

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2014

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator
Encana Oil & Gas (USA) Inc.

3a. Address
370 17th Street, Suite 1700
Denver, CO 80202

3b. Phone No. (include area code)
720-876-5867

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SHL: 2215' FSL and 2531' FEL Sec 31, T23N, R7W
BHL: 2217' FSL and 2288' FEL Sec 36, T23N, R8W

5. Lease Serial No.
NM 6681 NM LG-9090

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit of CA/Agreement, Name and/or No.
Pending

8. Well Name and No.
Lybrook J31-2307 01H

9. API Well No.
30-043-21214

10. Field and Pool or Exploratory Area
Alamito-Gallup

11. County or Parish, State
Sandoval, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Encana Oil & Gas (USA) Inc. (Encana) wishes to modify the drilling plan for the Lybrook J31-2307 01H well to cement the 4 1/2" production liner, instead of running open hole swell packers, as previously planned. Attached is an updated Directional Drilling Plan, 10-Point Drilling Plan and Wellbore Diagram that reflect this change. Please note, the 7" ICP was also moved from approximately 72 degrees to approximately 55 degrees.

OIL CONS. DIV DIST. 3

NOV 19 2014

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

ADHERE TO PREVIOUS NMOC
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Cristi Bauer		Title Operations Technician
Signature <i>Cristi BAUER</i>		Date 11/14/14

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by <i>William Tambekou</i>	Title Petroleum Engineer	Date 11/17/2014
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office FFD

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Lybrook J31-2307 01H

SHL: NW/4 SE/4 Sec 31 T23N R7W, 2215' FSL, 2531' FEL

BHL: NW/4 SW/4 Sec 36 T23N R8W, 2117' FSL, 330' FWL

Sandoval, New Mexico

**Encana Oil & Gas (USA) Inc.
Drilling Plan**

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
Nacimiento	0
Ojo Alamo	874
Kirtland Shale	1,069
Fruitland Coal	1,335
Pictured Cliffs Ss.	1,459
Lewis Shale	1,575
Cliffhouse Ss.	2,228
Menefee Fn.	3,018
Point Lookout Ss.	3,843
Mancos Shale	4,025
Mancos Silt	4,548
Gallup Fn.	4,809
Horizontal Target	5,075

The referenced surface elevation is 6974', KB 6990'

**2. ESTIMATED DEPTH OF POTENTIAL WATER, OIL, GAS,
& OTHER MINERAL BEARING FORMATIONS**

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,335
Oil/Gas	Pictured Cliffs Ss.	1,459
Oil/Gas	Cliffhouse Ss.	2,228
Gas	Menefee Fn.	3,018
Oil/Gas	Point Lookout Ss.	3,843
Oil/Gas	Mancos Shale	4,025
Oil/Gas	Mancos Silt	4,548
Oil/Gas	Gallup Fn.	4,809

All shows of fresh water and minerals will be reported and protected.

Lybrook J31-2307 01H

SHL: NW/4 SE/4 Sec 31 T23N R7W, 2215' FSL, 2531' FEL

BHL: NW/4 SW/4 Sec 36 T23N R8W, 2117' FSL, 330' FWL

Sandoval, New Mexico

3. PRESSURE CONTROL

- a) Pressure control equipment and configuration will be designed to meet 2M standards.
- b) Working pressure on rams and BOPE will be 3,000 psi.
- c) Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- d) The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- e) Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.
- f) Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.
- k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).
- l) The choke and manifold shall contain two adjustable chokes.
- m) Hand wheels shall be installed on all ram preventers.
- n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all times.
- o) Inside BOP or float sub shall also be available on the rig floor at all times.

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

- a) The proposed casing design is as follows:

Casing	Depth (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42.09#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5043'	8 3/4"	7"	26#	J55, LTC New
Production Liner	4943'-12413'	6 1/8"	4 1/2"	11.6#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (ppf)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lbs)	Collapse	Burst	Tension
9 5/8"	36	J55	STC	2020	3520	394	1.125	1.1	1.5
7"	26	J55	LTC	4320	4980	367	1.125	1.1	1.5
4.5"	11.6	B80	LTC	6350	7780	201	1.125	1.1	1.5

*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered

Lybrook J31-2307 01H

SHL: NW/4 SE/4 Sec 31 T23N R7W, 2215' FSL, 2531' FEL

BHL: NW/4 SW/4 Sec 36 T23N R8W, 2117' FSL, 330' FWL

Sandoval, New Mexico

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

b) The proposed cementing program is as follows

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	228 sks	Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5043'	100% open hole excess Stage 1 Lead: 467 sks Stage 1 Tail: 361 sks	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuft/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	4943'-12413'	50% OH excess Stage 1 Blend Total: 416sks	Blend: Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL- 52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk	Liner Hanger	N/A

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 4100'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5008'/12413'	Gallup

Lybrook J31-2307 01H

SHL: NW/4 SE/4 Sec 31 T23N R7W, 2215' FSL, 2531' FEL

BHL: NW/4 SW/4 Sec 36 T23N R8W, 2117' FSL, 330' FWL

Sandoval, New Mexico

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'/60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-4939'/5043'	Fresh Water LSND	8.3-10	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	4939'/5043'- 5008'/12413'	Fresh Water LSND	8.3-10	15-25	<15

- c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.
- d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING, & LOGGING

- a) Drill Stem Testing - None anticipated.
- b) Coring - None anticipated.
- c) Mudd Logging - Mud loggers will be on location from kick off point to TD.
- d) Logging - See below

Cased Hole:

CBL/CCL/GR/VDL will be run as needed for perforating control

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2375 psi based on a 9.0 ppg at 5075' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on November 5, 2015. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 20 days.

LOC: Lybrook J31-2307 01H County: Sandoval WELL: Lybrook J31-2307 01H			Encana Natural Gas WELL SUMMARY			ENG: Jeff Villalobos 11/13/14 RIG: Aztec 920 GLE: 6974 RKBE: 6990		
MWD	OPEN HOLE	FORM	DEPTH		HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
LWD	LOGGING		TVD	MD				
			60	60'		16" 42.09# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2	
Multi-Well pad take survey every stand and run anticollision report prior to spud	None	San Jose Fn.	0		26			
		Nacimiento	0			9 5/8" 36ppf J55 STC	Fresh wtr 8.3-10	Vertical <1°
		9 5/8" Csg	500	500.00		TOC Surface with 100% OH Excess: 228 sks Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water.		
Survey Every 60'-120', updating anticollision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs	Ojo Alamo Kirtland Shale	874			7" 26ppf J55 LTC	Fresh Wtr 8.3-10	Vertical <1°
		Fruitland Coal	1,069			TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 828sks		
		Pictured Cliffs Ss.	1,459			Stage 1 Lead: 467 sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL-52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk.		
		Lewis Shale	1,575			Stage 1 Tail: 361 sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk.		
		Cliffhouse Ss.	2,228					
		Menefee Fn.	3,018					
		Point Lookout Ss.	3,843					
		Mancos Shale	4,025					
	Mud logger onsite	KOP	4,100	4,100				
Surveys every 30' through the curve		Mancos Silt	4,548					
		Gallup Fn.	4,809					
		7" Csg	4,939	5,043'				
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD	5,075		6 1/8	100' overlap at liner top		Horz Inc/TVD 90.5 degdeg/5075ft
			5,008	12,413		7369' Drilled Lateral		TD = 12412.7 MD
MWD Gamma Directional		Base Gallup	5,149			4 1/2" 11.6ppf SB80 LTC	WBM 8.3-10	
						TOC @ hanger (50% OH excess) Stage 1 Total: 416sks		
						Stage 1 Blend: 416 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk.		

