

OCD-ARTESIA

FORM APPROVED  
OMB No. 1004-0136  
Expires July 31, 2010

EC

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

RECEIVED

JAN 19 2010

## APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.  
NMLC070175A

6. If Indian, Allottee or Tribe Name

7. If Unit or CA Agreement, Name and No.  
NMNM71016X

8. Lease Name and Well No.  
PLU PIERCE CANYON 12 FEDERAL 1H

9. API Well No.  
30015.37518

10. Field and Pool, or Exploratory  
WILDCAT, BONE SPRING

11. Sec., T., R., M., or Blk. and Survey or Area  
Sec 12 T24S R29E Mer NMP

12. County or Parish  
EDDY

13. State  
NM

17. Spacing Unit dedicated to this well  
200.00

20. BLM/BIA Bond No. on file  
NM2634

23. Estimated duration

1a. Type of Work. ☒ DRILL ☐ REENTER

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

2. Name of Operator  
CHESAPEAKE OPERATING, INC. E-Mail linda.good@chk.com

3a. Address  
P.O. BOX 18496  
OKLAHOMA CITY, OK 73154-0496

3b. Phone No. (include area code)  
Ph: 405-935-4275

4. Location of Well (Report location clearly and in accordance with any State requirements \*)  
At surface SESE 250FSL 217FEL  
At proposed prod. zone NWNE 330 250FNL 2310FEL

14. Distance in miles and direction from nearest town or post office\*  
APPROXIMATELY 28 MILES SE OF LOVING.

15. Distance from proposed location to nearest property or lease line, ft. (Also to nearest drig unit line, if any)

16. No. of Acres in Lease  
399.94

18. Distance from proposed location to nearest well, drilling, completed, applied for, on this lease, ft.

19. Proposed Depth  
12921 MD TVD 7940'  
12910' PLATTUE 8300'

21. Elevations (Show whether DF, KB, RT, GL, etc.)  
3116 GL

22. Approximate date work will start

## 24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall 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 shall 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 authorized officer.

25. Signature  
(Electronic Submission)

Name (Printed/Typed)  
LINDA GOOD Ph: 405-935-4275

Date  
12/11/2009

Title  
SR. REGULATORY COMPLIANCE SPEC

Approved by (Signature)  
/s/ Don Peterson

Name (Printed/Typed)  
/s/ Don Peterson

Date  
JAN 12 2010

Title  
FOR FIELD MANAGER

Office  
CARLSBAD FIELD OFFICE

Application approval does not warrant or certify 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.

APPROVAL FOR TWO YEARS

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.

## Additional Operator Remarks (see next page)

Electronic Submission #78754 verified by the BLM Well Information System  
For CHESAPEAKE OPERATING, INC., sent to the Carlsbad

SEE ATTACHED FOR  
CONDITIONS OF APPROVALAPPROVAL SUBJECT TO  
GENERAL REQUIREMENTS  
AND SPECIAL STIPULATIONS  
ATTACHED

Carlsbad Controlled Water Basin

\*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED

Additional Operator Remarks:

PLEASE STAMP THIS APD AS CONFIDENTIAL

CHESAPEAKE OPERATING, INC. RESPECTFULLY REQUESTS PERMISSION TO DRILL A WELL TO 12,921' TO TEST THE BONE SPRING FORMATION. IF PRODUCTIVE, CASING WILL BE RUN AND THE WELL COMPLETED. IF DRY, THE WELL WILL BE PLUGGED AND ABANDONED AS PER BLM AND NEW MEXICO OIL CONSERVATION DIVISION REQUIREMENTS

PLEASE FIND THE SURFACE USE PLAN AND DRILLING PROGRAM AS REQUIRED BY ONSHORE ORDER NO. 1.

ATTACHED ARE THE EXHIBIT A-1 TO A-4 SURVEY PLATS, EXHIBIT B 1 MILE RADIUS PLAT, EXHIBIT C PRODUCTION FACILITY, EXHIBIT D LATSHAW RIG #6 LAYOUT, EXHIBIT F-1 TO F-2 BOP & CHOKE MANIFOLD AND EXHIBIT G DIRECTIONAL DRILL PLAN

EXHIBIT E ARCHAEOLOGICAL SURVEY WILL BE DELIVERED TO THE BLM WHEN COMPLETED.

CHESAPEAKE OPERATING, INC. HAS AN AGREEMENT WITH THE SURFACE OWNER.

PLEASE BE ADVISED THAT CHESAPEAKE OPERATING, INC. IS ~~CONSIDERED TO BE THE OPERATOR OF THE ABOVE MENTIONED WELL~~. *Agent for BOPCO during drilling operations* CHESAPEAKE OPERATING, INC. AGREES TO BE RESPONSIBLE UNDER THE TERMS AND CONDITIONS OF THE LEASE FOR THE OPERATIONS CONDUCTED UPON THE LEASE LANDS.

(CHK PN 630487)

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240

DISTRICT II  
1901 W. Grand Avenue, Artesia, NM 88210

DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals and Natural Resources Department

**OIL CONSERVATION DIVISION**  
1220 South St. Francis Dr.  
Santa Fe, New Mexico 87505

Form C-102  
Revised October 15, 2009

Submit one copy to appropriate  
District Office

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

☐ AMENDED REPORT

API Number <b>30 015 3758</b>	Pool Code	Pool Name <b>Wildcat, Bone Spring</b>
Property Code <b>37499</b>	Property Name <b>PLU PIERCE CANYON "12" FEDERAL</b>	Well Number <b>1H</b>
OGRID No. <b>147179</b>	Operator Name <b>CHESAPEAKE OPERATING CO.</b>	Elevation <b>3116'</b>

**Surface Location**

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	12	24 S	29 E		250	SOUTH	217	EAST	EDDY

**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
B	12	24 S	29 E		330	NORTH	2310	EAST	EDDY

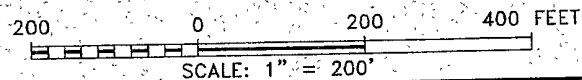
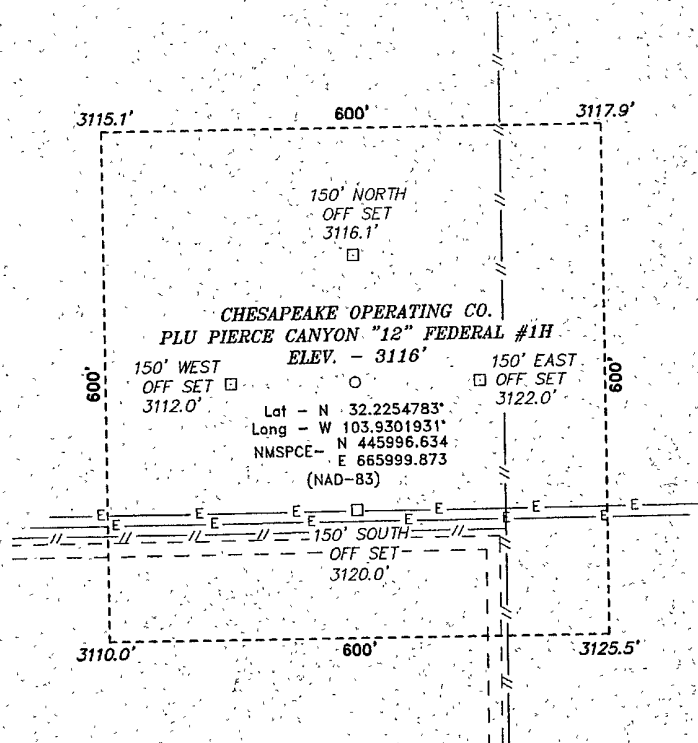
Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
200			

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

<p><b>PROPOSED BOTTOM HOLE LOCATION</b> Lat - N 32.2384833° Long - W 103.9369750° NMSPC - E 663885.209 (NAD-83)</p> <p><b>Project Area</b></p> <p><b>Producing Area</b></p> <p><b>Penetration Point</b></p> <p><b>SURFACE LOCATION</b> Lat - N 32.2254783° Long - W 103.9301931° NMSPC - E 665999.873 (NAD-83)</p>	<p><b>OPERATOR CERTIFICATION</b></p> <p>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.</p> <p><i>Bryan Arrant</i> 12/02/2009 Signature Date</p> <p><b>Bryan Arrant</b> Printed Name</p> <p><b>SURVEYOR CERTIFICATION</b></p> <p>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.</p> <p>NOVEMBER 26, 2009 Date Surveyed Signature &amp; Seal of Professional Surveyor W. L. JONES Certificate No. Gary L. Jones 7977 BASIN SURVEYS</p>
--	---

EXHIBIT A-1

SECTION 12, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.



Directions to Location:

FROM THE JUNCTION OF RAWHIDE AND GALAVAN, GO  
SOUTHWEST 1.5 MILES TO LEASE ROAD, ON LEASE  
ROAD GO WEST 1.0 MILES TO LEASE ROAD, ON  
LEASE ROAD GO SOUTH WINDING SOUTHWESTERLY 0.8  
MILES TO LEASE ROAD, ON LEASE ROAD GO  
SOUTHEAST 0.5 MILES TO PROPOSED LOCATION.

