ATS-12-603

Form 3160-3
(March 2012)

HOBBS OCD
OCT 29 2012
RECEIVED

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# APPLICATION FOR PERMIT TO DRILL OR REENTER

| | |
|---|---|
| 1a. Type of work: ☑ DRILL ☐ REENTER | 5. Lease Serial No. LC068281-B |
| | 6. If Indian, Allotee or Tribe Name N/A |
| | 7 If Unit or CA Agreement, Name and No. N/A |
| 1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone | 8. Lease Name and Well No. Buck 17 Federal # 5H <38027> |
| 2. Name of Operator ConocoPhillips Company <217817> | 9 API Well No. 30-025-40840 |
| 3a. Address P.O. Box 51810 Midland, Tx 79710 | 3b Phone No. (include area code) 432-688-6943 |
| | 10 Field and Pool or Exploratory Jennings <97838> ~~Red Hills~~, Bone Spring, Upper Shale |
| 4. Location of Well (Report location clearly and in accordance with any State requirements *) At surface 843 FNL & 1102 FEL (NENE) 20-26S-32E Unit A | 11. Sec., T. R. M. or Blk. and Survey or Area Section 20-26S-32E (Surface) |
| At proposed prod. zone 330 FNL & 1075 FEL (NENE) 17-26S-32E | |
| 14. Distance in miles and direction from nearest town or post office* 30 miles suth/west of Jal, NM | 12 County or Parish Lea / 13. State NM |

| | | |
|---|---|---|
| 15 Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 330 | 16 No. of acres in lease 640 | 17. Spacing Unit dedicated to this well 160 |
| 18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 325 | 19 Proposed Depth 14372 MD/8831 TVD | 20 BLM/BIA Bond No. on file ES0085 |
| 21 Elevations (Show whether DF, KDB, RT, GL, etc.) 3150 GL | 22. Approximate date work will start* 09/01/2012 | 23. Estimated duration 30 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 | Name (Printed/Typed) Donna Williams | Date 08/13/2012 |
| Title Sr. Regulatory Advisor | | |
| Approved by (Signature) /s/ Don Peterson | Name (Printed/Typed) | Date OCT 25 2012 |
| 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. 10-31-2012 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

ATTACHED FOR
CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached
NOV 01 2012

| | |
|---|---|
| **OPERATORS NAME:** | **ConocoPhillips Company** |
| **LEASE NAME AND WELL NO.:** | **Buck Federal 17 # 5H** |
| **SURFACE LOCATION:** | **843 FNL & 1102 FEL (NENE) of 20-26S-32E** |
| **CASING POINT:** | **127.6 FNL & 1124.2 FEL (NENE) of 20-26S-32E** |
| **BHL:** | **330 FNL & 1075 FEL (NENE) of 17-26S-32E** |
| **FIELD NAME:** | **Red Hills; Bone Spring** |
| **POOL NAME:** | **Bone Spring/Avalon** |
| **COUNTY:** | **Lea County, New Mexico** |
| | **Federal Surface/Federal Minerals LC068281-B** |

The following information is to supplement the Application for Permit to Drill.

## DRILLING PLAN

1. Name and estimated tops of all geologic groups, formations, members, or zones.(TVD)

| | | |
|---|---|---|
| Quaternary | Surface | Water |
| Rustler | 985 | Salt |
| Castille | 1826 | Salt |
| Delaware Top | 4326 | Oil/gas/water |
| Ramsey | 4364 | Oil/gas/water |
| Ford Shale | 4434 | Oil/gas/water |
| Olds | 4438 | Oil/gas/water |
| Cherry Canyon Lower Top | 6534 | Oil/gas/water |
| Bone Spring | 8157 | Oil/gas/water |
| Bone Spring 1st Carbonate | 8429 | Oil/gas/water |
| Base of Bone Spring 1st Carbonate | 8527 | Oil/gas/water |
| KOP (estimate) | 8120 | |
| Avalon A Shale Top | 8676 | Oil/gas/water |
| Avalon B Zone Top | 8941 | Oil/gas/water |
| Avalon C Shale Top | N/A | Oil/gas/water |
| Avalon Target | N/A | Oil/gas/water |

2. Estimated depths and thickness of formations, members or zones potentially containing usable water, oil, gas, or prospectively valuable deposits of other minerals that the operator expects to encounter, and the operator's plans for protecting such resources.

| | |
|---|---|
| Quanternary | Surface-985 (water) |
| Rustler & Castile | 985-4326' (salt) |

All of the water bearing formations identified above will be protected by the intermediate setting of the 9 5/8" casing and circulating of cement to surface

Delaware 4326-8676 (oil/gas/water)
The prospective formation identified will be protected by the intermediate setting of the 7" casing and tying the cement into the 9 5/8" casing
Bone Spring 8157-8941 (oil/gas/water)
The geologic tops identified above from the top of the Bone Spring/Avalon are part of the target formation

3. The operator's minimum specifications for blowout prevention equipment and diverter systems to be used, including size, pressure rating, configuration, and the testing procedure and frequency.

A 5000# system will be installed, used, maintained, and tested accordingly. After nippling up, and every 30 days thereafter, preventors will be pressure tested. BOP will be inspected and operated at least daily to insure good working order. All pressure and operating tests will be recorded on the daily drilling reports. Ram Type preventors will be tested to rated working pressure or 70% of the minimum internal yield of the casing. Annular type preventer(s) shall be tested to 50% of the approved BOP stack working pressure. Pressure shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer. Pursuant to Onshore Oil and Gas Order No. 2, the BOP equipment for a 5M system or greater shall include lower Kelly cock valve with handle available, safety valves and subs to fit all drill string connections in use and inside BOP or float sub shall be available. All choke lines from the drilling spool forward shall meet the requirements of the Onshore Order 2 as specified. **See Attached BOPe Schematic**

4. The proposed casing program including size, grade, weights, type of thread and coupling, and the setting depth of each string and its condition (new or acceptably reconditioned). For exploratory wells, or for wells as otherwise specified by the authorized officer, the operator shall include the minimum design factors for tensions, burst, and collapse that are incorporated into the casing design. In cases where tapered casing strings are utilized, the operator shall also include and/or setting depths of each portion.

NEW CASING:

See COA

955

Surface: 17 1/2" hole, 13 3/8" 54.5# J55 STC csg, set @ ~~1010~~'. Drill out with 12 ¼" bit and perform shoe test to 11.0 ppg MWE.
Burst: 2.37/Collapse: 4.92/Tension: 2.57
Intermediate 1: 12 1/4" hole, 9 5/8" 36# J55 LTC csg, set @ 4350
Burst: 2.88/Collapse: 2.62/Tension: 4.74
(This string of casing would not be subject ot the production collapse load case of being pumped off to zero pressure on the inside by beam pump or ESP production pumping the fluid level down. The 9 5/8" casing would be isolated

from the beam pumping production collapse load case by the production casing that would be run. If loss of circulation occurs during the drilling phase while drilling below the 9 5/8" intermediate casing, we would expect the fluid level would fall no further than 2200' below the surface of ground before reaching hydrostatic balance with the pressure of the loss zone. Our anticipated maximum mud weight for drilling below the 9 5/8" intermediate casing is 9.3 ppg and our experience has been that we have not had severe losses with this mud weight in our previous wells in this area. The 9 5/8" casing will be filled with mud while running it by filling it at least once each 30 joints) See Cont

Intermediate 2: 8 3/4" hole, 7" 29# P110 BTC csg set @ 9228MD/8820 TVD Burst: 2.29/Collapse: 1.74/Tension: 2.81/3.31

Production Liner (Uncemented): 6" hole, 4 ½" 11.6# P110 BTC liner set @ 9128-14372 MD Burst: 3.25/Collapse: 3.36/Tension: 5.78/6.80 (Packers and Sleeves)

The plan is to set casing and drill open hole in a northern direction to a proposed bottomhole location of 330 FNL & 1075 FEL (NENE) of Section 17-20S-32E

ConocoPhillips will utilize casing friendly hardbanded drill pipe in a manner that is consistent with current company policy and standards with respect to minimizing or mitigating internal casing wear. The responsibility to ensure all parties are acting according to their roles and responsibilities rest with the Company. Any damage or impacts from use of casing friendly hardbanded drill pipe rest with ConocoPhillips Company.

5. The amount and type(s) of cement, including anticipated additives to be used in setting each casing string, shall be described. If stage cementing techniques are to be employed, the setting depth of the stage collars and amount and type of cement, including additives, and preflush amounts to be used in each stage, shall be given. The expected linear fill-up of each cemented string, or each stage when utilizing stage-cementing techniques, shall also be given.