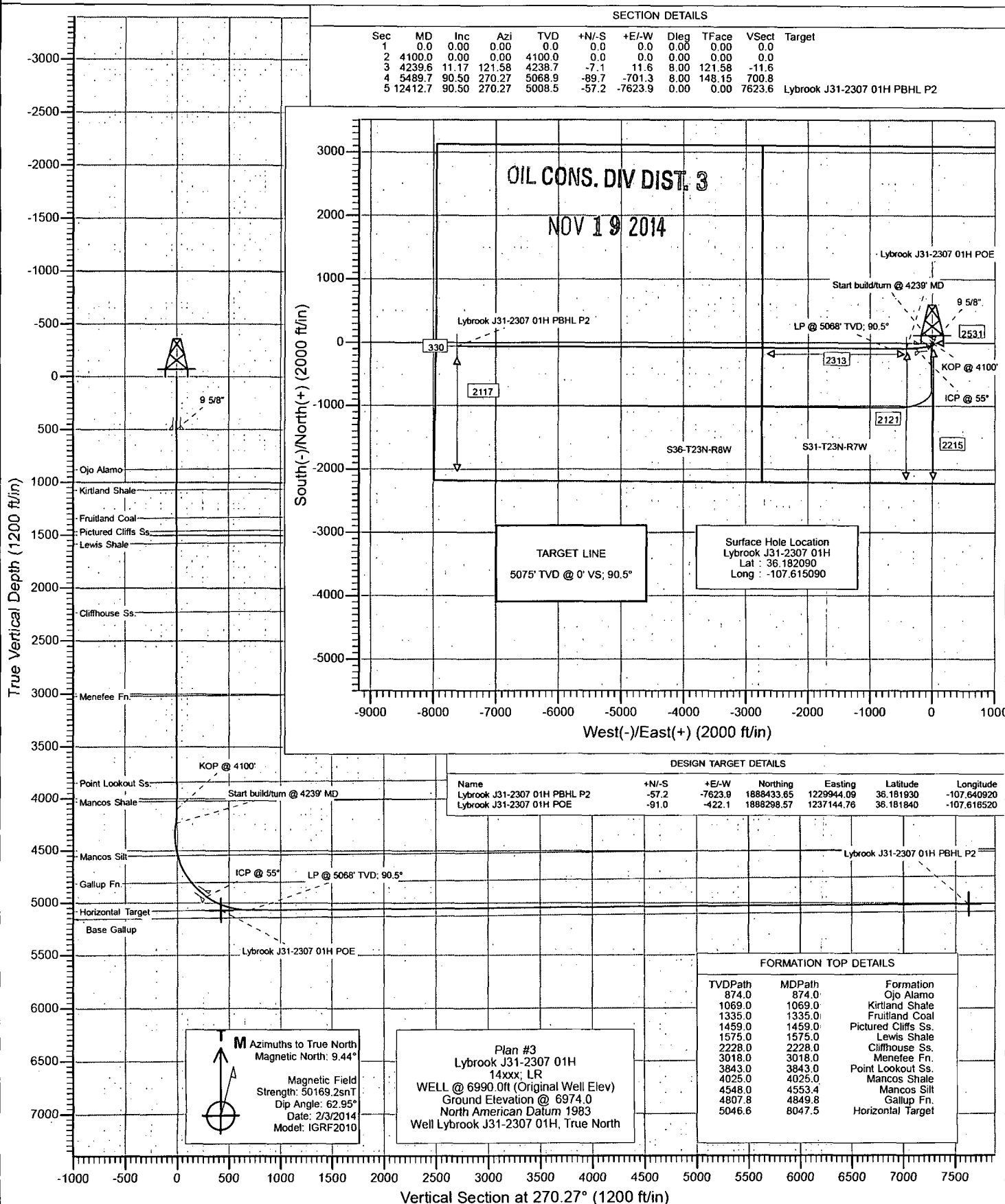
NOTES:

- 1) Drill with 26" bit to 60', set 16" 42.09ppf conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 4100', 8 3/4 inch holesize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 5043' MD
- 7) R&C 7" csg, circ cmt to surface
- 8) Land at ~90 deg, drill lateral to 12413' run 4 1/2 inch cemented liner

OIL CONS. DIV DIST. 3
NOV 19 2014



Project: Sandoval County, NM
Site: S31-T23N-R7W
Well: Lybrook J31-2307 01H
Wellbore: Hz
Design: Plan #3



Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S31-T23N-R7W
Well: Lybrook J31-2307 01H
Wellbore: Hz
Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
TVD Reference: WELL @ 6990.0ft (Original Well Elev)
MD Reference: WELL @ 6990.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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

Site	S31-T23N-R7W		
Site Position:		Northing:	1,890,125.34 ft
From:	Lat/Long	Easting:	1,237,740.16 ft
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in
		Latitude:	36.186880
		Longitude:	-107.614590
		Grid Convergence:	-0.81 °

Well	Lybrook J31-2307 01H		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	0.0 ft	Easting:
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	36.182090
		Longitude:	-107.615090
		Ground Level:	6,974.0 ft

Wellbore	Hz		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	2/3/2014	9.44
			Dip Angle
			(°)
			Field Strength
			(nT)
			50,169

Design	Plan #3		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.0	0.0	0.0
			Direction
			(°)
			270.23

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,239.6	11.17	121.58	4,238.7	-7.1	11.6	8.00	8.00	0.00	121.58	
5,489.7	90.50	270.27	5,068.9	-89.7	-701.3	8.00	6.35	11.89	148.15	
12,412.7	90.50	270.27	5,008.5	-57.2	-7,623.9	0.00	0.00	0.00	0.00	Lybrook J31-2307 01H

