HOBBS OCD
SECRETARY'S POTASH
JUL 10 2015
OCD HOBBS

Form 3160-3
(August 2007)

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. NM-84902 NMNM54432 BHL

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

ATS-14-886

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

8. Lease Name and Well No. North Lea 3 Fed Com #4H (313633)

2. Name of Operator Read and Stevens, Inc (18917)

9. API Well No. 30-025-42684

3a. Address 400 N. Pennsylvania Ave #1000 Roswell, NM 88201

3b. Phone No. *(include area code)* 575-622-3770

10. Field and Pool, or Exploratory (50461) QUAIL RIDGE; BS, SOUTH

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface 200' FNL 970' FWL (D)
At proposed prod. zone 330' FSL 970'FWL (M)

11. Sec., T. R. M. or Blk. and Survey or Area Sec. 3 T-20S R-34E

14. Distance in miles and direction from nearest town or post office* 26 miles WSW of Hobbs

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) 200'

16. No. of acres in lease 602.45

17. Spacing Unit dedicated to this well 160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. See raduis maps attached.

19. Proposed Depth 10,918TVD/ 15,467'MD

20. BLM/BIA Bond No. on file NM-2310

21. Elevations (Show whether DF, KDB, RT, GL, etc.) GL - 3660.5' RKB - 3682.5'

22. Approximate date work will start* 09/01/2014

23. Estimated duration 60 days until completion

## 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)* Steve Morris Date 05/30/2014

Title Sr. Drilling Engineer

Approved by *(Signature)* Steve Caffey Name *(Printed/Typed)* Date JUL 2 - 2015

Title FIELD MANAGER Office CARLSBAD FIELD OFFICE

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

Capitan Controlled Water Basin

KZ 07/10/15

JUL 13 2015

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

KZ

# Read and Stevens, Inc
# Drilling Prognosis
# North Lea 3 Fed Com #4H

**Revision date: May 30, 2014**

| | |
|---|---|
| Surface Location: | 580824.448usft N, 781207.576usft E<br>200' FNL, 2290' FWL<br><br>Section 3, T-20-S, R-34-E<br>Lea County, New Mexico |
| Bottom Hole: | 576076.674usft N, 781535.923usft E<br>330' FSL, 2290' FWL<br><br>Section 3, T-20-S, R-34-E<br>Lea County, New Mexico |
| Planned Total Depth: | 10920' TVD /15,486' MD |
| RKB: 3683' | GL: 3661' |
| Preparer: | Steve Morris |

# Contents

## *Article I.* *General Provisions:*

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

## *Article II.* *Permit Expiration*

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3106-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## *Article III.* *Estimated Formation Tops (geoprognosis with TVD's adjusted to actual KB):*

| Formation | TVD | Subsea | Thickness | Type |
|---|---|---|---|---|
| Rustler | 1592' | -2090 | | |
| Top of Salt | 1717' | -1965' | | |
| Base of Salt | 3337' | -345' | | |
| Tansil | 3337' | -345' | | |
| Yates | 3557' | -125' | | |
| Seven Rivers | 3847' | 165' | | |
| Queen | 4624' | 944' | | |
| Penrose | 4947' | 1265' | | |
| Grayburg | 5117' | 1435' | | |
| Delaware | 5525' | 1843' | 2707' | Hydrocarbon |
| Bone Spring Lime | 8232' | 4550' | | |
| Avalon | 8730' | 5048' | 692' | Hydrocarbon |
| 1st Bone Spring | 9422' | 5740' | 517' | Hydrocarbon |
| 2nd Bone Spring | 9939' | 6257' | 636' | Hydrocarbon |
| 3rd Bone Spring | 10575' | 6893' | 656' | Hydrocarbon |

POD, Water Column Reports attached.

## *Article IV.* *Pressure Control:* * See COA NOT A Multi-bowl

A 13-5/8" 5M BOP and 5M choke manifold will be used. See schematics below.
BOP test shall be conducted:

A. when initially installed
B. whenever any seal subject to test pressure is broken
C. following related repairs
D. at 30 day intervals

BOP, choke, kill lines, Kelly cock, inside BOP, etc. will be hydro tested to 250psi(low) and 5,000psi(high). The annular will be tested to 250psi (low) and 2500psi (high).

BOP will be function tested on each trip.

See COA

A variance is requested to use 1502(15,000psi working pressure) hammer unions downstream of the Choke Manifold used to connect the mud/gas separator and panic line.

*Article V.* *Casing Program (minimum):*

***All casing is new API casing.***

| Hole Size | Casing | Weight lb/ft | Grade | Conn | MD/RKB | |
|---|---|---|---|---|---|---|
| | 20" | | | | 120' | |
| 16" | 13.375" | 54.5 | J-55 | STC | 1617' | Set 25' into Rustler |
| 12.25" | 9.625" | 40 | L-80 | LTC | 5505' | Set 20' above Delaware |
| 8.5" | 5.5" | 17 | P-110 | BTC | ~~15439~~ 15,419 per directional plan | |
| | | | | | | |

| Size | Collapse psi | SF | Burst psi | SF | Tension Klbs | SF | Max Setting Depth TVD |
|---|---|---|---|---|---|---|---|
| 13.375 | 1130 | 3.08 | 2730 | 3.54 | 514 | 5.66 | 2568 |
| 9.625 | 2570 | 1.24 | 3950 | 1.82 | 520 | 3.12 | 4985 |
| 9.625 | 3090 | 1.28 | 5750 | 2.03 | 727 | 3.33 | 7022 |
| 5.5 | 7480 | 1.55 | 10640 | 1.29 | 568 | 3.06 | 17000 |

See COA

per operator will Keep casing filled

13.375" casing will be set 25' into the Rustler
9.625" casing will be set 20' above the Delaware

*Article VI.* *Cement Program:*

Section 6.01 13.375" Surface Casing

**Lead: 0 – 1317'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 13.5ppg | 1.93cuft/sk | 600 | 9.71 | 100% | Class C + 4% bwoc Bentonite II + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.005% bwoc Static Free + 0.005 gps FP- 6L |

**Tail: 1317' – 1617'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 14.8ppg | 1.34cuft/sk | 166 | 6.35 | 100% | Class C + 1.5% bwoc Calcium Chloride + 0.005 lbs/sack Static Free + 0.005 gps FP-6L |

Circulate cement to surface. If cement does not circulate a 1" grout string will be used to perform a top job.

Cement volumes will be adjusted respectively once actual casing depth is determined and washout from a fluid caliper.

Section 6.02 9.625" Intermediate Casing

A DV tool and ECP will be used to cement this 9⅝" casing if losses are encountered in the Capitan Reef. DV tool and ECP placement will be determined if and when the loss circulation is encountered. DV tool

and ECP placement will be a minimum of 100' above the lost circulation zone and a minimum of 100' from the previous casing shoe.

See COA

(i) Cement detail if DV tool is used: Assuming losses at 3200'. DV tool and ECP will be placed at 3100'. Actual DV tool placement will be determined when and if losses are encountered. DV tool will be placed 150' above loss zone and a minimum of 100' below the last casing shoe.

**Cement Stage 1**
**Lead: 3100' – 5005'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 12.6ppg | 2.13cuft/sk | 730 | 8.81 | 80% | Class C (35:65) + Poz (Fly Ash) + 4% bwoc Bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL-52 + 5 lbs/sack LCM-1 + 0.125 lbs/sack Cello Flake + 0.005 lbs/sack Static Free + 0.005 gps FP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride |

**Tail : 5005' – 5505'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 14.8ppg | 1.33cuft/sk | 220 | 6.35 | 80% | Class C |

**Cement Stage 2**
**Lead: 0-3100'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 12.6ppg | 2.13cuft/sk | 690 | 8.81 | 80% | Class C (35:65) + Poz (Fly Ash) + 4% bwoc Bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL-52 + 5 lbs/sack LCM-1 + 0.125 lbs/sack Cello Flake + 0.005 lbs/sack Static Free + 0.005 gps FP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride |

Once DV tool placement is determined cement volumes will be adjusted accordingly.

(ii) Cement detail if no DV tool is used: ** See COA

**Lead: 0 – 5005'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 12.5ppg | 2.13cuft/sk | 1520 | 8.81 | 80% | Class C (35:65) + Poz (Fly Ash) + 4% bwoc Bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL-52 + 5 lbs/sack LCM-1 + 0.125 lbs/sack Cello Flake + 0.005 lbs/sack Static Free + 0.005 gps FP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride |

**Tail: 5005' – 5505'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 14.8ppg | 1.33cuft/sk | 222 | 6.35 | 80% | Class C |

Circulate cement to surface. If cement does not circulate to surface a top squeeze job or casing perforation will be used. As well, a temperature survey or CBL will be performed.

Cement volumes will be adjusted accordingly once actual casing depth is determined and washout from a fluid caliper.

