

14
Kd

DEVIATION SURVEYS
Well Name Lybrook P32-2307 01H
API: 30-043-21198

CONFIDENTIAL

MD (Feet)	Inclination (Degree)
760'	1.00
1076'	1.40
1393'	0.90
1709'	0.80
2026'	3.20
2342'	2.90
2658'	2.10
2974'	1.10
3184'	8.50

OPERATOR CERTIFICATION

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

Brenda R. Linster
Brenda R. Linster, Regulatory Lead

11.03.14
Date

ACKNOWLEDGMENT

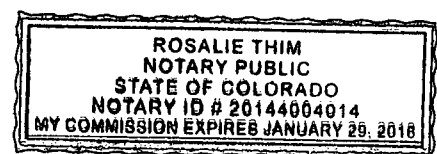
State of Colorado
City and County of Denver

This instrument was acknowledged before me on this 3rd day of November, 2014 by Brenda R. Linster 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: Rosalie Thim

My Commission Expires: 1/29/18

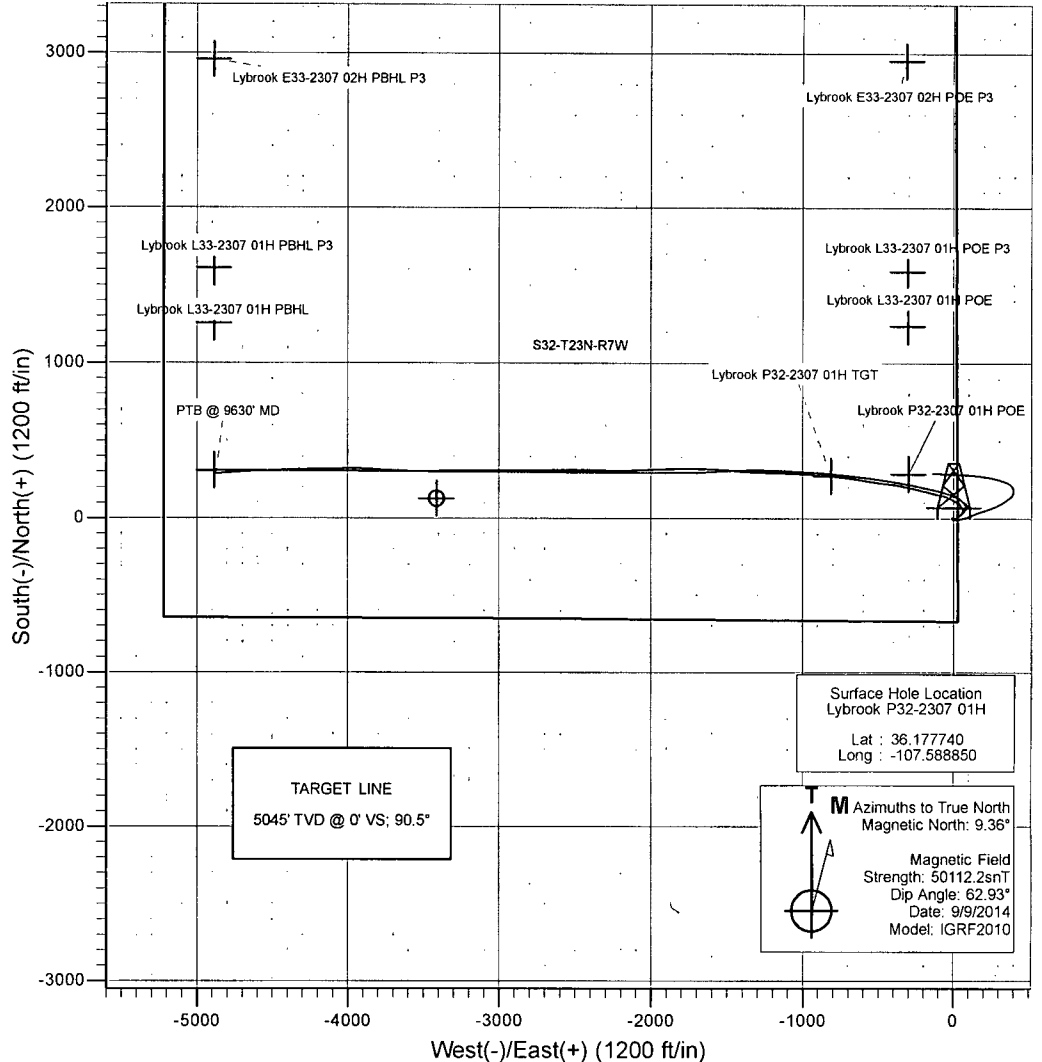
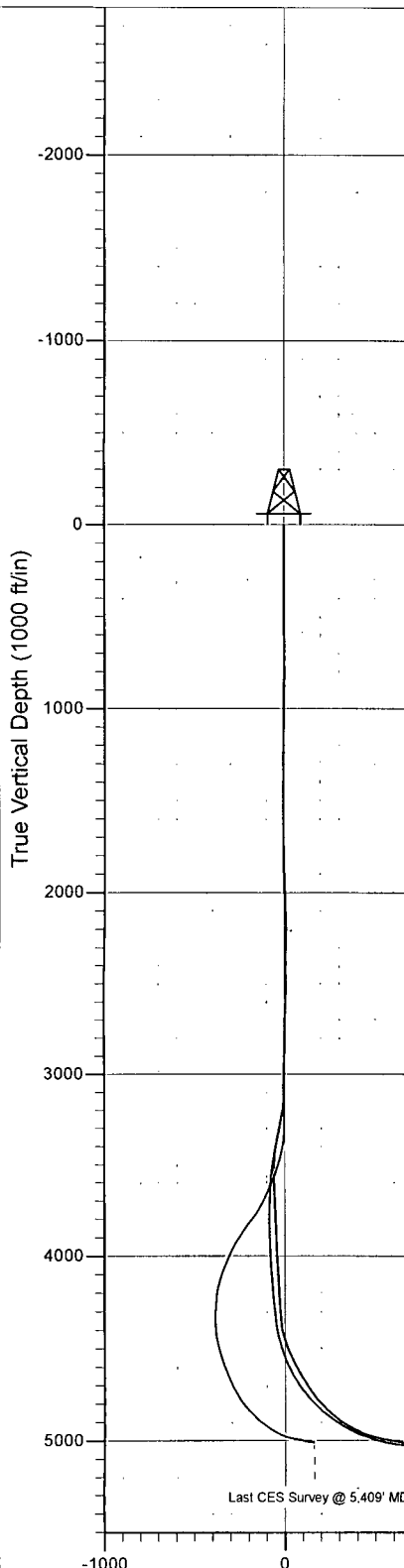




Project: Sandoval County, NM
 Site: S32-T23N-R7W
 Well: Lybrook P32-2307 01H
 Wellbore: STK #1
 Design: FINAL



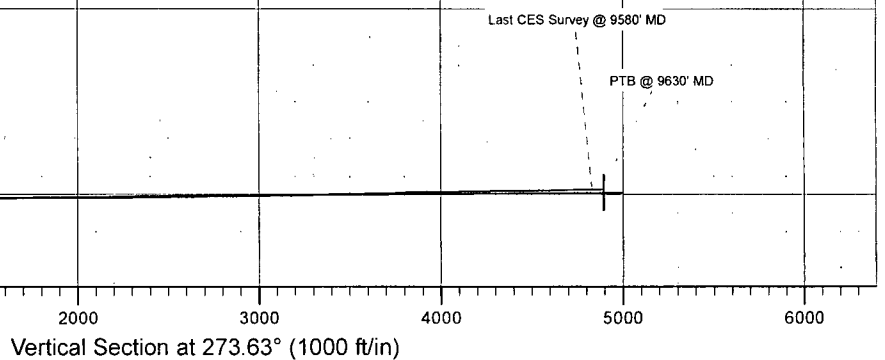
FINAL
 Lybrook P32-2307 01H
 18' KB @ 6892.0ft (A1099)
 Ground Elevation @ 6874.0
 North American Datum 1983
 Well Lybrook P32-2307 01H, True North



