

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-4 or 3160-5 form.

Operator Signature Date: January 14, 2014

Application Type:

☐ P&A ☒ Drilling/Casing Change ☐ Recomplete/DHC
☐ Location Change ☐ Other: _____

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf. Owner	UL	Sec	Twp	N/S	Rng	W/E
30-045-35492-00-00	LYBROOK 102 2308	002H	ENCANA OIL & GAS (USA) INC.	G	N	San Juan	F	I	2	23	N	8	W

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations

Hold C104 for "As Drilled Plat", Directional Survey, and NSL

A handwritten signature in black ink, appearing to read "W. Bailey", is written over a horizontal line.

NMOCD Approved by Signature

1-28-14
Date

RECEIVEDDEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM 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.

1. Type of Well ☐ Oil Well ☒ Gas Well ☐ Other		5. Lease Serial No. NMNM 118132
2. Name of Operator Encana Oil & Gas (USA) Inc.		6. If Indian, Allottee or Tribe Name N/A
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202	3b. Phone No. (include area code) 720-876-5331	7. If Unit of CA/Agreement, Name and/or No. Pending
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) SHL: 2266' FSL and 701' FEL Section 2, T23N, R8W BHL: 2250' FSL and 330' FEL Section 1, T23N, R8W		8. Well Name and No. Lybrook 102-2308 02H
		9. API Well No. 30-045-35492
		10. Field and Pool or Exploratory Area Basin Mancos
		11. County or Parish, State San Juan, New Mexico

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 recompleting 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 withdraw the sundry submitted on January 9, 2014 and replace it with this sundry.

Encana wishes to change the intermediate casing setting depth on the Lybrook 102-2308 02H well from 5899' MD to 5947' MD. The kick off point will also change from 4000' to 4689' and the TD will change from 10633' MD to 10811' MD. Please see attached directional plan, 10 point drilling plan and wellbore diagram for details.

Please note that Encana will set 7 inch intermediate casing 100' FWL in Section 1, T23N R8W per verbal approval from the NMOCD, BLM and NMSLO that occurred on January 10, 2013.

RCVD JAN 28 '14

OIL CONS. DIV.

DIST 3

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

CONDITIONS OF APPROVAL
Adhere to previously issued stipulations.

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Holly Hill		Title Regulatory Analyst
Signature <i>Holly Hill</i>		Date 1/14/14

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by <i>Wayne Townsend</i>	Title <i>Act. By.</i>	Date 1/27/14
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		

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.

(Instructions on page 2)

NMOCD

Lybrook I02-2308 02H
SHL: NESE Section 2, T23N R8W
2266 FSL and 701 FEL
BHL: NESE Section 1, T23N, R8W
2250 FSL and 330 FEL
San Juan County, New Mexico
Lease Number: NMNM 118132

Encana Oil & Gas (USA) Inc. Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

<u>Formation</u>	<u>Depth (TVD)</u>
Ojo Alamo Ss.	1161'
Kirtland	1315'
Fruitland Coal	1559'
Pictured Cliffs	1834'
Lewis	1945'
Cliffhouse	3319'
Menefee	3398'
Point Lookout	4194'
Mancos Shale	4426'
Mancos Silt	4921'
Gallup	5197'

The referenced surface elevation is 6971', KB 6987'

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

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Gas	Fruitland Coal	1559'
Gas	Pictured Cliffs	1834'
Gas	Cliffhouse	3319'
Gas	Point Lookout	4194'
Oil/Gas	Mancos	4921'

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

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.

Lybrook I02-2308 02H

SHL: NESE Section 2, T23N R8W
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San Juan County, New Mexico

Lease Number: NMNM 118132

- 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	Hole Size	Csg Size	Weight	Grade
Conductor	0-60'	30"	20"	94#	H40, STC New
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5947'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	5747'-10811'MD	6 1/8"	4 1/2"	11.6#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (lb/ft)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lb)	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 1/2"	11.6	B80	LTC	6350	7780	201	1.125	1.1	1.5

Casing design is subject to revision based on geologic conditions encountered.

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:

Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Lybrook 102-2308 02H

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Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	100sk	Type I Neat 14.8 ppg	Surface	None
Surface	500'	178sk	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 14.6ppg, 1.38cuf/sk	Surface	1 per joint on bottom 3 joints
Intermediate	5947'MD	30% open hole excess Stage 1 Lead: 299sks Stage 1 Tail: 302sks Stage 2 Lead: 168sks	Lead (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail (Stage 1): Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuf/sk	Surface	1 per joint for bottom 3 joints, 1 every 3 joints for remaining joints
Production Liner*	5747'-10811'	None – External casing packers	N/A	N/A	N/A

*Production liner clarification: Utilizing external swell casing packer system for zonal isolation will not use cement in the production liner.

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 a 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 ^{4688'}~~4946'~~. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5481'/10811'	Gallup

Lybrook I02-2308 02H

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6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60' TVD	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0-500' TVD	Fresh Water	8.4-8.6	60-70	NC
8 3/4"	500'TVD- 5490'TVD/5947'MD	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	MD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5947'-10811'	Synthetic Oil Based Mud	8.6-9.0	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, including fresh water and oil-based operations. 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 and LOGGING

- a) Drill Stem Testing – None anticipated
- b) Coring – None anticipated.
- c) Mud 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 +/- 2569 psi based on a 9.0 ppg at 5490' TVD of the landing point of the horizontal lateral. 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.

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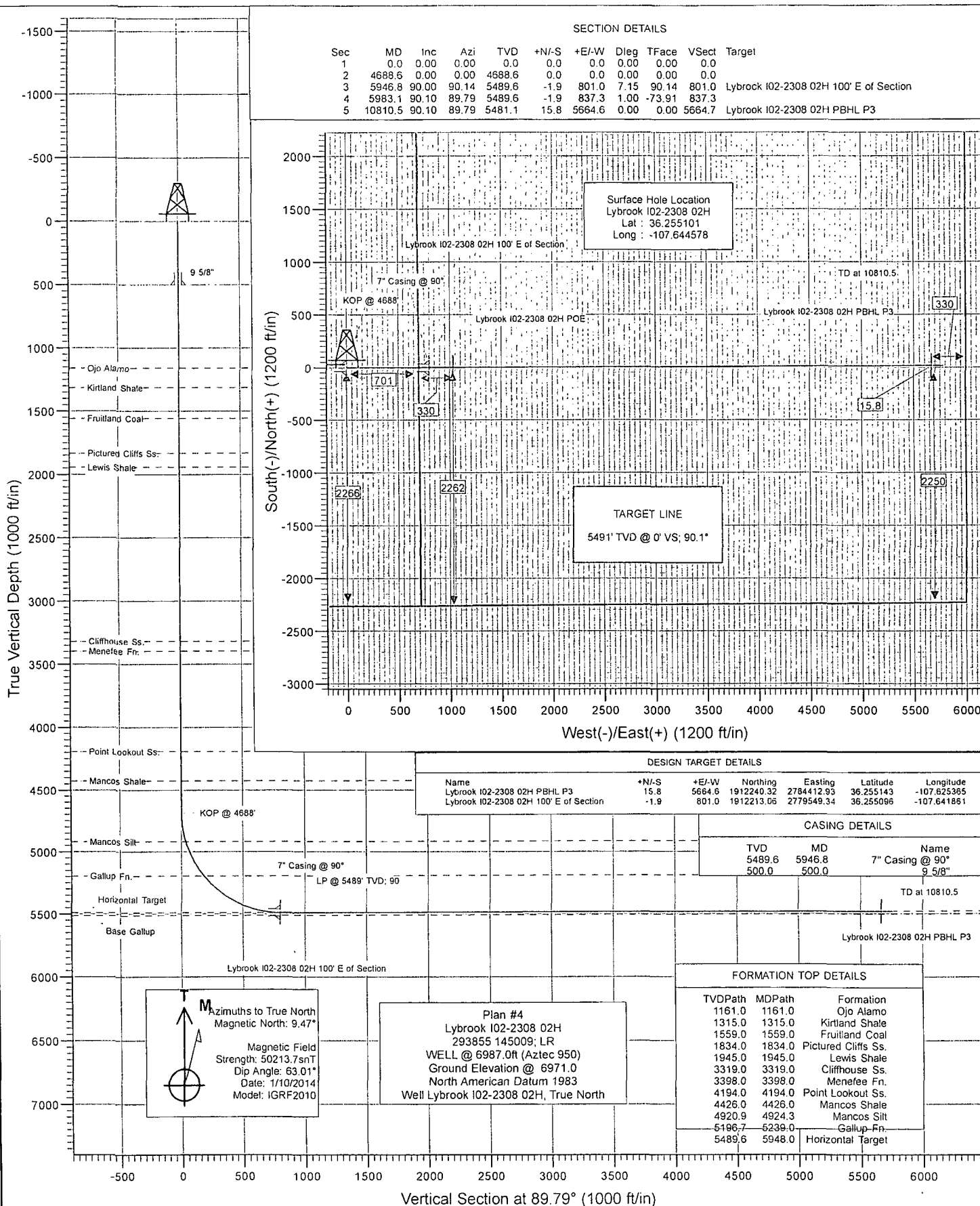
9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on January 13, 2014. 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.



Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook I02-2308 02H
Wellbore: Hz
Design: Plan #4



Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook I02-2308 02H
 Wellbore: Hz
 Design: Plan #4

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

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: 36.255101
From:	Lat/Long	Easting:	2,778,748.33 ft	Longitude: -107.644578
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
	+E/-W	0.0 ft	Easting:	2,778,748.33 ft
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	Plan #4			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	89.79

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	
4,688.6	0.00	0.00	4,688.6	0.0	0.0	0.00	0.00	0.00	0.00	
5,946.8	90.00	90.14	5,489.6	-1.9	801.0	7.15	7.15	0.00	90.14	Lybrook I02-2308 02H
5,983.1	90.10	89.79	5,489.6	-1.9	837.3	1.00	0.28	-0.96	-73.91	
10,810.5	90.10	89.79	5,481.1	15.8	5,664.6	0.00	0.00	0.00	0.00	Lybrook I02-2308 02H

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook 102-2308 02H
 Wellbore: Hz
 Design: Plan #4

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

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	
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	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,161.0	0.00	0.00	1,161.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
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	
1,315.0	0.00	0.00	1,315.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,559.0	0.00	0.00	1,559.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,834.0	0.00	0.00	1,834.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,945.0	0.00	0.00	1,945.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
2,300.0	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	
3,100.0	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	
3,319.0	0.00	0.00	3,319.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
3,398.0	0.00	0.00	3,398.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
3,900.0	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	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,194.0	0.00	0.00	4,194.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook I02-2308 02H
 Wellbore: Hz
 Design: Plan #4

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

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
4,426.0	0.00	0.00	4,426.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4688'
4,688.6	0.00	0.00	4,688.6	0.0	0.0	0.0	0.00	0.00	
4,700.0	0.82	90.14	4,700.0	0.0	0.1	0.1	7.15	7.15	
4,800.0	7.97	90.14	4,799.6	0.0	7.7	7.7	7.15	7.15	
4,900.0	15.12	90.14	4,897.6	-0.1	27.7	27.7	7.15	7.15	
4,924.3	16.86	90.14	4,920.9	-0.1	34.4	34.4	7.15	7.15	Mancos Silt
5,000.0	22.27	90.14	4,992.2	-0.1	59.8	59.8	7.15	7.15	
5,100.0	29.43	90.14	5,082.1	-0.2	103.3	103.3	7.15	7.15	Gallup Fn.
5,200.0	36.58	90.14	5,166.0	-0.4	157.8	157.8	7.15	7.15	
5,239.0	39.37	90.14	5,196.7	-0.4	181.8	181.8	7.15	7.15	
5,300.0	43.73	90.14	5,242.3	-0.5	222.2	222.2	7.15	7.15	
5,400.0	50.89	90.14	5,310.1	-0.7	295.7	295.7	7.15	7.15	
5,500.0	58.04	90.14	5,368.2	-0.9	377.0	377.0	7.15	7.15	LP @ 5489' TVD; 90 - 7" Casing @ 90° - Lybrook
5,600.0	65.19	90.14	5,415.7	-1.1	464.9	464.9	7.15	7.15	
5,700.0	72.35	90.14	5,451.9	-1.3	558.1	558.1	7.15	7.15	
5,800.0	79.50	90.14	5,476.2	-1.6	655.0	655.0	7.15	7.15	
5,900.0	86.65	90.14	5,488.2	-1.8	754.2	754.2	7.15	7.15	
5,946.8	90.00	90.14	5,489.6	-1.9	801.0	801.0	7.15	7.15	Horizontal Target
5,948.0	90.00	90.13	5,489.6	-1.9	802.2	802.2	1.02	0.33	
5,983.1	90.10	89.79	5,489.6	-1.9	837.3	837.3	1.00	0.28	Lybrook I02-2308 02H POE - Lybrook I02-2308
6,000.0	90.10	89.79	5,489.5	-1.8	854.2	854.2	0.00	0.00	
6,100.0	90.10	89.79	5,489.4	-1.5	954.2	954.2	0.00	0.00	
6,176.3	90.10	89.79	5,489.2	-1.2	1,030.5	1,030.5	0.00	0.00	
6,200.0	90.10	89.79	5,489.2	-1.1	1,054.2	1,054.2	0.00	0.00	
6,300.0	90.10	89.79	5,489.0	-0.7	1,154.2	1,154.2	0.00	0.00	
6,400.0	90.10	89.79	5,488.8	-0.4	1,254.2	1,254.2	0.00	0.00	
6,500.0	90.10	89.79	5,488.7	0.0	1,354.2	1,354.2	0.00	0.00	
6,600.0	90.10	89.79	5,488.5	0.4	1,454.2	1,454.2	0.00	0.00	
6,700.0	90.10	89.79	5,488.3	0.7	1,554.2	1,554.2	0.00	0.00	
6,800.0	90.10	89.79	5,488.1	1.1	1,654.2	1,654.2	0.00	0.00	
6,900.0	90.10	89.79	5,488.0	1.5	1,754.2	1,754.2	0.00	0.00	
7,000.0	90.10	89.79	5,487.8	1.8	1,854.2	1,854.2	0.00	0.00	
7,100.0	90.10	89.79	5,487.6	2.2	1,954.2	1,954.2	0.00	0.00	
7,200.0	90.10	89.79	5,487.4	2.6	2,054.2	2,054.2	0.00	0.00	
7,300.0	90.10	89.79	5,487.3	2.9	2,154.2	2,154.2	0.00	0.00	
7,400.0	90.10	89.79	5,487.1	3.3	2,254.2	2,254.2	0.00	0.00	
7,500.0	90.10	89.79	5,486.9	3.7	2,354.2	2,354.2	0.00	0.00	
7,600.0	90.10	89.79	5,486.7	4.0	2,454.2	2,454.2	0.00	0.00	
7,700.0	90.10	89.79	5,486.6	4.4	2,554.2	2,554.2	0.00	0.00	
7,800.0	90.10	89.79	5,486.4	4.8	2,654.2	2,654.2	0.00	0.00	
7,900.0	90.10	89.79	5,486.2	5.1	2,754.2	2,754.2	0.00	0.00	
8,000.0	90.10	89.79	5,486.0	5.5	2,854.2	2,854.2	0.00	0.00	
8,100.0	90.10	89.79	5,485.9	5.9	2,954.2	2,954.2	0.00	0.00	
8,200.0	90.10	89.79	5,485.7	6.2	3,054.2	3,054.2	0.00	0.00	
8,300.0	90.10	89.79	5,485.5	6.6	3,154.2	3,154.2	0.00	0.00	
8,400.0	90.10	89.79	5,485.3	7.0	3,254.2	3,254.2	0.00	0.00	
8,500.0	90.10	89.79	5,485.2	7.4	3,354.2	3,354.2	0.00	0.00	
8,600.0	90.10	89.79	5,485.0	7.7	3,454.2	3,454.2	0.00	0.00	
8,700.0	90.10	89.79	5,484.8	8.1	3,554.2	3,554.2	0.00	0.00	
8,800.0	90.10	89.79	5,484.6	8.5	3,654.2	3,654.2	0.00	0.00	
8,900.0	90.10	89.79	5,484.5	8.8	3,754.2	3,754.2	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook I02-2308 02H
 Wellbore: Hz
 Design: Plan #4

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

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
9,000.0	90.10	89.79	5,484.3	9.2	3,854.2	3,854.2	0.00	0.00	
9,100.0	90.10	89.79	5,484.1	9.6	3,954.2	3,954.2	0.00	0.00	
9,200.0	90.10	89.79	5,483.9	9.9	4,054.2	4,054.2	0.00	0.00	
9,300.0	90.10	89.79	5,483.7	10.3	4,154.2	4,154.2	0.00	0.00	
9,400.0	90.10	89.79	5,483.6	10.7	4,254.2	4,254.2	0.00	0.00	
9,500.0	90.10	89.79	5,483.4	11.0	4,354.2	4,354.2	0.00	0.00	
9,600.0	90.10	89.79	5,483.2	11.4	4,454.2	4,454.2	0.00	0.00	
9,700.0	90.10	89.79	5,483.0	11.8	4,554.2	4,554.2	0.00	0.00	
9,800.0	90.10	89.79	5,482.9	12.1	4,654.2	4,654.2	0.00	0.00	
9,900.0	90.10	89.79	5,482.7	12.5	4,754.2	4,754.2	0.00	0.00	
10,000.0	90.10	89.79	5,482.5	12.9	4,854.2	4,854.2	0.00	0.00	
10,100.0	90.10	89.79	5,482.3	13.2	4,954.2	4,954.2	0.00	0.00	
10,200.0	90.10	89.79	5,482.2	13.6	5,054.2	5,054.2	0.00	0.00	
10,300.0	90.10	89.79	5,482.0	14.0	5,154.2	5,154.2	0.00	0.00	
10,400.0	90.10	89.79	5,481.8	14.3	5,254.2	5,254.2	0.00	0.00	
10,500.0	90.10	89.79	5,481.6	14.7	5,354.2	5,354.2	0.00	0.00	
10,600.0	90.10	89.79	5,481.5	15.1	5,454.2	5,454.2	0.00	0.00	
10,700.0	90.10	89.79	5,481.3	15.4	5,554.2	5,554.2	0.00	0.00	
10,800.0	90.10	89.79	5,481.1	15.8	5,654.2	5,654.2	0.00	0.00	
10,810.5	90.10	89.79	5,481.1	15.8	5,664.6	5,664.7	0.00	0.00	TD at 10810.5 - Lybrook I02-2308 02H PBHL P.

