AT5-12-1170

Form 3160-3
(August 2007)

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SECRETARY'S POTASH

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. NMLC068431 — TES 1/3/2013
6. If Indian, Allottee or Tribe Name

1a. Type of Work: ☒ DRILL ☐ REENTER — CONFIDENTIAL
7. If Unit or CA Agreement, Name and No. 891000303X NM 71016X Poker Lake Unit <35614>

1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone
8. Lease Name and Well No. PLU BIG SINKS 15 24 30 USA 1H <39612>

2. Name of Operator Contact: BOPCO, LP (Per sundry dated 4/8/12) <260737>
9. API Well No. 30-015-40936

3a. Address: Box 2760, Midland, TX
3b. Phone No. (include area code) Ph: 405-935-2896
10. Field and Pool, or Exploratory WILDCAT WC; G-06 S243012GM; BS <97988>

4. Location of Well (Report location clearly and in accordance with any State requirements.*)
At surface: SESE 450FSL 770FEL 32.211707 N Lat, 103.862277 W Lon
At proposed prod. zone: NENE 100FNL 660FEL 32.224693 N Lat, 103.861870 W Lon
11. Sec., T., R., M., or Blk. and Survey or Area: Sec 15 T24S R30E Mer NMP SME: BLM

14. Distance in miles and direction from nearest town or post office*: 35 MILES FROM LOVING,NM
12. County or Parish: EDDY
13. State: NM

15. Distance from proposed location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any): 450 FT FROM SOUTH LINE
16. No. of Acres in Lease: 2480.84 2479.76
17. Spacing Unit dedicated to this well: 160.00

18. Distance from proposed location to nearest well, drilling, completed, applied for, on this lease, ft.: 750' FROM PLU BIG SINKS 22 FED 1H
19. Proposed Depth: 12777 MD 8241 TVD
20. BLM/BIA Bond No. on file: ESB000159

21. Elevations (Show whether DF, KB, RT, GL, etc.): 3434 GL
22. Approximate date work will start: 10/21/2012
23. Estimated duration: 30 DAYS

## 24. Attachments

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

25. Signature: (Electronic Submission) — Name (Printed/Typed): ERIN CARSON Ph: 405-935-2896 — Date: 08/13/2012

Title: AUTHORIZED REPRESENTATIVE

Approved by (Signature): Aden Beldutz — Name (Printed/Typed): — Date: DEC - 5 2012

Title: STATE DIRECTOR — Office: NM STATE 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)** Carlsbad Controlled Water Basin

NSL-6684

**Electronic Submission #145564 verified by the BLM Well Information System**
**For CHESAPEAKE OPERATING INC, sent to the Carlsbad**
**Committed to AFMSS for processing by KURT SIMMONS on 08/29/2012 (12KMS2937AE)**

SEE ATTACHED FOR CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

## Additional Operator Remarks:

CONFIDENTIAL

Chesapeake Operating, Inc. respectfully requests permission to drill a well to 12,777?. 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 Production facility, Exhibit D Trinidad Rig layout, Exhibit F-1 to F-2 BOP & Choke Manifold, Exhibit G Standard Planning Report, Wellbore Schematic and Form C-144 Closed Loop System Permit.

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.

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

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

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

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| 1 API Number | 2 Pool Code | 3 Pool Name |
|---|---|---|
| 30-015-40936 | 97798 | WILDCAT; G-06 S243026M; Bone Spring |

| 4 Property Code | 5 Property Name | 6 Well Number |
|---|---|---|
| 39614 | PLU BIG SINKS 15 24 30 USA | 1H |

| 7 OGRID No. | 8 Operator Name | 9 Elevation |
|---|---|---|
| ~~147179~~ 260737 | ~~CHESAPEAKE OPERATING, INC.~~ BOPCO, LP | 3434' |

## 10 Surface Location

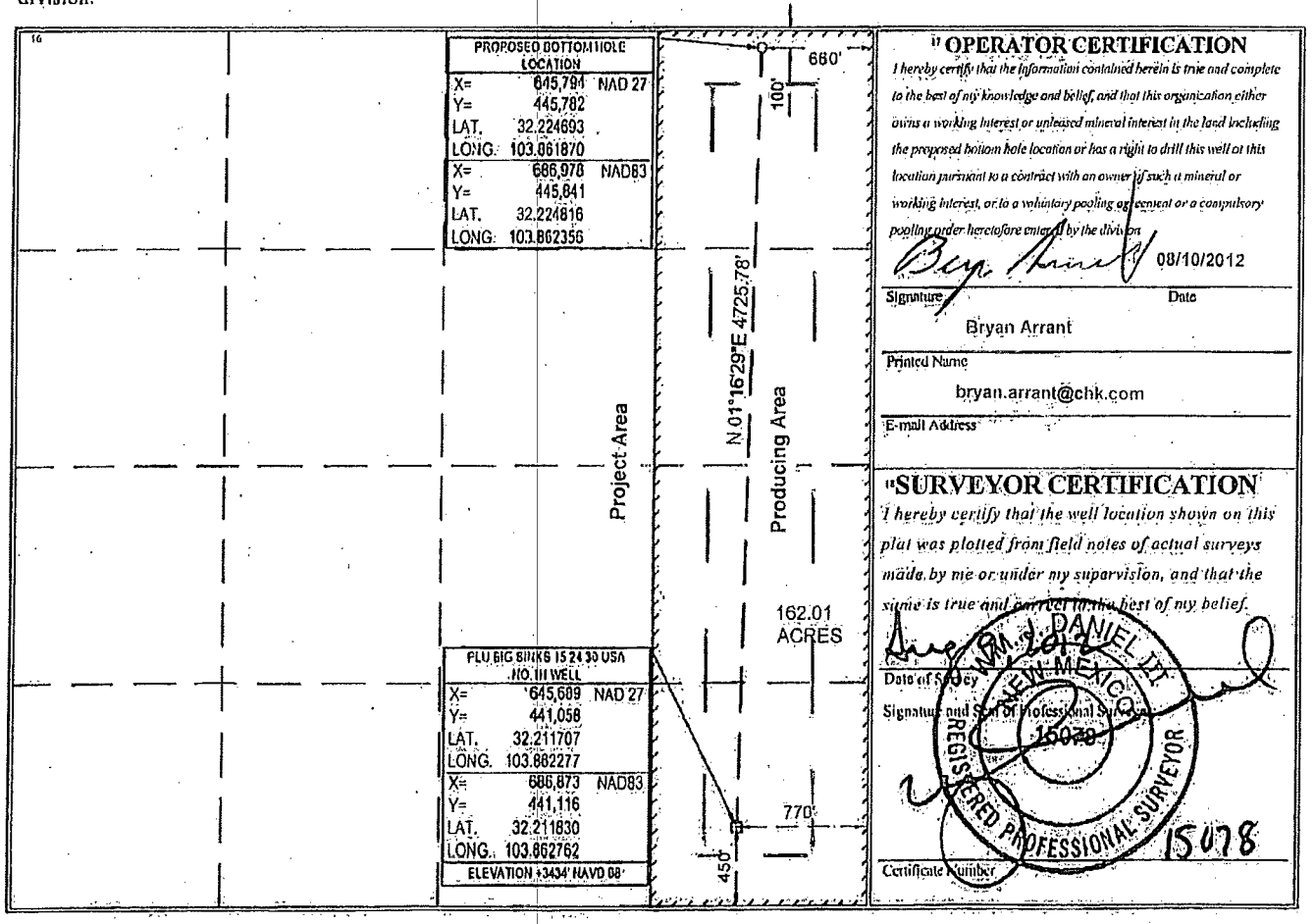
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| P | 15 | 24S | 30E | | 450' | SOUTH | 770' | EAST | EDDY |

## 11 Bottom Hole Location If Different From Surface

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| A | 15 | 24S | 30E | | 100' | NORTH | 660' | EAST | EDDY |

| 12 Dedicated Acres | 13 Joint or Infill | 14 Consolidation Code | 15 Order No. |
|---|---|---|---|
| 160 | | | NSL-6684 |

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.




## 17 OPERATOR CERTIFICATION

*I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

Bryan Arrant 08/10/2012
Signature Date

Bryan Arrant
Printed Name

bryan.arrant@chk.com
E-mail Address

## 18 SURVEYOR CERTIFICATION

*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.*

JUNE 9, 2012
Date of Survey

Signature and Seal of Professional Surveyor

NEW MEXICO DANIEL H. REGISTERED PROFESSIONAL SURVEYOR 15078

15078
Certificate Number

EXHIBIT A1

ONSHORE ORDER NO. 1
Chesapeake Agent for BOPCO
PLU Big Sinks 15 24 30 USA 1H
Eddy County, NM

CONFIDENTIAL – TIGHT HOLE
OPERATOR CERTIFICATION

## 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 20th day of June, 2011

Name: Toby Reid
Toby Reid - Field Superintendent

Address: 1616 W Bender Blvd Hobbs, NM 88240

Telephone: 575-725-8497

E-mail: toby.reid@chk.com

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 | 2838 | 621 | |
| Top of Salt | 2494 | 965 | |
| Base of Salt | -351 | 3810 | |
| Lamar | -558 | 4017 | |
| Bell Canyon | -579 | 4038 | |
| Cherry Canyon | -1525 | 4984 | |
| Brushy Canyon | -2766 | 6225 | |
| Bone Spring | -4405 | 7864 | |
| | | | |
| | | | |
| Lateral TD | -4782 | 8241 | 12777 |

## 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 | 621 |
| Oil/Gas | Brushy Canyon | 6225 |
| Oil/Gas | Bone Spring | 7864 |
| | | |

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

## 3. BOP EQUIPMENT

Will have a 5000 psi rig stack (see proposed schematic) for drill out below surface casing. Stack will be tested as specified below. Surface casing and Intermediate Casing shoes will be tested to 10.5 ppg equivalent after drilling out 10' of new formation.

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.
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.

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 Requency
1. The accumulator is to be tested each time the BO'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.

## 3. CASING PROGRAM

a. The proposed casing program will be as follows:

| Purpose | From | To | Hole Size | Csg Size | Weight | Grade | Thread | Condition |
|---|---|---|---|---|---|---|---|---|
| Surface | 0' | 750' | 17-1/2" | 13-3/8" | 48 # | H-40 | STC | New |
| Shallow Intermediate | 0' | 3,925' | 11" | 8-5/8" | 32 # | J-55 | LTC | New |
| | | | | | | | | |
| Production | 0' | 12,777' | 7-7/8" | 5-1/2" | 17.0 # | P-110 | LTC | New |

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

See COA

c. Casing Safety Factors

| Casing String | Min SF Burst | Min SF Collapse | Min SF Tension |
|---|---|---|---|
| Surface | 1.39 | 2.27 | 2.46 |
| Shallow Intermediate | 1.47 | 1.49 | 2.02 |
| | | | |
| Production | 1.43 | 1.98 | 2.48 |

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

5. CEMENTING PROGRAM

| Slurry | Type | Top | Bottom | Weight | Yield | %Excess | Sacks |
|---|---|---|---|---|---|---|---|
| Surface | | | | (ppg) | (sx/cu ft) | Open Hole | |
| Lead | C + 3% Gel | 0' | 650' | 13.7 | 1.65 | 250 | 869 |
| Tail | C | 650' | 750' | 14.8 | 1.33 | 250 | 213 |
| Intermediate | | | | | | | |
| Lead | TXI + 5% Salt | 0' | 3,425' | 12 | 1.99 | 250 | 1376 |
| Tail | 50C/50Poz +5% Salt | 3,425' | 3,925' | 14.2 | 1.37 | 250 | 336 |
| Production | | | | | | | |
| Lead | 35/65Poz H +8% Gel | 3,425' | 7,778' | 12.4 | 2.11 | 75 | 596 |
| Tail | 50/50Poz H +2% Gel | 7,778' | 12,777' | 14.5 | 1.27 | 75 | 1198 |
| | | | | | | | |
| | | | | | | | |

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 a single stage
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: No Pilot hole

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

## 6. MUD PROGRAM

| From | To | Type | Weight | F. Vis | Filtrate |
|---|---|---|---|---|---|
| 0' | 750' | Fresh Water | 8.4 - 8.7 | 32 - 34 | NC - NC |
| 750' | 3,925' | Brine | 9.5 - 10.1 | 28 - 29 | NC - NC |
| 3,925' | 7,778' | FW/Cut Brine | 8.3 - 9.5 | 28 - 29 | NC - NC |
| | | | | | |
| 7,778' | 8,530' | FW/Cut Brine | 8.3 - 9.5 | 28 - 29 | NC - NC |
| 8,530' | 12,777' | FW/Cut Brine | 8.3 - 9.5 | 28 - 29 | NC - NC |

A closed system will by 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:

a. Drill stem tests are not planned.
b. The logging program will be as follows: See COA

| TYPE | Logs | Interval | Timing | Vendor |
|---|---|---|---|---|
| OH | Triple Combo | Base of Curve- Int | After Curve | Baker Atlas |
| Mudlog | 2 man mudlogging crew | Int Csg to TD | Int Csg Drill Out | Nomac |
| | | | | |
| | | | | |
| | | | | |
| LWD | MWD Gamma | Curve and Lateral | While Drilling | Phoenix |

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

## 8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

a. No abnormal pressures or temperatures are expected. Estimated BHP is: 3649 psi
b. Hydrogen sulfide gas is not anticipated.