DESIGN TARGET DETAILS						
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lybrook P32-2307 01H PBHL STK	309.9	-4885.0	1887069.40	1240410.06	36.178590	-107.605400

OIL CONS. DIV DIST. 3

NOV 05 2014



Cathedral Energy Services

Survey Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S32-T23N-R7W
Well: Lybrook P32-2307 01H
Wellbore: STK #1
Design: FINAL

Local Co-ordinate Reference: Well Lybrook P32-2307 01H
TVD Reference: 18' KB @ 6892.0ft (A1099)
MD Reference: 18' KB @ 6892.0ft (A1099)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

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

Site: S32-T23N-R7W
Site Position: Northing: 1,886,692.15 ft Latitude: 36.177740
From: Lat/Long Easting: 1,245,290.35 ft Longitude: -107.588850
Position Uncertainty: 0.0 ft Slot Radius: 13.200 in Grid Convergence: -0.79 °

Well: Lybrook P32-2307 01H
Well Position: +N/-S 0.0 ft Northing: 1,886,692.15 ft Latitude: 36.177740
+E/-W 0.0 ft Easting: 1,245,290.35 ft Longitude: -107.588850
Position Uncertainty: 0.0 ft Wellhead Elevation: ft Ground Level: 6,874.0 ft

Wellbore: STK #1
Magnetics: Model Name Sample Date Declination (°) Dip Angle (°) Field Strength (nT)
IGRF2010 9/9/2014 9.36 62.93 50,112

Design: FINAL
Audit Notes:
Version: 1.0 Phase: ACTUAL Tie On Depth: 3,126.0
Vertical Section: Depth From (TVD) +N/-S +E/-W Direction
(ft) (ft) (ft) (°)
0.0 0.0 0.0 273.63

Survey Program Date: 9/23/2014
From (ft) To (ft) Survey (Wellbore) Tool Name Description
570.0 3,126.0 Survey #1 (Hz) Geolink MWD Geolink MWD
3,152.0 9,630.0 Survey #1 (STK #1) Geolink MWD Geolink MWD

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	
570.0	0.90	338.00	570.0	4.2	-1.7	1.9	0.16	0.16	
634.0	1.00	326.00	634.0	5.1	-2.2	2.5	0.35	0.16	
697.0	1.00	324.30	697.0	6.0	-2.8	3.2	0.05	0.00	
760.0	1.00	176.40	760.0	5.9	-3.1	3.5	3.05	0.00	
823.0	1.80	161.90	822.9	4.4	-2.8	3.0	1.38	1.27	
887.0	1.70	166.90	886.9	2.5	-2.2	2.4	0.29	-0.16	
950.0	1.50	169.30	949.9	0.8	-1.9	1.9	0.33	-0.32	
1,013.0	1.60	170.70	1,012.9	-0.9	-1.6	1.5	0.17	0.16	
1,076.0	1.40	163.80	1,075.8	-2.5	-1.2	1.0	0.43	-0.32	
1,140.0	1.50	159.80	1,139.8	-4.0	-0.7	0.4	0.22	0.16	
1,203.0	1.10	161.20	1,202.8	-5.4	-0.2	-0.1	0.64	-0.63	

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Well: Lybrook P32-2307 01H
Wellbore: STK #1
Design: FINAL

Local Co-ordinate Reference: Well Lybrook P32-2307 01H
TVD Reference: 18' KB @ 6892.0ft (A1099)
MD Reference: 18' KB @ 6892.0ft (A1099)
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)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,266.0	1.20	143.80	1,265.8	-6.5	0.4	-0.8	0.57	0.16	
1,329.0	0.50	22.70	1,328.8	-6.8	0.9	-1.3	2.41	-1.11	
1,393.0	0.90	12.90	1,392.8	-6.0	1.1	-1.5	0.65	0.62	
1,456.0	0.90	9.40	1,455.8	-5.0	1.3	-1.6	0.09	0.00	
1,519.0	0.90	5.00	1,518.8	-4.1	1.4	-1.7	0.11	0.00	
1,583.0	0.90	349.80	1,582.8	-3.1	1.4	-1.5	0.37	0.00	
1,646.0	0.80	355.10	1,645.8	-2.1	1.2	-1.4	0.20	-0.16	
1,709.0	0.80	343.90	1,708.7	-1.3	1.1	-1.1	0.25	0.00	
1,772.0	1.10	320.00	1,771.7	-0.4	0.6	-0.6	0.78	0.48	
1,836.0	1.40	299.30	1,835.7	0.5	-0.5	0.5	0.84	0.47	
1,899.0	1.50	290.60	1,898.7	1.1	-2.0	2.0	0.38	0.16	
1,962.0	1.70	288.70	1,961.7	1.7	-3.6	3.7	0.33	0.32	
2,026.0	3.20	300.70	2,025.6	2.9	-6.1	6.2	2.46	2.34	
2,089.0	2.20	280.60	2,088.5	4.1	-8.8	9.0	2.16	-1.59	
2,152.0	1.60	201.40	2,151.5	3.5	-10.3	10.5	3.91	-0.95	
2,215.0	2.30	181.90	2,214.5	1.4	-10.6	10.7	1.52	1.11	
2,279.0	1.20	100.20	2,278.5	0.0	-10.0	10.0	3.81	-1.72	
2,342.0	2.90	58.80	2,341.4	0.7	-8.0	8.0	3.41	2.70	
2,405.0	0.50	35.30	2,404.4	1.7	-6.5	6.6	3.89	-3.81	
2,468.0	1.50	240.90	2,467.4	1.6	-7.0	7.1	3.12	1.59	
2,531.0	2.30	156.60	2,530.4	0.0	-7.3	7.2	4.16	1.27	
2,595.0	4.20	145.10	2,594.3	-3.1	-5.4	5.2	3.12	2.97	
2,658.0	2.10	123.10	2,657.2	-5.6	-3.1	2.8	3.79	-3.33	
2,721.0	1.10	44.50	2,720.1	-5.8	-1.7	1.4	3.44	-1.59	
2,784.0	1.20	60.30	2,783.1	-5.1	-0.7	0.4	0.53	0.16	
2,848.0	1.10	53.40	2,847.1	-4.4	0.3	-0.6	0.27	-0.16	
2,911.0	1.30	61.70	2,910.1	-3.7	1.5	-1.7	0.42	0.32	
2,974.0	1.10	60.60	2,973.1	-3.0	2.6	-2.8	0.32	-0.32	
3,004.0	1.20	60.70	3,003.1	-2.7	3.1	-3.3	0.33	0.33	
3,065.0	1.10	55.80	3,064.1	-2.1	4.2	-4.3	0.23	-0.16	
3,126.0	0.40	41.40	3,125.1	-1.6	4.8	-4.9	1.18	-1.15	
3,152.0	4.00	57.30	3,151.0	-1.1	5.6	-5.7	13.91	13.85	
3,184.0	8.50	60.00	3,182.8	0.7	8.6	-8.6	14.09	14.06	
3,215.0	10.40	61.30	3,213.4	3.2	13.1	-12.8	6.17	6.13	
3,247.0	12.20	62.90	3,244.8	6.1	18.6	-18.2	5.71	5.62	
3,278.0	13.90	59.20	3,275.0	9.5	24.7	-24.1	6.11	5.48	
3,310.0	15.20	54.50	3,306.0	13.9	31.4	-30.5	5.49	4.06	
3,342.0	16.80	50.80	3,336.7	19.3	38.4	-37.1	5.93	5.00	
3,374.0	16.80	47.10	3,367.4	25.4	45.4	-43.7	3.34	0.00	
3,405.0	15.20	38.80	3,397.2	31.6	51.2	-49.1	8.99	-5.16	
3,437.0	13.20	34.20	3,428.2	37.9	55.9	-53.4	7.17	-6.25	
3,468.0	11.30	27.60	3,458.5	43.5	59.3	-56.4	7.60	-6.13	
3,500.0	9.80	22.50	3,489.9	48.8	61.8	-58.6	5.52	-4.69	
3,563.0	5.90	1.60	3,552.3	57.0	64.0	-60.2	7.58	-6.19	
3,626.0	3.30	315.60	3,615.2	61.5	62.8	-58.8	6.85	-4.13	
3,689.0	3.30	296.90	3,678.1	63.6	59.9	-55.7	1.70	0.00	
3,753.0	3.30	295.20	3,741.9	65.3	56.6	-52.3	0.15	0.00	
3,816.0	3.60	325.60	3,804.8	67.7	53.8	-49.4	2.91	0.48	
3,878.0	3.60	327.40	3,866.7	70.9	51.7	-47.1	0.18	0.00	
3,942.0	3.50	327.70	3,930.6	74.3	49.5	-44.7	0.16	-0.16	
4,005.0	4.40	330.70	3,993.4	78.0	47.3	-42.3	1.47	1.43	
4,068.0	5.50	332.50	4,056.2	82.8	44.8	-39.4	1.76	1.75	
4,131.0	5.00	332.70	4,119.0	87.9	42.1	-36.5	0.79	-0.79	