Targets

Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook I02-2308 02H P	- plan hits target center - Point	0.00	0.00	5,481.1	15.8	5,664.6	1,912,240.32	2,784,412.93	36.255143	-107.625365
Lybrook I02-2308 02H P	- plan misses target center by 12.8ft at 10810.5ft MD (5481.1 TVD, 15.8 N, 5664.6 E) - Point	0.00	0.00	5,468.3	15.8	5,664.6	1,912,240.32	2,784,412.93	36.255143	-107.625365
Lybrook I02-2308 02H P	- plan misses target center by 3.4ft at 6176.2ft MD (5489.2 TVD, -1.2 N, 1030.4 E) - Point	0.00	0.00	5,492.6	-1.4	1,030.4	1,912,214.00	2,779,778.78	36.255097	-107.641083
Lybrook I02-2308 02H 1 st	- plan hits target center - Point	0.00	0.00	5,489.6	-1.9	801.0	1,912,213.06	2,779,549.34	36.255096	-107.641861
Lybrook I02-2308 02H P	- plan misses target center by 29.8ft at 10810.5ft MD (5481.1 TVD, 15.8 N, 5664.6 E) - Point	0.00	0.00	5,451.3	15.8	5,664.6	1,912,240.32	2,784,412.93	36.255143	-107.625365
Lybrook I02-2308 02H P	- plan misses target center by 13.6ft at 6176.3ft MD (5489.2 TVD, -1.2 N, 1030.5 E) - Point	0.00	0.00	5,475.6	-1.4	1,030.4	1,912,214.00	2,779,778.78	36.255097	-107.641083

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook 102-2308 02H
 Wellbore: Hz
 Design: Plan #4

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

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
5,946.8	5,489.6	7" Casing @ 90°	0.000	0.000
500.0	500.0	9 5/8"	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,161.0	1,161.0	Ojo Alamo		-0.10	89.79
1,315.0	1,315.0	Kirtland Shale		-0.10	89.79
1,559.0	1,559.0	Fruitland Coal		-0.10	89.79
1,834.0	1,834.0	Pictured Cliffs Ss.		-0.10	89.79
1,945.0	1,945.0	Lewis Shale		-0.10	89.79
3,319.0	3,319.0	Cliffhouse Ss.		-0.10	89.79
3,398.0	3,398.0	Menefee Fn.		-0.10	89.79
4,194.0	4,194.0	Point Lookout Ss.		-0.10	89.79
4,426.0	4,426.0	Mancos Shale		-0.10	89.79
4,924.3	4,921.0	Mancos Silt		-0.10	89.79
5,239.0	5,197.0	Gallup Fn.		-0.10	89.79
5,948.0	5,491.0	Horizontal Target		-0.10	89.79

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,688.6	4,688.6	0.0	0.0	KOP @ 4688'
5,946.8	5,489.6	-1.9	801.0	LP @ 5489' TVD; 90
10,810.5	5,481.1	15.8	5,664.6	TD at 10810.5

EnCana Oil & Gas (USA) Inc

San Juan County, NM

S2-T23N-R8W (Lybrook)

Lybrook I02-2308 02H

Hz

Plan #4

Anticollision Report

10 January, 2014

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Reference Site: S2-T23N-R8W (Lybrook)
 Site Error: 0.0ft
 Reference Well: Lybrook 102-2308 02H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #4

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
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Reference	Plan #4
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,290.8ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	Systematic Ellipse
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date: 1/10/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,810.5	Plan #4 (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						
Lybrook						
Lybrook 102-2308 01H - Hz - FINAL	4,700.0	4,702.2	34.1	17.8	2.087	CC, ES, SF

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Reference Site: S2-T23N-R8W (Lybrook)
 Site Error: 0.0ft
 Reference Well: Lybrook I02-2308 02H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #4

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
 Output errors are at 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design Lybrook - Lybrook I02-2308 01H - Hz - FINAL														Offset Site Error:	0.0 ft
Survey Program: 553-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance								
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	Warning		
0.0	0.0	2.0	2.0	0.0	0.0	-34.67	32.4	-22.4	39.4						
100.0	100.0	102.0	102.0	0.1	0.2	-34.73	32.4	-22.5	39.4	39.1	0.32	123.369			
200.0	200.0	202.0	202.0	0.3	0.3	-34.91	32.4	-22.6	39.5	38.8	0.66	59.518			
300.0	300.0	301.9	301.9	0.5	0.5	-35.20	32.4	-22.8	39.6	38.6	1.01	39.322			
400.0	400.0	401.9	401.9	0.7	0.7	-35.60	32.4	-23.2	39.8	38.4	1.35	29.445			
500.0	500.0	501.9	501.9	0.8	0.9	-36.12	32.3	-23.6	40.0	38.3	1.70	23.608			
600.0	600.0	601.9	601.9	1.0	1.0	-36.67	32.3	-24.1	40.3	38.3	2.04	19.739			
700.0	700.0	702.0	702.0	1.2	1.2	-36.71	32.5	-24.2	40.5	38.1	2.39	16.936			
800.0	800.0	801.9	801.9	1.4	1.4	-36.49	32.7	-24.2	40.6	37.9	2.74	14.830			
900.0	900.0	902.1	902.1	1.5	1.5	-36.29	32.7	-24.0	40.6	37.5	3.09	13.146			
972.7	972.7	974.7	974.7	1.7	1.7	-36.66	32.5	-24.2	40.5	37.2	3.34	12.126			
1,000.0	1,000.0	1,001.9	1,001.9	1.7	1.7	-36.75	32.5	-24.3	40.6	37.1	3.44	11.797			
1,100.0	1,100.0	1,101.9	1,101.9	1.9	1.9	-37.23	32.6	-24.8	40.9	37.1	3.79	10.806			
1,200.0	1,200.0	1,201.9	1,201.9	2.1	2.1	-37.42	32.7	-25.0	41.1	37.0	4.14	9.939			
1,300.0	1,300.0	1,301.8	1,301.8	2.2	2.2	-37.89	32.7	-25.5	41.5	37.0	4.49	9.247			
1,400.0	1,400.0	1,401.9	1,401.9	2.4	2.4	-38.45	32.9	-26.1	42.0	37.1	4.84	8.680			
1,500.0	1,500.0	1,501.9	1,501.9	2.6	2.6	-37.89	33.3	-25.9	42.2	37.0	5.18	8.136			
1,600.0	1,600.0	1,601.8	1,601.8	2.8	2.8	-37.19	33.8	-25.6	42.4	36.9	5.53	7.666			
1,700.0	1,700.0	1,701.7	1,701.7	2.9	2.9	-37.15	34.3	-26.0	43.1	37.2	5.88	7.319			
1,800.0	1,800.0	1,801.9	1,801.9	3.1	3.1	-37.59	34.6	-26.6	43.6	37.4	6.23	7.002			
1,900.0	1,900.0	1,902.5	1,902.5	3.3	3.3	-36.88	34.5	-25.9	43.1	36.5	6.58	6.546			
2,000.0	2,000.0	2,002.4	2,002.3	3.5	3.5	-35.75	34.1	-24.6	42.0	35.1	6.93	6.064			
2,100.0	2,100.0	2,102.5	2,102.4	3.6	3.6	-34.90	33.8	-23.6	41.2	34.0	7.28	5.666			
2,200.0	2,200.0	2,202.6	2,202.6	3.8	3.8	-34.96	32.8	-22.9	40.0	32.3	7.63	5.240			
2,300.0	2,300.0	2,302.6	2,302.5	4.0	4.0	-34.75	31.7	-22.0	38.6	30.6	7.98	4.837			
2,400.0	2,400.0	2,402.6	2,402.5	4.2	4.2	-35.13	30.5	-21.5	37.3	29.0	8.33	4.480			
2,500.0	2,500.0	2,502.6	2,502.5	4.3	4.3	-35.96	28.9	-21.0	35.7	27.0	8.68	4.113			
2,577.9	2,577.9	2,579.9	2,579.9	4.5	4.5	-36.50	28.2	-20.9	35.1	26.1	8.95	3.920			
2,600.0	2,600.0	2,602.0	2,601.9	4.5	4.5	-36.49	28.2	-20.9	35.1	26.1	9.02	3.893			
2,700.0	2,700.0	2,702.0	2,701.9	4.7	4.7	-36.38	28.6	-21.1	35.5	26.1	9.37	3.790			
2,800.0	2,800.0	2,802.2	2,802.1	4.9	4.9	-36.62	28.5	-21.2	35.5	25.8	9.72	3.654			
2,822.6	2,822.6	2,824.6	2,824.6	4.9	4.9	-36.69	28.5	-21.2	35.5	25.7	9.80	3.622			
2,900.0	2,900.0	2,901.8	2,901.7	5.0	5.0	-36.98	28.6	-21.5	35.8	25.7	10.07	3.556			
3,000.0	3,000.0	3,001.9	3,001.8	5.2	5.2	-38.23	28.6	-22.5	36.4	26.0	10.42	3.491			
3,100.0	3,100.0	3,101.9	3,101.8	5.4	5.4	-38.81	28.9	-23.2	37.0	26.3	10.77	3.439			
3,200.0	3,200.0	3,202.0	3,201.9	5.6	5.6	-38.80	29.2	-23.5	37.5	26.4	11.12	3.372			
3,300.0	3,300.0	3,302.1	3,302.0	5.7	5.7	-38.82	29.3	-23.5	37.5	26.1	11.47	3.274			
3,400.0	3,400.0	3,402.3	3,402.2	5.9	5.9	-38.17	29.4	-23.1	37.4	25.6	11.82	3.168			
3,481.4	3,481.4	3,483.5	3,483.4	6.0	6.1	-37.97	29.3	-22.9	37.1	25.0	12.10	3.070			
3,500.0	3,500.0	3,502.0	3,501.9	6.1	6.1	-37.98	29.3	-22.9	37.2	25.0	12.17	3.055			
3,600.0	3,600.0	3,602.2	3,602.1	6.3	6.3	-38.53	29.2	-23.3	37.4	24.9	12.51	2.987			
3,675.0	3,675.0	3,677.1	3,677.0	6.4	6.4	-39.50	28.8	-23.7	37.3	24.5	12.78	2.917			
3,700.0	3,700.0	3,702.0	3,701.9	6.4	6.4	-39.72	28.7	-23.8	37.3	24.4	12.86	2.899			
3,800.0	3,800.0	3,801.8	3,801.7	6.6	6.6	-39.81	29.1	-24.2	37.8	24.6	13.21	2.863			
3,900.0	3,900.0	3,901.8	3,901.7	6.8	6.8	-39.94	29.7	-24.9	38.7	25.2	13.56	2.856			
4,000.0	4,000.0	4,001.9	4,001.8	7.0	7.0	-40.17	30.1	-25.4	39.4	25.5	13.91	2.833			
4,100.0	4,100.0	4,102.4	4,102.3	7.1	7.1	-39.63	30.3	-25.1	39.4	25.1	14.26	2.763			
4,200.0	4,200.0	4,202.6	4,202.5	7.3	7.3	-38.27	30.1	-23.7	38.3	23.7	14.61	2.621			
4,300.0	4,300.0	4,302.7	4,302.6	7.5	7.5	-36.67	29.6	-22.0	36.8	21.9	14.96	2.463			
4,400.0	4,400.0	4,402.5	4,402.3	7.7	7.7	-35.87	28.7	-20.8	35.4	20.1	15.31	2.314			
4,500.0	4,500.0	4,502.3	4,502.2	7.8	7.8	-36.28	28.1	-20.7	34.9	19.3	15.66	2.230			
4,600.0	4,600.0	4,602.3	4,602.2	8.0	8.0	-38.11	27.1	-21.2	34.4	18.4	16.01	2.149			