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook J31-2307 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6990.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 6990.0ft (Original Well Elev)
Site:	S31-T23N-R7W	North Reference:	True
Well:	Lybrook J31-2307 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	9 5/8"
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
874.0	0.00	0.00	874.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,069.0	0.00	0.00	1,069.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,335.0	0.00	0.00	1,335.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,459.0	0.00	0.00	1,459.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,575.0	0.00	0.00	1,575.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,228.0	0.00	0.00	2,228.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,018.0	0.00	0.00	3,018.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,843.0	0.00	0.00	3,843.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,025.0	0.00	0.00	4,025.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4100'
4,200.0	8.00	121.58	4,199.7	-3.7	5.9	-6.0	8.00	8.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S31-T23N-R7W
Well: Lybrook J31-2307 01H
Wellbore: Hz
Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
TVD Reference: WELL @ 6990.0ft (Original Well Elev)
MD Reference: WELL @ 6990.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,239.6	11.17	121.58	4,238.7	-7.1	11.6	-11.6	8.00	8.00	Start build/turn @ 4239'b MD
4,300.0	7.51	141.48	4,298.3	-13.3	19.0	-19.1	8.00	-6.07	
4,400.0	6.73	209.74	4,397.7	-23.5	20.2	-20.3	8.00	-0.77	
4,500.0	12.73	243.15	4,496.3	-33.6	7.4	-7.5	8.00	5.99	
4,553.4	16.63	250.09	4,548.0	-38.8	-5.0	4.9	8.00	7.31	Mancos Silt
4,600.0	20.15	253.96	4,592.2	-43.3	-19.0	18.9	8.00	7.57	
4,700.0	27.89	259.02	4,683.4	-52.5	-58.6	58.4	8.00	7.74	
4,800.0	35.74	262.01	4,768.4	-61.1	-110.6	110.3	8.00	7.85	
4,849.8	39.67	263.10	4,807.8	-65.0	-140.8	140.5	8.00	7.89	Gallup Fn.
4,900.0	43.64	264.03	4,845.3	-68.7	-173.9	173.6	8.00	7.91	
5,000.0	51.56	265.54	4,912.6	-75.4	-247.4	247.1	8.00	7.92	
5,043.4	55.00	266.09	4,938.6	-77.9	-282.1	281.8	8.00	7.94	ICP @ 55°
5,100.0	59.50	266.75	4,969.2	-80.9	-329.6	329.3	8.00	7.94	
5,200.0	67.45	267.77	5,013.8	-85.1	-418.9	418.5	8.00	7.95	
5,221.5	69.16	267.98	5,021.8	-85.9	-438.9	438.5	8.00	7.95	Lybrook J31-2307 01H POE
5,300.0	75.40	268.68	5,045.6	-88.0	-513.5	513.2	8.00	7.95	
5,400.0	83.36	269.53	5,064.1	-89.6	-611.7	611.4	8.00	7.96	
5,489.7	90.50	270.27	5,068.9	-89.7	-701.3	700.9	8.00	7.96	LP @ 5068' TVD; 90.5°
5,500.0	90.50	270.27	5,068.8	-89.7	-711.6	711.2	0.00	0.00	
5,600.0	90.50	270.27	5,067.9	-89.2	-811.6	811.2	0.00	0.00	
5,700.0	90.50	270.27	5,067.0	-88.7	-911.5	911.2	0.00	0.00	
5,800.0	90.50	270.27	5,066.2	-88.3	-1,011.5	1,011.2	0.00	0.00	
5,900.0	90.50	270.27	5,065.3	-87.8	-1,111.5	1,111.2	0.00	0.00	
6,000.0	90.50	270.27	5,064.4	-87.3	-1,211.5	1,211.2	0.00	0.00	
6,100.0	90.50	270.27	5,063.5	-86.8	-1,311.5	1,311.2	0.00	0.00	
6,200.0	90.50	270.27	5,062.7	-86.4	-1,411.5	1,411.2	0.00	0.00	
6,300.0	90.50	270.27	5,061.8	-85.9	-1,511.5	1,511.2	0.00	0.00	
6,400.0	90.50	270.27	5,060.9	-85.4	-1,611.5	1,611.2	0.00	0.00	
6,500.0	90.50	270.27	5,060.1	-85.0	-1,711.5	1,711.2	0.00	0.00	
6,600.0	90.50	270.27	5,059.2	-84.5	-1,811.5	1,811.1	0.00	0.00	
6,700.0	90.50	270.27	5,058.3	-84.0	-1,911.5	1,911.1	0.00	0.00	
6,800.0	90.50	270.27	5,057.4	-83.6	-2,011.5	2,011.1	0.00	0.00	
6,900.0	90.50	270.27	5,056.6	-83.1	-2,111.5	2,111.1	0.00	0.00	
7,000.0	90.50	270.27	5,055.7	-82.6	-2,211.5	2,211.1	0.00	0.00	
7,100.0	90.50	270.27	5,054.8	-82.2	-2,311.5	2,311.1	0.00	0.00	
7,200.0	90.50	270.27	5,054.0	-81.7	-2,411.5	2,411.1	0.00	0.00	
7,300.0	90.50	270.27	5,053.1	-81.2	-2,511.5	2,511.1	0.00	0.00	
7,400.0	90.50	270.27	5,052.2	-80.8	-2,611.5	2,611.1	0.00	0.00	
7,500.0	90.50	270.27	5,051.3	-80.3	-2,711.5	2,711.1	0.00	0.00	
7,600.0	90.50	270.27	5,050.5	-79.8	-2,811.5	2,811.1	0.00	0.00	
7,700.0	90.50	270.27	5,049.6	-79.3	-2,911.4	2,911.1	0.00	0.00	
7,800.0	90.50	270.27	5,048.7	-78.9	-3,011.4	3,011.1	0.00	0.00	
7,900.0	90.50	270.27	5,047.8	-78.4	-3,111.4	3,111.1	0.00	0.00	
8,000.0	90.50	270.27	5,047.0	-77.9	-3,211.4	3,211.1	0.00	0.00	
8,047.5	90.50	270.27	5,046.6	-77.7	-3,259.0	3,258.6	0.00	0.00	Horizontal Target
8,100.0	90.50	270.27	5,046.1	-77.5	-3,311.4	3,311.1	0.00	0.00	
8,200.0	90.50	270.27	5,045.2	-77.0	-3,411.4	3,411.1	0.00	0.00	
8,300.0	90.50	270.27	5,044.4	-76.5	-3,511.4	3,511.1	0.00	0.00	
8,400.0	90.50	270.27	5,043.5	-76.1	-3,611.4	3,611.1	0.00	0.00	
8,500.0	90.50	270.27	5,042.6	-75.6	-3,711.4	3,711.1	0.00	0.00	
8,600.0	90.50	270.27	5,041.7	-75.1	-3,811.4	3,811.1	0.00	0.00	
8,700.0	90.50	270.27	5,040.9	-74.7	-3,911.4	3,911.1	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: S31-T23N-R7W
 Well: Lybrook J31-2307 01H
 Wellbore: Hz
 Design: Plan #3

