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OIL CONS. DIV.
DIST. 3

JUL 26 2012
Form 3160-9
(August 2007)

Farmington Field Office UNITED STATES
Bureau of Land Management DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: ☒ DRILL ☐ REENTER

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

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

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

3b. Phone No. (include area code)
720-876-3989

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

At surface 959' FNL and 300' FEL Section 31, T24N, R9W

At proposed prod. zone 616' FNL and 330' FWL Section 31, T24N, R9W

14. Distance in miles and direction from nearest town or post office*
+/- 36 miles south of Bloomfield, NM

5. Lease Serial No.
NM 51000 and NM 4958

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

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

8. Lease Name and Well No.
Escrito A31-2409 01H

9. API Well No.
80-045-35390

10. Field and Pool, or Exploratory
Bisti Lower-Gallup

11. Sec., T. R. M. or Blk. and Survey or Area
Section 31, T24N, R9W NMPM

12. County or Parish
San Juan

13. State
NM

15. Distance from proposed*
location to nearest
property or lease line, ft.
(Also to nearest drig. unit line, if any)
SHL is 300' West of lease line

16. No. of acres in lease
NM 51000 160.84 acres
NM 4958 1,721.01 acres

17. Spacing Unit dedicated to this well
160.36 N1/2 N1/2

18. Distance from proposed location*
to nearest well, drilling, completed,
applied for, on this lease, ft.
Wellbore is 96' East of
April Surprise 7

19. Proposed Depth
5015' TVD/9563' MD

20. BLM/BIA Bond No. on file
COB-000235

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
6864' GL, 6877' KB

22. Approximate date work will start*
01/13/2013

23. Estimated duration
45 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 *Brenda R. Linster*
Title
Regulatory Advisor

Name (Printed/Typed)
Brenda R. Linster

Date
07/24/2012

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

Name (Printed/Typed)

Date
4/8/13

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.

(Continued on page 2)

*(Instructions on page 2)

NOTIFY AZTEC OCD 24 HRS.
PRIOR TO CASING & CEMENT

CONFIDENTIAL

This action is subject to technical and procedural review pursuant to 43 CFR 3163.2 and appeal pursuant to 43 CFR 3165.4

Hold C104

for Directional Survey
and "As Drilled" plat

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

Ar.
NMOC

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

APR 19 2013 ca

Hold C104
for Directional Survey
and "As Drilled" plat

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II
811 S. First Street, 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 Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

RECEIVED
Submit one copy to
Appropriate District Office
OIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505
JUL 26 2012
AMENDED REPORT

Farmington Field Office
Bureau of Land Management

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30.045-35390		2 Pool Code 5890		3 Pool Name BISTI LOWER - GALLUP	
4 Property Code 39823		5 Property Name ESCRITO A31-2409			6 Well Number 01H
7 OGRID No. 282327		8 Operator Name ENCANA OIL & GAS (USA) INC.			9 Elevation 6864'

