

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

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

David R. Catanach 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: 3-13-15

Well information;

Operator Encana, Well Name and Number Lybrook A032208 #2H

API# 30-045-35668, Section 3, Township 22 N/S, Range 9 E/W

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
- Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- 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. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

Charlton
NMOCD Approved by Signature

9-3-2015
Date KC

SEP 02 2015

RECEIVED

MAR 16 2015

Form 3160-3
(March 2012)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Farmington Field Office
Bureau of Land Management

APPLICATION FOR PERMIT TO DRILL OR REENTER

5a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NM 90468, NM 55836, NM 116055
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 A03-2208 02H		9. API Well No. 30-045-35668
10. Field and Pool, or Exploratory Basin Mancos Gas Pool		11. Sec., T. R. M. or Blk. and Survey or Area Section 3, T22N, R8W NMPM
12. County or Parish San Juan		13. State NM
14. Distance in miles and direction from nearest town or post office* +/- 45.3 miles South from the intersection of HWY 64 & US HWY 550 in Bloomfield, NM		15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) POE is 330' FEL Section 3, T22N, R8W
16. No. of acres in lease NM 90468- 1041.34 acres, NM 55836-1375.54 acres, NM 116055- 80 acres		17. Spacing Unit dedicated to this well 323.80 acres- N/2 of Sec.3, T22N, R8W
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL is +/- 30' South of Lybrook A03-2208 01H		19. Proposed Depth 4785' TVD, 10097' MD
20. BLM/BIA Bond No. on file COB-000235		21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6880' GL; 6896' KB
22. Approximate date work will start* 09/12/2015		23. Estimated duration 20 days

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 <i>Jillian McGrath</i>	Name (Printed/Typed) Jillian McGrath	Date 3/13/15
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Title
Regulatory Analyst

Approved by (Signature) <i>D Mancoske</i>	Name (Printed/Typed) AFM	Date 8/28/15
--	-----------------------------	-----------------

Title
Office
FFO

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.

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

*(Instructions on page 2)

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

NMOCD
AV

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

DISTRICT I
 1626 N. French Dr., Hobbs, N.M. 88240
 Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
 811 S. First St., Artesia, N.M. 88210
 Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
 1000 Rio Brazos Rd., Aztec, N.M. 87410
 Phone: (505) 334-8178 Fax: (505) 334-6170

DISTRICT IV
 1220 S. St. Francis Dr., Santa Fe, NM 87505
 Phone: (505) 476-3480 Fax: (505) 476-3482

State of New Mexico
 Energy, Minerals & Natural Resources Department

Form C-102
 Revised August 1, 2011

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 MAR 16 2015

Submit one copy to appropriate
 District Office

OIL CONSERVATION DIVISION
 1220 South St. Francis Dr.
 Santa Fe, NM 87505

Farmington Field Office
 Bureau of Land Management

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-045-35668		² Pool Code 97232	³ Pool Name BASIN MANCOS
⁴ Property Code 315237	⁵ Property Name LYBROOK A03-2208		⁶ Well Number 02H
⁷ OGRID No. 282327	⁸ Operator Name ENCANA OIL & GAS (USA) INC.		⁹ Elevation 6880.0'

