

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:

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	Feet	NS	Ft	EW
30-043-21150-00-00	LYBROOK E27 2306	003H	ENCANA OIL & GAS (USA) INC.	O	N	Sandoval	F	E	27	23	N	6	W	1629	N	199	W

Conditions of Approval:

Hold C-104 for NSL, as drilled plat, and directional survey  
Notify NMOCD 24hrs prior to beginning operations.

SEP 20 2013

\_\_\_\_\_  
NMOCD Approved by Signature

\_\_\_\_\_  
Date

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

RECEIVED

FORM APPROVED  
OMB No. 1004-0137  
Expires: July 31, 2010AUG 29 2013  
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.

Engineering Field Office  
Bureau of Land Management

SUBMIT IN TRIPLICATE - Other instructions on page 2.

## 1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

## 2. Name of Operator

Encana Oil &amp; Gas (USA) Inc.

## 3a. Address

370 17th Street, Suite 1700  
Denver, CO 80202

## 3b. Phone No. (include area code)

720-876-3567

## 4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SHL: 1629' FNL and 199' FWL Section 27, T23N, R6W  
BHL: 1730' FNL and 330' FWL Section 28, T23N, R6W5. Lease Serial No.  
NMNM 112953 ✓

6. If Indian, Allottee or Tribe Name

N/A

7. If Unit of CA/Agreement, Name and/or No.  
N/A8. Well Name and No.  
Lybrook E27-2306 03H ✓9. API Well No.  
30-043-21150 ✓10. Field and Pool or Exploratory Area  
Counselors Gallup-Dakota ✓11. Country or Parish, State  
Sandoval, New Mexico ✓

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

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other Update for cement volumes
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

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

Encana Oil & Gas (USA) Inc. Encana wishes to update the cement volumes submitted 7/12/2013 to the BLM. Please see attached wellbore diagram and drilling plan for details.

Estimated spud date is October 27, 2013.

## CONDITIONS OF APPROVAL

Adhere to previously issued stipulations.

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

RCVD SEP 9 '13

OIL CONS. DIV.

DIST. 3

\* Refer to previous Engineering Report

14. I hereby certify that the foregoing is true and correct.

Name (Printed/Typed)

Catherine Anadu

Title Regulatory Analyst

Signature

Date

28 AUGUST 2013

## THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Petroleum Engineer

Date

8/30/2013

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.


Office

FFD

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

(Instructions on page 2)

NMOCD 24

LOC: Soc 27-T23N-R6W County: Sandoval WELL: Lybrook E27-2306 03H			Encana Natural Gas  WELL SUMMARY					ENG: 8/28/13 RIG: GLE: 7054 RKBE: 7067	
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 48.8ppg 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          Mud logger onsite	Ojo Alamo Kirtland  Fruitland Coal  Pictured Cliffs Ss Lewis Shale  Cliffhouse Ss Menefee Fm Point Lookout Ss Mancos Sh    KICK OFF PT   Mancos Silt  Gallup Top  7" csg depth	1472 1628  1847  2029 2152  2891 3575 4275 4476  4915  5071  5318  5546	             5752	Stage tool @2079'          8 3/4	7" 26ppf J55 LTC   TOC @ surface 30% OH excess: 582 sks Total Stage 1 Lead: 236 sks Stage 1 Tail: 162 sks Stage 2 Lead: 184 sks	Fresh Wtr  8.5-8.8	Vertical <1°          KOP 4915 10 deg/100'	
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target  Base Gallup Pilot Hole TD	5565 5620 5820	5903	6 1/8	200' overlap at liner top   4557' Lateral	8.6-9.0 OBM  Switch to OBM 8.6-9.0	.25deg updip 5541'TVD TD = 10460' MD	
						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			

**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 pilot hole TD of 5820' and run OH logs.
- 5) Spot cement kick plug
- 6) Kick off at 4915' and start curve at 10deg/100' build rate
- 7) Drill to casing point of 5752' MD
- 8) R&C 7" casing, circ cmt to surface, switch to OBM
- 9) Land at 90deg, drill 4557' lateral to 10460', run 4 1/2" liner with external swellable csg packers

