12	2,778,746.62	36° 15' 18.33 N	107° 38' 40.50 W
3,809.0	1.40	178.70	3,808.6	-4.7	-1.7	1,912,208.75	2,778,746.67	36° 15' 18.32 N	107° 38' 40.50 W
3,872.0	0.60	152.20	3,871.6	-5.7	-1.5	1,912,207.69	2,778,746.84	36° 15' 18.31 N	107° 38' 40.50 W
3,935.0	1.00	94.20	3,934.6	-6.1	-0.8	1,912,207.36	2,778,747.54	36° 15' 18.30 N	107° 38' 40.49 W

Cathedral Energy Services

Survey Report - Geographic

Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook 102-2308 02H
Wellbore: Hz
Design: FINAL

Local Co-ordinate Reference: Well Lybrook 102-2308 02H
TVD Reference: WELL @ 6987.0ft (Aztec 950)
MD Reference: WELL @ 6987.0ft (Aztec 950)
North Reference: True
Survey Calculation Method: Minimum Curvature
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
3,998.0	0.90	105.80	3,997.6	-6.2	0.2	1,912,207.18	2,778,748.57	36° 15' 18.30 N	107° 38' 40.48 W
4,061.0	0.60	99.50	4,060.6	-6.4	1.0	1,912,207.00	2,778,749.37	36° 15' 18.30 N	107° 38' 40.47 W
4,124.0	0.90	100.30	4,123.6	-6.6	1.8	1,912,206.86	2,778,750.18	36° 15' 18.30 N	107° 38' 40.46 W
4,187.0	1.20	88.60	4,186.6	-6.7	3.0	1,912,206.79	2,778,751.33	36° 15' 18.30 N	107° 38' 40.44 W
4,251.0	1.40	92.90	4,250.6	-6.7	4.4	1,912,206.77	2,778,752.78	36° 15' 18.30 N	107° 38' 40.43 W
4,314.0	0.70	99.50	4,313.6	-6.8	5.6	1,912,206.67	2,778,753.93	36° 15' 18.30 N	107° 38' 40.41 W
4,376.0	0.30	132.50	4,375.6	-7.0	6.1	1,912,206.49	2,778,754.42	36° 15' 18.29 N	107° 38' 40.41 W
4,440.0	0.60	161.70	4,439.6	-7.4	6.3	1,912,206.06	2,778,754.65	36° 15' 18.29 N	107° 38' 40.40 W
4,503.0	0.40	275.40	4,502.6	-7.7	6.2	1,912,205.77	2,778,754.54	36° 15' 18.29 N	107° 38' 40.41 W
4,566.0	0.70	314.40	4,565.6	-7.4	5.7	1,912,206.06	2,778,754.04	36° 15' 18.29 N	107° 38' 40.41 W
4,627.0	0.30	279.30	4,626.6	-7.1	5.3	1,912,206.34	2,778,753.62	36° 15' 18.29 N	107° 38' 40.42 W
4,675.0	0.20	303.90	4,674.6	-7.0	5.1	1,912,206.41	2,778,753.42	36° 15' 18.29 N	107° 38' 40.42 W
4,707.0	1.40	88.80	4,706.6	-7.0	5.4	1,912,206.45	2,778,753.77	36° 15' 18.29 N	107° 38' 40.41 W
4,738.0	3.30	90.20	4,737.5	-7.0	6.7	1,912,206.46	2,778,755.04	36° 15' 18.29 N	107° 38' 40.40 W
4,769.0	5.60	92.70	4,768.4	-7.1	9.1	1,912,206.39	2,778,757.44	36° 15' 18.29 N	107° 38' 40.37 W
4,801.0	7.60	89.70	4,800.2	-7.1	12.8	1,912,206.33	2,778,761.12	36° 15' 18.29 N	107° 38' 40.32 W
4,832.0	9.30	89.00	4,830.9	-7.1	17.3	1,912,206.40	2,778,765.67	36° 15' 18.29 N	107° 38' 40.27 W
4,864.0	11.20	91.30	4,862.4	-7.1	23.0	1,912,206.38	2,778,771.37	36° 15' 18.29 N	107° 38' 40.20 W
4,895.0	13.60	92.50	4,892.6	-7.3	29.7	1,912,206.17	2,778,778.02	36° 15' 18.29 N	107° 38' 40.12 W
4,927.0	15.80	93.20	4,923.6	-7.7	37.8	1,912,205.78	2,778,786.13	36° 15' 18.29 N	107° 38' 40.02 W
4,958.0	17.90	93.30	4,953.3	-8.2	46.7	1,912,205.28	2,778,795.10	36° 15' 18.28 N	107° 38' 39.91 W
4,990.0	20.00	90.70	4,983.5	-8.6	57.1	1,912,204.95	2,778,805.49	36° 15' 18.28 N	107° 38' 39.78 W
5,021.0	21.90	87.00	5,012.5	-8.4	68.2	1,912,205.21	2,778,816.56	36° 15' 18.28 N	107° 38' 39.65 W
5,053.0	23.80	86.60	5,042.0	-7.7	80.6	1,912,205.93	2,778,828.97	36° 15' 18.29 N	107° 38' 39.50 W