# Permian District

**Poker Lake**
**PLU Big Sinks 15-24-30 USA 1H**
**Well #1**

**Wellbore #1**

**Plan: Plat**

# Standard Planning Report

**09 August, 2012**

EXHIBIT 6

# Chesapeake Operating
Planning Report

| | | | |
|---|---|---|---|
| Database: | Drilling Database | Local Co-ordinate Reference: | Well Well #1 |
| Company: | Permian District | TVD Reference: | WELL @ 0.00ft (Original Well Elev) |
| Project: | Poker Lake | MD Reference: | WELL @ 0.00ft (Original Well Elev) |
| Site: | PLU Big Sinks 15-24-30 USA 1H | North Reference: | Grid |
| Well: | Well #1 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plat | | |

**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 Big Sinks 15-24-30 USA 1H

| | | | | | |
|---|---|---|---|---|---|
| Site Position: | | Northing: | 441,116.00 usft | Latitude: | 32.211829 |
| From: | Map | Easting: | 686,873.00 usft | Longitude: | -103.862763 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13.200 in | Grid Convergence: | 0.25 ° |

**Well** Well #1

| | | | | | | |
|---|---|---|---|---|---|---|
| Well Position | +N/-S | 0.00 ft | Northing: | 441,116.00 usft | Latitude: | 32.211829 |
| | +E/-W | 0.00 ft | Easting: | 686,873.00 usft | Longitude: | -103.862763 |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | | Ground Level: | 0.00 ft |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF200510 | 5/23/2012 | 7.60 | 60.13 | 48,526 |

**Design** Plat

Audit Notes:

| | | | | | |
|---|---|---|---|---|---|
| Version: | | Phase: | PROTOTYPE | Tie On Depth: | 0.00 |

| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
|---|---|---|---|---|
| | 0.00 | 0.00 | 0.00 | 1.27 |

**Plan Sections**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,778.36 | 0.00 | 0.00 | 7,778.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 8,530.03 | 90.20 | 1.27 | 8,255.83 | 479.01 | 10.64 | 12.00 | 12.00 | 0.00 | 1.27 | |
| 12,777.10 | 90.20 | 1.27 | 8,241.00 | 4,725.01 | 105.00 | 0.00 | 0.00 | 0.00 | 0.00 | BS 15-24-30 1H - BI |

# Chesapeake Operating

Planning Report

| | | | |
|---|---|---|---|
| **Database:** | Drilling Database | **Local Co-ordinate Reference:** | Well Well #1 |
| **Company:** | Permian District | **TVD Reference:** | WELL @ 0.00ft (Original Well Elev) |
| **Project:** | Poker Lake | **MD Reference:** | WELL @ 0.00ft (Original Well Elev) |
| **Site:** | PLU Big Sinks 15-24-30 USA 1H | **North Reference:** | Grid |
| **Well:** | Well #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plat | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 0.00 | 0.00 | 2,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 0.00 | 0.00 | 2,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 0.00 | 0.00 | 2,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 0.00 | 0.00 | 2,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 0.00 | 0.00 | 2,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 0.00 | 0.00 | 2,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 0.00 | 0.00 | 2,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 0.00 | 0.00 | 3,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 0.00 | 0.00 | 3,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 0.00 | 0.00 | 3,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 0.00 | 0.00 | 3,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 0.00 | 0.00 | 3,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 0.00 | 0.00 | 3,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 0.00 | 0.00 | 3,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 0.00 | 0.00 | 3,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 0.00 | 0.00 | 3,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 0.00 | 0.00 | 3,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 0.00 | 0.00 | 4,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 0.00 | 0.00 | 4,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 0.00 | 0.00 | 4,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 0.00 | 0.00 | 4,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 0.00 | 0.00 | 4,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 0.00 | 0.00 | 4,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 0.00 | 0.00 | 4,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 0.00 | 0.00 | 4,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 0.00 | 0.00 | 4,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 0.00 | 0.00 | 4,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 0.00 | 0.00 | 5,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 0.00 | 0.00 | 5,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 0.00 | 0.00 | 5,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 0.00 | 0.00 | 5,300.00 | 0.00 | 0.00 | 0.00 | 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 @ 0.00ft (Original Well Elev) |
| **Project:** | Poker Lake | **MD Reference:** | WELL @ 0.00ft (Original Well Elev) |
| **Site:** | PLU Big Sinks 15-24-30 USA 1H | **North Reference:** | Grid |
| **Well:** | Well #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plat | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,400.00 | 0.00 | 0.00 | 5,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 0.00 | 0.00 | 5,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 0.00 | 0.00 | 5,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 0.00 | 0.00 | 5,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 0.00 | 0.00 | 5,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 0.00 | 0.00 | 5,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 0.00 | 0.00 | 6,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 0.00 | 0.00 | 6,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 0.00 | 0.00 | 6,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 0.00 | 0.00 | 6,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 0.00 | 0.00 | 6,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 0.00 | 0.00 | 6,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 0.00 | 0.00 | 6,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 0.00 | 0.00 | 6,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 0.00 | 0.00 | 6,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 0.00 | 0.00 | 6,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 0.00 | 0.00 | 7,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 0.00 | 0.00 | 7,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 0.00 | 0.00 | 7,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 0.00 | 0.00 | 7,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,400.00 | 0.00 | 0.00 | 7,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 0.00 | 0.00 | 7,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,600.00 | 0.00 | 0.00 | 7,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 0.00 | 0.00 | 7,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,778.36 | 0.00 | 0.00 | 7,778.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 2.60 | 1.27 | 7,799.99 | 0.49 | 0.01 | 0.49 | 12.00 | 12.00 | 0.00 |
| 7,900.00 | 14.60 | 1.27 | 7,898.69 | 15.41 | 0.34 | 15.41 | 12.00 | 12.00 | 0.00 |
| 8,000.00 | 26.60 | 1.27 | 7,992.13 | 50.51 | 1.12 | 50.52 | 12.00 | 12.00 | 0.00 |
| 8,100.00 | 38.60 | 1.27 | 8,076.22 | 104.27 | 2.32 | 104.30 | 12.00 | 12.00 | 0.00 |
| 8,200.00 | 50.60 | 1.27 | 8,147.30 | 174.34 | 3.87 | 174.38 | 12.00 | 12.00 | 0.00 |
| 8,300.00 | 62.60 | 1.27 | 8,202.25 | 257.65 | 5.73 | 257.71 | 12.00 | 12.00 | 0.00 |
| 8,400.00 | 74.60 | 1.27 | 8,238.68 | 350.56 | 7.79 | 350.64 | 12.00 | 12.00 | 0.00 |
| 8,500.00 | 86.60 | 1.27 | 8,254.99 | 449.01 | 9.98 | 449.12 | 12.00 | 12.00 | 0.00 |
| 8,530.03 | 90.20 | 1.27 | 8,255.83 | 479.01 | 10.64 | 479.13 | 12.00 | 12.00 | 0.00 |
| 8,600.00 | 90.20 | 1.27 | 8,255.68 | 548.97 | 12.20 | 549.10 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 90.20 | 1.27 | 8,255.23 | 648.94 | 14.42 | 649.10 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 90.20 | 1.27 | 8,254.88 | 748.92 | 16.64 | 749.10 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 90.20 | 1.27 | 8,254.53 | 848.89 | 18.86 | 849.10 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 90.20 | 1.27 | 8,254.18 | 948.87 | 21.09 | 949.10 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 90.20 | 1.27 | 8,253.84 | 1,048.84 | 23.31 | 1,049.10 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 90.20 | 1.27 | 8,253.49 | 1,148.81 | 25.53 | 1,149.10 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 90.20 | 1.27 | 8,253.14 | 1,248.79 | 27.75 | 1,249.10 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 90.20 | 1.27 | 8,252.79 | 1,348.76 | 29.97 | 1,349.10 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 90.20 | 1.27 | 8,252.44 | 1,448.74 | 32.19 | 1,449.10 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 90.20 | 1.27 | 8,252.09 | 1,548.71 | 34.42 | 1,549.10 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 90.20 | 1.27 | 8,251.74 | 1,648.69 | 36.64 | 1,649.10 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 90.20 | 1.27 | 8,251.39 | 1,748.66 | 38.86 | 1,749.09 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 90.20 | 1.27 | 8,251.04 | 1,848.64 | 41.08 | 1,849.09 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 90.20 | 1.27 | 8,250.69 | 1,948.61 | 43.30 | 1,949.09 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 90.20 | 1.27 | 8,250.35 | 2,048.59 | 45.52 | 2,049.09 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 90.20 | 1.27 | 8,250.00 | 2,148.56 | 47.75 | 2,149.09 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 90.20 | 1.27 | 8,249.65 | 2,248.54 | 49.97 | 2,249.09 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 90.20 | 1.27 | 8,249.30 | 2,348.51 | 52.19 | 2,349.09 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 90.20 | 1.27 | 8,248.95 | 2,448.49 | 54.41 | 2,449.09 | 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 @ 0.00ft (Original Well Elev) |
| **Project:** | Poker Lake | **MD Reference:** | WELL @ 0.00ft (Original Well Elev) |
| **Site:** | PLU Big Sinks 15-24-30 USA 1H | **North Reference:** | Grid |
| **Well:** | Well #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plat | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 10,600.00 | 90.20 | 1.27 | 8,248.60 | 2,548.46 | 56.63 | 2,549.09 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 90.20 | 1.27 | 8,248.25 | 2,648.44 | 58.85 | 2,649.09 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 90.20 | 1.27 | 8,247.90 | 2,748.41 | 61.08 | 2,749.09 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 90.20 | 1.27 | 8,247.55 | 2,848.38 | 63.30 | 2,849.09 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 90.20 | 1.27 | 8,247.20 | 2,948.36 | 65.52 | 2,949.09 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 90.20 | 1.27 | 8,246.85 | 3,048.33 | 67.74 | 3,049.09 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 90.20 | 1.27 | 8,246.51 | 3,148.31 | 69.96 | 3,149.09 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 90.20 | 1.27 | 8,246.16 | 3,248.28 | 72.18 | 3,249.09 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 90.20 | 1.27 | 8,245.81 | 3,348.26 | 74.41 | 3,349.08 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 90.20 | 1.27 | 8,245.46 | 3,448.23 | 76.63 | 3,449.08 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 90.20 | 1.27 | 8,245.11 | 3,548.21 | 78.85 | 3,549.08 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 90.20 | 1.27 | 8,244.76 | 3,648.18 | 81.07 | 3,649.08 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 90.20 | 1.27 | 8,244.41 | 3,748.16 | 83.29 | 3,749.08 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 90.20 | 1.27 | 8,244.06 | 3,848.13 | 85.51 | 3,849.08 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 90.20 | 1.27 | 8,243.71 | 3,948.11 | 87.74 | 3,949.08 | 0.00 | 0.00 | 0.00 |
| 12,100.00 | 90.20 | 1.27 | 8,243.36 | 4,048.08 | 89.96 | 4,049.08 | 0.00 | 0.00 | 0.00 |
| 12,200.00 | 90.20 | 1.27 | 8,243.01 | 4,148.06 | 92.18 | 4,149.08 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 90.20 | 1.27 | 8,242.67 | 4,248.03 | 94.40 | 4,249.08 | 0.00 | 0.00 | 0.00 |
| 12,400.00 | 90.20 | 1.27 | 8,242.32 | 4,348.01 | 96.62 | 4,349.08 | 0.00 | 0.00 | 0.00 |
| 12,500.00 | 90.20 | 1.27 | 8,241.97 | 4,447.98 | 98.84 | 4,449.08 | 0.00 | 0.00 | 0.00 |
| 12,600.00 | 90.20 | 1.27 | 8,241.62 | 4,547.95 | 101.07 | 4,549.08 | 0.00 | 0.00 | 0.00 |
| 12,700.00 | 90.20 | 1.27 | 8,241.27 | 4,647.93 | 103.29 | 4,649.08 | 0.00 | 0.00 | 0.00 |
| 12,777.10 | 90.20 | 1.27 | 8,241.00 | 4,725.01 | 105.00 | 4,726.18 | 0.00 | 0.00 | 0.00 |

