

OCD-ARTESIA

Form 3160-3
(August 2007)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 20105 Lease Serial No.
NMLC068431

6 If Indian, Allottee or Tribe Name

7 If Unit or CA Agreement, Name and No.
NMNM71016X8. Lease Name and Well No.
PLU Pierce Canyon 21-24-30 USA 1H [38970]

9 API Well No.

10 Field and Pool, or Exploratory
WILDCAT; BONE SPRING [9778]11. Sec., T. R. M. or Blk. and Survey or Area
21-24S-30E12 County or Parish
EDDY13 State
NM1a. Type of work: ☒ DRILL☐ REENTER1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone

2. Name of Operator CHESAPEAKE AGENT FOR BOPCO ATTN: LINDA GOOD

3a. Address P.O. BOX 18496
OKLAHOMA CITY, OK 73154-04963b Phone No. (include area code)
405-935-4275

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

At surface 130 FNL & 1940 FEL, NWNE

At proposed prod. zone 350 FSL 1980 FEL, SWSE

14. Distance in miles and direction from nearest town or post office*
APPROX. 30 MILES EAST OF LOVING.15 Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
130' North from Sec 16 State Line.16. No. of acres in lease
2480.840 ACRES17 Spacing Unit dedicated to this well
160 ACRES18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
Approx. 1850' South SW of proposed location.19 Proposed Depth
12,709' MD / 8078' TVD
No Pilot Hole20 BLM/BIA Bond No. on file
ESB00015921 Elevations (Show whether DF, KDB, RT, GL, etc.)
3353' GL22 Approximate date work will start*
01/15/201223. 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:

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

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

25 Signature

*Linda Good*Name (Printed/Typed)
Linda Good

Date

Revised
11/16/2011

Title

Sr. Regulatory Compliance Specialist

Approved by (Signature)

/s/ Don Peterson

Name (Printed/Typed)

Date

DEC 12 2011

Title

FIELD MANAGER

Office

CARLSBAD FIELD OFFICE

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.

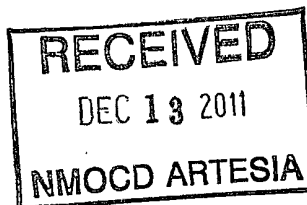
APPROVAL FOR TWO YEARS

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.

(Continued on page 2)

*(Instructions on page 2)

Carlsbad Controlled Water Basin

Approval Subject to General Requirements
& Special Stipulations AttachedSEE ATTACHED FOR
CONDITIONS OF APPROVAL

Additional Operator Remarks:

NO PILOT HOLE.

Chesapeake Operating, Inc. respectfully requests permission to drill a well to 12,709' 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 Plan 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-1 to C-3, Production facility, Exhibit D Generic Rig layout, Exhibit E Frac Pond Plat, Exhibit F-1 to F-2 BOP & Choke Manifold and Exhibit G Directional Drill Plan.

Archeological Survey will be delivered to the BLM when completed.

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

Please be advised that Chesapeake Operating, Inc. is the Designated Agent for BOPCO, the Operator of this unit. 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 639974)

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
DISTRICT II
1501 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

Form C-102
Revised July 18, 2010

Submit one copy to appropriate
District Office

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

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-39768	Pool Code 97798	Pool Name WILDCAT G-06S243026M; BONE SPRING
Property Code 38970	Property Name PLU PIERCE CANYON 21 24 30 USA	Well Number 1H
OGRID No. 147179	Operator Name CHESAPEAKE OPERATING CO.	Elevation 3353'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	21	24 S	30 E		130	NORTH	1940	EAST	EDDY

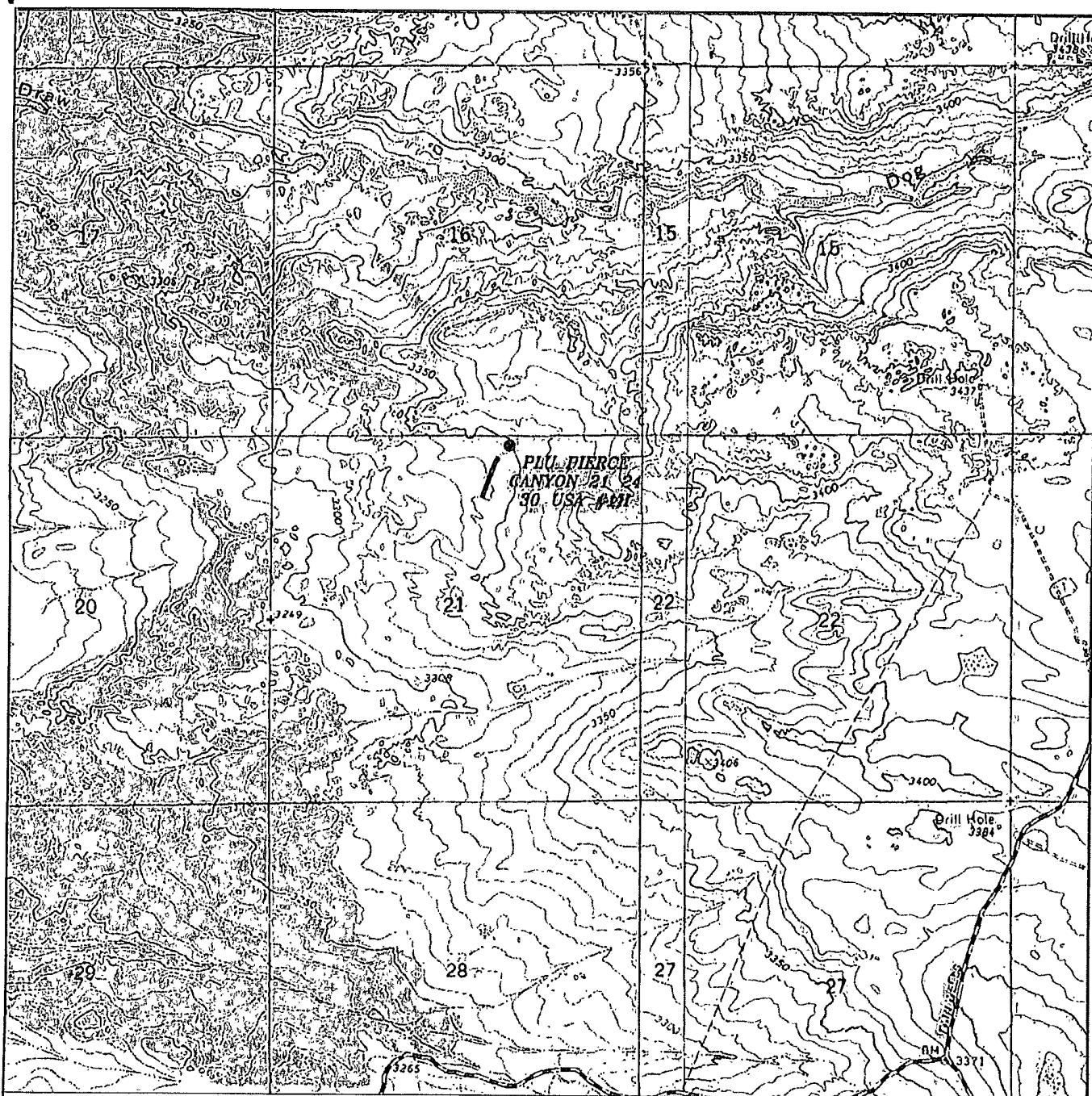
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	21	24 S	30 E		350	SOUTH	1980	EAST	EDDY
Dedicated Acres 160	Joint or Infill	Consolidation Code	Order No.						

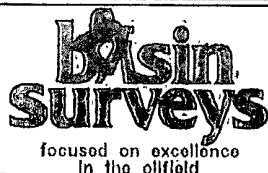
NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p>Penetration Point & SURFACE LOCATION Lat - N 32.21012306' Long - W 103.8838613' NMSPC- N 440467.503 E 680350.408 (NAD-83)</p>	<p>PROPOSED BOTTOM HOLE LOCATION Lat - N 32.19693526' Long - W 103.8839916' NMSPC- N 435669.814 E 680330.149 (NAD-83)</p>	<p>OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest, or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Bryan Arrant</i> 7/28/2011 Signature Date Bryan Arrant Printed Name bryan.arrant@chk.com Email Address</p> <p>SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief.</p> <p><i>GARY L. JONES</i> Date Surveyed Signature & Seal of Professional Surveyor Certificate No. Gary L. Jones 7977 BASIN SURVEYS 24812</p>
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EXHIBIT A-1



PLU PIERCE CANYON 21 24 30 USA #1H
 Located 130' FNL and 1940' FEL
 Section 21, Township 24 South, Range 30 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
 basinsurveys.com

W.O. Number: JMS 24812

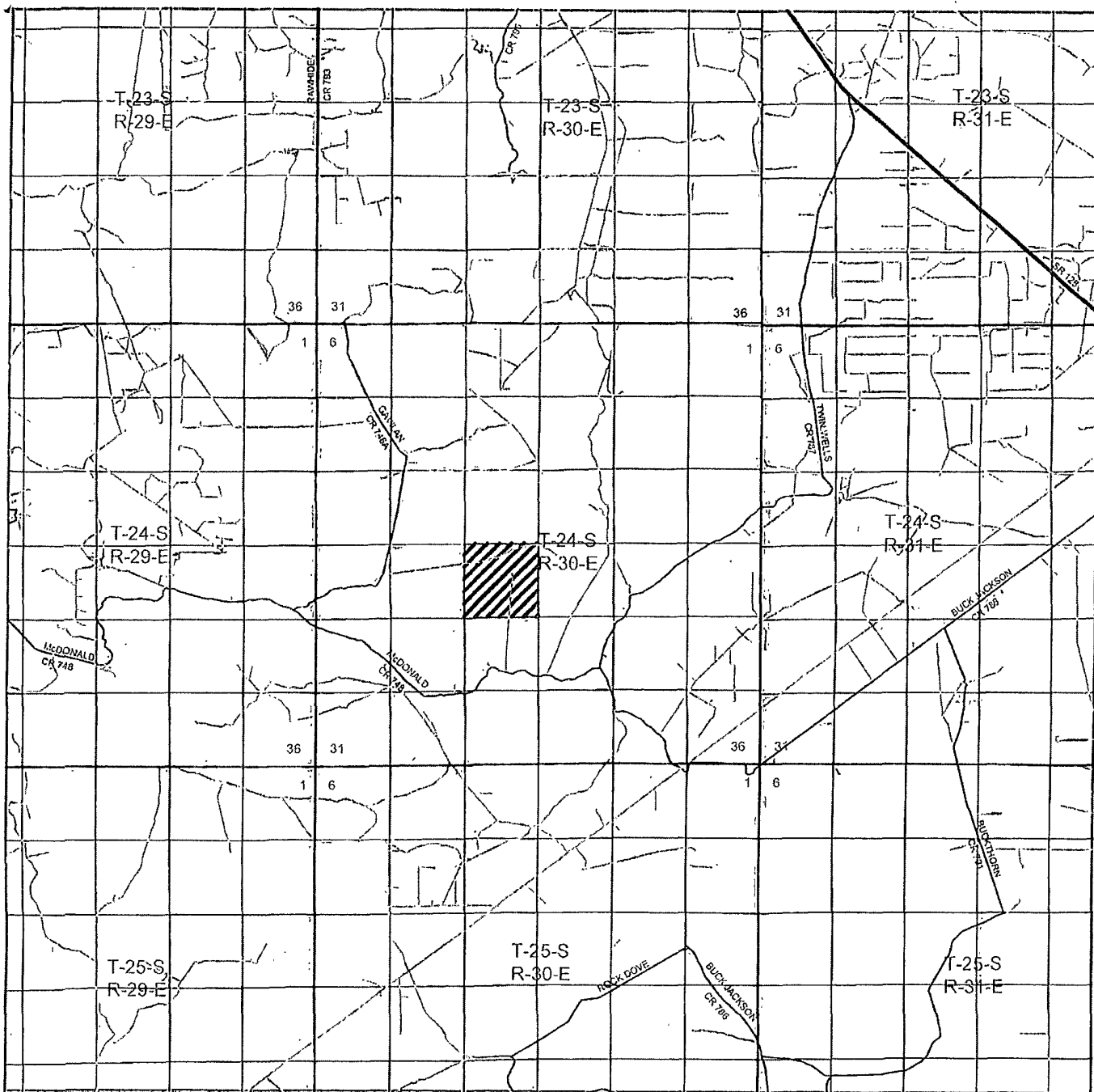
Survey Date: 07-19-2011

Scale: 1" = 2000'

Date: 07-20-2011

CHESAPEAKE
 OPERATING CO.

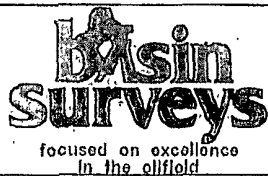
EXHIBIT A-3TH



PLU PIERCE CANYON 21 24 30 USA #1H

Located 130' FNL and 1940' FEL

Section 21, Township 24 South, Range 30 East,
N.M.P.M., Eddy County, New Mexico.