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Lybrook J31-2307 01H
 WELL @ 6990.0ft (Original Well Elev)
 WELL @ 6990.0ft (Original Well Elev)
 True
 Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
8,800.0	90.50	270.27	5,040.0	-74.2	-4,011.4	4,011.1	0.00	0.00	
8,900.0	90.50	270.27	5,039.1	-73.7	-4,111.4	4,111.1	0.00	0.00	
9,000.0	90.50	270.27	5,038.3	-73.2	-4,211.4	4,211.1	0.00	0.00	
9,100.0	90.50	270.27	5,037.4	-72.8	-4,311.4	4,311.1	0.00	0.00	
9,200.0	90.50	270.27	5,036.5	-72.3	-4,411.4	4,411.0	0.00	0.00	
9,300.0	90.50	270.27	5,035.6	-71.8	-4,511.4	4,511.0	0.00	0.00	
9,400.0	90.50	270.27	5,034.8	-71.4	-4,611.4	4,611.0	0.00	0.00	
9,500.0	90.50	270.27	5,033.9	-70.9	-4,711.4	4,711.0	0.00	0.00	
9,600.0	90.50	270.27	5,033.0	-70.4	-4,811.4	4,811.0	0.00	0.00	
9,700.0	90.50	270.27	5,032.2	-70.0	-4,911.3	4,911.0	0.00	0.00	
9,800.0	90.50	270.27	5,031.3	-69.5	-5,011.3	5,011.0	0.00	0.00	
9,809.3	90.50	270.27	5,031.2	-69.5	-5,020.6	5,020.3	0.00	0.00	Lybrook J31-2307 01H PBHL
9,900.0	90.50	270.27	5,030.4	-69.0	-5,111.3	5,111.0	0.00	0.00	
10,000.0	90.50	270.27	5,029.5	-68.6	-5,211.3	5,211.0	0.00	0.00	
10,100.0	90.50	270.27	5,028.7	-68.1	-5,311.3	5,311.0	0.00	0.00	
10,200.0	90.50	270.27	5,027.8	-67.6	-5,411.3	5,411.0	0.00	0.00	
10,300.0	90.50	270.27	5,026.9	-67.2	-5,511.3	5,511.0	0.00	0.00	
10,400.0	90.50	270.27	5,026.0	-66.7	-5,611.3	5,611.0	0.00	0.00	
10,500.0	90.50	270.27	5,025.2	-66.2	-5,711.3	5,711.0	0.00	0.00	
10,600.0	90.50	270.27	5,024.3	-65.7	-5,811.3	5,811.0	0.00	0.00	
10,700.0	90.50	270.27	5,023.4	-65.3	-5,911.3	5,911.0	0.00	0.00	
10,800.0	90.50	270.27	5,022.6	-64.8	-6,011.3	6,011.0	0.00	0.00	
10,900.0	90.50	270.27	5,021.7	-64.3	-6,111.3	6,111.0	0.00	0.00	
11,000.0	90.50	270.27	5,020.8	-63.9	-6,211.3	6,211.0	0.00	0.00	
11,100.0	90.50	270.27	5,019.9	-63.4	-6,311.3	6,311.0	0.00	0.00	
11,200.0	90.50	270.27	5,019.1	-62.9	-6,411.3	6,411.0	0.00	0.00	
11,300.0	90.50	270.27	5,018.2	-62.5	-6,511.3	6,511.0	0.00	0.00	
11,400.0	90.50	270.27	5,017.3	-62.0	-6,611.3	6,611.0	0.00	0.00	
11,500.0	90.50	270.27	5,016.5	-61.5	-6,711.3	6,711.0	0.00	0.00	
11,600.0	90.50	270.27	5,015.6	-61.1	-6,811.3	6,811.0	0.00	0.00	
11,700.0	90.50	270.27	5,014.7	-60.6	-6,911.3	6,911.0	0.00	0.00	
11,800.0	90.50	270.27	5,013.8	-60.1	-7,011.2	7,010.9	0.00	0.00	
11,900.0	90.50	270.27	5,013.0	-59.6	-7,111.2	7,110.9	0.00	0.00	
12,000.0	90.50	270.27	5,012.1	-59.2	-7,211.2	7,210.9	0.00	0.00	
12,100.0	90.50	270.27	5,011.2	-58.7	-7,311.2	7,310.9	0.00	0.00	
12,200.0	90.50	270.27	5,010.4	-58.2	-7,411.2	7,410.9	0.00	0.00	
12,300.0	90.50	270.27	5,009.5	-57.8	-7,511.2	7,510.9	0.00	0.00	
12,400.0	90.50	270.27	5,008.6	-57.3	-7,611.2	7,610.9	0.00	0.00	
12,412.7	90.50	270.27	5,008.5	-57.2	-7,623.9	7,623.6	0.00	0.00	TD at 12412.7 - Lybrook J31-2307 01H PBHL P

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook J31-2307 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6990.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 6990.0ft (Original Well Elev)
Site:	S31-T23N-R7W	North Reference:	True
Well:	Lybrook J31-2307 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #3		

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 J31-2307 01H F - plan misses target center by 2.9ft at 9809.3ft MD (5031.2 TVD, -69.5 N, -5020.6 E) - Point	0.00	0.00	5,031.2	-72.4	-5,020.6	1,888,381.89	1,232,546.92	36.181890	-107.632100
Lybrook J31-2307 01H F - plan misses target center by 52.5ft at 5221.5ft MD (5021.8 TVD, -85.9 N, -438.9 E) - Point	0.00	0.00	5,071.3	-91.0	-422.1	1,888,298.57	1,237,144.76	36.181840	-107.616520
Lybrook J31-2307 01H F - plan hits target center - Point	0.00	0.00	5,008.5	-57.2	-7,623.9	1,888,433.65	1,229,944.09	36.181930	-107.640920

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
874.0	874.0	Ojo Alamo		-0.50	270.23
1,069.0	1,069.0	Kirtland Shale		-0.50	270.23
1,335.0	1,335.0	Fruitland Coal		-0.50	270.23
1,459.0	1,459.0	Pictured Cliffs Ss.		-0.50	270.23
1,575.0	1,575.0	Lewis Shale		-0.50	270.23
2,228.0	2,228.0	Cliffhouse Ss.		-0.50	270.23
3,018.0	3,018.0	Menefee Fn.		-0.50	270.23
3,843.0	3,843.0	Point Lookout Ss.		-0.50	270.23
4,025.0	4,025.0	Mancos Shale		-0.50	270.23
4,553.4	4,548.0	Mancos Silt		-0.50	270.23
4,849.8	4,809.0	Gallup Fn.		-0.50	270.23
8,047.5	5,075.0	Horizontal Target		-0.50	270.23

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,100.0	4,100.0	0.0	0.0	KOP @ 4100'
4,239.6	4,238.7	-7.1	11.6	Start build/turn @ 4239'b MD
5,489.7	5,068.9	-89.7	-701.3	LP @ 5068' TVD; 90.5°
12,412.7	5,008.5	-57.2	-7,623.9	TD at 12412.7

EnCana Oil & Gas (USA) Inc

Sandoval County, NM

S31-T23N-R7W

Lybrook J31-2307 01H

Hz

Plan #3

Anticollision Report

05 November, 2014

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook J31-2307 01H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6990.0ft (Original Well Elev)
Reference Site:	S31-T23N-R7W	MD Reference:	WELL @ 6990.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook J31-2307 01H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Hz	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Reference	Plan #3		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,441.3ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	11/5/2014		
From	To	Survey (Wellbore)	Tool Name	Description
(ft)	(ft)			
0.0	12,412.2	Plan #3 (Hz)	Geolink MWD	Geolink MWD

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S30-T23N-R7W						
Lybrook O30-2307 01H - Hz - Plan #3	4,700.0	8,821.3	506.6	442.3	7.882	SF
Lybrook O30-2307 01H - Hz - Plan #3	4,800.0	8,828.4	482.2	421.8	7.988	ES
Lybrook O30-2307 01H - Hz - Plan #3	4,822.5	8,830.0	481.3	422.0	8.113	CC
S31-T23N-R7W						
Lybrook G31-2307 03H - Hz - Plan #4	12,408.0	15,087.2	939.4	576.2	2.587	CC
Lybrook G31-2307 03H - Hz - Plan #4	12,412.7	15,087.2	939.4	576.1	2.586	ES, SF
Lybrook J31-2307 02H - Hz - Plan #3	2,500.0	2,500.0	30.1	21.4	3.468	CC, ES
Lybrook J31-2307 02H - Hz - Plan #3	12,412.7	12,648.5	939.5	563.0	2.496	SF

