

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 3160-3 APD form.

Operator Signature Date: 8/1/13

Well information;

Operator Encana, Well Name and Number Lybrook I 02-2308 2H

API# 30-045-35492, Section 2, Township 23 NS, Range 8 EW

Conditions of Approval:

(See the below checked and handwritten conditions)

☒ Notify Aztec OCD 24hrs prior to casing & cement.

☒ Hold C-104 for directional survey & "As Drilled" Plat

☒ Hold C-104 for NSL, NSP, DHC

- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☐ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☐ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils

NMOCD Approved by Signature

9-16-2013

Date ca

CONFIDENTIAL
RECEIVED

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

AUG 02 2013

Lease Serial No.
~~NMNM 120374~~ NMNM 118132

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

7. If Unit or CA Agreement, Name and No.
PENDING

8. Lease Name and Well No.
Lybrook I02 2308 02H

9. API Well No.
30-045-35492

10. Field and Pool, or Exploratory
Basin Mancos

11. Sec., T. R. M. or Blk. and Survey or Area
Section 2, T23N, R8W NMPM

12. County or Parish
San Juan

13. State
NM

1a. Type of work: ☒ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

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)
720-876-5331

4. Location of Well (Report location clearly and in accordance with any State requirements.)*

At surface 2266' FSL and 701' FEL Section 2, T23N, R8W

At proposed prod. zone 2250' FSL and 330' FEL Section 1, T23N, R8W

14. Distance in miles and direction from nearest town or post office*
+/- 45.5 miles southeast of the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
BHL is 330' from east lease line of Section 1, T23N, R8W

16. No. of acres in lease
NMNM 120374 - 483 ac.
NMNM 118132 - 2,320 ac.

17. Spacing Unit dedicated to this well
320.0 acres - S/2 Section 1, T23N, R8W

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
Lybrook I02-2308 01H is +/-38' north of wellbore

19. Proposed Depth
5,468 TVD/10,633' MD

20. BLM/BIA Bond No. on file
COB-000235
RCVD SEP 11 '13 OIL CONS. DIV.

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
6,971' GL, 6,987' KB

22. Approximate date work will start*
10/11/2013

23. Estimated duration
25 days **DIST. 2**

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the BLM.

25. Signature **Holly Hill**

Name (Printed/Typed)
Holly Hill

Date
8/11/13

Title
Regulatory Analyst

Approved by (Signature) **[Signature]**

Name (Printed/Typed)

Date
9/18/13

Title
AFM

Office
FED

Application approval 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.
Conditions of approval, if any, are attached.

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.

(Continued on page 2)

*(Instructions on page 2)

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

NMOCD
N

DRILLING OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS".

This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

AMENDED REPORT

SHEET A

ENCANA OIL & GAS (USA) INC.
LYBROOK I02-2308 02H
WELL FLAG - 2266' FSL, 701' FEL
LOCATED IN THE NE/4 SE/4 OF SECTION 2, T23N R8W, NMPM
BOTTOM HOLE - 2250' FNL, 330' FEL
LOCATED IN THE NE/4 SE/4 OF SECTION 1, T23N R8W, NMPM
SAN JUAN COUNTY, NEW MEXICO
TOPO: LYBROOK, LYBROOK NW, CROW MESA EAST, NM
NO NEW ACCESS ROAD
FEDERAL PROPERTY

722.5 PIPELINE
STATE LANDS

455.32'
ACCESS RD - STATE LANDS

2,503.18'
ACCESS RD - BLM

LYBROOK I02-2308 01H
EXISTING WELL HEAD

EXISTING ACCESS ROAD

EXISTING PAD

2,510.95 PIPELINE
BLM LANDS

LYBROOK I02-2308 02H
SHL: 2266' FSL, 701' FEL
NE/4 SE/4 SEC 2, T23N, R8W, NMPM
LAT: 36.255101°N-NAD 83
LONG: 107.644578°W-NAD 83
LAT: 36.25509°N-NAD 27
LONG: 107.64397°W-NAD 27
ELEV. 6971

LYBROOK I02-2308 02H
BHL: 2250' FSL, 330' FEL
NE/4 SE/4 SEC 1, T23N, R8W, NMPM
LAT: 36.255143°N-NAD 83
LONG: 107.625365°W-NAD 83
LAT: 36.25513°N-NAD 27
LONG: 107.62476°W-NAD 27

DRIVING DIRECTIONS:
FROM THE INTERSECTION OF US HWY 64 AND US HWY 550
IN BLOOMFIELD N.M. TRAVEL SOUTH 44.7 MILES ON US HWY
550. TURN RT AT MP 109.7. TRAVEL AND THEN EAST 0.8
MILES PAST JEFFERS FED #22-23 WELL PAD
TO EXISTING WELL PAD FOR LYBROOK I02 01H.

