NM OIL CONSERVATION
ARTESIA DISTRICT
OCT 1 2019
RECEIVED

Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.: NMNM057273

6. If Indian, Allotee or Tribe Name:

1a. Type of work: ☑ DRILL ☐ REENTER

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

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.: PALLADIUM MDP1 7-6 FEDERAL COM 171H 317687

2. Name of Operator: OXY USA INCORPORATED

9. API Well No.: 30-015-46318

| 3a. Address | 3b. Phone No. *(include area code)* | 10. Field and Pool, or Exploratory |
|---|---|---|
| 5 Greenway Plaza, Suite 110 Houston TX 77046 | (713)366-5716 | PURPLE-SAGE WOLFCAMP / WOLFCAI |

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

At surface: LOT 4 / 609 FSL / 1197 FWL / LAT 32.226266 / LONG -103.821794

At proposed prod. zone: LOT 4 / 20 FNL / 440 FWL / LAT 32.253596 / LONG -103.824219

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 7 / T24S / R31E / NMP

| 14. Distance in miles and direction from nearest town or post office* | 12. County or Parish | 13. State |
|---|---|---|
| | EDDY | NM |

| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) | 16. No of acres in lease | 17. Spacing Unit dedicated to this well |
|---|---|---|
| 50 feet | 607.16 | 640 |

| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. | 19. Proposed Depth | 20. BLM/BIA Bond No. in file |
|---|---|---|
| 35 feet | 11624 feet / 20867 feet | FED: ESB000226 |

| 21. Elevations (Show whether DF, KDB, RT, GL, etc.) | 22. Approximate date work will start* | 23. Estimated duration |
|---|---|---|
| 3538 feet | 04/15/2019 | 25 days |

## 24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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 requested by the BLM.

| 25. Signature | Name *(Printed/Typed)* | Date |
|---|---|---|
| (Electronic Submission) | David Stewart / Ph: (575)631-2442 | 11/13/2018 |

Title: Sr. Regulatory Advisor

| Approved by *(Signature)* | Name *(Printed/Typed)* | Date |
|---|---|---|
| (Electronic Submission) | Cody Layton / Ph: (575)234-5959 | 09/27/2019 |

| Title | Office |
|---|---|
| Assistant Field Manager Lands & Minerals | CARLSBAD |

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.

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.

APPROVED WITH CONDITIONS

Approval Date: 09/27/2019

(Continued on page 2)

*(Instructions on page 2)

RWS 10-2-19

## INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionary drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

## NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48( d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160
PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.
ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.



(Continued on page 3)

## Additional Operator Remarks

### Location of Well

1. SHL: LOT 4 / 609 FSL / 1197 FWL / TWSP: 24S / RANGE: 31E / SECTION: 7 / LAT: 32.226266 / LONG: -103.821794 ( TVD: 0 feet, MD: 0 feet )
   PPP: LOT 4 / 100 FSL / 440 FWL / TWSP: 24S / RANGE: 31E / SECTION: 7 / LAT: 32.224867 / LONG: -103.824243 ( TVD: 11691 feet, MD: 12102 feet )
   PPP: LOT 7 / 2 FSL / 440 FWL / TWSP: 24S / RANGE: 31E / SECTION: 7 / LAT: 32.239111 / LONG: -103.824231 ( TVD: 11659 feet, MD: 16757 feet )
   BHL: LOT 4 / 20 FNL / 440 FWL / TWSP: 24S / RANGE: 31E / SECTION: 6 / LAT: 32.253596 / LONG: -103.824219 ( TVD: 11624 feet, MD: 20867 feet )

## BLM Point of Contact

Name: Candy Vigil
Title: Admin Support Assistant
Phone: 5752345982
Email: cvigil@blm.gov



**Approval Date: 09/27/2019**

## Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

**Flowback Strategy**

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Enterprise system at that time. Based on current information, it is OXY's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

**Alternatives to Reduce Flaring**

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
    - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
    - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
    - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

# PECOS DISTRICT
# DRILLING CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | OXY USA INCORPORATED |
| **LEASE NO.:** | NMNM057273 |
| **WELL NAME & NO.:** | PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| **SURFACE HOLE FOOTAGE:** | 609'/S & 1197'/W |
| **BOTTOM HOLE FOOTAGE** | 20'/N & 440'/W |
| **LOCATION:** | SECTION 07, T24S, R31E, NMPM |
| **COUNTY:** | EDDY |

COA

| | | | |
|---|---|---|---|
| H2S | ○ Yes | ◉ No | |
| Potash | ○ None | ○ Secretary | ◉ R-111-P |
| Cave/Karst Potential | ◉ Low | ○ Medium | ○ High |
| Variance | ○ None | ◉ Flex Hose | ○ Other |
| Wellhead | ○ Conventional | ○ Multibowl | ◉ Both |
| Other | ☐ 4 String Area | ☐ Capitan Reef | ☐ WIPP |
| Other | ☑ Fluid Filled | ☑ Cement Squeeze | ☐ Pilot Hole |
| Special Requirements | ☐ Water Disposal | ☑ COM | ☐ Unit |

## A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

## B. CASING

**Primary Casing Design:**

1. The **13-3/8** inch surface casing shall be set at approximately **655** feet (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The **9-5/8** inch surface casing shall be set at approximately **4230** feet. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

**Option 1 (Single Stage):**

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

**Option 2:**

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.
  **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

**2nd Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

3. The minimum required fill of cement behind the **7-5/8** inch 2nd intermediate casing is:

**Option 1 (Single Stage):**

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.

**Option 2:**

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.

**Operator has proposed to pump down 9-5/8" X 7-5/8" annulus. Operator must run a CBL from TD of the 7-5/8" casing to surface. Submit results to BLM.**

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:

- Cement should tie-back **500 feet** into the previous casing. Operator shall provide method of verification.

## C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2.

**Option 1:**

a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **5000 (5M)** psi.

**Option 2:**

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
c. Manufacturer representative shall install the test plug for the initial BOP test.
d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

## D. SPECIAL REQUIREMENT (S)

**BOP Break Testing Variance**

- While in transfer between wells, the BOPE shall be secured by the hydraulic carrier or cradle.
- Any well control event while drilling require notification to the BLM Petroleum Engineer prior to the commencement of any BOP Break Testing operations.
- A full BOP test is required prior to drilling the first deep intermediate hole section. If any subsequent hole interval is deeper than the first, a full BOP test will be required.

**Offline Cementing**

- Contact the BLM prior to the commencement of any offline cementing procedure.

**Communitization Agreement**

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

# GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

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

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

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

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, 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. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.

c. 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 (8 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).

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

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

f. 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.

g. 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. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

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

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

**NMK782019**

# PECOS DISTRICT
# SURFACE USE
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | OXY USA INCORPORATED |
| LEASE NO.: | |
| WELL NAME & NO.: | PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| SURFACE HOLE FOOTAGE: | 609'/S & 1197'/W |
| BOTTOM HOLE FOOTAGE | 20'/N & 440'/W |
| LOCATION: | SECTION 07, T24S, R31E, NMPM |
| COUNTY: | EDDY |

## TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.





**Approval Date: 09/27/2019**

## I. GENERAL PROVISIONS

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

## II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## V. SPECIAL REQUIREMENT(S)

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

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

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

## Cave and Karst

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

### Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

**Construction:**
In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

**No Blasting:**
No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

**Pad Berming:**
The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.

- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g. caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)

**Tank Battery Liners and Berms:**
Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

**Leak Detection System:**
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

**Automatic Shut-off Systems:**
Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

## Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

**Rotary Drilling with Fresh Water:**
Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

**Directional Drilling:**
Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

**Lost Circulation:**
ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

**Abandonment Cementing:**
Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

**Pressure Testing:**
Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

# VI. CONSTRUCTION

## A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

## B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

## C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

## D. FEDERAL MINERAL MATERIALS PIT

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

## E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

## F. EXCLOSURE FENCING (CELLARS & PITS)

**Exclosure Fencing**
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

## G. ON LEASE ACCESS ROADS

**Road Width**
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

**Surfacing**
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

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

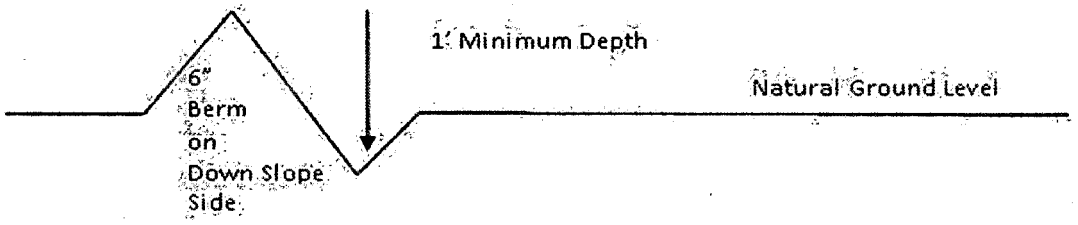
**Ditching**
Ditching shall be required on both sides of the road.