## Section 6.03 5.5" Production Casing

**Lead: 0 – 11000'**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 11.9ppg | 2.38cuft/sk | 2600 | 13.22 | 80% | Class H (50:50) + Poz (Fly Ash) + 10% bwoc Bentonite II + 5% bwow Sodium Chloride + 5 lbs/sack LCM-1 + 0.005 lbs/sack Static Free + 0.005 gps FP-6L |

**Tail: 11000 - TD**

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|---|---|---|---|---|---|
| 13.2ppg | 1.62cuft/sk | 900 | 9.45 | 20% | Class H (15:61:11) Poz (Fly Ash):Class H Cement:CSE-2 + 4% bwow Sodium Chloride + 3 lbs/sack LCM-1 + 0.6% bwoc FL-25 + 0.005 gps FP-6L + 0.005% bwoc Static Free |

Circulate cement to surface. If cement does not circulate to surface a top squeeze job or casing perforation will be used. As well, a temperature survey or CBL will be performed.
Cement volumes will be adjusted accordingly once actual depth is determined and washout from a fluid caliper.

*Article VII.* *Product Descriptions:*

**Bentonite II**
P105

**CSE-2**
An additive which contributes to low density, high compressive strength development of cement slurries at all temperature ranges. This material also controls free water without the need for standard extenders.

**Calcium Chloride**
A powdered, flaked or pelletized material used to decrease thickening time and increase the rate of strength development.

**Cello Flake**
Graded (3/8 to 3/4 inch) cellophane flakes used as a lost circulation material.

**Class C Cement**
Intended for use from surface to 6000 ft., and for conditions requiring high early strength and/or sulfate resistance.

**Class H Cement**
Class H cement is an API type, all-purpose oil well cement which is used without modification in wells up to 8,000 ft. It possesses a moderate sulfate resistance. With the use of accelerators or retarders, it can be used in a wide range of well depths and temperatures.

**FL-25**
An all-purpose salt-tolerant fluid loss additive that provides exceptional fluid loss control across a wide range of temperatures and salinity conditions and remedial cementing applications.

**FL-52**
A water soluble, high molecular weight fluid loss additive used in medium to low density slurries. It is functional from low to high temperature ranges.

**FP-6L**
A clear liquid that decreases foaming in slurries during mixing.

**LCM-1**
A graded (8 to 60 mesh) naturally occurring hydrocarbon, asphaltite. It is used as a lost circulation material at low to moderate temperatures and will act as a slurry extender. Cement compressive strength is reduced.

**MPA-5**
Used to enhanced compressive, tensile, fleural strength development and reduced permeability

**Poz (Fly Ash)**
A synthetic pozzolan, (primarily Silicon Dioxide). When blended with cement, Pozzolan can be used to create lightweight cement slurries used as either a filler slurry or a sulfate resistant completion cement.

**Sodium Chloride**
At low concentrations, it is used to protect against clay swelling.

**Sodium Metasilicate**
An extender used to produce economical, low density cement slurry.

**Static Free**
An anti-static additive used to prevent air entrainment due to agglomerated particles. Can be used in Cementing and Fracturing operations to aid in the flow of dry materials.

*Article VIII.* See COA *Mud Program:*

| Depth | Hole | Type | MW | PV | YP | WL | pH | Sol % |
|---|---|---|---|---|---|---|---|---|
| 0-1617 | 16" | Fresh Water | 8.4-8.9 | 10-12 | 12-15 | NC | 9.5 | <3.0 |
| 1617-5505 | 12.25" | Brine | 9.8-10 | 1-2 | 1-2 | NC | 9.5 | <1.0 |
| 5445- KOP | 8.5" | Cut Brine | 8.4-8.6 | 1-2 | 1-2 | NC | 9.5 | <1.0 |
| KOP-TD | 8.5" | Cut Brine | 8.9-9.1 | 4-6 | 4-6 | 18-20 | 9.5 | <3.0 |

Sufficient mud will be on location to control any abnormal conditions encountered. Such as but not limited to a kick, lost circulation and hole sloughing.

*Article IX.* *Mud Monitoring System:*
A Pason PVT system will be rigged up prior to spudding the well. A volume monitoring system that measures, calculates, and displays readings from the mud system on the rig to alert the rig crew of impending gas kicks and lost circulation issues.

**Components**

**a) PVT Pit Bull monitor:**
Acts as the heart of the system, containing all the controls, switches, and alarms. Typically, it is mounted near the driller's console.

**b) Junction box:**
Provides a safe, convenient place for making the wiring connections.

**c) Mud probes:**
Measure the volume of drilling fluid in each individual tank.

**d) Flow sensor:**
Measures the relative amount of mud flowing in the return line.

See COA *Article X.* *Logging, Drill stem testing and Coring:* * See COA
2 man mud logging will start after surface casing has been set.

8.75" hole will have LWD (Gamma Ray) to section TD.

*Article XI.* *Bottom Hole:*
Temperature is expected to be 162°F, using a 0.76°/100' gradient. The bottom hole pressure is expected to be 4796psi maximum using a pressure gradient of 0.44psi/ft. With a partially evacuated hole and a gradient of 0.22psi the maximum surface pressure would be 2398psi.

*Article XII.* *Abnormal Conditions:*
Temperature is expected to be normal. All zones are expected to be normal pressure.
Lost circulation is possible in both the 16" and 12.25" hole sections. 20ppb of LCM will be maintained in the active system at all times while drilling these sections. As well, a 50bbl pill of 50ppb LCM will be premixed in the slug pit in case lost circulation is encountered. If complete loss circulation is encountered in the Capitan Reef the Brine will be switched over to fresh water. The BLM will be notified of this and an inspector requested to witness the drilling fluid swap. Daily reports will be submitted to the BLM if losses are encountered.

*Article XIII.* *H2S:*

No H2S is expected. But there is the possibility of the presence of H2S. Attached is the H2S response plan. H2S response plan will be put into effect after surface casing has been set and BOPE has been nippled up.

*Article XIV.* *Directional:*

Directional survey plan and plot attached.

*Article XV.* *Drilling Recorder:*

Rig up EDR & PVT prior to spud to record drilling times and other drilling parameters from surface to TD.

MOJO
DIRECTIONAL CORPORATION

# Read and Stevens Inc.

**North Lea Prospect T20S-R34E**
**Section 3**
**North Lea Federal Com 3 #4H**
**North Lea Federal Com 3 #4H**

**Plan: 131003 North Lea 3 Fed Com 4H**

# MOJO Standard Survey

**03 October, 2013**

MOJO
DIRECTIONAL CORPORATION

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Project** North Lea Prospect T20S-R34E

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1983 | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | North American Datum 1983 | | |
| **Map Zone:** | New Mexico Eastern Zone | | Using geodetic scale factor |

**Site** Section 3

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 586,163.01 usft | **Latitude:** | 32° 36' 32.180 N |
| **From:** | Lat/Long | **Easting:** | 784,123.26 usft | **Longitude:** | 103° 32' 41.562 W |
| **Position Uncertainty:** | 1.0 usft | **Slot Radius:** | 16 " | **Grid Convergence:** | 0.42 ° |

**Well** North Lea Federal Com 3 #4H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 usft | **Northing:** | 586,138.67 usft | **Latitude:** | 32° 36' 32.132 N |
| | **+E/-W** | 0.0 usft | **Easting:** | 781,481.31 usft | **Longitude:** | 103° 33' 12.449 W |
| **Position Uncertainty** | | 1.0 usft | **Wellhead Elevation:** | usft | **Ground Level:** | 3,660.5 usft |

**Wellbore** North Lea Federal Com 3 #4H

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 28/12/2012 | 7.42 | 60.51 | 48,695 |