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 120374~~ NMNM 118132 ~~ST NM V07843~~

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 102-2308 02H

SHL: NESE Section 2, T23N R8W
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2250 FSL and 330 FEL

San Juan County, New Mexico

Lease Number: ~~NMNM 120374~~ NMNM 118132-ST NM V07843

- 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'-5899'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	5699'-10633'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

*B80 pipe specifications are attached

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.

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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 120374~~ NMNM 118132-ST NM-V07843

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	5899'MD	30% open hole excess Stage 1 Lead: 258sks Stage 1 Tail: 177sks Stage 2 Lead: 166sks	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*	5699'-10633'	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 4000'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5468'/10633'	Gallup

Lybrook 102-2308 02H

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2266 FSL and 701 FEL

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

San Juan County, New Mexico

Lease Number: ~~NMNM 120374~~ NMNM 118132 ST NM V07843

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- 5493'TVD/5899'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"	5899'-10633'	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 +/- 2571 psi based on a 9.0 ppg at 5493' 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

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2250 FSL and 330 FEL

San Juan County, New Mexico

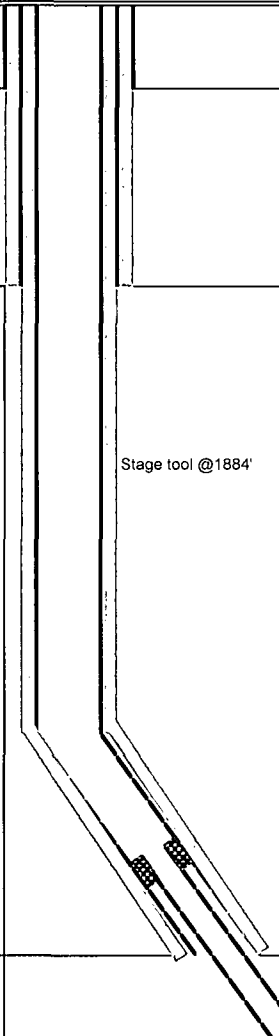
Lease Number: ~~NMNM 120374~~ NMNM 118132-ST NM V07843

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on October 11, 2013. 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 25 days.

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LOC: Sec 2-T24N-R8W County: San Juan WELL: Lybrook I02 2308 02H			Encana Natural Gas WELL SUMMARY				encana		ENG: 7/31/13 RIG: GLE: 6971 RKBE: 6987	
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH TVDMD			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION	
			60	60'		30	20" 94# 100sx Type I Neat 48.8ppg cmt	Fresh wtr 8.3-9.2		
Surveys After csg is run	None					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			8 3/4	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 601 sksTotal. Stage 1 Lead: 258sks Stage 1 Tail: 177sks. Stage 2 Lead: 166sks	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 4000 4921 5217 5493	5899					KOP 4000 10 deg/100'	
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target	5493	5899		6 1/8	200' overlap at liner top		.25deg updip 5468'TVD TD = 10633' MD	
		Base Gallup	5514			4734' 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	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 4000' , 8 3/4" hole size,
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 5899' MD
- 7) R&C 7" casing, circ cmt to surface, switch to OBM
- 8) Land at 90deg, drill 4734' lateral to 10633', run 4 1/2" liner with external swellable csg packers



Boomerang Tube LLC

CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)	_____	4.500
Pipe Wall Thickness (ins)	_____	0.250
Nominal Weight Per Foot (lbs)	_____	11.60
Thread Name	_____	Long Thread CSG
Grade Name	_____	SB-80
Pipe Minimum Yield (psi)	_____	80,000
Pipe Minimum Ultimate (psi)	_____	90,000
Coupling Minimum Yield (psi)	_____	80,000
Coupling Minimum Ultimate (psi)	_____	100,000
Coupling or Joint Outside Diameter (ins)	_____	5.000
Drift Diameter (ins)	_____	3.875
Plain End Weight per Foot (lbs)	_____	11.36
Joint Strength (lbs)	_____	201,000
Internal Yield (psi)	_____	7,780
Collapse Rating (psi)	_____	6,350

