| SECRETARY'S POTACH | | | | | 14 | -935 |
|---|---|---|----------------------------------|--|-------------------------|------------------------------------|
| The second | OCD Hot | obs | Ĺ | FORM | DBDOUED | |
| (August 2007) | | | | OMB No | 0. 1004-0137 | |
| UNITED STATES | NTERIOR HOE | BBS O | CD- | 5. Lease Serial No. | uly 51, 2010 | |
| BUREAU OF LAND MANA | GEMENT | 0.0.0.001 | | SHL: LC-065607 E | BHL: LC- | 064194 |
| LOCAPPECATION FOR PERMIT TO D | DRILL OR REEN | rer ² ² 201 | б | 6. If Indian, Allotee | or Tribe N | Jame |
| la. Type of work: 🗹 DRILL 🗌 REENTED | RE RE | CEIVE | ED | 7. If Unit or CA Agre | ement, Na | me and No. |
| Ib. Type of Well: 🔽 Oil Well 🗌 Gas Well 🛄 Other | ✓ Single Zone | Multiple 2 | Zone I | 8. Lease Name and North Lea 5 Fed Co | Well No. om #1H | 317 197 |
| 2. Name of Operator Read and Stevens, Inc. (18917) | 7) | | | 9. API Well No. | | 1 |
| | Dhana Na (1 1 1 | | | 30-029- | 47 | 507 |
| 3a. Address 400 N. Pennsylvania Ave #1000 | 55. Phone No. (<i>include a.</i> 575-622-3770 | rea code) | | 10. Field and Pool, or J | Exploratory | (96637) |
| 4 Location of Well Report location clearly and in accordance with any | State requirements *) | | | 11 Sec. T.R.M. or B | lk and Sur | vev or Area |
| At surface 280' FNL 2140' FEL (B2) | Side requirements.) | | | Sec. 5 T-20S R-34 | 4E | log of filou |
| At proposed prod. zone 330' ESI 350' EEI (P) | | | | | | |
| 14 Distance in miles and direction from nearest town or post office* | | | | 12. County or Parish | | 13. State |
| 26 miles WSW of Hobbs | | | 1 | Lea | | NM |
| 15. Distance from proposed* location to nearest property or lease line, ft | 16. No. of acres in lease 2722.39 | e 17 | 7. Spacing 60.09 | Unit dedicated to this v | well | |
| (Also to nearest drig. unit line, if any) | | | | | | 22 |
| Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. See raduis maps attached. | 19. Proposed Depth 10,828.17'TVD / 15. | ,377'MD |). BLM/BI NM-2310 | 'BIA Bond No. on file 10 | | |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.) | 22. Approximate date w | ork will start* | | 23. Estimated duration | | |
| GL - 3640.6' RKB - 3662.6' | 03/15/2017 | | | 60 days until completion | | |
| | 24. Attachments | | | | | |
| The following, completed in accordance with the requirements of Onshore | Oil and Gas Order No.1 | , must be attack | hed to this | form: | | |
| Well plat certified by a registered surveyor. A Drilling Plan. A Surface Use Plan (if the location is on National Forest System L SUPO must be filed with the appropriate Forest Service Office). | 4. Bond Item ands, the 5. Oper 6. Suct BL | d to cover the 20 above). ator certification h other site spect. | operations on ecific infor | s unless covered by an mation and/or plans as | existing b may be re | ond on file (see equired by the |
| 25. Signature | Name (Printed/Ty | vped) | | | Date | |
| Title Project Manager | Rory McMinn | | | | 10/24/2 | 2016 |
| Approved by (Signature) /s/Cody Layton | Name (Printed/Ty | vped) | | | DEC | 1 9 2016 |
| Title FIELD MANAGER | Office | CARLS | SBAD FI | ELD OFFICE | | |
| Application approval does not warrant or certify that the applicant holds | legal or equitable title to | o those rights in | n the subje | ect lease which would e | ntitle the a | pplicant to |
| Conduct operations inferent. | | | | APPROVAL | . FOR | TWO YEARS |
| Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a cri States any false, fictitious or fraudulent statements or representations as to | me for any person know any matter within its jur | ingly and willf isdiction. | fully to ma | ke to any department o | or agency of | of the United |
| (Continued on page 2) | | 14 | 2 | *(Inst | ructions | on page 2) |
| Capitan Controlled Water Basin | | n : | 2/20 | 7/16 | | |