Cathedral Energy Services

Survey Report

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Project: Sandoval County, NM
Site: S32-T23N-R7W
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Wellbore: STK #1
Design: FINAL

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North Reference: True
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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
4,195.0	4.80	320.40	4,182.7	92.4	39.1	-33.2	1.67	-0.31	
4,258.0	5.50	318.30	4,245.5	96.7	35.4	-29.2	1.15	1.11	
4,321.0	5.70	316.30	4,308.2	101.2	31.3	-24.8	0.44	0.32	
4,354.0	5.40	309.30	4,341.0	103.4	28.9	-22.3	2.24	-0.91	
4,386.0	8.10	303.00	4,372.8	105.6	25.9	-19.1	8.74	8.44	
4,417.0	13.10	298.50	4,403.2	108.5	20.9	-14.0	16.34	16.13	
4,449.0	16.90	296.60	4,434.2	112.3	13.6	-6.5	11.97	11.87	
4,480.0	20.90	298.80	4,463.5	117.0	4.7	2.7	13.10	12.90	
4,512.0	23.40	301.20	4,493.1	123.0	-5.7	13.5	8.31	7.81	
4,544.0	25.60	297.90	4,522.2	129.5	-17.3	25.4	8.09	6.87	
4,575.0	27.00	293.60	4,550.0	135.5	-29.6	38.2	7.62	4.52	
4,607.0	28.30	288.00	4,578.4	140.7	-43.5	52.3	9.08	4.06	
4,639.0	29.60	284.60	4,606.4	145.1	-58.4	67.4	6.55	4.06	
4,670.0	30.60	282.60	4,633.2	148.7	-73.5	82.8	4.57	3.23	
4,702.0	32.10	280.60	4,660.5	152.1	-89.8	99.2	5.70	4.69	
4,733.0	33.60	281.90	4,686.6	155.3	-106.3	115.9	5.35	4.84	
4,765.0	34.40	285.10	4,713.1	159.5	-123.7	133.5	6.12	2.50	
4,796.0	35.00	285.40	4,738.6	164.2	-140.7	150.8	2.01	1.94	
4,828.0	38.40	283.80	4,764.2	169.0	-159.2	169.6	11.04	10.62	
4,859.0	42.30	282.70	4,787.9	173.6	-178.7	189.4	12.79	12.58	
4,891.0	44.70	283.60	4,811.1	178.6	-200.2	211.1	7.75	7.50	
4,923.0	46.80	284.60	4,833.4	184.2	-222.4	233.6	6.93	6.56	
4,954.0	49.20	285.10	4,854.1	190.1	-244.7	256.2	7.83	7.74	
4,986.0	51.40	283.50	4,874.6	196.2	-268.5	280.4	7.88	6.87	
5,018.0	54.20	280.30	4,893.9	201.4	-293.5	305.6	11.83	8.75	
5,049.0	58.30	279.80	4,911.1	205.9	-318.8	331.2	13.29	13.23	
5,081.0	61.70	280.30	4,927.1	210.7	-346.1	358.8	10.71	10.62	
5,112.0	63.80	280.20	4,941.3	215.6	-373.2	386.2	6.78	6.77	
5,148.0	67.60	276.90	4,956.2	220.5	-405.7	418.8	13.46	10.56	
5,180.0	69.20	276.80	4,967.9	224.0	-435.2	448.5	5.01	5.00	
5,210.0	73.30	278.00	4,977.6	227.7	-463.4	476.9	14.18	13.67	
5,241.0	76.10	278.00	4,985.8	231.9	-493.0	506.7	9.03	9.03	
5,271.0	79.00	279.00	4,992.2	236.2	-522.0	535.9	10.20	9.67	
5,302.0	79.20	279.20	4,998.1	241.0	-552.0	566.2	0.90	0.65	
5,332.0	79.40	278.70	5,003.7	245.6	-581.1	595.5	1.77	0.67	
5,363.0	80.70	279.50	5,009.0	250.4	-611.3	625.9	4.90	4.19	
5,394.0	83.60	279.20	5,013.2	255.4	-641.6	656.5	9.40	9.35	
5,425.0	86.10	278.80	5,016.0	260.2	-672.1	687.2	8.17	8.06	
5,455.0	88.20	278.20	5,017.5	264.7	-701.7	717.1	7.28	7.00	
5,486.0	88.90	277.50	5,018.3	268.9	-732.4	748.0	3.19	2.26	
5,517.0	89.00	277.00	5,018.9	272.8	-763.2	778.9	1.64	0.32	
5,547.0	88.90	275.70	5,019.4	276.1	-793.0	808.9	4.35	-0.33	
5,578.0	88.70	274.30	5,020.1	278.8	-823.8	839.8	4.56	-0.65	
5,608.0	87.90	273.40	5,021.0	280.8	-853.8	869.8	4.01	-2.67	
5,639.0	87.90	273.20	5,022.1	282.6	-884.7	900.8	0.64	0.00	
5,670.0	88.80	273.10	5,023.0	284.3	-915.6	931.8	2.92	2.90	
5,701.0	89.70	273.10	5,023.4	286.0	-946.6	962.8	2.90	2.90	
5,731.0	90.00	273.10	5,023.5	287.6	-976.5	992.8	1.00	1.00	
5,792.0	90.80	272.60	5,023.0	290.7	-1,037.5	1,053.8	1.55	1.31	
5,854.0	91.30	272.80	5,021.9	293.6	-1,099.4	1,115.8	0.87	0.81	
5,915.0	91.00	272.70	5,020.7	296.5	-1,160.3	1,176.7	0.52	-0.49	
5,976.0	88.90	271.30	5,020.7	298.6	-1,221.3	1,237.7	4.14	-3.44	
6,038.0	89.00	271.90	5,021.9	300.4	-1,283.2	1,299.7	0.98	0.16	