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

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Reference Site: S2-T23N-R8W (Lybrook)
 Site Error: 0.0ft
 Reference Well: Lybrook I02-2308 02H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #4

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
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design Lybrook - Lybrook I02-2308 01H - Hz - FINAL														Offset Site Error: 0.0 ft	
Survey Program: 553-MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Total Uncertainty Axis	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
4,674.5	4,674.5	4,676.7	4,676.5	8.1	8.1	-129.69	26.5	-21.5	34.4	18.1	16.27	2.113	CC, ES, SF		
4,700.0	4,700.0	4,702.2	4,702.0	8.2	8.2	-129.48	26.4	-21.6	34.1	17.8	16.35	2.087			
4,800.0	4,799.6	4,801.6	4,801.5	8.4	8.4	-138.30	26.2	-21.9	39.6	22.9	16.64	2.377			
4,900.0	4,897.6	4,898.9	4,898.7	8.5	8.5	-151.75	25.9	-22.2	56.3	39.6	16.75	3.361			
5,000.0	4,992.2	4,975.9	4,975.2	8.8	8.7	-160.38	27.0	-29.7	95.5	78.8	16.63	5.740			
5,100.0	5,082.1	5,036.7	5,033.9	9.1	8.8	-164.46	29.3	-45.3	159.7	143.4	16.32	9.783			
5,200.0	5,166.0	5,075.0	5,069.7	9.6	8.9	-165.56	29.9	-58.8	239.7	223.9	15.88	15.096			
5,300.0	5,242.3	5,107.0	5,098.9	10.3	8.9	-165.09	30.0	-72.1	329.7	314.3	15.40	21.416			
5,400.0	5,310.1	5,126.1	5,116.0	11.3	9.0	-160.62	30.2	-80.7	425.5	410.4	15.16	28.069			
5,500.0	5,368.2	5,138.0	5,126.4	12.6	9.0	-141.88	30.4	-86.2	524.4	507.2	17.16	30.562			
5,600.0	5,415.7	5,138.0	5,126.4	14.1	9.0	-42.37	30.4	-86.2	624.2	605.8	18.35	34.011			
5,700.0	5,451.9	5,128.5	5,118.1	15.9	9.0	-13.42	30.2	-81.8	723.3	709.9	13.42	53.895			
5,800.0	5,476.2	5,117.4	5,108.2	17.9	9.0	-7.40	30.1	-76.7	820.5	808.1	12.43	66.013			
5,900.0	5,488.2	5,107.0	5,098.9	20.1	8.9	-4.99	30.0	-72.1	914.8	902.7	12.09	75.648			
6,000.0	5,489.5	5,087.3	5,081.0	22.3	8.9	-4.88	29.9	-63.7	1,006.0	993.8	12.27	82.009			
6,100.0	5,489.4	5,075.0	5,069.7	24.6	8.9	-4.73	29.9	-58.8	1,097.7	1,085.2	12.55	87.496			
6,200.0	5,489.2	5,061.8	5,057.6	26.9	8.8	-4.58	29.7	-53.9	1,190.3	1,177.5	12.82	92.872			
6,300.0	5,489.0	5,044.0	5,040.8	29.2	8.8	-4.37	29.4	-47.7	1,283.8	1,270.7	13.07	98.248			

Anticollision Report

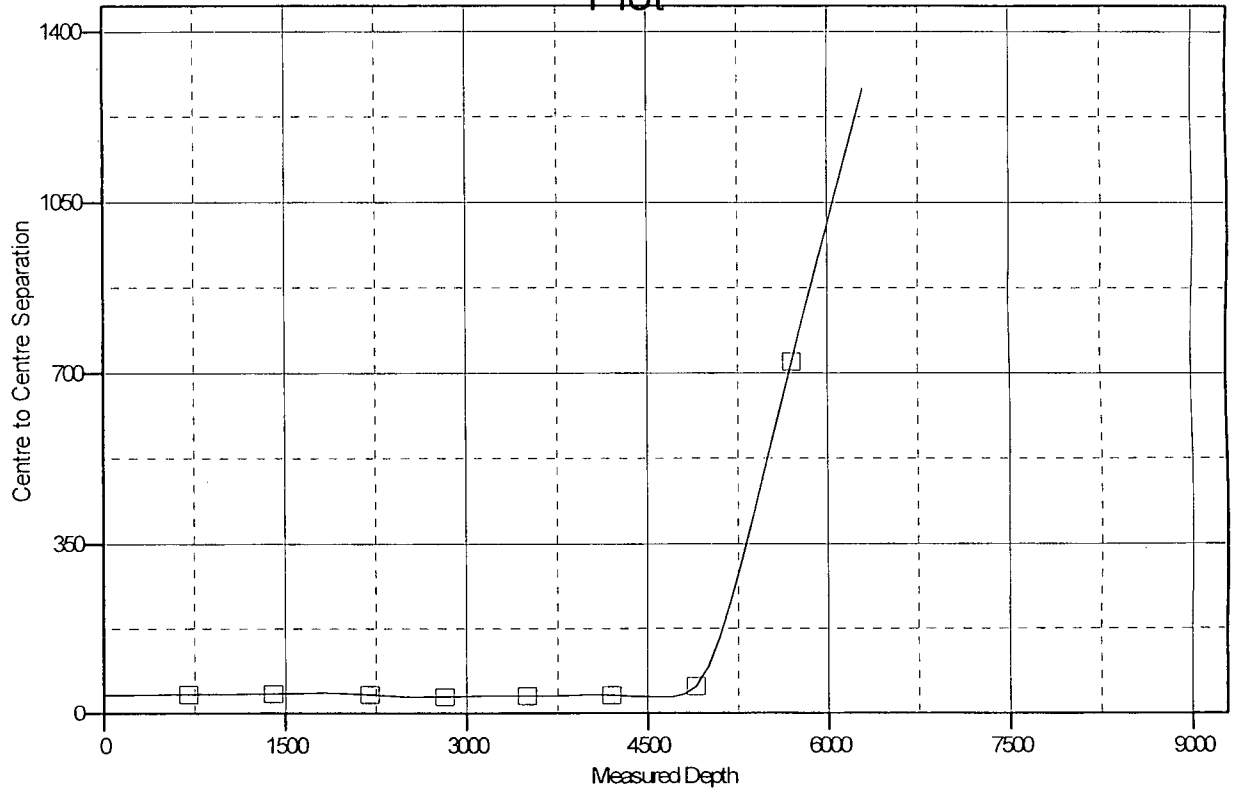
Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Reference Site: S2-T23N-R8W (Lybrook)
Site Error: 0.0ft
Reference Well: Lybrook I02-2308 02H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #4

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
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 @ 6987.0ft (Aztec 950)
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W °

Coordinates are relative to: Lybrook I02-2308 02H
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.11°

Ladder Plot



LEGEND

— Lybrook I02-2308 01H, Hz, FINAL V0

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONFIDENTIAL

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.**

RECEIVED

SUBMIT IN TRIPLICATE – Other instructions on page 2.

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

JAN 10 2014

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

Farmington Field Office
Bureau of Land Management

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

3b. Phone No. (include area code)
720-876-3437

5. Lease Serial No.
NMNM 118132

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 I02-2308 02H

9. API Well No.
30-045-35492

10. Field and Pool or Exploratory Area
Basin Mancos

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SHL: 2266' FSL and 701' FEL Section 2, T23N, R8W
BHL: 2250' FSL and 330' FEL Section 1, T23N, R8W

11. County or Parish, State
San Juan, New Mexico

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 recompleat 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 recompleat 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 change the intermediate casing setting depth on the Lybrook I02-2308 02H well from 5899'MD to 5817'MD. The kick off point will also change from 4000' to 4916' and the TD will change from 10633'MD to 10908'MD. Please see attached directional plan, 10 point drilling plan and wellbore diagram for details.

Please note that Encana will set an isolation packer at 330'FWL in Section 1 and the last completion packer will be set at +/- 355' FWL.