¹⁰ Surface Location

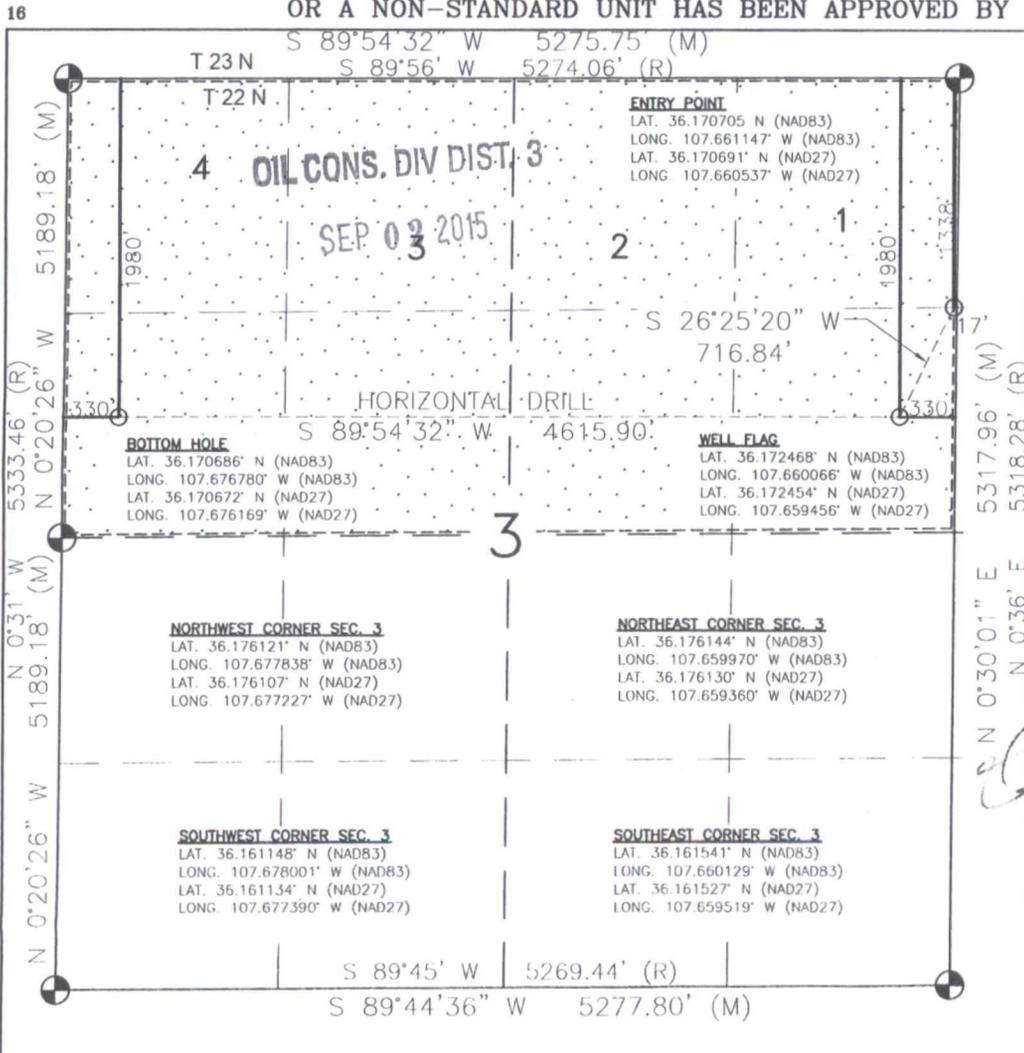
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	3	22N	8W	1	1338'	NORTH	17'	EAST	SAN JUAN

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	3	22N	8W		1980'	NORTH	330'	WEST	SAN JUAN

¹² Dedicated Acres 323.80 ACRES OF N/2 SEC. 3	¹³ Joint or Infill PROJECT AREA	¹⁴ Consolidation Code	¹⁵ Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



¹⁷ OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Jillian McGrath 3/13/15
 Signature Date

Jillian McGrath
 Printed Name

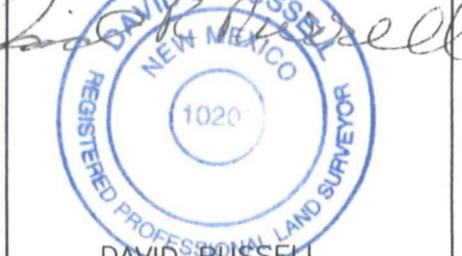
Jillian.McGrath@encana.com
 E-mail Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

MAY 13, 2014
 Date of Survey

Signature and Seal of Professional Surveyor:



DAVID RUSSELL
 Certificate Number 10201

Lybrook A03-2208 02H

SHL: 1338' FNL, 17' FEL Sec 03 T22N R08W

BHL: 1980' FNL, 330' FWL Sec 03 T22N R08W

San Juan, New Mexico

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

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
San Jose Fn.	n/a
Nacimiento Fn.	surface
Ojo Alamo Ss.	553
Kirtland Shale	728
Fruitland Coal	1,110
Pictured Cliffs Ss.	1,233
Lewis Shale	1,327
Cliffhouse Ss.	1,977
Menefee Fn.	2,665
Point Lookout Ss.	3,620
Mancos Shale	3,762
Mancos Silt	4,268
Gallup Fn.	4,518
Base Gallup	4,901

The referenced surface elevation is 6880', KB 6896'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,110
Oil/Gas	Pictured Cliffs Ss.	1,233
Oil/Gas	Cliffhouse Ss.	1,977
Gas	Menefee Fn.	2,665
Oil/Gas	Point Lookout Ss.	3,620
Oil/Gas	Mancos Shale	3,762
Oil/Gas	Mancos Silt	4,268
Oil/Gas	Gallup Fn.	4,518

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

Lybrook A03-2208 02H

SHL: 1338' FNL, 17' FEL Sec 03 T22N R08W

BHL: 1980' FNL, 330' FWL Sec 03 T22N R08W

San Juan, New Mexico

3. PRESSURE CONTROL

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

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

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

- a) The proposed casing design is as follows:

Casing	Depth (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42.09#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-4977'	8 3/4"	7"	26#	J55, LTC New
Production Liner	4877'-10097'	6 1/8"	4 1/2"	11.6#	B80*, LTC New

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

*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered

Lybrook A03-2208 02H

SHL: 1338' FNL, 17' FEL Sec 03 T22N R08W

BHL: 1980' FNL, 330' FWL Sec 03 T22N R08W

San Juan, New Mexico

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

b) The proposed cementing program is as follows:

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	276 sks	Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water	Surface	1 per joint on bottom 3 joints
Intermediate	0'-4977'	100% open hole excess Stage 1 Lead: 657 sks Stage 1 Tail: 504 sks	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuft/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	4877'-10097'	50% OH excess Stage 1 Blend Total: 295sks	Blend: Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk	Liner Hanger	N/A

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

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

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 3218'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	4785'/10097'	Gallup

Lybrook A03-2208 02H
 SHL: 1338' FNL, 17' FEL Sec 03 T22N R08W
 BHL: 1980' FNL, 330' FWL Sec 03 T22N R08W
 San Juan, New Mexico

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'/60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-4676'/4977'	Fresh Water LSND	8.3-10	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	4676'/4977'- 4785'/10097'	Fresh Water LSND	8.3-10	15-25	<15

c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

✓ d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING, & LOGGING

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

Cased Hole:

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

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2260 psi based on a 9.0 ppg at 4828' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

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

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on September 12, 2015. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

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

LOC: 1338' FNL, 17' FEL Sec 03 T22N R08W		Encana Natural Gas				ENG: Michael Sanch 3/13/15		
County: San Juan		WELL SUMMARY				RIG: Unassigned		
WELL: Lybrook A03-2208 02H						GLE: 6880		
						RKBE: 6896		
MWD	OPEN HOLE	FORM	DEPTH		HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
LWD	LOGGING		TVD	MD				
			60	60'	26	16" 42.09# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2	
Multi-Well pad take survey every stand and run anticollision report prior to spud	None	San Jose Fn.	0					
		Nacimiento Fn. 9 5/8" Csg	surface 500	500.00	12 1/4	9 5/8" 36ppf J55 STC TOC Surface with 100% OH Excess: 276 sks Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water.	Fresh wtr 8.3-10	Vertical <1°
Survey Every 60'-120', updating anticollision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs	Ojo Alamo Ss. Kirtland Shale Fruitland Coal Pictured Cliffs Ss. Lewis Shale Cliffhouse Ss. Menefee Fn. Point Lookout Ss. Mancos Shale	553 728 1,110 1,233 1,327 1,977 2,665 3,620 3,762		8 3/4	7" 26ppf J55 LTC TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 1161sks Stage 1 Lead: 657 sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL-52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk. Stage 1 Tail: 504 sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk.	Fresh Wtr 8.3-10	Vertical <1°
Surveys every 30' through the curve	Mud logger onsite	KOP Mancos Silt Gallup Fn. 7" Csg	3,218 4,268 4,518 4,676	3,218 4,977'				
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD	4,828 4,785	10,097	6 1/8	100' overlap at liner top 5120' Drilled Lateral		Horz Inc/TVD 90.5deg/4828ft TD = 10096.5 MD
MWD Gamma Directional		Base Gallup	4,901			4 1/2" 11.6ppf SB80 LTC TOC @ hanger (50% OH excess) Stage 1 Total: 295sks Stage 1 Blend: 295 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk.	WBM 8.3-10	