10 Surface Location

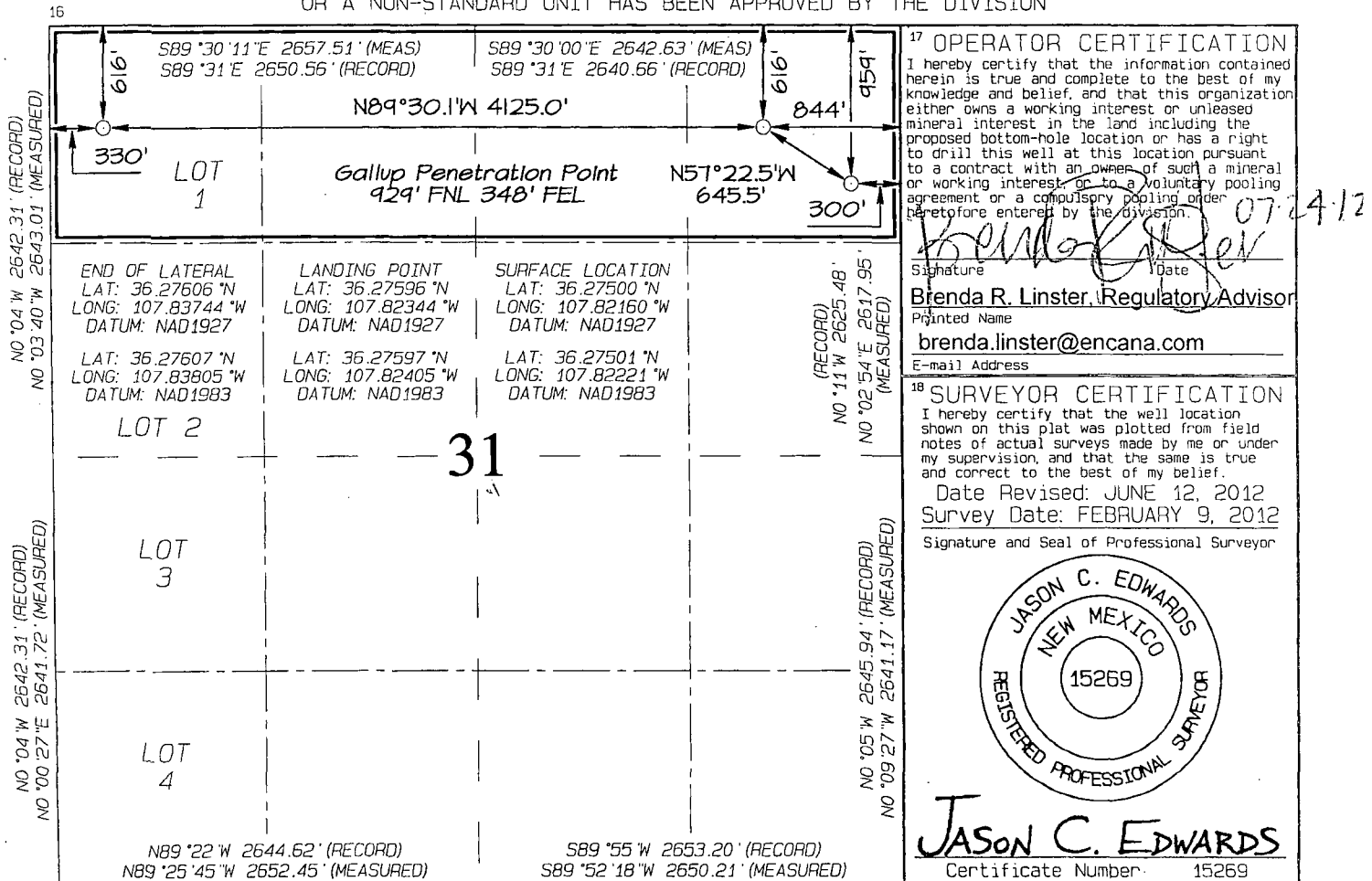
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	31	24N	9W		959	NORTH	300	EAST	SAN JUAN

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
D	31	24N	9W	Lot 1	616	NORTH	330	WEST	SAN JUAN

12 Dedicated Acres 160.36 Acres - (N/2 N/2)		13 Joint or Infill	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



Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Escrito A31-2409 01H
959' FNL & 300' FEL, Section 31, T24N, R9W, N.M.P.M., San Juan County, NM

Latitude: 36.27501°N Longitude: 107.82221°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 27.9 miles to State Hwy #57 @ Mile Marker 123.4;

Go right (South-westerly) on State Hwy #57 for 3.1 miles to fork in road;

Go left (South-westerly) exiting State Hwy #57 for 3.0 miles to fork in road;

Go left (South-easterly) for 0.6 miles to fork in road;

Go right (South-easterly) for 0.4 miles to fork in road;

Go left (South-westerly) for 0.6 miles to fork in road;

Go right (South-westerly) for 0.4 miles to new access on right-hand side of existing roadway which continues for 15' to staked location.

Escrito A31-2409 01H

SHL: NENE Section 31, T24N, R9W
959' FNL and 300' FEL

BHL: NWNW Section 31, T24N, R9W
616' FNL and 330' FWL

Sandoval Sandoval County, New Mexico

Lease Number: NM 51000 and ~~NM 4958~~

Encana Oil & Gas (USA) Inc. Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

<u>Formation</u>	<u>Depth (TVD)</u>
Ojo Alamo Ss.	649'
Kirtland	787'
Fruitland Coal	1117'
Pictured Cliffs	1391'
Lewis	1541'
Cliffhouse	2107'
Menefee	2772'
Point Lookout	3789'
Mancos	3963'
Gallup	4778'

The referenced surface elevation is 6864', KB 6877'

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	1117'
Gas	Pictured Cliffs	1391'
Gas	Cliffhouse	2107'
Gas	Point Lookout	3789'
Oil/Gas	Mancos	3963'

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 either 70 percent of the casings internal yield pressure or 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.
- 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.