**Turnouts**
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**
Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

**Cross Section of a Typical Lead-off Ditch**




All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

**Formula for Spacing Interval of Lead-off Ditches**

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

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

**Cattleguards**
An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

**Fence Requirement**
Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

**Public Access**

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

**Construction Steps** 1. Salvage topsoil 2. Construct road 3. Redistribute topsoil 4. Revegetate slopes

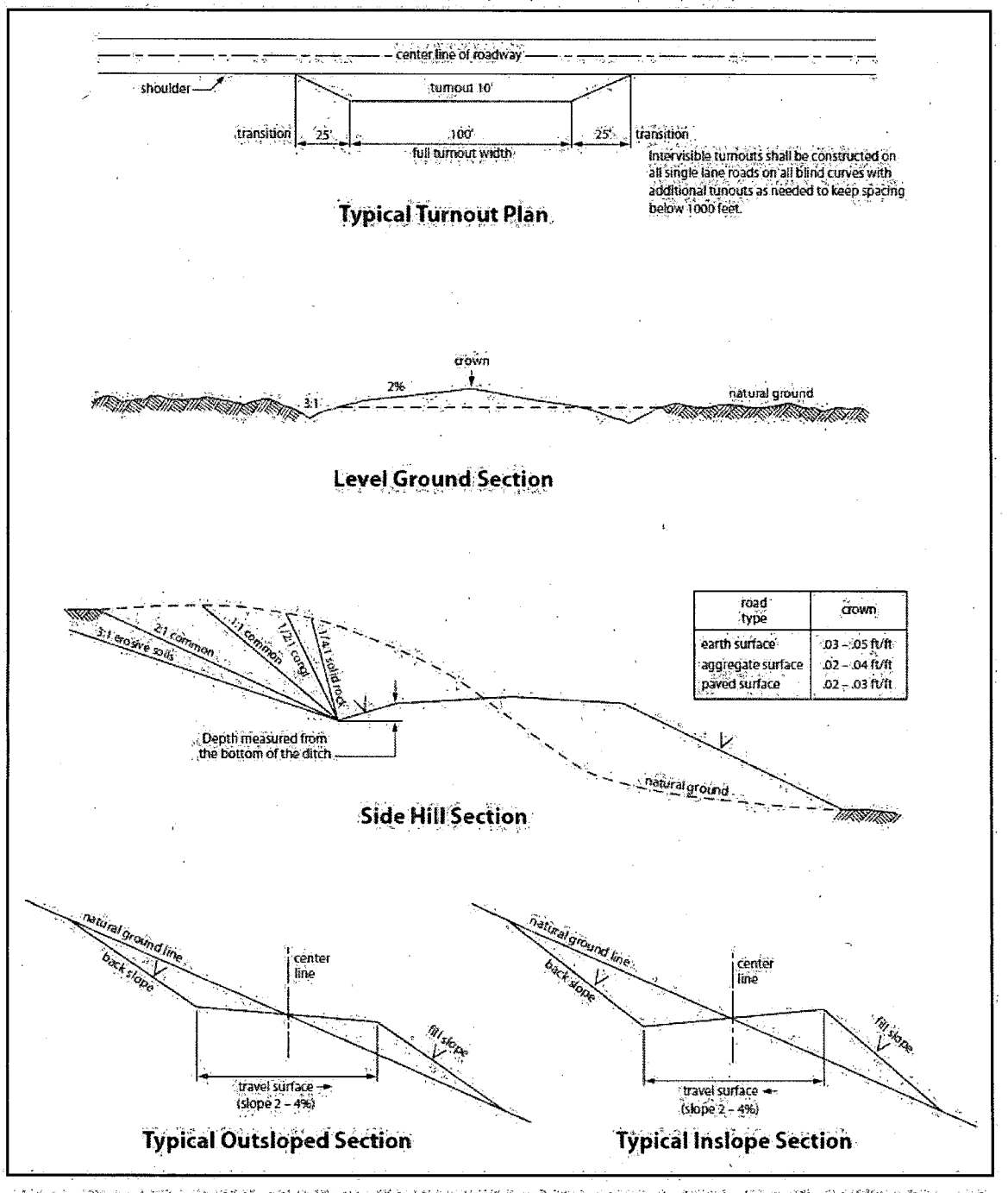



Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

# VII. PRODUCTION (POST DRILLING)

## A. WELL STRUCTURES & FACILITIES

**Placement of Production Facilities**
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

**Exclosure Netting (Open-top Tanks)**
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

**Chemical and Fuel Secondary Containment and Exclosure Screening**
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

**Open-Vent Exhaust Stack Exclosures**
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

**Containment Structures**

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

**Painting Requirement**
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

## B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

**A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.**

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third

parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
b. Activities of other parties including, but not limited to:
    (1) Land clearing.
    (2) Earth-disturbing and earth-moving work.
    (3) Blasting.
    (4) Vandalism and sabotage.
c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-way width of **20** feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing

by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline will be "snaked" around hummocks and dunes rather then suspended across these features.

9. The pipeline shall be buried with a minimum of **24** inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the

authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

## C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

**A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.**

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to

the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land

shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:
    - For reclamation remove poles, lines, transformer, etc. and dispose of properly.
    - Fill in any holes from the poles removed.

## VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

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

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

## X. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

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

Seed Mixture for LPC Sand/Shinnery Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

| Species | lb/acre |
|---|---|
| Plains Bristlegrass | 5lbs/A |
| Sand Bluestem | 5lbs/A |
| Little Bluestem | 3lbs/A |
| Big Bluestem | 6lbs/A |
| Plains Coreopsis | 2lbs/A |
| Sand Dropseed | 1lbs/A |

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

# Operator Certification Data Report

09/30/2019

## Operator Certification

*I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.*

**NAME:** Sarah Chapman **Signed on:** 11/12/2018

**Title:** Regulatory Specialist

**Street Address:** P.O. BOX 50250

**City:** MIDLAND **State:** TX **Zip:** 79710

**Phone:** (575)631-2442

**Email address:** sarah_chapman@oxy.com

## Field Representative

**Representative Name:** Sarah Chapman

**Street Address:** 5 Greenway Plaza, Suite 110

**City:** Houston **State:** TX **Zip:** 77046-0521

**Phone:**

**Email address:** sarah_chapman@oxy.com

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

# Application Data Report
09/30/2019

**APD ID:** 10400035697
**Submission Date:** 11/13/2018
**Operator Name:** OXY USA INCORPORATED
**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM
**Well Number:** 171H
**Well Type:** OIL WELL
**Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - General

**APD ID:** 10400035697
**Tie to previous NOS?**
**Submission Date:** 11/13/2018
**BLM Office:** CARLSBAD
**User:** Sarah Chapman
**Title:** Regulatory Specialist
**Federal/Indian APD:** FED
**Is the first lease penetrated for production Federal or Indian?** FED
**Lease number:** NMNM057273
**Lease Acres:** 607.16
**Surface access agreement in place?**
**Allotted?**
**Reservation:**
**Agreement in place?** NO
**Federal or Indian agreement:**
**Agreement number:**
**Agreement name:**
**Keep application confidential?** NO
**Permitting Agent?** NO
**APD Operator:** OXY USA INCORPORATED
**Operator letter of designation:**

## Operator Info

**Operator Organization Name:** OXY USA INCORPORATED
**Operator Address:** 5 Greenway Plaza, Suite 110
**Zip:** 77046
**Operator PO Box:**
**Operator City:** Houston
**State:** TX
**Operator Phone:** (713)366-5716
**Operator Internet Address:**

## Section 2 - Well Information

**Well in Master Development Plan?** EXISTING
**Master Development Plan name:** Sand Dunes Area
**Well in Master SUPO?** NO
**Master SUPO name:**
**Well in Master Drilling Plan?** NO
**Master Drilling Plan name:**
**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM
**Well Number:** 171H
**Well API Number:**
**Field/Pool or Exploratory?** Field and Pool
**Field Name:** PURPLE-SAGE WOLFCAMP
**Pool Name:** WOLFCAMP
**Is the proposed well in an area containing other mineral resources?** POTASH

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Is the proposed well in an area containing other mineral resources?** POTASH

**Is the proposed well in a Helium production area?** N **Use Existing Well Pad?** NO **New surface disturbance?**

**Type of Well Pad:** MULTIPLE WELL **Multiple Well Pad Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Number:** 171H