5,084.0	25.70	89.50	5,070.1	-7.2	93.6	1,912,206.39	2,778,841.93	36° 15' 18.29 N	107° 38' 39.34 W
5,116.0	27.30	92.20	5,098.8	-7.4	107.9	1,912,206.20	2,778,856.20	36° 15' 18.29 N	107° 38' 39.16 W
5,147.0	28.80	93.10	5,126.1	-8.1	122.4	1,912,205.55	2,778,870.77	36° 15' 18.28 N	107° 38' 38.99 W
5,178.0	30.50	91.50	5,153.1	-8.7	137.7	1,912,204.97	2,778,886.09	36° 15' 18.28 N	107° 38' 38.80 W
5,209.0	32.30	90.40	5,179.5	-9.0	153.9	1,912,204.73	2,778,902.24	36° 15' 18.27 N	107° 38' 38.60 W
5,240.0	34.40	89.90	5,205.4	-9.0	170.9	1,912,204.73	2,778,919.28	36° 15' 18.27 N	107° 38' 38.39 W
5,272.0	35.80	89.50	5,231.6	-8.9	189.3	1,912,204.86	2,778,937.68	36° 15' 18.28 N	107° 38' 38.17 W
5,303.0	38.10	90.00	5,256.4	-8.9	208.0	1,912,204.97	2,778,956.31	36° 15' 18.28 N	107° 38' 37.94 W
5,335.0	40.50	90.20	5,281.1	-8.9	228.2	1,912,204.98	2,778,976.58	36° 15' 18.28 N	107° 38' 37.69 W
5,366.0	42.90	89.60	5,304.3	-8.9	248.9	1,912,205.06	2,778,997.21	36° 15' 18.28 N	107° 38' 37.44 W
5,398.0	45.80	89.20	5,327.2	-8.6	271.2	1,912,205.34	2,779,019.57	36° 15' 18.28 N	107° 38' 37.17 W
5,429.0	49.50	89.50	5,348.0	-8.4	294.1	1,912,205.64	2,779,042.48	36° 15' 18.28 N	107° 38' 36.89 W
5,461.0	54.00	89.20	5,367.8	-8.1	319.2	1,912,205.97	2,779,067.60	36° 15' 18.28 N	107° 38' 36.58 W
5,492.0	58.70	89.40	5,385.0	-7.8	345.0	1,912,206.34	2,779,093.39	36° 15' 18.29 N	107° 38' 36.27 W
5,523.0	63.30	89.80	5,400.0	-7.6	372.1	1,912,206.58	2,779,120.50	36° 15' 18.29 N	107° 38' 35.94 W
5,555.0	66.90	90.20	5,413.5	-7.6	401.2	1,912,206.63	2,779,149.52	36° 15' 18.29 N	107° 38' 35.58 W
5,586.0	70.80	90.30	5,424.7	-7.7	430.1	1,912,206.56	2,779,178.42	36° 15' 18.29 N	107° 38' 35.23 W
5,618.0	74.70	89.90	5,434.2	-7.8	460.6	1,912,206.57	2,779,208.98	36° 15' 18.29 N	107° 38' 34.86 W
5,649.0	78.70	89.50	5,441.3	-7.6	490.8	1,912,206.79	2,779,239.14	36° 15' 18.29 N	107° 38' 34.49 W
5,681.0	80.50	89.20	5,447.1	-7.2	522.3	1,912,207.21	2,779,270.61	36° 15' 18.29 N	107° 38' 34.10 W
5,713.0	81.20	89.20	5,452.2	-6.8	553.9	1,912,207.71	2,779,302.20	36° 15' 18.30 N	107° 38' 33.72 W
5,744.0	83.00	89.40	5,456.4	-6.4	584.6	1,912,208.14	2,779,332.90	36° 15' 18.30 N	107° 38' 33.34 W
5,775.0	83.60	89.40	5,460.0	-6.1	615.3	1,912,208.53	2,779,363.69	36° 15' 18.30 N	107° 38' 32.97 W
5,807.0	84.30	89.00	5,463.4	-5.7	647.2	1,912,209.03	2,779,395.50	36° 15' 18.31 N	107° 38' 32.58 W
5,838.0	85.10	88.80	5,466.3	-5.1	678.0	1,912,209.69	2,779,426.36	36° 15' 18.31 N	107° 38' 32.20 W
5,870.0	85.70	89.10	5,468.9	-4.5	709.9	1,912,210.33	2,779,458.25	36° 15' 18.32 N	107° 38' 31.81 W
5,901.0	85.40	90.40	5,471.3	-4.3	740.8	1,912,210.53	2,779,489.15	36° 15' 18.32 N	107° 38' 31.44 W
5,933.0	85.90	90.60	5,473.7	-4.6	772.7	1,912,210.31	2,779,521.06	36° 15' 18.32 N	107° 38' 31.05 W
5,962.0	86.70	90.60	5,475.6	-4.9	801.6	1,912,210.06	2,779,549.99	36° 15' 18.31 N	107° 38' 30.69 W
5,988.0	88.60	93.80	5,476.6	-5.9	827.6	1,912,209.12	2,779,575.96	36° 15' 18.30 N	107° 38' 30.38 W
6,019.0	89.20	93.50	5,477.2	-7.9	858.5	1,912,207.20	2,779,606.90	36° 15' 18.29 N	107° 38' 30.00 W