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San Juan Sandoval County, New Mexico

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- 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'	17 1/2"	13 3/8"	48#	H40, STC New
Intermediate	0'-4100'	12 1/4"	9 5/8"	40#	J55, STC New
Production Liner	3900'-9563'	8 1/2"	5 1/2"	17#	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
13 3/8"	48	H40	STC	740	1730	322	1.125	1.1	1.5
9 5/8"	40	J55	STC	2570	3950	452	1.125	1.1	1.5
5 1/2"	17	B80	LTC	6290	7740	320	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	Redi-mix Construction Grade Cement	Surface	None
Surface	500'	291sk	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 14.6ppg, 1.38cuf/sk	Surface	1 per joint on bottom 3 joints
Intermediate	4100'	30% open hole excess Lead: 700sk Tail: 160sk	Lead: PremLite + 3% CaCl + 0.25lb/sk Cello Flake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail: 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, tubolizers at base of Ojo Alamo
Production Liner*	3900'-9563'	None – External casing packers	N/A	N/A	N/A

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

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

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

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 4250'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5015'/9563'	Gallup

Escrito A31-2409 01H

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616' FNL and 330' FWL

Sandoval Sandoval County, New Mexico

Lease Number: NM 51000 and ~~NM 4958~~

6. DRILLING FLUIDS PROGRAM

a) Vertical Portion

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
17 1/2"	0-500'	Fresh Water	8.4-8.6	60-70	NC
12 1/4"	500-4100'	Fresh Water LSND	8.5-8.8	40-50	8-10
8 1/2"	4100-4250'	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Kick off to Horizontal Lateral:

Hole Size (in)	MD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
8 1/2"	4250' (KOP)- 9563'	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

- c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.
- d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING and LOGGING

- a) Drill Stem Testing – None anticipated
- b) Coring – None anticipated.
- c) Mud Logging – Mud loggers will be on location from intermediate casing 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 +/- 2347 psi based on a 9.0 ppg at 5015' TVD of the landing point of the horizontal lateral. No abnormal pressure or temperatures are anticipated.

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

Escrito A31-2409 01H

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San Juan Sandoval County, New Mexico

Lease Number: NM 51000 and ~~NM 4958~~

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on January 24, 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 45 days.

LOC: Sec 31-T24N-R9W County: San Juan WELL: Escrito A31-2409 01H			New Mexico Mancos WELL SUMMARY			encana natural gas		ENG: J. Fox/ A. RIG: GLE: 6854 RKBE:		7/13/12
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH TVDMD			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION	
			60	60'		30	20" 94# 100sx Type I Neat 48.8ppg cmt	Fresh wtr 8.3-9.2		
Surveys After csg is run	None		500	500		17 1/2	13 3/8" 48ppf H40 STC TOC @ surface 291 sks Type III Cmt	Fresh wtr 8.4-8.6	Vertical <1°	
Surveys every 500'	No OH logs Mud logger onsite	Ojo Alamo Kirtland Shale Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Menefee Fn Point Lookout Ss Mancos Sh	649 787 1117 1391 1541 2107 2772 3789 3963 4100			12 1/4	9 5/8" 40ppf J55 STC TOC @ surface 50% OH excess: 860 sks Lead 700 sks Tail 160 sks	Fresh Wtr 8.5-8.8	Vertical <1°	
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	KICK OFF PT Mancos Silt Gallup Top horz target Base Gallup	4250 4519 4778 5044 5119			8 1/2	5 1/2" 17ppf I/L80 LTC Running external swellable csg packers for isolation of prod string 200' overlap at liner top 4120' Lateral	Fresh Wtr in pilot 8.5-8.8 Switch to OBM at K/O 8.6-9.0 8.6-9.0 OBM	KOP 4250 10 deg/100' .25deg updip 5015'TVD TD = 9563' MD	

NOTES:

- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 13 3/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to 4100', 12 1/4" hole size
- 5) R&C 9 5/8" casing, circ cmt to surface
- 6) Drill 8 1/2" hole to KOP, switch to OBM
- 7) PU directional tools and start curve at 10deg/100' build rate
- 8) Land at 90deg, drill 4120' lateral to 9563', run 5 1/2" liner with external swellable csg packers