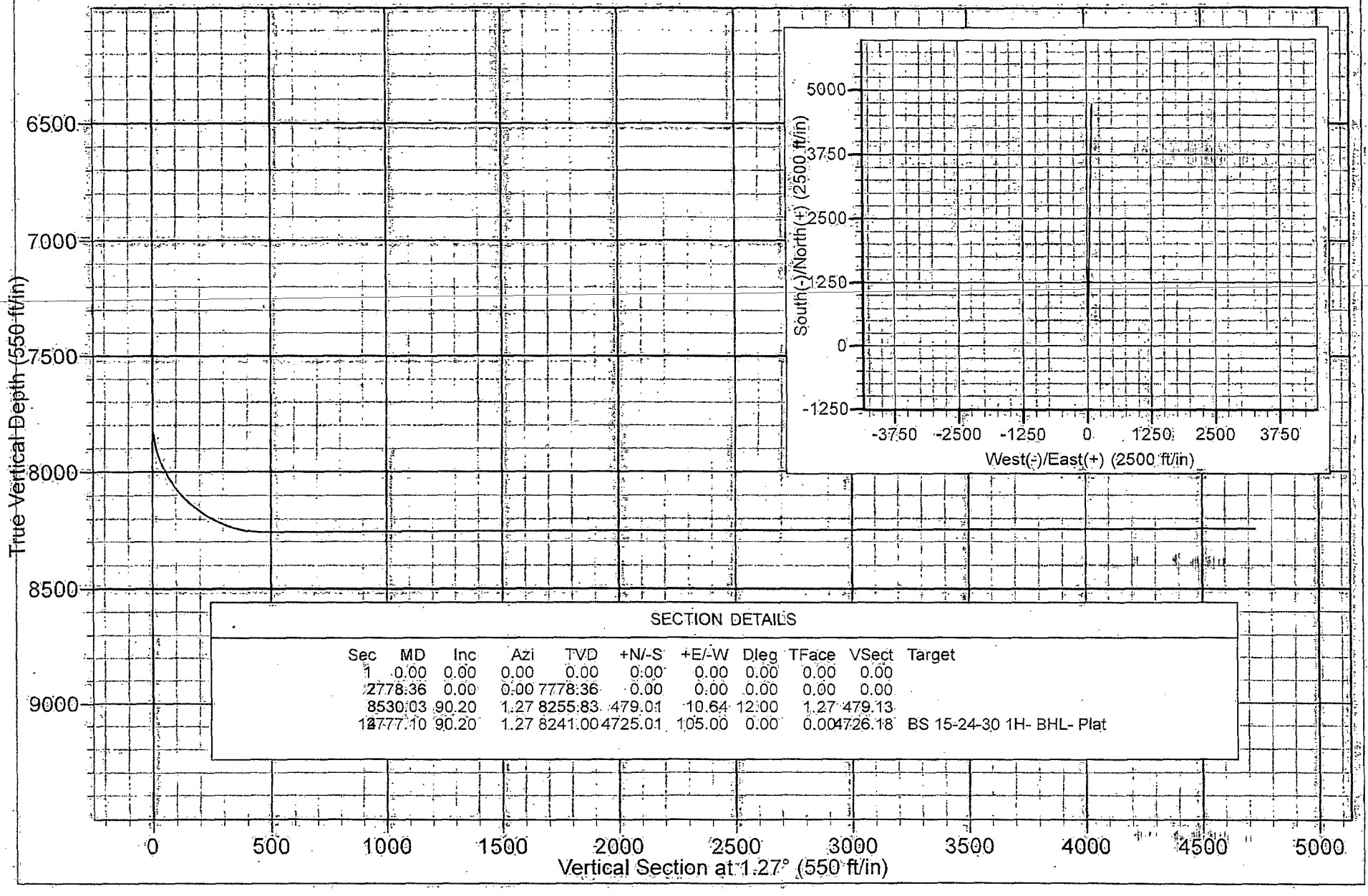
**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| BS 15-24-30 1H- BHL<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 8,241.00 | 4,725.01 | 105.00 | 445,841.00 | 686,978.00 | 32.224816 | -103.862357 |
| BS 15-24-30 1H- SHL<br>- plan misses target center by 198.61ft at 8155.60ft MD (8117.56 TVD, 141.40 N, 3.14 E)<br>- Point | 0.00 | 0.00 | 8,257.00 | 0.00 | 0.00 | 441,116.00 | 686,873.00 | 32.211829 | -103.862763 |

Project: Poker Lake
Site: PLU Big Sinks 15-24-30 USA 1H
Well: Well #1
Wellbore: Wellbore #1
Design: Plat

**PROJECT DETAILS: Poker Lake**

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




SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 7778.36 | 0.00 | 0.00 | 7778.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3 | 8530.03 | 90.20 | 1.27 | 8255.83 | 479.01 | 10.64 | 12.00 | 1.27 | 479.13 | |
| 4 | 12777.10 | 90.20 | 1.27 | 8241.00 | 4725.01 | 105.00 | 0.00 | 0.00 | 4726.18 | BS 15-24-30 1H- BHL- Plat |

Chesapeake ENERGY

Drilling Engineer: Chris Gray
Superintendent: Daniel Gipson
Geologist: Chris Perselin

| | |
|---|---|
| Well Name: | PLU Big Sinks 15-24-30 USA 1H |
| Target: | |
| County, State: | Eddy, NM |
| Surface Location: | 450' FSL 770' FEL, Section 15, Township 24S, Rangce 30E |
| BH Location: | 100' FNL 660' FEL, Section 15, Township 24S, Rangce 30E |

| | | | |
|---|---|---|---|
| SHL Latitude: | 32.211830 | SHL North: | 441116 |
| SHL Longitude: | -103.862762 | SHL East: | 686873 |
| BHL Latitude: | 32.224816 | BHL North: | 445841 |
| BHL Longitude: | -103.862356 | BHL East: | 686978 |
| Coordinates: | NAD83 | Coordinates: | NMSPCE |

| | |
|---|---|
| Drilling Rig: | Trinidad 111 |
| Directional: | Phoenix |
| Drilling Mud: | Nova |
| Cement: | Schlumberger |
| Wellhead: | Sunbelt |
| Property Number: | |
| AFE Number: | |

KB Elevation: 3,451' KB: 17'
Ground Elevation: 3,434'

Conductor
OD: 20"
Wt:
Hole Size:
Setting Depth: 120'

Surface Casing
OD: 13 3/8"
Wt: 48.#
Grd: H-40
Con: STC
Hole Size: 17 1/2"
Setting Depth: 750'

Intermediate
OD: 8 5/8"
Wt: 32.#
Grd: J-55
Con: LTC
Hole Size: 11"
Setting Depth: 3,928'

Hole Size: 7 7/8"

Hole Size: 7 7/8"

| | | |
|---|---|---|
| 621' | Rustler | |
| 965' | Top of Salt | |
| 3,810' | Base of Halite | |
| 4,017' | Lamar | |
| 4,038' | Bell Canyon | |
| 4,984' | Cherry Canyon | |
| 6,225' | Brushy Canyon | |
| 7,864' | Bone Spring | |

Hole Size: 7 7/8"

Production Casing
OD: 5 1/2"
Wt: 17.#
Grd: P-110
Con: LTC
Setting Depth: 12,777'

| Wellhead Equipment | |
|---|---|
| A Section | 13-3/8" x 13-5/8" 5K SOW (Multibowl) |
| B Section | N/A (Multibowl) |
| C Section | 11" 5K X 7-1/16" 10K w/10k gate valve |
| D Section | N/A |
| Required BOP Stack | 13-5/8" 5K- Double, Annular, Rot Head w/orbit valve |

| Mud | | | | |
|---|---|---|---|---|
| Depth | Type | Weight | F. Vis | FL |
| 0' - 750' | Fresh Water | 8.4 - 8.7 | 32 - 34 | NC - NC |
| 750' - 3,925' | Brine | 9.5 - 10.1 | 28 - 29 | NC - NC |
| 3,925' - 7,778' | FW/Cut Brine | 8.3 - 9.5 | 28 - 29 | NC - NC |
| 7,778' - 8,530' | FW/Cut Brine | 8.3 - 9.5 | 28 - 29 | NC - NC |
| 8,530' - 12,777' | FW/Cut Brine | 8.3 - 9.5 | 28 - 29 | NC - NC |

| Cement | | | | | | | |
|---|---|---|---|---|---|---|---|
| Slurry | Top | Btm | Wt | Yld | %Exc | Bbl | Sx |
| Surface | | | | | | | |
| Lead | 0' | 650' | 13.7 | 1.65 | 250 | 255 | 869 |
| Tail | 650' | 750' | 14.8 | 1.33 | 250 | 50 | 213 |
| Intermediate | | | | | | | |
| Lead | 0' | 3,425' | 12.0 | 1.99 | 250 | 488 | 1376 |
| Tail | 3,425' | 3,925' | 14.2 | 1.37 | 250 | 82 | 336 |
| Production | | | | | | | |
| Lead | 3,425' | 7,778' | 12.4 | 2.11 | 75 | 224 | 596 |
| Tail | 7,778' | 12,777' | 14.5 | 1.27 | 75 | 271 | 1198 |

| LOGS | Type | Logs | Interval | Vendor |
|---|---|---|---|---|
| | OH | Triple Combo | Base of Curve- Int Shoe | Baker Atlas |
| | Mudlog | 2 man mudlogging crew | Int Csg to TD | Nomac |
| | | | | |
| | | | | |
| | LWD | MWD Gamma | Curve and Lateral | Phoenix |

| Directional Plan | | | | | | |
|---|---|---|---|---|---|---|
| Target Line: | 8257' @ 0' VS w/90.2 deg Inclination | | | | | |
| Target Window: | 20' above, 20' below, 50' left, 50' right | | | | | |
| | MD | INC | AZM | TVD | VS | DLS |
| KOP | 7,778' | 0.00 | 0.00 | 7,778' | 0' | 0.00 |
| EOB | 8,530' | 90.20 | 1.27 | 8,256' | 479' | 12.00 |
| TD | 12,777' | 90.20 | 1.27 | 8,241' | 4,726' | 0.00 |
| Hardlines: | Lateral- 467' from parallel lease lines.<br>Vertical- Actual Lease Lines | | | | | |
| Notes: | Please note SHL and BHL distance from lease lines | | | | | |