13 3/8 casing: Lead w/750 sxs Class C cmt + HalCem-C (Yield 1.33 cft) Tail w/230 sxs Class C cmt + 1 lbm/sk EconoChem HRLTRRC (Yield 1.85 Cuft/sk). Circulated to surface based on 17 ½" hole with 100% excess

9 5/8" casing: Lead w/980 sxs 50/50 Class C Poz + 2.5 gal/bbl WG-19 + 1 lbm/sk EconoCem-C (Yield 2.48 cft/sk), Tail w/140 sxs H + HalCem C (Yield 1.33 cft/sk) Circulatd to surface based on 12 ¼" hole w/120% excess

7" casing: Lead w/560 sxs HLH + .3% Halad9 + 5 lbs/sk silicalite + .3% HR-800 (Yield 2.0 cft/sk), Tail w/232 sxs Class H + .4% Halad-9 + .1% WG-17 + 3.0% KCl + .3% HR800 (Yield 1.2 cft/sk). Circulate cement 500' into the 9 5/8" casing based on 8 ¾" hole w/100% excess

4 ½" Liner: Uncemented

6. The anticipated type and characteristics of the proposed circulating medium or mediums proposed for the drilling of each wellbore section, the quantities and types of mud and weighting material to be maintained, and the monitoring equipment to be used on the circulating system.

Mud Program:

| | | | | | |
|---|---|---|---|---|---|
| 0-1010 955 | Aquagel-Spud Mud | 8.9 | Wt/Gl | 32-36 Vis. | NC |
| 1010-4350 | Brine | 10 | Wt/Gl | 28-30 Vis. | 5-8 |
| 4350-9228 | Brine | 9.3 | Wt/Gl | 28-30 Vis | 5-8 |
| 9228-14372 | Cut Brine | 9.3 | Wt/Gl | 30-40 Vis | <=5 |

Gas detection equipment and pit level flow monitoring equipment will be on location. ConocoPhillips Company will maintain sufficient mud and weighted material on location at all times.

7. The anticipated testing, logging, and coring procedures to be used, including drill stem testing procedures, equipment, and safety measures.

a. DST Program: None
b. Mud Logging: Two-Man – 1030-TD
   Logs to be run: GR/MWD

8. List the expected bottom-hole pressure and any anticipated abnormal pressures, temperatures or potential hazards that are expected to be encountered, such as lost circulation zones and hydrogen sulfide. The operator's plans for mitigating such hazards shall be discussed. Should the potential to encounter hydrogen sulfide exist, the mitigation procedures shall comply with the provisions of the BLM.

The expected pressure gradient is 0.433 psi/ft or 9-9.1 ppg equivalent
.The average anticipated bottom hole pressure ranges on average is .65 psi/ft
No hydrogen sulfide is expected during drilling operations; however, the potential does exist for H2S. Please see attached H2S contingency plan to be used in the event of occurrence.

Any other facets of the proposed operation which the operator wishes to be considered in reviewing the application.

Anticipated construction date is September 1, 2012 with anticipated spud date of October 1, 2012. Construction of well pad and road will begin as soon as all agency approvals are obtained.

9. Address the proposed directional design, plan view, and vertical section in true vertical and measured depth for directional, horizontal, or coil tubing operations.

The proposed directional/horizontal documents are attached.

# DRILLING PLAN

| | | | | | | |
|---|---|---|---|---|---|---|
| PROSPECT/FIELD | Bonespring/Red Hills | | | COUNTY/STATE | | Lea County, NM |
| OWNERS | ConocoPhillips | | LEASE | | | |
| WELL NO. | Buck Federal 17 5H | FNL | FSL | FEL | FWL | |
| LOCATION | Surface Location | 843 | | 1102 | | |
| | Bottom Hole Location | 330 | | 1075 | | |
| EST. T.D. | Leg #1 14,372' MD | | | GROUND ELEV. | | 3,150' (est) |
| | | | | | RKB | 3,166' (est) |

PROGNOSIS: Based on 3,166' KB(est)

| MARKER | | S S. DEPTH | | TVD |
|---|---|---|---|---|
| Quaternary | | | | Surface |
| Rustler | | 2,181 | | 985 |
| Delaware Top | | -1,160 | | 4,326 |
| Bone Spring | | -8,157 | | 8,157 |
| Bone Spring 1st Carbonate Top | | -5,263 | | 8,429 |
| Bone Spring 1st Carbonate Base | | -5,361 | | 8,527 |
| KOP | | | | 8,103 |
| Avalon A Shale Top | | -5,510 | | 8,676 |
| Avalon A Shale Base | | -5,775 | | 8,941 |
| Avalon A Shale Horizontal Target | | -5,654 | | 8,820 |

LOGS:

| Type | Interval |
|---|---|
| Open Hole | |
| GR-MWD | KOP-TD |

DEVIATION:

| | |
|---|---|
| Surf | 3° max., s/v/ every 500' |
| Int #1/2 | 3° max., s/v/ every 90' |
| Interm #2 Curve : | 90°, s/v/ every 30' |
| Prod Lateral | 90°, s/v/ every 30' |

DST'S:

CORES: No core

SAMPLES:

| Mudlogging | Start | End | |
|---|---|---|---|
| Two-Man: | 1010' | TD | Vertical and Horizontal sections |

BOP: COP Category 3 Well Control Requirements

*Precision 827 BOPE,* (With Rotating Head)
- 13-5/8"-5Mpsi Annular
- 13-3/8"-5Mpsi Blind Ram
- 13-3/8"-5Mpsi Cross / Choke & Kill Lines
- 13-3/8"-5M psi Pipe Ram
- 13-3/8"-5Mpsi Spacer Spool

Dip Rate (See inclination prediction)

Max. Anticipated BHP: 0 65 psi/ft

Surface Formation:

MUD:

| | Interval | Type | Max. MW | Vis | WL | Remarks |
|---|---|---|---|---|---|---|
| Surface | 0'-1010' | Aquagel - Spud Mud | 8 9 | 32-36 | NC | |
| Intermediate 1 | 1010'-4350' | Brine | 10 | 28-30 | 5-8 | |
| Intermediate 2 | 4350'-9228' | Brine | 9 3 | 28-30 | 5-8 | |
| Production | 9228'-14372' | Cut Brine | 9 3 | 30-40 | <=5 | |

CASING:

| | Size | Wt ppf | Hole | Depth | Cement | WOC | Remarks |
|---|---|---|---|---|---|---|---|
| Surface | 13-3/8" | 54 5 | 17-1/2 | 1,010' | To Surface | 18hrs | |
| Intermediate 1: | 9-5/8" | 36 | 12-1/4" | 4,350' | To Surface | 18hrs | |
| Intermediate 2 | 7" | 29 | 8 3/4" | 9,228' | 500' into the 9-5/8" | 18hrs | |
| Production Lat #1 | 4 1/2" | 11 6 | 6" | 14,372' | Packers and Sleeves | N/A | Liner |

DIRECTIONAL PLAN

| | MD | TVD | AZ | | |
|---|---|---|---|---|---|
| Surface: | N/A | N/A | 0 | Directional Company | DDC |
| Vertical KOP | 8,103' | 8,103' | 0 0 | Vertical Build Rate | 8 0 °/100' |
| End Build/ 7"Casing (90° curve): | 9,228' | 8,820' | 359 6 | Tan Leg Turn Rate | 0 0 °/100' |
| Tangent. | N/A | N/A | 359 6 | | |
| Turn | N/A | N/A | 359 6 | | |
| TD | 14,372' | 8,831' | 359 6 | | |

Comments:
Surveys will be taken with INC Survey Tool below surface casing while drilling with PDC + Straight Motor BHA