**Well Class:** HORIZONTAL **Number of Legs:** 1

**Well Work Type:** Drill

**Well Type:** OIL WELL

**Describe Well Type:**

**Well sub-Type:** INFILL

**Describe sub-type:**

**Distance to town:** **Distance to nearest well:** 35 FT **Distance to lease line:** 50 FT

**Reservoir well spacing assigned acres Measurement:** 640 Acres

**Well plat:** PalladiumMDP17_6FedCom171H_SitePlan_20181029135314.pdf

PalladiumMDP17_6FedCom171H_C_102_20181029135342.pdf

**Well work start Date:** 04/15/2019 **Duration:** 25 DAYS

## Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83 **Vertical Datum:** NAVD88

**Survey number:** **Reference Datum:**

| | NS-Foot | NS Indicator | EW-Foot | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude | Longitude | County | State | Meridian | Lease Type | Lease Number | Elevation | MD | TVD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHL Leg #1 | 609 | FSL | 1197 | FWL | 24S | 31E | 7 | Lot 4 | 32.226266 | -103.821794 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 057273 | 3538 | 0 | 0 |
| KOP Leg #1 | 50 | FSL | 440 | FWL | 24S | 31E | 7 | Lot 4 | 32.224729 | -103.8242437 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 057273 | -7580 | 11198 | 11118 |

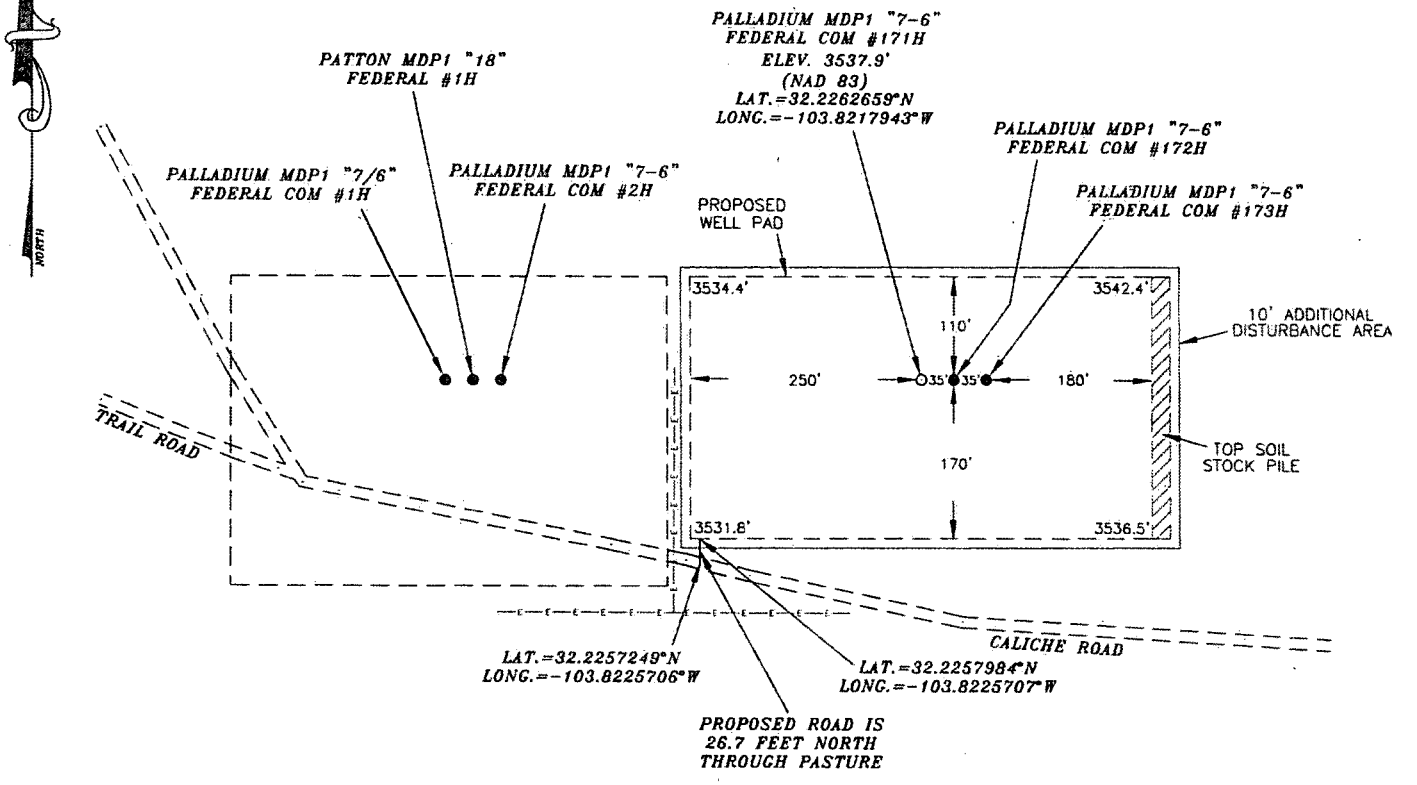
**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

| | NS-Foot | NS Indicator | EW-Foot | EW Indicator | Twsp | Range | Section | Aliquot/Lot/Tract | Latitude | Longitude | County | State | Meridian | Lease Type | Lease Number | Elevation | MD | TVD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPP Leg #1 | 2 | FSL | 440 | FWL | 24S | 31E | 7 | Lot 7 | 32.239111 | -103.824231 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 082904 | -8121 | 16757 | 11659 |
| PPP Leg #1 | 100 | FSL | 440 | FWL | 24S | 31E | 7 | Lot 4 | 32.224867 | -103.824243 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 057273 | -8153 | 12102 | 11691 |
| EXIT Leg #1 | 100 | FNL | 440 | FWL | 24S | 31E | 6 | Lot 4 | 32.253376 | -103.824219 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 082904 | -8093 | 20767 | 11631 |
| BHL Leg #1 | 20 | FNL | 440 | FWL | 24S | 31E | 6 | Lot 4 | 32.253596 | -103.824219 | EDDY | NEW MEXICO | NEW MEXICO | F | NMNM 082904 | -8086 | 20867 | 11624 |

# OXY USA INC.
## PALLADIUM MDP1 "7-6" FEDERAL COM #171H
## SITE PLAN

# FAA PERMIT: NO




TERRY J ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

***LEGEND***

- - - - DENOTES PROPOSED WELL PAD
——·—— DENOTES PROPOSED ROAD
▨ DENOTES STOCK PILE AREA

200' 0 200' 400' FEET

SCALE: 1"=200'

**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 6/14/2018

Terry J. Asel N.M. R.P.L.S. No. 15079


Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146


## OXY USA INC.

PALLADIUM MDP1 "7-6" FEDERAL COM #171H
LOCATED AT 609' FSL & 1197' FWL IN
SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31
EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

| | | |
|---|---|---|
| Survey Date: 11/22/17 | Sheet 1 of 1 Sheets | |
| W.O. Number: 171122WL-a | Drawn By: KA | Rev: |
| Date: 08/13/18 | 171122WL-a | Scale:1"=200' |

**APD ID:** 10400035697 **Submission Date:** 11/13/2018

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Well Type:** OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Geologic Formations

| Formation ID | Formation Name | Elevation | True Vertical Depth | Measured Depth | Lithologies | Mineral Resources | Producing Formation |
|---|---|---|---|---|---|---|---|
| 1 | RUSTLER | 3534 | 590 | 590 | ANHYDRITE,SHALE,DOLOMITE | USEABLE WATER | N |
| 2 | SALADO | 2584 | 950 | 950 | HALITE,ANHYDRITE,SHALE,DOLOMITE | OTHER : SALT | N |
| 3 | CASTILE | 674 | 2860 | 2860 | ANHYDRITE | OTHER : salt | N |
| 4 | LAMAR | -740 | 4274 | 4274 | LIMESTONE,SILTSTONE,SANDSTONE | OTHER,NATURAL GAS,OIL : BRINE | N |
| 5 | BELL CANYON | -785 | 4319 | 4319 | SILTSTONE,SANDSTONE | OTHER,NATURAL GAS,OIL : BRINE | N |
| 6 | CHERRY CANYON | -1568 | 5102 | 5102 | SILTSTONE,SANDSTONE | OTHER,NATURAL GAS,OIL : BRINE | N |
| 7 | BRUSHY CANYON | -2880 | 6414 | 6414 | LIMESTONE,SILTSTONE,SANDSTONE | OTHER,NATURAL GAS,OIL : BRINE | N |
| 8 | BONE SPRING | -4564 | 8098 | 8122 | LIMESTONE,SILTSTONE,SANDSTONE | NATURAL GAS,OIL | N |
| 9 | BONE SPRING 1ST | -5586 | 9120 | 9158 | LIMESTONE,SILTSTONE,SANDSTONE | NATURAL GAS,OIL | N |
| 10 | BONE SPRING 2ND | -5879 | 9413 | 9452 | LIMESTONE,SILTSTONE,SANDSTONE | NATURAL GAS,OIL | N |

## Section 2 - Blowout Prevention

**Pressure Rating (PSI):** 5M **Rating Depth:** 10005

**Equipment:** 13-5/8" 5M Annular, Blind Ram, Double Ram

**Requesting Variance?** YES

**Variance request:** Request for the use of a flexible choke line from the BOP to Choke Manifold.

**Testing Procedure:** BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system will be tested. We will test the flange

connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015.

