

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: 8-14-14

Well information;

Operator Encana, Well Name and Number Gallo Canyon Unit MIS-2306#2H

API# 30-039-31276, Section 15, Township 23 (N/S), Range 6 (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.

NMOCD Approved by Signature

3-6-2015
Date KC

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Form 3160-3
(August 2007)

FEB 27 2015

NMOCD
DISTRICT

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AUG 15 2014

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM 170096. If Indian, Allottee or Tribe Name
N/A1a. Type of work: ☒ DRILL ☐ REENTER1b. 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 802023b. Phone No. (include area code)
720-876-3533

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

At surface 210' FSL and 576' FWL Section 15, T23N, R6W SWSW

At proposed prod. zone 175' FSL and 1420' FWL Section 23, T23N, R6W SESW

7. If Unit or CA Agreement, Name and No.
NMNM 131017X8. Lease Name and Well No.
Gallo Canyon Unit M15-2306 02H9. API Well No.
30-039-3127610. Field and Pool, or Exploratory
Counselors Gallup-Dakota11. Sec., T. R. M. or Blk. and Survey or Area
Section 15, T23N, R6W NMPM

Sec 23, T23N, R6W

14. Distance in miles and direction from nearest town or post office*
+/- 54.6 miles southeast of the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM.12. County or Parish
Rio Arriba13. State
NM15. Distance from proposed*
location to nearest
property or lease line, ft.
(Also to nearest drig. unit line, if any)
BHL is 175' from south lease line
Section 23, T23N, R6W16. No. of acres in lease
NMNM 17009 - 2,560 ac.17. Spacing Unit dedicated to this well
5,120 acres - Section 22-26
and 33-3618. Distance from proposed location*
to nearest well, drilling, completed,
applied for, on this lease, ft.
Gallo Canyon Unit M15
01H is +/- 30' from SHL19. Proposed Depth
5,527' TVD/12,798' MD20. BLM/BIA Bond No. on file
COB-00023521. Elevations (Show whether DF, KDB, RT, GL, etc.)
6,951' GL, 6,967' KB22. Approximate date work will start*
02/11/201523. 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:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).

4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature

Katie Wegner

Name (Printed/Typed)
Katie Wegner

Date

8/14/14

Title

Regulatory Analyst

Approved by (signature)

J. Manley

Name (Printed/Typed)

Date

2/26/15

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.

THIS ACTION IS SUBJECT TO TECHNICAL AND PROCEDURAL REVIEW PURSUANT TO 43 CFR 3166.3 AND APPEAL PURSUANT TO 43 CFR 3166.4

BLM 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

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

NMOCD

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, NM 87505

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AUG 15 2014

Form C-102

Revised August 1, 2011

Submit one copy to
appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-039-31276		2 Pool Code 13379		3 Pool Name COUNSELORS GALLUP-DAKOTA	
4 Property Code 314235		5 Property Name GALLO CANYON UNIT M15-2306			6 Well Number 02H
7 OGRID No. 282327		8 Operator Name ENCANA OIL & GAS (USA) INC.			9 Elevation 6951

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
M	15	23-N	6-W		210'	SOUTH	576'	WEST	RIO ARriba

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
N	23	23-N	6-W		175'	SOUTH	1420'	WEST	SANDOVAL

12 Dedicated Acres 5.420 ACRES - SEC 22-26, 34-36 - UNDIVIDED UNIT PENETRATED SPACING UNITS: N2 & SE4 SEC 22; SW4 SEC 23 (640 acres)		13 Joint or Infill	14 Consolidation Code	15 Order No. R-13718-A (5.420 acres)
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No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.

16 SURFACE HOLE LOCATION: LAT: 36.218223°N-NAD 83 LONG: 107.462785°W-NAD 83 LAT: 36.21821°N-NAD 27 LONG: 107.46218°W-NAD 27 PENETRATION POINT: LAT: 36.216812°N-NAD 83 LONG: 107.457767°W-NAD 83 LAT: 36.21680°N-NAD 27 LONG: 107.45716°W-NAD 27 BOTTOM HOLE: LAT: 36.203909°N-NAD 83 LONG: 107.441876°W-NAD 83 LAT: 36.20390°N-NAD 27 LONG: 107.44127°W-NAD 27		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. Signature: <i>Katie Wegner</i> Date: 8/14/14 Printed Name: Katie Wegner E-mail Address: Katie.Wegner@encana.com	
18 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. SEPT 30, 2013 Date of Survey Signature and Seal of Professional Surveyor: WILLIAM E. MAHNKE II # 8466 Certificate Number: 8466			

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State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to
appropriate
District Office