Prep By: Katia Filina Date: 7/26/12 Doc. REV 2

Bonespring/Red Hills
ConocoPhillips
Buck Federal 17 5H

| **Surface Casing:** | |
|---|---|
| Surface Casing Depth (Ft) | 1,010 |
| Surface Casing O.D. (In.) | 13.375 |
| Surface Casing ID (In) | 12.715 |
| Hole O.D. (In) | 17.5 |
| Excess (%) | 100% |
| **Volume Tail (Sx)** | 230 |
| Yield Tail (Cu. Ft./Sx) | 1.85 |
| Yield Lead (Cu. Ft./Sx) | 1.33 |
| Shoe Joint (Ft) | 40 |
| Shoe Volume (Cu. Ft) | 35.3 |
| Tail feet of cement | 300 |
| Calculated Total Volume (Cu. Ft.) | 1,438 |
| Calc. Tail Volume (Cu. Ft.) | 417 |
| Calc. Lead Volume (Cu. Ft.) | 986 |
| **Calc. Lead Volume (Sx)** | 750 |

| **Intermediate1 Casing (Lead):** | |
|---|---|
| Intermediate Casing O.D. (In.) | 9.625 |
| Intermediate Casing ID (In) | 8.921 |
| Hole O.D. (In) | 12.25 |
| Excess (%) | 100% |
| cap 12-1/4 - 9-5/8" | 0.0558 |
| Calculated fill: | 3,850 |
| Yield Lead (Cu. Ft./Sx) | 2.48 |
| Calculated Total Lead (Cu. Ft.) | 2,412 |
| **Calc. Lead Volume (Sx)** | 980 |

| **Intermediate2 Casing (Lead):** | |
|---|---|
| Intermediate Casing O.D. (In.) | 7.000 |
| Intermediate Casing ID (In) | 6 184 |
| Hole O.D. (In) | 8.75 |
| Excess (%) | 135% |
| cap 7" - 8-3/4" bls/ft | 0.0268 |
| cap 7 - 9-5/8" bls/ft | 0.02823 |
| Calculated fill: (500' into 9-5/8") | 4,078 |
| Yield Lead (Cu. Ft./Sx) | 2.0 |
| Calculated Total Lead (Cu. Ft.) | 1,118 |
| **Calc. Lead Volume (Sx)** | 560 |

3850
7,928'

| **Intermediate1 Casing (Tail):** | |
|---|---|
| Intermediate Casing O.D. (In.) | 9.625 |
| Production Casing ID (In) | 8.835 |
| Hole O.D. (In) | 12.25 |
| Excess (%) | 100% |
| cap 12-1/4 - 9-5/8" | 0.0558 |
| Calculated fill: | 500 |
| Yield Tail (Cu. Ft./Sx) | 1.33 |
| Shoe Joint (Ft) | 40 |
| Shoe Volume (Cu. Ft) | 17.0 |
| Calc. Tail Volume (Cu. Ft.) | 174 |
| **Required Tail Volume (Sx)** | 140 |

| **Intermediate2 Casing (Tail):** | |
|---|---|
| Intermediate Casing O.D. (In.) | 7.000 |
| Intermediate Casing ID (In) | 6.184 |
| Hole O.D. (In) | 8.75 |
| Excess (%) | 135% |
| cap 7" - 8-3/4" bls/ft | 0.0268 |
| cap 7 - 9-5/8" bls/ft | 0.02823 |
| Calculated fill: | 1,300 |
| Yield Lead (Cu. Ft./Sx) | 1.2 |
| Calculated Total Tail (Cu. Ft.) | 278 |
| **Required Tail Volume (Sx)** | 232 |

# Buck Federal 17 5H Proposed Tops

GL 3150 KB (via survey plat) 3,166

**Notes:** No pilot hole will be drilled. This horizontal well will be drilled from S to N into the Avalon A Shale Zone. The well will be drilled relatively flat (*ANGLE ?*).

| | | | | |
|---|---|---|---|---|
| **Surface Location** | Sec 20 | T26S | R32E | Lea Co. NM, Surface Location: 843' FNL & 1102' FEL |
| **Bottom Hole Location** | Sec 17 | T26S | R32E | Lea Co. NM, Terminus Location: 330' FNL & 1075' FEL |

| Formation Name | Formation Top (TVD) | Subsea Depth | Gross Thickness | Gross Thickness | Gross Thickness | Comments |
|---|---|---|---|---|---|---|
| Quaternary | Surface | | | | | |
| Rustler | 985 | 2,181 | | | | |
| Castile | 1,826 | 1,340 | | | | |
| Delaware Top | 4,326 | -1,160 | | | | |
| Ramsey | 4,364 | -1,198 | | | | |
| Ford Sh | 4,434 | -1,268 | | | | |
| Olds | 4,438 | -1,272 | | | | |
| Cherry Canyon Lower Top | 6,534 | -3,368 | | | | |
| **KOP (est)** | **8,120** | **-4,954** | | | | Not a formation top. |
| Bone Spring Top | 8,157 | -4,991 | | | | |
| Bone Spring 1st Carbonate Top | 8,429 | -5,263 | 98 | | | |
| Bone Spring 1st Carbonate Base | 8,527 | -5,361 | | | | |
| Avalon A Shale Top | 8,676 | -5,510 | 265 | | | |
| LANDING: Avalon A Shale Horizontal Upper Target Limit | 8,795 | -5,629 | | | | Not a formation top. |
| **LANDING: Avalon A Shale Horizontal Target Center** | **8,820** | **-5,654** | | | | Not a formation top. |
| LANDING: Avalon A Shale Horizontal Lower Target Limit | 8,845 | -5,679 | | | | Not a formation top. |
| TERMINUS Avalon A Shale Horizontal Upper Target Limit. | 8,806 | -5,640 | | | | Not a formation top. |
| **TERMINUS: Avalon A Shale Horizontal Target Center** | **8,831** | **-5,665** | | | | Not a formation top. |
| TERMINUS: Avalon A Shale Horizontal Lower Target Limit | 8,856 | -5,690 | | | | Not a formation top. |
| Avalon A Shale Base (Should not penetrate) | 8,941 | -5,775 | | | | |