SEE ATTACHED FOR

CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

Ke

Read and Stevens, Inc. Drilling Prognosis North Lea 5 Fed Com #1H

Revision date: October 28, 2016

Surface Location:

280' FNL, 2140' FEL

Section 5, T-20-S, R-34-E Lea County, New Mexico

Bottom Hole:

330' FSL, 350' FEL

Section 5, T-20-S, R-34-E Lea County, New Mexico

Planned Total Depth:

RKB: 3662.6

Preparer:

10,828.17' TVD / 15,377' MD

GL: 3640.6

Rory McMinn

reportion to 16

Read and Stevens, Inc.

North Lea 5 Fed Com #1H

Contents

5

9

| Article I. | General Provisions: | | | | | | |
|---|---|--|--|--|--|--|--|
| Article II. | Permit Expiration | | | | | | |
| Article III. | Estimated Formation Tops (geoprognosis with TVD's adjusted to actual KB): | | | | | | |
| Article IV. | Pressure Control: | | | | | | |
| Article V. | Casing Program (minimum):7 | | | | | | |
| Article VI. | Cement Program: | | | | | | |
| Section 6 | .01 13.375" Surface Casing7 | | | | | | |
| Section 6 | .02 9.625" Intermediate Casing7 | | | | | | |
| (i) Actua 150' (ii) Section 6 | Cement detail if DV tool is used: Assuming losses at 3200'. DV tool and ECP will be placed at 3100'. al DV tool placement will be determined when and if losses are encountered. DV tool will be placed above loss zone | | | | | | |
| Article VII. | Product Descriptions: | | | | | | |
| Article VIII. | Mud Program: | | | | | | |
| Article IX. | Mud Monitoring System: | | | | | | |
| Article X. | Logging, Drill stem testing and Coring: | | | | | | |
| Article XI. | Bottom Hole: | | | | | | |
| Article XII. | Abnormal Conditions: | | | | | | |
| Article XIII. | H2S: | | | | | | |
| Article XIV. | Directional: | | | | | | |
| Article XV. | Drilling Recorder: | | | | | | |

Article I. <u>General Provisions:</u>

4

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. <u>Permit Expiration</u>

If the permit terminates prior to drilling and drilling cannot be commenced within 180 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 180 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 180 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 180 day extension.)

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

| Formation | TVD | Subsea | Thickness | Туре |
|-----------------------------|--------|--------|-----------|-------------|
| Rustler | 1524 | -2137' | | |
| Top of Salt | 1711' | -1950' | | |
| Base of Salt | 3154' | -507' | | |
| Tansil | 3154' | -507' | | |
| Yates | 3634' | -27' | | |
| Seven Rivers | 3806' | 145' | | |
| Goat Seep Reef | 4234' | 573' | ×. | |
| Delaware | 5742' | 2081' | 2537' | Hydrocarbon |
| Bone Spring Lime | 8279' | 4618' | | |
| Avalon | 8772' | 5111' | 622' | Hydrocarbon |
| 1 st Bone Spring | 9394' | 5733' | 552' | Hydrocarbon |
| 2 nd Bone Spring | 9946' | 6285' | 663' | Hydrocarbon |
| 3 rd Bone Spring | 10609' | 6948' | 617' | Hydrocarbon |

POD, Water Column Reports attached.

Article IV. <u>Pressure Control:</u>

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.

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 59 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.



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.