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(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: JMS 24812

Survey Date: 07-19-2011

Scale: 1" = 2 Miles

Date: 07-20-2011

**CHESAPEAKE
OPERATING CO.**

EXHIBIT A-4

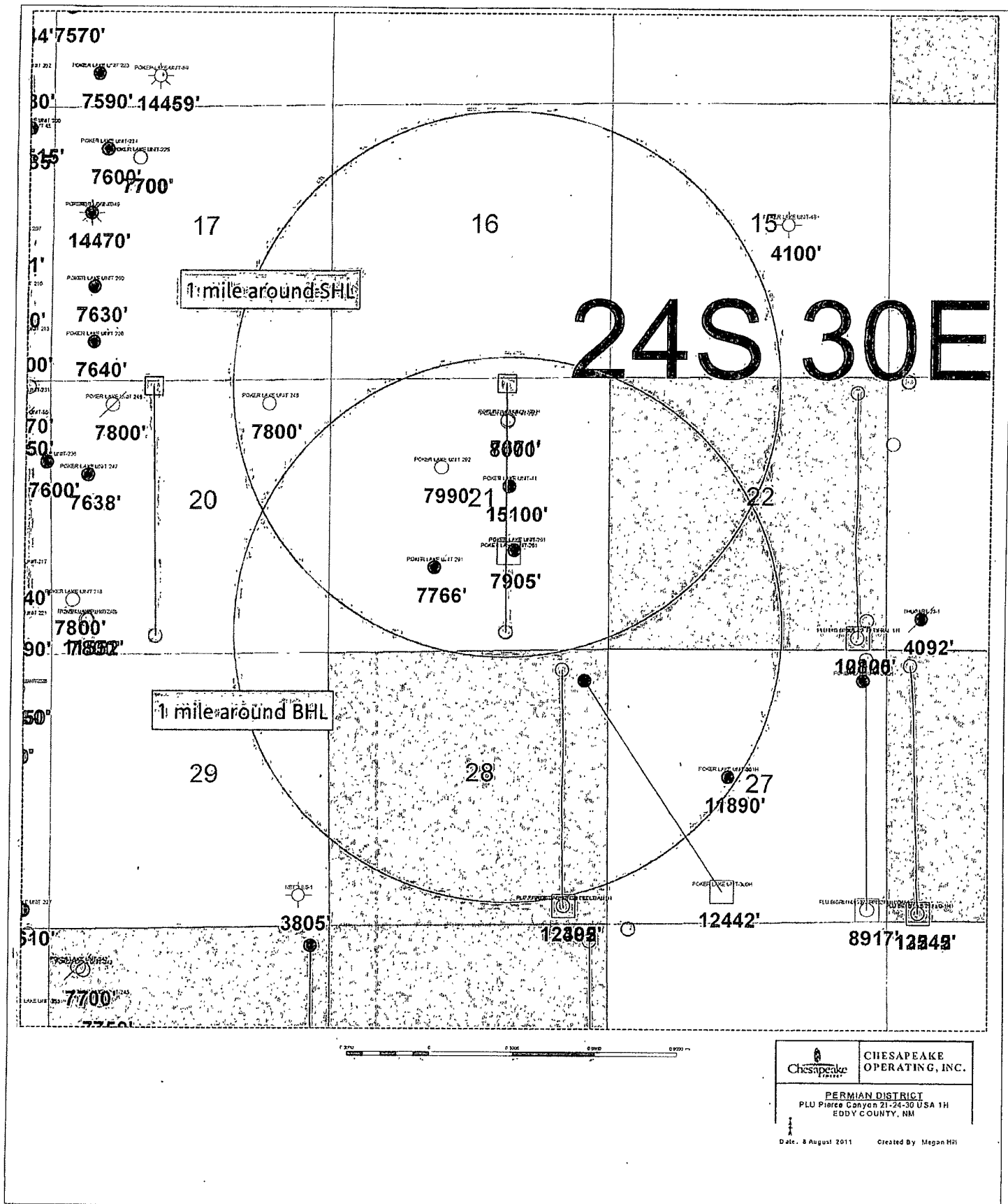
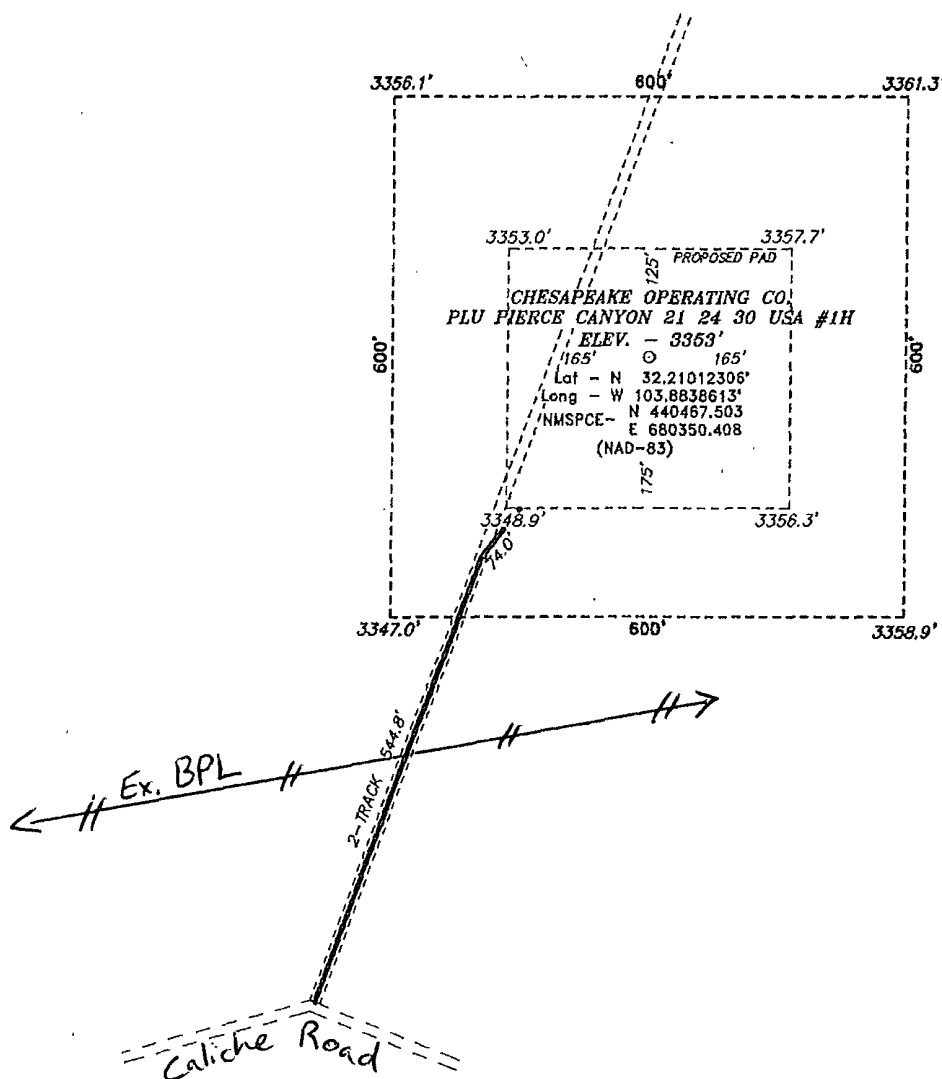


EXHIBIT B

SECTION 21, TOWNSHIP 24 SOUTH, RANGE 30 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.



Directions to Location:

FROM THE JUNCTION OF TWIN WELLS AND McDONALD,
GO WEST ON McDONALD FOR 1.3 MILES TO LEASE
ROAD, ON LEASE ROAD GO NORTHERLY 1.6 MILES TO
PROPOSED LEASE ROAD.

BASIN SURVEYS P.O. BOX 1786—HOBBS, NEW MEXICO

Drawn By: J. SMALL

Disk: JMS 24812

Sheet 1 of 1 Sheets

CHESAPEAKE OPERATING CO.

REF: PLU PIERCE CANYON 21 24 30 USA #1H / WELL PAD TOPO

THE PLU PIERCE CANYON 21 24 30 USA #1H LOCATED 130'
FROM THE ^{North}~~SOUTH~~ LINE AND 1940' FROM THE EAST LINE OF

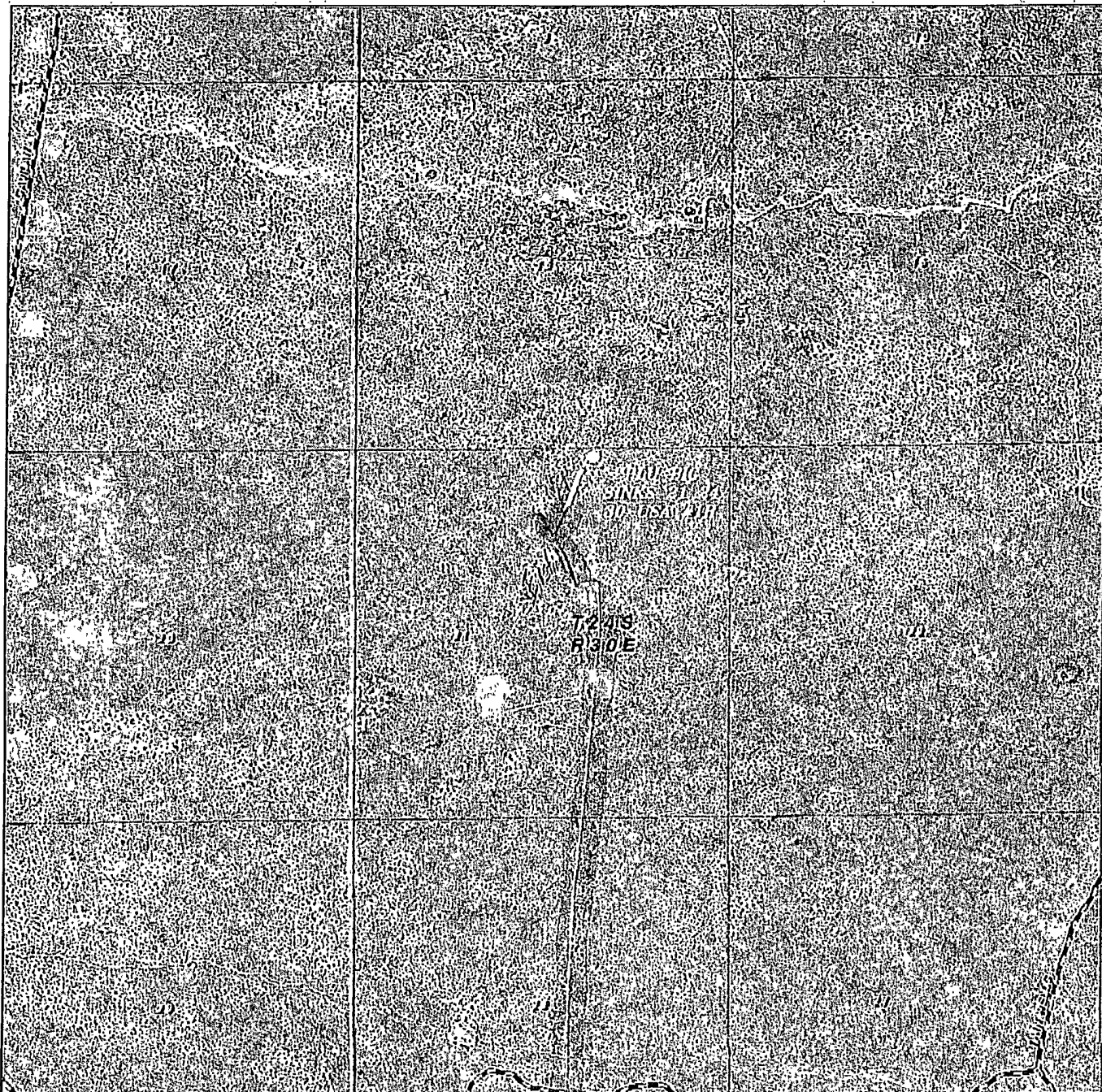
SECTION 21, TOWNSHIP 24 SOUTH, RANGE 30 EAST,

N.M.P.M., EDDY COUNTY, NEW MEXICO.

EXHIBIT A-2

TEN
12/21"

Proposed access road From McDonald Rd



PLU BIG SINKS 21 24 30 USA #1H
Located 130' FNL and 1940' FEL
Section 21, Township 24 South, Range 30 East,
N.M.P.M., Eddy County, New Mexico.

basin
surveys
focused on excellence
in the oilfield

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

W.O. Number: JMS 24812

Scale: 1" = 2000'

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND
NATURAL COLOR - FEE LAND

CHESAPEAKE
OPERATING CO.