**Proposed total MD of well 12,700'.**

ConocoPhillips

# Conoco Phillips

Lea County, New Mexico
Sec 20, T26S, 32E
Buck Federal 17 #5H

Wellbore #1

Plan: Design #1

# DDC Well Planning Report

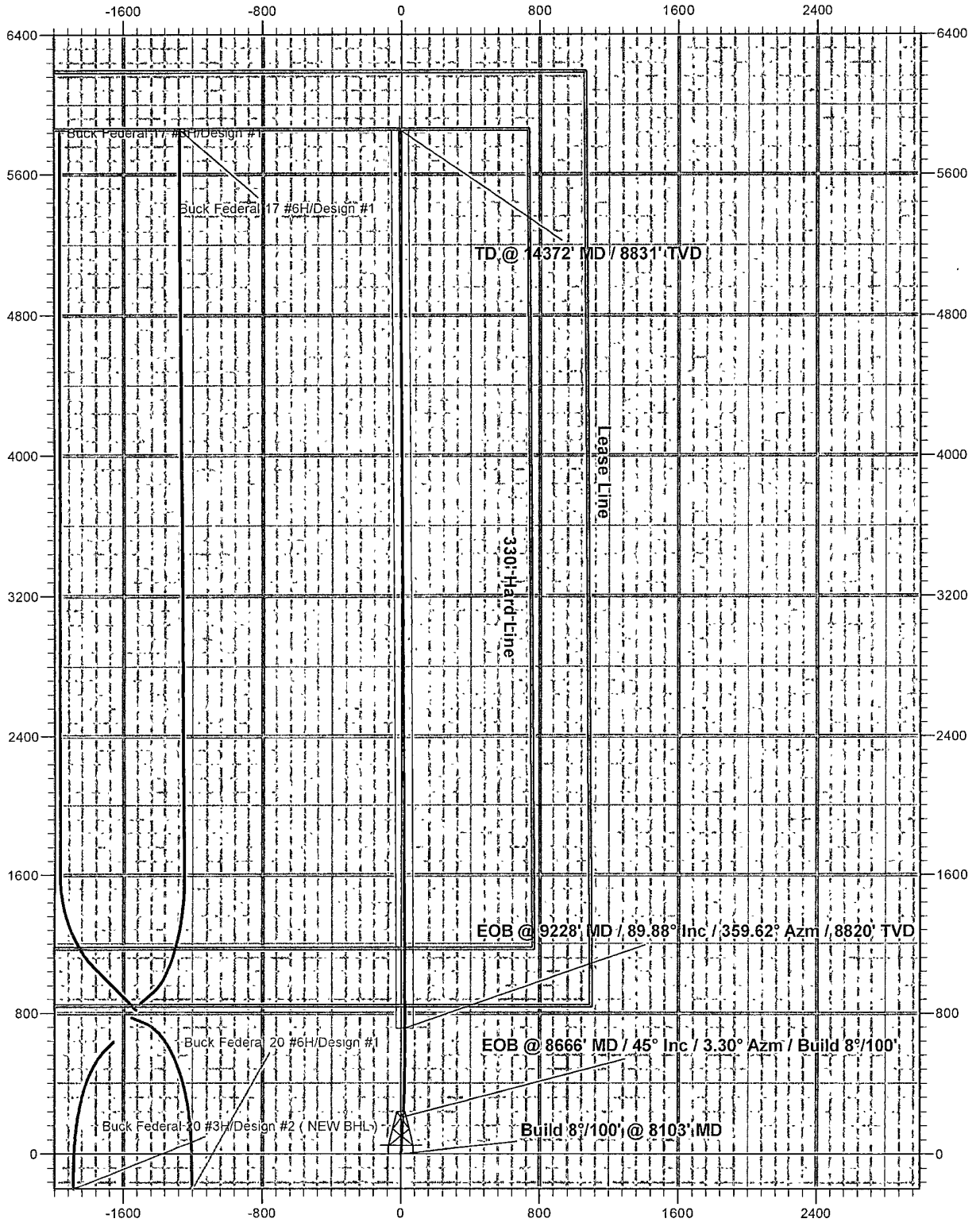
15 June, 2012

DDC
The DIRECTIONAL DRILLING COMPANY

ConocoPhillips

**Lea County, New Mexico**
**Buck Federal 17 #5H**
**Quote 120464**

DDC The DIRECTIONAL DRILLING COMPANY



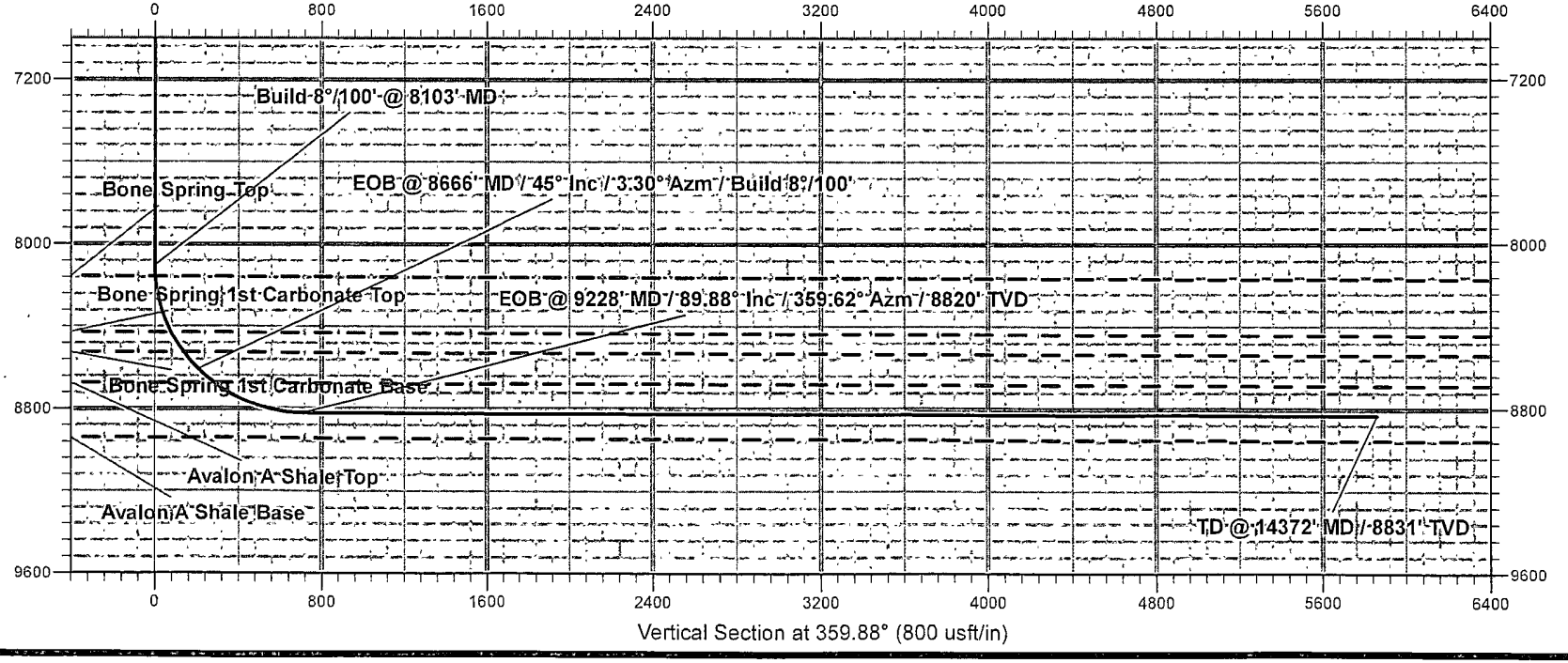
ConocoPhillips

Lea County, New Mexico

Buck Federal 17 #5H

Quote 120462

RDC
The DIRECTIONAL DRILLING COMPANY



| | | | |
|---|---|---|---|
| **Database:** | EDM 5000 1 Single User Db | **Local Co-ordinate Reference:** | Well Buck Federal 17 #5H |
| **Company:** | Conoco Phillips | **TVD Reference:** | WELL @ 3166.0usft (Precision #827) |
| **Project:** | Lea County, New Mexico | **MD Reference:** | WELL @ 3166.0usft (Precision #827) |
| **Site:** | Sec 20, T26S, 32E | **North Reference:** | Grid |
| **Well:** | Buck Federal 17 #5H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Design #1 | | |

**Project** Lea County, New Mexico

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1927 (Exact solution) | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | NAD 1927 (NADCON CONUS) | | |
| **Map Zone:** | New Mexico East 3001 | | |

**Site** Sec 20, T26S, 32E

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 376,829.70 usft | **Latitude:** | 32° 2' 3.859 N |
| **From:** | Map | **Easting:** | 698,257.30 usft | **Longitude:** | 103° 41' 36 778 W |
| **Position Uncertainty:** | 0 0 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0 34 ° |

**Well** Buck Federal 17 #5H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | -471 2 usft | **Northing:** | 376,358.53 usft | **Latitude:** | 32° 1' 59.162 N |
| | **+E/-W** | 586.2 usft | **Easting:** | 698,843.49 usft | **Longitude:** | 103° 41' 30 001 W |
| **Position Uncertainty** | | 0.0 usft | **Wellhead Elevation:** | | **Ground Level:** | 3,150.0 usft |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 6/15/2012 | 7.50 | 59.96 | 48,390 |

**Design** Design #1

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | | **Phase:** | PLAN | **Tie On Depth:** | 0.0 |
| **Vertical Section:** | **Depth From (TVD) (usft)** | **+N/-S (usft)** | **+E/-W (usft)** | **Direction (°)** | |
| | 0 0 | 0.0 | 0 0 | 359.88 | |

**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 | 0.00 | |
| 8,103.2 | 0.00 | 0 00 | 8,103 2 | 0.0 | 0.0 | 0.00 | 0.00 | 0 00 | 0.00 | |
| 8,665 7 | 45.00 | 3.30 | 8,609 6 | 209.4 | 12.1 | 8 00 | 8.00 | 0 00 | 3 30 | |
| 9,228.2 | 89 88 | 359 62 | 8,820 0 | 715.4 | 22 2 | 8 00 | 7.98 | -0.65 | -5 21 | |
| 14,371 6 | 89.88 | 359.62 | 8,831 0 | 5,858.8 | -12.2 | 0 00 | 0.00 | 0 00 | 0.00 | PBHL Buck Federa |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Single User Db | **Local Co-ordinate Reference:** | Well Buck Federal 17 #5H |
| **Company:** | Conoco Phillips | **TVD Reference:** | WELL @ 3166 0usft (Precision #827) |
| **Project:** | Lea County, New Mexico | **MD Reference:** | WELL @ 3166.0usft (Precision #827) |
| **Site:** | Sec 20, T26S, 32E | **North Reference:** | Grid |
| **Well:** | Buck Federal 17 #5H | **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 |
| **Rustler** | | | | | | | | | |
| 985 0 | 0 00 | 0.00 | 985.0 | 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 |
| **Castile** | | | | | | | | | |
| 1,826 0 | 0.00 | 0.00 | 1,826 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 |
| **Delaware Top** | | | | | | | | | |
| 4,326.0 | 0.00 | 0.00 | 4,326.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| **Ramsey** | | | | | | | | | |
| 4,364.0 | 0 00 | 0 00 | 4,364 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 |
| **Ford Sh** | | | | | | | | | |