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6,099.0	90.60	273.10	5,022.1	303.0	-1,344.2	1,360.6	3.28	2.62	
6,162.0	91.80	274.10	5,020.8	307.0	-1,407.0	1,423.6	2.48	1.90	
6,225.0	90.10	274.20	5,019.7	311.5	-1,469.8	1,486.6	2.70	-2.70	
6,289.0	89.70	272.10	5,019.8	315.1	-1,533.7	1,550.6	3.34	-0.62	
6,352.0	91.00	273.20	5,019.5	318.0	-1,596.7	1,613.6	2.70	2.06	
6,415.0	90.40	272.50	5,018.7	321.1	-1,659.6	1,676.6	1.46	-0.95	
6,478.0	90.90	270.50	5,018.0	322.8	-1,722.6	1,739.5	3.27	0.79	
6,542.0	91.20	269.10	5,016.8	322.5	-1,786.5	1,803.4	2.24	0.47	
6,605.0	89.30	268.40	5,016.5	321.2	-1,849.5	1,866.2	3.21	-3.02	
6,668.0	89.50	267.90	5,017.2	319.1	-1,912.5	1,928.9	0.85	0.32	
6,731.0	90.20	268.60	5,017.3	317.2	-1,975.5	1,991.6	1.57	1.11	
6,794.0	89.80	267.50	5,017.3	315.1	-2,038.4	2,054.3	1.86	-0.63	
6,857.0	89.20	268.10	5,017.9	312.6	-2,101.4	2,117.0	1.35	-0.95	
6,920.0	90.00	268.60	5,018.3	310.8	-2,164.3	2,179.7	1.50	1.27	
6,984.0	90.20	271.20	5,018.2	310.7	-2,228.3	2,243.5	4.07	0.31	
7,047.0	91.50	271.20	5,017.3	312.0	-2,291.3	2,306.5	2.06	2.06	
7,110.0	91.90	271.60	5,015.4	313.6	-2,354.3	2,369.4	0.90	0.63	
7,173.0	91.00	270.70	5,013.8	314.8	-2,417.2	2,432.3	2.02	-1.43	
7,237.0	91.10	270.30	5,012.7	315.4	-2,481.2	2,496.2	0.64	0.16	
7,300.0	90.70	269.50	5,011.7	315.3	-2,544.2	2,559.1	1.42	-0.63	
7,363.0	90.50	269.30	5,011.0	314.6	-2,607.2	2,621.9	0.45	-0.32	
7,426.0	90.70	269.20	5,010.3	313.8	-2,670.2	2,684.7	0.35	0.32	
7,489.0	90.50	268.60	5,009.7	312.6	-2,733.2	2,747.5	1.00	-0.32	
7,553.0	90.40	269.60	5,009.2	311.6	-2,797.2	2,811.3	1.57	-0.16	
7,616.0	90.40	269.80	5,008.7	311.3	-2,860.2	2,874.1	0.32	0.00	
7,679.0	89.90	270.50	5,008.6	311.4	-2,923.2	2,937.0	1.37	-0.79	
7,742.0	90.90	270.00	5,008.1	311.7	-2,986.2	2,999.9	1.77	1.59	
7,806.0	92.20	271.40	5,006.4	312.5	-3,050.1	3,063.8	2.98	2.03	
7,869.0	92.10	270.70	5,004.0	313.6	-3,113.1	3,126.7	1.12	-0.16	
7,932.0	89.10	268.00	5,003.4	312.9	-3,176.1	3,189.5	6.41	-4.76	
7,995.0	89.10	267.30	5,004.4	310.3	-3,239.0	3,252.1	1.11	0.00	
8,058.0	90.90	267.80	5,004.4	307.6	-3,301.9	3,314.8	2.97	2.86	
8,122.0	91.90	269.70	5,002.8	306.2	-3,365.9	3,378.5	3.35	1.56	
8,185.0	91.90	270.50	5,000.7	306.3	-3,428.9	3,441.4	1.27	0.00	
8,248.0	91.50	270.00	4,998.8	306.6	-3,491.8	3,504.2	1.02	-0.63	
8,311.0	90.50	269.90	4,997.7	306.6	-3,554.8	3,567.1	1.60	-1.59	
8,374.0	90.50	272.40	4,997.2	307.8	-3,617.8	3,630.0	3.97	0.00	
8,438.0	92.40	272.20	4,995.6	310.4	-3,681.7	3,694.0	2.99	2.97	
8,501.0	94.00	273.70	4,992.1	313.6	-3,744.5	3,756.9	3.48	2.54	
8,564.0	91.70	272.80	4,988.9	317.2	-3,807.4	3,819.8	3.92	-3.65	
8,627.0	91.40	272.80	4,987.2	320.3	-3,870.3	3,882.8	0.48	-0.48	
8,691.0	90.70	271.70	4,986.1	322.8	-3,934.2	3,946.7	2.04	-1.09	
8,754.0	90.10	268.70	4,985.6	323.0	-3,997.2	4,009.6	4.86	-0.95	
8,817.0	90.70	269.10	4,985.2	321.8	-4,060.2	4,072.4	1.14	0.95	
8,880.0	90.70	268.50	4,984.4	320.5	-4,123.1	4,135.2	0.95	0.00	
8,943.0	91.10	268.00	4,983.4	318.6	-4,186.1	4,197.9	1.02	0.63	
9,007.0	91.20	268.00	4,982.1	316.3	-4,250.1	4,261.6	0.16	0.16	
9,070.0	90.00	268.30	4,981.5	314.3	-4,313.0	4,324.3	1.96	-1.90	
9,133.0	90.50	269.00	4,981.2	312.8	-4,376.0	4,387.0	1.37	0.79	
9,196.0	91.00	268.40	4,980.4	311.4	-4,439.0	4,449.8	1.24	0.79	
9,259.0	91.00	268.40	4,979.3	309.6	-4,501.9	4,512.5	0.00	0.00	
9,323.0	90.90	267.90	4,978.2	307.6	-4,565.9	4,576.2	0.80	-0.16	
9,386.0	91.00	268.00	4,977.2	305.3	-4,628.9	4,638.9	0.22	0.16	

Cathedral Energy Services

Survey Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S32-T23N-R7W
Well: Lybrook P32-2307 01H
Wellbore: STK #1
Design: FINAL

Local Co-ordinate Reference: Well Lybrook P32-2307 01H
TVD Reference: 18' KB @ 6892.0ft (A1099)
MD Reference: 18' KB @ 6892.0ft (A1099)
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)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
9,449.0	91.30	267.30	4,975.9	302.7	-4,691.8	4,701.5	1.21	0.48	
9,512.0	90.70	265.70	4,974.8	298.9	-4,754.7	4,764.0	2.71	-0.95	
9,580.0	90.70	264.80	4,974.0	293.2	-4,822.4	4,831.3	1.32	0.00	Last CES Survey @ 9580' MD
9,630.0	90.70	264.80	4,973.4	288.7	-4,872.2	4,880.7	0.00	0.00	PTB @ 9630' MD