# Chesapeake Minimum BOPE Requirements

**Wellname:** PLU Big Sinks 15-24-30 USA 1H
**Operation:** Intermediate and Production Hole Sections

## BLOWOUT PREVENTOR SCHEMATIC

### CHESAPEAKE OPERATING INC

### Permian District-Minimum Requirements

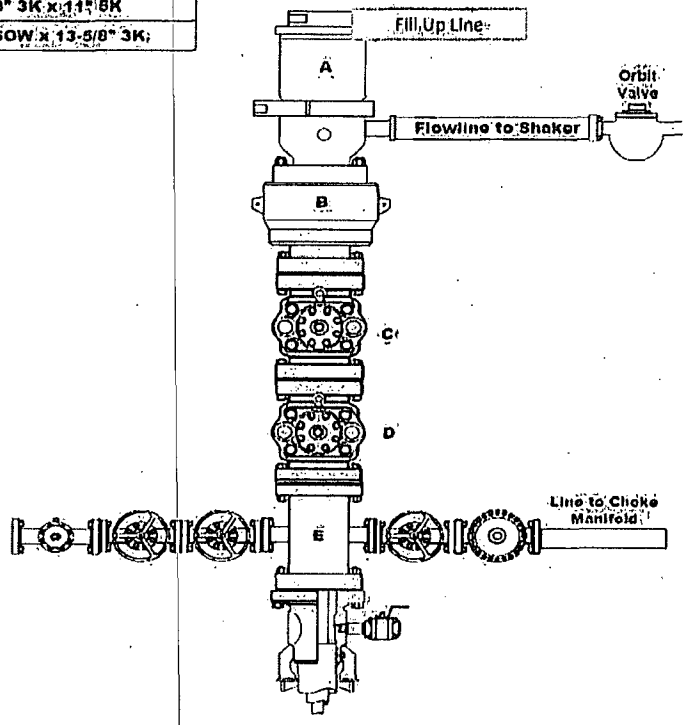
**FIELD** : Avalon

**OPERATION:** Intermediate and Production Hole Sections

| | SIZE | PRESSURE | DESCRIPTION |
|---|---|---|---|
| A | | 500 | Rotating Head |
| B | 13 5/8" | 5,000 | Annular |
| C | 13 5/8" | 5,000 | Pipe Ram |
| D | 13 5/8" | 5,000 | Blind Ram |
| E | 13 5/8" | 5,000 | Mud Cross |
| F | | | |
| DSA | | As required for each hole size | |
| C-Sec | | | |
| B-Sec | | 13-5/8" 3K x 11" 5K | |
| A-Sec | | 13-3/8" SOW x 13-5/8" 3K | |

Test Notes:

- Pressure test to rating of BOP or wellhead every 21 days.
- Function test on trips
- H2S service trim required




### Kill Line

| SIZE | PRESSURE | DESCRIPTION |
|---|---|---|
| 2" | 5,000 | Check Valve |
| 2" | 5,000 | Gate Valve |
| 2" | 5,000 | Gate Valve |
| | | |
| | | |

### Choke Line

| SIZE | PRESSURE | DESCRIPTION |
|---|---|---|
| 3" | 5,000 | Gate Valve |
| 3" | 5,000 | HCR Valve |
| 3" | 5,000 | Steel Line Only |
| | | |
| | | |

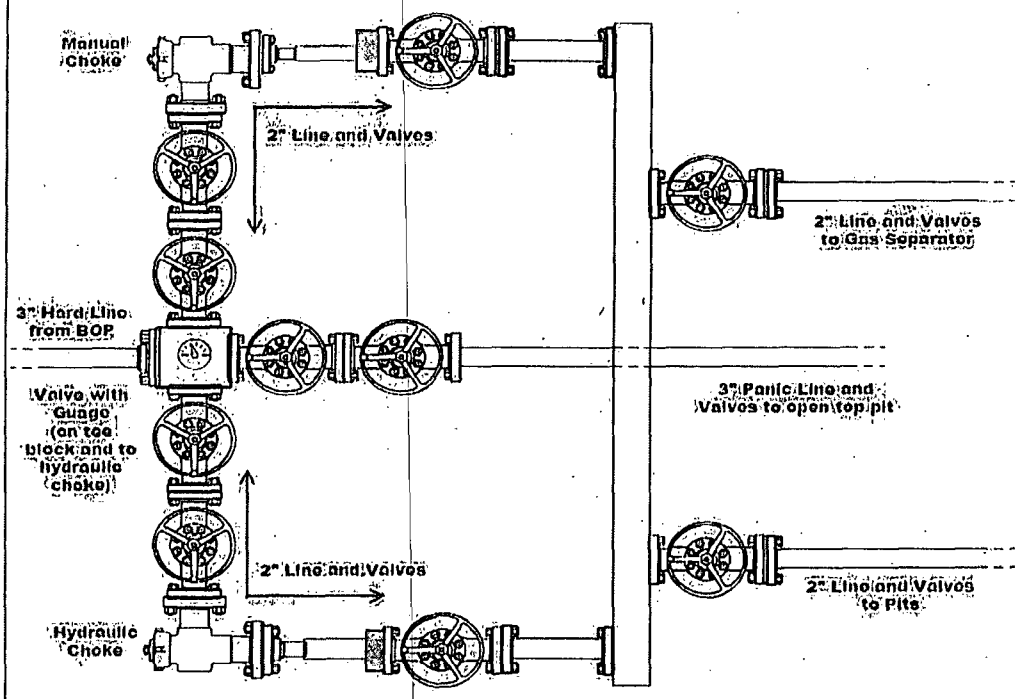
EXHIBIT F1

## Chesapeake Minimum BOPE Requirements

**Wellname:** PLU Big Sinks 15-24-30 USA 1H
**Operation:** Intermediate and Production Hole Sections

# CHOKE MANIFOLD SCHEMATIC

**CHESAPEAKE OPERATING INC**
**Permian District**
**Avalon Minimum Requirements**




### Choke Manifold

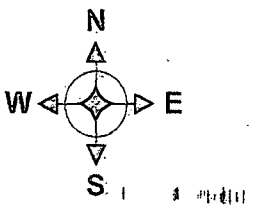
| SIZE | PRESSURE | DESCRIPTION |
|---|---|---|
| | | |
| 2" or 3" | 5,000 | Gate Valves |
| 3'x15' | | Gas Separator |
| 8" | | Gas Separator vent line (anchored) |
| | | |