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S31-T23N-R7W
Site Error: 0.0ft
Reference Well: Lybrook J31-2307 01H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
TVD Reference: WELL @ 6990.0ft (Original Well Elev)
MD Reference: WELL @ 6990.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design S30-T23N-R7W - Lybrook O30-2307 01H - Hz - Plan #3														Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor			
3,700.0	3,700.0	8,784.2	5,132.4	6.4	65.3	94.76	-21.6	259.3	1,402.7	1,351.1	51.61	27.179			
3,800.0	3,800.0	8,782.6	5,132.4	6.6	65.2	94.41	-20.0	259.3	1,304.6	1,252.5	52.04	25.071			
3,900.0	3,900.0	8,781.0	5,132.4	6.8	65.2	94.07	-18.4	259.3	1,206.7	1,154.3	52.46	23.003			
4,000.0	4,000.0	8,779.5	5,132.4	7.0	65.2	93.72	-16.9	259.3	1,109.3	1,056.4	52.88	20.977			
4,100.0	4,100.0	8,777.9	5,132.5	7.1	65.2	93.38	-15.3	259.3	1,012.3	959.0	53.30	18.992			
4,200.0	4,199.7	8,780.0	5,132.4	7.3	65.2	-50.83	-17.4	259.3	914.6	853.0	61.62	14.844			
4,300.0	4,298.3	8,788.0	5,132.3	7.5	65.3	-72.77	-25.4	259.3	816.2	755.3	60.97	13.388			
4,400.0	4,397.7	8,796.7	5,132.2	7.7	65.5	-131.51	-34.1	259.3	721.3	654.7	66.59	10.832			
4,500.0	4,496.3	8,805.2	5,132.0	7.9	65.6	-160.46	-42.6	259.3	634.0	566.2	67.80	9.351			
4,600.0	4,592.2	8,813.5	5,131.9	8.1	65.8	-168.57	-50.9	259.3	559.9	493.0	66.83	8.378			
4,700.0	4,683.4	8,821.3	5,131.8	8.3	65.9	-171.76	-58.6	259.3	506.6	442.3	64.26	7.882 SF			
4,800.0	4,768.4	8,828.4	5,131.7	8.8	66.0	-173.29	-65.8	259.3	482.2	421.8	60.36	7.988 ES			
4,822.5	4,786.4	8,830.0	5,131.6	8.9	66.0	-173.52	-67.3	259.3	481.3	422.0	59.32	8.113 CC			
4,900.0	4,845.3	8,834.9	5,131.6	9.4	66.1	-174.12	-72.3	259.3	491.6	436.2	55.33	8.885			
5,000.0	4,912.6	8,840.4	5,131.5	10.3	66.2	-174.60	-77.8	259.3	532.8	483.5	49.34	10.798			
5,100.0	4,869.2	8,845.0	5,131.4	11.6	66.3	-174.90	-82.4	259.3	598.7	556.1	42.64	14.041			
5,200.0	5,013.8	8,848.6	5,131.4	13.2	66.3	-175.12	-85.9	259.3	681.1	645.6	35.53	19.170			
5,300.0	5,045.6	8,850.9	5,131.3	15.0	66.4	-175.42	-88.3	259.3	773.5	745.0	28.49	27.150			
5,400.0	5,064.1	8,852.1	5,131.3	17.1	66.4	-176.43	-89.5	259.3	871.1	848.6	22.49	38.732			
5,500.0	5,068.8	8,852.1	5,131.3	19.2	66.4	90.71	-89.5	259.3	970.9	928.6	42.25	22.978			
5,600.0	5,067.9	8,851.7	5,131.3	21.5	66.4	90.73	-89.1	259.3	1,070.9	1,026.4	44.49	24.068			
5,700.0	5,067.0	8,851.2	5,131.3	23.7	66.4	90.74	-88.6	259.3	1,170.9	1,124.1	46.78	25.028			
5,800.0	5,066.2	8,850.7	5,131.3	26.1	66.4	90.76	-88.1	259.3	1,270.9	1,221.8	49.11	25.880			
5,900.0	5,065.3	8,850.2	5,131.3	28.4	66.4	90.77	-87.6	259.3	1,370.9	1,319.4	51.45	26.643			

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S31-T23N-R7W
 Site Error: 0.0ft
 Reference Well: Lybrook J31-2307 01H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
 TVD Reference: WELL @ 6990.0ft (Original Well Elev)
 MD Reference: WELL @ 6990.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design S31-T23N-R7W - Lybrook G31-2307 03H - Hz - Plan #4													Offset Site Error: 0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
11,400.0	5,017.3	15,091.7	5,034.6	163.4	175.9	90.31	882.1	-7,614.8	1,377.8	1,039.6	338.23	4.074	
11,500.0	5,016.5	15,091.1	5,034.0	165.8	175.9	90.27	882.1	-7,614.8	1,308.4	965.7	340.70	3.835	
11,600.0	5,015.6	15,090.5	5,033.4	168.3	175.9	90.24	882.1	-7,614.8	1,239.0	895.9	343.17	3.611	
11,700.0	5,014.7	15,090.0	5,032.9	170.8	175.9	90.21	882.1	-7,614.8	1,176.3	830.6	345.64	3.403	
11,800.0	5,013.8	15,089.5	5,032.4	173.2	175.9	90.18	882.1	-7,614.8	1,118.9	770.8	348.11	3.214	
11,900.0	5,013.0	15,089.1	5,032.0	175.7	175.9	90.15	882.1	-7,614.8	1,067.9	717.3	350.58	3.046	
12,000.0	5,012.1	15,088.7	5,031.6	178.2	175.9	90.12	882.1	-7,614.8	1,024.1	671.1	353.06	2.901	
12,100.0	5,011.2	15,088.3	5,031.2	180.7	175.9	90.10	882.1	-7,614.8	988.6	633.0	355.53	2.781	
12,200.0	5,010.4	15,087.9	5,030.8	183.1	175.9	90.08	882.1	-7,614.8	962.1	604.1	358.00	2.687	
12,300.0	5,009.5	15,087.6	5,030.5	185.6	175.9	90.06	882.1	-7,614.8	945.6	585.1	360.47	2.623	
12,400.0	5,008.6	15,087.3	5,030.1	188.1	175.9	90.04	882.1	-7,614.8	939.4	576.5	362.94	2.588	
12,408.0	5,008.5	15,087.2	5,030.1	188.3	175.9	90.03	882.1	-7,614.8	939.4	576.2	363.14	2.587 CC	
12,412.7	5,008.5	15,087.2	5,030.1	188.4	175.9	90.03	882.1	-7,614.8	939.4	576.1	363.26	2.586 ES, SF	