Lybrook E27-2306 03H

SHL: SWNW Section 27, T23N, R6W  
1629 FNL and 199 FWL

BHL: SWNW Section 28, T23N, R6W  
1730 FNL and 330 FWL

Sandoval County, New Mexico

Lease Number: NMNM 112953

## 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	1472'
Kirtland	1628'
Fruitland Coal	1847'
Pictured Cliffs	2029'
Lewis	2152'
Cliffhouse	2891'
Menefee	3575'
Point Lookout	4275'
Mancos Shale	4476'
Mancos Silt	5071'
Gallup	5318'

The referenced surface elevation is 7054', KB 7067'

### 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	1847'
Gas	Pictured Cliffs	2029'
Gas	Cliffhouse	2891'
Gas	Point Lookout	4275'
Oil/Gas	Mancos	4476'

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

### 3. PRESSURE CONTROL

- Pressure control equipment and configuration will be designed to meet 2M standards.
- Working pressure on rams and BOPE will be 3,000 psi.
- Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.
- Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- BOP testing procedures and testing frequency will conform to Onshore Order No. 2.

**Lybrook E27-2306 03H****SHL: SWNW Section 27, T23N, R6W  
1629 FNL and 199 FWL****BHL: SWNW Section 28, T23N, R6W  
1730 FNL and 330 FWL****Sandoval County, New Mexico****Lease Number: NMNM 112953**

- 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'-5752'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	5552'-10460'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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Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	100sk	Type I Neat 14.8ppg	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 turbolizer per joint on bottom 3 joints
Intermediate	5546'TVD/ 5752'MD	30% open hole excess Stage 1 Lead: 236sk Stage 1 Tail: 162sk Stage 2 Lead: 184sk  $V_T = 1118 \text{ cu ft}$	<b>Lead</b> (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk <b>Tail</b> (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*	5552'MD- 10460'MD	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 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 well will be drilled in two phases. A pilot hole will be drilled in the first phase, followed by kicking off a horizontal lateral in the existing wellbore in the second phase. The intent of drilling a pilot hole is to obtain open hole log data. The intent of the second phase of the well is to plug back the pilot hole with cement to the kick off point. After plugging back, the plan is to drill a horizontal lateral from the kick off point in the existing wellbore to the proposed bottom hole location.

Directional plans are attached.

Well Phase	Description	Proposed Depth (TVD/MD)	Formation
1	Vertical Pilot Hole	5820'/5820'	Gallup
2	Horizontal Lateral	5541'/10460'	Gallup

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1730 FNL and 330 FWL****Sandoval County, New Mexico****Lease Number: NMNM 112953****Proposed Plug Back Procedure:**

KOP 4915'

Set kick plug at KOP

1. Spot 400' kick plug from 4715' – 5115'
  - a. 167sx of Class G cement with salt (0.94ft<sup>3</sup>/sk yield, 17.5ppg)
  - b. Spot tuned spacer
2. Pull uphole and reverse out
3. Pump bottoms up 2 times, pull uphole
4. Tag plug, drill ahead to KOP when cement is solid

**6. DRILLING FLUIDS PROGRAM**

a) Vertical Pilot Hole:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0-500'	Fresh Water	8.4-8.6	60-70	NC
8 3/4"	500-5546'	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Kick off Point to Intermediate Casing Point:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
8 3/4"	4915' (KOP)- 5546' (5752'MD)	Fresh Water LSND	8.5-8.8	40-50	8-10

c) Intermediate Casing Point to TD:

Hole Size (in)	Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5546'MD- 10460'MD	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

- d) 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.
- e) 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.

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**Sandoval County, New Mexico**

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## **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

Open Hole:

Triple combo with Spectral Gamma TD to surface casing  
Specialty logs will be decided real time by onsite geologists

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 +/- 2604 psi based on a 9.0 ppg at 5565' TVD of the vertical pilot hole. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H<sub>2</sub>S 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 October 27, 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.