4

| CON | TITEC | 6-9 | | | Fluid QU2 | Technolo ality Do | ocument | |
|--|--|--|--|---|---|--|--|--|
| QUAL | | ROL | ATE | | CERT. N | ł": | 205 | |
| PURCHASER: ContiTech Beattie Co. P. | | | | | P.O. N°: | | 004790 |) |
| CONTITECH ORDER Nº: | 493177 | HOSE TYPE: | 3" | ID | | Choke | and Kill H | lose |
| HOSE SERIAL Nº: | 60295 | NOMINAL / AC | TUAL LE | ENGTH: | 10 |),67 m / | 10,67 m | |
| W.P. 68,9 MPa | 10000 psi | T.P. 103,4 | MPa | 15000 | psi | Duration: | 60 | m |
| | 1 | See attachme | ent (1 | 0000 | | | | |
| 110 mm = 10 Mi → 10 mm = 20 Mi | n. Pa | | | page |) | | | |
| 10 mm = 10 Mi → 10 mm = 20 Mi COUPLINGS Type | n. Pa | Serial N° | | G | } Ituality | | Hea | at N* |
| 10 mm = 10 Mi → 10 mm ≈ 20 Mi COUPLINGS Type 3" coupling with | n. Pa 226 | Serial N° 5 229 | | |) Ruality Si 4130 | | Hea | at N* 1434 |
| 10 mm = 10 Mi → 10 mm = 20 Mi COUPLINGS Type 3" coupling with 4 1/16" Swivel Flange end | n. Pa 226 | Serial N° 3 229 | | AIS AIS |) Ruality Si 4130 Si 4130 | | Hea H0 31 | at N* 1434 742 |
| 1 10 mm = 10 Mi → 10 mm = 20 Mi COUPLINGS Type 3" coupling with 4 1/16" Swivel Flange en Hub | n. Pa 226 nd | Serial N° 5 229 | | Ais Ais Ais |) Nuality 51 4130 51 4130 | | Hee H0 31 G9 | nt N* 1434 742 1496 |
| ↑ 10 mm = 10 Mi → 10 mm = 20 Mi COUPLINGS Type 3* coupling with 4 1/16* Swivel Flange en Hub ASSET NO.: 66-0 All metal onde am Saulon | n. Pa 226 nd 0628 | Serial N° 5 229 | | Ais Ais |) Ruality 51 4130 51 4130 51 4130 | Ten | Hea H0 31 G9 API Spe | at N* 1434 742 1496 er ate:"B |
| 10 mm = 10 Mi → 10 mm = 20 Mi COUPLINGS Type 3" coupling with 4 1/16" Swivel Flange et Hub ASSET NO.: 66-0 All metal parts are flawless WE CERTIFY THAT THE ABOY | n. Pa 226 nd 0628 | Serial N° 5 229 | | CCORDA |) Si 4130 Si 4130 Si 4130 | Теп | Hea HO 31 G9 API Spe nperature | at N* 1434 742 1496 Inc 16 C e rate:"E DRDER |
| ↑ 10 mm = 10 Mi → 10 mm = 20 Mi COUPLINGS Type 3" coupling with 4 1/16" Swivel Flange en Hub ASSET NO.: 66-0 All metal parts are flawless WE CERTIPY THAT THE ABOO NUSPECTED AND PRESSURE STATEMENT OF CONFORMT conditions and specifications o accordance with the referenced | n. Pa 226 nd 0628 FE HOSE HAS BE TESTED AS ABO Y: We hareby of f the above Purch standards, codes i | Serial N° 5 229 EEN MANUFACTUR VE WITH SATISFA actily that the abor haser Order and it and specifications a COUNTRY OF ORJ | LED IN AM CTORY re RemsAn lat these ind meet | CCORDAI AIS AIS AIS CCORDAI RESULT. equipment Items/equipment Items/equipment | Auality SI 4130 SI 4130 SI 4130 SI 4130 SI 4130 SI 4130 | Ten H THE TER by us are were fabrics ance criteria | Hea H0 31 G9 API Spe nperature MS OF THE C In conformity ited Inspected a and design r | at N* 1434 742 1496 er 16 C erate:"E DRDER with the term d and tested requirements. |
| ↑ 10 mm = 10 Mi → 10 mm = 20 Mi COUPLINGS Type 3" coupling with 4 1/16" Swivel Flange en Hub ASSET NO.: 66-0 All metal parts are flawless WE CERTIFY THAT THE ABOO INSPECTED AND PRESSURE STATEMENT OF CONFORMIT conditions and specifications o accordance with the referenced Date: | n. Pa 226 nd 226 nd 0628 7E HOSE HAS BE TESTED AS ABO Y: We hereby of the above Purci- standards, codes i (Inspector | Serial N° 3 229 EEN MANUFACTUR VE WITH SATISFA zerilly that the abon haser Order and the and specifications is COUNTRY OF ORI | ED IN AL CTORY re items/ tat these ind meet | CCORDAN AIS AIS AIS CCORDAN RESULT. Bensloq the releva IGARY/EU y Control | Auality Si 4130 Si 4130 Si 4130 Si 4130 NCE WITT t supplied ulpment v nt accept | Ten H THE TER by us are vere fabrics ance criteria | Hea HO 31: G9 API Spe nperature MS OF THE C In conformity ited inspected a and design r | at N° 434 742 496 cc 16 C e rate:"E DRDER with the term d and tested equirements. |