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
Lybrook P32-2307 01H f - actual wellpath misses target center by 144.5ft at 5107.2ft MD (4939.2 TVD, 214.9 N, -369.0 E) - Point	0.00	0.00	5,043.9	287.6	-301.1	1,886,983.90	1,244,993.28	36.178530	-107.589870
Lybrook P32-2307 01H f - actual wellpath misses target center by 30.0ft at 9630.0ft MD (4973.4 TVD, 288.7 N, -4872.2 E) - Point	0.00	0.00	4,990.3	309.9	-4,885.0	1,887,069.40	1,240,410.06	36.178590	-107.605400
Lybrook P32-2307 01H f - actual wellpath misses target center by 18.2ft at 5565.5ft MD (5019.8 TVD, 277.8 N, -811.4 E) - Point	0.00	0.00	5,037.9	275.7	-811.2	1,886,979.02	1,244,483.03	36.178497	-107.591598
Lybrook P32-2307 01H f - actual wellpath misses target center by 133.5ft at 5100.2ft MD (4936.0 TVD, 213.7 N, -362.8 E) - Point	0.00	0.00	5,028.5	287.6	-301.1	1,886,983.90	1,244,993.28	36.178530	-107.589870
Lybrook P32-2307 01H f - actual wellpath misses target center by 38.1ft at 9630.0ft MD (4973.4 TVD, 288.7 N, -4872.2 E) - Point	0.00	0.00	5,002.3	309.9	-4,885.0	1,887,069.40	1,240,410.06	36.178590	-107.605400

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
9,580.0	4,974.0	293.2	-4,822.4	Last CES Survey @ 9580' MD
9,630.0	4,973.4	288.7	-4,872.2	PTB @ 9630' MD

Checked By: _____ Approved By: _____ Date: _____

EnCana Oil & Gas (USA) Inc

Sandoval County, NM

S32-T23N-R7W

Lybrook P32-2307 01H

STK #1

Design: FINAL

Survey Report - Geographic

23 September, 2014

Cathedral Energy Services

Survey Report - Geographic

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S32-T23N-R7W
Well: Lybrook P32-2307 01H
Wellbore: STK #1
Design: FINAL

Local Co-ordinate Reference: Well Lybrook P32-2307 01H
TVD Reference: 18' KB @ 6892.0ft (A1099)
MD Reference: 18' KB @ 6892.0ft (A1099)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

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

Site: S32-T23N-R7W
Site Position: Northing: 1,886,692.16 ft Latitude: 36.177740
From: Lat/Long Easting: 1,245,290.35 ft Longitude: -107.588850
Position Uncertainty: 0.0 ft Slot Radius: 13.200 in Grid Convergence: -0.79 °

Well: Lybrook P32-2307 01H
Well Position: +N/-S 0.0 ft Northing: 1,886,692.16 ft Latitude: 36.177740
+E/-W 0.0 ft Easting: 1,245,290.35 ft Longitude: -107.588850
Position Uncertainty: 0.0 ft Wellhead Elevation: ft Ground Level: 6,874.0 ft

Wellbore: STK #1
Magnetics: Model Name Sample Date Declination (°) Dip Angle (°) Field Strength (nT)
IGRF2010 9/9/2014 9.36 62.93 50,112

Design: FINAL
Audit Notes:
Version: 1.0 Phase: ACTUAL Tie On Depth: 3,126.0
Vertical Section: Depth From (TVD) (ft) +N/-S (ft) +E/-W (ft) Direction (°)
0.0 0.0 0.0 273.63

Survey Program Date: 9/23/2014
From (ft) To (ft) Survey (Wellbore) Tool Name Description
570.0 3,126.0 Survey #1 (Hz) Geolink MWD Geolink MWD
3,152.0 9,630.0 Survey #1 (STK #1) 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	1,886,692.16	1,245,290.35	36.177740	-107.588850
570.0	0.90	338.00	570.0	4.2	-1.7	1,886,696.33	1,245,288.73	36.177751	-107.588856
634.0	1.00	326.00	634.0	5.1	-2.2	1,886,697.27	1,245,288.24	36.177754	-107.588858
697.0	1.00	324.30	697.0	6.0	-2.8	1,886,698.18	1,245,287.63	36.177757	-107.588860
760.0	1.00	176.40	760.0	5.9	-3.1	1,886,698.08	1,245,287.34	36.177756	-107.588861
823.0	1.80	161.90	822.9	4.4	-2.8	1,886,696.58	1,245,287.66	36.177752	-107.588860
887.0	1.70	166.90	886.9	2.5	-2.2	1,886,694.70	1,245,288.16	36.177747	-107.588858
950.0	1.50	169.30	949.9	0.8	-1.9	1,886,692.97	1,245,288.50	36.177742	-107.588857
1,013.0	1.60	170.70	1,012.9	-0.9	-1.6	1,886,691.29	1,245,288.77	36.177738	-107.588856
1,076.0	1.40	163.80	1,075.8	-2.5	-1.2	1,886,689.68	1,245,289.11	36.177733	-107.588854
1,140.0	1.50	159.80	1,139.8	-4.0	-0.7	1,886,688.13	1,245,289.60	36.177729	-107.588853