MAXIMUM DEPTH/LENGTH BASED ON MUD WTS & SAFETY FACTORS

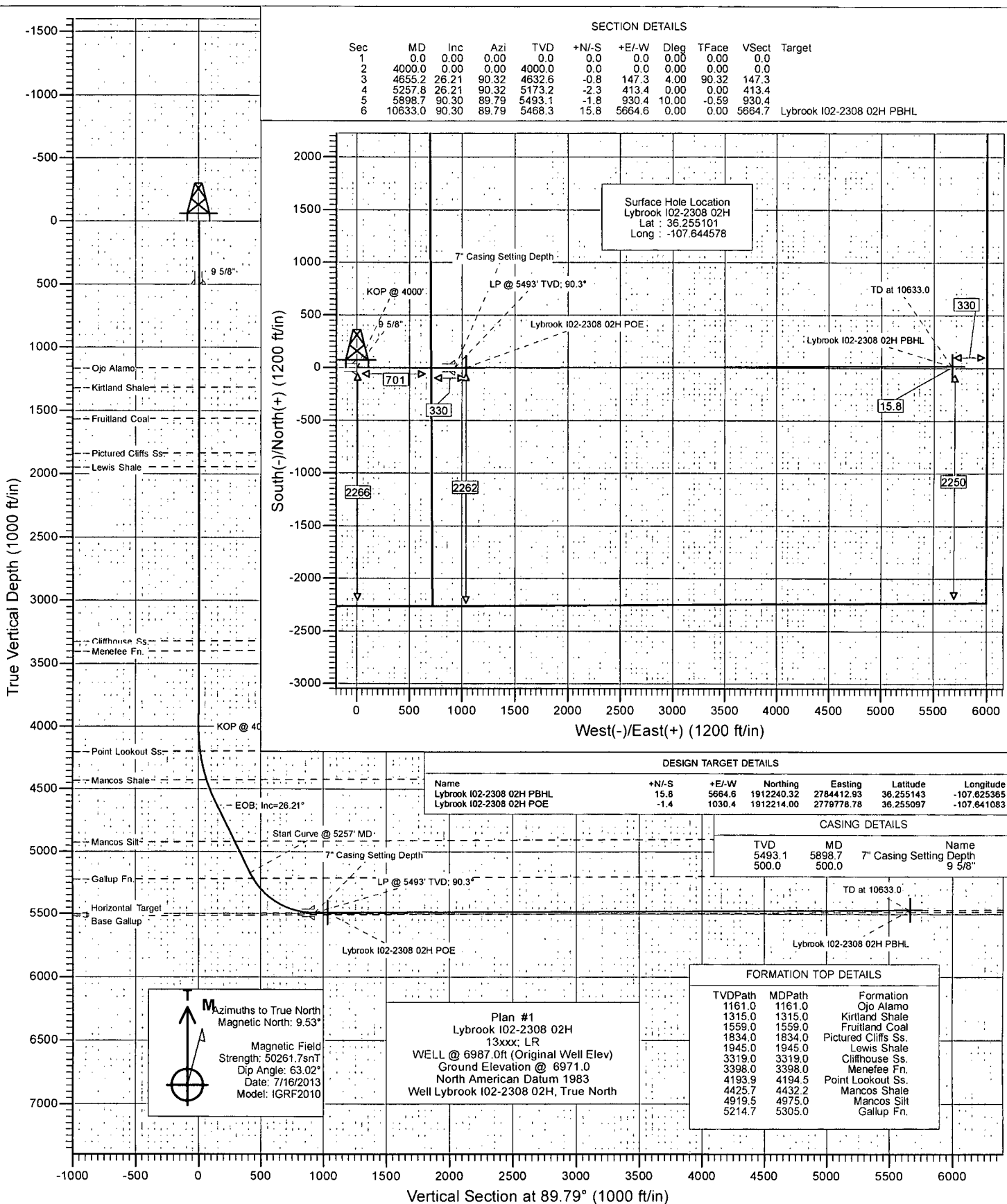
Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	9,630
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,150
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,290