.

VERY AND TEST CONTROL TAR. FOLION AND TEST CEVILICATE

140. 203, 203, 200 Page: 1/1

| | | | | | | | | | (| 494 | The second |
|---|-----------|-------|--------|----------|--------|----|----|---|-----|----------|-------------------|
| | GH 1 | 019.2 | 0 000 | 0 | 014:50 | 60 | 70 | ε | C | di Trij | Rubber at Kft. |
| | BL | +1052 | · bar | 1 | 14:20 | | | | Qua | lity Cot | trol Dept. |
| | 124 | 19.5 | 3 00 | | 14:00 | | | | | i | |
| : | BL | +1954 | . bar | • | 14:20 | | | | | 1 | |
| 1 | RD | -18-6 | 8 | <u> </u> | 111 | | | | | | |
| 1 | 19N | +18.7 | 3 .0 | | 14:00 | | | | | | |
| | BL | +18-4 | · bar | | 14:00 | | | 1 | | | |
| | GN | +18.8 | a oc | | 13:50 | | | | | | |
| | -RD BL | +1059 | · bar | 1 | 13150 | | | | | ; ; | |
| | Ett. | +18.8 | 7 00 | | 13:50 | | 1 | | | 1 | |
| | BL | +1062 | . bar | | 13:40 | | 1. | 1 | | | |
| | GN | +19.2 | 5 90 | | 13:80 | | | | | | |
| | BL | +1064 | - iban | | 13:30 | | | : | | | |
| | 9 | 1.1 | | | | | | - | | | |
| | 1.1 | | | | | | | | | | |
| : | 1 1 | | - | | | 5 | | | | | |
| 1 | 8 | 1, | | | - | | | | | | |
| | 6829 | 3,602 | 95768 | 296 | 31 1 | | 1 | | | | |
| | ! | | | - | | - | 1 | | | | |
| | 6825 | 34603 | 95,60 | 296 | 2:50 | | 1 | • | ; | | |
| | | | | | | | | | | | 1 |

Read and Stevens, Inc.

2

2

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.

| Λ | tio | 10 | 11 |
|---|------|----|----|
| A | lici | e | V |

| Casing Program | (minimum): | |
|----------------|------------------|--------------|
| *^ | Il casing is now | ADI casing * |

| Zel. | |
|------|--|
| COP | |

| All casing is new AFT casing. | | | | | | | | | |
|-------------------------------|---------|--------------|-------|------|-----------|------------------------|--|--|--|
| Hole Size | Casing | Weight Ib/ft | Grade | Conn | MD/RKB | Ment Construction In- | | | |
| | 20" | | | | 120' | 1 | | | |
| 16" | 13.375" | 54.5 | J-55 | STC | 1549' | Set 25' into Rustler | | | |
| 12.25" | 9.625" | 40 | L-80 | LTC | 5722'5450 | Set 20' above Delaware | | | |
| 8.5" | 5.5" | 17 | P-110 | BTC | 16443' | | | | |
| | | 2 | | | | | | | |

| 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 | 3090 | 1.28 | 5750 | 2.03 | 727 | 3.33 | 7022 |
| 5.5 | 7480 | 1.55 | 10640 | 1.29 | 568 | 3.06 | 17000 |