Cathedral Energy Services

Survey Report - Geographic

Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook I02-2308 02H
Wellbore: Hz
Design: FINAL

Local Co-ordinate Reference: Well Lybrook I02-2308 02H
TVD Reference: WELL @ 6987.0ft (Aztec 950)
MD Reference: WELL @ 6987.0ft (Aztec 950)
North Reference: True
Survey Calculation Method: Minimum Curvature
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
6,051.0	90.40	91.90	5,477.3	-9.4	890.5	1,912,205.76	2,779,638.86	36° 15' 18.27 N	107° 38' 29.61 W
6,114.0	90.70	89.20	5,476.7	-10.0	953.5	1,912,205.28	2,779,701.85	36° 15' 18.26 N	107° 38' 28.84 W
6,177.0	89.00	88.40	5,476.9	-8.7	1,016.5	1,912,206.72	2,779,764.83	36° 15' 18.28 N	107° 38' 28.07 W
6,240.0	88.60	87.80	5,478.2	-6.6	1,079.4	1,912,208.93	2,779,827.78	36° 15' 18.30 N	107° 38' 27.30 W
6,303.0	88.10	86.90	5,480.0	-3.7	1,142.3	1,912,211.96	2,779,890.68	36° 15' 18.33 N	107° 38' 26.53 W
6,366.0	88.60	87.20	5,481.8	-0.5	1,205.2	1,912,215.33	2,779,953.56	36° 15' 18.36 N	107° 38' 25.76 W
6,429.0	88.30	89.20	5,483.5	1.5	1,268.2	1,912,217.43	2,780,016.50	36° 15' 18.38 N	107° 38' 25.00 W
6,492.0	88.50	90.60	5,485.3	1.6	1,331.1	1,912,217.66	2,780,079.48	36° 15' 18.38 N	107° 38' 24.23 W
6,555.0	90.40	91.40	5,485.9	0.5	1,394.1	1,912,216.68	2,780,142.46	36° 15' 18.37 N	107° 38' 23.46 W
6,617.0	92.00	90.30	5,484.6	-0.4	1,456.1	1,912,215.89	2,780,204.44	36° 15' 18.36 N	107° 38' 22.70 W
6,680.0	90.70	89.10	5,483.1	-0.1	1,519.1	1,912,216.34	2,780,267.42	36° 15' 18.36 N	107° 38' 21.93 W
6,744.0	90.30	88.00	5,482.6	1.6	1,583.1	1,912,218.08	2,780,331.39	36° 15' 18.38 N	107° 38' 21.15 W
6,807.0	89.00	86.80	5,482.9	4.4	1,646.0	1,912,221.06	2,780,394.32	36° 15' 18.41 N	107° 38' 20.38 W
6,869.0	88.10	87.70	5,484.5	7.4	1,707.9	1,912,224.16	2,780,456.22	36° 15' 18.44 N	107° 38' 19.63 W
6,932.0	89.30	89.40	5,485.9	9.0	1,770.9	1,912,225.87	2,780,519.18	36° 15' 18.45 N	107° 38' 18.86 W
6,995.0	90.30	90.90	5,486.2	8.8	1,833.9	1,912,225.83	2,780,582.17	36° 15' 18.45 N	107° 38' 18.09 W
7,059.0	90.90	91.00	5,485.5	7.8	1,897.8	1,912,224.89	2,780,646.16	36° 15' 18.44 N	107° 38' 17.31 W
7,121.0	88.50	89.20	5,485.8	7.7	1,959.8	1,912,224.91	2,780,708.16	36° 15' 18.44 N	107° 38' 16.55 W
7,184.0	89.70	90.20	5,486.8	8.0	2,022.8	1,912,225.36	2,780,771.14	36° 15' 18.44 N	107° 38' 15.78 W
7,247.0	89.30	91.00	5,487.4	7.3	2,085.8	1,912,224.82	2,780,834.12	36° 15' 18.44 N	107° 38' 15.01 W
7,310.0	90.40	90.60	5,487.5	6.4	2,148.8	1,912,224.07	2,780,897.12	36° 15' 18.43 N	107° 38' 14.24 W
7,373.0	89.90	89.90	5,487.4	6.2	2,211.8	1,912,223.91	2,780,960.12	36° 15' 18.42 N	107° 38' 13.47 W
7,436.0	92.10	91.40	5,486.3	5.5	2,274.8	1,912,223.32	2,781,023.10	36° 15' 18.42 N	107° 38' 12.71 W
7,499.0	91.30	89.50	5,484.4	5.0	2,337.7	1,912,222.95	2,781,086.07	36° 15' 18.41 N	107° 38' 11.94 W
7,562.0	90.10	89.20	5,483.6	5.7	2,400.7	1,912,223.79	2,781,149.06	36° 15' 18.42 N	107° 38' 11.17 W