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook P32-2307 01H
Project:	Sandoval County, NM	TVD Reference:	18' KB @ 6892.0ft (A1099)
Site:	S32-T23N-R7W	MD Reference:	18' KB @ 6892.0ft (A1099)
Well:	Lybrook P32-2307 01H	North Reference:	True
Wellbore:	STK #1	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
1,203.0	1.10	161.20	1,202.8	-5.4	-0.2	1,886,686.78	1,245,290.06	36.177725	-107.588851
1,266.0	1.20	143.80	1,265.8	-6.5	0.4	1,886,685.67	1,245,290.63	36.177722	-107.588849
1,329.0	0.50	22.70	1,328.8	-6.8	0.9	1,886,685.38	1,245,291.12	36.177722	-107.588847
1,393.0	0.90	12.90	1,392.8	-6.0	1.1	1,886,686.13	1,245,291.35	36.177724	-107.588847
1,456.0	0.90	9.40	1,455.8	-5.0	1.3	1,886,687.09	1,245,291.55	36.177726	-107.588846
1,519.0	0.90	5.00	1,518.8	-4.1	1.4	1,886,688.07	1,245,291.69	36.177729	-107.588846
1,583.0	0.90	349.80	1,582.8	-3.1	1.4	1,886,689.07	1,245,291.66	36.177732	-107.588846
1,646.0	0.80	355.10	1,645.8	-2.1	1.2	1,886,690.00	1,245,291.55	36.177734	-107.588846
1,709.0	0.80	343.90	1,708.7	-1.3	1.1	1,886,690.86	1,245,291.40	36.177737	-107.588847
1,772.0	1.10	320.00	1,771.7	-0.4	0.6	1,886,691.75	1,245,290.90	36.177739	-107.588848
1,836.0	1.40	299.30	1,835.7	0.5	-0.5	1,886,692.62	1,245,289.84	36.177741	-107.588852
1,899.0	1.50	290.60	1,898.7	1.1	-2.0	1,886,693.31	1,245,288.40	36.177743	-107.588857
1,962.0	1.70	288.70	1,961.7	1.7	-3.6	1,886,693.92	1,245,286.75	36.177745	-107.588863
2,026.0	3.20	300.70	2,025.6	2.9	-6.1	1,886,695.17	1,245,284.33	36.177748	-107.588871
2,089.0	2.20	280.60	2,088.5	4.1	-8.8	1,886,696.33	1,245,281.65	36.177751	-107.588880
2,152.0	1.60	201.40	2,151.5	3.5	-10.3	1,886,695.75	1,245,280.13	36.177750	-107.588885
2,215.0	2.30	181.90	2,214.5	1.4	-10.6	1,886,693.67	1,245,279.74	36.177744	-107.588886
2,279.0	1.20	100.20	2,278.5	0.0	-10.0	1,886,692.26	1,245,280.34	36.177740	-107.588884
2,342.0	2.90	58.80	2,341.4	0.7	-8.0	1,886,692.94	1,245,282.36	36.177742	-107.588877
2,405.0	0.50	35.30	2,404.4	1.7	-6.5	1,886,693.97	1,245,283.90	36.177745	-107.588872
2,468.0	1.50	240.90	2,467.4	1.6	-7.0	1,886,693.80	1,245,283.33	36.177744	-107.588874
2,531.0	2.30	156.60	2,530.4	0.0	-7.3	1,886,692.25	1,245,283.09	36.177740	-107.588875
2,595.0	4.20	145.10	2,594.3	-3.1	-5.4	1,886,689.12	1,245,284.90	36.177732	-107.588869
2,658.0	2.10	123.10	2,657.2	-5.6	-3.1	1,886,686.57	1,245,287.15	36.177725	-107.588861
2,721.0	1.10	44.50	2,720.1	-5.8	-1.7	1,886,686.35	1,245,288.54	36.177724	-107.588856
2,784.0	1.20	60.30	2,783.1	-5.1	-0.7	1,886,687.09	1,245,289.55	36.177726	-107.588853
2,848.0	1.10	53.40	2,847.1	-4.4	0.3	1,886,687.77	1,245,290.63	36.177728	-107.588849
2,911.0	1.30	61.70	2,910.1	-3.7	1.5	1,886,688.46	1,245,291.76	36.177730	-107.588845
2,974.0	1.10	60.60	2,973.1	-3.0	2.6	1,886,689.08	1,245,292.92	36.177732	-107.588841
3,004.0	1.20	60.70	3,003.1	-2.7	3.1	1,886,689.37	1,245,293.45	36.177733	-107.588840
3,065.0	1.10	55.80	3,064.1	-2.1	4.2	1,886,689.99	1,245,294.50	36.177734	-107.588836
3,126.0	0.40	41.40	3,125.1	-1.6	4.8	1,886,690.47	1,245,295.13	36.177736	-107.588834
3,152.0	4.00	57.30	3,151.0	-1.1	5.6	1,886,691.02	1,245,295.96	36.177737	-107.588831
3,184.0	8.50	60.00	3,182.8	0.7	8.6	1,886,692.77	1,245,298.98	36.177742	-107.588821
3,215.0	10.40	61.30	3,213.4	3.2	13.1	1,886,695.19	1,245,303.45	36.177749	-107.588806
3,247.0	12.20	62.90	3,244.8	6.1	18.6	1,886,698.04	1,245,309.03	36.177757	-107.588787
3,278.0	13.90	59.20	3,275.0	9.5	24.7	1,886,701.36	1,245,315.19	36.177766	-107.588767
3,310.0	15.20	54.50	3,306.0	13.9	31.4	1,886,705.67	1,245,321.97	36.177778	-107.588744
3,342.0	16.80	50.80	3,336.7	19.3	38.4	1,886,710.93	1,245,329.05	36.177793	-107.588720
3,374.0	16.80	47.10	3,367.4	25.4	45.4	1,886,716.91	1,245,336.10	36.177810	-107.588696
3,405.0	15.20	38.80	3,397.2	31.6	51.2	1,886,723.04	1,245,342.01	36.177827	-107.588677
3,437.0	13.20	34.20	3,428.2	37.9	55.9	1,886,729.27	1,245,346.78	36.177844	-107.588661
3,468.0	11.30	27.60	3,458.5	43.5	59.3	1,886,734.84	1,245,350.26	36.177860	-107.588649
3,500.0	9.80	22.50	3,489.9	48.8	61.8	1,886,740.10	1,245,352.83	36.177874	-107.588641
3,563.0	5.90	1.60	3,552.3	57.0	64.0	1,886,748.27	1,245,355.08	36.177897	-107.588634
3,626.0	3.30	315.60	3,615.2	61.5	62.8	1,886,752.82	1,245,353.97	36.177909	-107.588638
3,689.0	3.30	296.90	3,678.1	63.6	59.9	1,886,754.97	1,245,351.11	36.177915	-107.588647
3,753.0	3.30	295.20	3,741.9	65.3	56.6	1,886,756.64	1,245,347.82	36.177919	-107.588659
3,816.0	3.60	325.60	3,804.8	67.7	53.8	1,886,759.08	1,245,345.10	36.177926	-107.588668
3,878.0	3.60	327.40	3,866.7	70.9	51.7	1,886,762.35	1,245,342.99	36.177935	-107.588675
3,942.0	3.50	327.70	3,930.6	74.3	49.5	1,886,765.73	1,245,340.91	36.177944	-107.588682
4,005.0	4.40	330.70	3,993.4	78.0	47.3	1,886,769.49	1,245,338.76	36.177954	-107.588690
4,068.0	5.50	332.50	4,056.2	82.8	44.8	1,886,774.31	1,245,336.24	36.177967	-107.588699
4,131.0	5.00	332.70	4,119.0	87.9	42.1	1,886,779.46	1,245,333.66	36.177982	-107.588708
4,195.0	4.80	320.40	4,182.7	92.4	39.1	1,886,784.05	1,245,330.74	36.177994	-107.588718