Boomerang Tube LLC

CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)	_____	5.500
Pipe Wall Thickness (ins)	_____	0.304
Nominal Weight Per Foot (lbs)	_____	17.00
Thread Name	_____	Long Thread CSG
Grade Name	_____	B-80
Pipe Minimum Yield (psi)	_____	80,000
Pipe Minimum Ultimate (psi)	_____	90,000
Coupling Minimum Yield (psi)	_____	80,000
Coupling Minimum Ultimate (psi)	_____	100,000
Coupling or Joint Outside Diameter (ins)	_____	6.050
Drift Diameter (ins)	_____	4.767
Plain End Weight per Foot (lbs)	_____	16.89
Joint Strength (lbs)	_____	320,000
Internal Yield (psi)	_____	7,740
Collapse Rating (psi)	_____	6,290

MAXIMUM DEPTH/LENGTH BASED ON MUD WTS & SAFETY FACTORS

Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	10,460
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,070
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,180

API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Coupling Thread Fracture Strength	_____	633,000
Pipe Thread Fracture Strength (lbs)	_____	320,000
Pipe Body Plain End Yield (lbs)	_____	397,000
Round Thread Pull-Out (lbs)	_____	335,000
Minimum Make-up Torque (ft-lbs)	_____	2,510
Nominal Make-up Torque (ft-lbs)	_____	3,350
Maximum Make-up Torque (ft-lbs)	_____	4,190
Coupling Internal Yield (psi)	_____	9,880
Pipe Body Internal Yield (psi)	_____	7,740
Leak @ E1 or E7 plane (psi)	_____	13,160
Pipe Hydrostatic Test Pressure @ 80 % SMYS	_____	7,100



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4250.0	0.00	0.00	4250.0	0.0	0.0	0.00	0.00	0.0	KOP @ 4250'
3	4529.2	27.92	9.24	4518.3	65.8	10.7	10.00	9.24	-10.1	
4	5442.8	90.40	270.00	5044.2	343.1	-544.1	10.36	-97.99	547.3	Landing Pt @ 5442' MD; 90.4°
5	9562.8	90.40	270.00	5015.4	343.1	-4664.0	0.00	0.00	4667.0	Escrito A31-2409 01H PBHL NEW TD at 9562.8

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle
649.0	649.0	Ojo Alamo Ss.	-0.40
787.0	787.0	Kirtland Shale	-0.40
1117.0	1117.0	Fruitland Coal	-0.40
1391.0	1391.0	Pictured Cliffs Ss.	-0.40
1541.0	1541.0	Lewis Shale	-0.40
2107.0	2107.0	Cliffhouse Ss.	-0.40
2772.0	2772.0	Menefee Fn.	-0.40
3789.0	3789.0	Point Lookout Ss.	-0.40
3963.0	3963.0	Mancos Shale	-0.40
4519.1	4530.1	Mancos Silt	-0.40
4777.7	4831.7	Gallup Fn.	-0.40

True Vertical Depth (1000 ft/in)

West(-)/East(+) (1000 ft/in)

Vertical Section at 270.54° (1000 ft/in)

CASING DETAILS

TVD	MD	Name	Size
500.0	500.0	13 3/8"	13.375
4100.0	4100.0	9 5/8"	9.625

Plan #1

Escrito A31-2409 01H
12xxx; LR
KB=13' @ 6877.0ft (Original Well Elev)
North American Datum 1983
Well Escrito A31-2409 01H, True North

Type	Target	Target	Origin	Type	N/S	E/W	From	TVD
Target	Escrito A31-2409 01H PBHL	Slot	Slot	Slot	0.0	0.0	0.0	0.0
Name	Escrito A31-2409 300' FEL	TVD	-5015.4	+N/-S	0.0	0.0	Latitude	-107.822210
	Escrito A31-2409 01H PBHL	5015.4	44.1	+E/-W	-4669.0	36.275130	Longitude	-107.838050
	Escrito A31-2409 01H PBHL NEW	5015.4	343.1		-4664.0	36.275951		-107.838033

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB	Local Co-ordinate Reference: Well Escrito A31-2409 01H	
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: KB=13' @ 6877.0ft (Original Well Elev)	
Project: San Juan Co, NM	MD Reference: KB=13' @ 6877.0ft (Original Well Elev)	
Site: S31-T24N-R9W	North Reference: True	
Well: Escrito A31-2409 01H	Survey Calculation Method: Minimum Curvature	
Wellbore: Hz		
Design: Plan #1		