API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Coupling Thread Fracture Strength	_____	464,000
Pipe Thread Fracture Strength (lbs)	_____	201,000
Pipe Body Plain End Yield (lbs)	_____	267,000
Round Thread Pull-Out (lbs)	_____	219,000
Minimum Make-up Torque (ft-lbs)	_____	1,640
Nominal Make-up Torque (ft-lbs)	_____	2,190
Maximum Make-up Torque (ft-lbs)	_____	2,740
Coupling Internal Yield (psi)	_____	10,660
Pipe Body Internal Yield (psi)	_____	7,780
Leak @ E1 or E7 plane (psi)	_____	17,920
Pipe Hydrostatic Test Pressure @ 80 % SMYS	_____	7,100



Project: San Juan County, NM
 Site: S2-T23N-R8W (Lybrook)
 Well: Lybrook I02-2308 02H
 Wellbore: Hz
 Design: Plan #1



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook I02-2308 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6987.0ft (Original Well Elev)
Project:	San Juan County, NM	MD Reference:	WELL @ 6987.0ft (Original Well Elev)
Site:	S2-T23N-R8W (Lybrook)	North Reference:	True
Well:	Lybrook I02-2308 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

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	Latitude:	36.255101
	+E/-W	0.0 ft	Easting:	2,778,748.33 ft	Longitude:	-107.644578
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	7/16/2013	9.53	63.02	50,262

Design	Plan #1			
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	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,655.2	26.21	90.32	4,632.6	-0.8	147.3	4.00	4.00	0.00	90.32	
5,257.8	26.21	90.32	5,173.2	-2.3	413.4	0.00	0.00	0.00	0.00	
5,898.7	90.30	89.79	5,493.1	-1.8	930.4	10.00	10.00	-0.08	-0.59	
10,633.0	90.30	89.79	5,468.3	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 #1

Local Co-ordinate Reference: Well Lybrook 102-2308 02H
 TVD Reference: WELL @ 6987.0ft (Original Well Elev)
 MD Reference: WELL @ 6987.0ft (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
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	KOP @ 4000'
4,100.0	4.00	90.32	4,099.9	0.0	3.5	3.5	4.00	4.00	
4,194.5	7.78	90.32	4,193.9	-0.1	13.2	13.2	4.00	4.00	Point Lookout Ss.
4,200.0	8.00	90.32	4,199.4	-0.1	13.9	13.9	4.00	4.00	
4,300.0	12.00	90.32	4,297.8	-0.2	31.3	31.3	4.00	4.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook 102-2308 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6987.0ft (Original Well Elev)
Project:	San Juan County, NM	MD Reference:	WELL @ 6987.0ft (Original Well Elev)
Site:	S2-T23N-R8W (Lybrook)	North Reference:	True
Well:	Lybrook 102-2308 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