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S31-T23N-R7W
Site Error: 0.0ft
Reference Well: Lybrook J31-2307 01H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
TVD Reference: WELL @ 6990.0ft (Original Well Elev)
MD Reference: WELL @ 6990.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design S31-T23N-R7W - Lybrook J31-2307 02H - Hz - Plan #3													Offset Site Error: 0.0 ft
Survey Program: O-Geolink MWD													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-136.60	-21.8	-20.7	30.1				
100.0	100.0	100.0	100.0	0.1	0.1	-136.60	-21.8	-20.7	30.1	29.8	0.29	102.545	
200.0	200.0	200.0	200.0	0.3	0.3	-136.60	-21.8	-20.7	30.1	29.4	0.64	46.814	
300.0	300.0	300.0	300.0	0.5	0.5	-136.60	-21.8	-20.7	30.1	29.1	0.99	30.330	
400.0	400.0	400.0	400.0	0.7	0.7	-136.60	-21.8	-20.7	30.1	28.7	1.34	22.432	
500.0	500.0	500.0	500.0	0.8	0.8	-136.60	-21.8	-20.7	30.1	28.4	1.69	17.797	
600.0	600.0	600.0	600.0	1.0	1.0	-136.60	-21.8	-20.7	30.1	28.0	2.04	14.750	
700.0	700.0	700.0	700.0	1.2	1.2	-136.60	-21.8	-20.7	30.1	27.7	2.39	12.593	
800.0	800.0	800.0	800.0	1.4	1.4	-136.60	-21.8	-20.7	30.1	27.3	2.74	10.987	
900.0	900.0	900.0	900.0	1.5	1.5	-136.60	-21.8	-20.7	30.1	27.0	3.09	9.744	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-136.60	-21.8	-20.7	30.1	26.6	3.43	8.754	
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	-136.60	-21.8	-20.7	30.1	26.3	3.78	7.946	
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	-136.60	-21.8	-20.7	30.1	25.9	4.13	7.275	
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	-136.60	-21.8	-20.7	30.1	25.6	4.48	6.709	
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	-136.60	-21.8	-20.7	30.1	25.2	4.83	6.224	
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	-136.60	-21.8	-20.7	30.1	24.9	5.18	5.804	
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	-136.60	-21.8	-20.7	30.1	24.5	5.53	5.438	
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	-136.60	-21.8	-20.7	30.1	24.2	5.88	5.115	
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	-136.60	-21.8	-20.7	30.1	23.8	6.23	4.828	
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	-136.60	-21.8	-20.7	30.1	23.5	6.58	4.572	
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	-136.60	-21.8	-20.7	30.1	23.1	6.93	4.342	
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	-136.60	-21.8	-20.7	30.1	22.8	7.27	4.133	
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	-136.60	-21.8	-20.7	30.1	22.4	7.62	3.944	
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	-136.60	-21.8	-20.7	30.1	22.1	7.97	3.771	
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	-136.60	-21.8	-20.7	30.1	21.7	8.32	3.613	
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	-136.60	-21.8	-20.7	30.1	21.4	8.67	3.468 CC, ES	
2,600.0	2,600.0	2,599.2	2,599.2	4.5	4.5	-138.78	-23.6	-20.6	31.3	22.3	9.02	3.475	
2,700.0	2,700.0	2,698.2	2,698.0	4.7	4.7	-144.33	-28.7	-20.6	35.4	26.0	9.37	3.776	
2,800.0	2,800.0	2,796.7	2,796.2	4.9	4.9	-151.12	-37.2	-20.5	42.7	32.9	9.73	4.385	
2,900.0	2,900.0	2,894.5	2,893.2	5.0	5.1	-157.37	-49.0	-20.4	53.5	43.4	10.09	5.299	
3,000.0	3,000.0	2,991.4	2,989.0	5.2	5.3	-162.40	-63.9	-20.3	67.9	57.4	10.47	6.486	
3,100.0	3,100.0	3,087.1	3,083.0	5.4	5.5	-166.20	-81.8	-20.1	85.9	75.1	10.87	7.904	
3,200.0	3,200.0	3,181.6	3,175.2	5.6	5.8	-169.01	-102.5	-19.9	107.4	96.1	11.29	9.511	
3,300.0	3,300.0	3,274.6	3,265.2	5.7	6.0	-171.11	-125.9	-19.7	132.1	120.4	11.73	11.263	
3,400.0	3,400.0	3,365.9	3,352.8	5.9	6.4	-172.70	-151.7	-19.4	160.1	147.9	12.20	13.123	
3,500.0	3,500.0	3,455.4	3,437.8	6.1	6.7	-173.91	-179.7	-19.2	191.1	178.4	12.69	15.058	
3,600.0	3,600.0	3,543.1	3,520.2	6.3	7.1	-174.85	-209.6	-18.9	225.1	211.9	13.21	17.039	
3,700.0	3,700.0	3,628.7	3,599.7	6.4	7.6	-175.59	-241.3	-18.6	262.0	248.2	13.76	19.044	
3,800.0	3,800.0	3,712.3	3,676.4	6.6	8.0	-176.19	-274.5	-18.3	301.6	287.3	14.33	21.054	
3,900.0	3,900.0	3,793.7	3,750.2	6.8	8.5	-176.67	-309.0	-18.0	343.9	329.0	14.92	23.050	
4,000.0	4,000.0	3,873.0	3,821.0	7.0	9.0	-177.07	-344.6	-17.6	388.7	373.2	15.54	25.014	
4,100.0	4,100.0	3,950.6	3,889.4	7.1	9.6	-177.40	-381.3	-17.3	435.9	419.8	16.17	26.964	
4,200.0	4,199.7	4,039.6	3,967.3	7.3	10.2	58.02	-424.4	-16.9	481.2	466.8	16.82	29.007	
4,300.0	4,298.3	4,130.6	4,047.0	7.5	10.9	40.53	-468.4	-16.5	521.1	506.5	17.47	31.133	
4,400.0	4,397.7	4,222.6	4,127.4	7.7	11.6	-24.14	-512.9	-16.1	560.2	545.2	18.15	33.333	
4,500.0	4,496.3	4,313.7	4,207.2	7.9	12.3	-55.45	-556.9	-15.6	598.4	582.9	18.82	35.622	
4,600.0	4,592.2	4,402.2	4,284.6	8.1	13.0	-65.26	-599.7	-15.2	635.8	620.0	19.54	38.029	
4,700.0	4,583.4	4,486.4	4,358.3	8.3	13.7	-70.00	-640.4	-14.9	673.2	657.1	20.31	40.492	
4,800.0	4,768.4	4,564.6	4,426.8	8.8	14.3	-72.92	-678.3	-14.5	711.9	695.3	21.15	43.025	
4,900.0	4,845.3	4,635.3	4,488.7	9.4	14.8	-74.71	-712.5	-14.2	753.0	735.7	22.05	45.618	
5,000.0	4,912.6	4,697.1	4,542.8	10.3	15.3	-75.46	-742.4	-13.9	797.6	779.3	23.00	48.271	
5,100.0	4,969.2	4,802.0	4,634.2	11.6	16.2	-78.13	-782.9	-21.6	845.0	825.3	24.00	51.000	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S31-T23N-R7W
 Site Error: 0.0ft
 Reference Well: Lybrook J31-2307 01H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
 TVD Reference: WELL @ 6990.0ft (Original Well Elev)
 MD Reference: WELL @ 6990.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design S31-T23N-R7W - Lybrook J31-2307 02H - Hz - Plan #3														Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
5,200.0	5,013.8	4,972.5	4,775.6	13.2	17.5	-82.89	-871.1	-74.1	890.7	869.0	21.75	40.962			
5,300.0	5,045.8	5,278.5	4,971.8	15.0	20.1	-88.96	-979.7	-274.0	926.2	900.4	25.84	35.845			
5,400.0	5,064.1	5,636.0	5,052.9	17.1	24.0	-89.24	-1,024.8	-615.4	935.3	901.2	34.08	27.446			
5,493.6	5,069.4	5,729.3	5,052.1	19.1	25.3	-88.93	-1,024.4	-708.7	934.8	896.8	37.98	24.616			
5,500.0	5,068.8	5,735.8	5,052.0	19.2	25.4	-88.97	-1,024.4	-715.2	934.9	896.6	38.25	24.442			
5,600.0	5,067.9	5,835.8	5,051.1	21.5	26.9	-88.97	-1,024.0	-815.2	934.9	892.2	42.71	21.890			
5,700.0	5,087.0	5,935.8	5,050.3	23.7	28.6	-88.97	-1,023.6	-915.2	935.0	887.7	47.27	19.780			
5,800.0	5,066.2	6,035.8	5,049.4	26.1	30.4	-88.97	-1,023.2	-1,015.1	935.1	883.2	51.90	18.016			
5,900.0	5,065.3	6,135.8	5,048.5	28.4	32.4	-88.97	-1,022.8	-1,115.1	935.1	878.5	56.59	16.526			
6,000.0	5,064.4	6,235.8	5,047.6	30.8	34.4	-88.97	-1,022.4	-1,215.1	935.2	873.9	61.31	15.253			
6,100.0	5,063.5	6,335.8	5,046.8	33.1	36.4	-88.97	-1,022.0	-1,315.1	935.3	869.2	66.07	14.155			
6,200.0	5,062.7	6,435.8	5,045.9	35.5	38.6	-88.97	-1,021.6	-1,415.1	935.3	864.5	70.86	13.200			