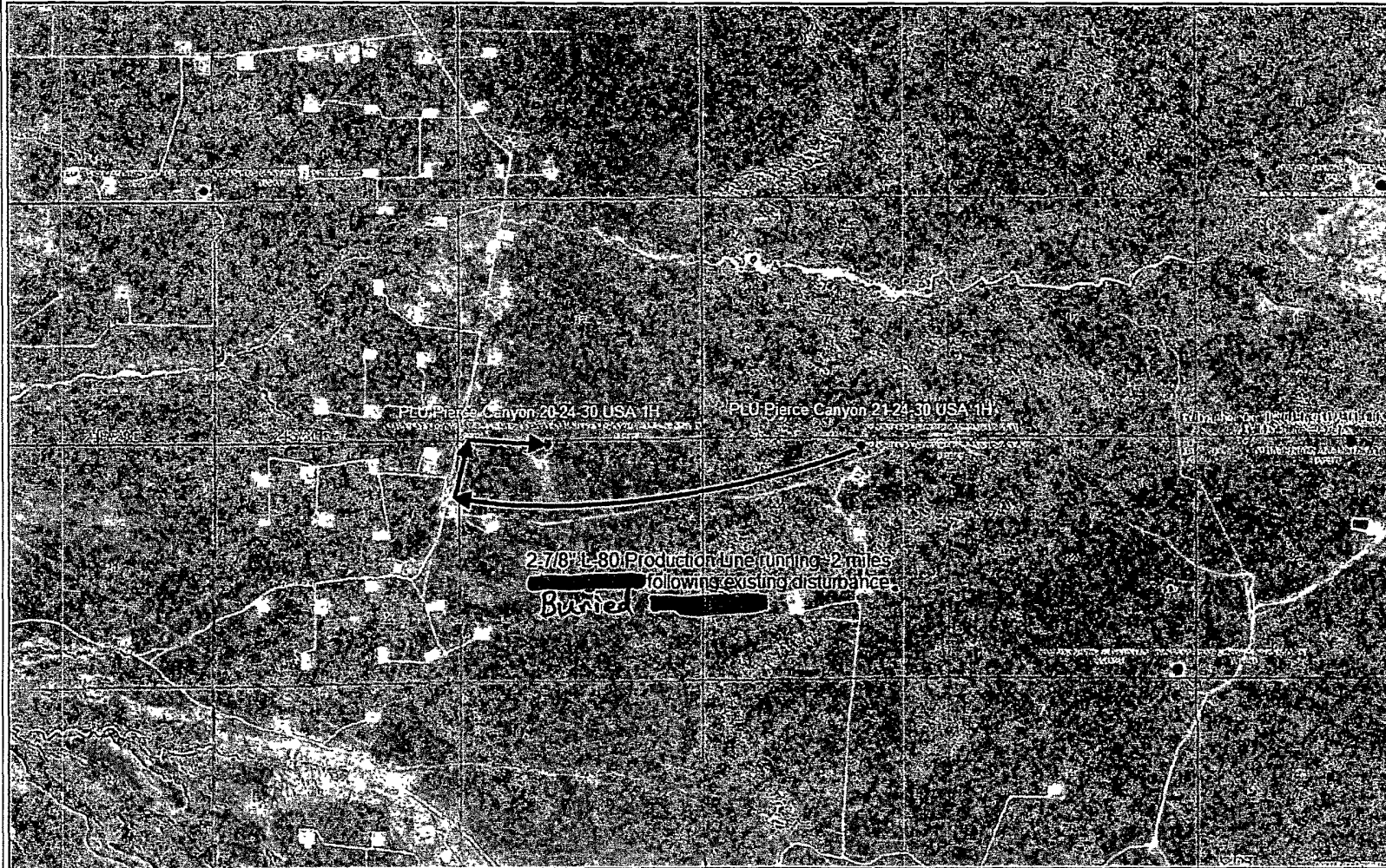
Revised EXHIBIT A-5

PLU Pierce Canyon 21-24-30 USA 1H Flowline Map



Legend

- WELL
 - OPERATED WELL
 - NON-OPERATED WELL
- COMPRESSOR STATION
- GAS VALVE - CRW
- GAS VALVE - OKC
- METER - CRW
- METER - OKC
- CHK Pipeline
- RIG
- PROSPECT
- ABSTRACT
- TOWNSHIP
- SECTION



1,29,896



0 0.47 0.9 Miles

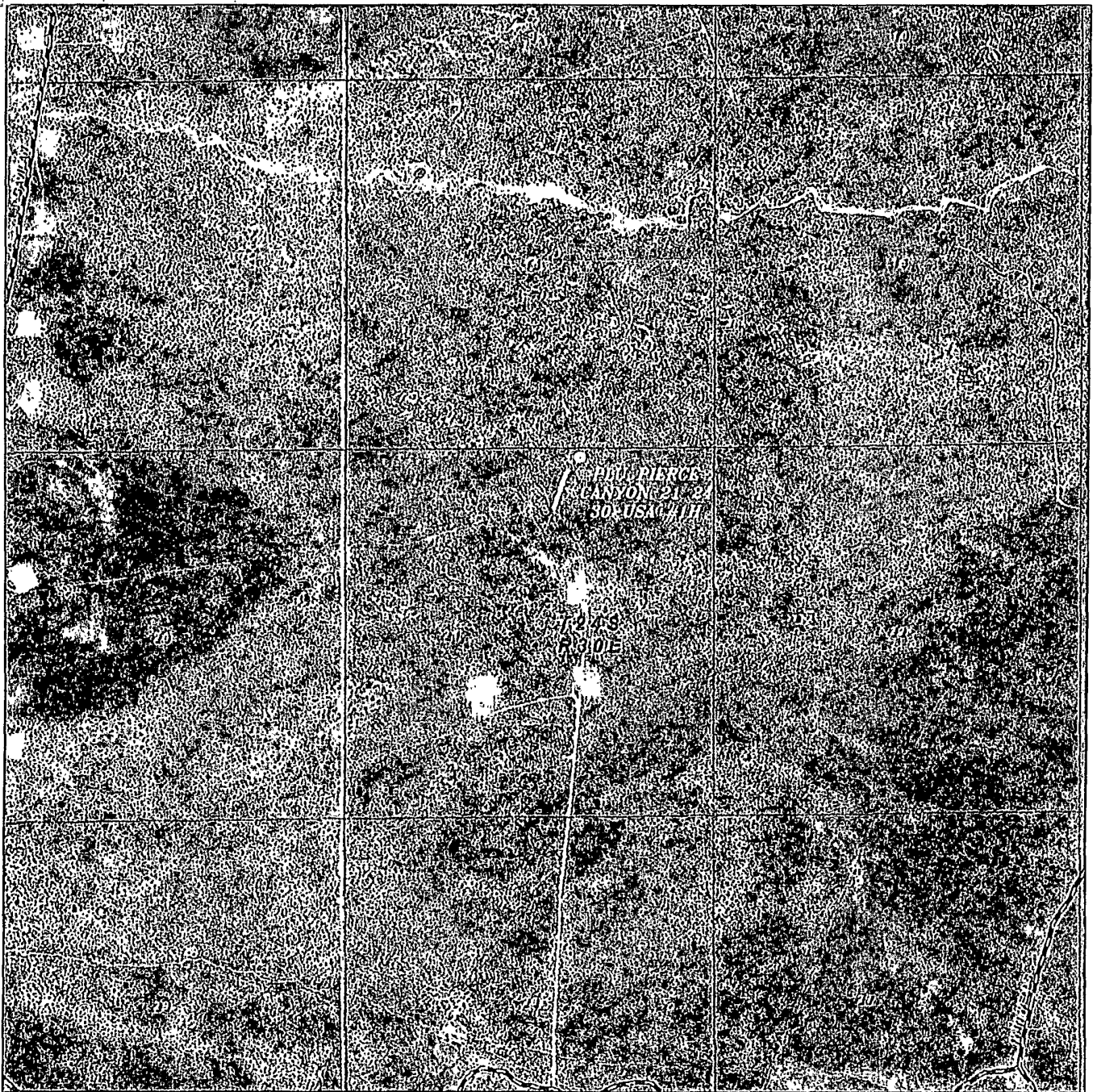
WGS_1984_Web_Mercator_Auxiliary_Sphere
© Chesapeake Energy Corporation

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

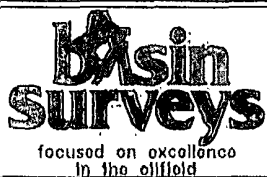
Notes

Not approved
with APD.
See COAs.
Must apply
through
Sundry Notice.

16/12/11



PLU PIERCE CANYON 21 24 30 USA #1H
Located 130' FNL and 1940' FEL
Section 21, Township 24 South, Range 30 East,
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Scale: 1" = 2000'

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND
NATURAL COLOR - FEE LAND

CHESAPEAKE
OPERATING CO.

EXHIBIT A-5

ONSHORE ORDER NO. 1
Chesapeake Operating, Inc. Agent for BOPCO
PLU Pierce Canyon 21-24-30 USA 1H
SHL:
BHL:
Eddy, NM

CONFIDENTIAL -- TIGHT HOLE
Lease Contract No NMLC068431

REVISED DRILLING PLAN 11/11/2011

PAGE: 1

OHSORE OIL & GAS ODER 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:

FORMATION	SUB-SEA	KBTVD	MD
Rustler	2,351	1,022	1,022
Top of Salt	1,672	1,701	1,701
Base of Salt	-500	3,873	3,873
Bell Canyon	-770	4,140	4,140
Cherry Canyon	-1,454	4,827	4,827
Brushy Canyon	-2,167	5,990	5,990
Bone Spring Lime	-4,343	7,716	7,716
Lateral TD	-4,705	8078	12,909

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:

Substance	Formation	Depth
Water	Rustler	1,022
Oil/Gas	Brushy Canyon	5,990
Oil/Gas	Bone Spring	7,716

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

ONSHORE ORDER NO. 1
Chesapeake Operating, Inc. Agent for BOPCO
PLU Pierce Canyon 21-24-30 USA 1H
SHL:
BHL:
Eddy, NM

CONFIDENTIAL -- TIGHT HOLE
Lease Contract No. NMLC068431

REVISED DRILLING PLAN 11/11/2011
PAGE: 2

3. BOP EQUIPMENT

Will have a 5000 psi rig stack (see proposed schematic) for drill out below surface casing, but this system will be tested to 3000 psi working pressure and 3000 psi working pressure for the annular preventer; therefore, no shoe tests will be conducted.

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

I. BOP, Annular, Choke Manifold Pressure Test - See Exhibit F-1 and 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
 - (d) Upper and lower kelly cock valves, inside BOP's and safety valves

B. Frequency

1. All tests shall 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
 - (d) at least once every 30 days while drilling

C. Frequency

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 unless otherwise stated (see above).
6. The "high pressure" test for the annular preventer will be conducted at 70% of the rated working pressure unless otherwise stated (see above).
7. A record of all pressures will be made on a pressure-recording chart.

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:

System Operating Pressure	Precharge Pressure
1500 psi	750 psi
2000 psi	1000 psi
3000 psi	1000 psi

3. Closing times for the annular preventer 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 the previous requirement, this pressure should not be less than the following pressures:

System Operating Pressure	Remaining Pressure After Test
1500 psi	950 psi
2000 psi	1200 psi
3000 psi	1200 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:

See
CA

Purpose	From	To	Hole Size	Csg Size	Weight	Grade	Thread	Condition
Surface	0'	810' 1,120'	17-1/2"	13-3/8"	48 #	H-40	STC	New
Intermediate	0'	375' 3,975'	11"	8-5/8"	32 #	J-55	LTC	New
Production	0'	12,708'	7-7/8"	5-1/2"	20 #	L-80	LTC	New

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

ONSHORE ORDER NO 1
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 Eddy, NM

CONFIDENTIAL -- TIGHT HOLE
 Lease Contract No. NMLC068431

REVISED DRILLING PLAN 11/11/2011
 PAGE: 4

c. Casing Safety Factors

Casing String	Min SF Burst	Min SF Collapse	Min SF Tension
Surface	1.33	1.52	2.19
Intermediate	2.1	1.22	2
Production	1.22	2.34	1.95

Min SF is the smallest of a group of safety factors that include the following considerations:

Min SF is the smallest of a group of safety factors that include the following considerations:

	Surf	Int	Prod
Burst Design			
Pressure Test- Surface, Int, Prod Csg P external: Water P internal: Test psi + next section heaviest mud in csg	X	X	X
Displace to Gas- Surf Csg P external: Water P internal: Dry Gas from Next Csg Point	X		
Frac at Shoe, Gas to Surf- Int Csg P external: Water P internal: Dry Gas, 15 ppg Frac Gradient		X	
Stimulation (Frac) Pressures- Prod Csg P external: Water P internal: Max inj pressure w/ heaviest injected fluid			X
Tubing leak- Prod Csg P external: Water P internal: Leak just below surf, 8.7 ppg packer fluid			X
Collapse Design			
Full Evacuation P external: Water gradient in cement, mud above TOC P internal: none	X	X	X
Cementing- Surf, Int, Prod Csg P external: Wet cement P internal: water	X	X	X
Tension Design			
100k lb overpull	X	X	X

ONSHORE ORDER NO. 1
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Eddy, NM

CONFIDENTIAL -- TIGHT HOLE
Lease Contract No. NMLC068431

REVISED DRILLING PLAN 1

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5. CEMENTING PROGRAM

Slurry	Type	Top	Btm	Wt	Yld	%Exc	Sx
<u>Surface</u>			810	(ppg)	(sx/cu ft)	Open Hole	
Single Slurry	C + % Gel	0'	1,120'	13.5	1.73	150	1111
<u>Shallow Int</u>							
Lead	TXI +5% Salt	0'	3,475'	12	1.8	150	1121
Tail	50C/50Poz +5% Salt	3,475'	3,975'	14.2	1.37	150	243
<u>Production</u>			3,775				
Slurry 1 Lead	35/65Poz H +8% Gel	4,750'	7,700'	12.4	2.09	75	428
Slurry 1 Tail	50H/50Poz	7,700'	12,708'	14.5	1.24	75	1234
Slurry 2 Lead	35/65Poz H +8% Gel	3,475'	4,500'	12.4	2.19	200	165
Slurry 2 Tail	50H/50Poz	4,500'	4,750'	14.8	1.33	200	98

1. Final cement volumes will be determined by caliper.
2. Surface casing shall have at least one centralizer installed on each of the bottom three joints starting with the shoe joint.
3. The production casing will be cemented in two stages with the DV tool place at: 4,750'
4. Production casing will have one centralizer on every other joint from TD to KOP (horizontal type) and from KOP to intermediate casing (bowspring type).