EXHIBIT F2

# PLU Big Sinks 15-24-30 USA 1H

Chesapeake ENERGY

Trinidad



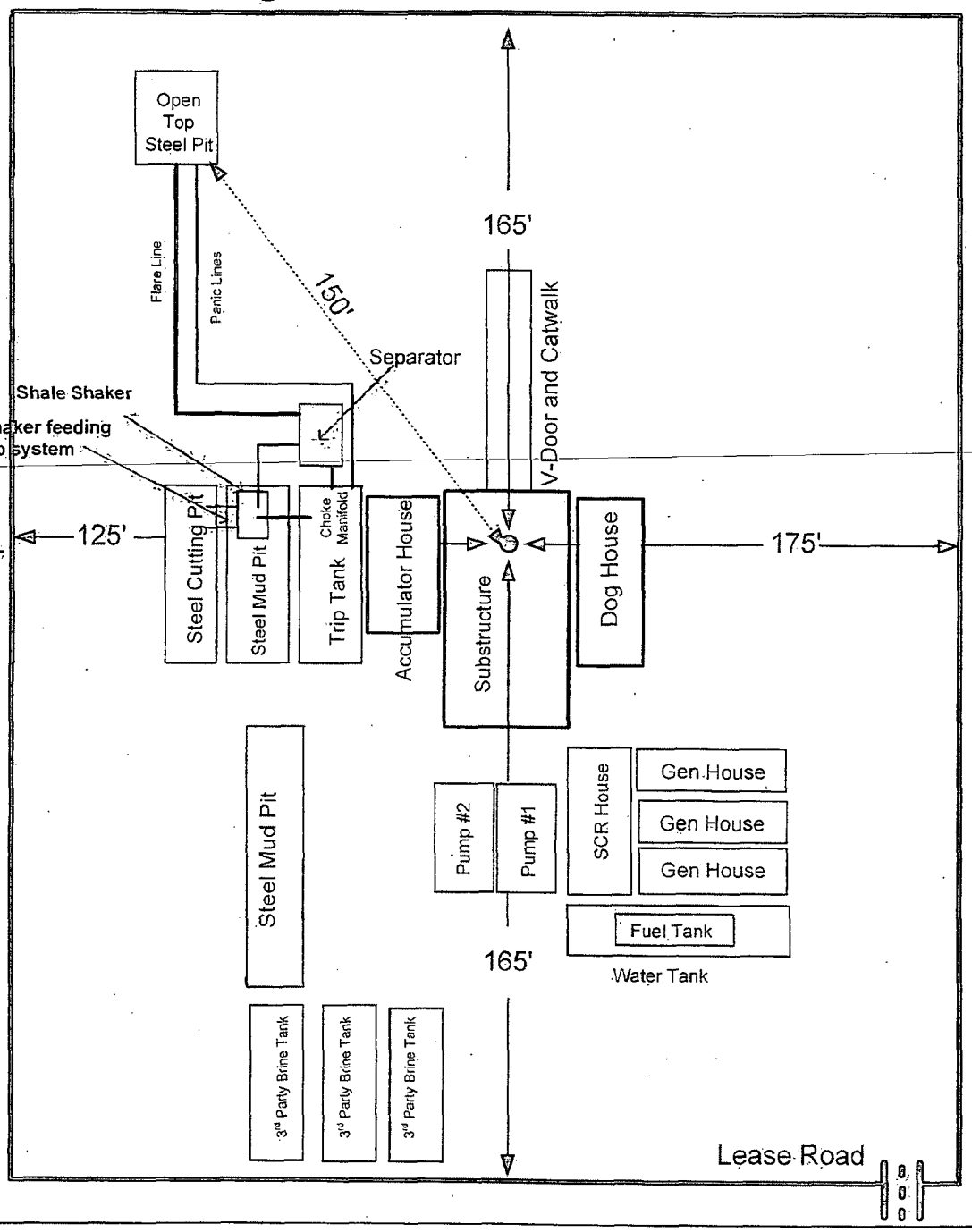




EXHIBIT D

TRINIDAD DRILLING

TDJ

Rig # 110 or

Trinidad Rig # 111 - AC 1200 HP Triple PAD

| | |
|---|---|
| SUBSTRUCTURE: | •Substructure Type: 1-piece, step down<br>•Manufacturer: Mastco<br>•Floor Height: 16'-6"<br>•Clear Working Height: 13'-6"<br>•Rotary Capacity: 500,000 lbs<br>•Maximum Rated Pipe Setback: 400,000 lbs<br>•Intergraded Skidding System |
| MAST: | •Mast Type: 142" cantilever<br>•Manufacturer: Mastco<br>•Static Hook Load: 500,000 lbs<br>•Number of Lines: 10 Lines<br>•Drill Line Size: 1-1/4"<br>•Racking Capacity: 15,000' of 4-1/2" DP & 450' of 8" DC |
| DRAWWORKS: | •Manufacture/Model: TSM 1200 AC<br>•Capacity: 500,000 lbs w/ 10 Lines<br>•Rated Power: 1500 hp<br>•Drive: 1 EA GE0 28 AC traction motor rated @ 1,500 hp<br>•Auxiliary/Parking Brake: Eaton 330 WCSB Brake<br>•Main Brake: GE0 20 AC traction motor |
| MUD PUMPS: | Mud Pump #1<br>•Manufacturer & Model: Gardner Denver PZ-10<br>•Rated Power: 1300 hp<br>•Stroke: 10"<br>•Mud Pump Drive: GE0 28 rated @ 1,500hp<br><br>Mud Pump #2<br>•Manufacturer & Model: Gardner Denver PZ-10<br>•Rated Power: 1300 hp<br>•Stroke: 10"<br>•Mud Pump Drive: GE0 28 rated @ 1,500hp |
| MUD SYSTEM: | •Total Capacity: 1000bbls (Two Tank System)<br>•Shakers: 2 EA MI Swaco Mongoose 3 panel linear motion shakers<br>•Desilter: 1 EA NOV-Brandt CTX w/20EA 4" cones with grooved end inlet and overflow, desilting capacity of 1300 gpm.<br>•Desander: 1 EA NOV CTX w/3EA 10" diameter cones with grooved end inlet and overflow, desanding capacity of 1500 gpm.<br>•Vacuum Degasser: 1 EA NOV DG-10, 60" vessel with a capacity of 1000 gpm. |
| BOP EQUIPMENT: | •1EA 11" Annular 3,000 psi WP; Naco Trim (API Spec 16A)<br>•1EA 11" Single Ram BOP; 3,000 psi WP; Naco Trim<br>•1EA 11" Single Ram BOP; 3,000 psi WP; Naco Trim |
| MANIFOLD: | •Naco Trim double gut line, 3" x 5,000psi c/w two 3" electrically actuated (Pason style) chokes |
| ACCUMULATOR: | • Control Tech 6 station, 120 gallon c/w 2 EA pneumatic pumps and 1 EA electric triplex pump |
| BLOCK: | •American Block 250 Ton |
| TOP DRIVE: | •National Oilwell Varco TDS11, AC 500 Ton, 37,500 ft-lbs, 800 HP |
| ROTARY TABLE: | •Emsco Style SJ-205 (20-1/2") driven by 1EA Hydraulic motor |
| CATWALK MACHINE: | •Mastco Hydraulic Catwalk System |
| POWER SYSTEM: | •ADD VFD System, MCC, Generator Control and three (3) 950BHP, 1200 RPM, 1750 KVA Caterpillar 3508 Engine Generator Sets |
| DRILL COLLARS: | •21 EA 6-1/2" DC w/ HC16 Connections, 3 EA 8" DC w/ HC16 Connections |
| DRILL PIPE: | •250 Joints of 4-1/2", 16.60 #/ft., grade S135, Range III w/ 6-5/8" TJ and HC16 connections |
| WATER TANK: | •500bbls capacity |
| FUEL TANK: | •10,000 gallon capacity |
| TOOL/STORAGE: | •Parts storage room and tool house room |
| CAMP: | •Tool Pusher House: One 12' x 50' skidded<br>•Crew Change House: One 13' X 48' skidded<br>•Crew Galley House: One 12' X 60' skidded<br>•Crew Quarters House: One 12' X 60' skidded |

# Chesapeake Operating, Inc.'s Closed Loop System
# PLU BIG SINKS 15 24 30 USA 1H
# Unit P, Sec.15, T-24-S R-30-E
# Eddy Co., NM
# API # TBD

**Chesapeake Operating, Inc. (COI) is to use a closed loop system with roll-off steel pits for the maintenance of the drilling mud fluids and drill cuttings. COI will maintain all solids and liquids within the closed loop system in a safe manner in order to protect public health and the environment.**

**Operations & Maintenance:**

**During each tour, the rig's drilling crew will inspect and monitor the drilling fluids contained within the steel pits and visually monitor any spill which may occur. Should a spill, release, or leak occur; the NMOCD District II office in Artesia (575-748-1283) will be notified. Please note that notifications may be made earlier to the district office should a greater release occur per NMOCD's rules.**

**Closure:**

**During and after drilling operations, drilling fluids and cuttings will be hauled to Controlled Recovery, Inc. Permit # NM-01-0006.**

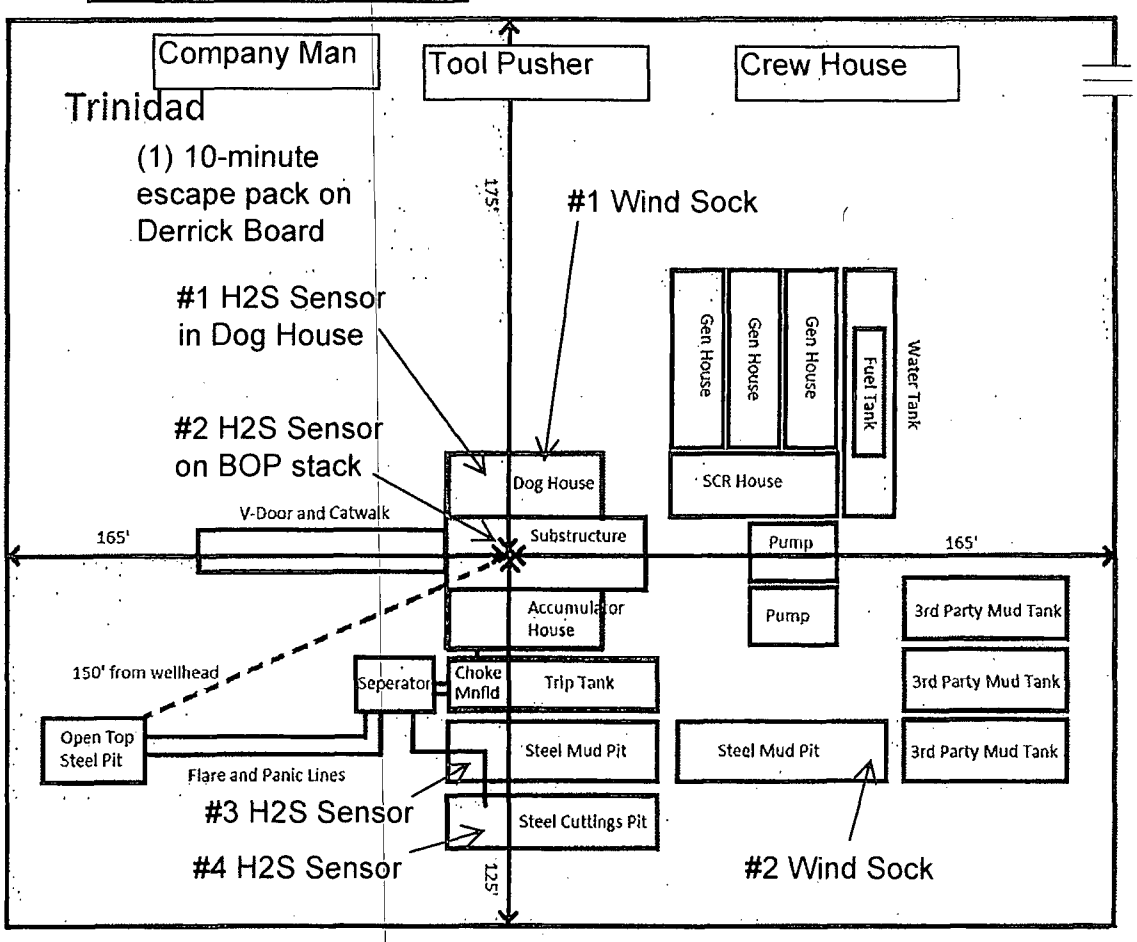
**The alternative disposal facility will be Sundance Disposal. Permit # NM-01-000**

Muster Area #1 @
Company Man Trailer
(1) safety sign
(2) 30 min SCBA packs
(1) handheld gas monitor

Muster Area #2 @ Road Entrance
(1) safety sign
(2) 30 min SCBA packs
(1) conditions sign

Prevailing wind from the SW

PLU Big Sinks 15-24-30 USA 1H




Top Soil

# Chesapeake Operating, Inc.

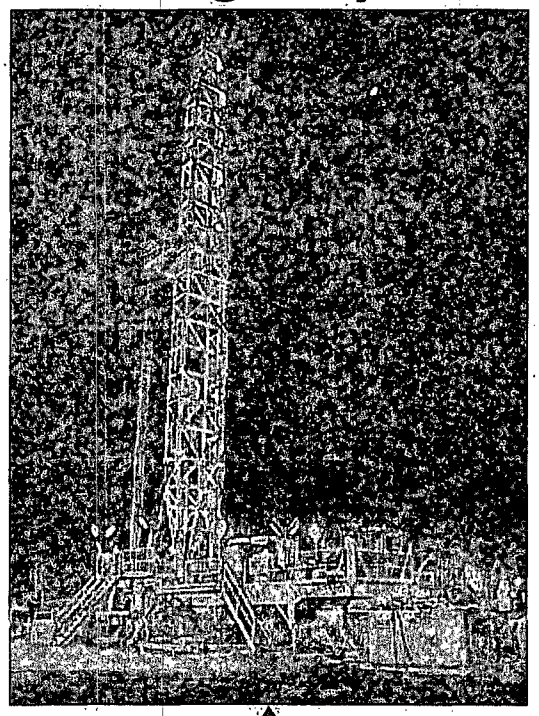
**Legals:**
**PLU Big Sinks 15 24 30 USA 1H**
**Trinidad 111**

Eddy County New Mexico

**Surface Location**
**UL P Section 15**
**Township 24 South**
**Lat: N 32.211709 Lat: N 32.211832**
**Long: W 103.861921 Long: W 103.862406**

**Bottom Hole**
**UL A Section 15**
**Township 24 South**
**Lat: N 32.224693 Lat: N 32.224816**
**Long: W 103.861870 Long: W 103.862356**

# $H_2S$
# "Contingency Plan"



SAFETY SOLUTIONS, LLC.

**Safety Solutions, LLC (432) 563-0400**
**7907 Industrial Midland, TX 79706**

## Emergency Assistance Telephone List

| **PUBLIC SAFETY:** | **911 or** |
|---|---|
| Eddy County Sheriff's Department | (575) 887-7551 |
| Carlsbad City Police Dept | (575)395-2121 |
| Fire Department: | |
| Carlsbad | (575) 885-3125 |
| Loving | (575) 745-3600 |
| Ambulance: Carlsbad | (575) 885-3125 |
| Loving | (575) 745-3600 |
| Hospitals: | |
| Carlsbad Medical Center | (575) 887-4100 |
| Dept. of Public Safety/Carlsbad | (575) 885-3138 |
| Eddy County Emergency Mgmt. | (575) 887-9511 |
| U.S. Dept. of Labor | (505) 841-8405 |
| AirMed/ Care Star | (877) 730-0009 |
| **Chesapeake Operating, Inc.** | |
| Chesapeake / Midland | Office (432) 687-2992 |
| **Company Drilling Consultants:** | |
| Trailer | (832) 280-2410 |
| **Drilling Engineer** | |
| Chris Gray | Cell (405) 935-4346 |
| **Drilling Superintendent - Chesapeake** | |
| Daniel Gipson | Cell (432) 425-6547 |
| **Trinidad 111** | |
| Office (Trailer) | (281) 617-4510 |
| Safety - Jonathan Lopez | (318) 780-0384 |
| Superintendent – Daniel Maudlin | (832) 470-0165 |
| **Safety Consultants** | |
| Chesapeake - Aaron Gallegos | Cell (432) 813-4533 |
| Safety Solutions, LLC | Office (432) 563-0400 |
| Cliff Strasner | Cell (432) 894-9789 |
| Craig Strasner | Cell (432) 894-0341 |

## Table of Contents

## $H_2S$ CONTINGENCY PLAN SECTION

**Scope:**

This contingency plan provides an organized plan of action for alerting and protecting the public within an area of exposure prior to an intentional release, or following the accidental release of a potentially hazardous volume of hydrogen sulfide. The plan establishes guidelines for all personnel whose work activity may involve exposure to Hydrogen Sulfide Gas ($H_2S$).