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

Article VI. <u>Cement Program:</u>

Section 6.01 13.375" Surface Casing

Lead: 0 - 1249'

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|-----------|-------------|-----|---------------|--------|---|
| 13.5ppg | 1.93cuft/sk | 556 | 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: 1249' – 1549'

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|-----------|-------------|-----|---------------|--------|---|
| 14.8ppg | 1.34cuft/sk | 188 | 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 proportionately 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 9%" casing <u>if</u> losses are encountered during drilling. 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.

(i) Cement detail if DV tool is used: Assuming losses at 3250'. 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' - 5222'

T

ġ.

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|-----------|-------------|-----|---------------|--------|---|
| 12.6ppg | 2.13cuft/sk | 800 | 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 :5222' - 5722'

| 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 proportionately.

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

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|-----------|-------------|------|---------------|--------|---|
| 12.5ppg | 2.13cuft/sk | 1236 | 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 Cellc Flake + 0.005 lbs/sack Static Free + 0.005 gps FP-6L - 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium |

.

ι

Tail: 5222' - 5722'

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|-----------|-------------|-----|---------------|--------|-----------|
| 14.8ppg | 1.33cuft/sk | 212 | 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 proportionately once actual casing depth is determined and washout from a fluid caliper.

5.5" Production Casing Section 6.03

Lead: 0 - 11625'

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|-----------|-------------|------|---------------|--------|---|
| 11.9ppg | 2.38cuft/sk | 1650 | 13.22 | 80% | Class H (50:50) + Poz (Fly Ash) + 10% bwoc Bentonite II + 5% bwow Sodium Chloride + 5 Ibs/sack LCM-1 + 0.005 lbs/sack Static Free + 0.005 gps FP-6L |

Tail: 11625 - TD

| Slurry WT | Yield | Sx | Gallons/ Sack | Excess | Additives |
|-----------|-------------|-----|---------------|--------|--|
| 13.2ppg | 1.62cuft/sk | 817 | 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 proportionately 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.

| AILICIE VIII. | <u>1</u> | nua rogram. | | | | | | |
|---------------|----------|-------------|---------|-------|-------|-------|-----|-------|
| Depth , | Hole | Туре | MW | PV | YP | WL | рН | Sol % |
| 0-1549 1600 | 16" | Fresh Water | 8.4-8.9 | 10-12 | 12-15 | NC | 9.5 | <3.0 |
| 1549-57225450 | 12.25" | Brine | 9.8-10 | 1-2 | 1-2 | NC | 9.5 | <1.0 |
| 5722- 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 |

Article VIII. Mud Program:

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. <u>Mud Monitoring System:</u>

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.

Article X. Logging, Drill stem testing and Coring:

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. <u>At</u>

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 Goat Soap 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. <u>Directional:</u> 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.

BOP Schematic





Closed Loop Diagram

η.

4



.

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

Design Plan:

4

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
2-20yd³ 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



North Lea 5 Fed Com 1H - Site Layout





New Mexico Office of the State Engineer Water Column/Average Depth to Water

No records found.

PLSS Search:

Section(s): 5

Township: 20S

Range: 34E

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



New Mexico Office of the State Engineer Active & Inactive Points of Diversion

(with Ownership Information)

No PODs found.

PLSS Search:

Section(s): 5

Township: 20S Range: 34E

ata is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, ity, usability, or suitability for any particular purpose of the data.