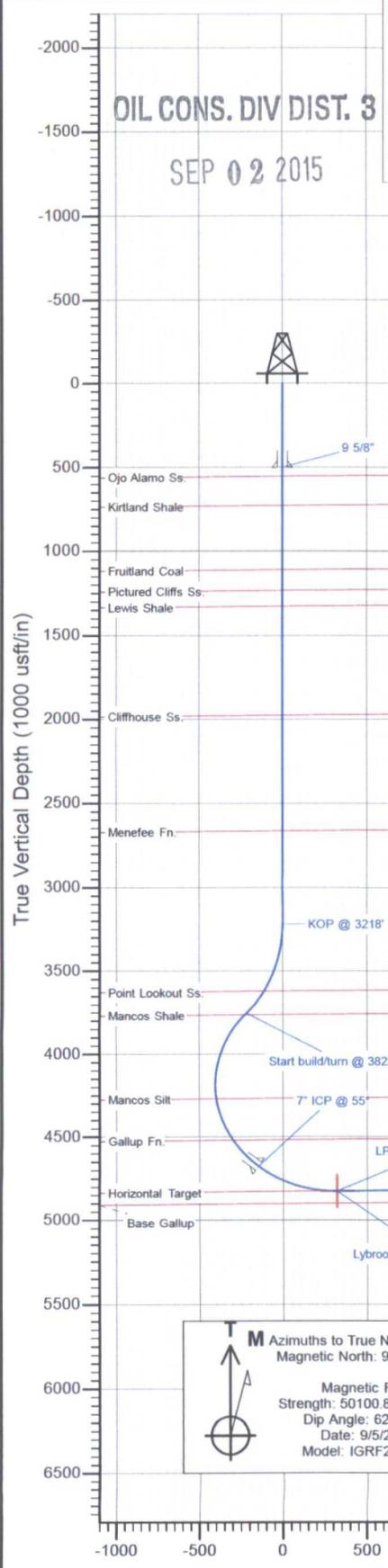
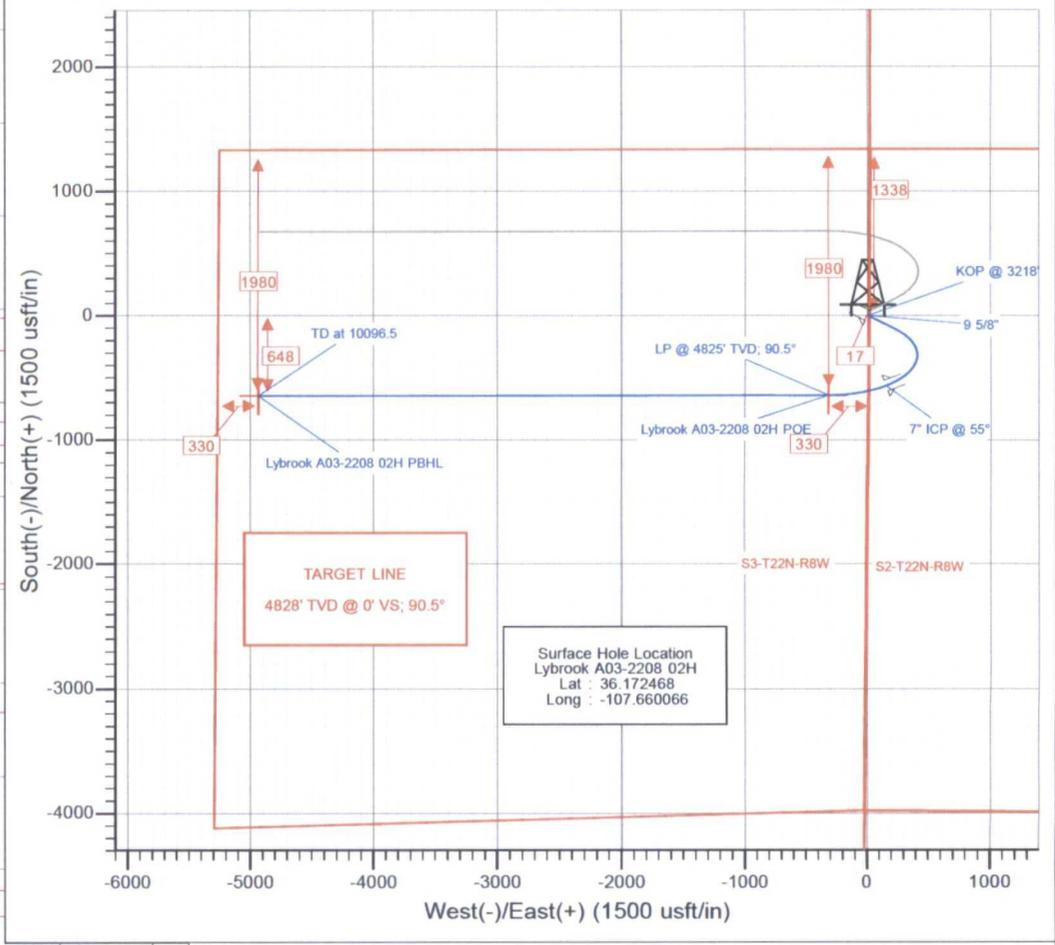
NOTES:

- 1) Drill with 26" bit to 60', set 16" 42.09ppf conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 3218', 8 3/4 inch holedsize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 4977' MD
- 7) R&C 7" csg, circ cmt to surface
- 8) Land at -90 deg, drill lateral to 10097' run 4 1/2 inch cemented liner

