



Peterson Ridge Unit 2-10H

API No. 05-057-06524

SHL: 616' FNL 2,417' FEL (NW/4 NE/4)

BHL: ±600' FSL ±2,100' FWL (SE/4 SW/4)

Sec. 10 T8N R80W

Jackson County, Colorado

Surface: Fee

Surface Hole Mineral Lease: Fee

Through Mineral Lease: Fee

Through Federal Mineral Lease: COC65604

Bottom-Hole Mineral Lease: Fee

Peterson Ridge Federal Unit: COC75018X

Drilling Plan

Revised July 16, 2014

This Application for Permit to Drill (APD) was initially filed under the Notice of Staking (NOS) process as stated per Onshore Order No. 1 and supporting Bureau of Land Management (BLM) documents. The process was changed to the “APD” process per Onshore Order No. 1. This document was prepared using language and requirements consistent with those previously approved by BLM for nearby wells. This APD process will include an onsite meeting as determined by BLM, at which time the specific concerns of EE3 LLC (EE3) and BLM will be discussed. Best efforts have been made to address specific concerns of the BLM representatives.

Please contact who with Doug Sandridge at 303-444-8881 if there are any questions or concerns regarding this Drilling Program.

Surface Elevation: 8,122'
Surface Formation: Tertiary

1. ESTIMATED FORMATION TOPS

Formation	TVD (ft)	MD (ft)	Geology
Tertiary	0'	0'	
Midcoal	2,672'	2,672'	Sandstones
Suddeth Coal	3,452'	3,452'	Sandstones
Sussex	5,952'	5,952'	Sandstone, shale, siltstones
Shannon	6,252'	6,252'	Sandstones & siltstones

Kick Off – start of curve	7,419'	7,419'	
Niobrara	7,622'	7,626'	Shale, sandstone & limestone
Landing Point – end of curve	7,992'	8,319'	
Carlisle Shale	8,068'		Shale, sandstone & limestone
Total Depth	7,992'	11,884'	

2. ESTIMATED DEPTHS OF ANTICIPATED WATER, OIL, GAS, OR MINERAL BEARING

All fresh water and prospectively valuable minerals encountered during drilling will be recorded by depth and protected.

Formation	TVD (ft)	MD (ft)	Lithology
Tertiary	0'	0'	
Midcoal	2,672'	2,672'	Gas
Suddeth Coal	3,452'	3,452'	Gas
Sussex	5,952'	5,952'	
Shannon	6,252'	6,252'	
Kick Off – start of curve	7,419'	7,419'	
Niobrara	7,622'	7,626'	Oil / Gas
Landing Point – end of curve	7,992'	8,319'	
Carlisle Shale	8,068'		

NOTE: Kick Off & Landing Points may change based upon results of correlations in the vertical hole.

All shows of fresh water and hydrocarbons will be adequately protected and reported. Gas detection to be operational prior to drilling the Niobrara.

3. PRESSURE CONTROL EQUIPMENT:

All well control equipment shall be in accordance with Onshore Order #2 for 3M systems.

The minimum specifications for pressure control equipment that will be provided are included on the attached schematic diagram showing size and pressure ratings

3,000# BOP with 4-1/2" or 5" Pipe Rams
3,000# BOP with Blind Rams
3,000# Annular
Rotating Head

Auxiliary equipment to be used

- Upper kelly cock with the handle available
- Stabbing Valve

The choke manifold will include appropriate valves and adjustable chokes. The kill line will have one check valve.

Ram type preventers will be pressure tested to full working pressure (utilizing a tester and a test plug) at:

- initial installation
- whenever any seal subject to test pressure is broken
- following related repairs
- 30 day intervals

The annular preventer will be pressure tested to 50 percent of the rated working pressure.

All pressure tests shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer.

Annular preventers shall be functionally operated at least weekly.

Pipe and blind rams shall be activated each trip.

A BOPE pit level drill will be conducted weekly for each drilling crew.

All test and drills will be recorded in the drilling log.

The accumulator will have sufficient capacity to open the HCR valve, close all rams plus the annular preventer, and retain 200 psi above pre-charged pressure without the use of closing unit pumps. The system will have two independent power sources to close the preventers in accordance with 3M system requirements outlined in Onshore Order #2.

Remote controls shall be readily accessible to the driller Master controls shall be at the accumulator.

4. CASING PROGRAM:

The proposed casing program will be as follows:

Section	Measured Depth (ft)	Hole Size (in)	Size (in)	Grade	Weight (#/ft)	Thread	Condition
Surface	0-1,400	12-1/4	9-5/8	K-55	36.0	STC	New
Production	0-11,884	8-3/4	5-1/2	P-110	17.0	LTC	New

Design Criteria:

Size	Grade	Weight (lbs/ft)	Thread/ Coupling	Tension/ Joint Strength	Burst	Collapse
9-5/8"	K-55	36	ST&C	423,000	3,520	2,020
5-1/2"	P-110	20	LT&C	548,000	12,360	11,080

5. CEMENTING PROGRAM:

All casing strings below the conductor shall be pressure tested to 0.22 psi/ft. of casing string length or 1,500 psi, whichever is greater, but not to exceed 70% minimum internal yield.