**Choke Diagram Attachment:**

PalladiumMDP17_6FedCom171H_ChkManifold_20190614084150.pdf

PalladiumMDP17_6FedCom171H_FlexHoseCert_20190614084202.pdf

**BOP Diagram Attachment:**

PalladiumMDP17_6FedCom171H_BOP_20190614084634.pdf

## Section 3 - Casing

| Casing ID | String Type | Hole Size | Csg Size | Condition | Standard | Tapered String | Top Set MD | Bottom Set MD | Top Set TVD | Bottom Set TVD | Top Set MSL | Bottom Set MSL | Calculated casing length MD | Grade | Weight | Joint Type | Collapse SF | Burst SF | Joint SF Type | Joint SF | Body SF Type | Body SF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SURFACE | 17.5 | 13.375 | NEW | API | N | 0 | 703 | 0 | 703 | | | 703 | J-55 | 54.5 | BUTT | 1.125 | 1.2 | BUOY | 1.4 | BUOY | 1.4 |
| 2 | INTERMEDIATE | 12.25 | 9.625 | NEW | API | N | 0 | 4343 | 0 | 4343 | | | 4343 | L-80 | 43.5 | BUTT | 1.125 | 1.2 | BUOY | 1.4 | BUOY | 1.4 |
| 3 | INTERMEDIATE | 8.5 | 7.625 | NEW | API | N | 0 | 11098 | 0 | 11098 | | | 11098 | L-80 | 26.4 | FJ | 1.125 | 1.2 | BUOY | 1.4 | BUOY | 1.4 |
| 4 | PRODUCTION | 8.5 | 5.5 | NEW | API | N | 0 | 21867 | 0 | 11624 | | | 21867 | P-110 | 20 | OTHER - DQX | 1.125 | 1.2 | BUOY | 1.4 | BUOY | 1.4 |

**Casing Attachments**

**Casing ID:** 1 **String Type:** SURFACE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

PalladiumMDP17_6FedCom171H_CsgCriteria_20190614091249.pdf

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Casing Attachments**

---

**Casing ID:** 2 **String Type:** INTERMEDIATE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

PalladiumMDP17_6FedCom171H_CsgCriteria_20190614091301.pdf

---

**Casing ID:** 3 **String Type:** INTERMEDIATE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

PalladiumMDP17_6FedCom171H_CsgCriteria_20190614091331.pdf

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**Casing ID:** 4 **String Type:** PRODUCTION

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

PalladiumMDP1_7_6FdCom171H_5.5_20_P110CY_TMKUPDQWTORQ_20190614085148.pdf

PalladiumMDP1_7_6FdCom171H_5.5_20_P110_DQX_20190614085200.pdf

PalladiumMDP1_7_6FdCom171H_5.5_20_P110HC_TMKUPSFTORQ_20190614085213.pdf

PalladiumMDP17_6FedCom171H_CsgCriteria_20190614091344.pdf

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**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

## Section 4 - Cement

| String Type | Lead/Tail | Stage Tool Depth | Top MD | Bottom MD | Quantity(sx) | Yield | Density | Cu Ft | Excess% | Cement type | Additives |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SURFACE | Lead | | 0 | 746 | 522 | 1.33 | 14.8 | 992 | 100 | Class C Cement | Accelerator |
| INTERMEDIATE | Lead | | 0 | 3843 | 921 | 1.88 | 12.9 | 1731 | 50 | Pozzolan | Retarder |
| INTERMEDIATE | Tail | | 3843 | 4343 | 155 | 1.33 | 14.8 | 206 | 20 | Class C Cement | Accelerator |
| INTERMEDIATE | Lead | | 6669 | 11098 | 218 | 1.65 | 13.2 | 360 | 5 | Class H | Retarder, Dispersant, Salt |
| INTERMEDIATE | Tail | | 0 | 6669 | 351 | 1.92 | 12.9 | 674 | 25 | Class C | Accelerator |
| PRODUCTION | Lead | | 10598 | 21867 | 826 | 1.38 | 13.2 | 1140 | 20 | Class H | Retarder, Dispersant, Salt |

## Section 5 - Circulating Medium

**Mud System Type:** Closed

**Will an air or gas system be Used?** NO

**Description of the equipment for the circulating system in accordance with Onshore Order #2:**

**Diagram of the equipment for the circulating system in accordance with Onshore Order #2:**

**Describe what will be on location to control well or mitigate other conditions:** Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CaCl2.

**Describe the mud monitoring system utilized:** PVT/MD Totco/Visual Monitoring

## Circulating Medium Table

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

| Top Depth | Bottom Depth | Mud Type | Min Weight (lbs/gal) | Max Weight (lbs/gal) | Density (lbs/cu ft) | Gel Strength (lbs/100 sqft) | PH | Viscosity (CP) | Salinity (ppm) | Filtration (cc) | Additional Characteristics |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 703 | WATER-BASED MUD | 8.6 | 8.8 | | | | | | | |
| 703 | 4343 | OTHER : Brine | 9.8 | 10 | | | | | | | |
| 4343 | 11098 | WATER-BASED MUD | 8 | 9.6 | | | | | | | |
| 11098 | 21867 | OIL-BASED MUD | 9.5 | 12 | | | | | | | |

## Section 6 - Test, Logging, Coring

**List of production tests including testing procedures, equipment and safety measures:**

GR from TD to surface (horizontal well – vertical portion of hole). Mud Log from intermediate shoe to TD.

**List of open and cased hole logs run in the well:**

GR,MUDLOG

**Coring operation description for the well:**

No coring is planned at this time.

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 7295 **Anticipated Surface Pressure:** 4722.97

**Anticipated Bottom Hole Temperature(F):** 174

**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO

**Describe:**

**Contingency Plans geoharzards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

PalladiumMDP17_6FedCom171H_H2S1_20181106110924.pdf

PalladiumMDP17_6FedCom171H_H2S2_20181106110933.pdf

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

## Section 8 - Other Information

**Proposed horizontal/directional/multi-lateral plan submission:**

PalladiumMDP17_6FedCom171H_DirectPlan_20181106111007.pdf

PalladiumMDP17_6FedCom171H_DirectPlot_20181106111020.pdf

**Other proposed operations facets description:**

OXY respectfully requests a variance to cement the 9-5/8" and/or 7-5/8" intermediate casing strings offline.

Well will be drilled with a walking/skidding operation. Plan to drill the three well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well.