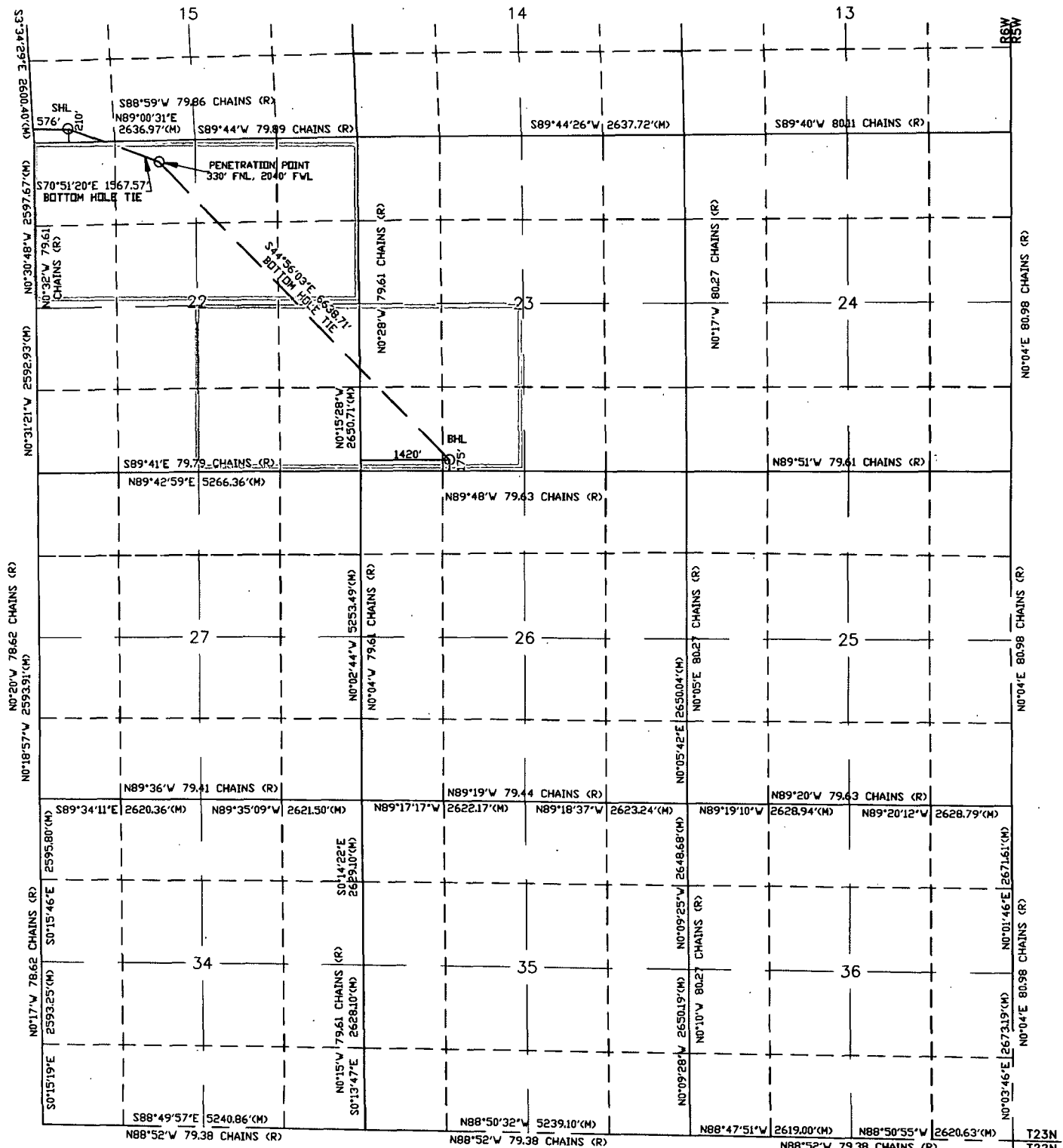
☐ AMENDED REPORT

SURFACE HOLE LOCATION:
LAT: 36.218223°N-NAD 83
LONG: 107.462785°W-NAD 83
LAT: 36.21821°N-NAD 27
LONG: 107.46218°W-NAD 27

PENETRATION POINT:
LAT: 36.216812°N-NAD 83
LONG: 107.457767°W-NAD 83
LAT: 36.21680°N-NAD 27
LONG: 107.45716°W-NAD 27

BOTTOM HOLE:
LAT: 36.203909°N-NAD 83
LONG: 107.441876°W-NAD 83
LAT: 36.20390°N-NAD 27
LONG: 107.44127°W-NAD 27

ENCANA OIL & GAS (USA) INC.
GALLO CANYON UNIT M15-2306 02H



GCU M15-2306 02H
 SHL: SWSW Sec 15 T23N R6W
 210' FSL, 576' FWL
 BHL: SESW Sec 23 T23N R6W
 175' FSL, 1420' FWL
 Rio Arriba, 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
Ojo Alamo	1,467
Kirtland Shale	1,648
Fruitland Coal	1,811
Pictured Cliffs Ss.	2,034
Lewis Shale	2,163
Cliffhouse Ss.	2,855
Menefee Fn.	3,576
Point Lookout Ss.	4,291
Mancos Shale	4,500
Mancos Silt	5,110
Gallup Fn.	5,345

The referenced surface elevation is 6951', KB 6967'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,811
Oil/Gas	Pictured Cliffs Ss.	2,034
Oil/Gas	Cliffhouse Ss.	2,855
Gas	Menefee Fn.	3,576
Oil/Gas	Point Lookout Ss.	4,291
Oil/Gas	Mancos Shale	4,500
Oil/Gas	Mancos Silt	5,110
Oil/Gas	Gallup Fn.	5,345

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.

GCU M15-2306 02H

SHL: SWSW Sec 15 T23N R6W

210' FSL, 576' FWL

BHL: SESW Sec 23 T23N R6W

175' FSL, 1420' FWL

Rio Arriba, New Mexico

- 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'	30"	20"	94#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-6035'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5835'-12798'	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

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.

GCU M15-2306 02H
 SHL: SWSW Sec 15 T23N R6W
 210' FSL, 576' FWL
 BHL: SESW Sec 23 T23N R6W
 175' FSL, 1420' FWL
 Rio Arriba, New Mexico

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'	314 sks	HALCEM™ SYSTEM + 2% CaCl2 + 0.125lbm/sk Poly-E-Flake. 15.8 ppg, 1.174 cuft/sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-6035'	30% open hole excess Stage 1 Lead: 434 sks Stage 1 Tail: 332 sks Stage 2 Lead: 215 sks	Stage 1 Lead: HALCEM™ SYSTEM + 0.2% HR-5 + 5lbm/sk Kol-Seal + 0.125lbm/sk Poly-E-Flake. 12.3 ppg, 1.948 cuft/sk Stage 1 Tail: VARICEM™ CEMENT + .15% CFR-3 + 5lbm/sk Kol-Seal + 0.125% Poly-E-Flake. 13.5 ppg, 1.308 cuft/sk. Stage 2 Contingency: HALCEM™ SYSTEM + 5lbm/sk Kol-Seal + 0.125lbm/sk Poly-E-Flake. 12.3 ppg,	Surface	1 every 3 joints through water bearing zones
Production Liner	5835'-12798'	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 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 2500'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5527'/12798'	Gallup

GCU M15-2306 02H
 SHL: SWSW Sec 15 T23N R6W
 210' FSL, 576' FWL
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 175' FSL, 1420' FWL
 Rio Arriba, 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'-5574'/6035'	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"	5574'/6035'- 5527'/12798'	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 +/- 2619 psi based on a 9.0 ppg at 5597' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

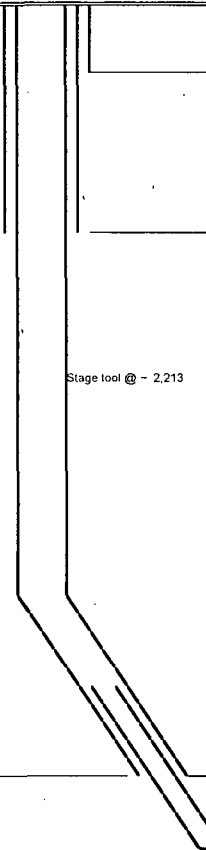
No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