Project: San Juan Co, 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: S31-T24N-R9W		
Site Position: Northing: 1,919,406.77 ft	Latitude: 36.275010	
From: Lat/Long Easting: 2,726,375.80 ft	Longitude: -107.822210	
Position Uncertainty: 0.0 ft	Slot Radius: 13.200 in	Grid Convergence: 0.01 °

Well: Escrito A31-2409 01H		
Well Position +N/-S 0.0 ft	Northing: 1,919,406.77 ft	Latitude: 36.275010
+E/-W 0.0 ft	Easting: 2,726,375.80 ft	Longitude: -107.822210
Position Uncertainty 0.0 ft	Wellhead Elevation: ft	Ground Level: 6,864.0 ft

Wellbore: Hz		
Magnetics: Model Name Sample Date Declination Dip Angle Field Strength		
	(°)	(°) (nT)
IGRF2010 5/14/2012 9.75 63.03 50,365		

Design: Plan #1		
Audit Notes:		
Version: Phase: PLAN Tie On Depth: 0.0		
Vertical Section: Depth From (TVD) +N/-S +E/-W Direction		
(ft) (ft) (ft) (°)		
0.0 0.0 0.0 270.54		

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 (°)
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00
4,250.0	0.00	0.00	4,250.0	0.0	0.0	0.00	0.00	0.00	0.00
4,529.2	27.92	9.24	4,518.3	65.8	10.7	10.00	10.00	0.00	9.24
5,442.8	90.40	270.00	5,044.2	343.1	-544.1	10.36	6.84	-10.86	-97.99
9,562.8	90.40	270.00	5,015.4	343.1	-4,664.0	0.00	0.00	0.00	0.00

Escrito A31-2409 01H

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Escrito A31-2409 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=13' @ 6877.0ft (Original Well Elev)
Project:	San Juan Co, NM	MD Reference:	KB=13' @ 6877.0ft (Original Well Elev)
Site:	S31-T24N-R9W	North Reference:	True
Well:	Escrito A31-2409 01H	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	Escrito A31-2409 300' FEL
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	13 3/8"
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
649.0	0.00	0.00	649.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
787.0	0.00	0.00	787.0	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	
1,117.0	0.00	0.00	1,117.0	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	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,391.0	0.00	0.00	1,391.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
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	
1,541.0	0.00	0.00	1,541.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
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	
2,107.0	0.00	0.00	2,107.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,772.0	0.00	0.00	2,772.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,789.0	0.00	0.00	3,789.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
3,963.0	0.00	0.00	3,963.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	9 5/8"
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan Co, NM
 Site: S31-T24N-R9W
 Well: Escrito A31-2409 01H
 Wellbore: Hz
 Design: Plan #1