**BASIN SURVEYS** P.O. BOX 1786 - HOBBS, NEW MEXICO

W.O. Number: 21972 Drawn By: J. SMALL

Date: 11-23-2009 Disk: JMS 21972

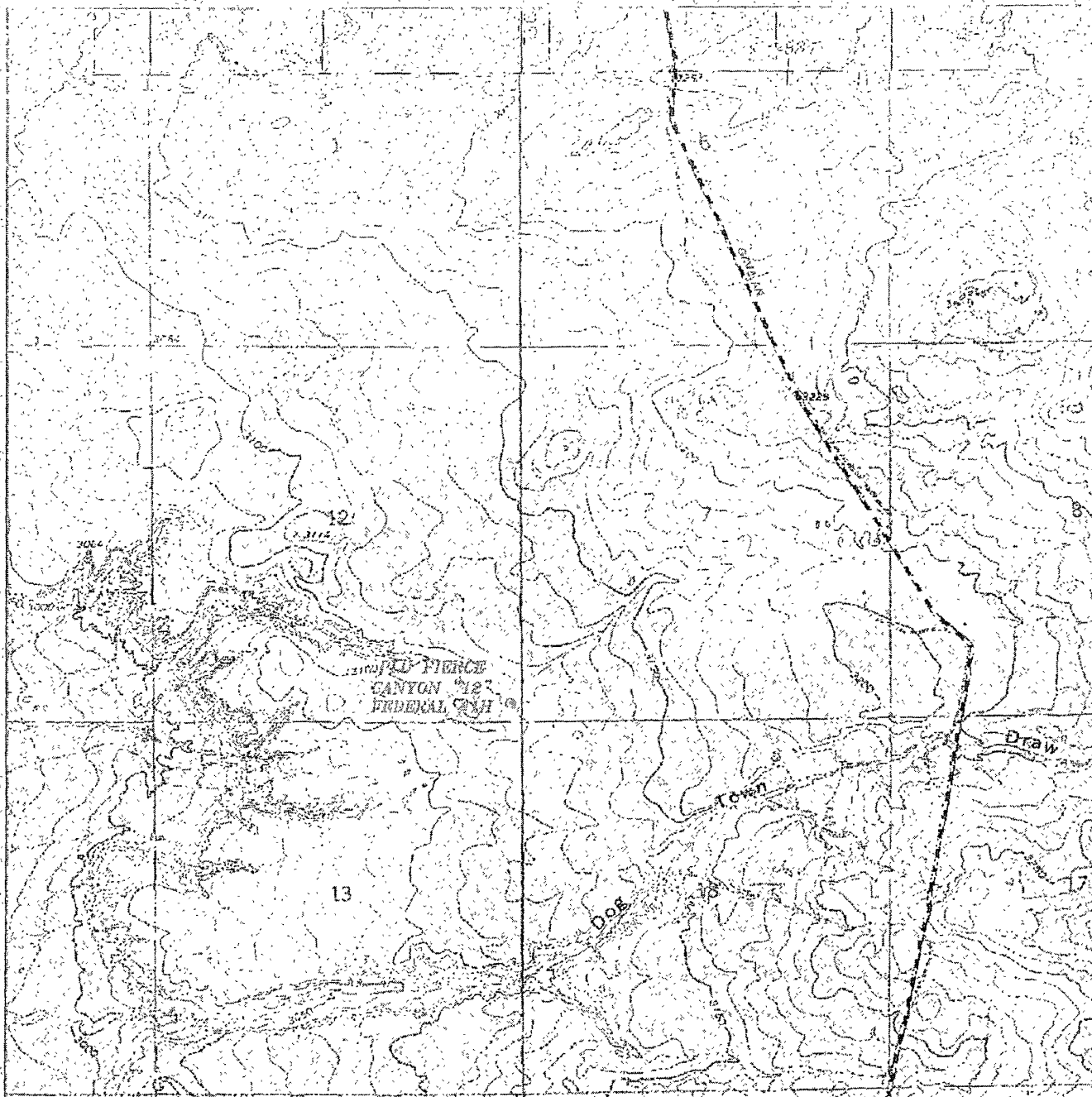
**CHESAPEAKE OPERATING CO.**

REF: PLU PIERCE CANYON #12 FEDERAL #1H / WELL PAD TOPO

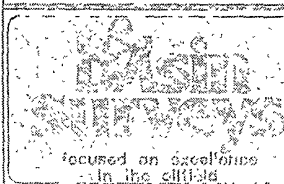
THE PLU PIERCE CANYON #12 FEDERAL #1H LOCATED 250'  
FROM THE SOUTH LINE AND 217' FROM THE EAST LINE OF  
SECTION 12, TOWNSHIP 24 SOUTH, RANGE 29 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO.

Survey Date: 11-20-2009 Sheet 1 of 1 Sheets

EXHIBIT A-2



PLU PIERCE CANYON "12" FEDERAL #10  
 Located 250' FSL and 217' FEL  
 Section 12, Township 24 South, Range 29 East,  
 N.M.P.M., Eddy County, New Mexico.



P.O. Box 1786  
 1120 N. West County Rd.  
 Hobbs, New Mexico 88241  
 (575) 393-7316 - Office  
 (575) 392-2206 - Fax  
 talaincurveys.com

W.O. Number: JMS 21072

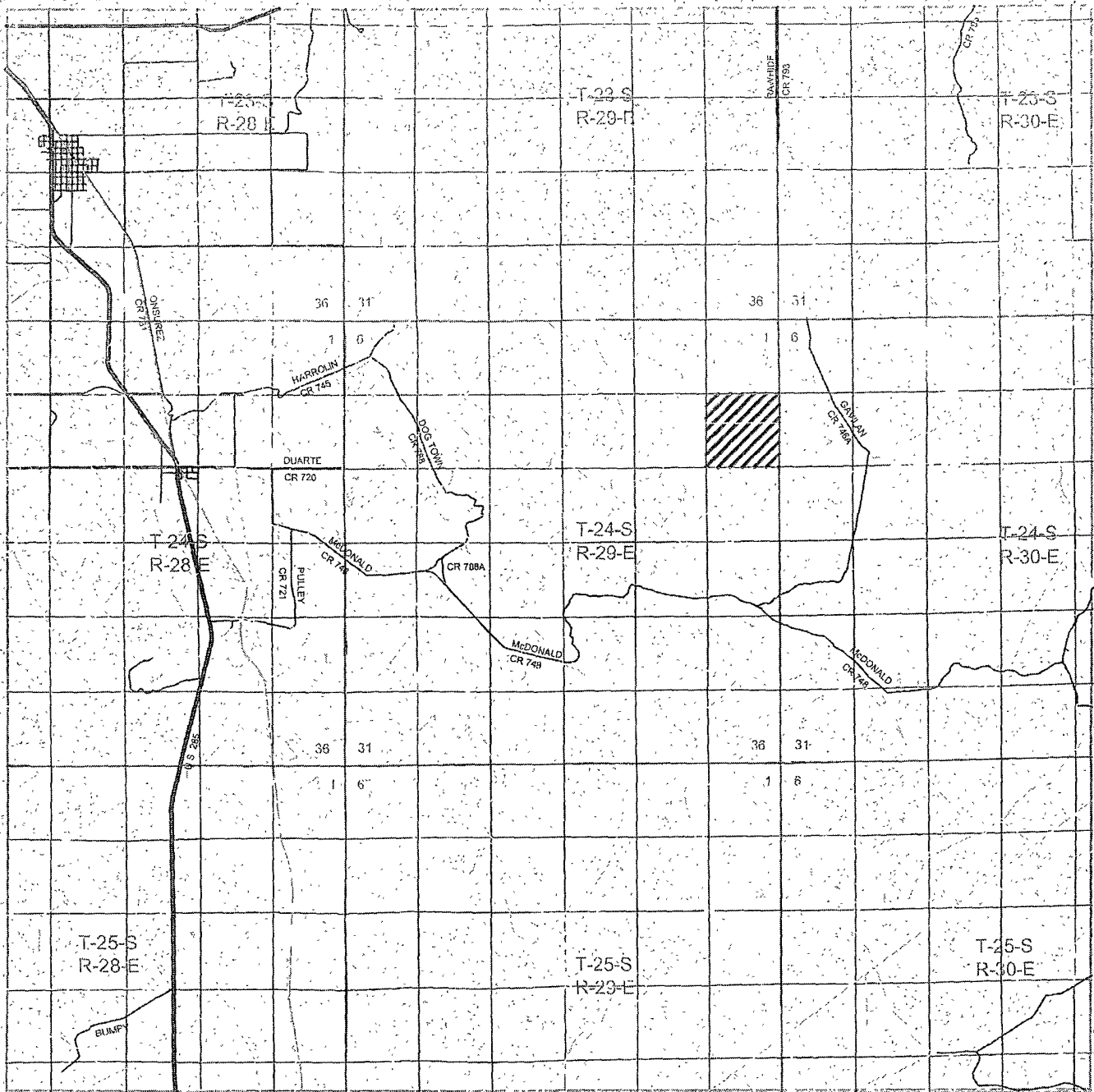
Survey Date: 11-20-2009

Scale: 1" = 2000'

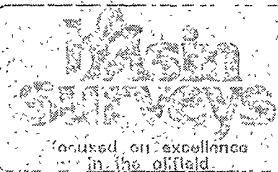
Date: 11-23-2009

CHESAPEAKE  
 OPERATING CO.