GCU M15-2306 02H
SHL: SWSW Sec 15 T23N R6W
210' FSL, 576' FWL
BHL: SESW Sec 23 T23N R6W
175' FSL, 1420' FWL
Rio Arriba, New Mexico

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on February 11, 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: SW/4 SW/4 Sec 15 T23N R6W, 210'			Encana Natural Gas				ENG: Mike Sanchez 8/14/14			
County: Rio Arriba (SHL)			WELL SUMMARY				RIG: Aztec 950			
WELL: GCU M15-2306 02H							GLE: 6951			
							RKBE: 6967			
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION	
			TVD	MD						
			60	50'		30	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 anti- collision report prior to spud	None					12 1/4	9 5/8" 36ppf J55 STC TOC Surface with 100% OH Excess: 314 sks of HALCEM™ SYSTEM + 2% CaCl2 + 0.125lbm/sk Poly-E-Flake. Mixed at 15.8 ppg. Yield 1.174 cuft/sk.	Fresh wtr 8.3-10'	Vertical <1°	
		Nacimiento 9 5/8" Csg	0 500	500.00						
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	#N/A 1,648 1,811 2,034 2,163 2,855 3,576 4,291 4,500			Stage tool @ ~ 2,213	8 3/4	7" 26ppf J55 LTC TOC @ surface (30% OH excess) Stage 1 Total: 766sks If necessary, Stage 2 Total: 215sks Stage 1 Lead: 434 sks HALCEM™ SYSTEM + 0.2% HR-5 + 5lbm/sk Kol- Seal + 0.125lbm/sk Poly-E-Flake. Mixed at 12.3 ppg. Yield 1.948 cuft/sk. Stage 1 Tail: 332 sks VARICEM™ CEMENT + .15% CFR-3 + 5lbm/sk Kol- Seal + 0.125% Poly-E-Flake. Mixed at 13.5 ppg. Yield 1.308 cuft/sk. Stage 2: 215 sks HALCEM™ SYSTEM + 5lbm/sk Kol-Seal + 0.125lbm/sk Poly- E-Flake. Mixed at 12.3 ppg. Yield 1.946 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	2,500 5,110 5,345 5,574	2,500 6,035'						
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD Base Gallup	5,597 5,527 5,671	12,798			6 1/8	200' overlap at liner top 6763' Drilled Lateral		Horiz Inc/TVD 90.5 degdeg/5597ft TD = 12797.5 MD
MWD Gamma Directional								4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string	WBM 8.3-10	

NOTES:

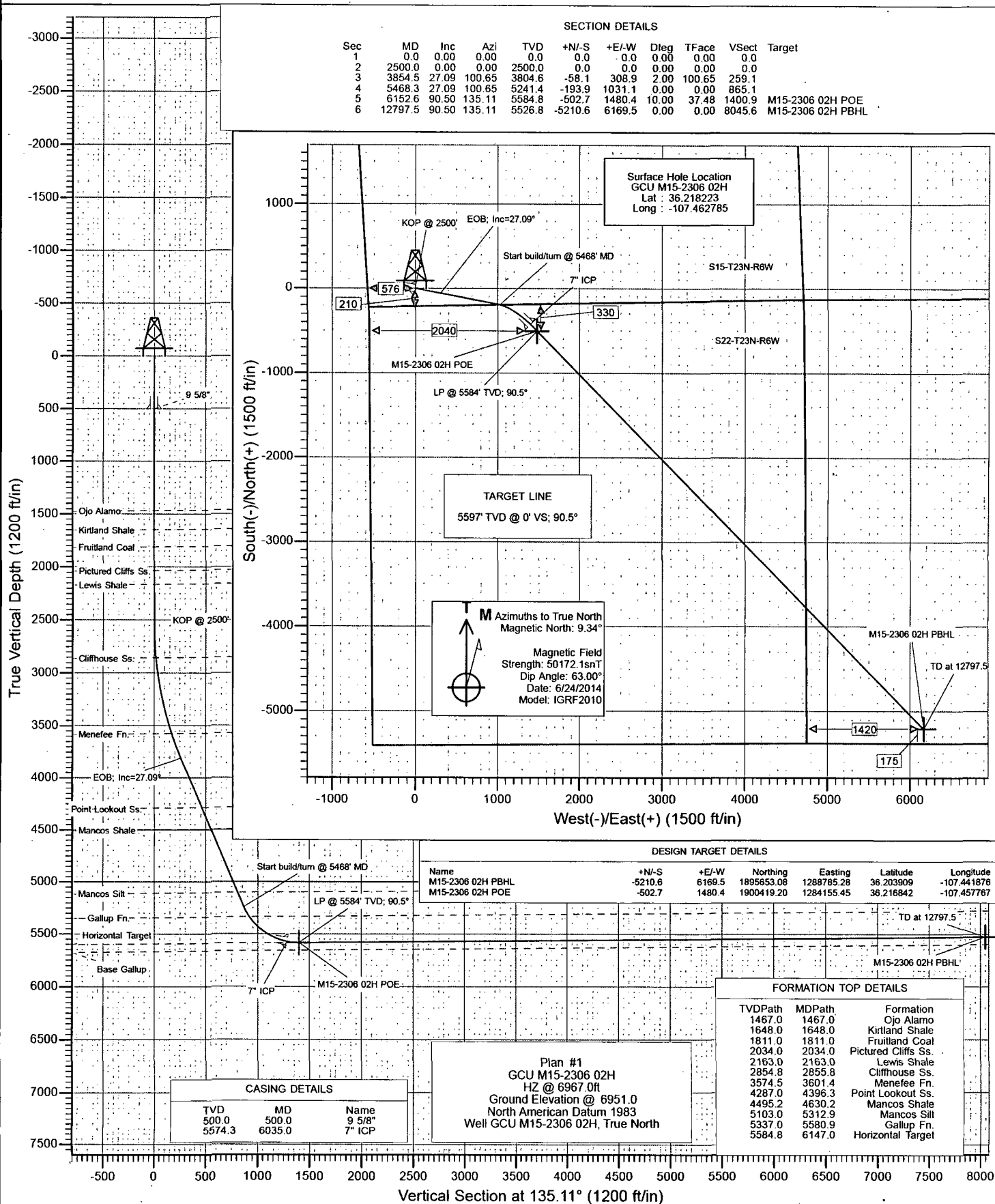
- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 2500', 8 3/4 inch holesize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 6035' MD
- 7) R&C 7" csg, circ cmt to surface, switch to WBM
- 8) Land at 90 deg, drill lateral to 12798' run 4 1/2 inch liner with external swellable csg packers