Local Co-ordinate Reference: Well Escrito A31-2409 01H
 TVD Reference: KB=13' @ 6877.0ft (Original Well Elev)
 MD Reference: KB=13' @ 6877.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,250.0	0.00	0.00	4,250.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4250'
4,300.0	5.00	9.24	4,299.9	2.2	0.4	-0.3	10.00	10.00	
4,400.0	15.00	9.24	4,398.3	19.3	3.1	-3.0	10.00	10.00	
4,500.0	25.00	9.24	4,492.1	53.0	8.6	-8.1	10.00	10.00	
4,529.2	27.92	9.24	4,518.3	65.8	10.7	-10.1	10.00	10.00	
4,530.1	27.91	9.04	4,519.1	66.2	10.8	-10.2	10.36	-1.43	Mancos Silt
4,600.0	27.79	353.50	4,581.0	98.6	11.5	-10.6	10.36	-0.17	
4,700.0	30.51	332.86	4,668.5	144.5	-2.8	4.1	10.36	2.72	
4,800.0	35.87	316.58	4,752.3	188.5	-34.6	36.3	10.36	5.36	
4,831.7	37.95	312.36	4,777.7	201.8	-48.1	50.0	10.36	6.58	Gallup Fn.
4,900.0	42.89	304.51	4,829.7	229.2	-82.9	85.0	10.36	7.22	
5,000.0	50.86	295.42	4,898.1	265.2	-146.1	148.6	10.36	7.98	
5,100.0	59.40	288.24	4,955.3	295.4	-222.2	225.0	10.36	8.54	
5,200.0	68.27	282.25	4,999.3	318.8	-308.7	311.7	10.36	8.87	
5,300.0	77.32	276.97	5,028.9	334.6	-402.8	405.9	10.36	9.05	
5,400.0	86.47	272.06	5,043.0	342.3	-501.4	504.6	10.36	9.15	
5,442.8	90.40	270.00	5,044.2	343.1	-544.1	547.3	10.36	9.18	Landing Pt @ 5442' MD; 90.4°
5,500.0	90.40	270.00	5,043.8	343.1	-601.3	604.5	0.00	0.00	
5,600.0	90.40	270.00	5,043.1	343.1	-701.3	704.5	0.00	0.00	
5,700.0	90.40	270.00	5,042.4	343.1	-801.3	804.5	0.00	0.00	
5,800.0	90.40	270.00	5,041.7	343.1	-901.3	904.5	0.00	0.00	
5,900.0	90.40	270.00	5,041.0	343.1	-1,001.3	1,004.5	0.00	0.00	
6,000.0	90.40	270.00	5,040.3	343.1	-1,101.3	1,104.5	0.00	0.00	
6,100.0	90.40	270.00	5,039.6	343.1	-1,201.3	1,204.5	0.00	0.00	
6,200.0	90.40	270.00	5,038.9	343.1	-1,301.3	1,304.5	0.00	0.00	
6,300.0	90.40	270.00	5,038.2	343.1	-1,401.3	1,404.5	0.00	0.00	
6,400.0	90.40	270.00	5,037.5	343.1	-1,501.3	1,504.5	0.00	0.00	
6,500.0	90.40	270.00	5,036.8	343.1	-1,601.3	1,604.5	0.00	0.00	
6,600.0	90.40	270.00	5,036.1	343.1	-1,701.3	1,704.5	0.00	0.00	
6,700.0	90.40	270.00	5,035.4	343.1	-1,801.3	1,804.4	0.00	0.00	
6,800.0	90.40	270.00	5,034.7	343.1	-1,901.3	1,904.4	0.00	0.00	
6,900.0	90.40	270.00	5,034.0	343.1	-2,001.3	2,004.4	0.00	0.00	
7,000.0	90.40	270.00	5,033.3	343.1	-2,101.3	2,104.4	0.00	0.00	
7,100.0	90.40	270.00	5,032.6	343.1	-2,201.3	2,204.4	0.00	0.00	
7,200.0	90.40	270.00	5,031.9	343.1	-2,301.3	2,304.4	0.00	0.00	
7,300.0	90.40	270.00	5,031.2	343.1	-2,401.3	2,404.4	0.00	0.00	
7,400.0	90.40	270.00	5,030.5	343.1	-2,501.3	2,504.4	0.00	0.00	
7,500.0	90.40	270.00	5,029.8	343.1	-2,601.3	2,604.4	0.00	0.00	
7,600.0	90.40	270.00	5,029.1	343.1	-2,701.3	2,704.4	0.00	0.00	
7,700.0	90.40	270.00	5,028.4	343.1	-2,801.3	2,804.4	0.00	0.00	
7,800.0	90.40	270.00	5,027.7	343.1	-2,901.3	2,904.4	0.00	0.00	
7,900.0	90.40	270.00	5,027.0	343.1	-3,001.3	3,004.4	0.00	0.00	
8,000.0	90.40	270.00	5,026.3	343.1	-3,101.3	3,104.4	0.00	0.00	
8,100.0	90.40	270.00	5,025.6	343.1	-3,201.3	3,204.4	0.00	0.00	
8,200.0	90.40	270.00	5,024.9	343.1	-3,301.3	3,304.3	0.00	0.00	
8,300.0	90.40	270.00	5,024.2	343.1	-3,401.3	3,404.3	0.00	0.00	
8,400.0	90.40	270.00	5,023.5	343.1	-3,501.3	3,504.3	0.00	0.00	
8,500.0	90.40	270.00	5,022.8	343.1	-3,601.2	3,604.3	0.00	0.00	
8,600.0	90.40	270.00	5,022.1	343.1	-3,701.2	3,704.3	0.00	0.00	
8,700.0	90.40	270.00	5,021.4	343.1	-3,801.2	3,804.3	0.00	0.00	
8,800.0	90.40	270.00	5,020.7	343.1	-3,901.2	3,904.3	0.00	0.00	
8,900.0	90.40	270.00	5,020.0	343.1	-4,001.2	4,004.3	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: San Juan Co, NM
 Site: S31-T24N-R9W
 Well: Escrito A31-2409 01H
 Wellbore: Hz
 Design: Plan #1