**Objective:**

Prevent any and all accidents, and prevent the uncontrolled release of $H_2S$ into the atmosphere.

Provide proper evacuation procedures to cope with emergencies.

Provide immediate and adequate medical attention should an injury occur.

**Discussion of Plan:**

**Suspected Problem Zones:**

***Implementation:*** This plan, with all details, is to be fully implemented 1000' before drilling into the first sour zone.

***Emergency Response Procedure:*** This section outlines the conditions and denotes steps to be taken in the event of an emergency.

***Emergency Equipment and Procedure:*** This section outlines the safety and emergency equipment that will be required for the drilling of this well.

***Training Provisions:*** This section outlines the training provisions that must be adhered to 1000' before drilling into the first sour zone.

***Emergency call list:*** Included are the telephone numbers of all persons that would need to be contacted, should an $H_2S$ emergency occur.

***Briefing:*** This section deals with the briefing of all persons involved with the drilling of this well.

***Public Safety:*** Public Safety Personnel will be made aware of the drilling of this well.

***Check Lists:*** Status check lists and procedural check lists have been included to ensure adherence to the plan.

***General Information:*** A general information section has been included to supply support information.

# EMERGENCY PROCEDURES SECTION

I. In the event of any evidence of $H_2S$ level above 10ppm, take the following steps immediately:

   a. Secure breathing apparatus.

   b. Order non-essential personnel out of the danger zone.

   c. Take steps to determine if the $H_2S$ level can be corrected or suppressed, and if so, proceed with normal operations.

II. If uncontrollable conditions occur, proceed with the following:

   a. Take steps to protect and/or remove any public downwind of the rig, including partial evacuation or isolation. Notify necessary public safety personnel and the New Mexico Oil Conservation Division of the situation.

   b. Remove all personnel to the Safe Briefing Area.

   c. Notify public safety personnel for help with maintaining roadblocks and implementing evacuation.

   d. Determine and proceed with the best possible plan to regain control of the well. Maintain tight security and safety measures.

III. Responsibility:

   a. The Company Approved Supervisor shall be responsible for the total implementation of the plan.

   b. The Company Approved Supervisor shall be in complete command during any emergency.

   c. The Company Approved Supervisor shall designate a back up Supervisor in the event that he/she is not available.

## EMERGENCY PROCEDURE IMPLEMENTATION

### I. Drilling or Tripping

***a.*** *All Personnel*

i. When alarm sounds, don escape unit and report to upwind Safe Briefing Area.

ii. Check status of other personnel (buddy system).

iii. Secure breathing apparatus.

iv. Wait for orders from supervisor.

***b.*** *Drilling Foreman*

i. Report to the upwind Safe Briefing Area.

ii. Don Breathing Apparatus and return to the point of release with the Tool Pusher or Driller (buddy system).

iii. Determine the concentration of $H_2S$.

iv. Assess the situation and take appropriate control measures.

***c.*** *Tool Pusher*

i. Report to the upwind Safe Briefing Area.

ii. Don Breathing Apparatus and return to the point of release with the Drilling Foreman or the Driller (buddy system).

iii. Determine the concentration of $H_2S$.

iv. Assess the situation and take appropriate control measures.

***d.*** *Driller*

i. Check the status of other personnel (in a rescue attempt, always use the buddy system).

ii. Assign the least essential person to notify the Drilling Foreman and Tool Pusher, in the event of their absence.

iii. Assume the responsiblility of the Drilling Foreman and the Tool Pusher until they arrive, in the event of their absence.

*e.* *Derrick Man and Floor Hands*

i. Remain in the upwind Safe Briefing Area until otherwise instructed by a supervisor.

*f.* *Mud Engineer*

i. Report to the upwind Safe Briefing Area.

ii. When instructed, begin check of mud for pH level and $H_2S$ level.

*g.* *Safety Personnel*

i. Don Breathing Apparatus.

ii. Check status of personnel.

iii. Wait for instructions from Drilling Foreman or Tool Pusher.

## II. Taking a Kick

**a.** All Personnel report to the upwind Safe Briefing Area.

**b.** Follow standard BOP procedures.

## III. Open Hole Logging

**a.** All unnecessary personnel should leave the rig floor.

**b.** Drilling Foreman and Safety Personnel should monitor the conditions and make necessary safety equipment recommendations.

## IV. Running Casing or Plugging

**a.** Follow "Drilling or Tripping" procedures.

**b.** Assure that all personnel have access to protective equipment.

**SIMULATED BLOWOUT CONTROL DRILLS**

All drills will be initiated by activating alarm devices (air horn). One long blast, on the air horn, for ACTUAL and SIMULATED Blowout Control Drills. This operation will be performed by the Drilling Foreman or Tool Pusher at least one time per week for each of the following conditions, with each crew:

| | |
|---|---|
| Drill #1 | Bottom Drilling |
| Drill #2 | Tripping Drill Pipe |

In each of these drills, the initial reaction time to shutting in the well shall be timed as well as the total time for the crew to complete its entire pit drill assignment. The times must be recorded on the IADC Driller's Log as "Blowout Control Drill".

Drill No.:
Reaction Time to Shut-In: minutes, seconds.
Total Time to Complete Assignment: minutes, seconds.

## I. Drill Overviews

a. Drill No. 1 – Bottom Drilling

i. Sound the alarm immediately.

ii. Stop the rotary and hoist Kelly joint above the rotary table.

iii. Stop the circulatory pump.

iv. Close the drill pipe rams.

v. Record casing and drill pipe shut-in pressures and pit volume increases.

b. Drill No. 2 – Tripping Drill Pipe

i. Sound the alarm immediately.

ii. Position the upper tool joint just above the rotary table and set the slips.

iii. Install a full opening valve or inside blowout preventer tool in order to close the drill pipe.

iv. Close the drill pipe rams.

v. Record the shut-in annular pressure.

vi.

## II. Crew Assignments

a. Drill No. 1 – Bottom Drilling

*i. Driller*

1. Stop the rotary and hoist Kelly joint above the rotary table.
2. Stop the circulatory pump.
3. Check Flow.
4. If flowing, sound the alarm immediately
5. Record the shit-in drill pipe pressure
6. Determine the mud weight increase needed or other courses of action.

*ii. Derrickman*

1. Open choke line valve at BOP.
2. Signal Floor Man #1 at accumulator that choke line is open.
3. Close choke and upstream valve after pipe tam have been closed.
4. Read the shut-in annular pressure and report readings to Driller.

*iii. Floor Man #1*

1. Close the pipe rams after receiving the signal from the Derrickman.
2. Report to Driller for further instructions.

*iv. Floor Man #2*

1. Notify the Tool Pusher and Operator representative of the $H_2S$ alarms.
2. Check for open fires and, if safe to do so, extinguish them.
3. Stop all welding operations.
4. Turn-off all non-explosions proof lights and instruments.
5. Report to Driller for further instructions.

*v. Tool Pusher*

1. Report to the rig floor.

2. Have a meeting with all crews.

3. Compile and summarize all information.

4. Calculate the proper kill weight.

5. Ensure that proper well procedures are put into action.

*vi. Operator Representative*

1. Notify the Drilling Superintendent.

2. Determine if an emergency exists and if so, activate the contingency plan.

b. Drill No. 2 – Tripping Pipe

i. Driller

1. Sound the alarm immediately when mud volume increase has been detected.

2. Position the upper tool joint just above the rotary table and set slips.

3. Install a full opening valve or inside blowout preventer tool to close the drill pipe.

4. Check flow.

5. Record all data reported by the crew.

6. Determine the course of action.

ii. Derrickman

1. Come down out of derrick.

2. Notify Tool Pusher and Operator Representative.

3. Check for open fires and, if safe to do so , extinguish them.

4. Stop all welding operations.

5. Report to Driller for further instructions.

iii. Floor Man #1

1. Pick up full opening valve or inside blowout preventer tool and stab into tool joint above rotary table (with Floor Man #2).
2. Tighten valve with back-up tongs.
3. Close pipe rams after signal from Floor Man #2.
4. Read accumulator pressure and check for possible high pressure fluid leaks in valves or piping.
5. Report to Driller for further instructions.

iv. Floor Man #2

1. Pick-up full opening valve or inside blowout preventer tool and stab into tool joint above rotary table (with Floor Man #1).
2. Position back-up tongs on drill pipe.
3. Open choke line valve at BOP.
4. Signal Floor Man #1 at accumulator that choke line is open.
5. Close choke and upstream valve after pipe rams have been closed.
6. Check for leaks on BOP stack and choke manifold.
7. Read annular pressure.
8. Report readings to the Driller.

v. Tool Pusher

1. Report to the rig floor.
2. Have a meeting with all of the crews.
3. Compile and summarize all information.
4. See that proper well kill procedures are put into action.

vi. Operator Representative

1. Notify Drilling Superintendent
2. Determine if an emergency exists, and if so, activate the contingency plan.

# IGNITION PROCEDURES

**Responsibility:**

The decision to ignite the well is the responsibility of the DRILLING FOREMAN in concurrence with the STATE POLICE. In the event the Drilling Foreman is incapacitated, it becomes the responsibility of the RIG TOOL PUSHER. This decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.

2. There is no hope of controlling the blowout under the prevailing conditions.

If time permits, notify the main office, but do not delay if human life is in danger. Initiate the first phase of the evacuation plan.

Instructions for Igniting the Well:

1. Two people are required for the actual igniting operation. Both men must wear self-contained breathing apparatus and must use a full body harness and attach a retrievable safety line to the D-Ring in the back. One man must monitor the atmosphere for explosive gases with the LEL monitor, while the Drilling Foreman is responsible for igniting the well.

2. The primary method to ignite is a 25mm flare gun with a range of approximately 500 feet.

3. Ignite from upwind and do not approach any closer than is warranted.

4. Select the ignition site best suited for protection and which offers an easy escape route.

5. Before igniting, check for the presence of combustible gases.

6. After igniting, continue emergency actions and procedures as before.

7. All unassigned personnel will limit their actions to those directed by the Drilling Foreman.

Note: After the well is ignited, burning Hydrogen Sulfide will convert to Sulfur Dioxide, which is also highly toxic. Do not assume the area is safe after the well is ignited.

# TRAINING PROGRAM

When working in an area where Hydrogen Sulfide ($H_2S$) might be encountered, definite training requirements must be carried out. The Company Supervisor will ensure that all personnel, at the well site, have had adequate training in the following:

1. Hazards and characteristics of Hydrogen Sulfide.
2. Physicals effects of Hydrogen Sulfide on the human body.
3. Toxicity of Hydrogen Sulfide and Sulfur Dioxide.
4. $H_2S$ detection, Emergency alarm and sensor location.
5. Emergency rescue.
6. Resuscitators.
7. First aid and artificial resuscitation.
8. The effects of Hydrogen Sulfide on metals.
9. Location safety.

Service company personnel and visiting personnel must be notified if the zone contains $H_2S$, and each service company must provide adequate training and equipment for their employees before they arrive at the well site.

# EMERGENCY EQUIPMENT REQUIREMENTS

## Lease Entrance Sign:

Should be located at the lease entrance with the following information:

CAUTION – POTENTIAL POISON GAS
HYDROGEN SULFIDE
NO ADMITTANCE WITHOUT AUTHORIZATION

## Respiratory Equipment:

- Fresh air breathing equipment should be placed at the safe briefing areas and should include the following:
- Two SCBA's at each briefing area.
- Enough air line units to operate safely, anytime the $H_2S$ concentration reaches the IDLH level (100 ppm).
- Cascade system with enough breathing air hose and manifolds to reach the rig floor, the derrickman and the other operation areas.