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|---|---|---|---|
| **Database:** | EDM 5000 1 Single User Db | **Local Co-ordinate Reference:** | Well Buck Federal 17 #5H |
| **Company:** | Conoco Phillips | **TVD Reference:** | WELL @ 3166.0usft (Precision #827) |
| **Project:** | Lea County, New Mexico | **MD Reference:** | WELL @ 3166.0usft (Precision #827) |
| **Site:** | Sec 20, T26S, 32E | **North Reference:** | Grid |
| **Well:** | Buck Federal 17 #5H | **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) |
|---|---|---|---|---|---|---|---|---|---|
| 4,434.0 | 0 00 | 0 00 | 4,434 0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0 00 |
| **Olds** | | | | | | | | | |
| 4,438 0 | 0 00 | 0 00 | 4,438 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 |
| 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 |
| **Cherry Canyon Lower Top** | | | | | | | | | |
| 6,534 0 | 0 00 | 0.00 | 6,534.0 | 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 |
| 7,700 0 | 0.00 | 0 00 | 7,700.0 | 0.0 | 0 0 | 0 0 | 0.00 | 0.00 | 0.00 |
| 7,800.0 | 0 00 | 0.00 | 7,800 0 | 0 0 | 0 0 | 0 0 | 0 00 | 0 00 | 0 00 |
| 7,900 0 | 0 00 | 0.00 | 7,900 0 | 0.0 | 0.0 | 0.0 | 0 00 | 0 00 | 0.00 |
| 8,000 0 | 0 00 | 0.00 | 8,000 0 | 0.0 | 0 0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 8,100 0 | 0.00 | 0 00 | 8,100 0 | 0.0 | 0 0 | 0.0 | 0.00 | 0.00 | 0 00 |
| **Build 8°/100' @ 8103' MD** | | | | | | | | | |
| 8,103 2 | 0.00 | 0 00 | 8,103 2 | 0.0 | 0.0 | 0 0 | 0.00 | 0.00 | 0.00 |
| **Bone Spring Top** | | | | | | | | | |
| 8,157.1 | 4 31 | 3.30 | 8,157.0 | 2.0 | 0 1 | 2.0 | 8.00 | 8.00 | 0.00 |
| 8,200 0 | 7.74 | 3.30 | 8,199.7 | 6.5 | 0.4 | 6 5 | 8.00 | 8.00 | 0 00 |
| 8,300.0 | 15.74 | 3.30 | 8,297.5 | 26 8 | 1.5 | 26.8 | 8 00 | 8 00 | 0.00 |
| 8,400.0 | 23.74 | 3.30 | 8,391.6 | 60.5 | 3.5 | 60 5 | 8 00 | 8 00 | 0 00 |
| **Bone Spring 1st Carbonate Top** | | | | | | | | | |
| 8,441.6 | 27.07 | 3.30 | 8,429 2 | 78.3 | 4 5 | 78.3 | 8.00 | 8.00 | 0 00 |
| 8,500 0 | 31 74 | 3.30 | 8,480 0 | 107 0 | 6.2 | 106.9 | 8 00 | 8 00 | 0.00 |
| **Bone Spring 1st Carbonate Base** | | | | | | | | | |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000 1 Single User Db | **Local Co-ordinate Reference:** | Well Buck Federal 17 #5H |
| **Company:** | Conoco Phillips | **TVD Reference:** | WELL @ 3166 0usft (Precision #827) |
| **Project:** | Lea County, New Mexico | **MD Reference:** | WELL @ 3166.0usft (Precision #827) |
| **Site:** | Sec 20, T26S, 32E | **North Reference:** | Grid |
| **Well:** | Buck Federal 17 #5H | **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) |
|---|---|---|---|---|---|---|---|---|---|
| 8,557.1 | 36.31 | 3 30 | 8,527.3 | 138.8 | 8.0 | 138.8 | 8.00 | 8.00 | 0.00 |
| 8,600.0 | 39.74 | 3.30 | 8,561.1 | 165.2 | 9.5 | 165.2 | 8.00 | 8.00 | 0.00 |
| **EOB @ 8666' MD / 45° Inc / 3.30° Azm / Build 8°/100'** | | | | | | | | | |
| 8,665.7 | 45 00 | 3.30 | 8,609 6 | 209.4 | 12.1 | 209 4 | 8 00 | 8.00 | 0 00 |
| 8,700 0 | 47.73 | 2.96 | 8,633.3 | 234.2 | 13.4 | 234.2 | 8 00 | 7.97 | -0.98 |
| **Avalon A Shale Top** | | | | | | | | | |
| 8,768 0 | 53.16 | 2.37 | 8,676.6 | 286.6 | 15.9 | 286 5 | 8 00 | 7.97 | -0 87 |
| 8,800.0 | 55.71 | 2.13 | 8,695.2 | 312.6 | 16.9 | 312.5 | 8 00 | 7 98 | -0.78 |
| 8,900.0 | 63.68 | 1.43 | 8,745 6 | 398.8 | 19 5 | 398.7 | 8 00 | 7.98 | -0.69 |
| 9,000.0 | 71.66 | 0.83 | 8,783.6 | 491 2 | 21 4 | 491.2 | 8 00 | 7 98 | -0.60 |
| 9,100.0 | 79 65 | 0.28 | 8,808.3 | 588 0 | 22.3 | 588.0 | 8.00 | 7 98 | -0.55 |
| 9,200.0 | 87 63 | 359.76 | 8,819.4 | 687.3 | 22.3 | 687.3 | 8.00 | 7.98 | -0 52 |
| **EOB @ 9228' MD / 89.88° Inc / 359.62° Azm / 8820' TVD** | | | | | | | | | |
| 9,228 2 | 89.88 | 359.62 | 8,820.0 | 715 4 | 22 2 | 715 4 | 8 00 | 7 98 | -0.51 |
| 9,300 0 | 89.88 | 359.62 | 8,820 2 | 787.3 | 21.7 | 787 2 | 0 00 | 0.00 | 0.00 |
| 9,400.0 | 89.88 | 359.62 | 8,820.4 | 887.3 | 21.0 | 887 2 | 0 00 | 0.00 | 0.00 |
| 9,500.0 | 89 88 | 359.62 | 8,820 6 | 987.3 | 20.3 | 987.2 | 0 00 | 0 00 | 0.00 |
| 9,600.0 | 89 88 | 359.62 | 8,820.8 | 1,087 3 | 19 7 | 1,087.2 | 0 00 | 0.00 | 0.00 |
| 9,700 0 | 89 88 | 359.62 | 8,821 0 | 1,187.3 | 19.0 | 1,187.2 | 0.00 | 0.00 | 0.00 |
| 9,800 0 | 89.88 | 359.62 | 8,821.2 | 1,287.3 | 18.3 | 1,287.2 | 0.00 | 0.00 | 0.00 |
| 9,900 0 | 89.88 | 359.62 | 8,821.4 | 1,387.3 | 17.7 | 1,387.2 | 0.00 | 0 00 | 0.00 |
| 10,000 0 | 89 88 | 359.62 | 8,821 7 | 1,487.3 | 17.0 | 1,487.2 | 0.00 | 0.00 | 0.00 |
| 10,100.0 | 89 88 | 359.62 | 8,821.9 | 1,587 3 | 16.3 | 1,587.2 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 89 88 | 359.62 | 8,822.1 | 1,687.3 | 15.7 | 1,687.2 | 0.00 | 0.00 | 0.00 |