The proposed cementing program will be as follows:

Surface String: Top of cement – surface

Estimated volume gauge hole + 100% excess

800 sx Class G + additives @ 1.16 ft³/sx

Top Out (if needed)

100 sx Class G + additives @ 1.16 ft³/sx

Production String:

Top of cement – Minimum 200' above Midcoal Fm.

Estimated volume gauge hole + 20% excess

(if open hole logs are run, caliper + 5% excess will be used)

Lead: 600 sx Class G + additives @ 2.40 ft³/sx

Tail: 1,200 sx Class G + additives @ 1.68 ft³/sx

After cementing, but before commencing any test, the casing string will stand cemented until cement has reached a compressive strength of 500 psi at the shoe. WOC times will be recorded in the driller's log.

6. DRILLING FLUIDS PROGRAM:

Interval (ft)	Type	Weight (ppg)	Viscosity	Ph	Water Loss (cc)	Remarks
Surface	Spud	8.4-9.0	40-60	8-10	NC	WBM – gel & lime
Production	LSND	9.0-9.8	40-50	8-10	<6	WBM – polymer system

NC = no control

Sufficient quantities of mud material will be maintained on site or be readily accessible for the purpose of assuring well control SPR will be recorded on daily drilling report after mudding up Electronic/mechanical mud monitoring equipment will be utilized and will include a pit volume totalizer (PVT), stroke counter, and flow sensor as a minimum.

7. EVALUATION PROGRAM:

Logs: (while drilling)	MWD-GR	Kick Off point to TD
OH Logs:	Vertical & Horizontal GR	
Cores:	None anticipated	
DST's	None anticipated	

8. ABNORMAL/GEOLOGIC CONDITIONS:

No anticipated abnormal pressures or temperatures expected to be encountered No hydrogen sulfide expected.

Anticipated bottom-hole pressure is approximately 3,660 psi (9.3 ppg EMW)

9. ADDITIONAL FACETS OF PROPOSED OPERATIONS:

The anticipated starting date and duration of the drilling and completion operations will be as follows:

Start Date: Upon Approval
Duration: 60 days

The well will be drilled from surface location to bottom-hole location per attached directional plan. The proposed well path should not pose any collision or interference concerns with any existing wells along its proposed path.

Footage at top of productive zone 600' FNL & 2,413' FEL, Sec 10 T8N R80W

A completion rig will be used for completion operations. All conditions of this approved plan will be applicable during all operations conducted with the completion rig.

To ensure maximum operational flexibility, EE3 LLC respectfully requests that the Commission approve a window around the HL with a tolerance of 200' in all directions.

EE3 LLC
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 Sec. 10 T8N R80W
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 Peterson Ridge Federal Unit: COC75018X

SURFACE CASING AND CENTRALIZER DESIGN

Proposed Total Depth:	7,992 ' TVD	11,884 ' - MD	
Proposed Depth of Surface Casing:	1,400 ' MD		
Estimated Pressure Gradient:	0.46 psi/ft		
Bottom Hole Pressure at	7,992 ' =		
0.46 psi/ft x 7,992 ' =	3,676 psi		
Hydrostatic Head of gas/oil mud:	0.22 psi/ft		
0.22 psi/ft x 7,992 ' =	1,758 psi		

Maximum Design Surface Pressure

Bottom Hole Pressure	-	Hydrostatic Head	=
(0.46 psi/ft x 7,992 ')	-	(0.22 psi/ft x 7,992 ')	=
3,676 psi	-	1,758 psi	= 1,918 psi

Casing Strengths 9-5/8" K-55 36# ST&C

Wt.	Tension (lbs)	Burst (psi)	Collapse (psi)
36 #	523,000	3,520	2,020

Safety Factors

Tension (Dry):	1.8	Burst: 1.0	Collapse: 1.125	
Tension (Dry):	36 # / ft x 1,400 ' =	50,400 #		
	Safety Factor =	$\frac{523,000}{50,400}$ =	10.38	ok
Burst:	Safety Factor =	$\frac{3,520 \text{ psi}}{1,918 \text{ psi}}$ =	1.84	ok
Collapse:	Hydrostatic =	0.052 x 9.0 ppg x 1,400 ' =	655 psi	
	Safety Factor =	$\frac{2,020 \text{ psi}}{655 \text{ psi}}$ =	3.08	ok

Use 1,400 ' 9-5/8" K-55 36# ST&C

Use 2,000 psi minimum casinghead and BOP's

Centralizers

8 Total
 1 near surface at 160'
 3 -1 each at middle of bottom joint, second joint, third joint
 4 -1 each at every other joint ±80' spacing
 Total centralized ± 600 ' (800 ' - 1,400 ')

Note that field experience indicates that additional centralizers greatly increase the chance of "sticking" the surface casing prior to reaching surface casing total depth.