EXHIBIT A-3



PLU PIERCE CANYON "12" FEDERAL #1H  
 Located 250' FSL and 217' FEL  
 Section 12, Township 24 South, Range 29 East,  
 N.M.P.M., Eddy County, New Mexico.



P.O. Box 1786  
 1120 N. West County Rd.  
 Hobbs, New Mexico 88241  
 (575) 393-7316 - Office  
 (575) 392-2206 - Fax  
 businessurveys.com

W.O. Number: JWS 21972  
 Survey Date: 11-20-2009  
 Scale: 1" = 2 Miles  
 Date: 11-23, 2009

CHESAPEAKE  
 OPERATING CO.

EXHIBIT A-4

PLU PIERCE CANYON "12" FEDERAL #1H  
Located 250' FSL and 217' FEL  
Section 12, Township 24 South, Range 29 East,  
N.M.P.M., Eddy County, New Mexico.

	P.O. Box 1786 1120 N. West County Rd. Hobbs, New Mexico 88241 (575) 393-7316 - Office (575) 392-2296 - Fax ba@insurcys.com	W.O. Number: JMS 21977	CL	<b>CHESAPEAKE OPERATING CO.</b>
	focused on excellence in the oilfield	Scale: 1" = 2000'		

EXHIB. A-5

12-14-09  
per [signature]  
330'  
ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 288' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, New Mexico

**CONFIDENTIAL – TIGHT HOLE  
DRILLING PLAN**

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 1

**ONSHORE OIL & GAS ORDER NO. 1  
Approval of Operations on Onshore  
Federal and Indian Oil and Gas Leases**

All lease and/or unit operations are to be conducted in such a manner that full compliance is made with the applicable laws, regulations (CFR 43, Part 3160) and the approved Application for Permit to Drill. The operator is considered fully responsible for the actions of his subcontractors. A copy of the approved APD must be on location during construction, drilling and completion operations.

Approval of this application 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.

**1. FORMATION TOPS**

The estimated tops of important geologic markers are as follows:

<b>Formation</b>	<b>Subsea KBTVD</b>	<b>KBTVD</b>
BASE OF SALT	-220'	3,356'
BELL CANYON	-269'	3,405'
CHERRY CANYON MARKER	-1,265'	4,401'
BRUSHY CANYON	-2,723'	5,859'
LOWER BRUSHY CANYON	-3,713'	6,849'
BONE SPRING	-3,975'	7,111'
1 <sup>st</sup> BONE SPRING SAND	-4,974'	8,110'
PILOT HOLE	TD	8,300'

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

The estimated depths at which the top and bottom of the anticipated water, oil, gas or other mineral bearing formations are expected to be encountered are as follows:

<b>Substance</b>	<b>Formation</b>	<b>Depth</b>
Oil/Gas	Bell Canyon	4,207'
Oil/Gas	Cherry Canyon	5,107'
Oil/Gas	Brushy Canyon	6,172'
Oil/Gas	Bone Spring	7,838'

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

12-14-09 *AK*  
*pls Sign*  
*Good*  
*330*  
ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 356' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, New Mexico  
3. BOP EQUIPMENT:

CONFIDENTIAL – TIGHT HOLE  
DRILLING PLAN

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 2

Will have a 5000 psi rig stack (see proposed schematic) for drill out below surface casing; this system will be tested to 5000 psi working pressure and 3500 psi working pressure for the annular preventer.

Chesapeake Operating, Inc.'s minimum specifications for pressure control equipment are as follows:

I. BOP, Annular, Choke Manifold, Pressure Test - See Exhibit F-1 to F-2.

A. Equipment

1. The equipment to be tested includes all of the following that is installed on the well:
  - (a) Ram-type and annular preventers,
  - (b) Choke manifolds and valves,
  - (c) Kill lines and valves, and
  - (d) Upper and lower kelly cock valves, inside BOP's and safety valves.

B. Test Frequency

1. All tests should be performed with clear water.
  - (a) when installed,
  - (b) before drilling out each casing string,
  - (c) at any time that there is a repair requiring a pressure seal to be broken in the assembly, and
  - (d) at least once every 30 days while drilling.

C. Test Pressure

1. In some drilling operations, the pressures to be used for low and high-pressure testing of preventers and casing may be different from those given below due to governmental regulations, or approved local practices.
2. If an individual component does not test at the low pressure, **do not**, test to the high pressure and then drop back down to the low pressure.
3. All valves located downstream of a valve being tested must be placed in the open position.
4. All equipment will be tested with an initial "low pressure" test at 250 psi.
5. The subsequent "high pressure" test will be conducted at the rated working pressure of the equipment for all equipment except the annular preventer.
6. The "high pressure" test for the annular preventer will be conducted at 70% of the rated working pressure.
7. A record of all pressures will be made on a pressure-recording chart.

D. Test Duration

ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 300' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, New Mexico

CONFIDENTIAL - TIGHT HOLE  
DRILLING PLAN

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 3

1. In each case, the individual components should be monitored for leaks for 10 minutes, with no observable pressure decline, once the test pressure as been applied.

II. Accumulator Performance Test

A. Scope

1. The purpose of this test is to check the capabilities of the BOP control systems, and to detect deficiencies in the hydraulic oil volume and recharge time.

B. Test Frequency

1. The accumulator is to be tested each time the BOP's are tested, or any time a major repair is performed.

C. Minimum Requirements

1. The accumulator should be of sufficient volume to supply 1.5 times the volume to close and hold all BOP equipment in sequence, without recharging and the pump turned off, and have remaining pressures of 200 PSI above the precharge pressure.

2. Minimum precharge pressures for the various accumulator systems per manufacturers recommended specifications are as follows:

<u>System Operating Pressures</u>	<u>Precharge Pressure</u>
1500 PSI	750 PSI
2000 PSI	1,000 PSI
3000 PSI	1,000 PSI

3. Closing times for the Hydril should be less than 20 seconds, and for the ram-type preventers less than 10 seconds.

4. System Recharge time should not exceed 10 minutes.

D. Test Procedure

1. Shut accumulator pumps off and record accumulator pressure.
2. In sequence, close the annular and one set of properly sized pipe rams, and open the HCR valve.
3. Record time to close or open each element and the remaining accumulator pressure after each operation.
4. Record the remaining accumulator pressure at the end of the test sequence. Per

ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 350' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, New Mexico  
pressures:

CONFIDENTIAL – TIGHT HOLE  
DRILLING PLAN

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 4

System Pressure

1,500 PSI  
2,000 PSI  
3,000 PSI

Remaining Pressure At Conclusion of

Test  
950 PSI  
1,200 PSI  
1,200 PSI

5. Turn the accumulator pumps on and record the recharge time. This time should not exceed **10 minutes**.

6. Open annular and ram-type preventers. Close HCR valve.

7. Place all 4-way control valves in **full open** or **full closed** position. **Do not leave in neutral position**.

4. CASING PROGRAM

a. The proposed casing program will be as follows:

<u>Purpose</u>	<u>Interval</u>	<u>Hole Size</u>	<u>Casing Size</u>	<u>Weight</u>	<u>Grade</u>	<u>Thread</u>	<u>Condition</u>
Surface	Surface – 700'	17-1/2"	13-3/8"	48.0#	H-40	STC	New
Intermediate	Surface – 3375'	12-1/4"	9-5/8"	40.0#	J-55	LTC	New
Production	Surface – 12,910'	8-3/4"	5-1/2"	20.0#	L-80	LTC	New

b. Casing design subject to revision based on geologic conditions encountered.

c. Casing Safety Factors:

13-3/8" Surface Casing: SFb = 1.7, SFc = 1.66 and SFt = 2.49  
9-5/8" Intermediate Casing: SFb = 3.2, SFc = 2.63 and SFt = 2.42  
5-1/2" Production Casing: SFb = 1.84, SFc = 2.26 and SFt = 1.76

d. The cementing program will be as follows:

5. Cementing Program

ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 350' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, New Mexico

CONFIDENTIAL - TIGHT HOLE  
DRILLING PLAN

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 5

Interval	Type	Amount	Yield	Top Of Cement	Excess
Surface	Tail: Class C 1% CaCl <sub>2</sub> (Accelerator)	735 sks	1.34	Surface	100%
Intermediate	Lead: 35/65 Poz/Class C	900 sks	2.0	Surface	100%
	Tail: Class C	300 sks	1.34		100%
Production 1 <sup>st</sup> Stage	Class H DV Tool 4200'	1925 sks	1.6	4,200	40%
Production 2 <sup>nd</sup> Stage	ECONOCEM™ SYSTEM	195 sks	2.63	2,875	50%

Final cement volumes will be determined by caliper.