Cathedral Energy Services

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Design: FINAL

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MD Reference: 18' KB @ 6892.0ft (A1099)
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
4,258.0	5.50	318.30	4,245.5	96.7	35.4	1,886,788.38	1,245,327.11	36.178006	-107.588730
4,321.0	5.70	316.30	4,308.2	101.2	31.3	1,886,792.96	1,245,323.00	36.178018	-107.588744
4,354.0	5.40	309.30	4,341.0	103.4	28.9	1,886,795.16	1,245,320.70	36.178024	-107.588752
4,386.0	8.10	303.00	4,372.8	105.6	25.9	1,886,797.38	1,245,317.67	36.178030	-107.588763
4,417.0	13.10	298.50	4,403.2	108.5	20.9	1,886,800.32	1,245,312.79	36.178038	-107.588779
4,449.0	16.90	296.60	4,434.2	112.3	13.6	1,886,804.23	1,245,305.50	36.178048	-107.588804
4,480.0	20.90	298.80	4,463.5	117.0	4.7	1,886,809.04	1,245,296.68	36.178061	-107.588834
4,512.0	23.40	301.20	4,493.1	123.0	-5.7	1,886,815.22	1,245,286.33	36.178078	-107.588870
4,544.0	25.60	297.90	4,522.2	129.5	-17.3	1,886,821.91	1,245,274.87	36.178096	-107.588909
4,575.0	27.00	293.60	4,550.0	135.5	-29.6	1,886,828.03	1,245,262.59	36.178112	-107.588951
4,607.0	28.30	288.00	4,578.4	140.7	-43.5	1,886,833.48	1,245,248.79	36.178127	-107.588998
4,639.0	29.60	284.60	4,606.4	145.1	-58.4	1,886,838.02	1,245,233.98	36.178139	-107.589048
4,670.0	30.60	282.60	4,633.2	148.7	-73.5	1,886,841.88	1,245,218.93	36.178149	-107.589099
4,702.0	32.10	280.60	4,660.5	152.1	-89.8	1,886,845.44	1,245,202.67	36.178158	-107.589154
4,733.0	33.60	281.90	4,686.6	155.3	-106.3	1,886,848.95	1,245,186.22	36.178167	-107.589210
4,765.0	34.40	285.10	4,713.1	159.5	-123.7	1,886,853.37	1,245,168.89	36.178178	-107.589269
4,796.0	35.00	285.40	4,738.6	164.2	-140.7	1,886,858.25	1,245,151.93	36.178191	-107.589327
4,828.0	38.40	283.80	4,764.2	169.0	-159.2	1,886,863.31	1,245,133.49	36.178204	-107.589390
4,859.0	42.30	282.70	4,787.9	173.6	-178.7	1,886,868.18	1,245,114.02	36.178217	-107.589456
4,891.0	44.70	283.60	4,811.1	178.6	-200.2	1,886,873.48	1,245,092.65	36.178231	-107.589528
4,923.0	46.80	284.60	4,833.4	184.2	-222.4	1,886,879.38	1,245,070.50	36.178246	-107.589604
4,954.0	49.20	285.10	4,854.1	190.1	-244.7	1,886,885.59	1,245,048.32	36.178262	-107.589679
4,986.0	51.40	283.50	4,874.6	196.2	-268.5	1,886,891.99	1,245,024.55	36.178279	-107.589760
5,018.0	54.20	280.30	4,893.9	201.4	-293.5	1,886,897.58	1,244,999.68	36.178293	-107.589845
5,049.0	58.30	279.80	4,911.1	205.9	-318.8	1,886,902.42	1,244,974.37	36.178306	-107.589930
5,081.0	61.70	280.30	4,927.1	210.7	-346.1	1,886,907.64	1,244,947.16	36.178319	-107.590023
5,112.0	63.80	280.20	4,941.3	215.6	-373.2	1,886,912.91	1,244,920.11	36.178332	-107.590115
5,148.0	67.60	276.90	4,956.2	220.5	-405.7	1,886,918.22	1,244,887.75	36.178346	-107.590225
5,180.0	69.20	276.80	4,967.9	224.0	-435.2	1,886,922.18	1,244,858.26	36.178355	-107.590325
5,210.0	73.30	278.00	4,977.6	227.7	-463.4	1,886,926.23	1,244,830.15	36.178366	-107.590420
5,241.0	76.10	278.00	4,985.8	231.9	-493.0	1,886,930.80	1,244,800.60	36.178377	-107.590520
5,271.0	79.00	279.00	4,992.2	236.2	-522.0	1,886,935.53	1,244,771.69	36.178389	-107.590619
5,302.0	79.20	279.20	4,998.1	241.0	-552.0	1,886,940.76	1,244,741.70	36.178402	-107.590720
5,332.0	79.40	278.70	5,003.7	245.6	-581.1	1,886,945.74	1,244,712.65	36.178415	-107.590819
5,363.0	80.70	279.50	5,009.0	250.4	-611.3	1,886,950.99	1,244,682.57	36.178428	-107.590921
5,394.0	83.60	279.20	5,013.2	255.4	-641.6	1,886,956.39	1,244,652.35	36.178442	-107.591024
5,425.0	86.10	278.80	5,016.0	260.2	-672.1	1,886,961.64	1,244,621.92	36.178455	-107.591127
5,455.0	88.20	278.20	5,017.5	264.7	-701.7	1,886,966.48	1,244,592.35	36.178467	-107.591228
5,486.0	88.90	277.50	5,018.3	268.9	-732.4	1,886,971.14	1,244,561.72	36.178479	-107.591332
5,517.0	89.00	277.00	5,018.9	272.8	-763.2	1,886,975.47	1,244,531.03	36.178489	-107.591436
5,547.0	88.90	275.70	5,019.4	276.1	-793.0	1,886,979.20	1,244,501.26	36.178499	-107.591537
5,578.0	88.70	274.30	5,020.1	278.8	-823.8	1,886,982.33	1,244,470.43	36.178506	-107.591641
5,608.0	87.90	273.40	5,021.0	280.8	-853.8	1,886,984.75	1,244,440.54	36.178511	-107.591743
5,639.0	87.90	273.20	5,022.1	282.6	-884.7	1,886,986.96	1,244,409.64	36.178516	-107.591848
5,670.0	88.80	273.10	5,023.0	284.3	-915.6	1,886,989.09	1,244,378.73	36.178521	-107.591952
5,701.0	89.70	273.10	5,023.4	286.0	-946.6	1,886,991.20	1,244,347.80	36.178526	-107.592057
5,731.0	90.00	273.10	5,023.5	287.6	-976.5	1,886,993.23	1,244,317.87	36.178530	-107.592159
5,792.0	90.80	272.60	5,023.0	290.7	-1,037.5	1,886,997.10	1,244,257.00	36.178538	-107.592365
5,854.0	91.30	272.80	5,021.9	293.6	-1,099.4	1,887,000.88	1,244,195.12	36.178546	-107.592575
5,915.0	91.00	272.70	5,020.7	296.5	-1,160.3	1,887,004.64	1,244,134.25	36.178554	-107.592781
5,976.0	88.90	271.30	5,020.7	298.6	-1,221.3	1,887,007.61	1,244,073.33	36.178560	-107.592988
6,038.0	89.00	271.90	5,021.9	300.4	-1,283.2	1,887,010.20	1,244,011.39	36.178565	-107.593198
6,099.0	90.60	273.10	5,022.1	303.0	-1,344.2	1,887,013.70	1,243,950.50	36.178572	-107.593404
6,162.0	91.80	274.10	5,020.8	307.0	-1,407.0	1,887,018.52	1,243,887.70	36.178583	-107.593617
6,225.0	90.10	274.20	5,019.7	311.5	-1,469.8	1,887,023.95	1,243,824.94	36.178596	-107.593830

Cathedral Energy Services

Survey Report - Geographic

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S32-T23N-R7W
Well: Lybrook P32-2307 01H
Wellbore: STK #1
Design: FINAL