Pilot Hole Plugging Plan:

There will be no pilot hole for this well.

6. MUD PROGRAM

From	To	Type	Weight	F. Vis	FL
Depth					
0'	1,120'	Spud Mud	8.4 - 8.7	32 - 34	NC - NC
1,120'	3,975'	Brine	9.8 - 10.1	28 - 29	NC - NC
3,975'	7,638'	Cut Brine	8.4 - 9	28 - 30	NC - NC
7,638'	8,393'	Cut Brine	8.4 - 9	28 - 30	NC - NC
8,393'	12,708'	Cut Brine	8.4 - 9	28 - 30	NC - NC

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

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:

- Drill stem tests are not planned.
- The logging program will be as follows:

TYPE	Logs	Interval	Timing	Vendor
Mudlog	Mudlog	Int Csg to TD	Drill out Int Csg	Suttles
OH	Triple Combo (Dual Induction)	Curve to Int Csg	After Curve	Halliburton
LWD	GR/Neutron	Int Csg to Surface	While Drilling	TBD
LWD	MWD/Gamma	Curve/Lateral	While Drilling	TBD

- Core samples are not planned.
- A Directional Survey will be run.

8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

- No abnormal pressures or temperatures are expected. Estimated BHP is: 3587 psi
- Hydrogen sulfide gas is not anticipated.

Permian District

Poker Lake

PLU Pierce Canyon 21-24-30 USA 1H

Well #1

Wellbore #1

Plan: Design #1

Standard Planning Report

26 August, 2011

Chesapeake Operating Planning Report

Database:	Drilling Database	Local Co-ordinate Reference:	Well Well #1
Company:	Permian District	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Project:	Poker Lake	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	PLU Pierce Canyon 21-24-30 USA 1H	North Reference:	Grid
Well:	Well #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project:	Poker Lake, Eddy County, NM		
Map System:	US State Plane 1983	System Datum:	Ground Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:	PLU Pierce Canyon 21-24-30 USA 1H
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Site Position:		Northing:	440,467.50 usft	Latitude:	32.2101230623
From:	Map	Easting:	680,350.40 usft	Longitude:	-103.8838612680
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	0.2396028 °

Well:	Well #1					
Well Position	+N/-S	0.0 usft	Northing:	440,467.50 usft	Latitude:	32.2101230623
	+E/-W	0.0 usft	Easting:	680,350.40 usft	Longitude:	-103.8838612680
Position Uncertainty	0.0 usft	Wellhead Elevation:	.	Ground Level:	0.0 usft	

Wellbore:	Wellbore #1				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/11/2011	7.7185946	60.1429414	48,613

Design:	Design #1
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Audit Notes:	
Version:	Phase: PROTOTYPE Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	180.24

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0000000	
7,638.4	0.00	0.00	7,638.4	0.0	0.0	0.00	0.00	0.00	0.0000000	
8,392.5	90.50	180.24	8,115.8	-481.6	-2.0	12.00	12.00	0.00	80.2419390	
12,708.8	90.50	180.24	8,078.1	-4,797.7	-20.3	0.00	0.00	0.00	0.0000000	PC21-24-30USA 1H

Chesapeake Operating

Planning Report

Database:	Drilling Database	Local Co-ordinate Reference:	Well: Well #1
Company:	Permian District	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Project:	Poker Lake	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	PLU Pierce Canyon 21-24-30 USA 1H	North Reference:	Grid
Well:	Well #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
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
3,400.0	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
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

Chesapeake Operating

Planning Report

Database:	Drilling Database	Local Co-ordinate Reference:	Well: Well #1
Company:	Permian District	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Project:	Poker Lake	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	PLU Pierce Canyon 21-24-30 USA 1H	North Reference:	Grid
Well:	Well #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
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	
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,638.4	0.00	0.00	7,638.4	0.0	0.0	0.0	0.00	0.00	0.00	
7,700.0	7.40	180.24	7,699.8	-4.0	0.0	4.0	12.00	12.00	0.00	
7,800.0	19.40	180.24	7,796.9	-27.1	-0.1	27.1	12.00	12.00	0.00	
7,900.0	31.40	180.24	7,887.1	-69.9	-0.3	69.9	12.00	12.00	0.00	
8,000.0	43.40	180.24	7,966.4	-130.5	-0.6	130.5	12.00	12.00	0.00	
8,100.0	55.40	180.24	8,031.4	-206.3	-0.9	206.3	12.00	12.00	0.00	
8,200.0	67.40	180.24	8,079.1	-294.0	-1.2	294.0	12.00	12.00	0.00	
8,300.0	79.40	180.24	8,107.7	-389.6	-1.6	389.6	12.00	12.00	0.00	
8,392.5	90.50	180.24	8,115.8	-481.6	-2.0	481.6	12.00	12.00	0.00	
8,400.0	90.50	180.24	8,115.7	-489.1	-2.1	489.1	0.00	0.00	0.00	
8,500.0	90.50	180.24	8,114.9	-589.1	-2.5	589.1	0.00	0.00	0.00	
8,600.0	90.50	180.24	8,114.0	-689.1	-2.9	689.1	0.00	0.00	0.00	
8,700.0	90.50	180.24	8,113.1	-789.1	-3.3	789.1	0.00	0.00	0.00	
8,800.0	90.50	180.24	8,112.3	-889.1	-3.8	889.1	0.00	0.00	0.00	
8,900.0	90.50	180.24	8,111.4	-989.1	-4.2	989.1	0.00	0.00	0.00	
9,000.0	90.50	180.24	8,110.5	-1,089.1	-4.6	1,089.1	0.00	0.00	0.00	
9,100.0	90.50	180.24	8,109.6	-1,189.1	-5.0	1,189.1	0.00	0.00	0.00	
9,200.0	90.50	180.24	8,108.8	-1,289.1	-5.4	1,289.1	0.00	0.00	0.00	
9,300.0	90.50	180.24	8,107.9	-1,389.1	-5.9	1,389.1	0.00	0.00	0.00	
9,400.0	90.50	180.24	8,107.0	-1,489.1	-6.3	1,489.1	0.00	0.00	0.00	
9,500.0	90.50	180.24	8,106.1	-1,589.0	-6.7	1,589.1	0.00	0.00	0.00	
9,600.0	90.50	180.24	8,105.3	-1,689.0	-7.1	1,689.1	0.00	0.00	0.00	
9,700.0	90.50	180.24	8,104.4	-1,789.0	-7.6	1,789.1	0.00	0.00	0.00	
9,800.0	90.50	180.24	8,103.5	-1,889.0	-8.0	1,889.1	0.00	0.00	0.00	
9,900.0	90.50	180.24	8,102.7	-1,989.0	-8.4	1,989.0	0.00	0.00	0.00	
10,000.0	90.50	180.24	8,101.8	-2,089.0	-8.8	2,089.0	0.00	0.00	0.00	
10,100.0	90.50	180.24	8,100.9	-2,189.0	-9.2	2,189.0	0.00	0.00	0.00	
10,200.0	90.50	180.24	8,100.0	-2,289.0	-9.7	2,289.0	0.00	0.00	0.00	
10,300.0	90.50	180.24	8,099.2	-2,389.0	-10.1	2,389.0	0.00	0.00	0.00	
10,400.0	90.50	180.24	8,098.3	-2,489.0	-10.5	2,489.0	0.00	0.00	0.00	
10,500.0	90.50	180.24	8,097.4	-2,589.0	-10.9	2,589.0	0.00	0.00	0.00	

Chesapeake Operating Planning Report

Database:	Drilling Database	Local Co-ordinate Reference:	Well Well #1
Company:	Permian District	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Project:	Poker Lake	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	PLU: Pierce Canyon 21-24-30 USA 1H	North Reference:	Grid
Well:	Well #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

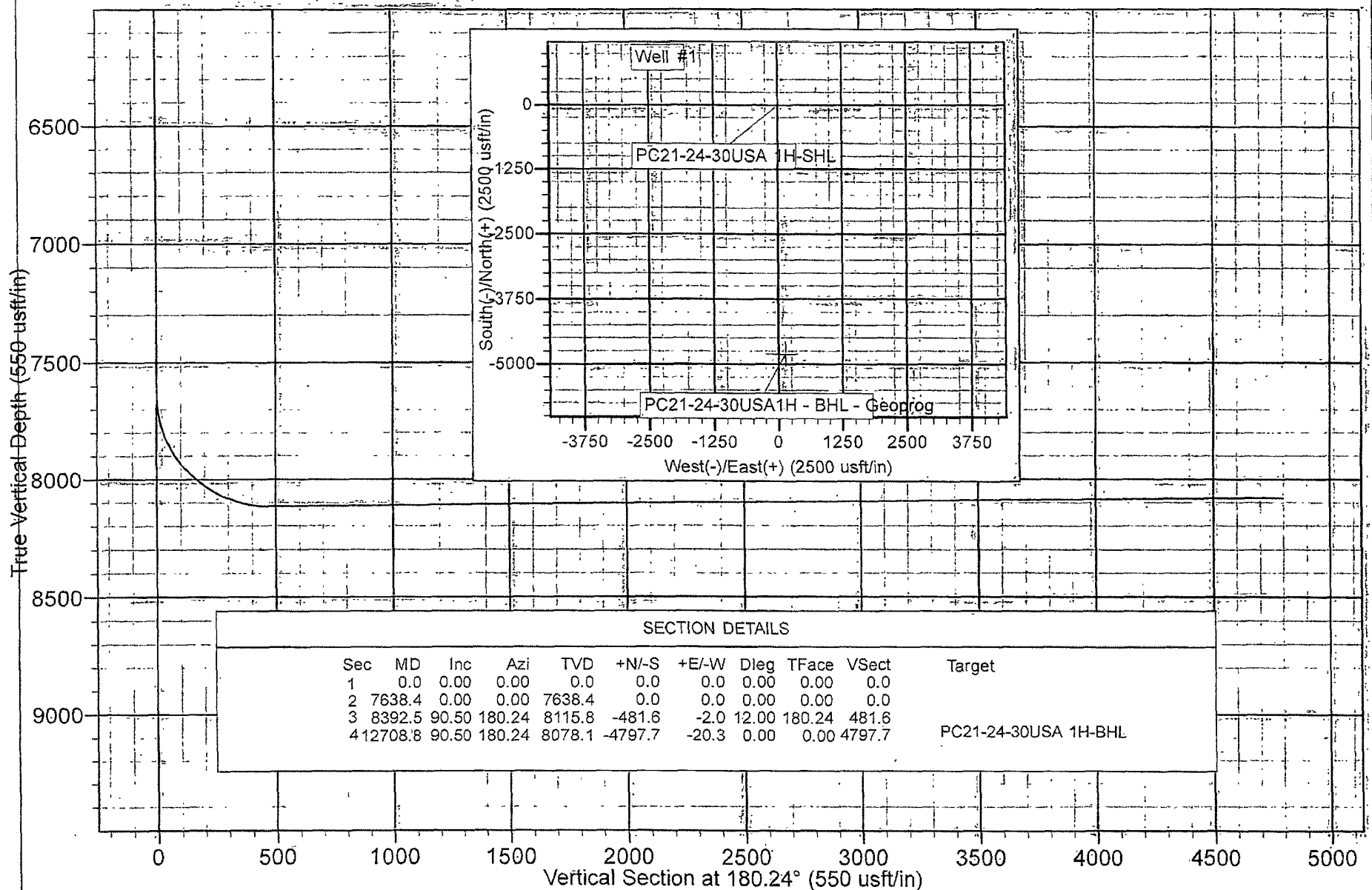
Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
10,600.0	90.50	180.24	8,096.5	-2,689.0	-11.4	2,689.0	0.00	0.00	0.00	
10,700.0	90.50	180.24	8,095.7	-2,789.0	-11.8	2,789.0	0.00	0.00	0.00	
10,800.0	90.50	180.24	8,094.8	-2,889.0	-12.2	2,889.0	0.00	0.00	0.00	
10,900.0	90.50	180.24	8,093.9	-2,989.0	-12.6	2,989.0	0.00	0.00	0.00	
11,000.0	90.50	180.24	8,093.1	-3,089.0	-13.0	3,089.0	0.00	0.00	0.00	
11,100.0	90.50	180.24	8,092.2	-3,189.0	-13.5	3,189.0	0.00	0.00	0.00	
11,200.0	90.50	180.24	8,091.3	-3,289.0	-13.9	3,289.0	0.00	0.00	0.00	
11,300.0	90.50	180.24	8,090.4	-3,389.0	-14.3	3,389.0	0.00	0.00	0.00	
11,400.0	90.50	180.24	8,089.6	-3,489.0	-14.7	3,489.0	0.00	0.00	0.00	
11,500.0	90.50	180.24	8,088.7	-3,589.0	-15.2	3,589.0	0.00	0.00	0.00	
11,600.0	90.50	180.24	8,087.8	-3,689.0	-15.6	3,689.0	0.00	0.00	0.00	
11,700.0	90.50	180.24	8,086.9	-3,788.9	-16.0	3,789.0	0.00	0.00	0.00	
11,800.0	90.50	180.24	8,086.1	-3,888.9	-16.4	3,889.0	0.00	0.00	0.00	
11,900.0	90.50	180.24	8,085.2	-3,988.9	-16.8	3,989.0	0.00	0.00	0.00	
12,000.0	90.50	180.24	8,084.3	-4,088.9	-17.3	4,089.0	0.00	0.00	0.00	
12,100.0	90.50	180.24	8,083.5	-4,188.9	-17.7	4,189.0	0.00	0.00	0.00	
12,200.0	90.50	180.24	8,082.6	-4,288.9	-18.1	4,289.0	0.00	0.00	0.00	
12,300.0	90.50	180.24	8,081.7	-4,388.9	-18.5	4,389.0	0.00	0.00	0.00	
12,400.0	90.50	180.24	8,080.8	-4,488.9	-19.0	4,489.0	0.00	0.00	0.00	
12,500.0	90.50	180.24	8,080.0	-4,588.9	-19.4	4,588.9	0.00	0.00	0.00	
12,600.0	90.50	180.24	8,079.1	-4,688.9	-19.8	4,688.9	0.00	0.00	0.00	
12,700.0	90.50	180.24	8,078.2	-4,788.9	-20.2	4,788.9	0.00	0.00	0.00	
12,708.8	90.50	180.24	8,078.1	-4,797.7	-20.3	4,797.7	0.00	0.00	0.00	