OIL CONS. DIV DIST. 3

SEP 02 2015

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	3218.0	0.00	0.00	3218.0	0.0	0.0	0.00	0.00	0.0	
3	3822.9	48.39	115.91	3753.5	-105.1	-216.4	8.00	115.91	-216.3	
4	5482.3	90.50	269.92	4825.2	-641.8	-319.1	8.00	143.41	319.9	Lybrook A03-2208 02H POE
5	10096.5	90.50	269.92	4784.9	-648.3	-4933.1	0.00	0.00	4934.0	Lybrook A03-2208 02H PBHL



DESIGN TARGET DETAILS						
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lybrook A03-2208 02H PBHL	-648.3	-4933.1	1881463.85	2769298.19	36.170686	-107.676780
Lybrook A03-2208 02H POE	-641.8	-319.1	1881478.58	2773912.25	36.170705	-107.661147

CASING DETAILS		
TVD	MD	Name
500.0	500.0	9 5/8"
4676.2	4976.8	7" ICP @ 55°

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
553.0	553.0	Ojo Alamo Ss.
728.0	728.0	Kirtland Shale
1110.0	1110.0	Fruitland Coal
1233.0	1233.0	Pictured Cliffs Ss.
1327.0	1327.0	Lewis Shale
1977.0	1977.0	Cliffhouse Ss.
2665.0	2665.0	Menefee Fn.
3621.0	3646.0	Point Lookout Ss.
3764.0	3838.5	Mancos Shale
4271.5	4448.0	Mancos Silt
4520.6	4745.8	Gallup Fn.

M Azimuths to True North
 Magnetic North: 9.39°
 Magnetic Field
 Strength: 50100.8snT
 Dip Angle: 62.92°
 Date: 9/5/2014
 Model: IGRF2010

Plan #1
 Lybrook A03-2208 02H
 WELL @ 6896.0usft
 Ground Elevation @ 6880.0
 North American Datum 1983
 Well Lybrook A03-2208 02H, True North

Vertical Section at 269.92° (1000 usft/in)

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook A03-2208 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6896.0usft
Project:	San Juan County, NM	MD Reference:	WELL @ 6896.0usft
Site:	S3-T22N-R8W	North Reference:	Grid
Well:	Lybrook A03-2208 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	S3-T22N-R8W				
Site Position:		Northing:	1,882,151.13 usft	Latitude:	36.172551
From:	Lat/Long	Easting:	2,774,229.81 usft	Longitude:	-107.660067
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	Lybrook A03-2208 02H					
Well Position	+N/-S	0.0 usft	Northing:	1,882,120.91 usft	Latitude:	36.172468
	+E/-W	0.0 usft	Easting:	2,774,230.16 usft	Longitude:	-107.660066
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	6,880.0 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/5/2014	9.39	62.92	50,101

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	269.82

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,218.0	0.00	0.00	3,218.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,822.9	48.39	115.81	3,753.5	-104.8	216.6	8.00	8.00	0.00	115.81	
5,482.3	90.50	269.82	4,825.2	-642.3	-317.9	8.00	2.54	9.28	143.41	Lybrook A03-2208 02I
10,096.5	90.50	269.82	4,784.9	-657.1	-4,932.0	0.00	0.00	0.00	0.00	Lybrook A03-2208 02I

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan County, NM
 Site: S3-T22N-R8W
 Well: Lybrook A03-2208 02H
 Wellbore: HZ
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook A03-2208 02H
 TVD Reference: WELL @ 6896.0usft
 MD Reference: WELL @ 6896.0usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	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"
553.0	0.00	0.00	553.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
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	
728.0	0.00	0.00	728.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,110.0	0.00	0.00	1,110.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,233.0	0.00	0.00	1,233.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,327.0	0.00	0.00	1,327.0	0.0	0.0	0.0	0.00	0.00	Lewis 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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,977.0	0.00	0.00	1,977.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
2,665.0	0.00	0.00	2,665.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
3,218.0	0.00	0.00	3,218.0	0.0	0.0	0.0	0.00	0.00	KOP @ 3218'
3,300.0	6.56	115.81	3,299.8	-2.0	4.2	-4.2	8.00	8.00	
3,400.0	14.56	115.81	3,398.0	-10.0	20.7	-20.7	8.00	8.00	
3,500.0	22.56	115.81	3,492.8	-23.9	49.3	-49.3	8.00	8.00	
3,600.0	30.56	115.81	3,582.1	-43.3	89.6	-89.4	8.00	8.00	
3,646.0	34.24	115.81	3,621.0	-54.0	111.7	-111.6	8.00	8.00	Point Lookout Ss.
3,700.0	38.56	115.81	3,664.4	-68.0	140.6	-140.4	8.00	8.00	
3,800.0	46.56	115.81	3,738.0	-97.4	201.4	-201.1	8.00	8.00	
3,822.9	48.39	115.81	3,753.5	-104.8	216.6	-216.3	8.00	8.00	Start build/turn @ 3822' MD
3,838.5	47.39	116.82	3,764.0	-109.9	227.0	-226.7	8.00	-6.39	Mancos Shale
3,900.0	43.56	121.14	3,807.1	-131.1	265.3	-264.9	8.00	-6.24	
4,000.0	37.75	129.59	3,883.0	-168.4	318.5	-318.0	8.00	-5.81	