**Other proposed operations facets attachment:**

PalladiumMDP17_6FedCom171H_SpudRigData_20181106111844.pdf

PalladiumMDP1_7_6FdCom171H_DrillPlan_20190614091150.pdf

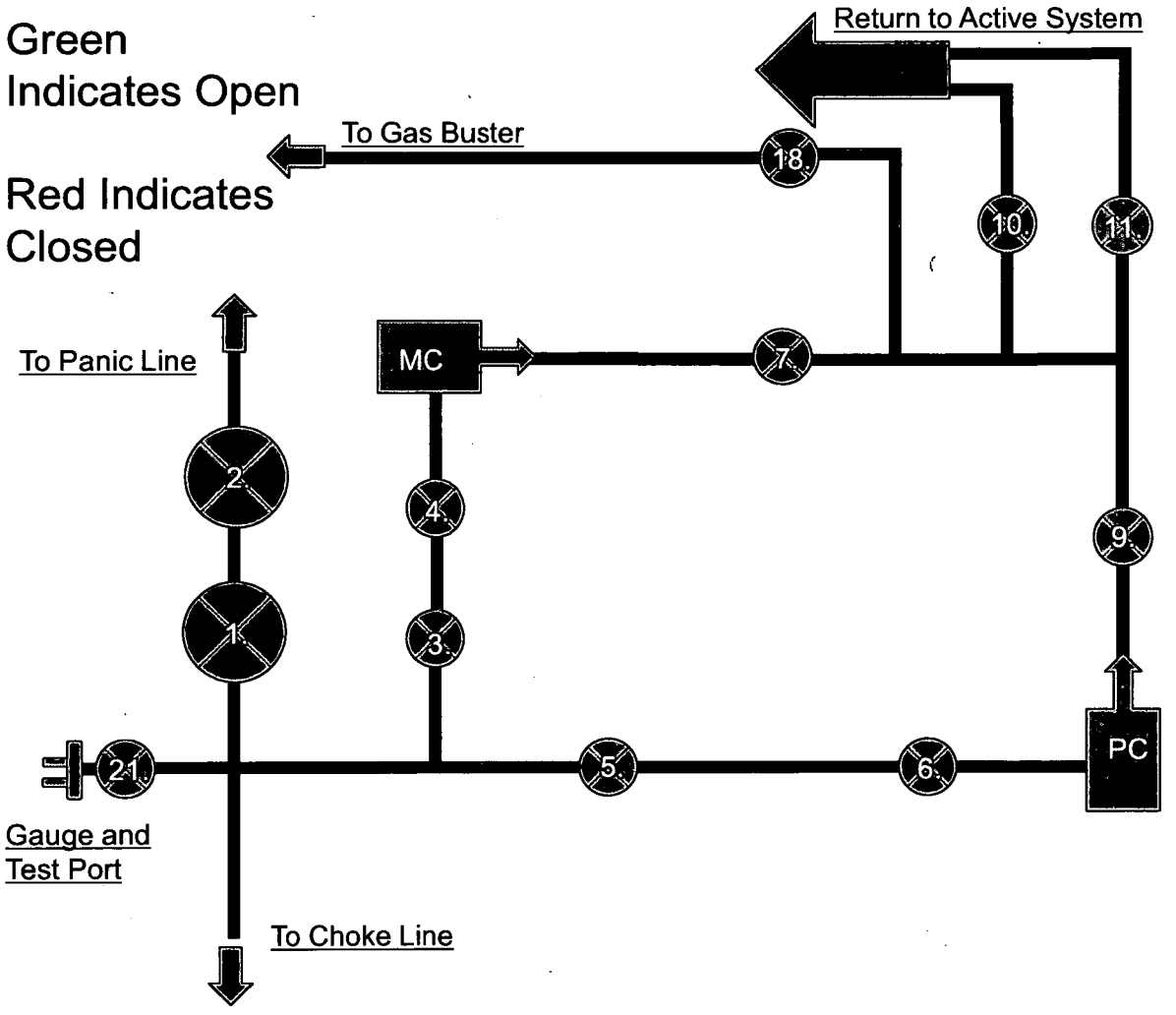
**Other Variance attachment:**

PalladiumMDP1_7_6FdCom171H_OfflineCmtgDetail_20190614091511.pdf

# 5M Choke Panel

Green
Indicates Open

Red Indicates
Closed




1. 4" Choke Manifold Valve
2. 4" Choke Manifold Valve
3. 3" Choke Manifold Valve
4. 3" Choke Manifold Valve
5. 3" Choke Manifold Valve
6. 3" Choke Manifold Valve
7. 3" Choke Manifold Valve
8. PC – Power Choke
9. 3" Choke Manifold Valve
10. 3" Choke Manifold Valve
11. Choke Manifold Valve
12. MC – Manual Choke