Design Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PC21-24-30USA 1H-E	- plan hits target center	0.00	0.00	8,078.1	-4,797.7	-20.3	435,669.81	680,330.14	32.1969352586	-103.8839916035
	- Point									
PC21-24-30USA 1H -	- plan misses target center by 151.3usft at 12708.8usft MD (8078.1 TVD, -4797.7 N, -20.3 E)	0.00	0.00	8,120.0	-4,803.0	125.0	435,664.51	680,475.43	32.1969190000	-103.8835220000
	- Point									
PC21-24-30USA 1H-S	- plan misses target center by 201.5usft at 8000.9usft MD (7967.0 TVD, -131.1 N, -0.6 E)	0.00	0.00	8,120.0	0.0	0.0	440,467.50	680,350.40	32.2101230623	-103.8838612680
	- Point									

Project: Poker Lake
Site: PLU Pierce Canyon 21-24-30 USA 1H
Well: Well #1
Wellbore: Wellbore #1
Design: Design #1

PROJECT DETAILS: Poker Lake

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone





Drilling Engineer: Chris Gray

Superintendent: Cecil Luttrill

Geologist: Carl Standley

Well Name: PLU Pierce Canyon 21-24-30 USA 1H Planning
Target: Upper Avalon
County, State: Eddy, NM

Surface Location: 130' FNL 1940' FEL, Section 21, Township 24S, Range 30

BH Location: 350' FSL 1980' FEL, Section 21, Township 24S, Range 30

SHL Latitude: 32.210123 SHL North: 440467
SHL Longitude: -103.883861 SHL East: 680350
BHL Latitude: 32.19693526 BHL North: 435669
BHL Longitude: -103.8839916 BHL East: 680330
Coordinates: NAD.83 Coordinates: NMSPC

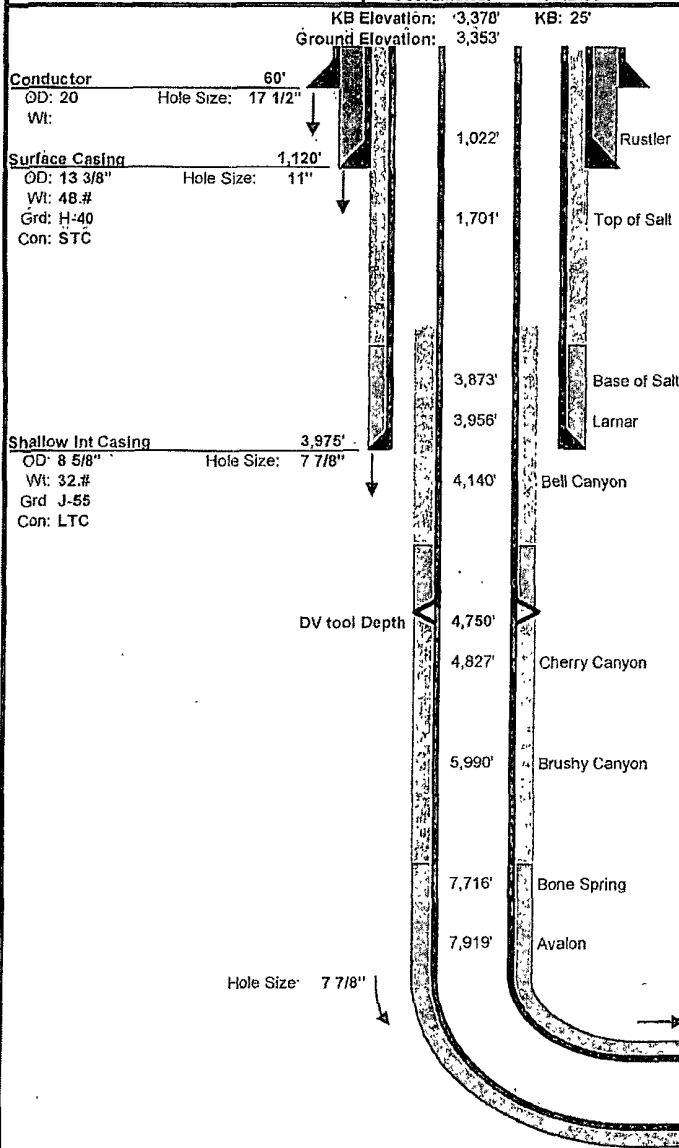
Drilling Rig: Patterson 52
Directional-Surface: Ryan
Directional-Curve: Ryan
Directional-Lateral: Ryan
Drilling Mud: Nova

Cement: Schlumberger

Wellhead: Sunbelt

Property Number: 639974

AFE Number: 157144



Wellhead Equipment	
A Section	13-3/8" x 11" 5K SOW
B Section	11" 5K X 11" 5K
C Section	11" 5K X 7-1/16" 10K
D Section	N/A
Required BOP Stack	11" 5K- Double, Annular, Rot Head, W/Orbit Valve

Mud				
Depth	Type	Weight	F. Vis	FL
0' - 1,120'	Spud Mud	8.4 - 8.7	32 - 34	NC - NC
1,120' - 3,975'	Brine	9.8 - 10.1	28 - 29	NC - NC
3,975' - 7,638'	Cut Brine	8.4 - 9	28 - 30	NC - NC
7,638' - 8,393'	Cut Brine	8.4 - 9	28 - 30	NC - NC
8,393' - 12,708'	Cut Brine	8.4 - 9	28 - 30	NC - NC

Cement						
Slurry	Top	Btm	Wt	Yld	%Exc	Bbl
Surface						
Single Slurry	0'	1,120'	13.5	1.73	150	342
Shallow Int						
Lead	0'	3,475'	12.0	1.8	150	359
Tail	3,475'	3,975'	14.2	1.37	150	59
Production						
1st Lead	4,750'	7,700'	12.4	2.09	75	159
1st Tail	7,700'	12,708'	14.5	1.24	75	272
2nd Lead	3,475'	4,500'	12.4	2.19	200	64
2nd Tail	4,500'	4,750'	14.8	1.33	200	23

Directional Plan						
Target Line:	8120' @ 0' VS w/ 0.5 degrees Updip					
Target Window:	20' above and 20' below					
KOP	MD	INC	AZM	TVD	VS	DLS
EOB	7,638'	0.00	0.00	7,638'	0'	0.00
TD	8,393'	90.50	180.24	8,116'	482'	12.00
Hardlines:	Lateral: 330' from all lease lines.					
Notes:	Please note SHL and BHL distance from lease lines					

Type	Logs	Interval	Vendor
Mudlog	Mudlog	Int Csg to TD	Suttles
OH	Triple Combo (Dual Induction)	Curve to Int Csg	Halliburton
LWD	GR/Neutron	Int Csg to Surface	Ryan
LWD	MWD/Gamma	Curve/Lateral	Ryan

BLOWOUT PREVENTER SCHEMATIC

CHESAPEAKE OPERATING INC

WELL : Permian District

FIELD : Avalon

RIG :

COUNTY :

OPERATION : Intermediate and Production Hole Sections

STATE :

REVISION : : / /

Component Descriptions

	Size	Pressure	Description
A	13 3/4"	LP	Rotating Head w/ Orbit Valve
B	13 3/4"	5,000 psi	Annular
C	13 3/4"	5,000 psi	Pipe Ram
D	13 3/4"	5,000 psi	Blind Ram
E	13 3/4"	5,000 psi	Mud Cross
F	13 3/4"	5,000 psi	Drilling Spool (as req'd)
G			
DSA (Int)		13 3/4" 3M x 13 3/4" 5M	
DSA (Prod)		11" 5M x 13 3/4" 5M	
B Sec		13 3/4" 3M x 11" 5M with 5M Gate Valves	
A Sec		13 3/4" SOW x 13 3/4" 3M w/ 3M Gate Valve	

Exception	Reference

Trip Tank Required Yes ☒ No ☐

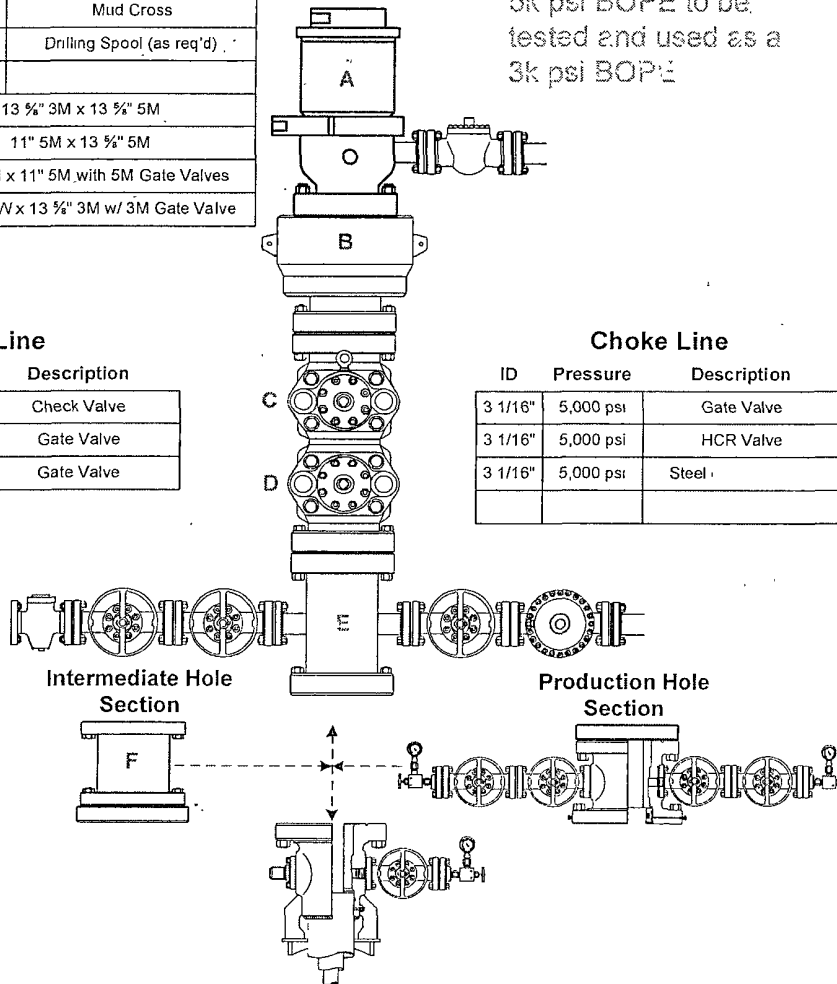
5k psi BOPE to be tested and used as a 3k psi BOPE