**Design** 131003 North Lea 3 Fed Com 4H

**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 | 179.62 |

**Survey Tool Program** **Date** 03/10/2013

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 15,418.6 | 131003 North Lea 3 Fed Com 4H (North L | MWD | MWD - Standard |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | -3,682.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 100.0 | 0.00 | 0.00 | 100.0 | -3,582.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 200.0 | 0.00 | 0.00 | 200.0 | -3,482.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 300.0 | 0.00 | 0.00 | 300.0 | -3,382.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 400.0 | 0.00 | 0.00 | 400.0 | -3,282.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 500.0 | 0.00 | 0.00 | 500.0 | -3,182.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 600.0 | 0.00 | 0.00 | 600.0 | -3,082.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 700.0 | 0.00 | 0.00 | 700.0 | -2,982.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 800.0 | 0.00 | 0.00 | 800.0 | -2,882.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 900.0 | 0.00 | 0.00 | 900.0 | -2,782.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | -2,682.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,100.0 | 0.00 | 0.00 | 1,100.0 | -2,582.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,200.0 | 0.00 | 0.00 | 1,200.0 | -2,482.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,300.0 | 0.00 | 0.00 | 1,300.0 | -2,382.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,400.0 | 0.00 | 0.00 | 1,400.0 | -2,282.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,500.0 | 0.00 | 0.00 | 1,500.0 | -2,182.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,592.5 | 0.00 | 0.00 | 1,592.5 | -2,090.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Rustler** | | | | | | | | | | |
| 1,600.0 | 0.00 | 0.00 | 1,600.0 | -2,082.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,617.5 | 0.00 | 0.00 | 1,617.5 | -2,065.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **13 3/8"** | | | | | | | | | | |
| 1,700.0 | 0.00 | 0.00 | 1,700.0 | -1,982.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,717.5 | 0.00 | 0.00 | 1,717.5 | -1,965.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Top of Salt** | | | | | | | | | | |
| 1,800.0 | 0.00 | 0.00 | 1,800.0 | -1,882.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 1,900.0 | 0.00 | 0.00 | 1,900.0 | -1,782.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,000.0 | 0.00 | 0.00 | 2,000.0 | -1,682.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,100.0 | 0.00 | 0.00 | 2,100.0 | -1,582.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2,200.0 | 0.00 | 0.00 | 2,200.0 | -1,482.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,300.0 | 0.00 | 0.00 | 2,300.0 | -1,382.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,400.0 | 0.00 | 0.00 | 2,400.0 | -1,282.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,500.0 | 0.00 | 0.00 | 2,500.0 | -1,182.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,600.0 | 0.00 | 0.00 | 2,600.0 | -1,082.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,700.0 | 0.00 | 0.00 | 2,700.0 | -982.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,800.0 | 0.00 | 0.00 | 2,800.0 | -882.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 2,900.0 | 0.00 | 0.00 | 2,900.0 | -782.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,000.0 | 0.00 | 0.00 | 3,000.0 | -682.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,100.0 | 0.00 | 0.00 | 3,100.0 | -582.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,200.0 | 0.00 | 0.00 | 3,200.0 | -482.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,300.0 | 0.00 | 0.00 | 3,300.0 | -382.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,337.5 | 0.00 | 0.00 | 3,337.5 | -345.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Base of Salt** | | | | | | | | | | |
| 3,400.0 | 0.00 | 0.00 | 3,400.0 | -282.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,500.0 | 0.00 | 0.00 | 3,500.0 | -182.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,557.5 | 0.00 | 0.00 | 3,557.5 | -125.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Yates (Capitan Reef)** | | | | | | | | | | |
| 3,600.0 | 0.00 | 0.00 | 3,600.0 | -82.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,700.0 | 0.00 | 0.00 | 3,700.0 | 17.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,800.0 | 0.00 | 0.00 | 3,800.0 | 117.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 3,847.5 | 0.00 | 0.00 | 3,847.5 | 165.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **7 Rivers (Capitan Reef)** | | | | | | | | | | |
| 3,900.0 | 0.00 | 0.00 | 3,900.0 | 217.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,000.0 | 0.00 | 0.00 | 4,000.0 | 317.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,100.0 | 0.00 | 0.00 | 4,100.0 | 417.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,200.0 | 0.00 | 0.00 | 4,200.0 | 517.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,300.0 | 0.00 | 0.00 | 4,300.0 | 617.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,400.0 | 0.00 | 0.00 | 4,400.0 | 717.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,500.0 | 0.00 | 0.00 | 4,500.0 | 817.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,600.0 | 0.00 | 0.00 | 4,600.0 | 917.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,626.5 | 0.00 | 0.00 | 4,626.5 | 944.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Queen (Capitan Reef)** | | | | | | | | | | |
| 4,700.0 | 0.00 | 0.00 | 4,700.0 | 1,017.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,800.0 | 0.00 | 0.00 | 4,800.0 | 1,117.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,900.0 | 0.00 | 0.00 | 4,900.0 | 1,217.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 4,947.5 | 0.00 | 0.00 | 4,947.5 | 1,265.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Penrose (Capitan Reef)** | | | | | | | | | | |
| 5,000.0 | 0.00 | 0.00 | 5,000.0 | 1,317.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,100.0 | 0.00 | 0.00 | 5,100.0 | 1,417.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,117.5 | 0.00 | 0.00 | 5,117.5 | 1,435.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Grayburg (Capitan Reef)** | | | | | | | | | | |
| 5,187.5 | 0.00 | 0.00 | 5,187.5 | 1,505.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **San Andres** | | | | | | | | | | |
| 5,200.0 | 0.00 | 0.00 | 5,200.0 | 1,517.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,300.0 | 0.00 | 0.00 | 5,300.0 | 1,617.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,400.0 | 0.00 | 0.00 | 5,400.0 | 1,717.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,500.0 | 0.00 | 0.00 | 5,500.0 | 1,817.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,501.5 | 0.00 | 0.00 | 5,501.5 | 1,819.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Lamar Lime** | | | | | | | | | | |
| 5,511.5 | 0.00 | 0.00 | 5,511.5 | 1,829.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **9 5/8"** | | | | | | | | | | |
| 5,525.5 | 0.00 | 0.00 | 5,525.5 | 1,843.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Delaware/Bell Canyon** | | | | | | | | | | |
| 5,600.0 | 0.00 | 0.00 | 5,600.0 | 1,917.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,700.0 | 0.00 | 0.00 | 5,700.0 | 2,017.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5,800.0 | 0.00 | 0.00 | 5,800.0 | 2,117.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 5,900.0 | 0.00 | 0.00 | 5,900.0 | 2,217.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,000.0 | 0.00 | 0.00 | 6,000.0 | 2,317.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,010.5 | 0.00 | 0.00 | 6,010.5 | 2,328.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Cherry Canyon** | | | | | | | | | | |
| 6,100.0 | 0.00 | 0.00 | 6,100.0 | 2,417.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,200.0 | 0.00 | 0.00 | 6,200.0 | 2,517.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,300.0 | 0.00 | 0.00 | 6,300.0 | 2,617.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,400.0 | 0.00 | 0.00 | 6,400.0 | 2,717.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,500.0 | 0.00 | 0.00 | 6,500.0 | 2,817.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,600.0 | 0.00 | 0.00 | 6,600.0 | 2,917.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,700.0 | 0.00 | 0.00 | 6,700.0 | 3,017.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,800.0 | 0.00 | 0.00 | 6,800.0 | 3,117.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 6,900.0 | 0.00 | 0.00 | 6,900.0 | 3,217.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,000.0 | 0.00 | 0.00 | 7,000.0 | 3,317.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,100.0 | 0.00 | 0.00 | 7,100.0 | 3,417.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,200.0 | 0.00 | 0.00 | 7,200.0 | 3,517.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,300.0 | 0.00 | 0.00 | 7,300.0 | 3,617.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,303.5 | 0.00 | 0.00 | 7,303.5 | 3,621.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Brushy Canyon** | | | | | | | | | | |
| 7,400.0 | 0.00 | 0.00 | 7,400.0 | 3,717.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,500.0 | 0.00 | 0.00 | 7,500.0 | 3,817.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,600.0 | 0.00 | 0.00 | 7,600.0 | 3,917.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,700.0 | 0.00 | 0.00 | 7,700.0 | 4,017.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,800.0 | 0.00 | 0.00 | 7,800.0 | 4,117.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 7,900.0 | 0.00 | 0.00 | 7,900.0 | 4,217.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,000.0 | 0.00 | 0.00 | 8,000.0 | 4,317.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 8,100.0 | 0.00 | 0.00 | 8,100.0 | 4,417.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,200.0 | 0.00 | 0.00 | 8,200.0 | 4,517.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,232.5 | 0.00 | 0.00 | 8,232.5 | 4,550.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Bone Springs Lime** | | | | | | | | | | |