| 10,300.0 | 89 88 | 359.62 | 8,822.3 | 1,787 3 | 15.0 | 1,787 2 | 0 00 | 0 00 | 0 00 |
| 10,400.0 | 89.88 | 359.62 | 8,822.5 | 1,887.3 | 14.3 | 1,887.2 | 0 00 | 0.00 | 0.00 |
| 10,500 0 | 89.88 | 359 62 | 8,822 7 | 1,987.3 | 13.7 | 1,987 2 | 0.00 | 0 00 | 0.00 |
| 10,600.0 | 89 88 | 359.62 | 8,822.9 | 2,087.3 | 13.0 | 2,087.2 | 0.00 | 0.00 | 0 00 |
| 10,700.0 | 89.88 | 359 62 | 8,823.2 | 2,187.3 | 12.3 | 2,187.2 | 0.00 | 0.00 | 0 00 |
| 10,800.0 | 89.88 | 359 62 | 8,823 4 | 2,287.3 | 11.7 | 2,287.2 | 0 00 | 0.00 | 0.00 |
| 10,900.0 | 89.88 | 359 62 | 8,823.6 | 2,387.3 | 11.0 | 2,387 2 | 0.00 | 0 00 | 0.00 |
| 11,000.0 | 89 88 | 359 62 | 8,823.8 | 2,487 3 | 10.3 | 2,487 2 | 0.00 | 0.00 | 0.00 |
| 11,100.0 | 89.88 | 359.62 | 8,824.0 | 2,587.2 | 9.7 | 2,587 2 | 0 00 | 0.00 | 0.00 |
| 11,200.0 | 89.88 | 359.62 | 8,824.2 | 2,687.2 | 9.0 | 2,687.2 | 0 00 | 0.00 | 0.00 |
| 11,300 0 | 89 88 | 359.62 | 8,824.4 | 2,787 2 | 8.3 | 2,787 2 | 0 00 | 0.00 | 0 00 |
| 11,400.0 | 89 88 | 359 62 | 8,824 7 | 2,887 2 | 7.6 | 2,887.2 | 0.00 | 0.00 | 0.00 |
| 11,500.0 | 89 88 | 359 62 | 8,824 9 | 2,987 2 | 7.0 | 2,987 2 | 0.00 | 0 00 | 0.00 |
| 11,600 0 | 89.88 | 359.62 | 8,825.1 | 3,087.2 | 6.3 | 3,087 2 | 0 00 | 0 00 | 0 00 |
| 11,700 0 | 89 88 | 359.62 | 8,825.3 | 3,187.2 | 5 6 | 3,187 2 | 0.00 | 0.00 | 0 00 |
| 11,800.0 | 89 88 | 359.62 | 8,825 5 | 3,287.2 | 5 0 | 3,287.2 | 0 00 | 0.00 | 0 00 |
| 11,900.0 | 89 88 | 359.62 | 8,825 7 | 3,387 2 | 4.3 | 3,387.2 | 0.00 | 0.00 | 0 00 |
| 12,000.0 | 89 88 | 359 62 | 8,825 9 | 3,487.2 | 3.6 | 3,487.2 | 0 00 | 0.00 | 0.00 |
| 12,100.0 | 89.88 | 359.62 | 8,826.1 | 3,587 2 | 3.0 | 3,587.2 | 0.00 | 0.00 | 0.00 |
| 12,200 0 | 89.88 | 359 62 | 8,826 4 | 3,687 2 | 2.3 | 3,687 2 | 0 00 | 0 00 | 0.00 |
| 12,300 0 | 89 88 | 359 62 | 8,826.6 | 3,787.2 | 1 6 | 3,787 2 | 0.00 | 0.00 | 0 00 |
| 12,400.0 | 89.88 | 359.62 | 8,826.8 | 3,887.2 | 1 0 | 3,887.2 | 0 00 | 0 00 | 0.00 |
| 12,500.0 | 89.88 | 359.62 | 8,827.0 | 3,987.2 | 0 3 | 3,987.2 | 0 00 | 0.00 | 0.00 |
| 12,600.0 | 89 88 | 359.62 | 8,827 2 | 4,087 2 | -0.4 | 4,087.2 | 0 00 | 0.00 | 0 00 |
| 12,700 0 | 89 88 | 359 62 | 8,827.4 | 4,187.2 | -1.0 | 4,187.2 | 0.00 | 0.00 | 0.00 |
| 12,800 0 | 89 88 | 359.62 | 8,827 6 | 4,287 2 | -1.7 | 4,287.2 | 0.00 | 0.00 | 0.00 |
| 12,900.0 | 89.88 | 359.62 | 8,827.9 | 4,387 2 | -2.4 | 4,387.2 | 0 00 | 0.00 | 0.00 |
| 13,000.0 | 89.88 | 359.62 | 8,828.1 | 4,487.2 | -3.1 | 4,487 2 | 0 00 | 0.00 | 0 00 |
| 13,100.0 | 89.88 | 359.62 | 8,828 3 | 4,587.2 | -3.7 | 4,587.2 | 0 00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 Single User Db | **Local Co-ordinate Reference:** | Well Buck Federal 17 #5H |
| **Company:** | Conoco Phillips | **TVD Reference:** | WELL @ 3166 0usft (Precision #827) |
| **Project:** | Lea County, New Mexico | **MD Reference:** | WELL @ 3166.0usft (Precision #827) |
| **Site:** | Sec 20, T26S, 32E | **North Reference:** | Grid |
| **Well:** | Buck Federal 17 #5H | **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) |
|---|---|---|---|---|---|---|---|---|---|
| 13,200.0 | 89 88 | 359.62 | 8,828 5 | 4,687 2 | -4.4 | 4,687.2 | 0 00 | 0.00 | 0 00 |
| 13,300.0 | 89 88 | 359.62 | 8,828 7 | 4,787 2 | -5.1 | 4,787.2 | 0 00 | 0.00 | 0 00 |
| 13,400.0 | 89 88 | 359.62 | 8,828 9 | 4,887 2 | -5.7 | 4,887.2 | 0.00 | 0.00 | 0 00 |
| 13,500.0 | 89.88 | 359 62 | 8,829.1 | 4,987.2 | -6.4 | 4,987.2 | 0.00 | 0 00 | 0 00 |
| 13,600 0 | 89.88 | 359 62 | 8,829.4 | 5,087.2 | -7.1 | 5,087 2 | 0.00 | 0 00 | 0.00 |
| 13,700 0 | 89.88 | 359 62 | 8,829.6 | 5,187.2 | -7 7 | 5,187.2 | 0.00 | 0.00 | 0.00 |
| 13,800 0 | 89 88 | 359.62 | 8,829.8 | 5,287 2 | -8.4 | 5,287.2 | 0.00 | 0.00 | 0.00 |
| 13,900 0 | 89.88 | 359.62 | 8,830 0 | 5,387.2 | -9.1 | 5,387.2 | 0.00 | 0.00 | 0.00 |
| 14,000.0 | 89 88 | 359.62 | 8,830 2 | 5,487 2 | -9.7 | 5,487.2 | 0.00 | 0.00 | 0 00 |
| 14,100.0 | 89 88 | 359.62 | 8,830.4 | 5,587.2 | -10.4 | 5,587.2 | 0.00 | 0.00 | 0.00 |
| 14,200.0 | 89.88 | 359 62 | 8,830.6 | 5,687.2 | -11.1 | 5,687 2 | 0.00 | 0 00 | 0.00 |
| 14,300.0 | 89.88 | 359.62 | 8,830.8 | 5,787.2 | -11.7 | 5,787.2 | 0 00 | 0.00 | 0.00 |
| **TD @ 14372' MD / 8831' TVD** | | | | | | | | | |
| 14,371.6 | 89.88 | 359.62 | 8,831.0 | 5,858.8 | -12.2 | 5,858.8 | 0 00 | 0 00 | 0.00 |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| PBHL Buck Federal 1 - plan hits target center - Rectangle (sides W100 0 H50.0 D5,143.5) | 90.12 | 359 62 | 8,831.0 | 5,858 8 | -12.2 | 382,217.34 | 698,831.27 | 32° 2' 57.142 N | 103° 41' 29 739 W |