Project: Rio Arriba County, NM
Site: S15-T23N-R6W
Well: GCU M15-2306 02H
Wellbore: HZ
Design: Plan #1



SECTION DETAILS										
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	2500.0	0.00	0.00	2500.0	0.0	0.0	0.00	0.00	0.0	
3	3854.5	27.09	100.65	3804.6	-58.1	308.9	2.00	100.65	259.1	
4	5468.3	27.09	100.65	5241.4	-193.9	1031.1	0.00	0.00	865.1	
5	6152.6	90.50	135.11	5584.8	-502.7	1480.4	10.00	37.48	1400.9	M15-2306 02H POE
6	12797.5	90.50	135.11	5526.8	-5210.6	6169.5	0.00	0.00	8045.6	M15-2306 02H PBHL



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M15-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	HZ @ 6967.0ft
Project:	Rio Arriba County, NM	MD Reference:	HZ @ 6967.0ft
Site:	S15-T23N-R6W	North Reference:	True
Well:	GCU M15-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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

Site	S15-T23N-R6W				
Site Position:		Northing:	1,900,961.44 ft	Latitude:	36.218280
From:	Lat/Long	Easting:	1,282,659.90 ft	Longitude:	-107.462859
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.72 °

Well	GCU M15-2306 02H					
Well Position	+N-S	0.0 ft	Northing:	1,900,940.42 ft	Latitude:	36.21822
	+E-W	0.0 ft	Easting:	1,282,681.47 ft	Longitude:	-107.46278
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	6,951.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/24/2014	9.34	63.00	50,172

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N-S (ft)	+E-W (ft)	Direction (°)
	0.0	0.0	0.0	135.11

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	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,854.5	27.09	100.65	3,804.6	-58.1	308.9	2.00	2.00	0.00	100.65	
5,468.3	27.09	100.65	5,241.4	-193.9	1,031.1	0.00	0.00	0.00	0.00	
6,152.6	90.50	135.11	5,584.8	-502.7	1,480.4	10.00	9.27	5.04	37.48	M15-2306 02H POE
12,797.5	90.50	135.11	5,526.8	-5,210.6	6,169.5	0.00	0.00	0.00	0.00	M15-2306 02H PBHL