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	16.00	90.32	4,394.8	-0.3	55.5	55.5	4.00	4.00	
4,432.2	17.29	90.32	4,425.7	-0.4	64.7	64.7	4.00	4.00	Mancos Shale
4,500.0	20.00	90.32	4,489.9	-0.5	86.4	86.4	4.00	4.00	
4,600.0	24.00	90.32	4,582.6	-0.7	123.8	123.8	4.00	4.00	
4,655.2	26.21	90.32	4,632.6	-0.8	147.3	147.3	4.00	4.00	EOB; Inc=26.21°
4,700.0	26.21	90.32	4,672.8	-0.9	167.0	167.0	0.00	0.00	
4,800.0	26.21	90.32	4,762.5	-1.2	211.2	211.2	0.00	0.00	
4,900.0	26.21	90.32	4,852.2	-1.4	255.4	255.4	0.00	0.00	
4,975.0	26.21	90.32	4,919.5	-1.6	288.5	288.5	0.00	0.00	Mancos Silt
5,000.0	26.21	90.32	4,941.9	-1.6	299.5	299.5	0.00	0.00	
5,100.0	26.21	90.32	5,031.7	-1.9	343.7	343.7	0.00	0.00	
5,200.0	26.21	90.32	5,121.4	-2.1	387.9	387.8	0.00	0.00	
5,257.8	26.21	90.32	5,173.2	-2.3	413.4	413.4	0.00	0.00	Start Curve @ 5257' MD
5,300.0	30.43	90.23	5,210.4	-2.4	433.4	433.4	10.00	10.00	
5,305.0	30.94	90.22	5,214.7	-2.4	436.0	436.0	10.00	10.00	Gallup Fn.
5,400.0	40.43	90.09	5,291.8	-2.5	491.3	491.3	10.00	10.00	
5,500.0	50.43	90.00	5,361.8	-2.6	562.4	562.4	10.00	10.00	
5,600.0	60.43	89.94	5,418.5	-2.5	644.7	644.7	10.00	10.00	
5,700.0	70.43	89.88	5,460.0	-2.4	735.5	735.5	10.00	10.00	
5,800.0	80.43	89.83	5,485.2	-2.1	832.2	832.2	10.00	10.00	
5,898.7	90.30	89.79	5,493.1	-1.8	930.4	930.4	10.00	10.00	LP @ 5493' TVD; 90.3° - 7" Casing Setting Dep
5,900.0	90.30	89.79	5,493.1	-1.8	931.7	931.7	0.00	0.00	
6,000.0	90.30	89.79	5,492.6	-1.4	1,031.7	1,031.7	0.00	0.00	
6,100.0	90.30	89.79	5,492.1	-1.1	1,131.7	1,131.7	0.00	0.00	
6,200.0	90.30	89.79	5,491.5	-0.7	1,231.7	1,231.7	0.00	0.00	
6,300.0	90.30	89.79	5,491.0	-0.3	1,331.7	1,331.7	0.00	0.00	
6,400.0	90.30	89.79	5,490.5	0.1	1,431.7	1,431.7	0.00	0.00	
6,500.0	90.30	89.79	5,490.0	0.4	1,531.7	1,531.7	0.00	0.00	
6,600.0	90.30	89.79	5,489.4	0.8	1,631.7	1,631.7	0.00	0.00	
6,700.0	90.30	89.79	5,488.9	1.2	1,731.7	1,731.7	0.00	0.00	
6,800.0	90.30	89.79	5,488.4	1.6	1,831.7	1,831.7	0.00	0.00	
6,900.0	90.30	89.79	5,487.9	1.9	1,931.7	1,931.7	0.00	0.00	
7,000.0	90.30	89.79	5,487.3	2.3	2,031.7	2,031.7	0.00	0.00	
7,100.0	90.30	89.79	5,486.8	2.7	2,131.7	2,131.7	0.00	0.00	
7,200.0	90.30	89.79	5,486.3	3.0	2,231.7	2,231.7	0.00	0.00	
7,300.0	90.30	89.79	5,485.8	3.4	2,331.7	2,331.7	0.00	0.00	
7,400.0	90.30	89.79	5,485.3	3.8	2,431.7	2,431.7	0.00	0.00	
7,500.0	90.30	89.79	5,484.7	4.2	2,531.7	2,531.7	0.00	0.00	
7,600.0	90.30	89.79	5,484.2	4.5	2,631.7	2,631.7	0.00	0.00	
7,700.0	90.30	89.79	5,483.7	4.9	2,731.7	2,731.7	0.00	0.00	
7,800.0	90.30	89.79	5,483.2	5.3	2,831.7	2,831.7	0.00	0.00	
7,900.0	90.30	89.79	5,482.6	5.7	2,931.7	2,931.7	0.00	0.00	
8,000.0	90.30	89.79	5,482.1	6.0	3,031.7	3,031.7	0.00	0.00	
8,100.0	90.30	89.79	5,481.6	6.4	3,131.7	3,131.7	0.00	0.00	
8,200.0	90.30	89.79	5,481.1	6.8	3,231.7	3,231.7	0.00	0.00	
8,300.0	90.30	89.79	5,480.5	7.1	3,331.7	3,331.7	0.00	0.00	
8,400.0	90.30	89.79	5,480.0	7.5	3,431.7	3,431.7	0.00	0.00	
8,500.0	90.30	89.79	5,479.5	7.9	3,531.7	3,531.7	0.00	0.00	
8,600.0	90.30	89.79	5,479.0	8.3	3,631.7	3,631.7	0.00	0.00	
8,700.0	90.30	89.79	5,478.4	8.6	3,731.7	3,731.7	0.00	0.00	
8,800.0	90.30	89.79	5,477.9	9.0	3,831.7	3,831.7	0.00	0.00	
8,900.0	90.30	89.79	5,477.4	9.4	3,931.7	3,931.7	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook 102-2308 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6987.0ft (Original Well Elev)
Project:	San Juan County, NM	MD Reference:	WELL @ 6987.0ft (Original Well Elev)
Site:	S2-T23N-R8W (Lybrook)	North Reference:	True
Well:	Lybrook 102-2308 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	H2		
Design:	Plan #1		