Withdraw

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)

Amanda Cavoto

Title Engineering Technologist

Signature

Date

1/9/14

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

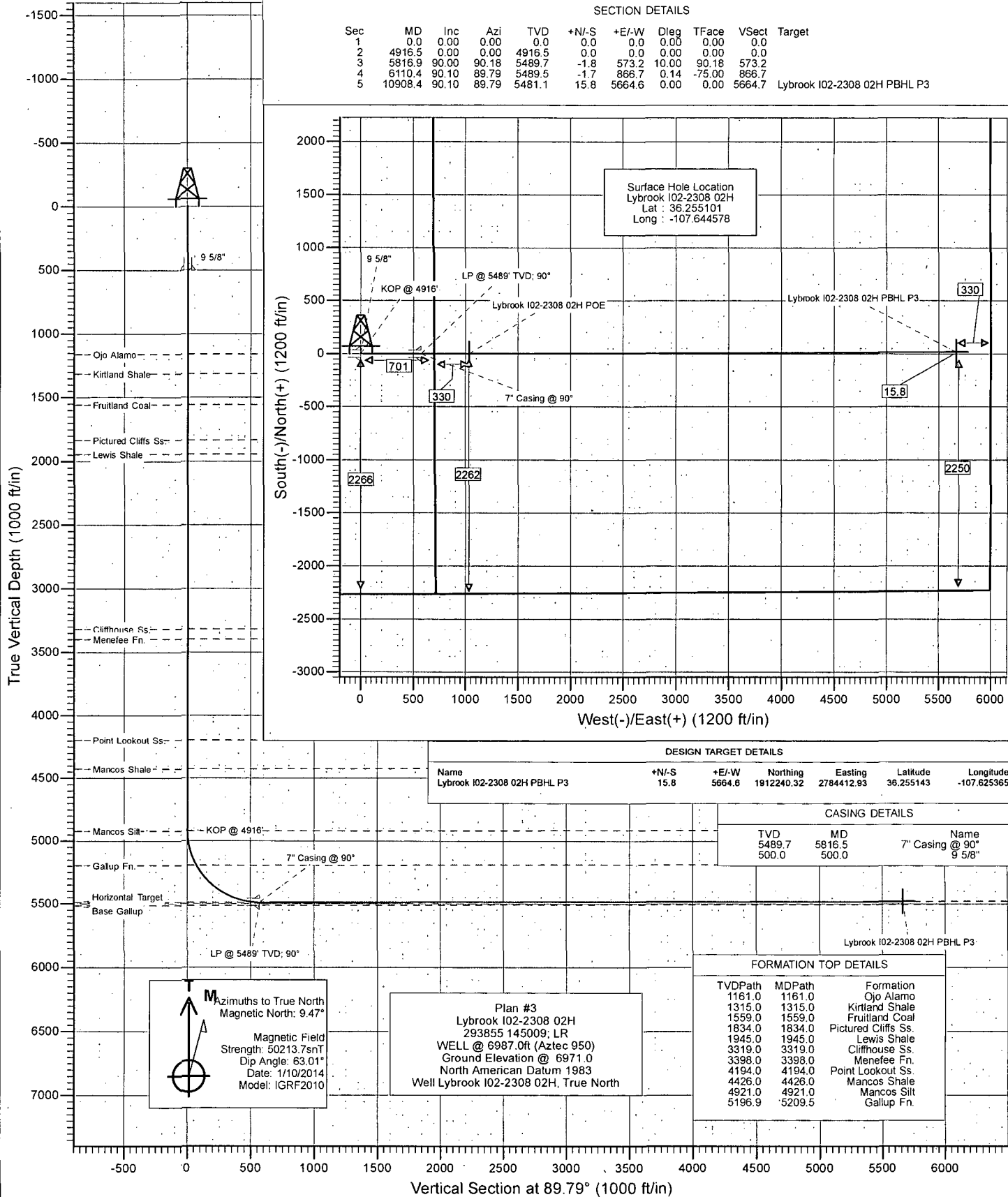
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

UNM000



Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook 102-2308 02H
 Wellbore: Hz
 Design: Plan #3



Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook I02-2308 02H
Wellbore: Hz
Design: Plan #3

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

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: 36.255101
From:	Lat/Long	Easting:	2,778,748.33 ft	Longitude: -107.644578
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
	+E/-W	0.0 ft	Easting:	2,778,748.33 ft
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	Plan #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	89.79

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	
4,916.5	0.00	0.00	4,916.5	0.0	0.0	0.00	0.00	0.00	0.00	
5,816.9	90.00	90.18	5,489.7	-1.8	573.2	10.00	10.00	0.00	90.18	
6,110.4	90.10	89.79	5,489.5	-1.7	866.7	0.14	0.04	-0.13	-75.00	
10,908.4	90.10	89.79	5,481.1	15.8	5,664.6	0.00	0.00	0.00	0.00	Lybrook I02-2308 02H

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook 102-2308 02H
 Wellbore: Hz
 Design: Plan #3

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

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	
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	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,161.0	0.00	0.00	1,161.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
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	
1,315.0	0.00	0.00	1,315.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,559.0	0.00	0.00	1,559.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,834.0	0.00	0.00	1,834.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,945.0	0.00	0.00	1,945.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
2,300.0	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	
3,100.0	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	
3,319.0	0.00	0.00	3,319.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
3,398.0	0.00	0.00	3,398.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
3,900.0	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	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,194.0	0.00	0.00	4,194.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook 102-2308 02H
 Wellbore: Hz
 Design: Plan #3

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

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
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,426.0	0.00	0.00	4,426.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	
4,916.5	0.00	0.00	4,916.5	0.0	0.0	0.0	0.00	0.00	KOP @ 4916'
4,921.0	0.45	90.18	4,921.0	0.0	0.0	0.0	10.00	10.00	Mancos Silt
5,000.0	8.35	90.18	4,999.7	0.0	6.1	6.1	10.00	10.00	
5,100.0	18.34	90.18	5,096.9	-0.1	29.1	29.1	10.00	10.00	
5,200.0	28.34	90.18	5,188.6	-0.2	68.7	68.7	10.00	10.00	
5,209.5	29.28	90.18	5,196.9	-0.2	73.2	73.2	10.00	10.00	Gallup Fn.
5,300.0	38.33	90.18	5,272.0	-0.4	123.6	123.6	10.00	10.00	
5,400.0	48.33	90.18	5,344.7	-0.6	192.1	192.1	10.00	10.00	
5,500.0	58.32	90.18	5,404.3	-0.9	272.2	272.2	10.00	10.00	
5,600.0	68.32	90.18	5,449.2	-1.1	361.4	361.4	10.00	10.00	
5,700.0	78.31	90.18	5,477.8	-1.4	457.1	457.1	10.00	10.00	
5,800.0	88.31	90.18	5,489.5	-1.8	556.3	556.3	10.00	10.00	
5,816.5	89.96	90.18	5,489.7	-1.8	572.8	572.8	10.00	10.00	7" Casing @ 90°
5,816.9	90.00	90.18	5,489.7	-1.8	573.2	573.2	10.00	10.00	LP @ 5489' TVD; 90°
5,900.0	90.02	90.07	5,489.7	-2.0	656.3	656.3	0.14	0.04	
6,000.0	90.06	89.94	5,489.6	-2.0	756.3	756.3	0.14	0.04	
6,100.0	90.10	89.80	5,489.5	-1.8	856.3	856.3	0.14	0.04	
6,110.4	90.10	89.79	5,489.5	-1.7	866.7	866.7	0.14	0.04	
6,200.0	90.10	89.79	5,489.3	-1.4	956.3	956.3	0.00	0.00	
6,300.0	90.10	89.79	5,489.1	-1.0	1,056.3	1,056.3	0.00	0.00	
6,400.0	90.10	89.79	5,489.0	-0.7	1,156.3	1,156.3	0.00	0.00	
6,500.0	90.10	89.79	5,488.8	-0.3	1,256.3	1,256.3	0.00	0.00	
6,600.0	90.10	89.79	5,488.6	0.1	1,356.3	1,356.3	0.00	0.00	
6,700.0	90.10	89.79	5,488.4	0.4	1,456.3	1,456.3	0.00	0.00	
6,800.0	90.10	89.79	5,488.3	0.8	1,556.3	1,556.3	0.00	0.00	
6,900.0	90.10	89.79	5,488.1	1.2	1,656.3	1,656.3	0.00	0.00	
7,000.0	90.10	89.79	5,487.9	1.5	1,756.3	1,756.3	0.00	0.00	
7,100.0	90.10	89.79	5,487.7	1.9	1,856.3	1,856.3	0.00	0.00	
7,200.0	90.10	89.79	5,487.6	2.3	1,956.3	1,956.3	0.00	0.00	
7,300.0	90.10	89.79	5,487.4	2.6	2,056.3	2,056.3	0.00	0.00	
7,400.0	90.10	89.79	5,487.2	3.0	2,156.3	2,156.3	0.00	0.00	
7,500.0	90.10	89.79	5,487.0	3.4	2,256.3	2,256.3	0.00	0.00	
7,600.0	90.10	89.79	5,486.9	3.7	2,356.3	2,356.3	0.00	0.00	
7,700.0	90.10	89.79	5,486.7	4.1	2,456.3	2,456.3	0.00	0.00	
7,800.0	90.10	89.79	5,486.5	4.5	2,556.3	2,556.3	0.00	0.00	
7,900.0	90.10	89.79	5,486.4	4.8	2,656.3	2,656.3	0.00	0.00	
8,000.0	90.10	89.79	5,486.2	5.2	2,756.3	2,756.3	0.00	0.00	
8,100.0	90.10	89.79	5,486.0	5.6	2,856.3	2,856.3	0.00	0.00	
8,200.0	90.10	89.79	5,485.8	5.9	2,956.3	2,956.3	0.00	0.00	
8,300.0	90.10	89.79	5,485.7	6.3	3,056.3	3,056.3	0.00	0.00	
8,400.0	90.10	89.79	5,485.5	6.7	3,156.3	3,156.3	0.00	0.00	
8,500.0	90.10	89.79	5,485.3	7.0	3,256.3	3,256.3	0.00	0.00	
8,600.0	90.10	89.79	5,485.1	7.4	3,356.3	3,356.3	0.00	0.00	
8,700.0	90.10	89.79	5,485.0	7.8	3,456.3	3,456.3	0.00	0.00	
8,800.0	90.10	89.79	5,484.8	8.1	3,556.3	3,556.3	0.00	0.00	