Kill Line

ID	Pressure	Description
2 1/16"	5,000 psi	Check Valve
2 1/16"	5,000 psi	Gate Valve
2 1/16"	5,000 psi	Gate Valve

Choke Line

ID	Pressure	Description
3 1/16"	5,000 psi	Gate Valve
3 1/16"	5,000 psi	HCR Valve
3 1/16"	5,000 psi	Steel



Testing Requirements

Item	Pressure	Frequency
Rotating Head	250 psi	Once prior to DO shoe
Annular	250 / 3,500 psi	Every 21 Days
Rams	250 / 5,000 psi	Every 21 Days
Choke Manifold	250 / 5,000 psi	Every 21 Days

- Function test on trips
- H₂S service trim required

Approved by

Date

DEM	
VP	
B&C	

Revised 5/15/11 F-1

CHOKER MANIFOLD SCHEMATIC

CHESAPEAKE OPERATING INC

WELL : Permian District
 FIELD : Avalon
 RIG :
 COUNTY :
 OPERATION :

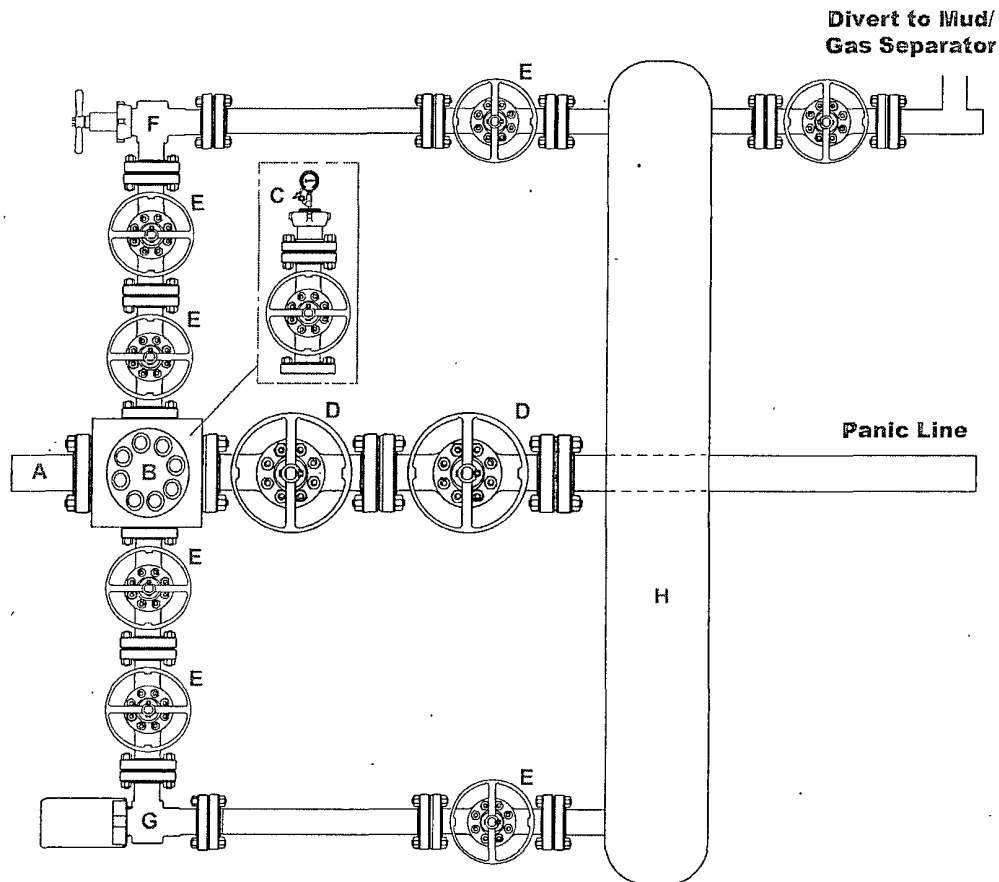
STATE :
 REVISION : : / /

Component Descriptions

	Size	Pressure	Description
A	3 1/16"	5,000 psi	Steel
B	3 1/16" x 2 1/16"	5,000 psi	Block T
C	2 1/16"	5,000 psi	Top Valve
D	3 1/16"	5,000 psi	Gate Valve
E	2 1/16"	5,000 psi	Gate Valve
F	2 1/16"	5,000 psi	Manual Choke
G	2 1/16"	5,000 psi	Hydraulic Choke
H	8" minimum		Buffer Chamber

Exception	Reference

5k psi BOPE to be
 tested and used as a
 3k psi BOPE



Approved by Date

DEM	
VP	
B&C	

Revised EXHIBIT F-2

CHESAPEAKE OPERATING, INC.



PLU Pierce Canyon 21-24-30 USA

Property # 639974

Section 21 – T24S – R30E

SW SE - 100 FNL & 1980 FEL of Section

Lat.: 32.196919 – Long.: -103.883522

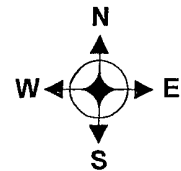
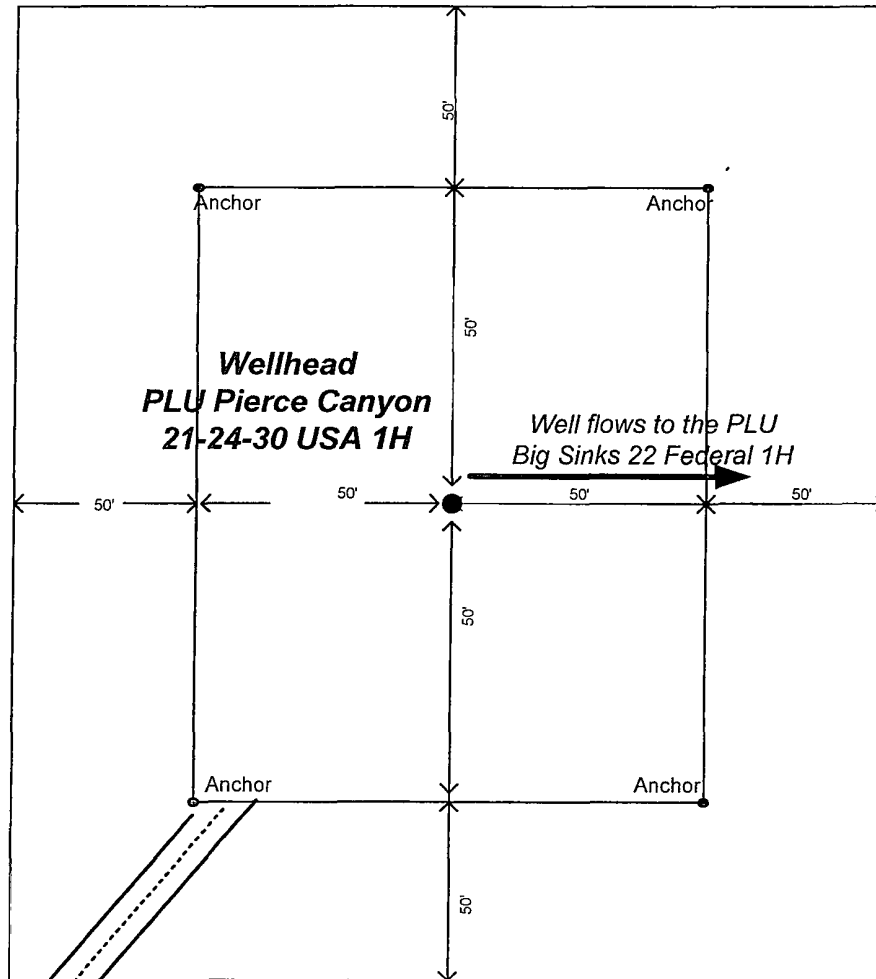
Eddy County, New Mexico

Drawing not to scale

320 Feet

Reclamation
Area

General sealing of valves and sales by tank gauging.
Production phase: all drain valves (D1-D3) and sales valves (L1-L5) sealed closed.
Sales phase: the tank from which sales are being made will be isolated by sealing closed the drain, fill, and any equalizer valves during sales.
Draining phase: the tank being drained will be isolated by sealing closed the sales, fill, equalizer valves and drain valves on the other tanks.



300 Feet

Reclamation
Area

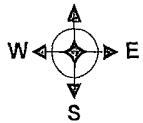
Prepared by: Jean Ann Dunn
Date: 8-31-11

Approved by: Sam Frydenlund
Date: 8-30-11

Direction of Flow off Site: East

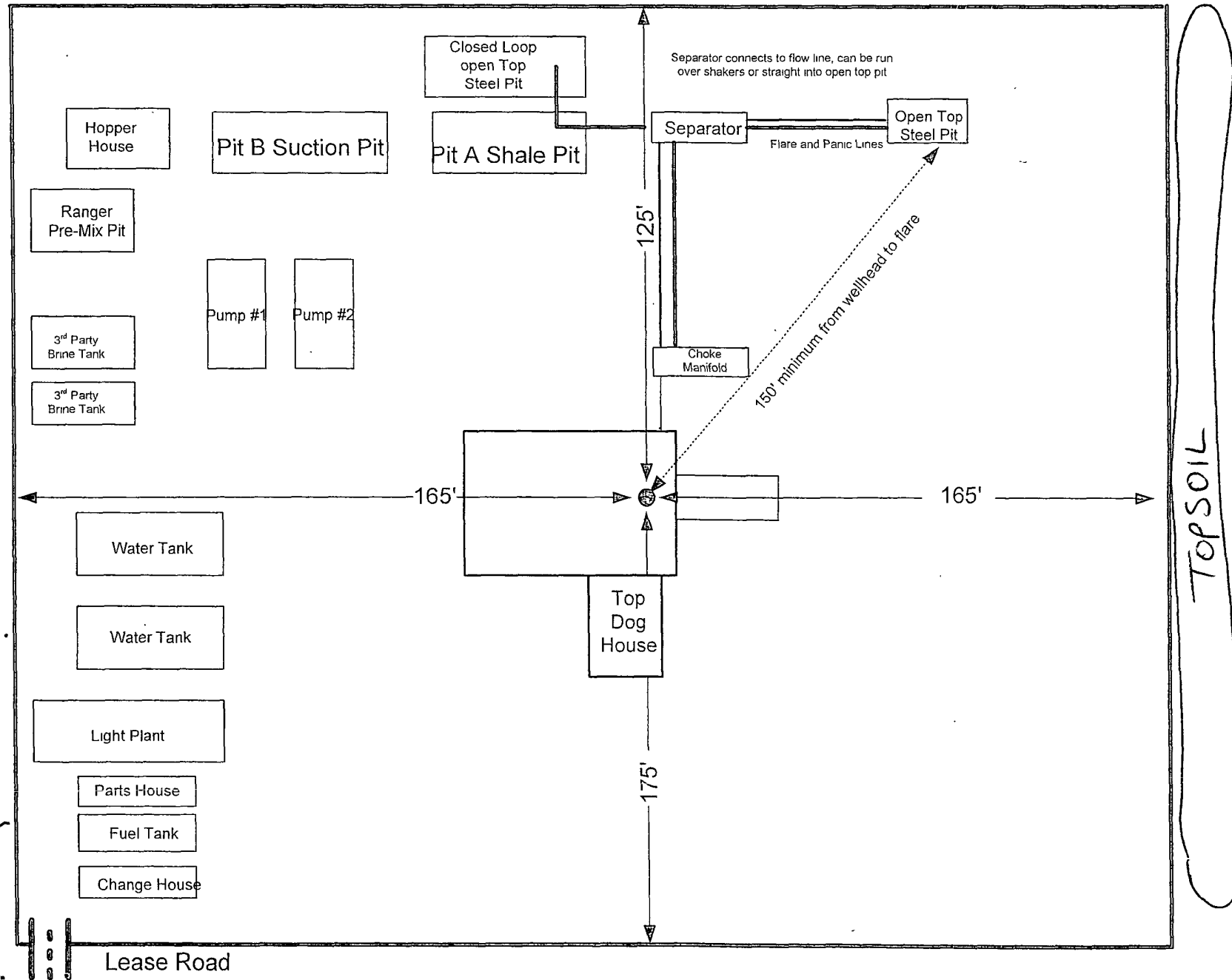
This lease is subject to
Chesapeake's Site
Security Plan located
at 6100 N. Western
Oklahoma City, OK
73118