| 8,300.0 | 0.00 | 0.00 | 8,300.0 | 4,617.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,400.0 | 0.00 | 0.00 | 8,400.0 | 4,717.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,500.0 | 0.00 | 0.00 | 8,500.0 | 4,817.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,600.0 | 0.00 | 0.00 | 8,600.0 | 4,917.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,700.0 | 0.00 | 0.00 | 8,700.0 | 5,017.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,730.5 | 0.00 | 0.00 | 8,730.5 | 5,048.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **Avalon Shale** | | | | | | | | | | |
| 8,800.0 | 0.00 | 0.00 | 8,800.0 | 5,117.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 8,900.0 | 0.00 | 0.00 | 8,900.0 | 5,217.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,000.0 | 0.00 | 0.00 | 9,000.0 | 5,317.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,100.0 | 0.00 | 0.00 | 9,100.0 | 5,417.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,200.0 | 0.00 | 0.00 | 9,200.0 | 5,517.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,300.0 | 0.00 | 0.00 | 9,300.0 | 5,617.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,400.0 | 0.00 | 0.00 | 9,400.0 | 5,717.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,422.5 | 0.00 | 0.00 | 9,422.5 | 5,740.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **1st Bone Spring Sand** | | | | | | | | | | |
| 9,500.0 | 0.00 | 0.00 | 9,500.0 | 5,817.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,600.0 | 0.00 | 0.00 | 9,600.0 | 5,917.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,700.0 | 0.00 | 0.00 | 9,700.0 | 6,017.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,800.0 | 0.00 | 0.00 | 9,800.0 | 6,117.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,900.0 | 0.00 | 0.00 | 9,900.0 | 6,217.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 9,939.5 | 0.00 | 0.00 | 9,939.5 | 6,257.0 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| **2nd Bone Spring Sand** | | | | | | | | | | |
| 10,000.0 | 0.00 | 0.00 | 10,000.0 | 6,317.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 10,100.0 | 0.00 | 0.00 | 10,100.0 | 6,417.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 10,200.0 | 0.00 | 0.00 | 10,200.0 | 6,517.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 10,300.0 | 0.00 | 0.00 | 10,300.0 | 6,617.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 10,337.0 | 0.00 | 0.00 | 10,337.0 | 6,654.5 | 0.0 | 0.0 | 0.0 | 0.00 | 586,138.67 | 781,481.31 |
| 10,350.0 | 1.43 | 180.00 | 10,350.0 | 6,667.5 | -0.2 | 0.0 | 0.2 | 11.00 | 586,138.51 | 781,481.31 |
| 10,400.0 | 6.93 | 180.00 | 10,399.8 | 6,717.3 | -3.8 | 0.0 | 3.8 | 11.00 | 586,134.86 | 781,481.31 |
| 10,450.0 | 12.43 | 180.00 | 10,449.1 | 6,766.6 | -12.2 | 0.0 | 12.2 | 11.00 | 586,126.46 | 781,481.31 |
| 10,500.0 | 17.93 | 180.00 | 10,497.4 | 6,814.9 | -25.3 | 0.0 | 25.3 | 11.00 | 586,113.37 | 781,481.31 |
| 10,550.0 | 23.43 | 180.00 | 10,544.1 | 6,861.6 | -42.9 | 0.0 | 42.9 | 11.00 | 586,095.72 | 781,481.31 |
| 10,584.7 | 27.25 | 180.00 | 10,575.5 | 6,893.0 | -57.8 | 0.0 | 57.8 | 11.00 | 586,080.86 | 781,481.31 |
| **3rd Bne Spring** | | | | | | | | | | |
| 10,600.0 | 28.93 | 180.00 | 10,589.0 | 6,906.5 | -65.0 | 0.0 | 65.0 | 11.00 | 586,073.67 | 781,481.31 |
| 10,650.0 | 34.43 | 180.00 | 10,631.5 | 6,949.0 | -91.2 | 0.0 | 91.2 | 11.00 | 586,047.42 | 781,481.31 |
| 10,700.0 | 39.93 | 180.00 | 10,671.3 | 6,988.8 | -121.5 | 0.0 | 121.4 | 11.00 | 586,017.22 | 781,481.31 |
| 10,750.0 | 45.43 | 180.00 | 10,708.1 | 7,025.6 | -155.3 | 0.0 | 155.3 | 11.00 | 585,983.34 | 781,481.31 |
| 10,800.0 | 50.93 | 180.00 | 10,741.4 | 7,058.9 | -192.6 | 0.0 | 192.6 | 11.00 | 585,946.09 | 781,481.31 |
| 10,850.0 | 56.43 | 180.00 | 10,771.0 | 7,088.5 | -232.9 | 0.0 | 232.8 | 11.00 | 585,905.82 | 781,481.31 |
| 10,900.0 | 61.93 | 180.00 | 10,796.6 | 7,114.1 | -275.8 | 0.0 | 275.8 | 11.00 | 585,862.90 | 781,481.31 |
| 10,950.0 | 67.43 | 180.00 | 10,818.0 | 7,135.5 | -321.0 | 0.0 | 320.9 | 11.00 | 585,817.72 | 781,481.31 |
| 11,000.0 | 72.93 | 180.00 | 10,834.9 | 7,152.4 | -368.0 | 0.0 | 368.0 | 11.00 | 585,770.70 | 781,481.31 |
| 11,050.0 | 78.43 | 180.00 | 10,847.3 | 7,164.8 | -416.4 | 0.0 | 416.4 | 11.00 | 585,722.28 | 781,481.31 |
| 11,100.0 | 83.93 | 180.00 | 10,855.0 | 7,172.5 | -465.8 | 0.0 | 465.8 | 11.00 | 585,672.89 | 781,481.31 |
| 11,150.0 | 89.43 | 180.00 | 10,857.8 | 7,175.3 | -515.7 | 0.0 | 515.7 | 11.00 | 585,622.99 | 781,481.31 |
| 11,155.2 | 90.00 | 180.00 | 10,857.9 | 7,175.4 | -520.9 | 0.0 | 520.9 | 11.00 | 585,617.81 | 781,481.31 |
| 11,200.0 | 89.98 | 179.99 | 10,857.9 | 7,175.4 | -565.7 | 0.0 | 565.7 | 0.05 | 585,573.00 | 781,481.31 |
| 11,300.0 | 89.93 | 179.96 | 10,858.0 | 7,175.5 | -665.7 | 0.0 | 665.7 | 0.05 | 585,473.00 | 781,481.35 |
| 11,400.0 | 89.89 | 179.94 | 10,858.1 | 7,175.6 | -765.7 | 0.1 | 765.7 | 0.05 | 585,373.00 | 781,481.44 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 11,500.0 | 89.84 | 179.92 | 10,858.4 | 7,175.9 | -865.7 | 0.3 | 865.7 | 0.05 | 585,273.00 | 781,481.56 |
| 11,600.0 | 89.79 | 179.89 | 10,858.7 | 7,176.2 | -965.7 | 0.4 | 965.7 | 0.05 | 585,173.01 | 781,481.73 |
| 11,700.0 | 89.75 | 179.87 | 10,859.1 | 7,176.6 | -1,065.7 | 0.6 | 1,065.7 | 0.05 | 585,073.01 | 781,481.94 |
| 11,800.0 | 89.70 | 179.84 | 10,859.6 | 7,177.1 | -1,165.7 | 0.9 | 1,165.7 | 0.05 | 584,973.01 | 781,482.20 |
| 11,900.0 | 89.65 | 179.82 | 10,860.1 | 7,177.6 | -1,265.7 | 1.2 | 1,265.7 | 0.05 | 584,873.02 | 781,482.50 |
| 12,000.0 | 89.61 | 179.79 | 10,860.8 | 7,178.3 | -1,365.7 | 1.5 | 1,365.7 | 0.05 | 584,773.02 | 781,482.84 |
| 12,100.0 | 89.56 | 179.77 | 10,861.5 | 7,179.0 | -1,465.7 | 1.9 | 1,465.7 | 0.05 | 584,673.03 | 781,483.22 |
| 12,200.0 | 89.51 | 179.74 | 10,862.3 | 7,179.8 | -1,565.7 | 2.3 | 1,565.7 | 0.05 | 584,573.04 | 781,483.65 |
| 12,300.0 | 89.47 | 179.72 | 10,863.2 | 7,180.7 | -1,665.7 | 2.8 | 1,665.7 | 0.05 | 584,473.04 | 781,484.12 |
| 12,400.0 | 89.42 | 179.69 | 10,864.2 | 7,181.7 | -1,765.7 | 3.3 | 1,765.6 | 0.05 | 584,373.05 | 781,484.63 |
| 12,500.0 | 89.37 | 179.67 | 10,865.2 | 7,182.7 | -1,865.7 | 3.9 | 1,865.6 | 0.05 | 584,273.06 | 781,485.18 |
| 12,600.0 | 89.33 | 179.64 | 10,866.4 | 7,183.9 | -1,965.6 | 4.5 | 1,965.6 | 0.05 | 584,173.07 | 781,485.78 |
| 12,700.0 | 89.28 | 179.62 | 10,867.6 | 7,185.1 | -2,065.6 | 5.1 | 2,065.6 | 0.05 | 584,073.08 | 781,486.42 |
| 12,800.0 | 89.23 | 179.60 | 10,868.9 | 7,186.4 | -2,165.6 | 5.8 | 2,165.6 | 0.05 | 583,973.10 | 781,487.11 |
| 12,900.0 | 89.19 | 179.57 | 10,870.3 | 7,187.8 | -2,265.6 | 6.5 | 2,265.6 | 0.05 | 583,873.11 | 781,487.84 |
| 13,000.0 | 89.14 | 179.55 | 10,871.7 | 7,189.2 | -2,365.6 | 7.3 | 2,365.6 | 0.05 | 583,773.13 | 781,488.60 |
| 13,100.0 | 89.09 | 179.52 | 10,873.3 | 7,190.8 | -2,465.6 | 8.1 | 2,465.6 | 0.05 | 583,673.15 | 781,489.42 |
| 13,200.0 | 89.05 | 179.50 | 10,874.9 | 7,192.4 | -2,565.6 | 9.0 | 2,565.6 | 0.05 | 583,573.17 | 781,490.27 |
| 13,300.0 | 89.00 | 179.47 | 10,876.6 | 7,194.1 | -2,665.5 | 9.9 | 2,665.6 | 0.05 | 583,473.19 | 781,491.17 |
| 13,400.0 | 88.95 | 179.45 | 10,878.4 | 7,195.9 | -2,765.5 | 10.8 | 2,765.5 | 0.05 | 583,373.21 | 781,492.11 |
| 13,500.0 | 88.91 | 179.42 | 10,880.3 | 7,197.8 | -2,865.5 | 11.8 | 2,865.5 | 0.05 | 583,273.23 | 781,493.10 |
| 13,539.3 | 88.89 | 179.41 | 10,881.0 | 7,198.5 | -2,904.8 | 12.2 | 2,904.8 | 0.05 | 583,233.92 | 781,493.50 |
| 13,600.0 | 88.89 | 179.41 | 10,882.2 | 7,199.7 | -2,965.5 | 12.8 | 2,965.5 | 0.00 | 583,173.26 | 781,494.12 |
| 13,700.0 | 88.89 | 179.41 | 10,884.1 | 7,201.6 | -3,065.5 | 13.8 | 3,065.5 | 0.00 | 583,073.29 | 781,495.14 |
| 13,800.0 | 88.89 | 179.41 | 10,886.1 | 7,203.6 | -3,165.4 | 14.9 | 3,165.5 | 0.00 | 582,973.31 | 781,496.16 |
| 13,900.0 | 88.89 | 179.41 | 10,888.0 | 7,205.5 | -3,265.4 | 15.9 | 3,265.4 | 0.00 | 582,873.34 | 781,497.18 |
| 14,000.0 | 88.89 | 179.41 | 10,890.0 | 7,207.5 | -3,365.4 | 16.9 | 3,365.4 | 0.00 | 582,773.37 | 781,498.21 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 14,100.0 | 88.89 | 179.41 | 10,891.9 | 7,209.4 | -3,465.4 | 17.9 | 3,465.4 | 0.00 | 582,673.39 | 781,499.23 |
| 14,200.0 | 88.89 | 179.41 | 10,893.8 | 7,211.3 | -3,565.3 | 18.9 | 3,565.4 | 0.00 | 582,573.42 | 781,500.25 |
| 14,300.0 | 88.89 | 179.41 | 10,895.8 | 7,213.3 | -3,665.3 | 20.0 | 3,665.4 | 0.00 | 582,473.45 | 781,501.27 |
| 14,400.0 | 88.89 | 179.41 | 10,897.7 | 7,215.2 | -3,765.3 | 21.0 | 3,765.3 | 0.00 | 582,373.47 | 781,502.30 |
| 14,500.0 | 88.89 | 179.41 | 10,899.7 | 7,217.2 | -3,865.3 | 22.0 | 3,865.3 | 0.00 | 582,273.50 | 781,503.32 |
| 14,600.0 | 88.89 | 179.41 | 10,901.6 | 7,219.1 | -3,965.2 | 23.0 | 3,965.3 | 0.00 | 582,173.53 | 781,504.34 |
| 14,700.0 | 88.89 | 179.41 | 10,903.5 | 7,221.0 | -4,065.2 | 24.1 | 4,065.3 | 0.00 | 582,073.55 | 781,505.36 |
| 14,800.0 | 88.89 | 179.41 | 10,905.5 | 7,223.0 | -4,165.2 | 25.1 | 4,165.3 | 0.00 | 581,973.58 | 781,506.39 |
| 14,900.0 | 88.89 | 179.41 | 10,907.4 | 7,224.9 | -4,265.2 | 26.1 | 4,265.2 | 0.00 | 581,873.61 | 781,507.41 |
| 15,000.0 | 88.89 | 179.41 | 10,909.4 | 7,226.9 | -4,365.1 | 27.1 | 4,365.2 | 0.00 | 581,773.63 | 781,508.43 |
| 15,100.0 | 88.89 | 179.41 | 10,911.3 | 7,228.8 | -4,465.1 | 28.1 | 4,465.2 | 0.00 | 581,673.66 | 781,509.45 |
| 15,200.0 | 88.89 | 179.41 | 10,913.3 | 7,230.8 | -4,565.1 | 29.2 | 4,565.2 | 0.00 | 581,573.69 | 781,510.48 |
| 15,300.0 | 88.89 | 179.41 | 10,915.2 | 7,232.7 | -4,665.1 | 30.2 | 4,665.2 | 0.00 | 581,473.71 | 781,511.50 |
| 15,391.2 | 88.89 | 179.41 | 10,917.0 | 7,234.5 | -4,756.3 | 31.1 | 4,756.4 | 0.00 | 581,382.54 | 781,512.43 |
| 15,400.0 | 88.89 | 179.41 | 10,917.1 | 7,234.6 | -4,765.0 | 31.2 | 4,765.2 | 0.02 | 581,373.74 | 781,512.52 |
| 15,418.6 | 88.89 | 179.41 | 10,917.5 | 7,235.0 | -4,783.6 | 31.4 | 4,783.7 | 0.02 | 581,355.16 | 781,512.71 |