Surface casing shall have at least one centralizer installed on each of the bottom three joints starting with the shoe joint.

Pilot Hole Plugging Plan:

The pilot hole will be plugged back with one cement plug. The plug will serve as kick off plug. Note: objective formation is Bone Spring. Pilot Hole will TD in the Bone Spring so no isolation plug is needed.

See — The plug will be placed from +7,250' to 7,750' (+/-200' above to 300' below kick off  
COA point, 305 sx, 40% excess, Class H 17.5 ppg, 0.96yld + 0.75% CFR-3 + 3% KCL + 0.2% HR-800).

6. MUD PROGRAM

a. The proposed circulating mediums to be used in drilling are as follows:

Interval	Mud Type	Mud Weight	Viscosity	Fluid Loss
0' - 700'	FW/Gel	8.4 - 8.7	32-34	NC
700' - 3,375'	Brine	9.9 - 10.1	28-30	NC
3,375' - 7,460'	FW/Cut Brine	8.4 - 8.5	28-29	NC
7,460'-TD	FW/Cut Brine	8.8-9.5	34-38	10-25

A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill. Sanitary wastes will be contained in a chemical porta-toilet and then hauled to an approved sanitary landfill.

61A  
330'  
ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 300' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, New Mexico

CONFIDENTIAL - TIGHT HOLE  
DRILLING PLAN

SL: Lease No. NMNM 005912  
BL: Lease No. NMMLC 070175A

Page 3

All fluids and cuttings will be disposed of in accordance with New Mexico Oil Conservation Division rules and regulations.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

7. TESTING, LOGGING AND CORING

The anticipated type and amount of testing, logging and coring are as follows:

- See  
COA
- a. Drill stem tests are not planned.
  - b. The logging program will consist of Natural GR, Density-Neutron, PE & Dual Laterolog from pilot hole TD to surface casing; Neutron-GR surface casing to surface. GR in lateral.
  - c. Cores samples are not planned.

8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

- a. The estimated bottom hole pressure is 3700 psi.
- b. No abnormal pressures or temperatures are anticipated.

**Permian District**  
**NM - Eddy - Morrow Project**  
**PLU Pierce Canyon 12 Fed 1H**  
**PLU Pierce Canyon 12 Fed 1H**  
**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**07 December, 2009**

**EXHIBIT** 6

# Chesapeake Operating

## Planning Report

<b>Database:</b> Drilling Database <b>Company:</b> Permian District <b>Project:</b> NM - Eddy - Morrow Project <b>Site:</b> PLU Pierce Canyon 12 Fed 1H <b>Well:</b> PLU Pierce Canyon 12 Fed 1H <b>Wellbore:</b> Wellbore #1 <b>Design:</b> Design #1	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	<b>Site PLU Pierce Canyon 12 Fed 1H</b> Default Datum @ 0 0ft Default Datum @ 0 0ft True Minimum Curvature
--	--	--

<b>Project</b>	NM - Eddy - Morrow Project	<b>System Datum:</b>	Ground Level
<b>Map System:</b>	US State Plane 1927 (Exact solution)		
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

<b>Site</b>	PLU Pierce Canyon 12 Fed 1H		
<b>Site Position:</b>	<b>Northing:</b>	135,935.54 m	<b>Latitude:</b> 32° 13' 31.722 N
<b>From:</b>	<b>Easting:</b>	190,398.27 m	<b>Longitude:</b> 103° 55' 48.695 W
<b>Position Uncertainty:</b>	<b>Slot Radius:</b>	0 000 in	<b>Grid Convergence:</b> 0.21 °

<b>Well</b>	PLU Pierce Canyon 12 Fed 1H		
<b>Well Position</b>	<b>+N/-S</b>	0 0 ft	<b>Northing:</b> 135,935.54 m
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b> 190,398.27 m
<b>Position Uncertainty</b>		0 0 ft	<b>Wellhead Elevation:</b> ft
			<b>Ground Level:</b> 0.0 ft

<b>Wellbore</b>	Wellbore #1		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>
	IGRF2005	12/7/2009	7 94
			<b>Dip Angle</b> 60.14
			<b>Field Strength</b> 48,707

<b>Design</b>	Design #1		
<b>Audit Notes:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b> 0.0
<b>Version:</b>			
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>Direction</b>
	(ft)	(ft)	(°)
	0 0	0 0	336 10

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(ft)	(ft)	Rate	Rate	Rate	(°)	
(ft)			(ft)			(°/100ft)	(°/100ft)	(°/100ft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
7,462.5	0 00	0.00	7,462.5	0 0	0.0	0.00	0 00	0 00	0.00	
8,212.5	90.00	336.10	7,940.0	436.5	-193.5	12.00	12.00	0.00	336.10	
12,909.9	90.00	336.10	7,940.0	4,731.0	-2,096.9	0.00	0.00	0.00	0.00	0.00 Lateral TD

# Chesapeake Operating Planning Report

Database: Drilling Database  
Company: Permian District  
Project: NM - Eddy - Morrow Project  
Site: PLU Pierce Canyon 12 Fed 1H  
Well: PLU Pierce Canyon 12 Fed 1H  
Wellbore: Wellbore #1  
Design: Design #1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Site PLU Pierce Canyon 12 Fed 1H  
Default Datum @ 0.0ft  
Default Datum @ 0.0ft  
True  
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)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>13 3/8" Surface Casing</b>									
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,375.0	0.00	0.00	3,375.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>9 5/8" Intermediate Casing</b>									
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00

# Chesapeake Operating

## Planning Report

Database: Drilling Database  
 Company: Permian District  
 Project: NM - Eddy- Morrow Project  
 Site: PLU Pierce Canyon 12 Fed 1H  
 Well: PLU Pierce Canyon 12 Fed 1H  
 Wellbore: Wellbore #1  
 Design: Design #1

Local Co-ordinate Reference: Site PLU Pierce Canyon 12 Fed 1H  
 TVD Reference: Default Datum @ 0.0ft  
 MD Reference: Default Datum @ 0.0ft  
 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)	Turn Rate (°/100ft)
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,462.5	0.00	0.00	7,462.5	0.0	0.0	0.0	0.00	0.00	0.00
7,475.0	1.50	336.10	7,475.0	0.1	-0.1	0.2	12.00	12.00	0.00
7,500.0	4.50	336.10	7,500.0	1.3	-0.6	1.5	12.00	12.00	0.00
7,525.0	7.50	336.10	7,524.8	3.7	-1.7	4.1	12.00	12.00	0.00
7,550.0	10.50	336.10	7,548.5	7.3	-3.2	8.0	12.00	12.00	0.00
7,575.0	13.50	336.10	7,574.0	12.1	-5.3	13.2	12.00	12.00	0.00
7,600.0	16.50	336.10	7,598.1	18.0	-8.0	19.7	12.00	12.00	0.00
7,625.0	19.50	336.10	7,621.9	25.0	-11.1	27.4	12.00	12.00	0.00
7,650.0	22.50	336.10	7,645.2	33.2	-14.7	36.3	12.00	12.00	0.00
7,675.0	25.50	336.10	7,668.1	42.5	-18.8	46.5	12.00	12.00	0.00
7,700.0	28.50	336.10	7,690.3	52.9	-23.4	57.8	12.00	12.00	0.00
7,725.0	31.50	336.10	7,712.0	64.3	-28.5	70.3	12.00	12.00	0.00
7,750.0	34.50	336.10	7,732.9	76.8	-34.0	84.0	12.00	12.00	0.00
7,775.0	37.50	336.10	7,753.2	90.2	-40.0	98.6	12.00	12.00	0.00
7,800.0	40.50	336.10	7,772.6	104.6	-46.3	114.4	12.00	12.00	0.00
7,825.0	43.50	336.10	7,791.2	119.9	-53.1	131.1	12.00	12.00	0.00
7,850.0	46.50	336.10	7,808.9	136.0	-60.3	148.8	12.00	12.00	0.00
7,875.0	49.50	336.10	7,825.6	153.0	-67.8	167.3	12.00	12.00	0.00
7,900.0	52.50	336.10	7,841.3	170.8	-75.7	186.8	12.00	12.00	0.00
7,925.0	55.50	336.10	7,856.0	189.2	-83.9	207.0	12.00	12.00	0.00
7,950.0	58.50	336.10	7,869.6	208.4	-92.4	228.0	12.00	12.00	0.00
7,975.0	61.50	336.10	7,882.1	228.2	-101.1	249.6	12.00	12.00	0.00
8,000.0	64.50	336.10	7,893.5	248.6	-110.2	271.9	12.00	12.00	0.00
8,025.0	67.50	336.10	7,903.6	269.4	-119.4	294.7	12.00	12.00	0.00
8,050.0	70.50	336.10	7,912.6	290.8	-128.9	318.1	12.00	12.00	0.00
8,075.0	73.50	336.10	7,920.3	312.5	-138.5	341.8	12.00	12.00	0.00
8,100.0	76.50	336.10	7,926.8	334.6	-148.3	366.0	12.00	12.00	0.00
8,125.0	79.50	336.10	7,932.0	356.9	-158.2	390.4	12.00	12.00	0.00
8,150.0	82.50	336.10	7,935.9	379.5	-168.2	415.1	12.00	12.00	0.00