Local Co-ordinate Reference: Well Lybrook P32-2307 01H
TVD Reference: 18' KB @ 6892.0ft (A1099)
MD Reference: 18' KB @ 6892.0ft (A1099)
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
6,289.0	89.70	272.10	5,019.8	315.1	-1,533.7	1,887,028.34	1,243,761.10	36.178605	-107.594046
6,352.0	91.00	273.20	5,019.5	318.0	-1,596.7	1,887,032.12	1,243,698.21	36.178613	-107.594260
6,415.0	90.40	272.50	5,018.7	321.1	-1,659.6	1,887,036.12	1,243,635.35	36.178622	-107.594473
6,478.0	90.90	270.50	5,018.0	322.8	-1,722.6	1,887,038.64	1,243,572.40	36.178626	-107.594686
6,542.0	91.20	269.10	5,016.8	322.5	-1,786.5	1,887,039.30	1,243,508.42	36.178626	-107.594903
6,605.0	89.30	268.40	5,016.5	321.2	-1,849.5	1,887,038.80	1,243,445.43	36.178622	-107.595116
6,668.0	89.50	267.90	5,017.2	319.1	-1,912.5	1,887,037.63	1,243,382.44	36.178616	-107.595330
6,731.0	90.20	268.60	5,017.3	317.2	-1,975.5	1,887,036.58	1,243,319.45	36.178611	-107.595543
6,794.0	89.80	267.50	5,017.3	315.1	-2,038.4	1,887,035.30	1,243,256.46	36.178605	-107.595756
6,857.0	89.20	268.10	5,017.9	312.6	-2,101.4	1,887,033.75	1,243,193.49	36.178599	-107.595970
6,920.0	90.00	268.60	5,018.3	310.8	-2,164.3	1,887,032.81	1,243,130.49	36.178594	-107.596183
6,984.0	90.20	271.20	5,018.2	310.7	-2,228.3	1,887,033.58	1,243,066.50	36.178593	-107.596400
7,047.0	91.50	271.20	5,017.3	312.0	-2,291.3	1,887,035.77	1,243,003.55	36.178597	-107.596613
7,110.0	91.90	271.60	5,015.4	313.6	-2,354.3	1,887,038.17	1,242,940.62	36.178601	-107.596826
7,173.0	91.00	270.70	5,013.8	314.8	-2,417.2	1,887,040.30	1,242,877.68	36.178605	-107.597040
7,237.0	91.10	270.30	5,012.7	315.4	-2,481.2	1,887,041.75	1,242,813.71	36.178606	-107.597256
7,300.0	90.70	269.50	5,011.7	315.3	-2,544.2	1,887,042.51	1,242,750.72	36.178606	-107.597470
7,363.0	90.50	269.30	5,011.0	314.6	-2,607.2	1,887,042.71	1,242,687.73	36.178604	-107.597683
7,426.0	90.70	269.20	5,010.3	313.8	-2,670.2	1,887,042.76	1,242,624.73	36.178602	-107.597897
7,489.0	90.50	268.60	5,009.7	312.6	-2,733.2	1,887,042.42	1,242,561.73	36.178598	-107.598110
7,553.0	90.40	269.60	5,009.2	311.6	-2,797.2	1,887,042.30	1,242,497.74	36.178596	-107.598327
7,616.0	90.40	269.80	5,008.7	311.3	-2,860.2	1,887,042.84	1,242,434.74	36.178595	-107.598540
7,679.0	89.90	270.50	5,008.6	311.4	-2,923.2	1,887,043.87	1,242,371.75	36.178595	-107.598754
7,742.0	90.90	270.00	5,008.1	311.7	-2,986.2	1,887,045.01	1,242,308.76	36.178596	-107.598967
7,806.0	92.20	271.40	5,006.4	312.5	-3,050.1	1,887,046.68	1,242,244.81	36.178598	-107.599184
7,869.0	92.10	270.70	5,004.0	313.6	-3,113.1	1,887,048.70	1,242,181.89	36.178601	-107.599397
7,932.0	89.10	268.00	5,003.4	312.9	-3,176.1	1,887,048.85	1,242,118.90	36.178599	-107.599610
7,995.0	89.10	267.30	5,004.4	310.3	-3,239.0	1,887,047.14	1,242,055.95	36.178592	-107.599824
8,058.0	90.90	267.80	5,004.4	307.6	-3,301.9	1,887,045.31	1,241,992.98	36.178585	-107.600037
8,122.0	91.90	269.70	5,002.8	306.2	-3,365.9	1,887,044.80	1,241,929.01	36.178581	-107.600254
8,185.0	91.90	270.50	5,000.7	306.3	-3,428.9	1,887,045.78	1,241,866.05	36.178581	-107.600467
8,248.0	91.50	270.00	4,998.8	306.6	-3,491.8	1,887,046.92	1,241,803.09	36.178582	-107.600680
8,311.0	90.50	269.90	4,997.7	306.6	-3,554.8	1,887,047.74	1,241,740.10	36.178582	-107.600894
8,374.0	90.50	272.40	4,997.2	307.8	-3,617.7	1,887,049.87	1,241,677.15	36.178585	-107.601107
8,438.0	92.40	272.20	4,995.6	310.4	-3,681.7	1,887,053.32	1,241,613.26	36.178592	-107.601324
8,501.0	94.00	273.70	4,992.1	313.6	-3,744.5	1,887,057.42	1,241,550.50	36.178601	-107.601536
8,564.0	91.70	272.80	4,988.9	317.2	-3,807.4	1,887,061.86	1,241,487.74	36.178611	-107.601749
8,627.0	91.40	272.80	4,987.2	320.3	-3,870.3	1,887,065.80	1,241,424.88	36.178619	-107.601962
8,691.0	90.70	271.70	4,986.1	322.8	-3,934.2	1,887,069.19	1,241,360.99	36.178626	-107.602179
8,754.0	90.10	268.70	4,985.6	323.0	-3,997.2	1,887,070.28	1,241,298.00	36.178627	-107.602392
8,817.0	90.70	269.10	4,985.2	321.8	-4,060.2	1,887,069.94	1,241,235.01	36.178623	-107.602606
8,880.0	90.70	268.50	4,984.4	320.5	-4,123.1	1,887,069.49	1,241,172.01	36.178620	-107.602819
8,943.0	91.10	268.00	4,983.4	318.6	-4,186.1	1,887,068.44	1,241,109.03	36.178614	-107.603032
9,007.0	91.20	268.00	4,982.1	316.3	-4,250.1	1,887,067.09	1,241,045.06	36.178608	-107.603249
9,070.0	90.00	268.30	4,981.5	314.3	-4,313.0	1,887,065.92	1,240,982.07	36.178602	-107.603462
9,133.0	90.50	269.00	4,981.2	312.8	-4,376.0	1,887,065.31	1,240,919.08	36.178598	-107.603676
9,196.0	91.00	268.40	4,980.4	311.4	-4,439.0	1,887,064.75	1,240,856.09	36.178594	-107.603889
9,259.0	91.00	268.40	4,979.3	309.6	-4,501.9	1,887,063.86	1,240,793.10	36.178590	-107.604102
9,323.0	90.90	267.90	4,978.2	307.6	-4,565.9	1,887,062.67	1,240,729.12	36.178584	-107.604319
9,386.0	91.00	268.00	4,977.2	305.3	-4,628.9	1,887,061.29	1,240,666.15	36.178578	-107.604532
9,449.0	91.30	267.30	4,975.9	302.7	-4,691.8	1,887,059.57	1,240,603.18	36.178571	-107.604746
9,512.0	90.70	265.70	4,974.8	298.9	-4,754.7	1,887,056.60	1,240,540.26	36.178560	-107.604959
9,580.0	90.70	264.80	4,974.0	293.2	-4,822.4	1,887,051.90	1,240,472.43	36.178544	-107.605188

Last CES Survey @ 9580' MD

Cathedral Energy Services

Survey Report - Geographic

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S32-T23N-R7W
Well: Lybrook P32-2307 01H
Wellbore: STK #1
Design: FINAL

Local Co-ordinate Reference: Well Lybrook P32-2307 01H
TVD Reference: 18' KB @ 6892.0ft (A1099)
MD Reference: 18' KB @ 6892.0ft (A1099)
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
9,630.0	90.70	264.80	4,973.4	288.7	-4,872.2	1,887,048.06	1,240,422.58	36.178532	-107.605357
PTB @ 9630' MD									

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
Lybrook P32-2307 01H	0.00	0.00	4,990.3	309.9	-4,885.0	1,887,069.40	1,240,410.06	36.178590	-107.605400
- actual wellpath misses target center by 30.0ft at 9630.0ft MD (4973.4 TVD, 288.7 N, -4872.2 E)									
- Point									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
9,580.0	4,974.0	293.2	-4,822.4	Last CES Survey @ 9580' MD
9,630.0	4,973.4	288.7	-4,872.2	PTB @ 9630' MD

Checked By: _____ Approved By: _____ Date: _____