**Casing Points**

| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") |
|---|---|---|---|---|
| 5,511.5 | 5,511.5 | 9 5/8" | 9-5/8 | 12-1/4 |
| 15,418.6 | 10,917.5 | 5 1/2" | 5-1/2 | 6 |
| 1,617.5 | 1,617.5 | 13 3/8" | 13-3/8 | 17-1/2 |

| | | | |
|---|---|---|---|
| **Company:** | Read and Stevens Inc. | **Local Co-ordinate Reference:** | Well North Lea Federal Com 3 #4H |
| **Project:** | North Lea Prospect T20S-R34E | **TVD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Site:** | Section 3 | **MD Reference:** | WELL (copy) @ 3682.5usft (Original Well Elev) |
| **Well:** | North Lea Federal Com 3 #4H | **North Reference:** | Grid |
| **Wellbore:** | North Lea Federal Com 3 #4H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | 131003 North Lea 3 Fed Com 4H | **Database:** | EDM 5000.1 Single User Db |

**Formations**

| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 9,422.5 | 9,422.5 | 1st Bone Spring Sand | | 0.00 | |
| 1,717.5 | 1,717.5 | Top of Salt | | 0.00 | |
| 3,847.5 | 3,847.5 | 7 Rivers (Capitan Reef) | | 0.00 | |
| 5,187.5 | 5,187.5 | San Andres | | 0.00 | |
| 5,117.5 | 5,117.5 | Grayburg (Capitan Reef) | | 0.00 | |
| 3,337.5 | 3,337.5 | Base of Salt | | 0.00 | |
| 6,010.5 | 6,010.5 | Cherry Canyon | | 0.00 | |
| 10,584.7 | 10,575.5 | 3rd Bne Spring | | 0.00 | |
| 3,557.5 | 3,557.5 | Yates (Capitan Reef) | | 0.00 | |
| 4,626.5 | 4,626.5 | Queen (Capitan Reef) | | 0.00 | |
| 8,730.5 | 8,730.5 | Avalon Shale | | 0.00 | |
| 1,592.5 | 1,592.5 | Rustler | | 0.00 | |
| 4,947.5 | 4,947.5 | Penrose (Capitan Reef) | | 0.00 | |
| 9,939.5 | 9,939.5 | 2nd Bone Spring Sand | | 0.00 | |
| 8,232.5 | 8,232.5 | Bone Springs Lime | | 0.00 | |
| 5,501.5 | 5,501.5 | Lamar Lime | | 0.00 | |
| 5,525.5 | 5,525.5 | Delaware/Bell Canyon | | 0.00 | |
| 7,303.5 | 7,303.5 | Brushy Canyon | | 0.00 | |