**Formations**

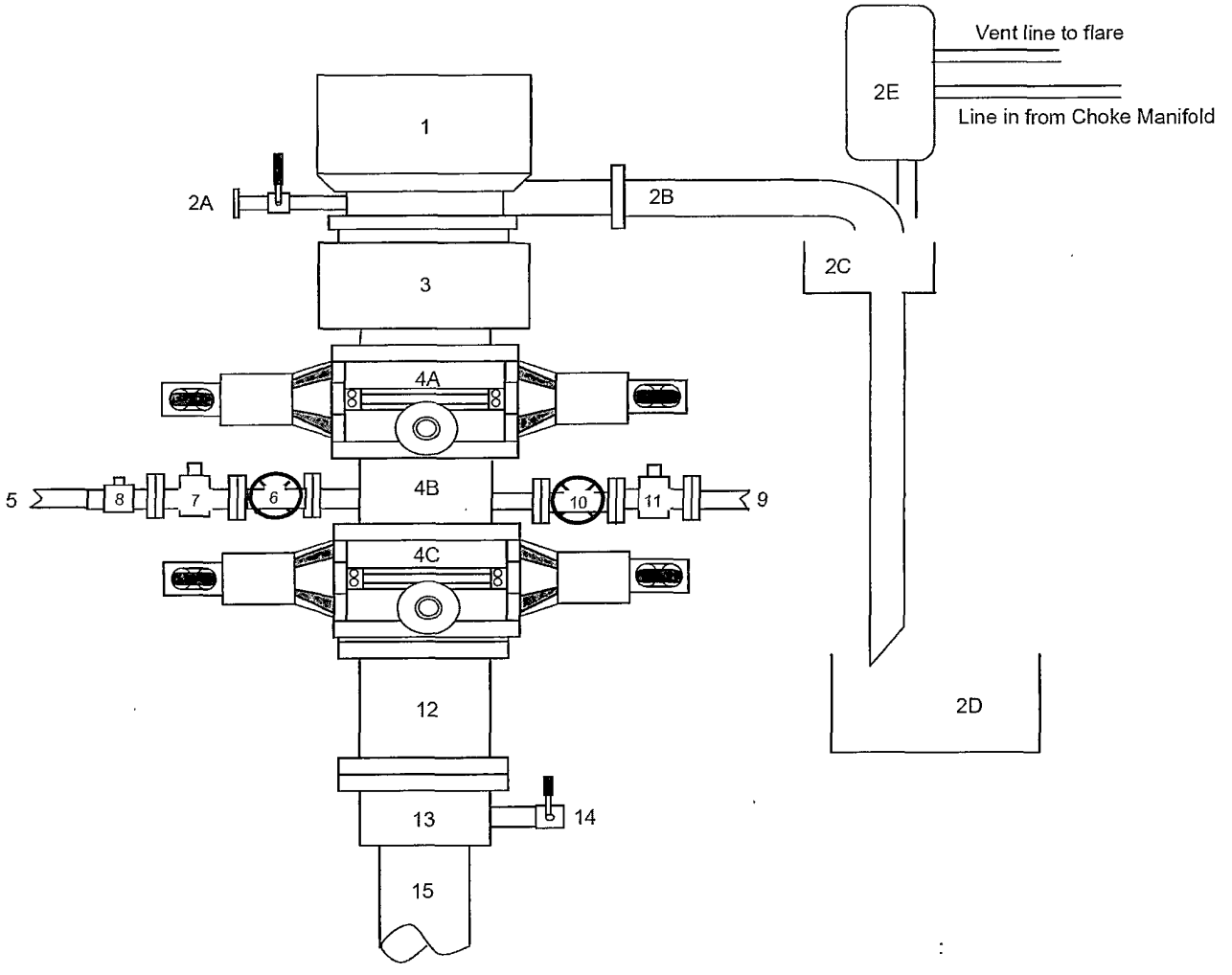
| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 985.0 | 1,006 0 | Rustler | | 0 12 | 359 88 |
| 1,826.0 | 1,847 0 | Castile | | 0 12 | 359 88 |
| 4,326.0 | 4,347.0 | Delaware Top | | 0 12 | 359 88 |
| 4,364.0 | 4,385.0 | Ramsey | | 0 12 | 359.88 |
| 4,434.0 | 4,455 0 | Ford Sh | | 0.12 | 359.88 |
| 4,438 0 | 4,459.0 | Olds | | 0 12 | 359.88 |
| 6,534.0 | 6,555.0 | Cherry Canyon Lower Top | | 0 12 | 359.88 |
| 8,157 1 | 8,178.0 | Bone Spring Top | | 0.12 | 359.88 |
| 8,441.6 | 8,450 2 | Bone Spring 1st Carbonate Top | | 0.12 | 359.88 |
| 8,557.1 | 8,548.3 | Bone Spring 1st Carbonate Base | | 0.12 | 359.88 |
| 8,768 0 | 8,697 6 | Avalon A Shale Top | | 0.12 | 359.88 |

**Plan Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 8,103 2 | 8,103 2 | 0 0 | 0.0 | Build 8°/100' @ 8103' MD |
| 8,665 7 | 8,609 6 | 209.4 | 12.1 | EOB @ 8666' MD / 45° Inc / 3.30° Azm / Build 8°/100' |
| 9,228.2 | 8,820.0 | 715.4 | 22.2 | EOB @ 9228' MD / 89.88° Inc / 359 62° Azm / 8820' TVD |
| 14,371.6 | 8,831.0 | 5,858.8 | -12.2 | TD @ 14372' MD / 8831' TVD |

# BLOWOUT PREVENTER ARRANGEMENT

3M System per Onshore Oil and Gas Order No. 2 utilizing 5M Rated Equipment

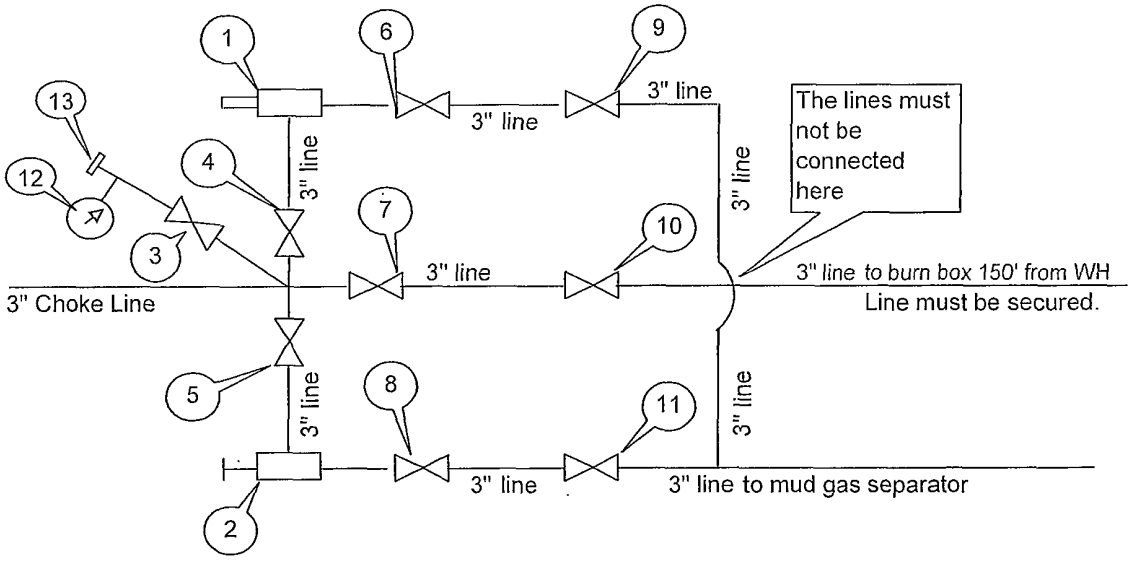



| Item | Description |
|---|---|
| 1 | Rotating Head, 13-5/8" |
| 2A | Fill up Line and Valve |
| 2B | Flow Line (10") |
| 2C | Shale Shakers and Solids Settling Tank |
| 2D | Cuttings Bins for Zero Discharge |
| 2E | Mud Gas Separator with vent line to flare and return line to mud system |
| 3 | Annular BOP (13-5/8", 5M) |
| 4A | Single Ram (13-3/8", 5M, equipped with Blind Rams) |
| 4B | Drilling Spool (13-3/8" 5M) |
| 4C | Single Ram (13-3/8", 5M, equipped with Pipe Rams) |
| 5 | Kill Line (3", 5000 psi WP, steel line) (not a flexible line) |
| 6 | Kill Line Valve, Inner (3-1/8", 5000 psi WP) |
| 7 | Kill Line Valve, Outer (3-1/8", 5000 psi WP, Hydraulically Operated) |
| 8 | Kill Line Check Valve (3-1/8", 5000 psi WP) |
| 9 | Choke Line (3", 5000 psi WP, steel line) (not a flexible line) |
| 10 | Choke Line Valve, Inner (3-1/8", 5000 psi WP) |
| 11 | Choke Line Valve, Outer, (Hydraulically operated, 3-1/8", 5000 psi WP) |
| 12 | Spacer Spool (13-3/8", 5M, with rotating bottom flange) |
| 13 | Casing Head (11", 5M) |
| 14 | Ball Valve and Threaded Nipple on Casing Head Outlet, 2" 5M |
| 15 | Surface Casing |

Drawn by: Steven O. Moore, Chief Drilling Engineer, Mid-Continent Business Unit, ConocoPhillips Company, 29-May-2012

# CHOKE MANIFOLD ARRANGEMENT

3M System per Onshore Oil and Gas Order No. 2 utilizing 5M Equipment




All Tees must be targeted

| Item | Description |
|---|---|
| 1 | Remote Controlled Hydraulic Adjustable Choke, 3-1/8", 5M |
| 2 | Manual Adjustable Choke, 3-1/8", 5M |
| 3 | Gate Valve, 2-1/16" 5M |
| 4 | Gate Valve, 3-1/8" 5M |
| 5 | Gate Valve, 3-1/8" 5M |
| 6 | Gate Valve, 3-1/8" 5M |
| 7 | Gate Valve, 3-1/8" 5M |
| 8 | Gate Valve, 3-1/8" 5M |
| 9 | Gate Valve, 3-1/8" 5M |
| 10 | Gate Valve, 3-1/8" 5M |
| 11 | Gate Valve, 3-1/8" 5M |
| 12 | Pressure Gauge |
| 13 | 2" hammer union tie-in point for BOP Tester |