Local Co-ordinate Reference: Well Escrito A31-2409 01H
 TVD Reference: KB=13' @ 6877.0ft (Original Well Elev)
 MD Reference: KB=13' @ 6877.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments/ Formations
9,000.0	90.40	270.00	5,019.3	343.1	-4,101.2	4,104.3	0.00	0.00	
9,100.0	90.40	270.00	5,018.6	343.1	-4,201.2	4,204.3	0.00	0.00	
9,200.0	90.40	270.00	5,017.9	343.1	-4,301.2	4,304.3	0.00	0.00	
9,300.0	90.40	270.00	5,017.2	343.1	-4,401.2	4,404.3	0.00	0.00	
9,400.0	90.40	270.00	5,016.5	343.1	-4,501.2	4,504.3	0.00	0.00	
9,500.0	90.40	270.00	5,015.8	343.1	-4,601.2	4,604.3	0.00	0.00	
9,562.8	90.40	270.00	5,015.4	343.1	-4,664.0	4,667.0	0.00	0.00	TD at 9562.8 - Escrito A31-2409 01H PBHL NE

Targets

Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Escrito A31-2409 300' FI	- plan misses target center by 5015.4ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)	0.00	0.00	-5,015.4	0.0	0.0	1,919,406.77	2,726,375.80	36.275010	-107.822210
- Polygon										
Point 1				-5,015.4	300.0	300.0	1,919,706.81	2,726,675.77		
Point 2				-5,015.4	-300.0	300.0	1,919,106.81	2,726,675.83		
Escrito A31-2409 01H PI	- plan hits target center	0.00	0.00	5,015.4	343.1	-4,664.0	1,919,749.34	2,721,711.76	36.275951	-107.838033
- Point										
Escrito A31-2409 01H PI	- plan misses target center by 299.1ft at 9562.8ft MD (5015.4 TVD, 343.1 N, -4664.0 E)	0.00	0.00	5,015.4	44.1	-4,669.0	1,919,450.30	2,721,706.84	36.275130	-107.838050
- Polygon										
Point 1				5,015.4	-300.0	-330.0	1,919,150.26	2,721,376.88		
Point 2				5,015.4	959.0	-330.0	1,920,409.26	2,721,376.73		
Point 3				5,015.4	959.0	300.0	1,920,409.33	2,722,006.73		
Point 4				5,015.4	959.0	-330.0	1,920,409.26	2,721,376.73		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.0	500.0	13 3/8"	13.375	13.375
4,100.0	4,100.0	9 5/8"	9.625	9.625

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Escrito A31-2409 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=13' @ 6877.0ft (Original Well Elev)
Project:	San Juan Co, NM	MD Reference:	KB=13' @ 6877.0ft (Original Well Elev)
Site:	S31-T24N-R9W	North Reference:	True
Well:	Escrito A31-2409 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
649.0	649.0	Ojo Alamo Ss.		-0.40	270.54	
787.0	787.0	Kirtland Shale		-0.40	270.54	
1,117.0	1,117.0	Fruitland Coal		-0.40	270.54	
1,391.0	1,391.0	Pictured Cliffs Ss.		-0.40	270.54	
1,541.0	1,541.0	Lewis Shale		-0.40	270.54	
2,107.0	2,107.0	Cliffhouse Ss.		-0.40	270.54	
2,772.0	2,772.0	Menefee Fn.		-0.40	270.54	
3,789.0	3,789.0	Point Lookout Ss.		-0.40	270.54	
3,963.0	3,963.0	Mancos Shale		-0.40	270.54	
4,530.1	4,519.0	Mancos Silt		-0.40	270.54	
4,831.7	4,778.0	Gallup Fn.		-0.40	270.54	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
4,250.0	4,250.0	0.0	0.0	KOP @ 4250'	
5,442.8	5,044.2	343.1	-544.1	Landing Pt @ 5442' MD; 90.4°	
9,562.8	5,015.4	343.1	-4,664.0	TD at 9562.8	

WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:

Escrito A31-2409 01H

13 5/8" 3K Rotating Head

13 5/8" 3K Double (Blind/Pipe)
Ram

3K Mud Cross 3" gate valves