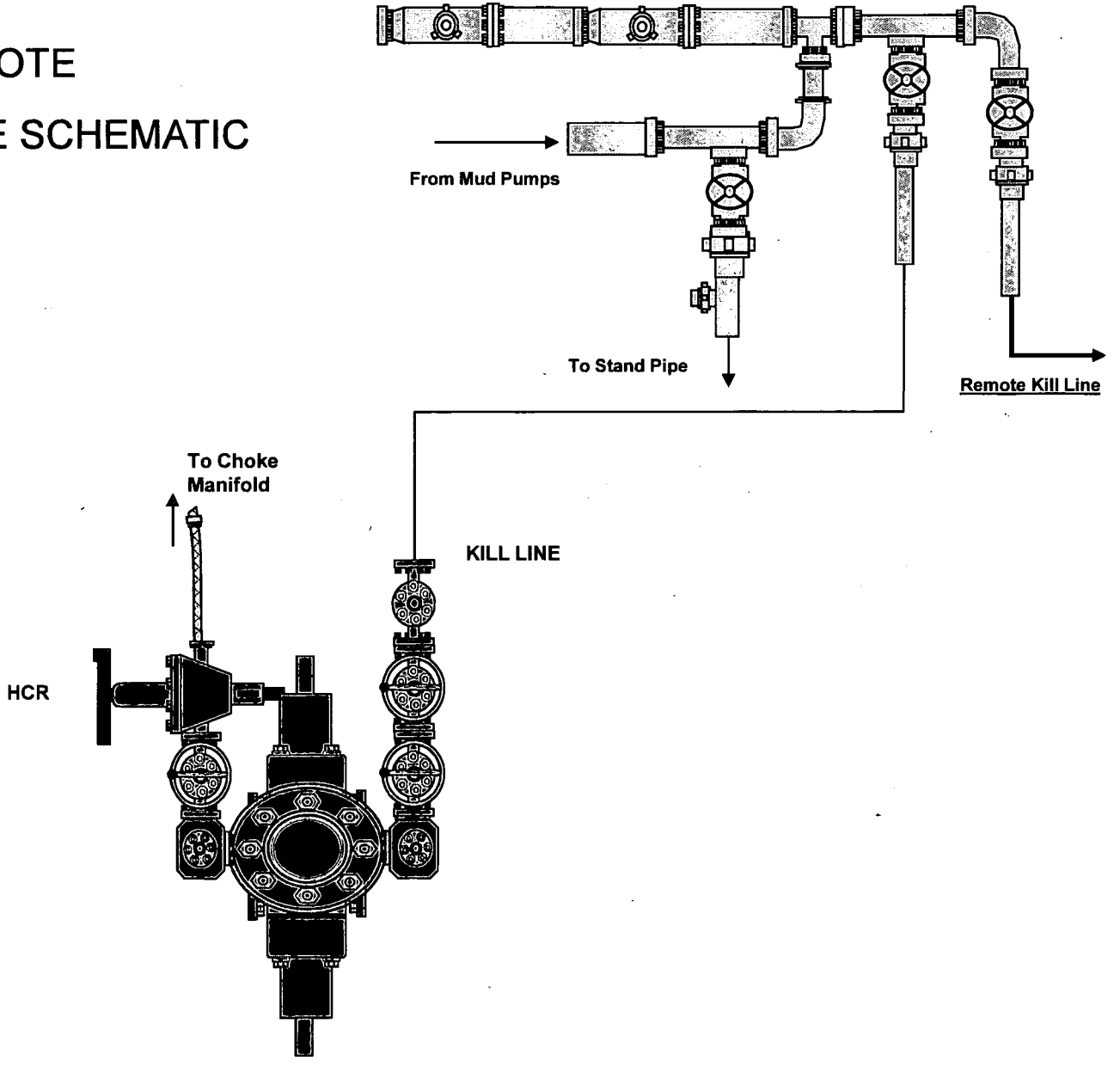
18. Choke Manifold Valve

21. Vertical Choke Manifold Valve

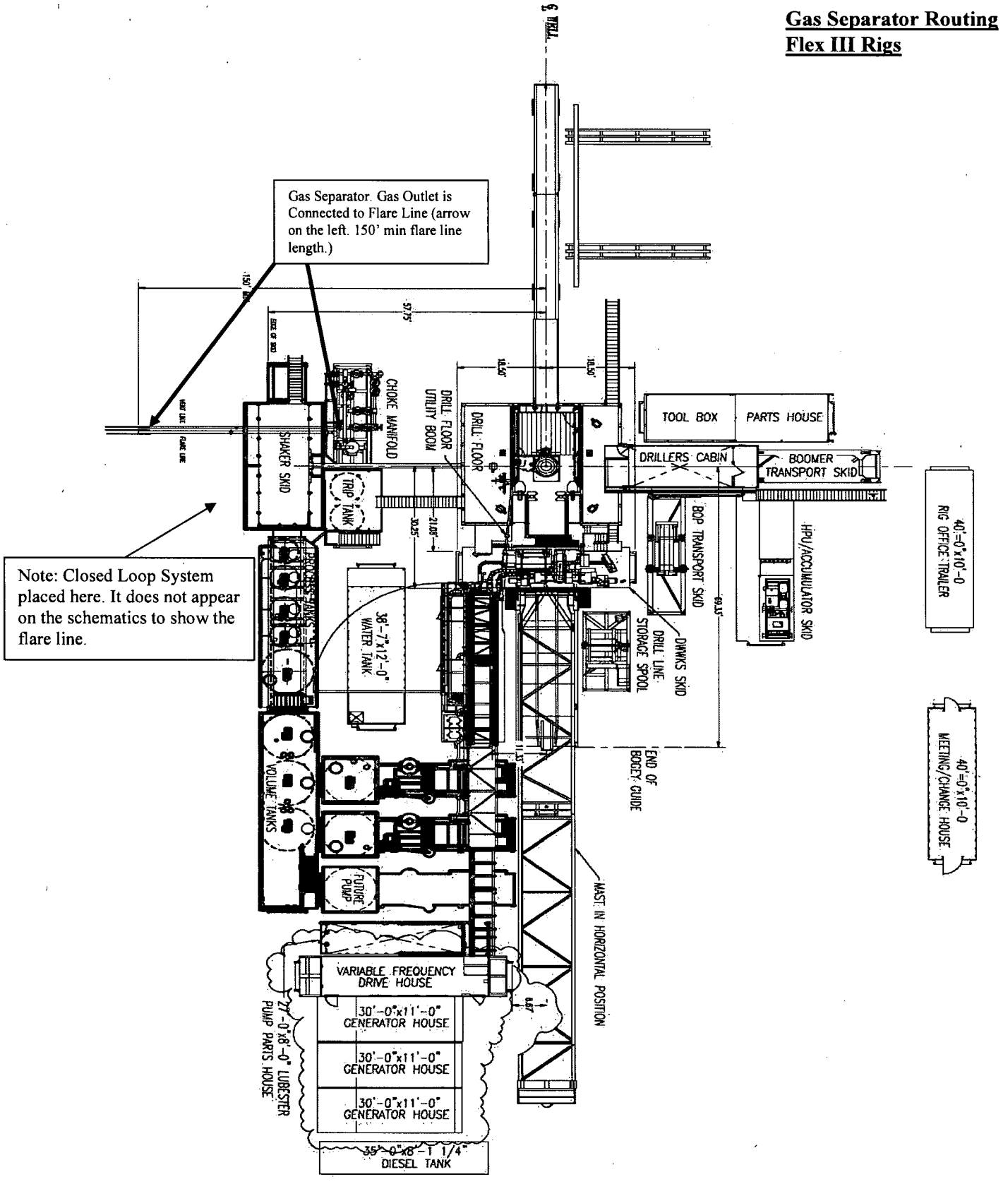
***All Valves 3" minimum**

# 10M REMOTE

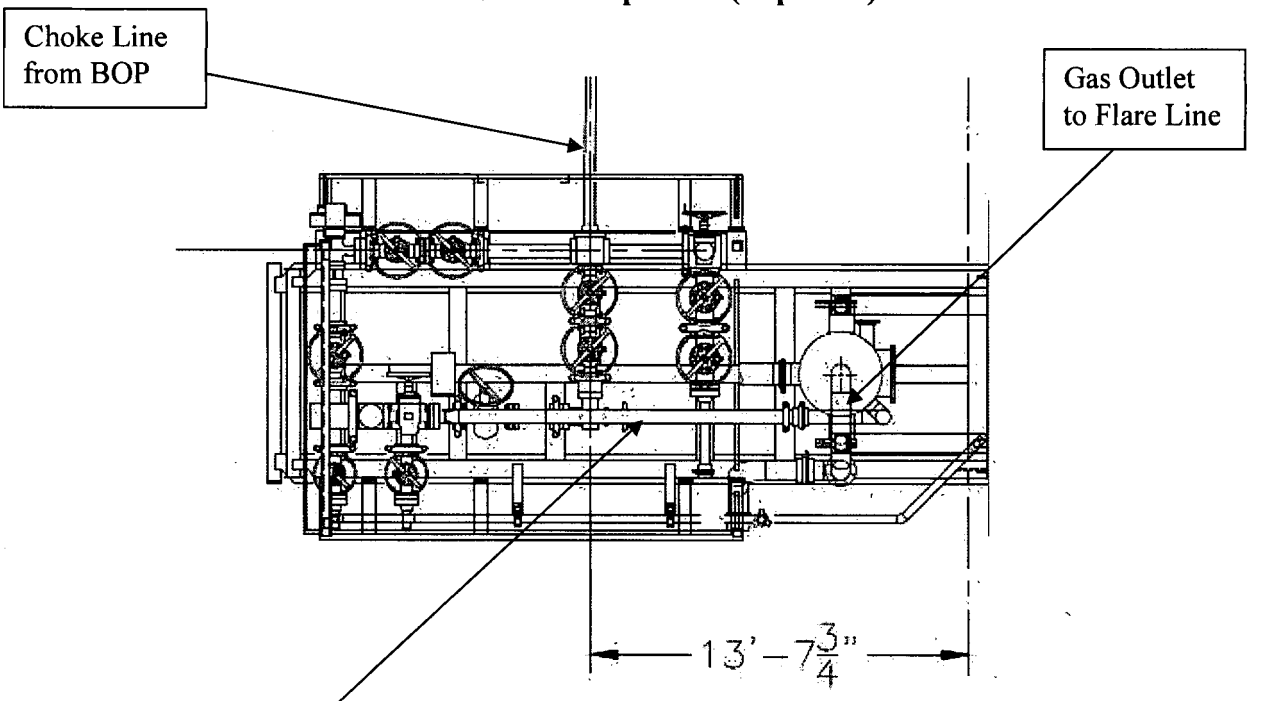
# KILL LINE SCHEMATIC



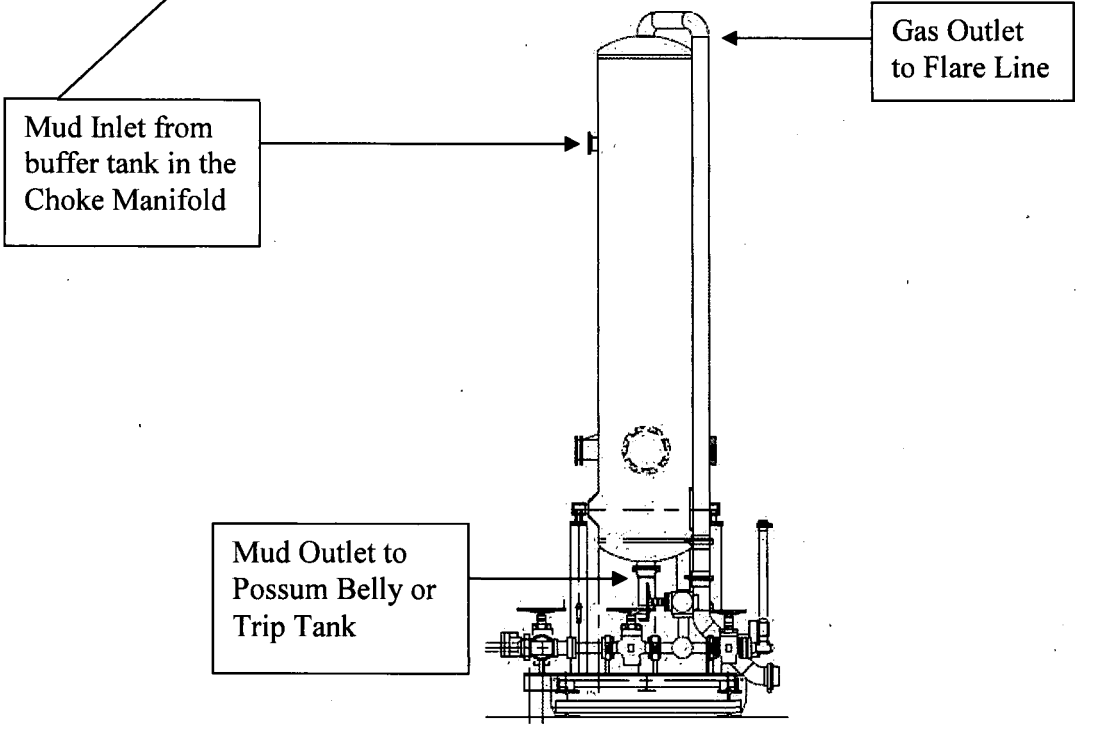
## Gas Separator Routing
## Flex III Rigs