Revised EXHIBIT A-1



Patterson RIG 62

11/21/21
TEN 12/21/11



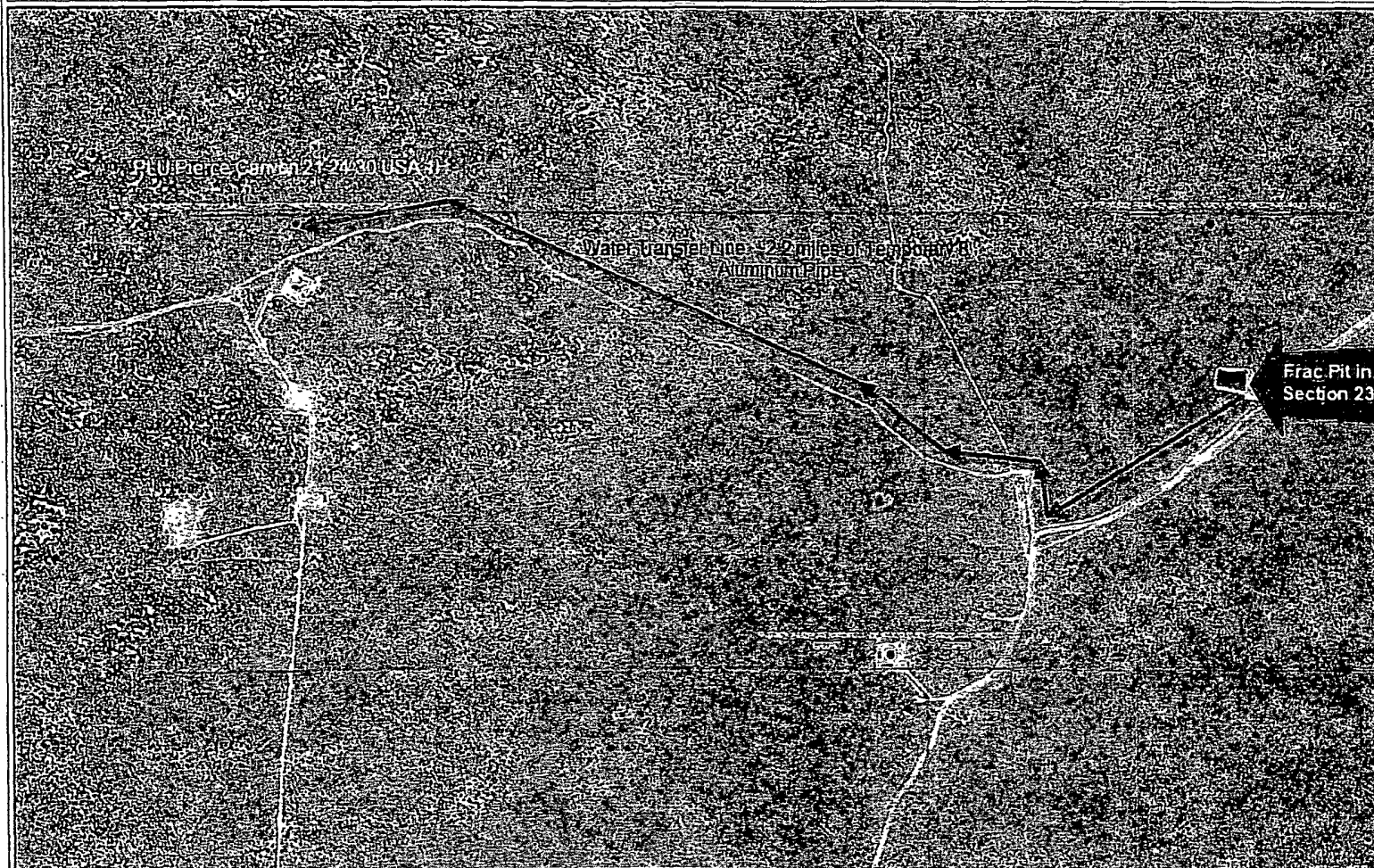
Revised EXHIBIT D

PLU Pierce Canyon 21-24-30 USA 1H Water Transfer Line



Legend:

- WELL
 - OPERATED WELL
 - NON-OPERATED WELL
- COMPRESSOR STATION
- GAS VALVE - CRW
- GAS VALVE - OKC
- METER - CRW
- METER - OKC
- CHK Pipeline
- RIG
- OWNERSHIP
- PROSPECT
- ABSTRACT
- TOWNSHIP
- SECTION



1:15,779



Notes

This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

0.5 0 0.25 0.5 Miles
WGS_1984 Web_Mercator_Auxiliary_Sphere
© Chesapeake Energy Corporation

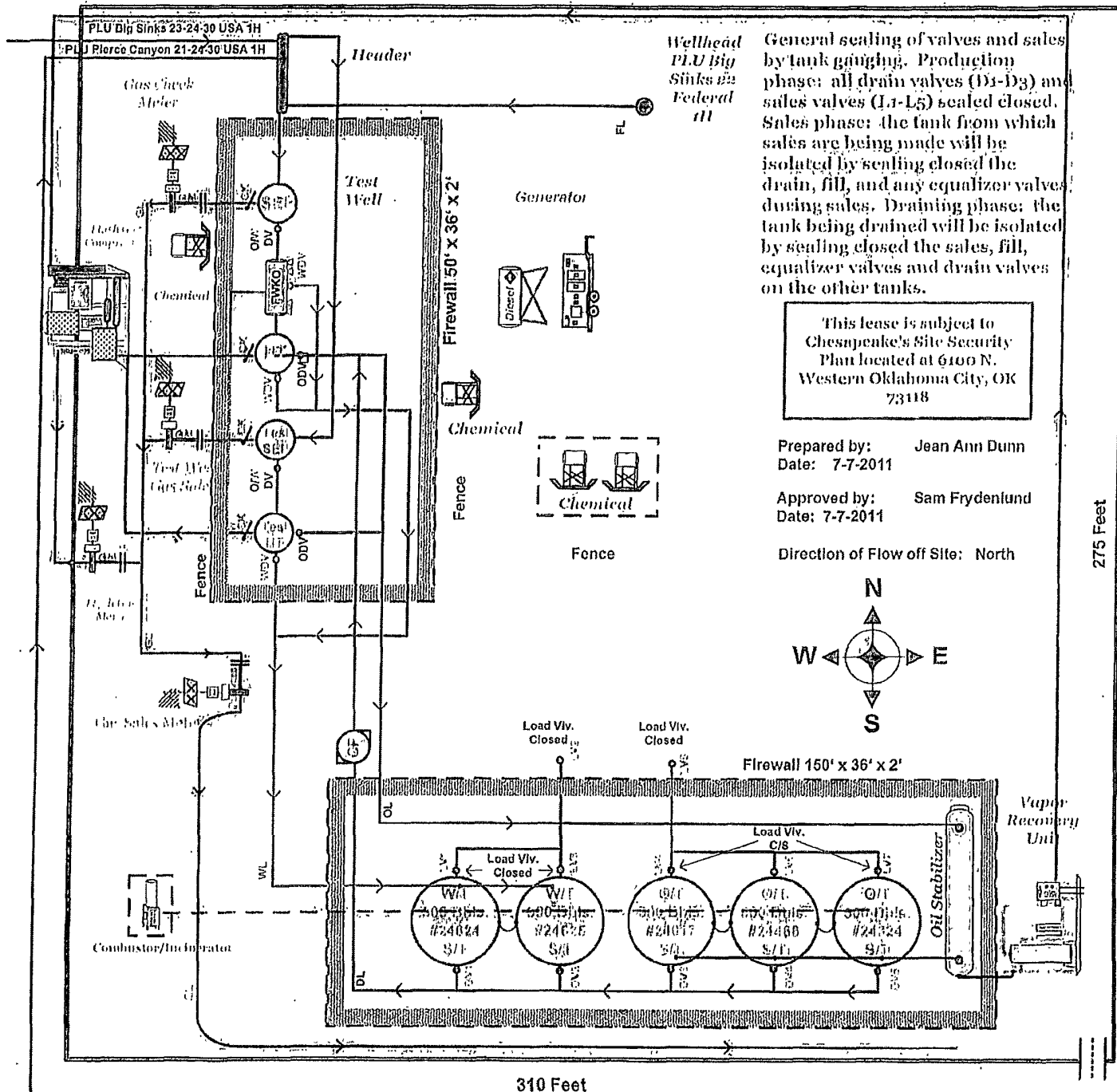
Revised EXHIBIT E

CHESAPEAKE OPERATING, INC.



PLU Big Sinks 22 Federal 1H
 Property # 631298
 NW NE Section 22 - T24S - R30E
 175 FSL & 400 FEL
 Lat.: 32.209617- Long.: -103.861064
 Eddy County, New Mexico

All equipment shown here will be on location
 but subject to changes in positioning.

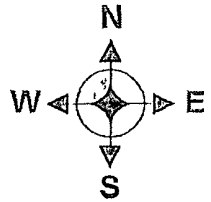


General sealing of valves and sales by tank gauging. Production phase: all drain valves (D1-D3) and sales valves (L1-L5) sealed closed. Sales phase: the tank from which sales are being made will be isolated by sealing closed the drain, fill, and any equalizer valves during sales. Draining phase: the tank being drained will be isolated by sealing closed the sales, fill, equalizer valves and drain valves on the other tanks.

This lease is subject to Chesapeake's Site Security Plan located at 6100 N. Western Oklahoma City, OK 73118

Prepared by: Jean Ann Dunn
 Date: 7-7-2011
 Approved by: Sam Frydenlund
 Date: 7-7-2011

Direction of Flow off Site: North



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

1. EXISTING ROADS

- 20' 14' see COAs
- a. The proposed lease road 544.8' in length and ~~16'~~ in travel way width with a maximum disturbance area of ~~30'~~ will be used, and in accordance with guidelines set forth in the BLM Onshore Orders. No turnouts are expected.
 - b. Existing county and lease roads will be used to enter proposed access road.
 - c. Location, access, and vicinity plats attached hereto All existing roads will be upgraded by watering, blading, rolling and adding caliche if needed.
 - d. See Exhibits A-1 to A-5.

LOCATION

- a. In order to level the location, cut and fill will be required. Please see attached Well Location and Acreage Dedication Plat.
- 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: Loving North on Carter Rd to Hwy 32. East on Hwy 32 to State Hwy #128 to Twin Wells Rd. South-Southwest On Twin Wells Rd to McDonald Rd. McDonald Rd West for 1.3 Miles to Lease Rd. North on Lease Rd. 1.6 Miles to Location.
- f. See Exhibits A-1 to A-5.

2. LOCATION OF EXISTING WELLS WITHIN A 1-MILE RADIUS OF THE PROPOSED LOCATION

- a. See Exhibit B.

3. LOCATION OF PRODUCTION FACILITIES

- a. It is anticipated that production will be piped to the PLU Big Sinks 22 Federal 1H facilities where it will be measured and sold.
- b. See Exhibits C-1 to C-2.

TEN
12/2/11

- c. We plan to run 2 7/8" L80 pipeline underground approximately 2 miles from the PLU Pierce Canyon 21 24 30 USA 1H to the PLU Big Sinks 22 Federal 1H tank battery.
- d. Tubing operating pressure of 400 psi.
- e. See Revised Exhibit C-3.

4. LOCATION AND TYPE OF WATER SUPPLY

- a. Water will be obtained from the Big Sinks 11 Frac Pond.
- b. Chesapeake Operating, Inc. will ensure all proper notifications and filings are made with the state.
- c. An 8" aluminum pipeline will be needed to supply water to the well from the frac pond and will run parallel to the existing disturbance.
- d. See Revised Exhibit E.

5. CONSTRUCTION MATERIALS

- a. No construction materials will be used from Section 21-24S-30E. All material (i.e. shale) will be acquired from private or commercial sources.

6. METHODS FOR HANDLING WASTE DISPOSAL

- a. A closed system will be utilized consisting of above ground steel tanks. Cuttings will be stored in steel tanks and disposed of at a state approved disposal/landfill. All garbage and trash wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill.
- b. Two 3000 gal tanks are used to capture the grey water on location. A contractor hauls the water to the City of Carlsbad or City of Jal City Sewage Disposal. Manifest forms are utilized to track the number of loads.

7. ANCILLARY FACILITIES

- a. None

8. WELLSITE LAYOUT

- a. The proposed site layout plat is attached showing the Generic rig orientation and equipment location.
- b. See Exhibit D.

9. PLANS FOR RECLAMATION OF THE SURFACE

- a. The site will be reduced within 50 feet of the pending anchor positions for interim reclamation.
- b. Final Reclamation Procedure: Upon final abandonment of the well, caliche material from the well pad and access road will be removed and utilized to recontour to a final contour that blends with the surrounding topography as much as possible. Any caliche material not used will be utilized to repair roads within the lease. Topsoil will be distributed over the reclamation area and cross ripped to control erosion, the site will be seeded with an approved BLM mixture.
- c. 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 and BLM.
- d. See Exhibit C-1.

11. MINERAL OWNERSHIP

United States of America
Department of Interior
Bureau of Land Management

Surface Owner

Tyson & Leslie Manaffey
P.O. Box 161
Loving, NM 88256

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

12. ADDITIONAL INFORMATION

- a. 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.