## Windsocks or Wind Streamers:

- A minimum of two 10" windsocks located at strategic locations so that they may be seen from any point on location.
- Wind streamers (if preferred) should be placed at various locations on the well site to ensure wind consciousness at all times. (Corners of location).

## Hydrogen Sulfide Detector and Alarms:

- 1 - Four channel $H_2S$ monitor with alarms.
- Four (4) sensors located as follows: #1 – Rig Floor, #2 – Bell Nipple, #3 – Shale Shaker, #4 – Mud Pits.
- Gastec or Draeger pump with tubes.
- Sensor test gas.

**Well Condition Sign and Flags:**

The Well Condition Sign w/flags should be placed a minimum of 150' before you enter the location. It should have three (3) color coded flags (green, yellow and red) that will be used to denote the following location conditions:

GREEN – Normal Operating Conditions
YELLOW – Potential Danger
RED – Danger, $H_2S$ Gas Present

**Auxiliary Rescue Equipment:**

- Stretcher
- 2 – 100' Rescue lines.
- First Aid Kit properly stocked.

**Mud Inspection Equipment:**

Garret Gas Train or Hach Tester for inspection of Hydrogen Sulfide in the drilling mud system.

**Fire Extinguishers:**

Adequate fire extinguishers shall be located at strategic locations.

**Blowout Preventer:**

- The well shall have hydraulic BOP equipment for the anticipated BHP.
- The BOP should be tested upon installation.
- BOP, Choke Line and Kill Line will be tested as specified by Operator.

**Confined Space Monitor:**

There should be a portable multi-gas monitor with at least 3 sensors ($O_2$, LEL $H_2S$). This instrument should be used to test the atmosphere of any confined space before entering. It should also be used for atmospheric testing for LEL gas before beginning any type of Hot Work. Proper calibration documentation will need to be provided.

**Communication Equipment:**

- Proper communication equipment such as cell phones or 2-way radios should be available at the rig.
- Radio communication shall be available for communication between the company man's trailer, rig floor and the tool pusher's trailer.

- Communication equipment shall be available on the vehicles.

**Special Control Equipment:**

- Hydraulic BOP equipment with remote control on the ground.
- Rotating head at the surface casing point.

**Evacuation Plan:**

- Evacuation routes should be established prior to spudding the well.
- Should be discussed with all rig personnel.

**Designated Areas:**

***Parking and Visitor area:***

- All vehicles are to be parked at a pre-determined safe distance from the wellhead.
- Designated smoking area.

Safe Briefing Areas:

- Two Safe Briefing Areas shall be designated on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds or they are at a 180 degree angle if wind directions tend to shift in the area.
- Personal protective equipment should be stored at both briefing areas or if a moveable cascade trailer is used, it should be kept upwind of existing winds. When wind is from the prevailing direction, both briefing areas should be accessible.

***Note:***

- Additional equipment will be available at the Safety Solutions, LLC office.
- Additional personal $H_2S$ monitors are available for all employees on location.
- Automatic Flare Igniters are recommended for installation on the rig.

# CHECK LISTS

## Status Check List

Note: Date each item as they are implemented.

1. Sign at location entrance. _____
2. Two (2) wind socks (in required locations). _____
3. Wind Streamers (if required). _____
4. SCBA's on location for all rig personnel and mud loggers. _____
5. Air packs, inspected and ready for use. _____
6. Spare bottles for each air pack (if required). _____
7. Cascade system for refilling air bottles. _____
8. Cascade system and hose line hook up. _____
9. Choke manifold hooked-up and tested. (before drilling out surface casing.) _____
10. Remote Hydraulic BOP control (hooked-up and tested before drilling out surface casing). _____
11. BOP tested (before drilling out surface casing). _____
12. Mud engineer on location with equipment to test mud for $H_2S$. _____
13. Safe Briefing Areas set-up _____
14. Well Condition sign and flags on location and ready. _____
15. Hydrogen Sulfide detection system hooked -up & tested. _____
16. Hydrogen Sulfide alarm system hooked-up & tested. _____
17. Stretcher on location at Safe Briefing Area. _____
18. 2 – 100' Life Lines on location. _____
19. 1 – 20# Fire Extinguisher in safety trailer. _____
20. Confined Space Monitor on location and tested. _____
21. All rig crews and supervisor trained (as required). _____

22. Access restricted for unauthorized personnel. _____

23. Drills on $H_2S$ and well control procedures. _____

24. All outside service contractors advised of potential $H_2S$ on the well. _____

25. NO SMOKING sign posted. _____

26. $H_2S$ Detector Pump w/tubes on location. _____

27. 25mm Flare Gun on location w/flares. _____

28. Automatic Flare Igniter installed on rig. _____

## Procedural Check List

Perform the following on each tour:

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to insure that they have not been tampered with.
3. Check pressure on the supply air bottles to make sure they are capable of recharging.
4. Make sure all of the Hydrogen Sulfide detection systems are operative.

Perform the following each week:

1. Check each piece of breathing equipment to make sure that they are fully charged and operational. This requires that the air cylinder be opened and the mask assembly be put on and tested to make sure that the regulators and masks are properly working. Negative and Positive pressure should be conducted on all masks.
2. BOP skills.
3. Check supply pressure on BOP accumulator stand-by source.
4. Check all breathing air mask assemblies to see that straps are loosened and turned back, ready for use.
5. Check pressure on cascade air cylinders to make sure they are fully charged and ready to use for refill purposes if necessary.
6. Check all cascade system regulators to make sure they work properly.
7. Perform breathing drills with on-site personnel.
8. Check the following supplies for availability:
    - Stretcher
    - Safety Belts and Ropes
    - Spare air Bottles
    - Spare Oxygen Bottles (if resuscitator required)
    - Gas Detector Pump and Tubes
    - Emergency telephone lists
9. Test the Confined Space Monitor to verify the batteries are good

BRIEFING PROCEDURES

The following scheduled briefings will be held to ensure the effective drilling and operation of this project:

Pre-Spud Meeting

Date: Prior to spudding the well.

Attendance:
- Drilling Supervisor
- Drilling Engineer
- Drilling Foreman
- Rig Tool Pushers
- Rig Drillers
- Mud Engineer
- All Safety Personnel
- Key Service Company Personnel

Purpose: Review and discuss the well program, step-by-step, to insure complete understanding of assignments and responsibilities.

# EVACUATION PLAN

## General Plan

The direct lines of action prepared by SAFETY SOLUTIONS, LLC to protect the public from hazardous gas situations are as follows:

1. When the company approved supervisor (Drilling Foreman, Tool Pusher or Driller) determine that Hydrogen Sulfide gas cannot be limited to the well location, and the public will be involved, he will activate the evacuation plan. Escape routes are noted on the area map.

2. Company safety personnel or designee will notify the appropriate local government agency that a hazardous condition exists and evacuation needs to be implemented.

3. Company approved safety personnel that have been trained in the use of the proper emergency equipment will be utilized.

4. Law enforcement personnel (State Police, Local Police Department, Fire Department, and the Sheriff's Department) will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.

NOTE: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.

5. After the discharge of gas has been controlled, "Company" safety personnel will determine when the area is safe for re-entry.

**See Emergency Action Plan**

## MAPS AND PLATS
## (Maps & Plats Attached)

## Affected Notification List

The geologic zones that will be encountered during drilling are known to contain hazardous quantities of $H_2S$. The accompanying map illustrates the affected areas of the community. The residents within this radius will be notified via a hand delivered written notice describing the activities, potential hazards, conditions of evacuation, evacuation drill siren alarms and other precautionary measures.

Evacuee Description:
Residents: **THERE ARE NO RESIDENTS WITHIN 3000' ROE.**

Notification Process:

A continuous siren audible to all residence will be activated, signaling evacuation of previously notified and informed residents.

Evacuation Plan:
All evacuees will migrate lateral to the wind direction.

The Oil Company will identify all home bound or highly susceptible individuals and make special evacuation preparations, interfacing with the local and emergency medical service as necessary.

No offset wells production data available, so Chesapeake assumes a worst-case 3000' ROE. There are no public roads, building, or residences within 3000'.

## Toxic Effects of $H_2S$ Poisoning

Hydrogen Sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 PPM, which is .001% by volume. Hydrogen Sulfide is heavier than air (specific gravity – 1.192) and is colorless and transparent. Hydrogen Sulfide is almost as toxic as Hydrogen Cyanide and is 5-6 times more toxic than Carbon Monoxide. Occupational exposure limits for Hydrogen Sulfide and other gases are compared below in Table 1. Toxicity table for $H_2S$ and physical effects are shown in Table 2.

Table 1

Permissible Exposure Limits of Various Gases

| Common Name | Symbol | Sp. Gravity | TLV | STEL | IDLH |
|---|---|---|---|---|---|
| Hydrogen Cyanide | HCN | .94 | 4.7 ppm | C | |
| Hydrogen Sulfide | $H_2S$ | 1.192 | 10 ppm | 15 ppm | 100 ppm |
| Sulfide Dioxide | $SO_2$ | 2.21 | 2 ppm | 5 ppm | |
| Chlorine | CL | 2.45 | .5 ppm | 1 ppm | |
| Carbon Monoxide | CO | .97 | 25 ppm | 200 ppm | |
| Carbon Dioxide | $CO_2$ | 1.52 | 5000 ppm | 30,000 ppm | |
| Methane | $CH_4$ | .55 | 4.7% LEL | 14% UEL | |

## Definitions

A. TLV – Threshold Limit Value is the concentration employees may be exposed based on a TWA (time weighted average) for eight (8) hours in one day for 40 hours in one (1) week. This is set by ACGIH (American Conference of Governmental Hygienists) and regulated by OSHA.

B. STEL – Short Term Exposure Limit is the 15 minute average concentration an employee may be exposed to providing that the highest exposure never exceeds the OEL (Occupational Exposure Limit). The OEL for $H_2S$ is 19 PPM.

C. IDLH – Immediately Dangerous to Life and Health is the concentration that has been determined by the ACGIH to cause serious health problems or death if exposed to this level. The IDLH for $H_2S$ is 100 PPM.

D. TWA – Time Weighted Average is the average concentration of any chemical or gas for an eight (8) hour period. This is the concentration that any employee may be exposed based on an TWA.

**TABLE 2**

Toxicity Table of $H_2S$

| Percent % | PPM | Physical Effects |
|---|---|---|
| .0001 | 1 | Can smell less than 1 ppm. |
| .001 | 10 | TLV for 8 hours of exposure. |
| .0015 | 15 | STEL for 15 minutes of exposure. |
| .01 | 100 | Immediately Dangerous to Life & Health. Kills sense of smell in 3 to 5 minutes. |
| .02 | 200 | Kills sense of smell quickly, may burn eyes and throat. |
| .05 | 500 | Dizziness, cessation of breathing begins **in a few minutes.** |
| .07 | 700 | Unconscious quickly, death will result if not rescued promptly. |
| .10 | 1000 | Death will result unless rescued promptly. Artificial resuscitation may be necessary. |

## PHYSICAL PROPERTIES OF $H_2S$

The properties of all gases are usually described in the context of seven major categories:

- COLOR
- ODOR
- VAPOR DENSITY
- EXPLOSIVE LIMITS
- FLAMMABILITY
- SOLUBILITY (IN WATER)
- BOILING POINT

Hydrogen Sulfide is no exception. Information from these categories should be considered in order to provide a fairly complete picture of the properties of the gas.

### *COLOR – TRANSPARENT*

Hydrogen Sulfide is colorless so it is invisible. This fact simply means that you can't rely on your eyes to detect its presence. In fact that makes this gas extremely dangerous to be around.