**Choke Manifold – Gas Separator (Top View)**



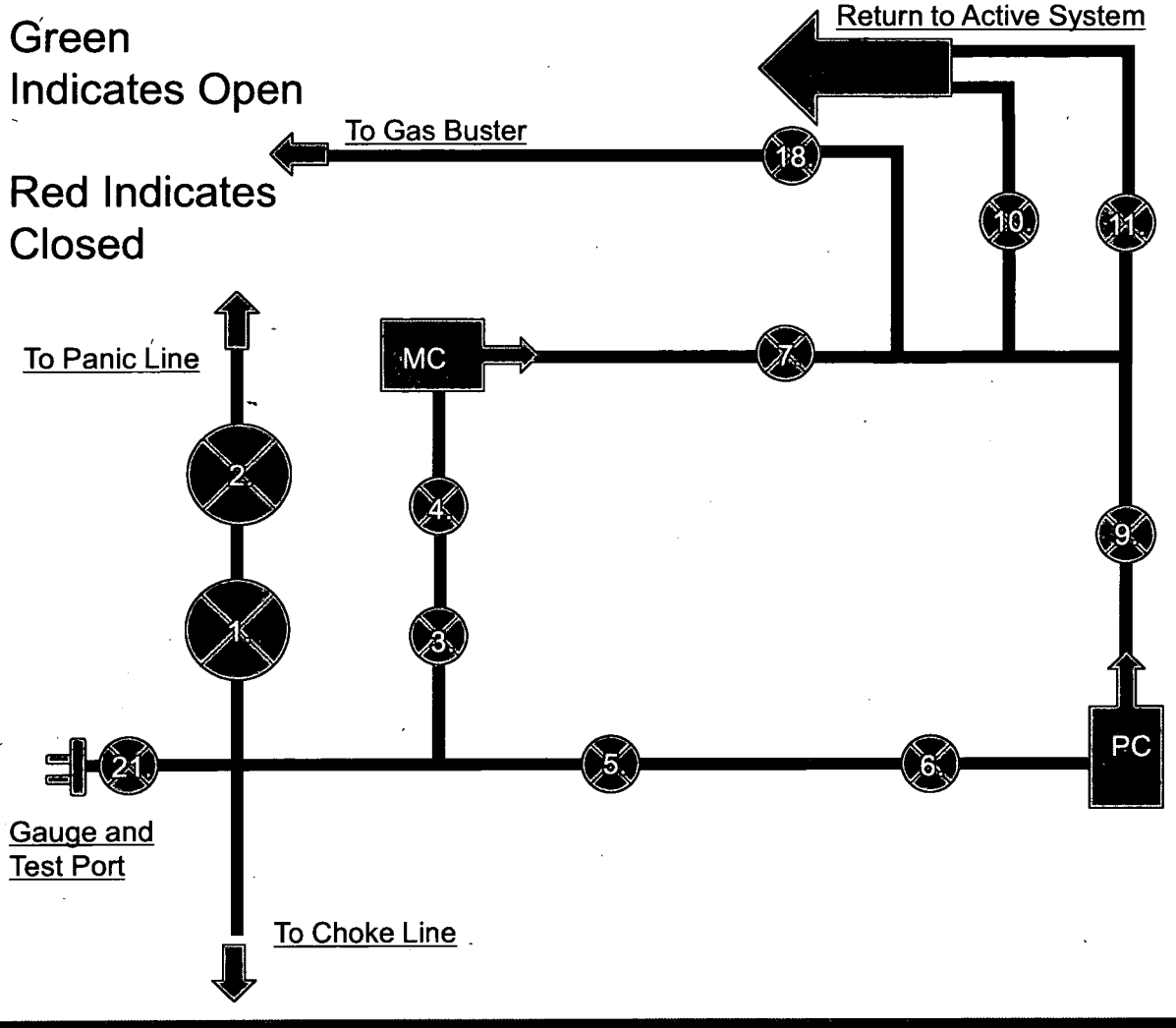

**Choke Manifold – Gas Separator (Side View)**



# 5M Choke Panel

Green
Indicates Open

Red Indicates
Closed




1. 4" Choke Manifold Valve
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11. Choke Manifold Valve
12. MC – Manual Choke