ONSHORE ORDER NO. 1
Chesapeake Agent for BOPCO
PLU Pierce Canyon 21-24-30 USA 1H
SL: 130' FNL & 1940' FEL
BL: 350' FSL & 1980' FEL
Section 21-24S-30E
Eddy County, NM

CONFIDENTIAL – TIGHT HOLE
SURFACE USE PLAN

Lease No. NMNM 068431

Page 4

13. CHESAPEAKE REPRESENTATIVES

Drilling and Completion Operations

District Manager

Jay Stratton
P.O. Box 18496
Oklahoma City, OK 73154
405-935-6164 (Office)
405-831-3994 (Cell)
jay.stratton@chk.com

Drilling Engineer

Chris Gray
P.O. Box 14896
Oklahoma City, OK 73154
405-935-4346 (Office)
405-301-6515 (Cell)
chris.gray@chk.com

Field Representative

Toby Reid
1616 W. Bender
Hobbs, NM 88241
575-391-1462, x 86413 (Office)
575-725-84977293 (Cell)
toby.reid@chk.com

Sr. Asset Manager

Jeff Finnell
P.O. Box 18496
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405-919-3305 (Cell)
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Geologist

Robert Martin
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405-618-0394 (Cell)
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Geoscience Coordinator

David Godsey
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Sr. Regulatory Compliance Specialist

Linda Good
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405-935-4275 (Office)
405-245-3623 (Cell)
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District Land Coordinator

Craig Barnard
P.O. Box 18496
Oklahoma City, OK 73154
405-879-8401 (Office)
405-397-8404 (Cell)
craig.barnard@chk.com

ONSHORE ORDER NO. 1
Chesapeake Agent for BOPCO
PLU Pierce Canyon 21-24-30 USA 1H
SL: 130' FNL & 1940' FEL
BL: 350' FSL & 1980' FEL
Section 21-24S-30E
Eddy County, NM

CONFIDENTIAL – TIGHT HOLE
OPERATOR CERTIFICATION
Lease No. NMNM 068431

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 2nd day of August, 2011

Name: Toby Reid
Toby Reid - Field Representative

Address: 1616 W Bender Blvd Hobbs N.M. 88240

Telephone: 575-725-8497

E-mail: toby.reid@chk.com

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Chesapeake
LEASE NO.:	LC068431
WELL NAME & NO.:	1H PLU Pierce Canyon 21 24 30 USA
SURFACE HOLE FOOTAGE:	130' FNL & 1940' FEL
BOTTOM HOLE FOOTAGE	350' FSL & 1980' FEL
LOCATION:	Section 21, T.24 S., R.30 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**
 - Proposed Buried Pipeline NOT Approved with this APD
 - Temporary Frac Pond Water Pipeline
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
 - Commercial Well Determination
- ☒ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
 - Medium Cave/Karst
 - Logging requirements
 - Waste Material and Fluids
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
- ☐ **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)

Proposed Buried Pipeline NOT Approved with this APD:

The operator must submit a sundry notice with a survey plat of the buried pipeline route from the well to the tank battery. The operator is not permitted to disturb any land for the buried pipeline under this APD and COA.

Temporary Freshwater Pipelines (Fracturing Operations):

Maintain a copy of your APD and your approved route diagram on location. BLM personnel may request to see a copy of your permit during construction to ensure compliance with all conditions of approval.

Holder agrees to comply with the following conditions of approval to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this permit.
2. Standard Conditions of Approval:
 - No fences shall be cut or disturbed for water pipeline installation.
 - Temporary pipelines must be removed within 30-45 days from this route unless granted in writing by the authorized officer.
 - Temporary pipelines flowing from the frac pond to the target well(s) will be laid along existing roadways and within the disturbed area of buried pipelines.
 - Areas impacted (disturbed greater than vegetation compaction) by your project will require full reclamation.
 - Pipelines will be empty before disassembly. Flow water back to the pond whenever possible.
 - Do not restrict traffic on existing roads. Place ramps where needed.
 - Pipe will be placed not more than 2 feet off the edge of existing lease roads and within buried pipeline corridors.
 - All pumps will be placed on existing disturbance (pads, roads, etc.).
3. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer.
4. Special Requirement:

The operator must rough up (i.e. drag chains) over the vehicle path that is created from installing and maintaining the pipeline on the buried pipeline corridor that the pipeline is placed in.

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken:

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

Commercial Well Determination

A commercial well determination will need to be submitted, after production has been established for at least six months.

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) 234-6235 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 in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be used for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. 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.

F. 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 twenty (20) 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

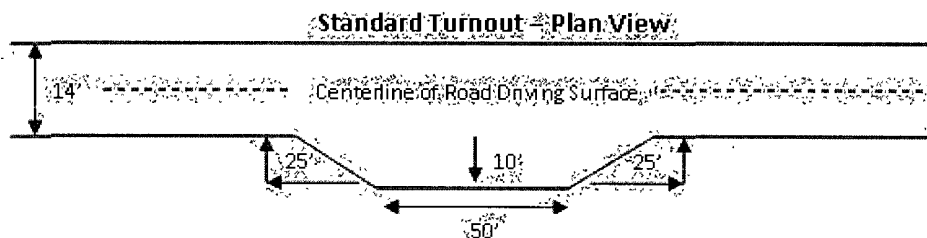
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

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:

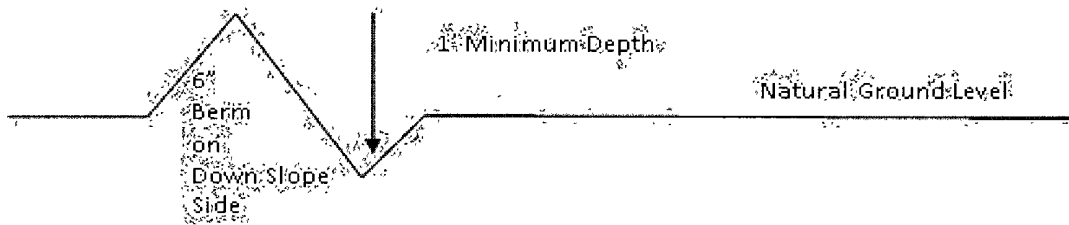


Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping 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.

Cross Section of a Typical 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:

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

Cattleguards

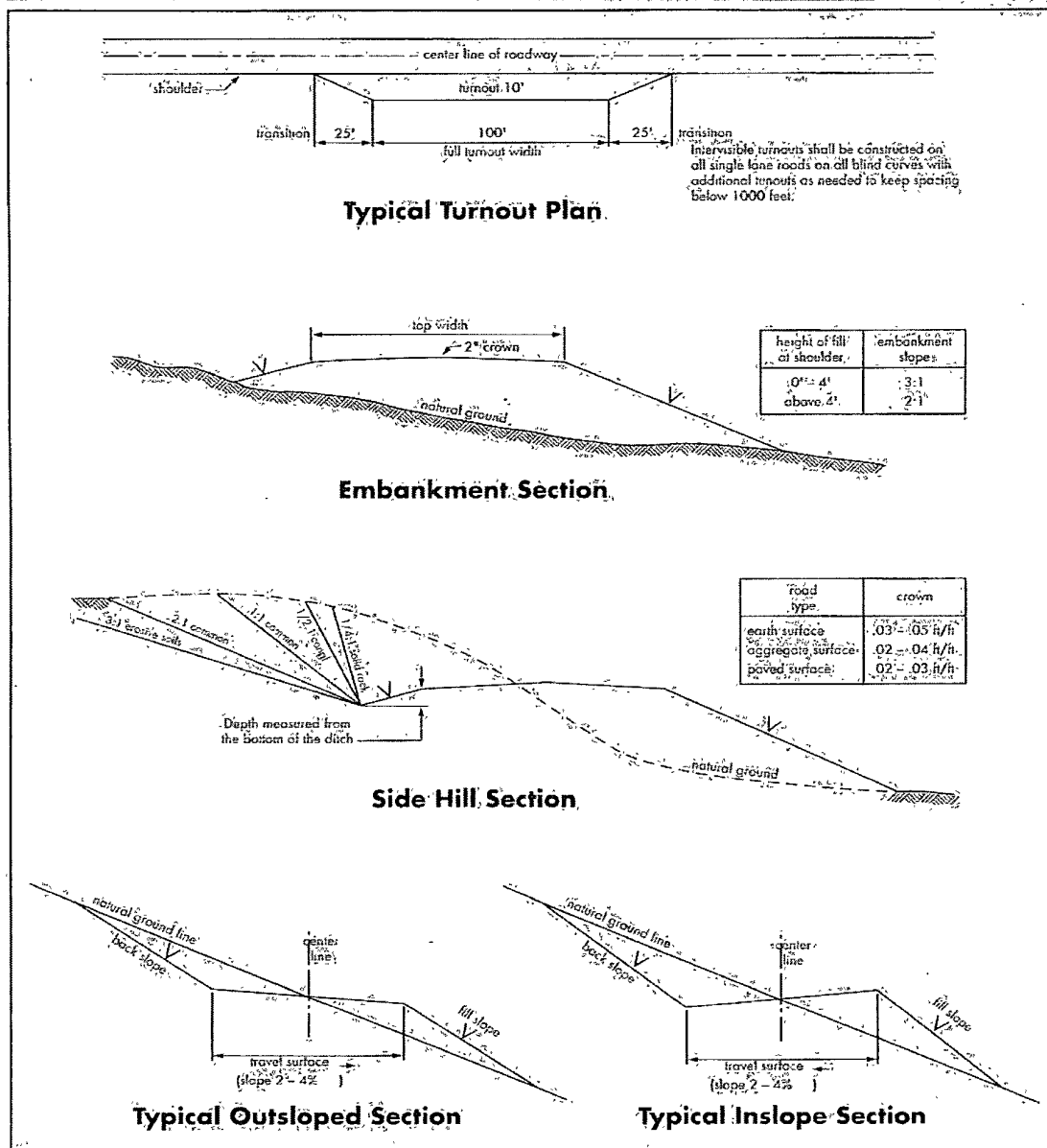
An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

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.

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 the area, 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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
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 are located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall 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 prior to drilling out 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. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. 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 water flows in the Castile, Salado, Delaware and Bone Springs Groups
Possible lost circulation in the Delaware and Bone Spring formations**

1. The **13-3/8 inch** surface casing shall be set at **approximately 810 feet (below the Magenta Dolomite member of the Rustler Anhydrite and above the salt)** and cemented to the surface.
 - 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. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - 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.
2. The minimum required fill of cement behind the **8-5/8 inch** intermediate casing, **which is to be set in the Lamar limestone at approximately 3775', is:**
 - ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

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

Centralizers required on horizontal leg, must be type for horizontal service and a 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. Operator should have plans as to how they will achieve circulation on the next stage.
 - 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 **3000 (3M)** psi. **Operator installing a 5M and testing as a 3M.**
 - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

- a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
- b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- 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.

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

CRW 120811

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

No buried production pipelines approved with this APD.

IX. 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.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation 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 that is free of contaminants 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.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

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

DISTRICT I --- CHECKLIST FOR INTENTS TO DRILL

Operator CHESAPEAKE OGRID # 147179
 Well Name & # PLU PIONEER CANYON Surface Type (F) (S) (P)
 Location: UL B, Sect 21, Township 24 s, RNG 30 e, Sub-surface Type (F) (S) (P)

A. Date C101 rec'd 12/13/2011 C101 reviewed 12/13/2011

B. 1. Check mark, Information is OK on Forms:

OGRID ✓, BONDING ✓, PROP CODE •, WELL # •, SIGNATURE •

2. Inactive Well list as of: 12/13/2011 # wells 250, # Inactive wells 15

a. District Grant APD but see number of inactive wells:

No letter required ✓, Sent Letter to Operator •, to Santa Fe •

3. Additional Bonding as of: 12/13/2011

a. District Denial because operator needs addition bonding:

No Letter required •; Sent Letter to Operator •, To Santa Fe •

b. District Denial because of Inactive well list and Financial Assurance:

No Letter required •; Sent Letter to Operator •, To Santa Fe •

C. C102 YES ✓, NO •, Signature ✓

1. Pool WILDCAT G-06524 30 26 M.B.S., Code 97778

a. Dedicated acreage 160, What Units •

b. SUR. Location Standard •; Non-Standard Location •

c. Well shares acres: Yes •, No •, # of wells • plus this well # •

2. 2nd. Operator in same acreage, Yes •, No •

Agreement Letter •, Disagreement letter •

3. Intent to Directional Drill Yes ✓, No •

a. Dedicated acreage 160, What Units B-G-J-O

b. Bottomhole Location Standard ✓, Non-Standard Bottomhole •

4. Downhole Commingle: Yes •, No •

a. Pool #2 •, Code •, Acres •

Pool #3 •, Code •, Acres •

Pool #4 •, Code •, Acres •

5. POTASH Area Yes •, No ✓

D. Blowout Preventer Yes ✓, No •

E. H2S Yes •, No ✓

F. C144 Pit Registration Yes •, No ✓

G. Does APD require Santa Fe Approval:

1. Non-Standard Location: Yes •, No ✓, NSL # •

2. Non-Standard Proration: Yes •, No ✓, NSP # •

3. Simultaneous Dedication: Yes •, No ✓, SD # •

Number of wells • Plus # •

4. Injection order Yes •, No ✓; PMX # • or WFX # •

5. SWD order Yes •, NO ✓; SWD # •

6. DHC from SF •; DHC-HOB •; Holding •

7. OCD Approval Date 12/13/2011

API #30-0 15-38768

8. Reviewers TC