# Chesapeake Operating Planning Report

Database: Drilling Database  
Company: Permian District  
Project: NM - Eddy - Morrow Project  
Site: PLU Pierce Canyon 12 Fed 1H  
Well: PLU Pierce Canyon 12 Fed 1H  
Wellbore: Wellbore #1  
Design: Design #1

Local Co-ordinate Reference: Site PLU Pierce Canyon 12 Fed 1H  
TVD Reference: Default Datum @ 0.0ft  
MD Reference: Default Datum @ 0.0ft  
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)	Turn Rate (°/100ft)
8,175.0	85.50	336.10	7,938.5	402.2	-178.3	440.0	12.00	12.00	0.00
8,200.0	88.50	336.10	7,939.8	425.1	-188.4	464.9	12.00	12.00	0.00
8,212.5	90.00	336.10	7,940.0	436.5	-193.5	477.5	12.00	12.00	0.00
8,300.0	90.00	336.10	7,940.0	516.5	-228.9	564.9	0.00	0.00	0.00
8,400.0	90.00	336.10	7,940.0	607.9	-269.4	664.9	0.00	0.00	0.00
8,500.0	90.00	336.10	7,940.0	699.3	-310.0	764.9	0.00	0.00	0.00
8,600.0	90.00	336.10	7,940.0	790.7	-350.5	864.9	0.00	0.00	0.00
8,700.0	90.00	336.10	7,940.0	882.2	-391.0	964.9	0.00	0.00	0.00
8,800.0	90.00	336.10	7,940.0	973.6	-431.5	1,064.9	0.00	0.00	0.00
8,900.0	90.00	336.10	7,940.0	1,065.0	-472.0	1,164.9	0.00	0.00	0.00
9,000.0	90.00	336.10	7,940.0	1,156.4	-512.6	1,264.9	0.00	0.00	0.00
9,100.0	90.00	336.10	7,940.0	1,247.8	-553.1	1,364.9	0.00	0.00	0.00
9,200.0	90.00	336.10	7,940.0	1,339.3	-593.6	1,464.9	0.00	0.00	0.00
9,300.0	90.00	336.10	7,940.0	1,430.7	-634.1	1,564.9	0.00	0.00	0.00
9,400.0	90.00	336.10	7,940.0	1,522.1	-674.7	1,664.9	0.00	0.00	0.00
9,500.0	90.00	336.10	7,940.0	1,613.5	-715.2	1,764.9	0.00	0.00	0.00
9,600.0	90.00	336.10	7,940.0	1,705.0	-755.7	1,864.9	0.00	0.00	0.00
9,700.0	90.00	336.10	7,940.0	1,796.4	-796.2	1,964.9	0.00	0.00	0.00
9,800.0	90.00	336.10	7,940.0	1,887.8	-836.7	2,064.9	0.00	0.00	0.00
9,900.0	90.00	336.10	7,940.0	1,979.2	-877.3	2,164.9	0.00	0.00	0.00
10,000.0	90.00	336.10	7,940.0	2,070.6	-917.8	2,264.9	0.00	0.00	0.00
10,100.0	90.00	336.10	7,940.0	2,162.1	-958.3	2,364.9	0.00	0.00	0.00
10,200.0	90.00	336.10	7,940.0	2,253.5	-998.8	2,464.9	0.00	0.00	0.00
10,300.0	90.00	336.10	7,940.0	2,344.9	-1,039.3	2,564.9	0.00	0.00	0.00
10,400.0	90.00	336.10	7,940.0	2,436.3	-1,079.9	2,664.9	0.00	0.00	0.00
10,500.0	90.00	336.10	7,940.0	2,527.8	-1,120.4	2,764.9	0.00	0.00	0.00
10,600.0	90.00	336.10	7,940.0	2,619.2	-1,160.9	2,864.9	0.00	0.00	0.00
10,700.0	90.00	336.10	7,940.0	2,710.6	-1,201.4	2,964.9	0.00	0.00	0.00
10,800.0	90.00	336.10	7,940.0	2,802.0	-1,242.0	3,064.9	0.00	0.00	0.00
10,900.0	90.00	336.10	7,940.0	2,893.4	-1,282.5	3,164.9	0.00	0.00	0.00
11,000.0	90.00	336.10	7,940.0	2,984.9	-1,323.0	3,264.9	0.00	0.00	0.00
11,100.0	90.00	336.10	7,940.0	3,076.3	-1,363.5	3,364.9	0.00	0.00	0.00
11,200.0	90.00	336.10	7,940.0	3,167.7	-1,404.0	3,464.9	0.00	0.00	0.00
11,300.0	90.00	336.10	7,940.0	3,259.1	-1,444.6	3,564.9	0.00	0.00	0.00
11,400.0	90.00	336.10	7,940.0	3,350.6	-1,485.1	3,664.9	0.00	0.00	0.00
11,500.0	90.00	336.10	7,940.0	3,442.0	-1,525.6	3,764.9	0.00	0.00	0.00
11,600.0	90.00	336.10	7,940.0	3,533.4	-1,566.1	3,864.9	0.00	0.00	0.00
11,700.0	90.00	336.10	7,940.0	3,624.8	-1,606.6	3,964.9	0.00	0.00	0.00
11,800.0	90.00	336.10	7,940.0	3,716.2	-1,647.2	4,064.9	0.00	0.00	0.00
11,900.0	90.00	336.10	7,940.0	3,807.7	-1,687.7	4,164.9	0.00	0.00	0.00
12,000.0	90.00	336.10	7,940.0	3,899.1	-1,728.2	4,264.9	0.00	0.00	0.00
12,100.0	90.00	336.10	7,940.0	3,990.5	-1,768.7	4,364.9	0.00	0.00	0.00
12,200.0	90.00	336.10	7,940.0	4,081.9	-1,809.3	4,464.9	0.00	0.00	0.00
12,300.0	90.00	336.10	7,940.0	4,173.4	-1,849.8	4,564.9	0.00	0.00	0.00
12,400.0	90.00	336.10	7,940.0	4,264.8	-1,890.3	4,664.9	0.00	0.00	0.00
12,500.0	90.00	336.10	7,940.0	4,356.2	-1,930.8	4,764.9	0.00	0.00	0.00
12,600.0	90.00	336.10	7,940.0	4,447.6	-1,971.3	4,864.9	0.00	0.00	0.00
12,700.0	90.00	336.10	7,940.0	4,539.0	-2,011.9	4,964.9	0.00	0.00	0.00
12,800.0	90.00	336.10	7,940.0	4,630.5	-2,052.4	5,064.9	0.00	0.00	0.00
12,909.9	90.00	336.10	7,940.0	4,731.0	-2,096.9	5,174.9	0.00	0.00	0.00

# Chesapeake Operating

## Planning Report

Database: Drilling Database  
 Company: Permian District  
 Project: NM - Eddy - Morrow Project  
 Site: PLU Pierce Canyon 12 Fed 1H  
 Well: PLU Pierce Canyon 12 Fed 1H  
 Wellbore: Wellbore #1  
 Design: Design #1

Local Co-ordinate Reference: Site PLU Pierce Canyon 12 Fed 1H  
 TVD Reference: Default Datum @ 0.0ft  
 MD Reference: Default Datum @ 0.0ft  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature

### Targets

Target Name	hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape		(°)	(°)	(ft)	(ft)	(ft)	(m)	(m)		
Pilot Hole TD		0.00	0.00	8,300.0	-443,835.6	-626,335.3	0.00	0.00	30° 59' 24.512 N	105° 55' 44.137 W
	- plan misses target center by 767534.5ft at 7462.5ft MD (7462.5 TVD, 0.0 N, 0.0 E)									
	- Point									
Lateral TD		0.00	0.00	7,940.0	4,731.0	-2,096.9	137,375.14	189,753.72	32° 14' 18.540 N	103° 56' 13.110 W
	- plan hits target center									
	- Point									

### Casing Points

Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(ft)	(ft)		(in)	(in)
700.0	700.0	13 3/8" Surface Casing	13.375	17.500
3,375.0	3,375.0	9 5/8" Intermediate Casing	9.625	12.250
12,909.9	7,940.0	5 1/2" Production Casing	5.500	8.750

The site plan illustrates the layout of the proposed wellhead facility, centered around a SUBSTRUCTURE. Key components and dimensions are as follows:

- Dimensions:** The overall site is 330' wide and 275' deep. The SUBSTRUCTURE is 180' wide and 175' deep. The distance from the SUBSTRUCTURE to the DERRICK STAND is 150'.
- Equipment Layout:**
  - Solids Control Equipment (above steel tanks):** Located at the top of the plan.
  - Steel Tanks:** Four tanks are arranged in two rows above the SUBSTRUCTURE.
  - PUMP:** Two pumps are located between the steel tanks and the SUBSTRUCTURE.
  - Trip Tank:** Located to the right of the pumps.
  - BRAKE WATER COOLER:** Located to the right of the pumps.
  - SER:** Located to the left of the SUBSTRUCTURE.
  - FUEL:** Located to the left of the SER.
  - CEMENT:** Three cement storage areas are located to the left of the SER.
  - CHANGE HOUSE:** Located to the left of the SUBSTRUCTURE.
  - WATER:** Located to the left of the SUBSTRUCTURE.
  - ACCUMULATOR:** Located to the right of the SUBSTRUCTURE.
  - LINE SPOOL:** Located to the right of the SUBSTRUCTURE.
  - DERRICK STAND:** Located to the right of the SUBSTRUCTURE.
  - Flare Tank:** Located to the right of the SUBSTRUCTURE.
  - Flare Line:** A line connecting the Flare Tank to the Choke manifold.
  - Choke manifold:** Located to the right of the SUBSTRUCTURE.
- Orientation:** A compass rose indicates North (N) is towards the top right, South (S) is towards the bottom left, East (E) is towards the bottom right, and West (W) is towards the top left.
- Notes:** A note states: "Flare line discharge will be 100' from well head".

LATSHAW #6

Exhibit D



# BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

WELL : PLU Pierce Canyon 12 Federal 1 H

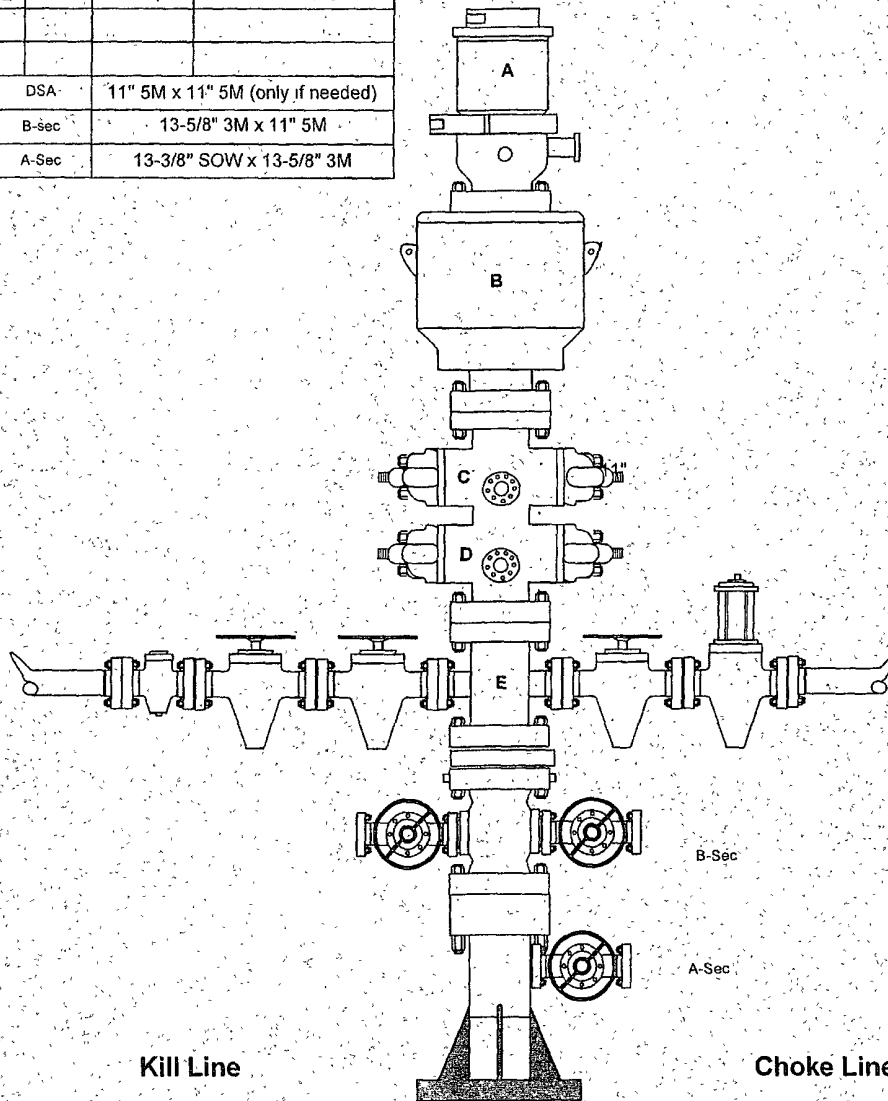
RIG Latshaw 6

COUNTY : Eddy

STATE: New Mexico

OPERATION: Drilled below 13-3/8 and 9-5/8" Casing (12-1/4" and 8-3/4" hole sizes, respectively)

	SIZE	PRESSURE	DESCRIPTION
A	11"	500 psi	Rot Head
B	11"	5000 psi	Annular
C	11"	5000 psi	Pipe Rams
D	11"	5000 psi	Blind Rams
E	11"	5000 psi	Mud Cross
DSA	11" 5M x 11" 5M (only if needed)		
B-Sec	13-5/8" 3M x 11" 5M		
A-Sec	13-3/8" SOW x 13-5/8" 3M		



SIZE	PRESSURE	DESCRIPTION
2"	5000 psi	Check Valve
2"	5000 psi	Gate Valve
2"	5000 psi	Gate Valve

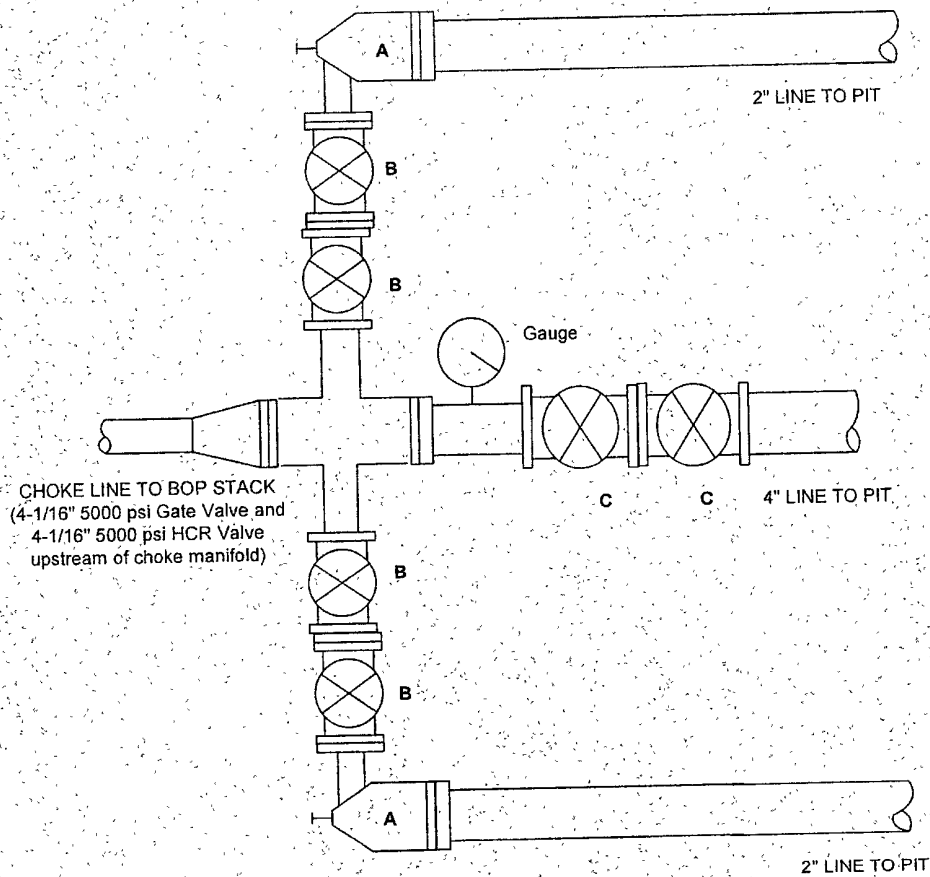
SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

EXHIBIT F-1

# CHOKE MANIFOLD SCHEMATIC

## CHESAPEAKE OPERATING, INC.

WELL : PLU Pierce Canyon 12 Federal1 H  
 RIG : Latshaw 6  
 COUNTY : Eddy STATE : New Mexico  
 OPERATION: Drilling below/beyond 13-3/8" surface casing



	SIZE	PRESSURE	DESCRIPTION
A	2-1/16"	5000 psi	Remotely Operated Choke with Manual Backup
B	2-1/16"	5000 psi	Gate Valve
C	4-1/16"	5000 psi	Gate Valve

EXHIBIT F-2

*for Lease 12-14-09 3301*  
ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 380' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, NM

CONFIDENTIAL – TIGHT HOLE  
SURFACE USE PLAN

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 1

ONSHORE OIL & GAS ORDER NO. 1  
Approval of Operations on Onshore  
Federal and Indian Oil and Gas Leases

1. EXISTING ROADS

- a. Existing county and lease roads will be used to enter proposed access road.
- b. Location, access, and vicinity plats attached hereto. See Exhibits A-1 to A-4.