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M15-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	HZ @ 6967.0ft
Project:	Rio Arriba County, NM	MD Reference:	HZ @ 6967.0ft
Site:	S15-T23N-R6W	North Reference:	True
Well:	GCU M15-2306 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
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	
1,200.0	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	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,467.0	0.00	0.00	1,467.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
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	
1,648.0	0.00	0.00	1,648.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,811.0	0.00	0.00	1,811.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,034.0	0.00	0.00	2,034.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,163.0	0.00	0.00	2,163.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	KOP @ 2500'
2,600.0	2.00	100.65	2,600.0	-0.3	1.7	1.4	2.00	2.00	
2,700.0	4.00	100.65	2,699.8	-1.3	6.9	5.8	2.00	2.00	
2,800.0	6.00	100.65	2,799.5	-2.9	15.4	12.9	2.00	2.00	
2,855.8	7.12	100.65	2,854.8	-4.1	21.7	18.2	2.00	2.00	Cliffhouse Ss.
2,900.0	8.00	100.65	2,898.7	-5.2	27.4	23.0	2.00	2.00	
3,000.0	10.00	100.65	2,997.5	-8.0	42.8	35.9	2.00	2.00	
3,100.0	12.00	100.65	3,095.6	-11.6	61.5	51.6	2.00	2.00	
3,200.0	14.00	100.65	3,193.1	-15.7	83.6	70.2	2.00	2.00	
3,300.0	16.00	100.65	3,289.6	-20.5	109.1	91.5	2.00	2.00	
3,400.0	18.00	100.65	3,385.3	-25.9	137.8	115.6	2.00	2.00	
3,500.0	20.00	100.65	3,479.8	-31.9	169.8	142.5	2.00	2.00	
3,600.0	22.00	100.65	3,573.2	-38.6	205.0	172.0	2.00	2.00	
3,601.4	22.03	100.65	3,574.5	-38.7	205.5	172.4	2.00	2.00	Menefee Fn.
3,700.0	24.00	100.65	3,665.2	-45.8	243.4	204.2	2.00	2.00	
3,800.0	26.00	100.65	3,755.8	-53.6	284.9	239.1	2.00	2.00	
3,854.5	27.09	100.65	3,804.6	-58.1	308.9	259.1	2.00	2.00	EOB; Inc=27.09°
3,900.0	27.09	100.65	3,845.1	-61.9	329.2	276.2	0.00	0.00	
4,000.0	27.09	100.65	3,934.1	-70.3	374.0	313.8	0.00	0.00	
4,100.0	27.09	100.65	4,023.2	-78.8	418.7	351.3	0.00	0.00	
4,200.0	27.09	100.65	4,112.2	-87.2	463.5	388.9	0.00	0.00	
4,300.0	27.09	100.65	4,201.2	-95.6	508.3	426.4	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M15-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	HZ @ 6967.0ft
Project:	Rio Arriba County, NM	MD Reference:	HZ @ 6967.0ft
Site:	S15-T23N-R6W	North Reference:	True
Well:	GCU M15-2306 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
4,396.3	27.09	100.65	4,287.0	-103.7	551.4	462.6	0.00	0.00	Point Lookout Ss.
4,400.0	27.09	100.65	4,290.3	-104.0	553.0	464.0	0.00	0.00	
4,500.0	27.09	100.65	4,379.3	-112.4	597.8	501.5	0.00	0.00	
4,600.0	27.09	100.65	4,468.3	-120.8	642.5	539.1	0.00	0.00	
4,630.2	27.09	100.65	4,495.2	-123.4	656.0	550.4	0.00	0.00	Mancos Shale
4,700.0	27.09	100.65	4,557.3	-129.3	687.3	576.6	0.00	0.00	
4,800.0	27.09	100.65	4,646.4	-137.7	732.0	614.2	0.00	0.00	
4,900.0	27.09	100.65	4,735.4	-146.1	776.8	651.7	0.00	0.00	
5,000.0	27.09	100.65	4,824.4	-154.5	821.5	689.3	0.00	0.00	
5,100.0	27.09	100.65	4,913.5	-162.9	866.3	726.8	0.00	0.00	
5,200.0	27.09	100.65	5,002.5	-171.3	911.0	764.4	0.00	0.00	
5,300.0	27.09	100.65	5,091.5	-179.8	955.8	801.9	0.00	0.00	
5,312.9	27.09	100.65	5,103.0	-180.8	961.5	806.7	0.00	0.00	Mancos Silt
5,400.0	27.09	100.65	5,180.5	-188.2	1,000.5	839.5	0.00	0.00	
5,468.3	27.09	100.65	5,241.4	-193.9	1,031.1	865.1	0.00	0.00	Start build/turn @ 5468' MD
5,500.0	29.66	104.55	5,269.2	-197.2	1,045.8	877.8	10.00	8.12	
5,580.9	36.62	112.14	5,337.0	-211.4	1,087.6	917.3	10.00	8.60	Gallup Fn.
5,600.0	38.32	113.57	5,352.1	-215.9	1,098.3	928.1	10.00	8.90	
5,700.0	47.44	119.62	5,425.4	-246.6	1,158.9	992.6	10.00	9.12	
5,800.0	56.80	124.09	5,486.7	-288.3	1,225.7	1,069.3	10.00	9.36	
5,900.0	66.29	127.69	5,534.3	-339.9	1,296.8	1,156.0	10.00	9.49	
6,000.0	75.85	130.80	5,566.7	-399.7	1,369.9	1,250.0	10.00	9.56	
6,035.0	79.21	131.82	5,574.3	-422.3	1,395.6	1,284.1	10.00	9.59	7" ICP
6,100.0	85.45	133.65	5,582.9	-466.0	1,442.8	1,348.4	10.00	9.60	
6,147.0	89.97	134.96	5,584.8	-498.8	1,476.5	1,395.4	10.00	9.61	Horizontal Target
6,152.6	90.50	135.11	5,584.8	-502.7	1,480.4	1,400.9	10.00	9.61	LP @ 5584' TVD; 90.5°
6,200.0	90.50	135.11	5,584.4	-536.3	1,513.8	1,448.4	0.00	0.00	
6,300.0	90.50	135.11	5,583.5	-607.2	1,584.4	1,548.4	0.00	0.00	
6,400.0	90.50	135.11	5,582.6	-678.0	1,655.0	1,648.4	0.00	0.00	
6,500.0	90.50	135.11	5,581.8	-748.9	1,725.5	1,748.4	0.00	0.00	
6,600.0	90.50	135.11	5,580.9	-819.7	1,796.1	1,848.4	0.00	0.00	
6,700.0	90.50	135.11	5,580.0	-890.6	1,866.7	1,948.3	0.00	0.00	
6,800.0	90.50	135.11	5,579.1	-961.4	1,937.2	2,048.3	0.00	0.00	
6,900.0	90.50	135.11	5,578.3	-1,032.3	2,007.8	2,148.3	0.00	0.00	
7,000.0	90.50	135.11	5,577.4	-1,103.1	2,078.4	2,248.3	0.00	0.00	
7,100.0	90.50	135.11	5,576.5	-1,174.0	2,148.9	2,348.3	0.00	0.00	
7,200.0	90.50	135.11	5,575.7	-1,244.8	2,219.5	2,448.3	0.00	0.00	
7,300.0	90.50	135.11	5,574.8	-1,315.7	2,290.1	2,548.3	0.00	0.00	
7,400.0	90.50	135.11	5,573.9	-1,386.5	2,360.6	2,648.3	0.00	0.00	
7,500.0	90.50	135.11	5,573.0	-1,457.4	2,431.2	2,748.3	0.00	0.00	
7,600.0	90.50	135.11	5,572.2	-1,528.2	2,501.8	2,848.3	0.00	0.00	
7,700.0	90.50	135.11	5,571.3	-1,599.1	2,572.3	2,948.3	0.00	0.00	
7,800.0	90.50	135.11	5,570.4	-1,669.9	2,642.9	3,048.3	0.00	0.00	
7,900.0	90.50	135.11	5,569.5	-1,740.8	2,713.5	3,148.3	0.00	0.00	
8,000.0	90.50	135.11	5,568.7	-1,811.6	2,784.0	3,248.3	0.00	0.00	
8,100.0	90.50	135.11	5,567.8	-1,882.5	2,854.6	3,348.3	0.00	0.00	
8,200.0	90.50	135.11	5,566.9	-1,953.3	2,925.2	3,448.3	0.00	0.00	
8,300.0	90.50	135.11	5,566.1	-2,024.2	2,995.7	3,548.3	0.00	0.00	
8,400.0	90.50	135.11	5,565.2	-2,095.0	3,066.3	3,648.3	0.00	0.00	
8,500.0	90.50	135.11	5,564.3	-2,165.9	3,136.9	3,748.3	0.00	0.00	
8,600.0	90.50	135.11	5,563.4	-2,236.7	3,207.4	3,848.3	0.00	0.00	
8,700.0	90.50	135.11	5,562.6	-2,307.6	3,278.0	3,948.3	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M15-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	HZ @ 6967.0ft
Project:	Rio Arriba County, NM	MD Reference:	HZ @ 6967.0ft
Site:	S15-T23N-R6W	North Reference:	True
Well:	GCU M15-2306 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
8,800.0	90.50	135.11	5,561.7	-2,378.4	3,348.6	4,048.3	0.00	0.00	
8,900.0	90.50	135.11	5,560.8	-2,449.3	3,419.1	4,148.3	0.00	0.00	
9,000.0	90.50	135.11	5,559.9	-2,520.1	3,489.7	4,248.3	0.00	0.00	
9,100.0	90.50	135.11	5,559.1	-2,591.0	3,560.3	4,348.3	0.00	0.00	
9,200.0	90.50	135.11	5,558.2	-2,661.8	3,630.8	4,448.3	0.00	0.00	
9,300.0	90.50	135.11	5,557.3	-2,732.7	3,701.4	4,548.2	0.00	0.00	
9,400.0	90.50	135.11	5,556.5	-2,803.5	3,772.0	4,648.2	0.00	0.00	
9,500.0	90.50	135.11	5,555.6	-2,874.4	3,842.5	4,748.2	0.00	0.00	
9,600.0	90.50	135.11	5,554.7	-2,945.2	3,913.1	4,848.2	0.00	0.00	
9,700.0	90.50	135.11	5,553.8	-3,016.0	3,983.7	4,948.2	0.00	0.00	
9,800.0	90.50	135.11	5,553.0	-3,086.9	4,054.2	5,048.2	0.00	0.00	
9,900.0	90.50	135.11	5,552.1	-3,157.7	4,124.8	5,148.2	0.00	0.00	
10,000.0	90.50	135.11	5,551.2	-3,228.6	4,195.4	5,248.2	0.00	0.00	
10,100.0	90.50	135.11	5,550.3	-3,299.4	4,265.9	5,348.2	0.00	0.00	
10,200.0	90.50	135.11	5,549.5	-3,370.3	4,336.5	5,448.2	0.00	0.00	
10,300.0	90.50	135.11	5,548.6	-3,441.1	4,407.1	5,548.2	0.00	0.00	
10,400.0	90.50	135.11	5,547.7	-3,512.0	4,477.6	5,648.2	0.00	0.00	
10,500.0	90.50	135.11	5,546.9	-3,582.8	4,548.2	5,748.2	0.00	0.00	
10,600.0	90.50	135.11	5,546.0	-3,653.7	4,618.8	5,848.2	0.00	0.00	
10,700.0	90.50	135.11	5,545.1	-3,724.5	4,689.3	5,948.2	0.00	0.00	
10,800.0	90.50	135.11	5,544.2	-3,795.4	4,759.9	6,048.2	0.00	0.00	
10,900.0	90.50	135.11	5,543.4	-3,866.2	4,830.5	6,148.2	0.00	0.00	
11,000.0	90.50	135.11	5,542.5	-3,937.1	4,901.0	6,248.2	0.00	0.00	
11,100.0	90.50	135.11	5,541.6	-4,007.9	4,971.6	6,348.2	0.00	0.00	
11,200.0	90.50	135.11	5,540.7	-4,078.8	5,042.2	6,448.2	0.00	0.00	
11,300.0	90.50	135.11	5,539.9	-4,149.6	5,112.7	6,548.2	0.00	0.00	
11,400.0	90.50	135.11	5,539.0	-4,220.5	5,183.3	6,648.2	0.00	0.00	
11,500.0	90.50	135.11	5,538.1	-4,291.3	5,253.9	6,748.2	0.00	0.00	
11,600.0	90.50	135.11	5,537.3	-4,362.2	5,324.4	6,848.2	0.00	0.00	
11,700.0	90.50	135.11	5,536.4	-4,433.0	5,395.0	6,948.2	0.00	0.00	
11,800.0	90.50	135.11	5,535.5	-4,503.9	5,465.6	7,048.2	0.00	0.00	
11,900.0	90.50	135.11	5,534.6	-4,574.7	5,536.1	7,148.1	0.00	0.00	
12,000.0	90.50	135.11	5,533.8	-4,645.6	5,606.7	7,248.1	0.00	0.00	
12,100.0	90.50	135.11	5,532.9	-4,716.4	5,677.3	7,348.1	0.00	0.00	
12,200.0	90.50	135.11	5,532.0	-4,787.3	5,747.8	7,448.1	0.00	0.00	
12,300.0	90.50	135.11	5,531.1	-4,858.1	5,818.4	7,548.1	0.00	0.00	
12,400.0	90.50	135.11	5,530.3	-4,929.0	5,889.0	7,648.1	0.00	0.00	
12,500.0	90.50	135.11	5,529.4	-4,999.8	5,959.5	7,748.1	0.00	0.00	
12,600.0	90.50	135.11	5,528.5	-5,070.7	6,030.1	7,848.1	0.00	0.00	
12,700.0	90.50	135.11	5,527.7	-5,141.5	6,100.7	7,948.1	0.00	0.00	
12,797.5	90.50	135.11	5,526.8	-5,210.6	6,169.5	8,045.6	0.00	0.00	TD at 12797.5