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook 102-2308 02H
Wellbore: Hz
Design: Plan #3

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

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
8,900.0	90.10	89.79	5,484.6	8.5	3,656.3	3,656.3	0.00	0.00	
9,000.0	90.10	89.79	5,484.4	8.9	3,756.3	3,756.3	0.00	0.00	
9,100.0	90.10	89.79	5,484.3	9.2	3,856.3	3,856.3	0.00	0.00	
9,200.0	90.10	89.79	5,484.1	9.6	3,956.3	3,956.3	0.00	0.00	
9,300.0	90.10	89.79	5,483.9	10.0	4,056.3	4,056.3	0.00	0.00	
9,400.0	90.10	89.79	5,483.7	10.3	4,156.3	4,156.3	0.00	0.00	
9,500.0	90.10	89.79	5,483.6	10.7	4,256.3	4,256.3	0.00	0.00	
9,600.0	90.10	89.79	5,483.4	11.1	4,356.3	4,356.3	0.00	0.00	
9,700.0	90.10	89.79	5,483.2	11.4	4,456.3	4,456.3	0.00	0.00	
9,800.0	90.10	89.79	5,483.0	11.8	4,556.3	4,556.3	0.00	0.00	
9,900.0	90.10	89.79	5,482.9	12.2	4,656.3	4,656.3	0.00	0.00	
10,000.0	90.10	89.79	5,482.7	12.5	4,756.3	4,756.3	0.00	0.00	
10,100.0	90.10	89.79	5,482.5	12.9	4,856.3	4,856.3	0.00	0.00	
10,200.0	90.10	89.79	5,482.3	13.3	4,956.3	4,956.3	0.00	0.00	
10,300.0	90.10	89.79	5,482.2	13.6	5,056.3	5,056.3	0.00	0.00	
10,400.0	90.10	89.79	5,482.0	14.0	5,156.3	5,156.3	0.00	0.00	
10,500.0	90.10	89.79	5,481.8	14.4	5,256.3	5,256.3	0.00	0.00	
10,600.0	90.10	89.79	5,481.6	14.7	5,356.3	5,356.3	0.00	0.00	
10,700.0	90.10	89.79	5,481.5	15.1	5,456.3	5,456.3	0.00	0.00	
10,800.0	90.10	89.79	5,481.3	15.5	5,556.3	5,556.3	0.00	0.00	
10,900.0	90.10	89.79	5,481.1	15.8	5,656.3	5,656.3	0.00	0.00	
10,908.4	90.10	89.79	5,481.1	15.8	5,664.6	5,664.7	0.00	0.00	TD at 10908.4

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	5,481.1	15.8	5,664.6	1,912,240.32	2,784,412.93	36.255143	-107.625365
- plan hits target center									
- Point									
Lybrook 102-2308 02H P	0.00	0.00	5,468.3	15.8	5,664.6	1,912,240.32	2,784,412.93	36.255143	-107.625365
- plan misses target center by 12.8ft at 10908.4ft MD (5481.1 TVD, 15.8 N, 5664.6 E)									
- Point									
Lybrook 102-2308 02H P	0.00	0.00	5,492.6	-1.4	1,030.4	1,912,214.00	2,779,778.78	36.255097	-107.641083
- plan misses target center by 3.4ft at 6274.1ft MD (5489.2 TVD, -1.1 N, 1030.4 E)									
- Point									
Lybrook 102-2308 02H P	0.00	0.00	5,451.3	15.8	5,664.6	1,912,240.32	2,784,412.93	36.255143	-107.625365
- plan misses target center by 29.8ft at 10908.4ft MD (5481.1 TVD, 15.8 N, 5664.6 E)									
- Point									
Lybrook 102-2308 02H P	0.00	0.00	5,475.6	-1.4	1,030.4	1,912,214.00	2,779,778.78	36.255097	-107.641083
- plan misses target center by 13.6ft at 6274.2ft MD (5489.2 TVD, -1.1 N, 1030.5 E)									
- Point									

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Site: S2-T23N-R8W (Lybrook)
Well: Lybrook 102-2308 02H
Wellbore: Hz
Design: Plan #3

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

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.0	500.0	9 5/8"	0.000	0.000
5,816.5	5,489.7	7" Casing @ 90°	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,161.0	1,161.0	Ojo Alamo		-0.10	89.79
1,315.0	1,315.0	Kirtland Shale		-0.10	89.79
1,559.0	1,559.0	Fruitland Coal		-0.10	89.79
1,834.0	1,834.0	Pictured Cliffs Ss.		-0.10	89.79
1,945.0	1,945.0	Lewis Shale		-0.10	89.79
3,319.0	3,319.0	Cliffhouse Ss.		-0.10	89.79
3,398.0	3,398.0	Menefee Fn.		-0.10	89.79
4,194.0	4,194.0	Point Lookout Ss.		-0.10	89.79
4,426.0	4,426.0	Mancos Shale		-0.10	89.79
4,921.0	4,921.0	Mancos Silt		-0.10	89.79
5,209.5	5,197.0	Gallup Fn.		-0.10	89.79

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,916.5	4,916.5	0.0	0.0	KOP @ 4916'
5,816.9	5,489.7	-1.8	573.2	LP @ 5489' TVD; 90°
10,908.4	5,481.1	-1.7	866.7	TD at 10908.4

EnCana Oil & Gas (USA) Inc

San Juan County, NM

S2-T23N-R8W (Lybrook)

Lybrook 102-2308 02H

Hz

Plan #3

Anticollision Report

07 January, 2014

Anticollision Report

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)
Reference Site:	S2-T23N-R8W (Lybrook)	MD Reference:	WELL @ 6987.0ft (Aztec 950)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook 102-2308 02H	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 1,290.8ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	1/7/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,908.3	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						
Lybrook						
Lybrook 102-2308 01H - Hz - FINAL	4,743.1	4,745.3	34.0	17.5	2.063 CC	
Lybrook 102-2308 01H - Hz - FINAL	4,900.0	4,901.8	34.2	17.1	2.003 ES, SF	

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Reference Site: S2-T23N-R8W (Lybrook)
 Site Error: 0.0ft
 Reference Well: Lybrook I02-2308 02H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #3