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	90.30	89.79	5,476.9	9.8	4,031.7	4,031.7	0.00	0.00	
9,100.0	90.30	89.79	5,476.3	10.1	4,131.7	4,131.7	0.00	0.00	
9,200.0	90.30	89.79	5,475.8	10.5	4,231.7	4,231.7	0.00	0.00	
9,300.0	90.30	89.79	5,475.3	10.9	4,331.7	4,331.7	0.00	0.00	
9,400.0	90.30	89.79	5,474.8	11.3	4,431.7	4,431.7	0.00	0.00	
9,500.0	90.30	89.79	5,474.2	11.6	4,531.7	4,531.7	0.00	0.00	
9,600.0	90.30	89.79	5,473.7	12.0	4,631.7	4,631.7	0.00	0.00	
9,700.0	90.30	89.79	5,473.2	12.4	4,731.7	4,731.7	0.00	0.00	
9,800.0	90.30	89.79	5,472.7	12.7	4,831.7	4,831.7	0.00	0.00	
9,900.0	90.30	89.79	5,472.1	13.1	4,931.7	4,931.7	0.00	0.00	
10,000.0	90.30	89.79	5,471.6	13.5	5,031.6	5,031.7	0.00	0.00	
10,100.0	90.30	89.79	5,471.1	13.9	5,131.6	5,131.7	0.00	0.00	
10,200.0	90.30	89.79	5,470.6	14.2	5,231.6	5,231.7	0.00	0.00	
10,300.0	90.30	89.79	5,470.0	14.6	5,331.6	5,331.7	0.00	0.00	
10,400.0	90.30	89.79	5,469.5	15.0	5,431.6	5,431.7	0.00	0.00	
10,500.0	90.30	89.79	5,469.0	15.4	5,531.6	5,531.7	0.00	0.00	
10,600.0	90.30	89.79	5,468.5	15.7	5,631.6	5,631.7	0.00	0.00	
10,633.0	90.30	89.79	5,468.3	15.8	5,664.6	5,664.7	0.00	0.00	TD at 10633.0

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook 102-2308 02H P - hit/miss target - Shape - 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 102-2308 02H P - plan hits target center - 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

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
5,898.7	5,493.1	7" Casing Setting Depth	0.000	0.000
500.0	500.0	9 5/8"	0.000	0.000

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook 102-2308 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6987.0ft (Original Well Elev)
Project:	San Juan County, NM	MD Reference:	WELL @ 6987.0ft (Original Well Elev)
Site:	S2-T23N-R8W (Lybrook)	North Reference:	True
Well:	Lybrook 102-2308 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,161.0	1,161.0	Ojo Alamo		-0.30	89.79
1,315.0	1,315.0	Kirtland Shale		-0.30	89.79
1,559.0	1,559.0	Fruitland Coal		-0.30	89.79
1,834.0	1,834.0	Pictured Cliffs Ss.		-0.30	89.79
1,945.0	1,945.0	Lewis Shale		-0.30	89.79
3,319.0	3,319.0	Cliffhouse Ss.		-0.30	89.79
3,398.0	3,398.0	Menefee Fn.		-0.30	89.79
4,194.5	4,194.0	Point Lookout Ss.		-0.30	89.79
4,432.2	4,426.0	Mancos Shale		-0.30	89.79
4,975.0	4,921.0	Mancos Silt		-0.30	89.79
5,305.0	5,217.0	Gallup Fn.		-0.30	89.79

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,000.0	4,000.0	0.0	0.0	KOP @ 4000'
4,655.2	4,632.6	-0.8	147.3	EOB; Inc=26.21°
5,257.8	5,173.2	-2.3	413.4	Start Curve @ 5257' MD
5,898.7	5,493.1	-1.8	930.4	LP @ 5493' TVD; 90.3°
10,633.0	5,468.3	15.8	5,664.6	TD at 10633.0

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well name and number:

Lybrook 102-2308 02H