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M15-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	HZ @ 6967.0ft
Project:	Rio Arriba County, NM	MD Reference:	HZ @ 6967.0ft
Site:	S15-T23N-R6W	North Reference:	True
Well:	GCU M15-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
M15-2306 02H POE	0.00	0.00	5,584.8	-502.7	1,480.4	1,900,419.20	1,284,155.45	36.216842	-107.457767
- plan hits target center									
- Point									
M15-2306 02H PBHL	0.00	0.00	5,526.8	-5,210.6	6,169.5	1,895,653.08	1,288,785.28	36.203909	-107.441876
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.0	500.0	9 5/8"	9.625	12.250
6,035.0	5,574.3	7" ICP	5.500	6.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,467.0	1,467.0	Ojo Alamo		-0.50	135.11
1,648.0	1,648.0	Kirtland Shale		-0.50	135.11
1,811.0	1,811.0	Fruiland Coal		-0.50	135.11
2,034.0	2,034.0	Pictured Cliffs Ss.		-0.50	135.11
2,163.0	2,163.0	Lewis Shale		-0.50	135.11
2,855.8	2,855.0	Cliffhouse Ss.		-0.50	135.11
3,601.4	3,576.0	Menefee Fn.		-0.50	135.11
4,396.3	4,291.0	Point Lookout Ss.		-0.50	135.11
4,630.2	4,500.0	Mancos Shale		-0.50	135.11
5,312.9	5,110.0	Mancos Silt		-0.50	135.11
5,580.9	5,345.0	Gallup Fn.		-0.50	135.11
6,147.0	5,597.0	Horizontal Target		-0.50	135.11

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,500.0	2,500.0	0.0	0.0	KOP @ 2500'
3,854.5	3,804.6	-58.1	308.9	EOB; Inc=27.09°
5,468.3	5,241.4	-193.9	1,031.1	Start build/turn @ 5468' MD
6,152.6	5,584.8	-502.7	1,480.4	LP @ 5584' TVD; 90.5°
12,797.5	5,526.8	-5,210.6	6,169.5	TD at 12797.5

EnCana Oil & Gas (USA) Inc

Rio Arriba County, NM

S15-T23N-R6W

GCU M15-2306 02H

HZ

Plan #1

Anticollision Report

26 June, 2014

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GCU M15-2306 02H
Project:	Rio Arriba County, NM	TVD Reference:	HZ @ 6967.0ft
Reference Site:	S15-T23N-R6W	MD Reference:	HZ @ 6967.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	GCU M15-2306 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 #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
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 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	6/26/2014
From (ft)	To (ft)	Survey (Wellbore)
0.0	12,797.5	Plan #1 (HZ)
		Tool Name
		Geolink MWD
		Description
		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						
S15-T23N-R6W						
GCU M15-2306 01H - HZ - Plan #1	2,500.0	2,500.0	30.1	21.4	3.474	CC, ES, SF