6,300.0	5,061.8	6,535.8	5,045.0	37.9	40.7	-88.97	-1,021.2	-1,515.1	935.4	859.7	75.66	12.363			
6,400.0	5,060.9	6,635.8	5,044.1	40.4	43.0	-88.97	-1,020.8	-1,615.1	935.5	855.0	80.49	11.623			
6,500.0	5,060.1	6,735.8	5,043.3	42.8	45.2	-88.97	-1,020.4	-1,715.1	935.5	850.2	85.32	10.965			
6,600.0	5,059.2	6,835.8	5,042.4	45.2	47.5	-88.97	-1,019.9	-1,815.1	935.6	845.4	90.17	10.376			
6,700.0	5,058.3	6,935.8	5,041.5	47.6	49.8	-88.97	-1,019.5	-1,915.1	935.7	840.6	95.03	9.846			
6,800.0	5,057.4	7,035.8	5,040.7	50.1	52.1	-88.97	-1,019.1	-2,015.1	935.7	835.8	99.90	9.367			
6,900.0	5,056.6	7,135.8	5,039.8	52.5	54.4	-88.97	-1,018.7	-2,115.1	935.8	831.0	104.77	8.932			
7,000.0	5,055.7	7,235.8	5,038.9	54.9	56.8	-88.97	-1,018.3	-2,215.1	935.9	826.2	109.66	8.535			
7,100.0	5,054.8	7,335.8	5,038.0	57.4	59.1	-88.97	-1,017.9	-2,315.1	935.9	821.4	114.54	8.171			
7,200.0	5,054.0	7,435.8	5,037.2	59.8	61.5	-88.97	-1,017.5	-2,415.1	936.0	816.6	119.44	7.837			
7,300.0	5,053.1	7,535.8	5,036.3	62.3	63.8	-88.97	-1,017.1	-2,515.1	936.1	811.7	124.33	7.529			
7,400.0	5,052.2	7,635.8	5,035.4	64.7	66.2	-88.97	-1,016.7	-2,615.1	936.1	806.9	129.24	7.244			
7,500.0	5,051.3	7,735.8	5,034.5	67.2	68.6	-88.97	-1,016.3	-2,715.1	936.2	802.1	134.14	6.979			
7,600.0	5,050.5	7,835.8	5,033.7	69.6	71.0	-88.97	-1,015.9	-2,815.1	936.3	797.2	139.05	6.734			
7,700.0	5,049.6	7,935.8	5,032.8	72.1	73.4	-88.97	-1,015.5	-2,915.1	936.3	792.4	143.96	6.504			
7,800.0	5,048.7	8,035.8	5,031.9	74.6	75.8	-88.97	-1,015.1	-3,015.1	936.4	787.5	148.87	6.290			
7,900.0	5,047.8	8,135.8	5,031.1	77.0	78.2	-88.97	-1,014.7	-3,115.1	936.5	782.7	153.78	6.090			
8,000.0	5,047.0	8,235.8	5,030.2	79.5	80.6	-88.97	-1,014.3	-3,215.0	936.5	777.8	158.70	5.901			
8,100.0	5,046.1	8,335.8	5,029.3	81.9	83.0	-88.97	-1,013.9	-3,315.0	936.6	773.0	163.62	5.724			
8,200.0	5,045.2	8,435.8	5,028.4	84.4	85.5	-88.97	-1,013.5	-3,415.0	936.7	768.1	168.54	5.558			
8,300.0	5,044.4	8,535.8	5,027.6	86.9	87.9	-88.97	-1,013.1	-3,515.0	936.8	763.3	173.46	5.400			
8,400.0	5,043.5	8,635.8	5,026.7	89.3	90.3	-88.97	-1,012.7	-3,615.0	936.8	758.4	178.39	5.252			
8,500.0	5,042.6	8,735.8	5,025.8	91.8	92.7	-88.97	-1,012.3	-3,715.0	936.9	753.6	183.31	5.111			
8,600.0	5,041.7	8,835.8	5,024.9	94.2	95.2	-88.97	-1,011.9	-3,815.0	937.0	748.7	188.24	4.978			
8,700.0	5,040.9	8,935.8	5,024.1	96.7	97.6	-88.97	-1,011.5	-3,915.0	937.0	743.9	193.16	4.851			
8,800.0	5,040.0	9,035.8	5,023.2	99.2	100.0	-88.97	-1,011.1	-4,015.0	937.1	739.0	198.09	4.731			
8,900.0	5,039.1	9,135.8	5,022.3	101.6	102.5	-88.97	-1,010.7	-4,115.0	937.2	734.1	203.02	4.616			
9,000.0	5,038.3	9,235.8	5,021.5	104.1	104.9	-88.97	-1,010.3	-4,215.0	937.2	729.3	207.95	4.507			
9,100.0	5,037.4	9,335.8	5,020.6	106.6	107.4	-88.97	-1,009.9	-4,315.0	937.3	724.4	212.88	4.403			
9,200.0	5,036.5	9,435.8	5,019.7	109.0	109.8	-88.97	-1,009.5	-4,415.0	937.4	719.5	217.81	4.303			
9,300.0	5,035.6	9,535.8	5,018.8	111.5	112.2	-88.97	-1,009.1	-4,515.0	937.4	714.7	222.75	4.208			
9,400.0	5,034.8	9,635.8	5,018.0	114.0	114.7	-88.97	-1,008.7	-4,615.0	937.5	709.8	227.68	4.118			
9,500.0	5,033.9	9,735.8	5,017.1	116.4	117.1	-88.97	-1,008.3	-4,715.0	937.6	704.9	232.61	4.031			
9,600.0	5,033.0	9,835.8	5,016.2	118.9	119.6	-88.97	-1,007.9	-4,815.0	937.6	700.1	237.55	3.947			
9,700.0	5,032.2	9,935.8	5,015.3	121.4	122.0	-88.97	-1,007.5	-4,915.0	937.7	695.2	242.48	3.867			
9,800.0	5,031.3	10,035.8	5,014.5	123.8	124.5	-88.97	-1,007.1	-5,015.0	937.8	690.3	247.42	3.790			
9,900.0	5,030.4	10,135.8	5,013.6	126.3	126.9	-88.97	-1,006.7	-5,115.0	937.8	685.5	252.35	3.716			
10,000.0	5,029.5	10,235.8	5,012.7	128.8	129.4	-88.97	-1,006.3	-5,215.0	937.9	680.6	257.29	3.645			
10,100.0	5,028.7	10,335.8	5,011.9	131.2	131.8	-88.97	-1,005.9	-5,314.9	938.0	675.7	262.23	3.577			
10,200.0	5,027.8	10,435.8	5,011.0	133.7	134.3	-88.97	-1,005.5	-5,414.9	938.0	670.9	267.16	3.511			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S31-T23N-R7W
Site Error: 0.0ft
Reference Well: Lybrook J31-2307 01H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
TVD Reference: WELL @ 6990.0ft (Original Well Elev)
MD Reference: WELL @ 6990.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design S31-T23N-R7W - Lybrook J31-2307 02H - Hz - Plan #3														Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor			
10,300.0	5,026.9	10,535.8	5,010.1	136.2	136.8	-88.97	-1,005.1	-5,514.9	938.1	666.0	272.10	3.448			
10,400.0	5,026.0	10,635.8	5,009.2	138.7	139.2	-88.97	-1,004.7	-5,614.9	938.2	661.1	277.04	3.386			
10,500.0	5,025.2	10,735.8	5,008.4	141.1	141.7	-88.97	-1,004.3	-5,714.9	938.2	656.3	281.98	3.327			
10,600.0	5,024.3	10,835.8	5,007.5	143.6	144.1	-88.97	-1,003.9	-5,814.9	938.3	651.4	286.91	3.270			
10,700.0	5,023.4	10,935.8	5,006.6	146.1	146.6	-88.97	-1,003.5	-5,914.9	938.4	646.5	291.85	3.215			
10,800.0	5,022.6	11,035.8	5,005.7	148.5	149.0	-88.97	-1,003.1	-6,014.9	938.4	641.6	296.79	3.162			
10,900.0	5,021.7	11,135.8	5,004.9	151.0	151.5	-88.97	-1,002.7	-6,114.9	938.5	636.8	301.73	3.110			
11,000.0	5,020.8	11,235.8	5,004.0	153.5	153.9	-88.97	-1,002.3	-6,214.9	938.6	631.9	306.67	3.061			
11,100.0	5,019.9	11,335.8	5,003.1	155.9	156.4	-88.97	-1,001.9	-6,314.9	938.6	627.0	311.61	3.012			
11,200.0	5,019.1	11,435.8	5,002.3	158.4	158.9	-88.97	-1,001.5	-6,414.9	938.7	622.2	316.55	2.965			
11,300.0	5,018.2	11,535.8	5,001.4	160.9	161.3	-88.97	-1,001.1	-6,514.9	938.8	617.3	321.49	2.920			
11,400.0	5,017.3	11,635.8	5,000.5	163.4	163.8	-88.97	-1,000.7	-6,614.9	938.8	612.4	326.43	2.876			
11,500.0	5,016.5	11,735.8	4,999.6	165.8	166.2	-88.97	-1,000.3	-6,714.9	938.9	607.5	331.37	2.833			
11,600.0	5,015.6	11,835.8	4,998.8	168.3	168.7	-88.97	-999.9	-6,814.9	939.0	602.7	336.31	2.792			
11,700.0	5,014.7	11,935.8	4,997.9	170.8	171.2	-88.97	-999.5	-6,914.9	939.0	597.8	341.26	2.752			
11,800.0	5,013.8	12,035.8	4,997.0	173.2	173.6	-88.97	-999.1	-7,014.9	939.1	592.9	346.20	2.713			
11,900.0	5,013.0	12,135.8	4,996.1	175.7	176.1	-88.97	-998.7	-7,114.9	939.2	588.0	351.14	2.675			
12,000.0	5,012.1	12,235.8	4,995.3	178.2	178.6	-88.97	-998.3	-7,214.9	939.2	583.2	356.08	2.638			
12,100.0	5,011.2	12,335.8	4,994.4	180.7	181.0	-88.97	-997.9	-7,314.9	939.3	578.3	361.02	2.602			
12,200.0	5,010.4	12,435.8	4,993.5	183.1	183.5	-88.97	-997.5	-7,414.9	939.4	573.4	365.96	2.567			
12,300.0	5,009.5	12,535.8	4,992.7	185.6	185.9	-88.97	-997.1	-7,514.8	939.4	568.5	370.91	2.533			
12,400.0	5,008.6	12,635.8	4,991.8	188.1	188.4	-88.97	-996.7	-7,614.8	939.5	563.7	375.85	2.500			
12,412.7	5,008.5	12,648.5	4,991.7	188.4	188.7	-88.97	-996.6	-7,627.6	939.5	563.0	376.48	2.496 SF			