7,625.0	89.30	88.50	5,484.0	6.9	2,463.7	1,912,225.17	2,781,212.04	36° 15' 18.43 N	107° 38' 10.40 W
7,688.0	89.70	88.00	5,484.5	8.9	2,526.7	1,912,227.22	2,781,275.00	36° 15' 18.45 N	107° 38' 9.63 W
7,751.0	89.90	88.00	5,484.7	11.1	2,589.6	1,912,229.54	2,781,337.96	36° 15' 18.47 N	107° 38' 8.86 W
7,814.0	90.70	88.80	5,484.4	12.8	2,652.6	1,912,231.42	2,781,400.93	36° 15' 18.49 N	107° 38' 8.09 W
7,877.0	91.50	88.80	5,483.2	14.1	2,715.6	1,912,232.87	2,781,463.90	36° 15' 18.50 N	107° 38' 7.32 W
7,940.0	89.30	88.20	5,482.7	15.8	2,778.6	1,912,234.64	2,781,526.87	36° 15' 18.52 N	107° 38' 6.55 W
8,003.0	90.00	89.40	5,483.1	17.1	2,841.6	1,912,236.08	2,781,589.85	36° 15' 18.53 N	107° 38' 5.78 W
8,066.0	90.90	89.70	5,482.6	17.6	2,904.5	1,912,236.70	2,781,652.85	36° 15' 18.54 N	107° 38' 5.02 W
8,129.0	90.10	90.30	5,482.1	17.6	2,967.5	1,912,236.82	2,781,715.84	36° 15' 18.54 N	107° 38' 4.25 W
8,192.0	90.70	90.10	5,481.6	17.4	3,030.5	1,912,236.72	2,781,778.84	36° 15' 18.53 N	107° 38' 3.48 W
8,255.0	90.20	91.20	5,481.1	16.7	3,093.5	1,912,236.13	2,781,841.83	36° 15' 18.53 N	107° 38' 2.71 W
8,318.0	90.90	91.00	5,480.5	15.5	3,156.5	1,912,235.04	2,781,904.82	36° 15' 18.51 N	107° 38' 1.94 W
8,381.0	89.60	91.20	5,480.3	14.3	3,219.5	1,912,233.96	2,781,967.81	36° 15' 18.50 N	107° 38' 1.17 W
8,444.0	90.20	91.20	5,480.4	12.9	3,282.5	1,912,232.76	2,782,030.80	36° 15' 18.49 N	107° 38' 0.40 W
8,507.0	90.40	90.70	5,480.0	11.9	3,345.5	1,912,231.84	2,782,093.79	36° 15' 18.48 N	107° 37' 59.63 W
8,570.0	89.50	90.20	5,480.1	11.4	3,408.5	1,912,231.47	2,782,156.79	36° 15' 18.47 N	107° 37' 58.86 W
8,633.0	90.20	89.90	5,480.3	11.3	3,471.5	1,912,231.54	2,782,219.79	36° 15' 18.47 N	107° 37' 58.09 W
8,696.0	89.30	90.80	5,480.5	11.0	3,534.5	1,912,231.27	2,782,282.79	36° 15' 18.47 N	107° 37' 57.32 W
8,759.0	89.70	90.40	5,481.1	10.3	3,597.5	1,912,230.74	2,782,345.78	36° 15' 18.46 N	107° 37' 56.55 W
8,823.0	90.40	90.60	5,481.0	9.7	3,661.5	1,912,230.30	2,782,409.78	36° 15' 18.46 N	107° 37' 55.77 W
8,886.0	90.50	90.50	5,480.5	9.1	3,724.5	1,912,229.82	2,782,472.77	36° 15' 18.45 N	107° 37' 55.00 W
8,949.0	87.20	88.90	5,481.8	9.5	3,787.4	1,912,230.27	2,782,535.75	36° 15' 18.45 N	107° 37' 54.24 W
9,012.0	89.80	90.40	5,483.5	9.8	3,850.4	1,912,230.78	2,782,598.72	36° 15' 18.46 N	107° 37' 53.47 W
9,075.0	88.60	88.40	5,484.3	10.5	3,913.4	1,912,231.56	2,782,661.72	36° 15' 18.46 N	107° 37' 52.70 W
9,138.0	90.80	89.80	5,484.7	11.5	3,976.4	1,912,232.67	2,782,724.71	36° 15' 18.47 N	107° 37' 51.93 W
9,201.0	91.20	90.10	5,483.6	11.5	4,039.4	1,912,232.85	2,782,787.70	36° 15' 18.47 N	107° 37' 51.16 W
9,264.0	91.50	90.80	5,482.1	11.1	4,102.4	1,912,232.48	2,782,850.68	36° 15' 18.47 N	107° 37' 50.39 W
9,327.0	91.20	90.10	5,480.6	10.6	4,165.3	1,912,232.11	2,782,913.66	36° 15' 18.47 N	107° 37' 49.62 W
9,389.0	88.90	90.10	5,480.5	10.5	4,227.3	1,912,232.12	2,782,975.65	36° 15' 18.46 N	107° 37' 48.86 W
9,452.0	89.80	91.50	5,481.3	9.6	4,290.3	1,912,231.36	2,783,038.64	36° 15' 18.46 N	107° 37' 48.09 W