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GCU M15-2306 02H
Project:	Rio Arriba County, NM	TVD Reference:	HZ @ 6967.0ft
Reference Site:	S15-T23N-R6W	MD Reference:	HZ @ 6967.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	GCU M15-2306 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 #1	Offset TVD Reference:	Offset Datum

Offset Design S15-T23N-R6W - GCU M15-2306 01H - HZ - Plan #1													Offset Site Error: 0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis			Distance		Total		Separation		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)	Uncertainty Axis	Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-46.45	20.8	-21.8	30.1				
100.0	100.0	100.0	100.0	0.1	0.1	-46.45	20.8	-21.8	30.1	29.8	0.29	102.723	
200.0	200.0	200.0	200.0	0.3	0.3	-46.45	20.8	-21.8	30.1	29.5	0.64	46.895	
300.0	300.0	300.0	300.0	0.5	0.5	-46.45	20.8	-21.8	30.1	29.1	0.99	30.383	
400.0	400.0	400.0	400.0	0.7	0.7	-46.45	20.8	-21.8	30.1	28.8	1.34	22.471	
500.0	500.0	500.0	500.0	0.8	0.8	-46.45	20.8	-21.8	30.1	28.4	1.69	17.828	
600.0	600.0	600.0	600.0	1.0	1.0	-46.45	20.8	-21.8	30.1	28.1	2.04	14.775	
700.0	700.0	700.0	700.0	1.2	1.2	-46.45	20.8	-21.8	30.1	27.7	2.39	12.815	
800.0	800.0	800.0	800.0	1.4	1.4	-46.45	20.8	-21.8	30.1	27.4	2.74	11.006	
900.0	900.0	900.0	900.0	1.5	1.5	-46.45	20.8	-21.8	30.1	27.0	3.09	9.761	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-46.45	20.8	-21.8	30.1	26.7	3.43	8.769	
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	-46.45	20.8	-21.8	30.1	26.3	3.78	7.960	
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	-46.45	20.8	-21.8	30.1	26.0	4.13	7.288	
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	-46.45	20.8	-21.8	30.1	25.6	4.48	6.720	
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	-46.45	20.8	-21.8	30.1	25.3	4.83	6.235	
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	-46.45	20.8	-21.8	30.1	24.9	5.18	5.815	
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	-46.45	20.8	-21.8	30.1	24.6	5.53	5.447	
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	-46.45	20.8	-21.8	30.1	24.2	5.88	5.124	
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	-46.45	20.8	-21.8	30.1	23.9	6.23	4.837	
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	-46.45	20.8	-21.8	30.1	23.5	6.58	4.580	
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	-46.45	20.8	-21.8	30.1	23.2	6.93	4.349	
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	-46.45	20.8	-21.8	30.1	22.8	7.27	4.140	
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	-46.45	20.8	-21.8	30.1	22.5	7.62	3.951	
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	-46.45	20.8	-21.8	30.1	22.1	7.97	3.778	
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	-46.45	20.8	-21.8	30.1	21.8	8.32	3.619	
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	-46.45	20.8	-21.8	30.1	21.4	8.67	3.474 CC, ES, SF	
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	-148.81	20.8	-21.8	31.6	22.6	9.02	3.504	
2,700.0	2,699.8	2,699.8	2,699.8	4.7	4.7	-153.06	20.8	-21.8	36.2	26.8	9.36	3.866	
2,800.0	2,799.5	2,799.5	2,799.5	4.9	4.9	-158.13	20.8	-21.8	44.1	34.4	9.69	4.554	
2,900.0	2,898.7	2,898.7	2,898.7	5.1	5.0	-162.74	20.8	-21.8	55.6	45.6	10.01	5.556	
3,000.0	2,997.5	2,997.5	2,997.5	5.3	5.2	-166.43	20.8	-21.8	70.7	60.4	10.32	6.851	
3,100.0	3,095.6	3,093.0	3,093.0	5.5	5.4	-169.59	20.6	-23.3	90.8	80.2	10.62	8.550	
3,200.0	3,193.1	3,186.2	3,186.0	5.8	5.5	-172.44	20.2	-27.9	117.4	106.5	10.90	10.767	
3,300.0	3,289.6	3,276.5	3,276.1	6.1	5.7	-174.77	19.6	-35.1	150.3	139.1	11.16	13.461	
3,400.0	3,385.3	3,363.5	3,362.5	6.5	5.9	-176.60	18.8	-44.8	189.3	177.9	11.41	16.591	
3,500.0	3,479.8	3,446.8	3,445.0	7.0	6.0	-178.04	17.8	-56.5	234.3	222.6	11.64	20.119	
3,600.0	3,573.2	3,526.1	3,523.2	7.5	6.2	-179.18	16.6	-69.8	284.7	272.9	11.86	24.013	
3,700.0	3,665.2	3,600.0	3,595.6	8.1	6.4	179.91	15.4	-84.2	340.5	328.4	12.05	28.245	
3,800.0	3,755.8	3,671.8	3,665.6	8.7	6.6	179.14	14.0	-99.9	401.1	388.8	12.24	32.776	
3,900.0	3,845.1	3,738.0	3,729.9	9.4	6.8	178.53	12.7	-116.0	465.9	453.5	12.46	37.397	
4,000.0	3,934.1	3,800.0	3,789.6	10.2	7.0	178.04	11.3	-132.4	532.9	520.1	12.74	41.819	
4,100.0	4,023.2	3,862.5	3,849.5	10.9	7.2	177.60	9.7	-150.2	601.4	588.4	13.03	46.162	
4,200.0	4,112.2	3,921.1	3,905.3	11.7	7.4	177.22	8.2	-168.1	671.4	658.1	13.31	50.451	
4,300.0	4,201.2	3,988.1	3,968.8	12.5	7.7	176.84	6.4	-189.5	742.5	728.9	13.60	54.582	
4,400.0	4,290.3	4,058.3	4,035.3	13.3	8.0	176.51	4.4	-211.9	813.6	799.7	13.90	58.515	
4,500.0	4,379.3	4,128.6	4,101.8	14.1	8.3	176.23	2.5	-234.4	884.7	870.5	14.20	62.278	
4,600.0	4,468.3	4,198.8	4,168.4	14.9	8.6	176.00	0.6	-256.8	955.8	941.3	14.51	65.883	