Cathedral Energy Services

Anticollision Report

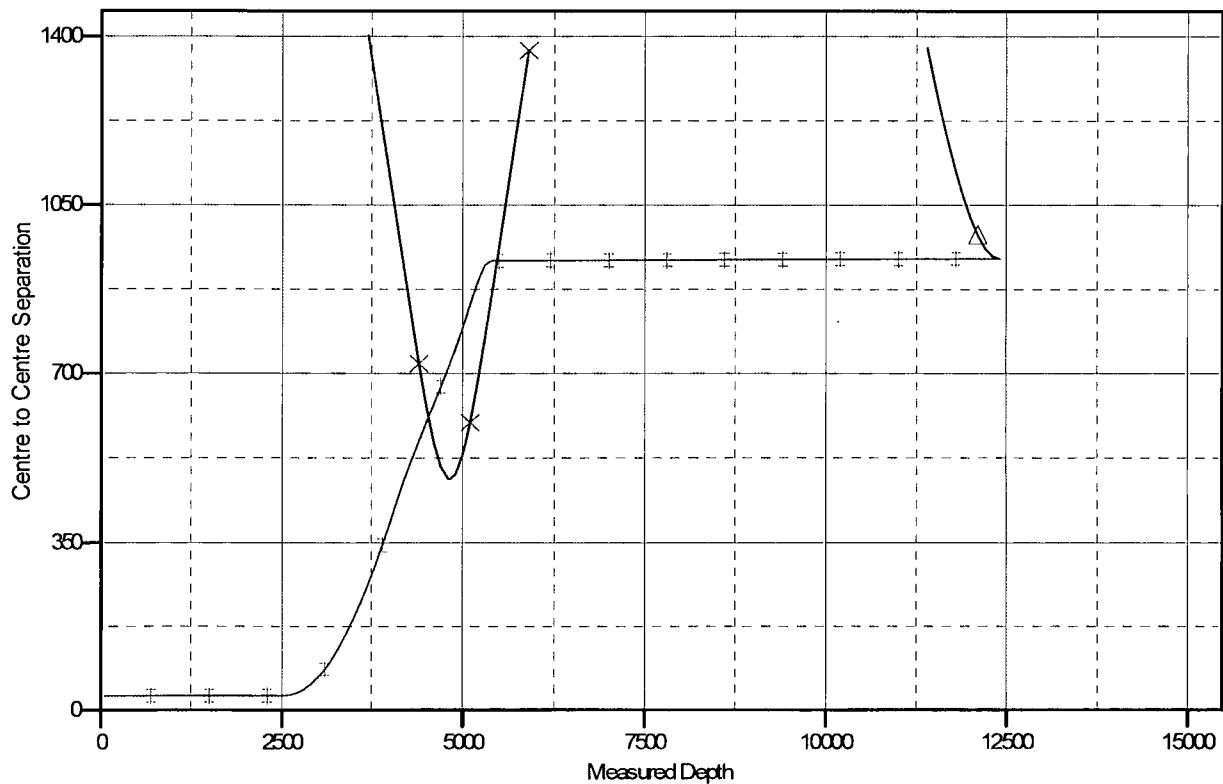
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S31-T23N-R7W
Site Error: 0.0ft
Reference Well: Lybrook J31-2307 01H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook J31-2307 01H
TVD Reference: WELL @ 6990.0ft (Original Well Elev)
MD Reference: WELL @ 6990.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 6990.0ft (Original Well Elev)
 Offset Depths are relative to Offset Datum
 Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook J31-2307 01H
 Coordinate System is US State Plane 1983, New Mexico Central Zone
 Grid Convergence at Surface is: -0.81°

Ladder Plot



LEGEND

x Lybrook G31-2307 03H, Hz, Plan #4 V0 o Lybrook J31-2307 02H, Hz, Plan #3 V0