Checked By: _____ Approved By: _____ Date: _____

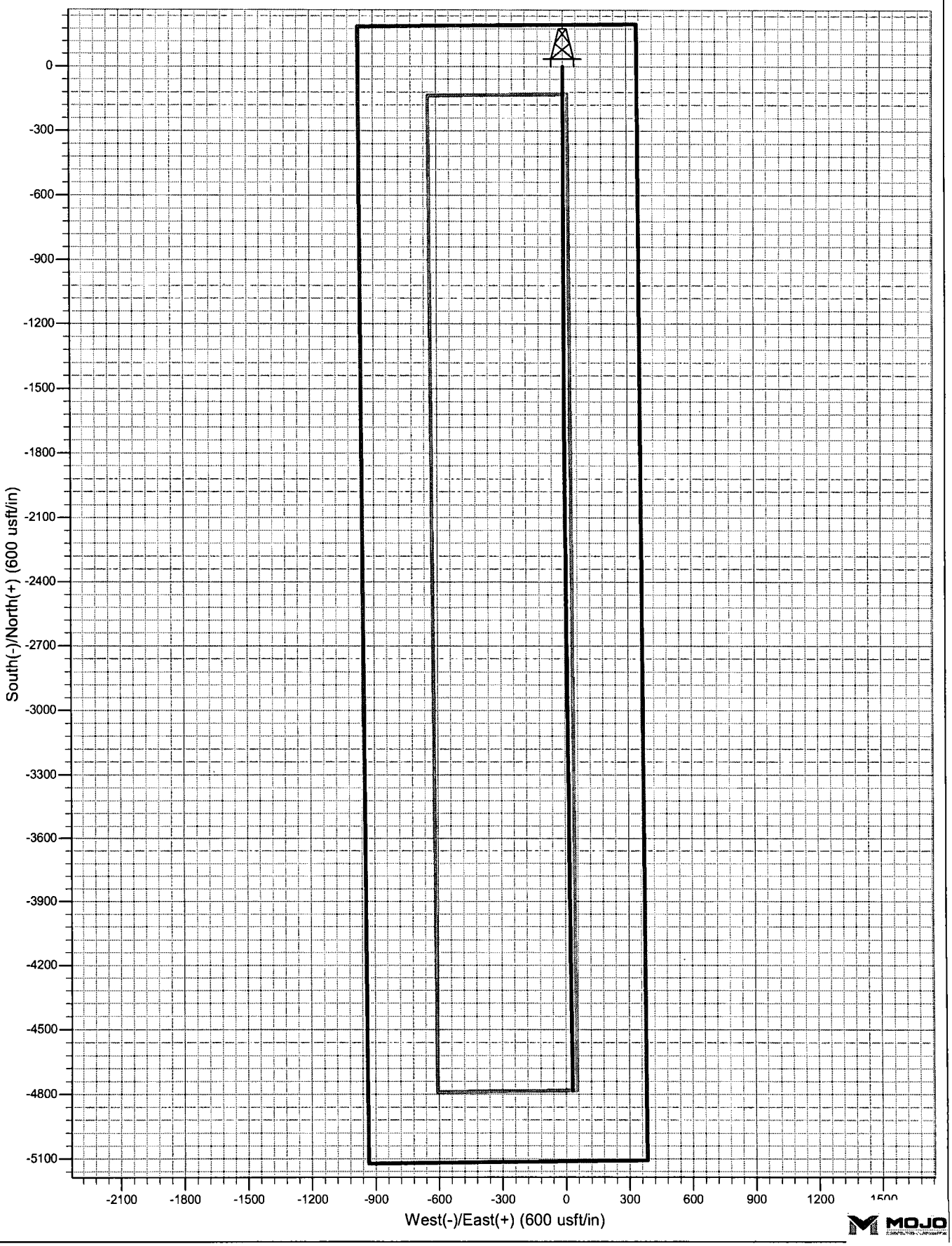
Project: North Lea Prospect T20S-R34E
Site: Section 3
Well: North Lea Federal Com 3 #4H
Wellbore: North Lea Federal Com 3 #4H
Design: 131003 North Lea 3 Fed Com 4H

REED & STEVENS, INC. ROSWELL, NM

T G M

Azimuths to Grid North
True North: -0.42°
Magnetic North: 7.00°

Magnetic Field
Strength: 48694.6snT
Dip Angle: 60.51°
Date: 28/12/2012
Model: IGRF2010