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
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design Lybrook - Lybrook I02-2308 01H - Hz - FINAL													Offset Site Error:	0.0 ft
Survey Program: 553-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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	2.0	2.0	0.0	0.0	-34.67								
100.0	100.0	102.0	102.0	0.1	0.2	-34.73	32.4	-22.5	39.4	39.1	0.32	123.369		
200.0	200.0	202.0	202.0	0.3	0.3	-34.91	32.4	-22.6	39.5	38.8	0.66	59.518		
300.0	300.0	301.9	301.9	0.5	0.5	-35.20	32.4	-22.8	39.6	38.6	1.01	39.322		
400.0	400.0	401.9	401.9	0.7	0.7	-35.60	32.4	-23.2	39.8	38.4	1.35	29.445		
500.0	500.0	501.9	501.9	0.8	0.9	-36.12	32.3	-23.6	40.0	38.3	1.70	23.608		
600.0	600.0	601.9	601.9	1.0	1.0	-36.67	32.3	-24.1	40.3	38.3	2.04	19.739		
700.0	700.0	702.0	702.0	1.2	1.2	-36.71	32.5	-24.2	40.5	38.1	2.39	16.936		
800.0	800.0	801.9	801.9	1.4	1.4	-36.49	32.7	-24.2	40.6	37.9	2.74	14.830		
900.0	900.0	902.1	902.1	1.5	1.5	-36.29	32.7	-24.0	40.6	37.5	3.09	13.146		
972.7	972.7	974.7	974.7	1.7	1.7	-36.66	32.5	-24.2	40.5	37.2	3.34	12.126		
1,000.0	1,000.0	1,001.9	1,001.9	1.7	1.7	-36.75	32.5	-24.3	40.6	37.1	3.44	11.797		
1,100.0	1,100.0	1,101.9	1,101.9	1.9	1.9	-37.23	32.6	-24.8	40.9	37.1	3.79	10.806		
1,200.0	1,200.0	1,201.9	1,201.9	2.1	2.1	-37.42	32.7	-25.0	41.1	37.0	4.14	9.939		
1,300.0	1,300.0	1,301.8	1,301.8	2.2	2.2	-37.89	32.7	-25.5	41.5	37.0	4.49	9.247		
1,400.0	1,400.0	1,401.9	1,401.9	2.4	2.4	-38.45	32.9	-26.1	42.0	37.1	4.84	8.680		
1,500.0	1,500.0	1,501.9	1,501.9	2.6	2.6	-37.89	33.3	-25.9	42.2	37.0	5.18	8.136		
1,600.0	1,600.0	1,601.8	1,601.8	2.8	2.8	-37.19	33.8	-25.6	42.4	36.9	5.53	7.666		
1,700.0	1,700.0	1,701.7	1,701.7	2.9	2.9	-37.15	34.3	-26.0	43.1	37.2	5.88	7.319		
1,800.0	1,800.0	1,801.9	1,801.9	3.1	3.1	-37.59	34.6	-26.6	43.6	37.4	6.23	7.002		
1,900.0	1,900.0	1,902.5	1,902.5	3.3	3.3	-36.88	34.5	-25.9	43.1	36.5	6.58	6.546		
2,000.0	2,000.0	2,002.4	2,002.3	3.5	3.5	-35.75	34.1	-24.6	42.0	35.1	6.93	6.064		
2,100.0	2,100.0	2,102.5	2,102.4	3.6	3.6	-34.90	33.8	-23.6	41.2	34.0	7.28	5.666		
2,200.0	2,200.0	2,202.6	2,202.6	3.8	3.8	-34.96	32.8	-22.9	40.0	32.3	7.63	5.240		
2,300.0	2,300.0	2,302.6	2,302.5	4.0	4.0	-34.75	31.7	-22.0	38.6	30.6	7.98	4.837		
2,400.0	2,400.0	2,402.6	2,402.5	4.2	4.2	-35.13	30.5	-21.5	37.3	29.0	8.33	4.480		
2,500.0	2,500.0	2,502.6	2,502.5	4.3	4.3	-35.96	28.9	-21.0	35.7	27.0	8.68	4.113		
2,577.9	2,577.9	2,579.9	2,579.9	4.5	4.5	-36.50	28.2	-20.9	35.1	26.1	8.95	3.920		
2,600.0	2,600.0	2,602.0	2,601.9	4.5	4.5	-36.49	28.2	-20.9	35.1	26.1	9.02	3.893		
2,700.0	2,700.0	2,702.0	2,701.9	4.7	4.7	-36.38	28.6	-21.1	35.5	26.1	9.37	3.790		
2,800.0	2,800.0	2,802.2	2,802.1	4.9	4.9	-36.62	28.5	-21.2	35.5	25.8	9.72	3.654		
2,822.6	2,822.6	2,824.6	2,824.6	4.9	4.9	-36.69	28.5	-21.2	35.5	25.7	9.80	3.622		
2,900.0	2,900.0	2,901.8	2,901.7	5.0	5.0	-36.98	28.6	-21.5	35.8	25.7	10.07	3.556		
3,000.0	3,000.0	3,001.9	3,001.8	5.2	5.2	-38.23	28.6	-22.5	36.4	26.0	10.42	3.491		
3,100.0	3,100.0	3,101.9	3,101.8	5.4	5.4	-38.81	28.9	-23.2	37.0	26.3	10.77	3.439		
3,200.0	3,200.0	3,202.0	3,201.9	5.6	5.6	-38.80	29.2	-23.5	37.5	26.4	11.12	3.372		
3,300.0	3,300.0	3,302.1	3,302.0	5.7	5.7	-38.82	29.3	-23.5	37.5	26.1	11.47	3.274		
3,400.0	3,400.0	3,402.3	3,402.2	5.9	5.9	-38.17	29.4	-23.1	37.4	25.6	11.82	3.168		
3,481.4	3,481.4	3,483.5	3,483.4	6.0	6.1	-37.97	29.3	-22.9	37.1	25.0	12.10	3.070		
3,500.0	3,500.0	3,502.0	3,501.9	6.1	6.1	-37.98	29.3	-22.9	37.2	25.0	12.17	3.055		
3,600.0	3,600.0	3,602.2	3,602.1	6.3	6.3	-38.53	29.2	-23.3	37.4	24.9	12.51	2.987		
3,675.0	3,675.0	3,677.1	3,677.0	6.4	6.4	-39.50	28.8	-23.7	37.3	24.5	12.78	2.917		
3,700.0	3,700.0	3,702.0	3,701.9	6.4	6.4	-39.72	28.7	-23.8	37.3	24.4	12.86	2.899		
3,800.0	3,800.0	3,801.8	3,801.7	6.6	6.6	-39.81	29.1	-24.2	37.8	24.6	13.21	2.863		
3,900.0	3,900.0	3,901.8	3,901.7	6.8	6.8	-39.94	29.7	-24.9	38.7	25.2	13.56	2.856		
4,000.0	4,000.0	4,001.9	4,001.8	7.0	7.0	-40.17	30.1	-25.4	39.4	25.5	13.91	2.833		
4,100.0	4,100.0	4,102.4	4,102.3	7.1	7.1	-39.63	30.3	-25.1	39.4	25.1	14.26	2.763		
4,200.0	4,200.0	4,202.6	4,202.5	7.3	7.3	-38.27	30.1	-23.7	38.3	23.7	14.61	2.621		
4,300.0	4,300.0	4,302.7	4,302.6	7.5	7.5	-36.67	29.6	-22.0	36.8	21.9	14.96	2.463		
4,400.0	4,400.0	4,402.5	4,402.3	7.7	7.7	-35.87	28.7	-20.8	35.4	20.1	15.31	2.314		
4,500.0	4,500.0	4,502.3	4,502.2	7.8	7.8	-36.28	28.1	-20.7	34.9	19.3	15.66	2.230		
4,600.0	4,600.0	4,602.3	4,602.2	8.0	8.0	-38.11	27.1	-21.2	34.4	18.4	16.01	2.149		

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

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Reference Site: S2-T23N-R8W (Lybrook)
Site Error: 0.0ft
Reference Well: Lybrook I02-2308 02H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #3

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
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design Lybrook - Lybrook I02-2308 01H - Hz - FINAL													Offset Site Error: 0.0 ft	
Survey Program: 553-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		
4,700.0	4,700.0	4,702.2	4,702.0	8.2	8.2	-39.24	26.4	-21.6	34.1	17.7	16.35	2.083		
4,743.1	4,743.1	4,745.3	4,745.1	8.3	8.3	-39.52	26.3	-21.7	34.0	17.5	16.50	2.063 CC		
4,800.0	4,800.0	4,802.0	4,801.9	8.3	8.4	-39.85	26.2	-21.9	34.2	17.5	16.70	2.045		
4,876.4	4,876.4	4,878.7	4,878.5	8.5	8.5	-40.35	26.0	-22.1	34.1	17.1	16.97	2.011		
4,900.0	4,900.0	4,901.8	4,901.6	8.5	8.5	-40.74	25.9	-22.3	34.2	17.1	17.05	2.003 ES, SF		
5,000.0	4,999.7	4,992.3	4,991.2	8.7	8.7	-143.61	27.7	-33.3	49.2	31.9	17.31	2.845		
5,100.0	5,096.9	5,068.6	5,063.8	8.9	8.9	-157.10	29.8	-56.4	97.1	79.9	17.20	5.648		
5,200.0	5,188.6	5,123.6	5,113.8	9.2	9.0	-162.35	30.2	-79.5	169.7	153.0	16.71	10.152		
5,300.0	5,272.0	5,159.9	5,145.6	9.6	9.1	-161.94	30.8	-97.0	257.1	241.1	16.04	16.031		
5,400.0	5,344.7	5,179.7	5,162.5	10.3	9.2	-153.42	31.1	-107.1	352.7	337.0	15.76	22.379		
5,500.0	5,404.3	5,185.5	5,167.5	11.3	9.2	-85.48	31.1	-110.1	451.9	431.5	20.48	22.071		
5,600.0	5,449.2	5,179.9	5,162.7	12.7	9.2	-17.95	31.1	-107.2	551.2	537.5	13.73	40.159		
5,700.0	5,477.8	5,170.0	5,154.3	14.4	9.1	-8.47	30.9	-102.1	647.9	635.6	12.21	53.063		
5,800.0	5,489.5	5,138.0	5,126.4	16.4	9.0	-4.97	30.4	-86.2	739.7	728.0	11.71	63.147		
5,900.0	5,489.7	5,122.8	5,113.0	18.5	9.0	-4.71	30.2	-79.2	827.9	815.9	11.95	69.264		
6,000.0	5,489.6	5,107.0	5,098.9	20.7	8.9	-4.79	30.0	-72.1	917.3	905.1	12.24	74.916		
6,100.0	5,489.5	5,086.9	5,080.7	22.9	8.9	-4.83	29.9	-63.6	1,007.9	995.4	12.53	80.438		
6,200.0	5,489.3	5,075.0	5,069.7	25.2	8.9	-4.73	29.9	-58.8	1,099.6	1,086.8	12.81	85.855		
6,300.0	5,489.1	5,061.6	5,057.3	27.5	8.8	-4.57	29.7	-53.8	1,192.2	1,179.2	13.07	91.197		
6,400.0	5,489.0	5,044.0	5,040.8	29.8	8.8	-4.37	29.4	-47.7	1,285.7	1,272.4	13.32	96.528		