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook 102-2308 02H
Project:	San Juan County, NM	TVD Reference:	WELL @ 6987.0ft (Aztec 950)
Site:	S2-T23N-R8W (Lybrook)	MD Reference:	WELL @ 6987.0ft (Aztec 950)
Well:	Lybrook 102-2308 02H	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
9,515.0	90.50	91.30	5,481.1	8.0	4,353.3	1,912,229.95	2,783,101.63	36° 15' 18.44 N	107° 37' 47.33 W
9,578.0	91.00	90.20	5,480.3	7.2	4,416.3	1,912,229.25	2,783,164.62	36° 15' 18.43 N	107° 37' 46.56 W
9,641.0	90.50	90.20	5,479.4	7.0	4,479.3	1,912,229.15	2,783,227.61	36° 15' 18.43 N	107° 37' 45.79 W
9,704.0	90.10	89.60	5,479.1	7.1	4,542.3	1,912,229.38	2,783,290.61	36° 15' 18.43 N	107° 37' 45.02 W
9,767.0	89.20	89.50	5,479.5	7.6	4,605.3	1,912,230.00	2,783,353.60	36° 15' 18.44 N	107° 37' 44.25 W
9,830.0	89.00	90.60	5,480.5	7.5	4,668.3	1,912,230.07	2,783,416.60	36° 15' 18.43 N	107° 37' 43.48 W
9,893.0	90.70	91.20	5,480.7	6.5	4,731.3	1,912,229.20	2,783,479.59	36° 15' 18.42 N	107° 37' 42.71 W
9,956.0	90.70	89.90	5,479.9	5.9	4,794.3	1,912,228.72	2,783,542.58	36° 15' 18.42 N	107° 37' 41.94 W
10,019.0	90.10	89.40	5,479.4	6.3	4,857.3	1,912,229.22	2,783,605.58	36° 15' 18.42 N	107° 37' 41.17 W
10,082.0	90.40	89.20	5,479.2	7.1	4,920.3	1,912,230.12	2,783,668.57	36° 15' 18.43 N	107° 37' 40.40 W
10,145.0	90.90	88.80	5,478.5	8.2	4,983.2	1,912,231.34	2,783,731.55	36° 15' 18.44 N	107° 37' 39.63 W
10,208.0	90.50	89.50	5,477.7	9.1	5,046.2	1,912,232.40	2,783,794.54	36° 15' 18.45 N	107° 37' 38.86 W
10,271.0	90.50	89.40	5,477.1	9.7	5,109.2	1,912,233.12	2,783,857.53	36° 15' 18.46 N	107° 37' 38.10 W
10,334.0	89.60	89.50	5,477.1	10.3	5,172.2	1,912,233.85	2,783,920.53	36° 15' 18.46 N	107° 37' 37.33 W
10,397.0	90.10	89.50	5,477.2	10.9	5,235.2	1,912,234.52	2,783,983.52	36° 15' 18.47 N	107° 37' 36.56 W
10,460.0	91.00	89.40	5,476.6	11.5	5,298.2	1,912,235.25	2,784,046.49	36° 15' 18.47 N	107° 37' 35.79 W
10,523.0	90.50	89.80	5,475.8	11.9	5,361.2	1,912,235.81	2,784,109.49	36° 15' 18.48 N	107° 37' 35.02 W
10,586.0	90.00	89.80	5,475.5	12.2	5,424.2	1,912,236.16	2,784,172.48	36° 15' 18.48 N	107° 37' 34.25 W
10,649.0	90.40	89.60	5,475.3	12.5	5,487.2	1,912,236.61	2,784,235.48	36° 15' 18.48 N	107° 37' 33.48 W
10,712.0	91.10	89.40	5,474.5	13.0	5,550.2	1,912,237.28	2,784,298.47	36° 15' 18.49 N	107° 37' 32.71 W
10,755.0	91.10	89.00	5,473.7	13.6	5,593.2	1,912,237.97	2,784,341.48	36° 15' 18.49 N	107° 37' 32.19 W
Last Cathedral Survey @ 10,755' MD									
10,800.0	91.10	89.00	5,472.8	14.4	5,638.1	1,912,238.84	2,784,386.44	36° 15' 18.50 N	107° 37' 31.64 W
Projection to Bit @ 10,800'									