Planning Report

Database: USA EDM 5000 Multi Users DB	Local Co-ordinate Reference: Well Lybrook A03-2208 02H
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: WELL @ 6896.0usft
Project: San Juan County, NM	MD Reference: WELL @ 6896.0usft
Site: S3-T22N-R8W	North Reference: Grid
Well: Lybrook A03-2208 02H	Survey Calculation Method: Minimum Curvature
Wellbore: HZ	
Design: Plan #1	

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
4,100.0	32.71	140.39	3,964.7	-208.8	359.4	-358.7	8.00	-5.04	
4,200.0	28.87	154.14	4,050.7	-251.4	387.2	-386.4	8.00	-3.84	
4,300.0	26.74	170.72	4,139.3	-295.4	401.4	-400.4	8.00	-2.13	
4,400.0	26.75	188.54	4,228.7	-340.0	401.7	-400.6	8.00	0.01	
4,448.0	27.53	196.78	4,271.5	-361.3	396.9	-395.7	8.00	1.62	Mancos Silt
4,500.0	28.89	205.11	4,317.3	-384.2	388.1	-386.8	8.00	2.61	
4,600.0	32.74	218.83	4,403.3	-427.2	360.8	-359.5	8.00	3.85	
4,700.0	37.78	229.61	4,485.0	-468.2	320.4	-319.0	8.00	5.04	
4,745.8	40.37	233.73	4,520.6	-486.0	297.8	-296.2	8.00	5.65	Gallup Fn.
4,800.0	43.60	238.05	4,560.8	-506.3	267.8	-266.2	8.00	5.96	
4,900.0	49.91	244.80	4,629.4	-540.9	203.8	-202.1	8.00	6.31	
4,976.8	54.99	249.16	4,676.2	-564.6	147.8	-146.0	8.00	6.61	7" ICP @ 55°
5,000.0	56.55	250.37	4,689.2	-571.3	129.8	-128.0	8.00	6.73	
5,100.0	63.40	255.13	4,739.2	-596.8	47.1	-45.3	8.00	6.85	
5,200.0	70.40	259.35	4,778.5	-617.0	-42.5	44.5	8.00	6.99	
5,300.0	77.48	263.22	4,806.1	-631.5	-137.4	139.4	8.00	7.08	
5,400.0	84.61	266.88	4,821.7	-640.0	-235.8	237.8	8.00	7.13	
5,482.3	90.50	269.82	4,825.2	-642.3	-317.9	319.9	8.00	7.16	LP @ 4825' TVD; 90.5° - Lybrook A03-2208 02H
5,500.0	90.50	269.82	4,825.0	-642.4	-335.6	337.6	0.00	0.00	
5,600.0	90.50	269.82	4,824.2	-642.7	-435.6	437.6	0.00	0.00	
5,700.0	90.50	269.82	4,823.3	-643.0	-535.6	537.6	0.00	0.00	
5,800.0	90.50	269.82	4,822.4	-643.3	-635.6	637.6	0.00	0.00	
5,900.0	90.50	269.82	4,821.6	-643.7	-735.6	737.6	0.00	0.00	
6,000.0	90.50	269.82	4,820.7	-644.0	-835.6	837.6	0.00	0.00	
6,100.0	90.50	269.82	4,819.8	-644.3	-935.6	937.6	0.00	0.00	
6,200.0	90.50	269.82	4,818.9	-644.6	-1,035.6	1,037.6	0.00	0.00	
6,300.0	90.50	269.82	4,818.1	-644.9	-1,135.6	1,137.6	0.00	0.00	
6,400.0	90.50	269.82	4,817.2	-645.3	-1,235.6	1,237.6	0.00	0.00	
6,500.0	90.50	269.82	4,816.3	-645.6	-1,335.6	1,337.6	0.00	0.00	
6,600.0	90.50	269.82	4,815.4	-645.9	-1,435.6	1,437.6	0.00	0.00	
6,700.0	90.50	269.82	4,814.6	-646.2	-1,535.6	1,537.6	0.00	0.00	
6,800.0	90.50	269.82	4,813.7	-646.5	-1,635.6	1,637.6	0.00	0.00	