LOCATION

- a. In order to level the location, cut and fill will be required. Please see attached Well Location and Acreage Dedication Plat – Exhibits A-1 to A-4.
- b. A locking gate will be installed at the site entrance.
- c. Any fences cut will be repaired. Cattle guards will be installed, if needed.
- d. Surface disturbance and vehicular travel will be limited to the approved location and approved access route. Any additional area needed will be approved in advance.
- e. Driving directions are from the junction of Rawhide and Galavan, go Southwest 1.5 miles to lease road, on lease road go West 1.0 miles to lease road, on lease road go South winding Southwesterly 0.8 miles to lease road, on lease road go Southeast 0.5 miles to proposed location.

2. LOCATION OF EXISTING WELLS WITHIN A 1-MILE RADIUS OF THE PROPOSED LOCATION – see Exhibit B.

3. LOCATION OF PRODUCTION FACILITIES

It is anticipated that production facilities will be located on the well pad and oil to be sold at the wellhead and/or tank battery. An allocation meter will be installed on location and we will lay the gas lines from our location to the Southern Union sales meter. – See Exhibit C

4. LOCATION AND TYPE OF WATER SUPPLY

Water will be obtained from a private water source. Chesapeake Operating, Inc. will ensure all proper notifications and filings are made with the state.

330' 330'  
ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 250' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, NM

CONFIDENTIAL – TIGHT HOLE  
SURFACE USE PLAN

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 2

5. CONSTRUCTION MATERIALS

No construction materials will be used from Section 12-24S-29E. All material (i.e. shale) will be acquired from private or commercial sources.

6. METHODS FOR HANDLING WASTE DISPOSAL

A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill.

7. ANCILLARY FACILITIES

None

8. WELLSITE LAYOUT

The proposed site layout plat is attached showing the Latshaw Rig #6 orientation and equipment location. See Exhibit D.

9. PLANS FOR RECLAMATION OF THE SURFACE

The location will be restored to as near as original condition as possible. Reclamation of the surface shall be done in strict compliance with the existing New Mexico Oil Conservation Division regulations.

Backfilling leveling, and contouring are planned as soon as the drilling rig and steel tanks are removed. Wastes and spoils materials will be buried immediately after drilling is completed. If production is obtained, the unused area will be restored as soon as possible. The rehabilitation will begin after the drilling rig is removed.

Interim Reclamation: downsize the footprint of disturbance by reclaiming portions of the well pad not needed for production operations. The portions of the cleared well pad not needed for operational and safety purposes will be recontoured back to natural surroundings as much as possible. Caliche material will be used either to recontour or will be used to repair roads within the lease. Topsoil material will be spread out over reclaimed area and the site will be seeded with an approved BLM grass mix. In order to inspect and operate the well or complete work over operations, it may be necessary to drive, park, and operate on restored, interim vegetation as long as the damage is repaired or reclaimed after work is complete. In most cases the BLM wants these well pads pulled in to within 30 feet of the well anchors unless layout won't allow or a safety issues is in place.

61  
330'  
ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 350' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, NM

**CONFIDENTIAL – TIGHT HOLE  
SURFACE USE PLAN**

SL: Lease No: NMNM 005912  
BL: Lease No: NMLC 070175A

Page 3

11. SURFACE & MINERAL OWNERSHIP

United States of America  
Department of Interior  
Bureau of Land Management

GRAZING LESSEE

Tyson Mahaffey  
P.O. Box 161  
Loving, NM 88256

**(Chesapeake Operating, Inc. has an agreement with the grazing lessee)**

12. ADDITIONAL INFORMATION

A Class III cultural resource inventory report was prepared by Boone Archaeological Services, Carlsbad, New Mexico for the proposed location. A copy of the report has been sent to the BLM office under separate cover and is also attached for reference. See Exhibit E.

**Chesapeake Operating, Inc. agrees to be responsible under the terms and conditions of the lease for the operations conducted upon the lease lands.**

ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 330' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, NM

**CONFIDENTIAL – TIGHT HOLE  
SURFACE USE PLAN**

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

Page 4

13. OPERATOR'S REPRESENTATIVES

**Drilling and Completion Operations**

**District Manager**

Rob Jones  
P.O. Box 18496  
Oklahoma City, OK 73154  
405-935-2694 (Office)  
405-623-5880 (Cell)  
[rob.jones@chk.com](mailto:rob.jones@chk.com)

**Sr. Drilling Engineer**

Yemi Aijolaiya  
P.O. Box 14896  
Oklahoma City, OK 73154  
405-935-6802 (Office)  
405-625-5468 (Cell)  
[yemi.ajiolaiya@chk.com](mailto:yemi.ajiolaiya@chk.com)

**Sr. Field Representative**

Bud Cravey  
2010 Rankin Hwy  
Midland, TX  
432-687-2992, x 86151 (Office)  
432-575-238-7293 (Cell)  
[bud.cravey@chk.com](mailto:bud.cravey@chk.com)

**Sr. Asset Manager**

Jeff Finnell  
P.O. Box 18496  
Oklahoma City, OK 73154  
405-935-4347 (Office)  
405-919-3305 (Cell)  
[jeff.finnell@chk.com](mailto:jeff.finnell@chk.com)

**Sr. Geologist**

Robert Martin  
P.O. Box 18496  
Oklahoma City, OK 73154  
405-935-4985 (Office)  
405-849-4985 (Cell)  
[robert.martin@chk.com](mailto:robert.martin@chk.com)

**Geoscience Coordinator**

David Godsey  
P.O. Box 14896  
Oklahoma City, OK 73154  
405-935-7995 (Office)  
405-618-0474 (Cell)  
[david.godsey@chk.com](mailto:david.godsey@chk.com)

**District Land Coordinator**

Craig Barnard  
P.O. Box 18496  
Oklahoma City, OK 73154  
405-879-8401 (Office)  
[craig.barnard@chk.com](mailto:craig.barnard@chk.com)

**Associate Landman**

Justin Zerkle  
P.O. Box 18496  
Oklahoma City, OK 73154  
405-767-4925 Office  
[justin.zerkle@chk.com](mailto:justin.zerkle@chk.com)

**Sr. Regulatory Compliance Specialist**

Linda Good  
P.O. Box 18496  
Oklahoma City, OK 73154  
405-935-4275 (Office)  
405-849-4275 (Fax)  
[linda.good@chk.com](mailto:linda.good@chk.com)

ONSHORE ORDER NO. 1  
Chesapeake Operating, Inc.  
PLU Pierce Canyon 12 Federal 1H  
SL: 250' FSL & 217' FEL  
BL: 250' FNL & 2310' FEL  
Section 12-24S-29E  
Eddy County, NM

CONFIDENTIAL - TIGHT HOLE  
OPERATOR CERTIFICATION

SL: Lease No. NMNM 005912  
BL: Lease No. NMLC 070175A

CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and, that the work associated with the operations proposed will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

Executed this 11<sup>th</sup> day of December, 2009

Name: 

Christian Combs, Manager - Regulatory, Southern Division

Address: P.O. Box 18496, Oklahoma City, OK 73154-0496

Telephone: 405-935-4703

Sr. Field Representative: Bud Cravey

Telephone: 432-238-7293

E-mail: bud.cravey@chk.com

# PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CHESAPEAKE OPERATING INC
LEASE NO.:	LC070175A
WELL NAME & NO.:	PLU PIERCE CANYON 12 FEDERAL 1H
SURFACE HOLE FOOTAGE:	250' FSL & 217' FEL
BOTTOM HOLE FOOTAGE:	330' FNL & 2310' FEL
LOCATION:	Section 12, T. 24 S., R 29 E., NMPM
COUNTY:	Eddy County, New Mexico

## TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☐ **Special Requirements**

- ☒ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads

- ☐ **Road Section Diagram**

- ☒ **Drilling**
  - Medium cave/karst

- ☐ **Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
  - Electric Lines

- ☐ **Reserve Pit Closure/Interim Reclamation**
- ☐ **Final Abandonment/Reclamation**

## **I. GENERAL PROVISIONS**

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## **II. PERMIT EXPIRATION**

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## **III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES**

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## **IV. NOXIOUS WEEDS**

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## **V. SPECIAL REQUIREMENT(S)**

## **VI. CONSTRUCTION**

### **A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

### **B. TOPSOIL**

The operator shall stockpile the topsoil of the well pad. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

#### **Closed Loop System**

Closed Loop System- V- Door East

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

### **C. FEDERAL MINERAL MATERIALS PIT**

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the Carlsbad Field Office at (575) 234-5972.