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

Anticollision Report

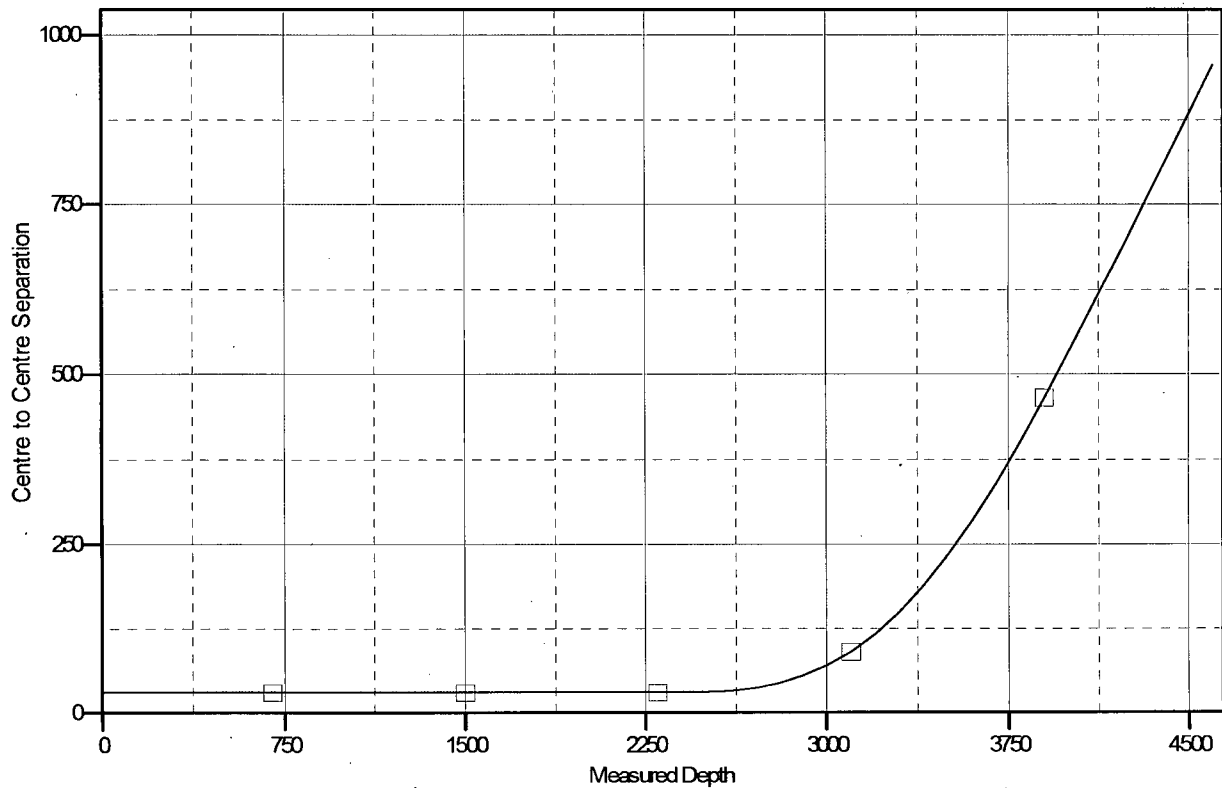
Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Reference Site: S15-T23N-R6W
Site Error: 0.0ft
Reference Well: GCU M15-2306 02H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #1

Local Co-ordinate Reference: Well GCU M15-2306 02H
TVD Reference: HZ @ 6967.0ft
MD Reference: HZ @ 6967.0ft
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 HZ @ 6967.0ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -106.250000 °

Coordinates are relative to: GCU M15-2306 02H
 Coordinate System is US State Plane 1983, New Mexico Central Zone
 Grid Convergence at Surface is: -0.72°

Ladder Plot



LEGEND

GCU M15-2306 01H, HZ, Plan #1 V0

Gallo Canyon Unit M15-2306 02H
SHL: SWSW Section 15, T23N, R6W
210 FSL and 576 FWL
BHL: SESW Section 23, T23N, R6W
175 FSL and 1420 FEL
Rio Arriba County, New Mexico
Lease Number: NMNM 17009

If the location becomes prone to wind or water erosion, Encana will take appropriate measures to prevent topsoil loss from wind. Such measures may include using tackifiers or water to wet the topsoil stockpile so that a crust is created across the exposed soil to prevent soil loss.

3. All construction materials for the well pad will consist of native borrow and subsoil accumulated during well pad construction. If additional fill or surfacing material is required, it will be obtained from existing permitted or private sources and will be hauled in by trucks over existing access roads.

The maximum cut will be approximately 14.8 feet at corner 4 and the maximum fill will be approximately 10.6 feet on the east corner (corner 2).

4. As determined during the onsite on March 11, 2014, the following best management practices will be implemented:

Water will be diverted around the pad and silt traps installed as needed upon interim reclamation.

5. Construction equipment may include chain saws, a brush hog, scraper, maintainer, excavator, and dozer. Construction for the access road and well pad will take approximately 3 weeks.

C. Pipeline

See the Standard SF-299 Application for authorization to construct, operate, maintain and terminate a 477 foot, up to 6-inch outside diameter, buried steel well connect pipeline that was submitted to the BLM on February 11, 2013.

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.

encana

VIA OVERNIGHT PRIORITY MAIL

August 14, 2014

Bureau of Land Management
Farmington Field Office
6251 College Blvd Suite A
Farmington, New Mexico 87402

RECEIVED

AUG 15 2014

Farmington Field Office
Bureau of Land Management

**Re: Application for Permit to Drill
Gallo Canyon Unit M15-2306 02H**

To Whom It May Concern:

For your records, Encana Oil & Gas (USA) Inc. (Encana) submits an original and four copies of an Application for Permit to Drill the Gallo Canyon Unit M15-2306 02H oil well. Also enclosed is the processing fee for \$6,500.

Encana requests tight-hole status on this proposed well.

Please feel free to contact me directly at 720-876-3533 with any questions or concerns.

Encana Oil & Gas (USA) Inc.



Katie Wegner
Regulatory Analyst

Enc. Lybrook E13-2306 02H APD Submittals

Encana Oil & Gas (USA) Inc.

370 17th Street, Suite 1700, Denver Colorado 80202 720.876.3533 (O) 303.482.6819 (C) Katie.Wegner@encana.com

Driving Directions:

1. From the intersection of US Hwy 64 and US Hwy 550 in Bloomfield N.M. travel south 53.6 miles on US Hwy 550.
2. Turn right at MP 197.7.
3. Turn Left at intersection of US Hwy 550 and Rio Arriba CO RD 379.
4. Travel north on Rio Arriba CO Road 379 for 0.7 miles.
5. Turn left and travel southwest along staked new access road 0.08 miles to staked well pad.

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
GCU M15-2306 02H