6,900.0	90.50	269.82	4,812.8	-646.9	-1,735.5	1,737.6	0.00	0.00	
7,000.0	90.50	269.82	4,811.9	-647.2	-1,835.5	1,837.6	0.00	0.00	
7,100.0	90.50	269.82	4,811.1	-647.5	-1,935.5	1,937.6	0.00	0.00	
7,200.0	90.50	269.82	4,810.2	-647.8	-2,035.5	2,037.6	0.00	0.00	
7,300.0	90.50	269.82	4,809.3	-648.1	-2,135.5	2,137.6	0.00	0.00	
7,400.0	90.50	269.82	4,808.5	-648.5	-2,235.5	2,237.5	0.00	0.00	
7,500.0	90.50	269.82	4,807.6	-648.8	-2,335.5	2,337.5	0.00	0.00	
7,600.0	90.50	269.82	4,806.7	-649.1	-2,435.5	2,437.5	0.00	0.00	
7,700.0	90.50	269.82	4,805.8	-649.4	-2,535.5	2,537.5	0.00	0.00	
7,800.0	90.50	269.82	4,805.0	-649.7	-2,635.5	2,637.5	0.00	0.00	
7,900.0	90.50	269.82	4,804.1	-650.0	-2,735.5	2,737.5	0.00	0.00	
8,000.0	90.50	269.82	4,803.2	-650.4	-2,835.5	2,837.5	0.00	0.00	
8,100.0	90.50	269.82	4,802.3	-650.7	-2,935.5	2,937.5	0.00	0.00	
8,200.0	90.50	269.82	4,801.5	-651.0	-3,035.5	3,037.5	0.00	0.00	
8,300.0	90.50	269.82	4,800.6	-651.3	-3,135.5	3,137.5	0.00	0.00	
8,400.0	90.50	269.82	4,799.7	-651.6	-3,235.5	3,237.5	0.00	0.00	
8,500.0	90.50	269.82	4,798.8	-652.0	-3,335.5	3,337.5	0.00	0.00	
8,600.0	90.50	269.82	4,798.0	-652.3	-3,435.5	3,437.5	0.00	0.00	
8,700.0	90.50	269.82	4,797.1	-652.6	-3,535.5	3,537.5	0.00	0.00	
8,800.0	90.50	269.82	4,796.2	-652.9	-3,635.5	3,637.5	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: S3-T22N-R8W
 Well: Lybrook A03-2208 02H
 Wellbore: HZ
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook A03-2208 02H
 TVD Reference: WELL @ 6896.0usft
 MD Reference: WELL @ 6896.0usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
8,900.0	90.50	269.82	4,795.4	-653.2	-3,735.5	3,737.5	0.00	0.00	
9,000.0	90.50	269.82	4,794.5	-653.6	-3,835.4	3,837.5	0.00	0.00	
9,100.0	90.50	269.82	4,793.6	-653.9	-3,935.4	3,937.5	0.00	0.00	
9,200.0	90.50	269.82	4,792.7	-654.2	-4,035.4	4,037.5	0.00	0.00	
9,300.0	90.50	269.82	4,791.9	-654.5	-4,135.4	4,137.5	0.00	0.00	
9,400.0	90.50	269.82	4,791.0	-654.8	-4,235.4	4,237.5	0.00	0.00	
9,500.0	90.50	269.82	4,790.1	-655.2	-4,335.4	4,337.5	0.00	0.00	
9,600.0	90.50	269.82	4,789.2	-655.5	-4,435.4	4,437.5	0.00	0.00	
9,700.0	90.50	269.82	4,788.4	-655.8	-4,535.4	4,537.5	0.00	0.00	
9,800.0	90.50	269.82	4,787.5	-656.1	-4,635.4	4,637.5	0.00	0.00	
9,900.0	90.50	269.82	4,786.6	-656.4	-4,735.4	4,737.4	0.00	0.00	
10,000.0	90.50	269.82	4,785.7	-656.8	-4,835.4	4,837.4	0.00	0.00	
10,096.5	90.50	269.82	4,784.9	-657.1	-4,932.0	4,934.0	0.00	0.00	TD at 10096.5 - Lybrook A03-2208 02H PBHL