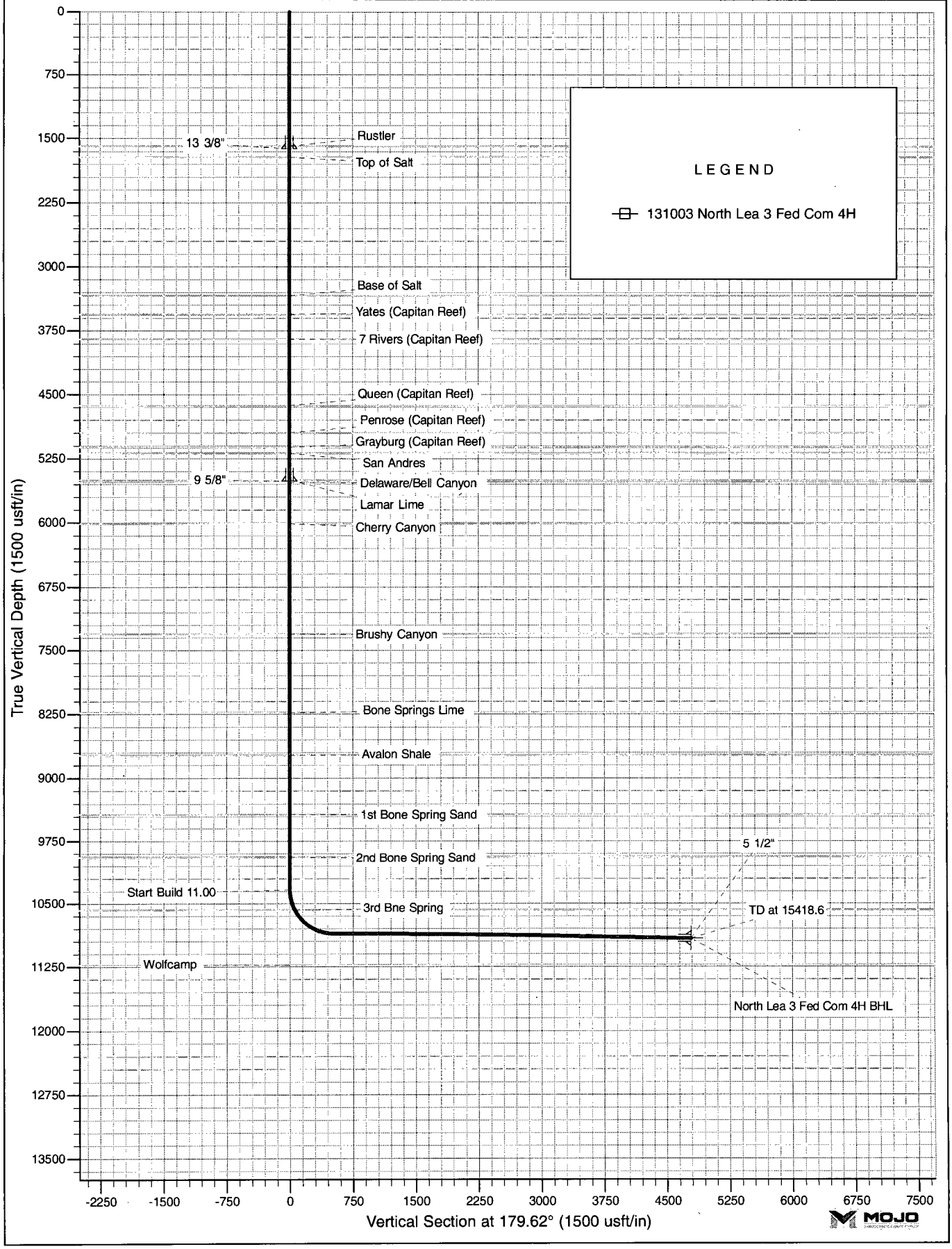



MOJO

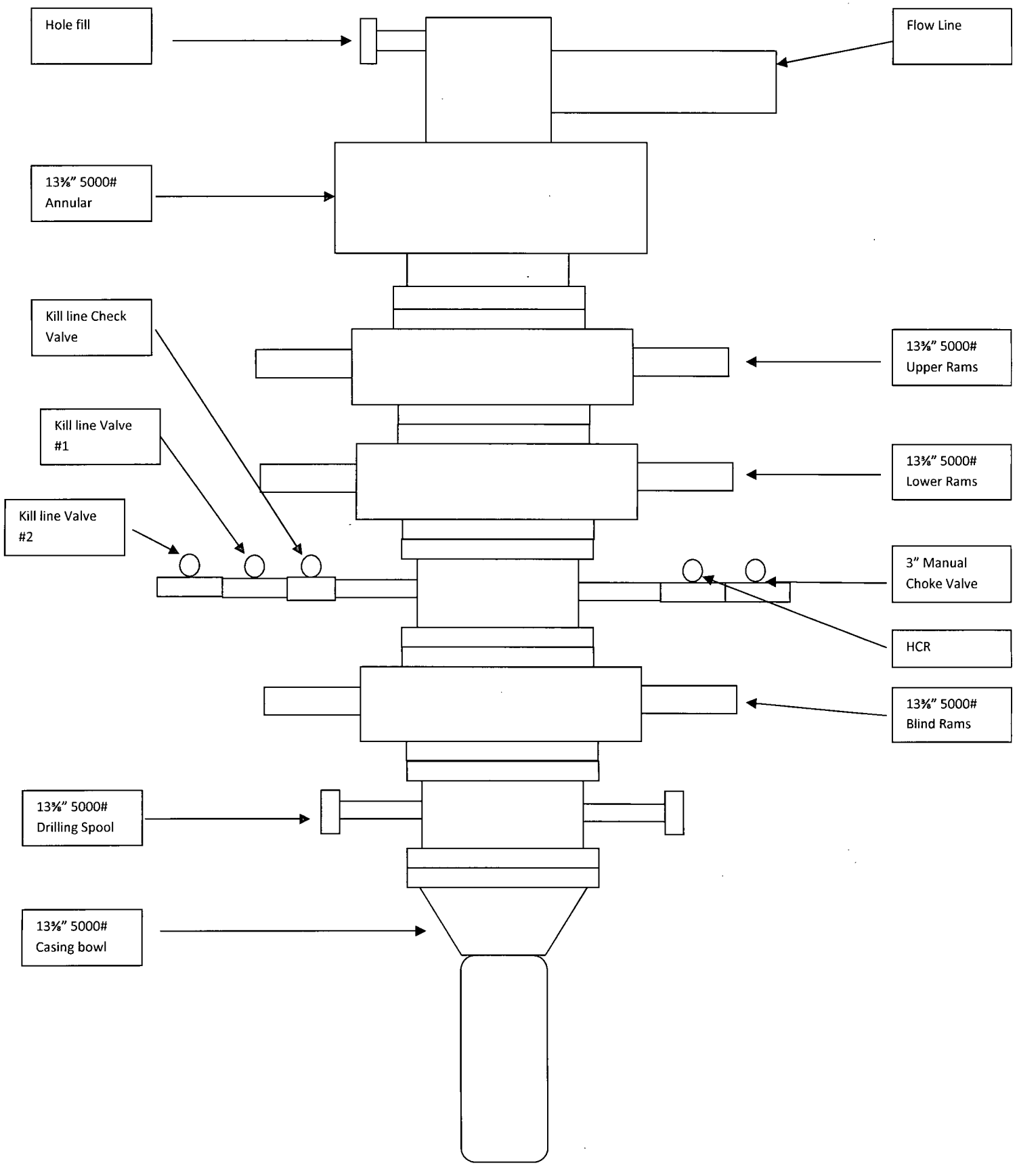
| | |
|---|---|
| Project: | North Lea Prospect T20S-R34E |
| Site: | Section 3 |
| Well: | North Lea Federal Com 3 #4H |
| Wellbore: | North Lea Federal Com 3 #4H |
| Design: | 131003 North Lea 3 Fed Com 4H |

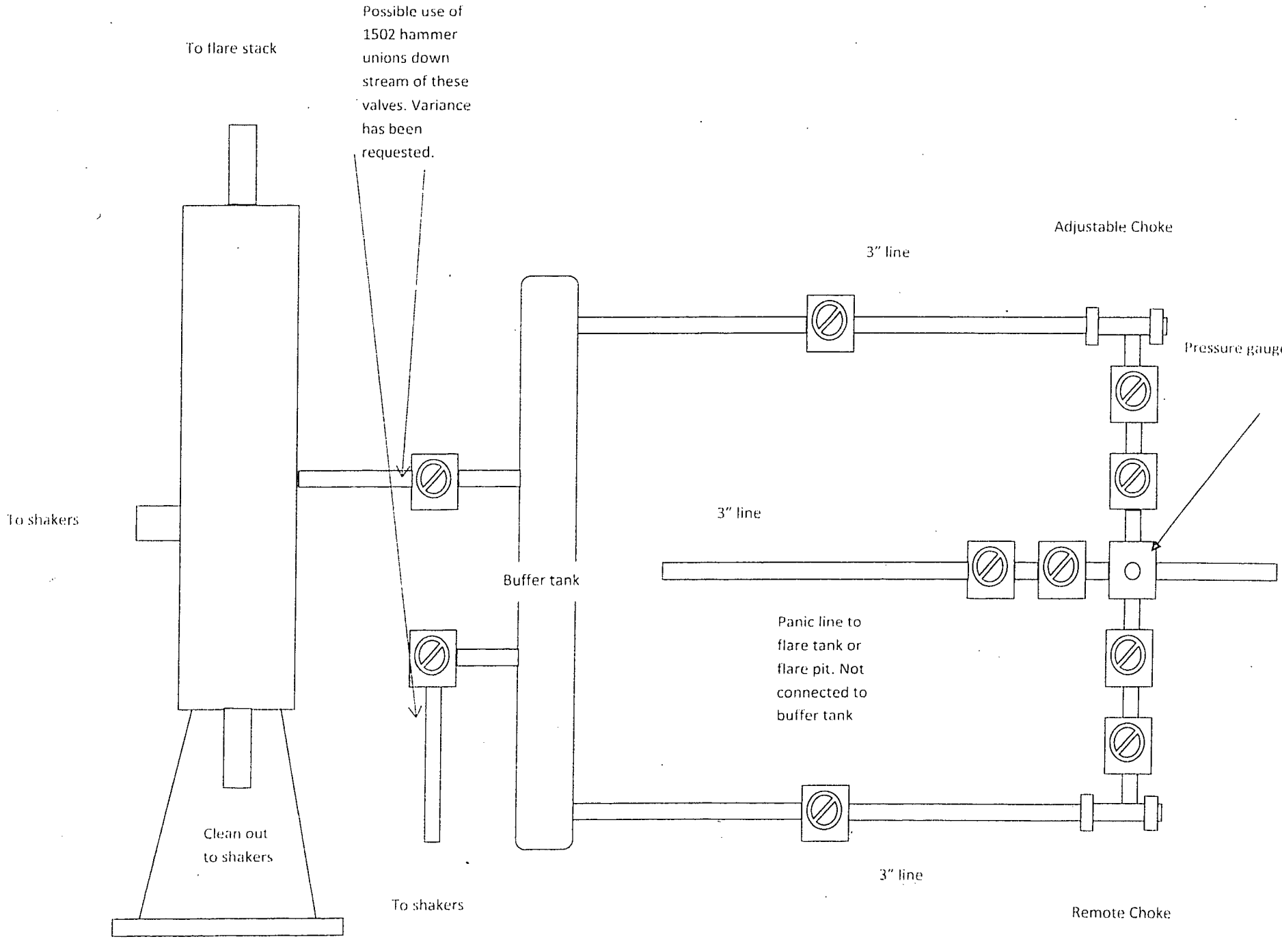
Azimuths to Grid North
True North: -0.42°
Magnetic North: 7.00°

Magnetic Field
Strength: 48694.6snT
Dip Angle: 60.51°
Date: 28/12/2012
Model: IGRF2010