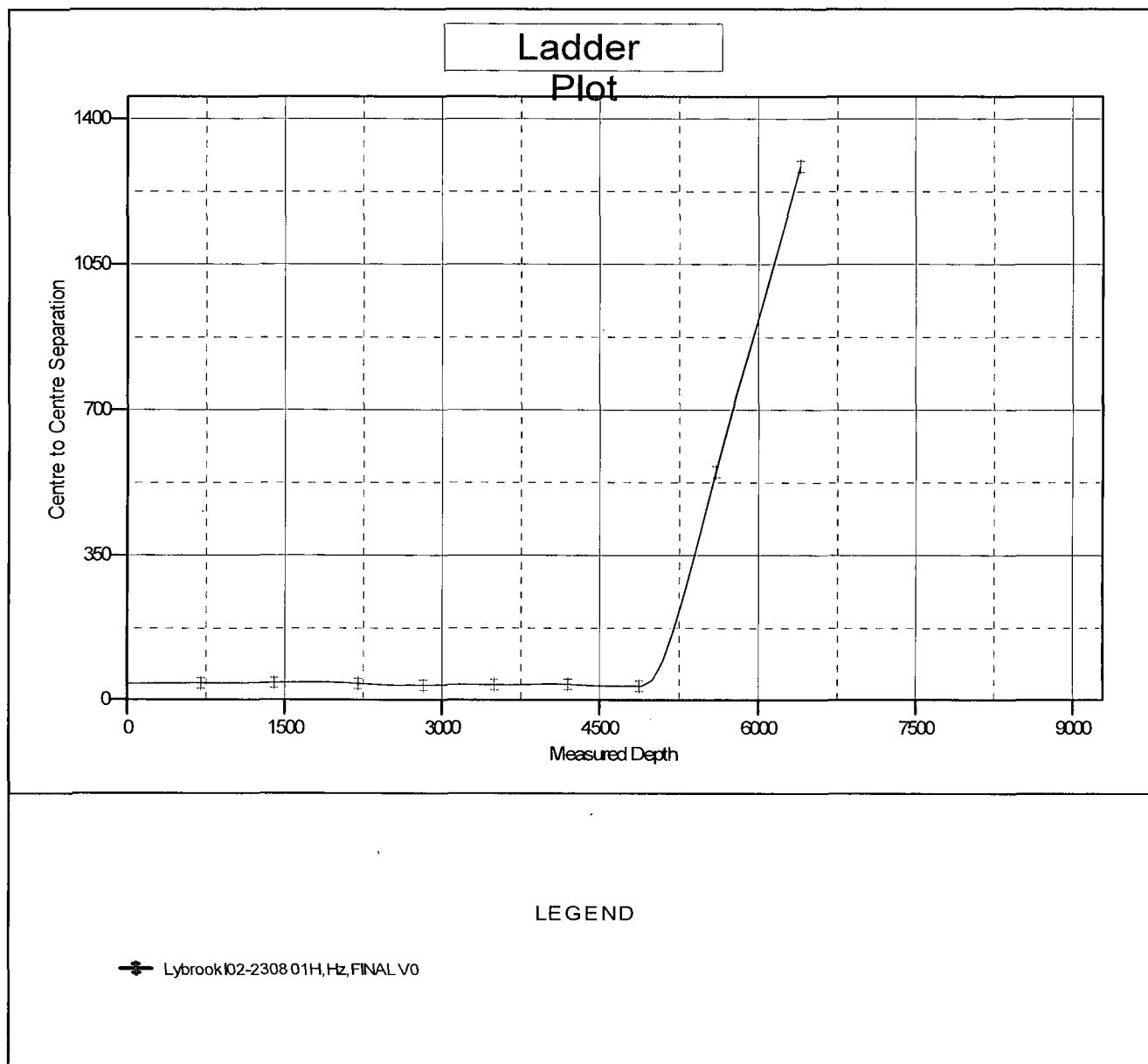
Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: San Juan County, NM
Reference Site: S2-T23N-R8W (Lybrook)
Site Error: 0.0ft
Reference Well: Lybrook I02-2308 02H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #3

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
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 @ 6987.0ft (Aztec 950)
 Offset Depths are relative to Offset Datum
 Central Meridian is -107.833333 °

Coordinates are relative to: Lybrook I02-2308 02H
 Coordinate System is US State Plane 1983, New Mexico Western Zone
 Grid Convergence at Surface is: 0.11°



Lybrook I02-2308 02H
SHL: NESE Section 2, T23N R8W
2266 FSL and 701 FEL
BHL: NESE Section 1, T23N, R8W
2250 FSL and 330 FEL
San Juan County, New Mexico
Lease Number: NMNM 118132

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

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

<u>Formation</u>	<u>Depth (TVD)</u>
Ojo Alamo Ss.	1161'
Kirtland	1315'
Fruitland Coal	1559'
Pictured Cliffs	1834'
Lewis	1945'
Cliffhouse	3319'
Menefee	3398'
Point Lookout	4194'
Mancos Shale	4426'
Mancos Silt	4921'
Gallup	5217'

The referenced surface elevation is 6971', KB 6987'

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

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Gas	Fruitland Coal	1559'
Gas	Pictured Cliffs	1834'
Gas	Cliffhouse	3319'
Gas	Point Lookout	4194'
Oil/Gas	Mancos	4921'

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

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.

Lybrook I02-2308 02H

**SHL: NESE Section 2, T23N R8W
2266 FSL and 701 FEL**

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2250 FSL and 330 FEL**

San Juan County, New Mexico

Lease Number: NMNM 118132

- 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	Hole Size	Csg Size	Weight	Grade
Conductor	0-60'	30"	20"	94#	H40, STC New
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5817'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	5617'-10908'MD	6 1/8"	4 1/2"	11.6#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (lb/ft)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lb)	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 1/2"	11.6	B80	LTC	6350	7780	201	1.125	1.1	1.5

Casing design is subject to revision based on geologic conditions encountered.

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:

Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Lybrook I02-2308 02H

SHL: NESE Section 2, T23N R8W
2266 FSL and 701 FEL

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2250 FSL and 330 FEL

San Juan County, New Mexico

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Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	100sk	Type I Neat 14.8 ppg	Surface	None
Surface	500'	178sk	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 14.6ppg, 1.38cuf/sk	Surface	1 per joint on bottom 3 joints
Intermediate	5817'MD	30% open hole excess Stage 1 Lead: 299sks Stage 1 Tail: 288sks Stage 2 Lead: 168sks	Lead (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail (Stage 1): Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuf/sk	Surface	1 per joint for bottom 3 joints, 1 every 3 joints for remaining joints
Production Liner*	5617'-10908'	None – External casing packers	N/A	N/A	N/A

*Production liner clarification: Utilizing external swell casing packer system for zonal isolation will not use cement in the production liner.

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 a 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 4916'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5481'/10908'	Gallup

Lybrook I02-2308 02H**SHL: NESE Section 2, T23N R8W
2266 FSL and 701 FEL****BHL: NESE Section 1, T23N, R8W
2250 FSL and 330 FEL****San Juan County, New Mexico****Lease Number: NMNM 118132****6. DRILLING FLUIDS PROGRAM**

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60' TVD	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0-500' TVD	Fresh Water	8.4-8.6	60-70	NC
8 3/4"	500'TVD- 5490'TVD/5817'MD	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	MD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5817'-10908'	Synthetic Oil Based Mud	8.6-9.0	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, including fresh water and oil-based operations. 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 and LOGGING

- a) Drill Stem Testing – None anticipated
- b) Coring – None anticipated.
- c) Mud 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 +/- 2569 psi based on a 9.0 ppg at 5490' TVD of the landing point of the horizontal lateral. 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.

Lybrook I02-2308 02H

**SHL: NESE Section 2, T23N R8W
2266 FSL and 701 FEL**

**BHL: NESE Section 1, T23N, R8W
2250 FSL and 330 FEL**

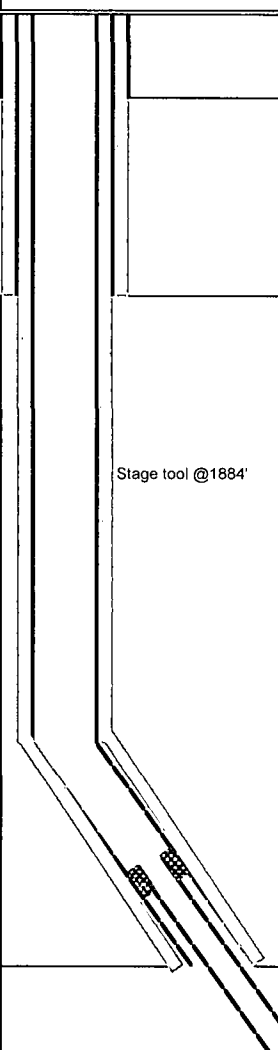
San Juan County, New Mexico

Lease Number: NMNM 118132

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on January 13, 2014. 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: Sec 2-T23N-R8W County: San Juan WELL: Lybrook 102-2308 02H			Encana Natural Gas WELL SUMMARY						ENG: 1/9/14 RIG: GLE: 6971 RKBE: 6987	
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION	
			TVD	MD						
			60	60'		30	20" 94# 100sx Type I Neat 16.0 ppg cmt	Fresh wtr 8.3-9.2		
Surveys After csg is run	None		500	500		12 1/4	9 5/8" 36ppf J55 STC TOC @ surface 178 sks Type III Cmt	Fresh wtr 8.4-8.6	Vertical <1°	
Surveys every 500'	No OH logs	Ojo Alamo Kirtland Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Menefee Fn	1161 1315 1559 1834 1945 3319 3398	5817		8 3/4	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 755 sksTotal. Stage 1 Lead: 299sks Stage 1 Tail: 288sks. Stage 2 Lead: 168sks	Fresh Wtr 8.5-8.8	Vertical <1°	
	Mud logger onsite	Point Lookout Ss Mancos Sh KICK OFF PT Mancos Silt Gallup Top 7" csg	4194 4426 4916 4921 5197 5490			Stage tool @1884'				KOP 0 10 deg/100'
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target	5490		5817	6 1/8	200' overlap at liner top		.25deg updip 5481'TVD TD = 10908' MD	
		Base Gallup	5514				5091' Lateral	8.6-9.0 OBM		
						4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string Plan on setting top packer within 100' of intermediate casing shoe Plan on setting isolation packer at 330'FWL of Sec 1, T23N, R8W.	Switch to OBM 8.6-9.0			

NOTES:

- 1) Drill with 30" bit to 60', set 20" 94# 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 4916' , 8 3/4" hole size,
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 5817' MD
- 7) R&C 7" casing, circ cmt to surface, switch to OBM
- 8) Land at 90deg, drill 5091' lateral to 10908', run 4 1/2" liner with external swellable csg packers