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lybrook A03-2208 02H F - plan hits target center - Point	0.00	359.91	4,784.9	-657.1	-4,932.0	1,881,463.85	2,769,298.19	36.170686	-107.676780
Lybrook A03-2208 02H F - plan hits target center - Point	0.00	359.91	4,825.2	-642.3	-317.9	1,881,478.58	2,773,912.25	36.170705	-107.661147

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
500.0	500.0	9 5/8"	0	0
4,976.8	4,676.2	7" ICP @ 55°	0	0

Planning Report

Database: USA EDM 5000 Multi Users DB	Local Co-ordinate Reference: Well Lybrook A03-2208 02H
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: WELL @ 6896.0usft
Project: San Juan County, NM	MD Reference: WELL @ 6896.0usft
Site: S3-T22N-R8W	North Reference: Grid
Well: Lybrook A03-2208 02H	Survey Calculation Method: Minimum Curvature
Wellbore: HZ	
Design: Plan #1	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
553.0	553.0	Ojo Alamo Ss.		-0.50	269.82	
728.0	728.0	Kirtland Shale		-0.50	269.82	
1,110.0	1,110.0	Fruitland Coal		-0.50	269.82	
1,233.0	1,233.0	Pictured Cliffs Ss.		-0.50	269.82	
1,327.0	1,327.0	Lewis Shale		-0.50	269.82	
1,977.0	1,977.0	Cliffhouse Ss.		-0.50	269.82	
2,665.0	2,665.0	Menefee Fn.		-0.50	269.82	
3,646.0	3,620.0	Point Lookout Ss.		-0.50	269.82	
3,838.5	3,762.0	Mancos Shale		-0.50	269.82	
4,448.0	4,268.0	Mancos Silt		-0.50	269.82	
4,745.8	4,518.0	Gallup Fn.		-0.50	269.82	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,218.0	3,218.0	0.0	0.0	KOP @ 3218'	
3,822.9	3,753.5	-104.8	216.6	Start build/turn @ 3822' MD	
5,482.3	4,825.2	-642.3	-317.9	LP @ 4825' TVD; 90.5°	
10,096.5	4,784.9	-657.1	-4,932.0	TD at 10096.5	

Lybrook A03-2208 02H

SHL: NENE Section 3, T22N, R8W
1338 FNL and 17 FEL

BHL: SWNW Section 3, T22N, R8W
1980 FNL and 330 FWL

San Juan County, New Mexico

Lease Number: NM 90468, NM 55836, & NM 116055

C. Pipeline

See the Plan of Development submitted with the final modifications to the Standard SF-299 Application for authorization to construct, operate, maintain and terminate a 920 foot, up to 6-inch outside diameter, buried steel well connect pipeline that was submitted to the BLM concurrently with the APD.

7. METHODS FOR HANDLING WASTE

A. Cuttings

1. A closed-loop system will be used. Cuttings will be moved through a shaker system on the drill rig that separates drilling fluids from the cuttings. Cuttings will be stored onsite in above-ground storage tanks. Cuttings will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at the Envirotech, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.
2. The closed-loop system storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.
3. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

B. Drilling Fluids

1. A closed-loop system will be used. Drilling fluids will be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical. Residual fluids will be vacuumed from the storage tanks and disposed of at Basin Disposal, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.
2. The closed-loop system storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.
3. The closed-loop system storage tanks will be placed in bermed secondary containment sized to accommodate a minimum of 110 percent of the volume of the largest storage tank.
4. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

C. Flowback Water

1. The water-based solution that flows back to the surface during and after completion operations will be placed in storage tanks on the location.
2. Flowback water will be confined to a storage tank for a period not to exceed 90 days after initial production and will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.

D. Spills – any spills of non-freshwater fluids will be immediately cleaned up and removed to an approved disposal site. Encana will also notify the BLM within 24 hours of any spill.

E. Sewage – self-contained, chemical toilets will be provided for human waste disposal. The toilet holding tanks will be pumped, as needed, and the contents thereof disposed of in an approved sewage disposal facility. The toilets will be onsite during all operations.

ENCANA OIL & GAS (USA) INC.

LYBROOK A03-2208 #02H

1338' FNL & 17' FEL

LOCATED IN THE NE/4 NE/4 OF SECTION 3, T22N, R8W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO

DIRECTIONS

- 1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 39.0 MILES TO INDIAN ROUTE 7061 (M.P. 112.6).
- 2) TURN RIGHT AND GO 5.3 MILES.
- 3) TURN LEFT AND GO 1.0 MILE TO WHERE ACCESS IS STAKED ON RIGHT SIDE OF ROAD.

WELL FLAG LOCATED AT LAT. 36.172468° N, LONG. 107.660066° W (NAD 83).



WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
Lybrook A03-2208 02H