### **D. WELL PAD SURFACING**

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

## **E. ON LEASE ACCESS ROADS**

### **Road Width**

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

### **Surfacing**

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

### **Crowning**

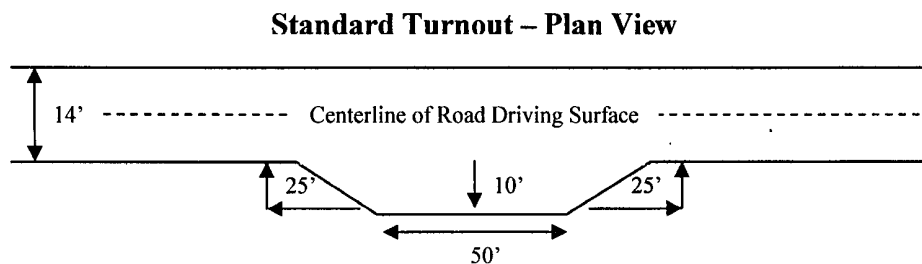
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

### **Ditching**

Ditching shall be required on both sides of the road.

### **Turnouts**

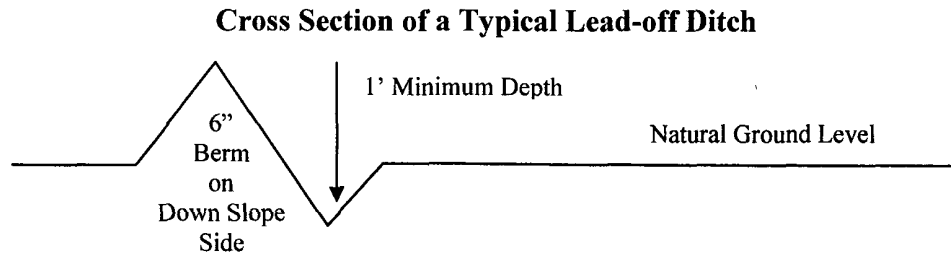
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:



## Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outslowing and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

### Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

## Culvert Installations

Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

## Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for

the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

A gate shall be constructed and fastened securely to H-braces.

**Fence Requirement**

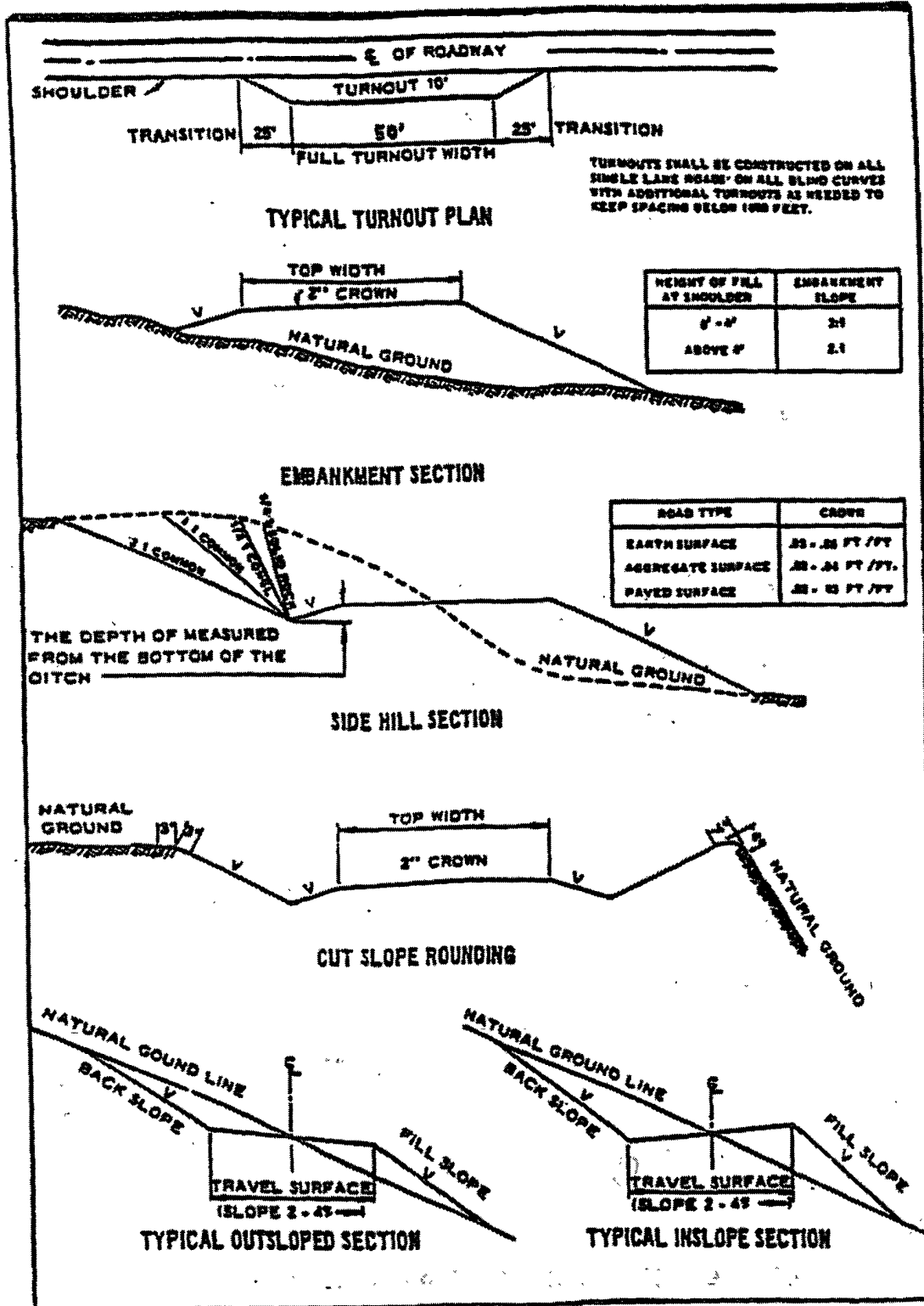
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

**Public Access**

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Figure 1 – Cross Sections and Plans For Typical Road Sections



## VII. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822

1. **Although Hydrogen Sulfide has not been reported in this section, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the CAL/GR/N well log run from TD to surface will be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

### B. CASING

**Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.**

**Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**

**Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.**

**No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.**

**Medium cave/karst.**

**Possible lost circulation in the Delaware and Bone Spring formations.**

- 1. The 13-3/8 inch surface casing shall be set at approximately 700 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. If the salt is encountered at a shallower depth, the casing must be set 25 feet above the top of the salt.**
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement.**
  - b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.**
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.**

**Formation below the 13-3/8" shoe to be tested according to Onshore Order**

**2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

- 2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:**

- ☒ **Cement to surface. If cement does not circulate see B.1.a, c-d above. Casing to be set in the Lamar Limestone or the Fletcher Anhydrite. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst concerns.**

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.

Pilot hole plugging procedure approved as written. Tag depth to be reported on subsequent sundry with spud/casing details.

Centralizers required on horizontal leg, must be type for horizontal service and minimum of one every other joint.

3. The minimum required fill of cement behind the 5-1/2 inch production casing is:
  - a. First stage to DV tool, cement shall:
    - ☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office, before proceeding with second stage cement job.
  - b. Second stage above DV tool, cement shall:
    - ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.
4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

#### **C. PRESSURE CONTROL**

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi. 5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. Casing cut-off and BOP installation will not be initiated until the cement has had 4-6 hours of setup time in a water basin and 12 hours in the potash areas. This time will start after the cement plug is bumped. Testing the BOP/BOPE against a plug can commence after meeting the above conditions plus the BOP installation time.
  - b. The tests shall be done by an independent service company utilizing a test plug.
  - c. The results of the test shall be reported to the appropriate BLM office.
  - d. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
  - e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

#### **D. DRILL STEM TEST**

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

**RGH 010510**

### **VIII. PRODUCTION (POST DRILLING)**

#### **A. WELL STRUCTURES & FACILITIES**

##### **Placement of Production Facilities**

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

##### **Containment Structures**

The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

##### **Painting Requirement**

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color Shale Green, Munsell Soil Color Chart # 5Y 4/2

**B. PIPELINES**

**C. ELECTRIC LINES**

**IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE**

**A. INTERIM RECLAMATION**

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

The operators should work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

**Seed Mixture 2, for Sandy Sites**

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)\* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed\* per acre:

<u>Species</u>	<u>lb/acre</u>
Sand dropseed ( <i>Sporobolus cryptandrus</i> )	1.0
Sand love grass ( <i>Eragrostis trichodes</i> )	1.0
Plains bristlegrass ( <i>Setaria macrostachya</i> )	2.0

\*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed  
(Insert Seed Mixture Here)

## **X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS**

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.