### *ODOR – ROTTEN EGGS*

Hydrogen Sulfide has a distinctive offensive smell, similar to "rotten eggs". For this reason it earned its common name "sour gas". However, $H_2S$, even in low concentrations, is so toxic that it attacks and quickly impairs a victim's sense of smell, so it could be fatal to rely on your nose as a detection device.

### *VAPOR DENSITY – SPECIFIC GRAVITY OF 1.192*

Hydrogen Sulfide is heavier than air so it tends to settle in low-lying areas like pits, cellars or tanks. If you find yourself in a location where $H_2S$ is known to exist, protect yourself. Whenever possible, work in an area upwind and keep to higher ground.

### *EXPLOSIVE LIMITS – 4.3% TO 46%*

Mixed with the right proportion of air or oxygen, $H_2S$ will ignite and burn or explode, producing another alarming element of danger besides poisoning.

### *FLAMMABILITY*

Hydrogen Sulfide will burn readily with a distinctive clear blue flame, producing Sulfur Dioxide ($SO_2$), another hazardous gas that irritates the eyes and lungs.

### *SOLUBILITY – 4 TO 1 RATIO WITH WATER*

Hydrogen Sulfide can be dissolved in liquids, which means that it can be present in any container or vessel used to carry or hold well fluids including oil, water, emulsion and sludge. The solubility of $H_2S$ is dependent on temperature and pressure, but if conditions are right, simply agitating a fluid containing $H_2S$ may release the gas into the air.

### *BOILING POINT – (-76 degrees Fahrenheit)*

Liquefied Hydrogen Sulfide boils at a very low temperature, so it is usually found as a gas.

## RESPIRATOR USE

The Occupational Safety and Health Administration (OSHA) regulate the use of respiratory protection to protect the health of employees. OSHA's requirements are written in the Code of Federal Regulations, Title 29, Part 1910, Section 134, Respiratory Protection. This regulation requires that all employees who might be required to wear respirators, shall complete a OSHA mandated medical evaluation questionnaire. The employee then should be fit tested prior to wearing any respirator while being exposed to hazardous gases.

Written procedures shall be prepared covering safe use of respirators in dangerous atmospheric situations, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.

Respirators shall be inspected prior to and after each use to make sure that the respirator has been properly cleaned, disinfected and that the respirator works properly. The unit should be fully charged prior to being used.

Anyone who may use respirators shall be properly trained in how to properly seal the face piece. They shall wear respirators in normal air and then in a test atmosphere. (Note: Such items as facial hair (beard or sideburns) and eyeglass temple pieces will not allow a proper seal.) Anyone that may be expected to wear respirators should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses. Contact lenses should not be allowed.

Respirators shall be worn during the following conditions:

A. Any employee who works near the top or on the top of any tank unless tests reveal less than 20 ppm of $H_2S$.

B. When breaking out any line where $H_2S$ can reasonably be expected.

C. When sampling air in areas where $H_2S$ may be present.

D. When working in areas where the concentration of $H_2S$ exceeds the Threshold Limit Value for $H_2S$ (10 ppm).

E. At any time where there is a doubt as to the $H_2S$ level in the area to be entered.

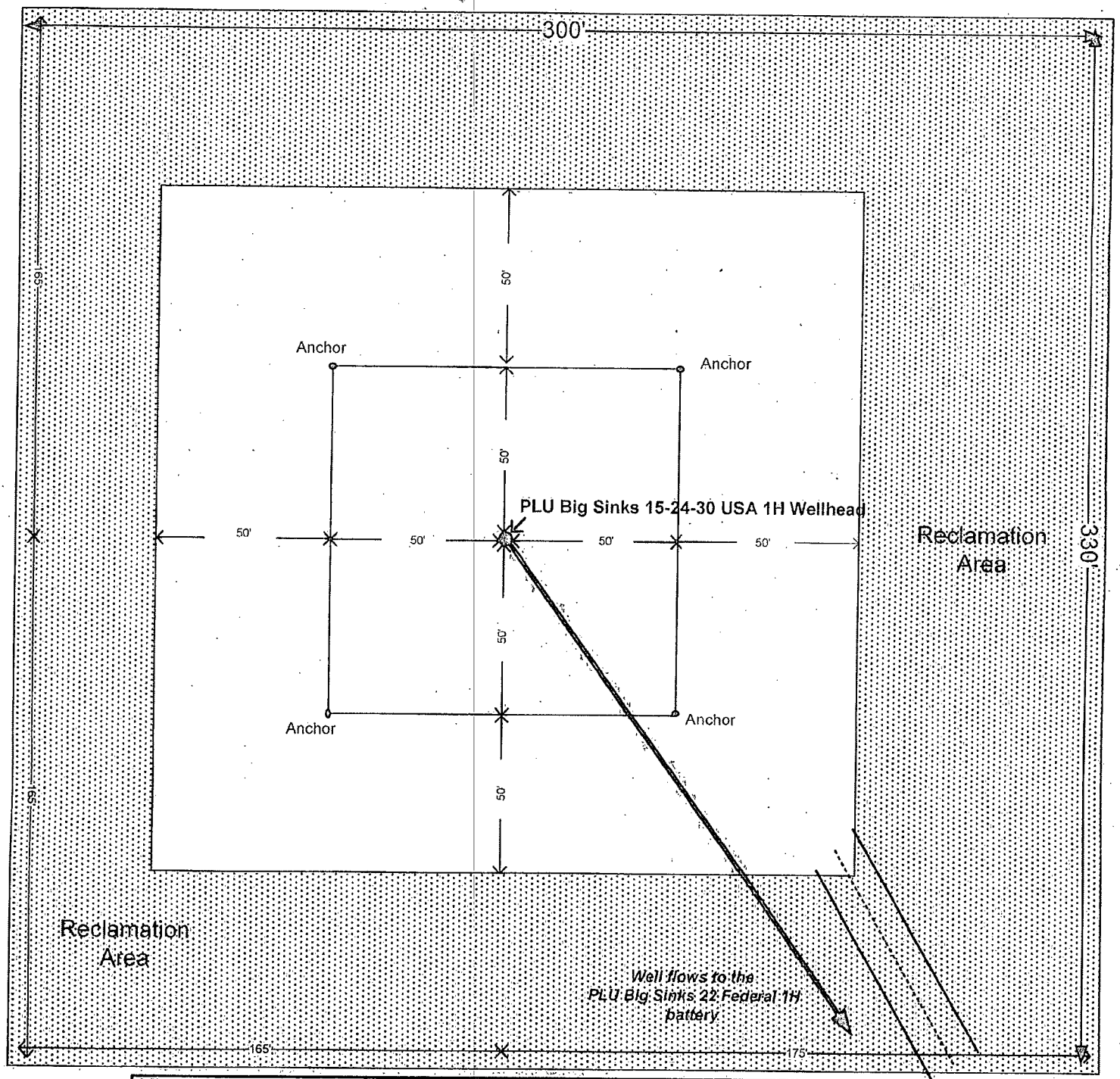
# PLU Big Sinks 15-24-30 USA 1H

**Property Number: 645558 Pad Site Number: 919984**

**Section 15 – T24S – R30E 450' FSL & 660 FEL of Section**

**NAD 27 Lat.: 32.2117 – Long.: 103.8619**

**Eddy County, New Mexico**




| | | |
|---|---|---|
| Drawing not to scale | This lease is subject to Chesapeake's Site Security Plan located at 6100 N. Western Oklahoma City, OK 73118 | Prepared by: Donny Lowry Date:6/21/2012 |

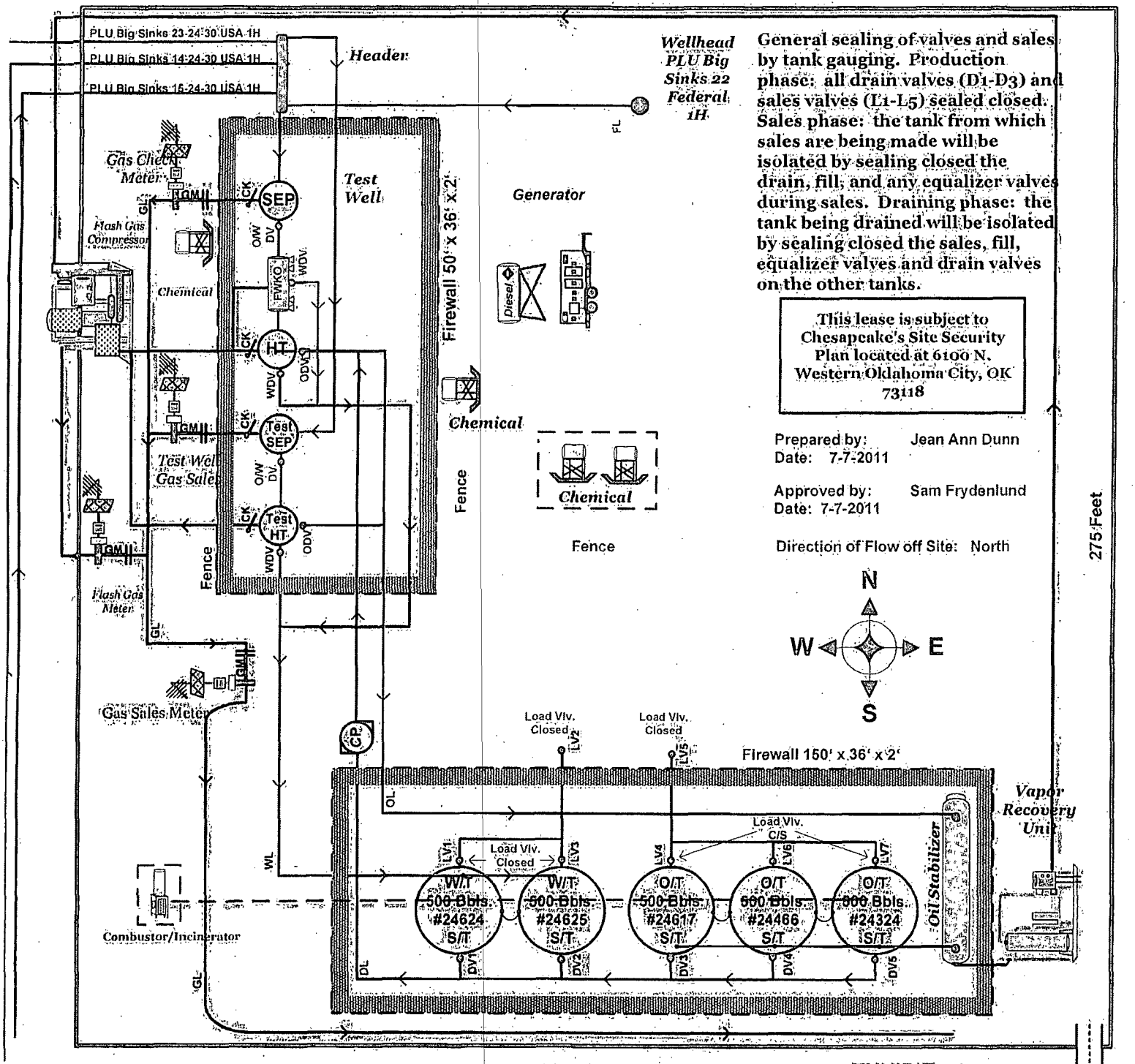
EXHIBIT C2

# CHESAPEAKE OPERATING, INC.

Chesapeake ENERGY

**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

EXHIBIT C1

# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | CHESAPEAKE OPERATING INC. |
| LEASE NO.: | LC068431 |
| WELL NAME & NO.: | PLU BIG SINKS 15 24 30 USA |
| SURFACE HOLE FOOTAGE: | 450'/S. & 770'/E. |
| BOTTOM HOLE FOOTAGE | 100'/N. & 660'/E. |
| LOCATION: | Section 15, 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.