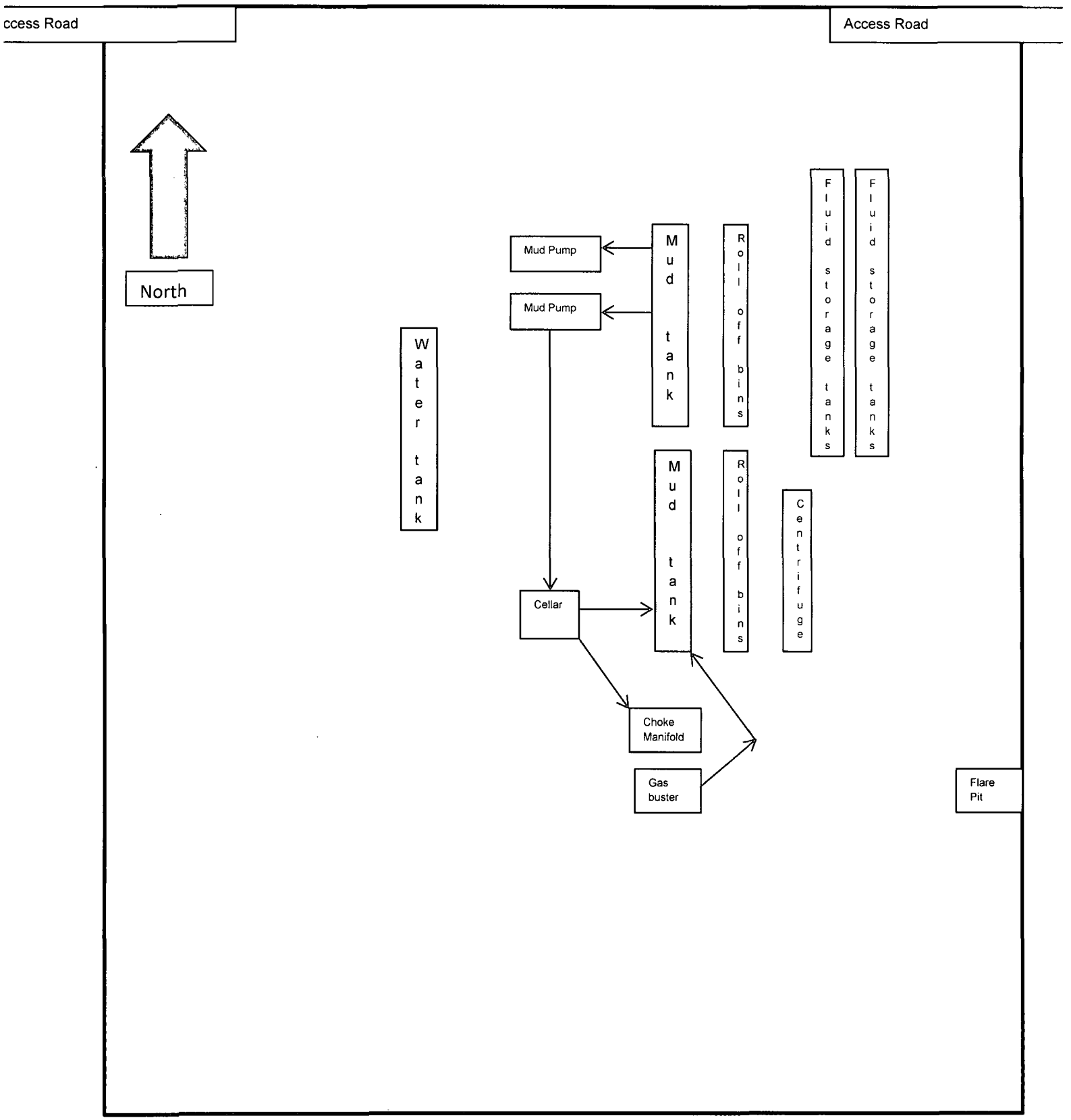


# BOP Schematic




To flare stack
Possible use of 1502 hammer unions down stream of these valves. Variance has been requested.
Adjustable Choke
3" line
Pressure gauge
To shakers
3" line
Buffer tank
Panic line to flare tank or flare pit. Not connected to buffer tank
Clean out to shakers
To shakers
3" line
Remote Choke

## *Closed Loop Diagram*



Design Plan, Operating Plan and Maintenance Plan, and Closure Plan for the OCD form C-144

**Design Plan:**

Fluid and cuttings coming from drilling operations will pass over the shale shaker with the cuttings going to the haul off bin and the cleaned fluid returning to the working steel pits.

Equipment Includes:

1-670bbl steel working pit
2-100bbl steel working suction pits
2-500bbl steel tanks
2-20yd$^3$ steel haul off bins
2-pumps (HHF-1600)
2-Shale shakers
1-Centrifuge
1-Desilter/Desander

**Operating and Maintenance Plan:**

Inspection to occur every tour for proper operation of system and individual components. If any problems are found they will be repaired and/or corrected immediately.

All drilling fluid circulated over shakers with cuttings discharged into roll off bins

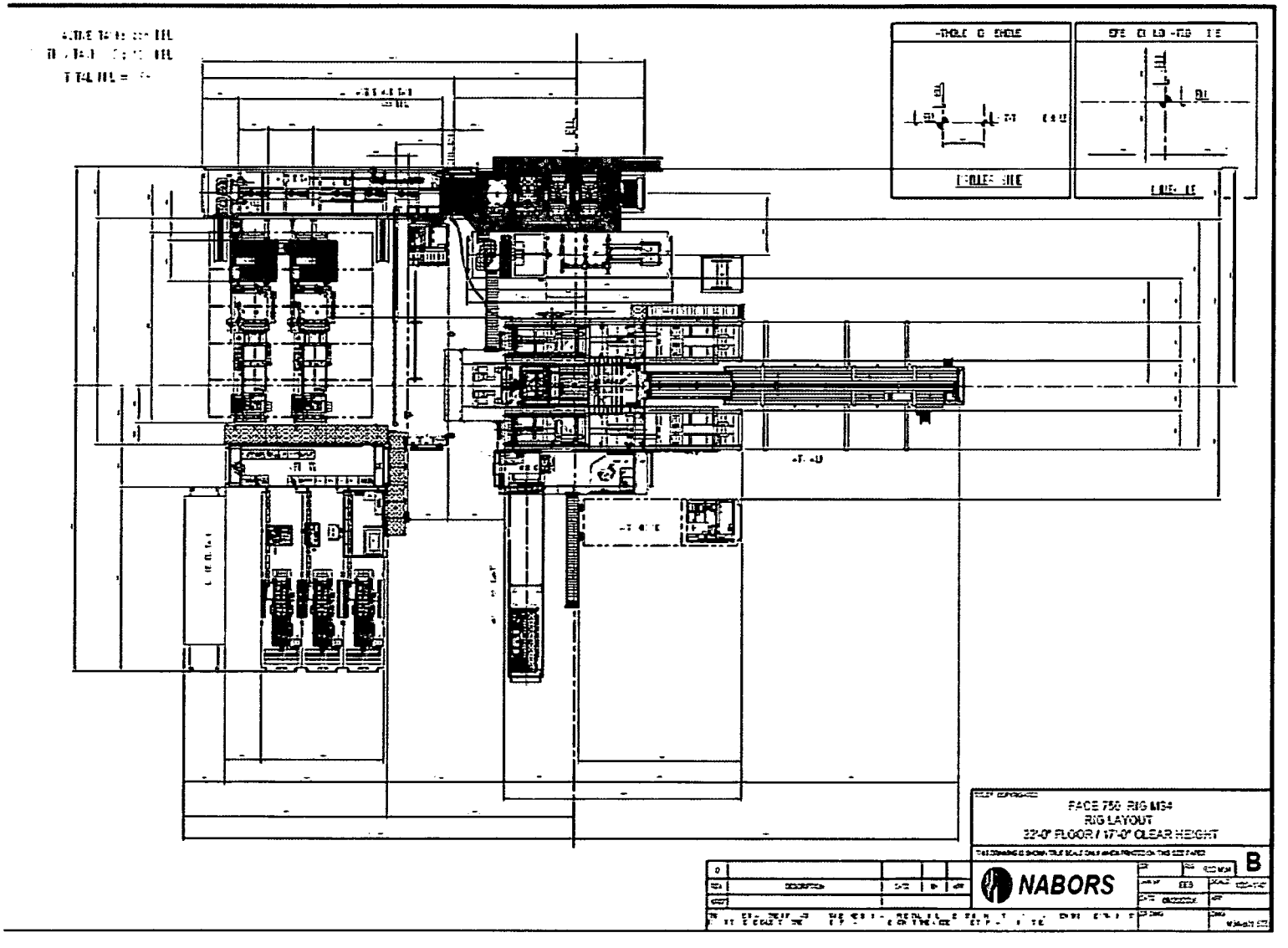
Fluid and fines below shakers are circulated with transfer pump through centrifuge

Roll off bins are lined and de watered with fluids recirculated into system

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

**Closure Plan:**

All haul off bins containing cuttings will be removed from location and hauled to:
R360 Permit number R9166/NM-01-0006
GMI Permit number 711-019-001/NM-01-0019



FACE 750 RIG M34
RIG LAYOUT
22'-0" FLOOR / 17'-0" CLEAR HEIGHT

B

NABORS

## Table of Contents

All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17

Minimum Working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the 9-5/8 inch intermediate casing show shall be 5000 (5M) psi. 5M system requires an HCR valve, remote kill line ad annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips the minimum wait time before cut-off is eight hours after bumping the pug. BOP/BOPE testing can begin after cut-off or once cement reaches 500PSI compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater prior to initiating the test (see casing segment as lead cement may be critical item).

a. The results of the test shall be reported to the appropriate BLM office.

b. All Tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

c. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

See COA

A Co-Flex hose may be used from the BOP to the Choke Manifold. If this is used the manufacture specifications and certifications will be furnished prior to use. A variance is requested for the use of the Co-Flex hose. Below is an example of a typical test sheet.

Continental CONTITECH

Fluid Technology

Quality Document

| QUALITY CONTROL INSPECTION AND TEST CERTIFICATE | | | | CERT. N°: | 205 | |
|---|---|---|---|---|---|---|
| PURCHASER: | ContiTech Beattie Co. | | | P.O. N°: | 004790 | |
| CONTITECH ORDER N°: | 493177 | HOSE TYPE: | 3" ID | Choke and Kill Hose | | |
| HOSE SERIAL N°: | 60296 | NOMINAL / ACTUAL LENGTH: | | 10,67 m / 10,67 m | | |
| W.P. 68,9 MPa | 10000 psi | T.P. 103,4 MPa | 15000 psi | Duration: | 60 | min. |

*Pressure test with water at ambient temperature*

See attachment. ( 1 page )

↑ 10 mm = 10 Min.

→ 10 mm = 20 MPa

| COUPLINGS Type | Serial N° | Quality | Heat N° |
|---|---|---|---|
| 3" coupling with | 226 229 | AISI 4130 | H0434 |
| 4 1/16" Swivel Flange end | | AISI 4130 | 31742 |
| Hub | | AISI 4130 | G9496 |

**ASSET NO.: 66-0628**

**API Spec 16 C**
**Temperature rate:"B"**

All metal parts are flawless

**WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.**

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

| Date: | Inspector | Quality Control |
|---|---|---|
| 21. February 2011. | | ContiTech Rubber Industrial Kft. Quality Control Dept. (1) |

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE No. 203, 203, 200

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