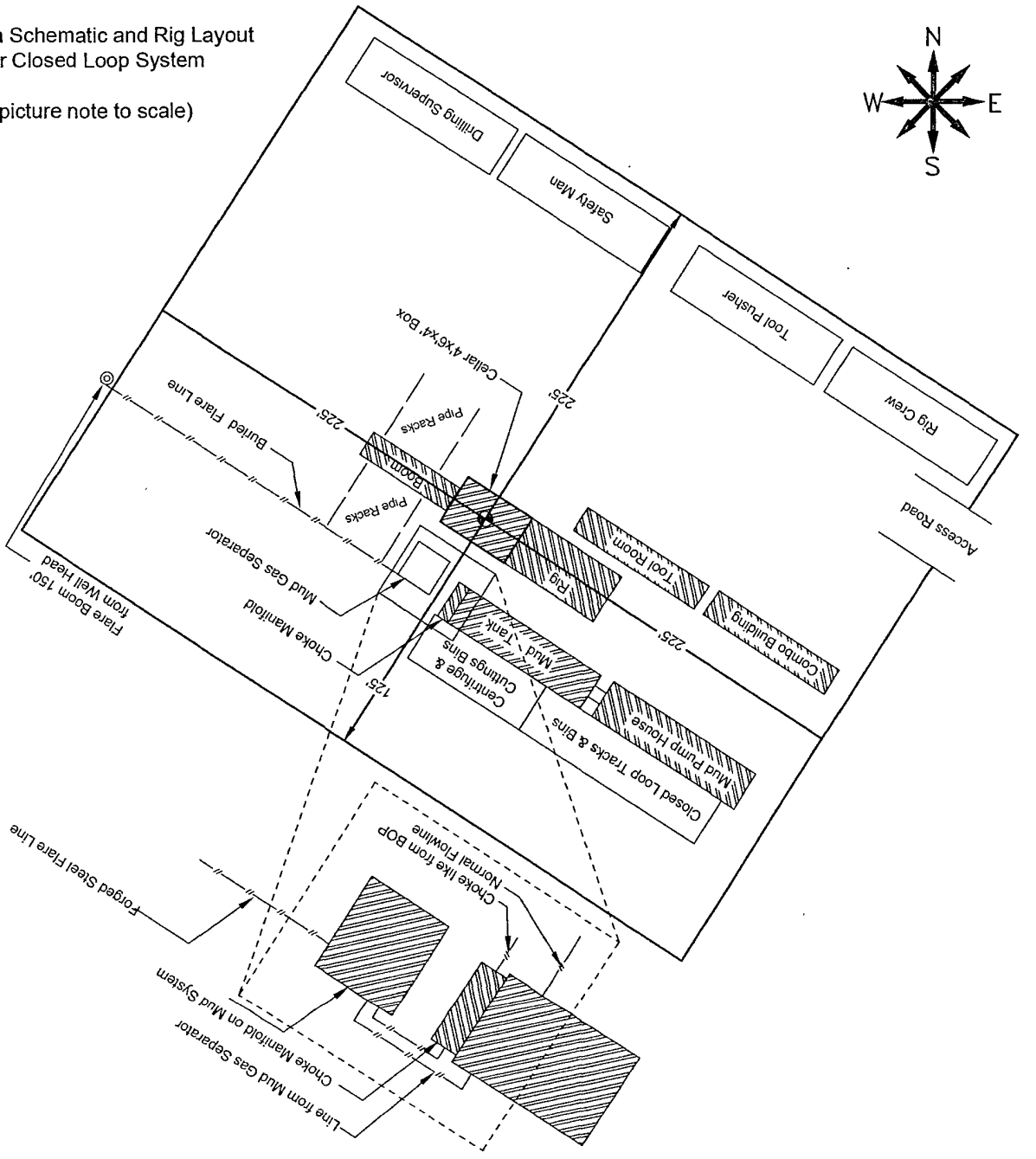
We will test each valve to 3000 psi from the upstream side.

Drawn by:
Steven O. Moore
Chief Drilling Engineer, Mid-Continent Business Unit, ConocoPhillips Company
Date: 25-Sept-2012

RIG LAYOUT

Locaton Schematic and Rig Layout
for Closed Loop System

(picture note to scale)



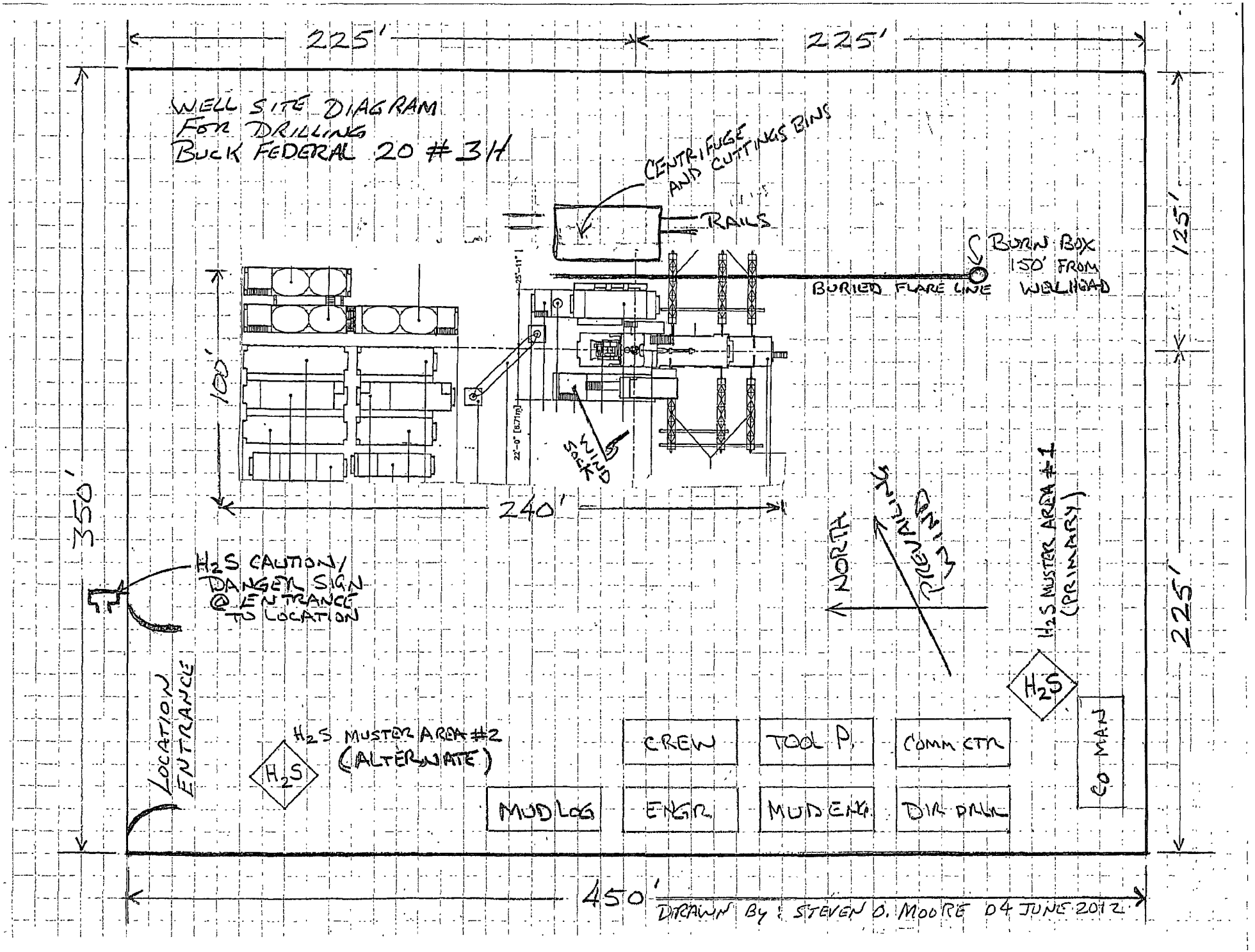

# BUCK FEDERAL 17 #5H
## Located 843' FNL and 1102' FEL
## Section 20, Township 26 South, Range 32 East, N.M.P.M., Lea County, New Mexico.


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 26449 |
| Survey Date: | 04-16-2012 |
| Scale: | 1" = NONE |
| Date: | 04-30-2012 |

ConocoPhillips


225'
225'
WELL SITE DIAGRAM
FOR DRILLING
BUCK FEDERAL 20 #31
CENTRIFUGE AND CUTTINGS BINS
RAILS
BURN BOX 150' FROM WELLHEAD
BURIED FLARE LINE
125'
100'
240'
WIND SOCK
350'
H2S CAUTION/ DANGER SIGN @ ENTRANCE TO LOCATION
NORTH
PREVAILING WINDS
H2S MUSTER AREA #1 (PRIMARY)
H2S
LOCATION ENTRANCE
H2S MUSTER AREA #2 (ALTERNATE)
H2S
CREW
TOOL P.
COMM CTR
MUD LOG
ENGR.
MUD ENG.
DIR DRLR
CO MAN
225'
450'
DRAWN BY: STEVEN O. MOORE 04 JUNE 2012