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									
Lybrook 102-2308 02H P	0.00	0.00	5,476.1	15.8	5,664.6	1,912,240.32	2,784,412.93	36° 15' 18.51 N	107° 37' 31.31 W
- actual wellpath misses target center by 26.7ft at 10800.0ft MD (5472.8 TVD, 14.4 N, 5638.1 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
10,755.0	5,473.7	13.6	5,593.2	Last Cathedral Survey @ 10,755' MD	
10,800.0	5,472.8	14.4	5,638.1	Projection to Bit @ 10,800'	

Checked By: _____ Approved By: _____ Date: _____

DEVIATION SURVEYS

MD (Feet)	Inclination (Degree)
198	.80
376	.40
682	1.00
988	.20
1293	.30
1603	1.00
1917	1.50
2233	.50
2548	.70
2864	.80
3179	.20
3494	.60
3809	1.40
4124	.90
4440	.60
4707	1.40

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.



Vy Nguyen, Engineering Technologist

02/19/14

2/19/14

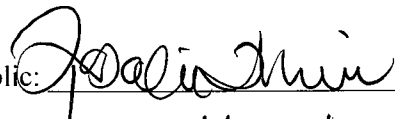
ACKNOWLEDGMENT

State of Colorado
City and County of Denver

This instrument was acknowledged before me on this 19th day of February, 2014 by Vy Nguyen as Attorney in Fact of Encana Oil & Gas (USA) Inc., on behalf of said corporation.

In witness whereof, I hereunto set my hand and official seal.

Notary Public:



My Commission Expires:

1/29/18