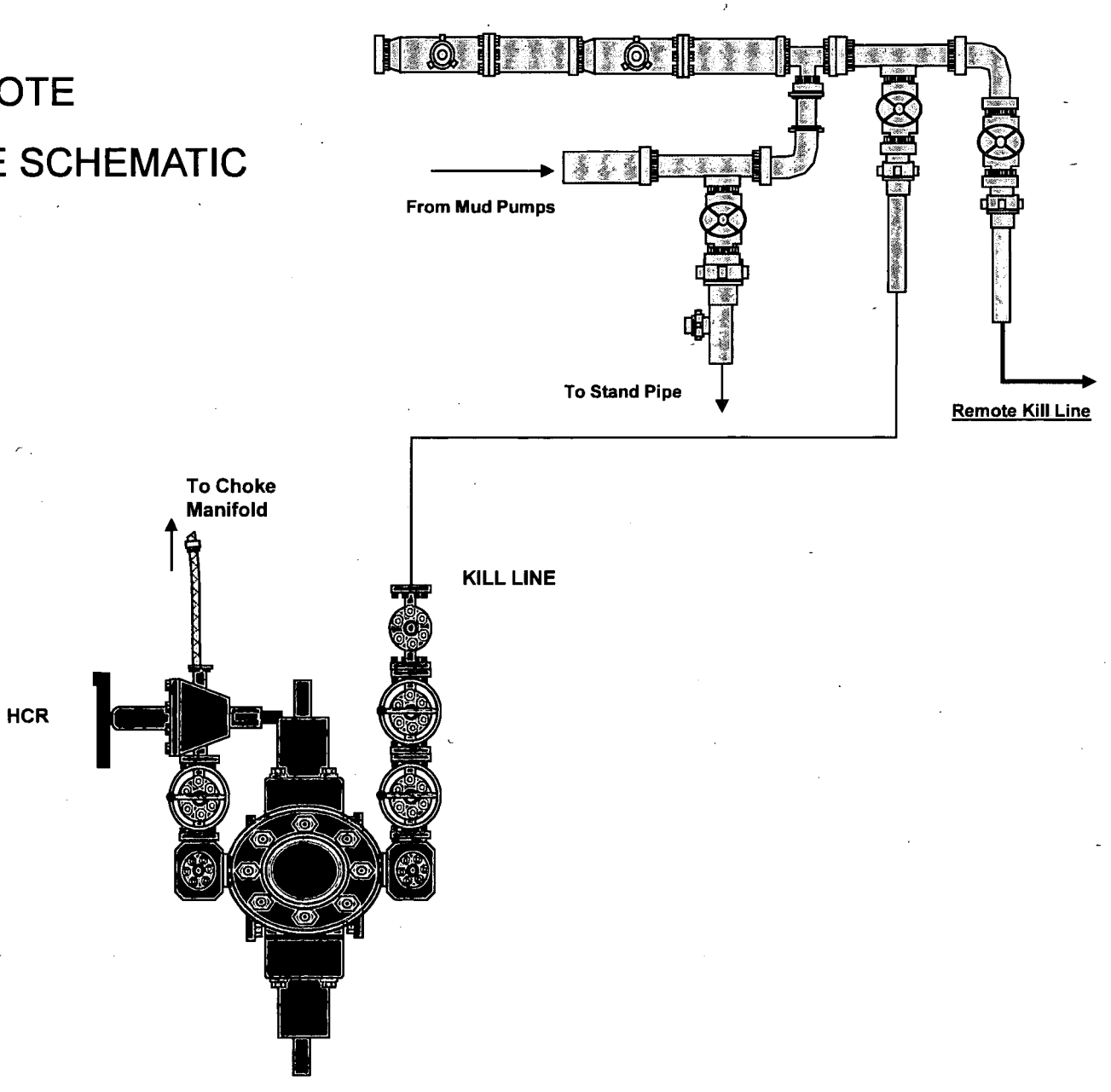
18. Choke Manifold Valve

21. Vertical Choke Manifold Valve

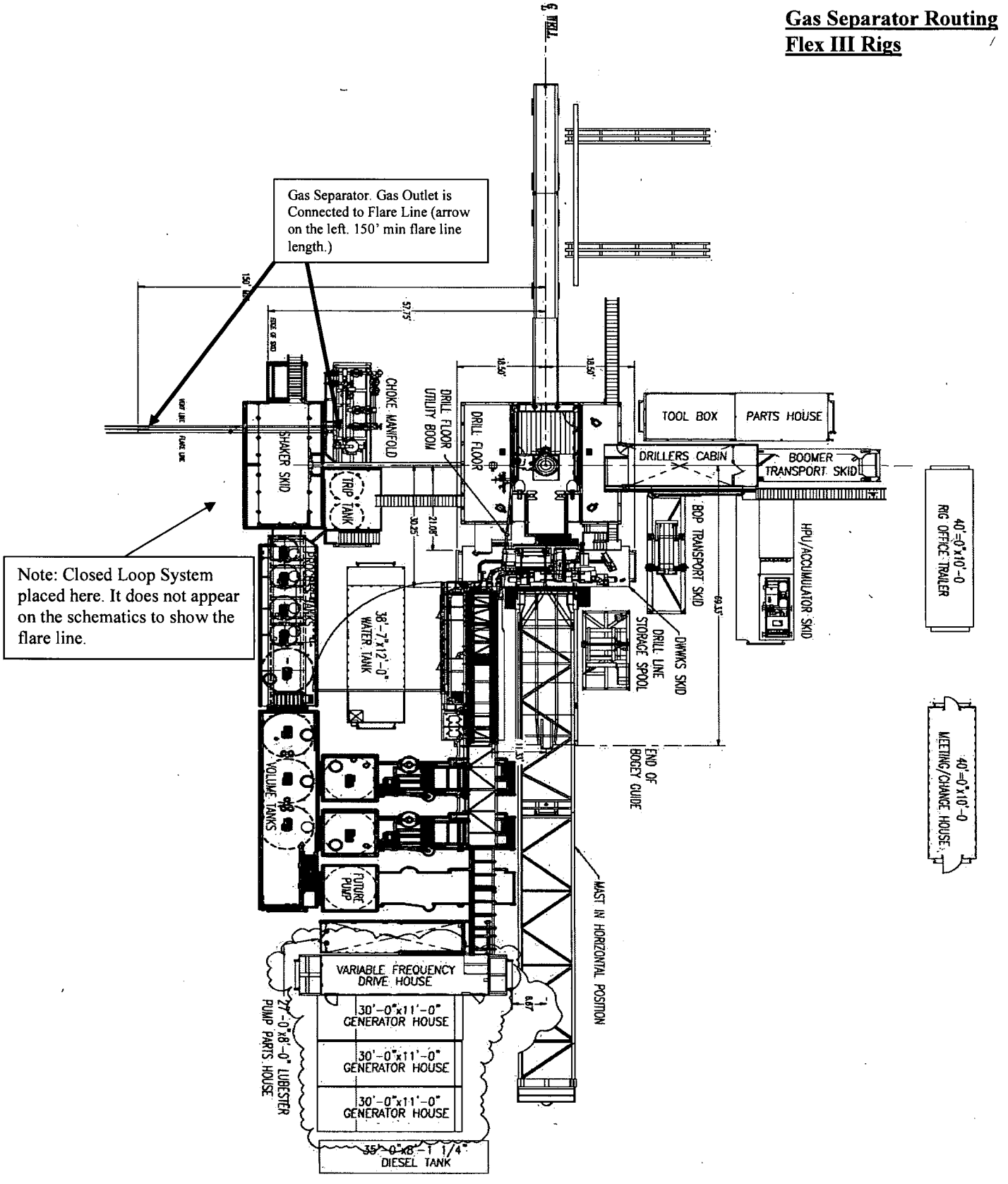
***All Valves 3" minimum**

# 10M REMOTE

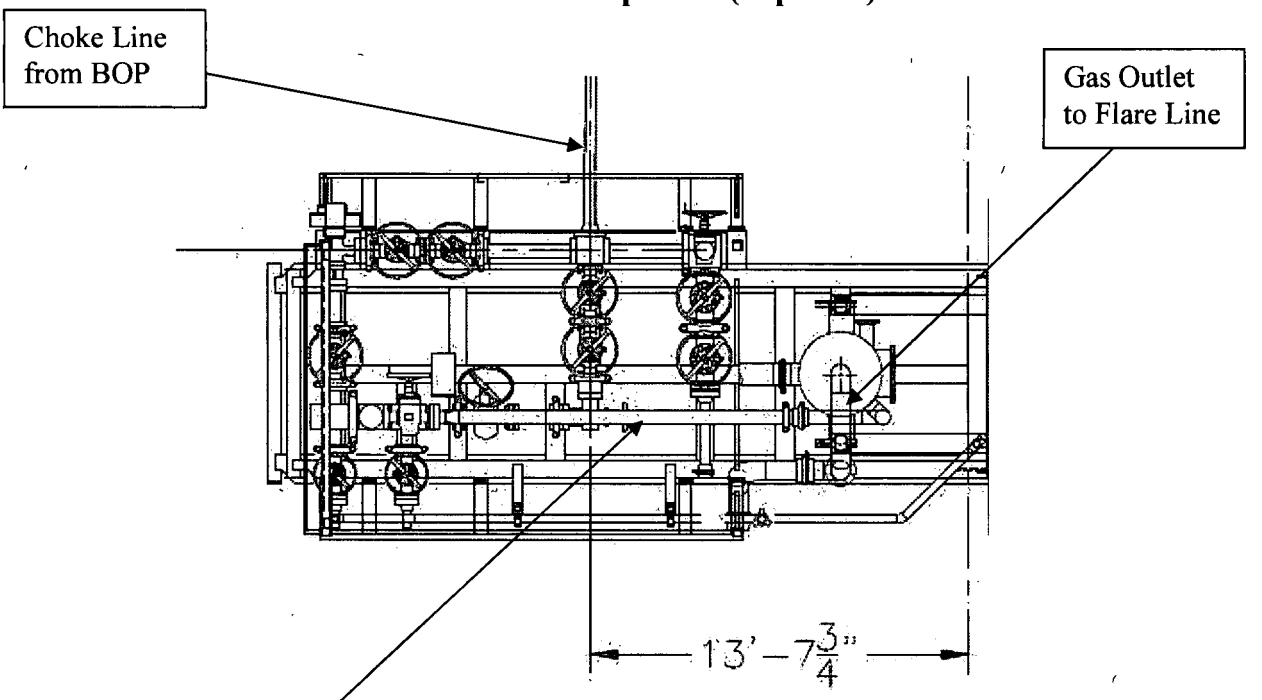
# KILL LINE SCHEMATIC



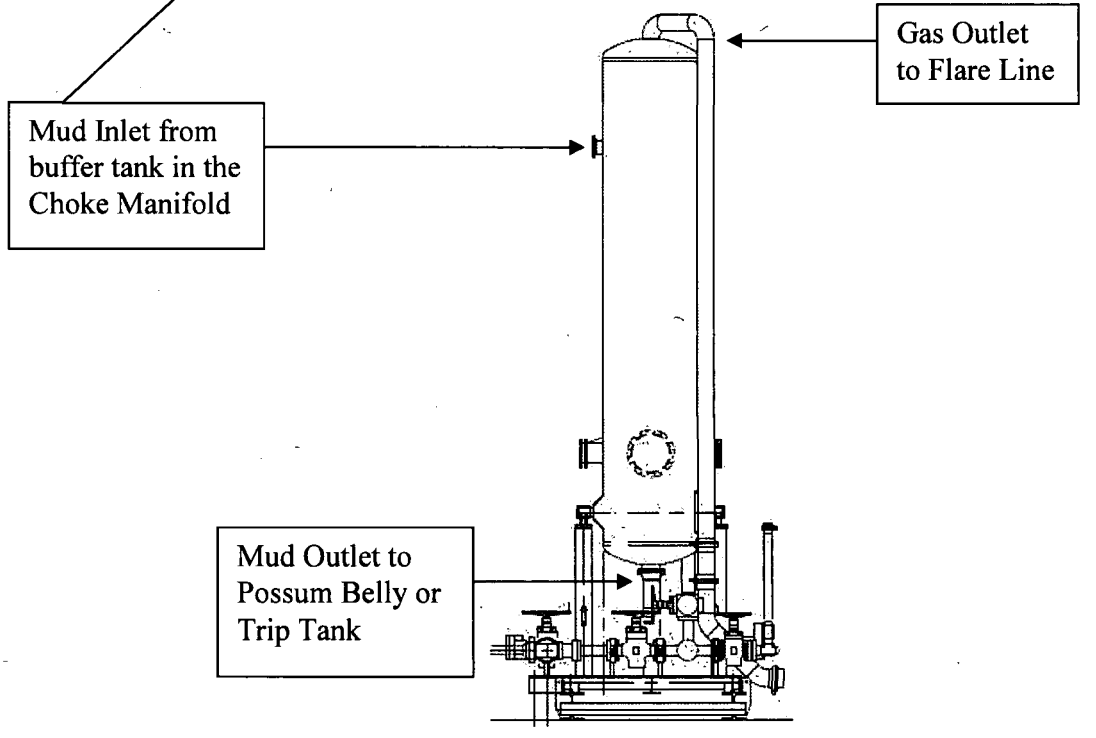
## Gas Separator Routing
## Flex III Rigs



**Choke Manifold – Gas Separator (Top View)**




**Choke Manifold – Gas Separator (Side View)**



**Coflex Hose Certification** FH-1

Continental CONTITECH

Fluid Technology

Quality Document

| QUALITY CONTROL INSPECTION AND TEST CERTIFICATE | | | CERT. N°: 746 |
|---|---|---|---|
| PURCHASER: Phoenix Beattie Co. | | | P.O. N°: 002491 |
| CONTITECH ORDER N°: 412638 | HOSE TYPE: 3" ID | Choke and Kill Hose | |
| HOSE SERIAL N°: 52777 | NOMINAL / ACTUAL LENGTH: | 10,67 m | |
| W.P. 68,96 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 = 25 MPa

COUPLINGS

| Type | Serial N° | Quality | Heat N° |
|---|---|---|---|
| 3" coupling with | 917 913 | AISI 4130 | T7998A |
| 4 1/16" Flange end | | AISI 4130 | 26984 |

INFOCHIP INSTALLED

API Spec 16 C
Temperature rate:"B"

All metal parts are flawless

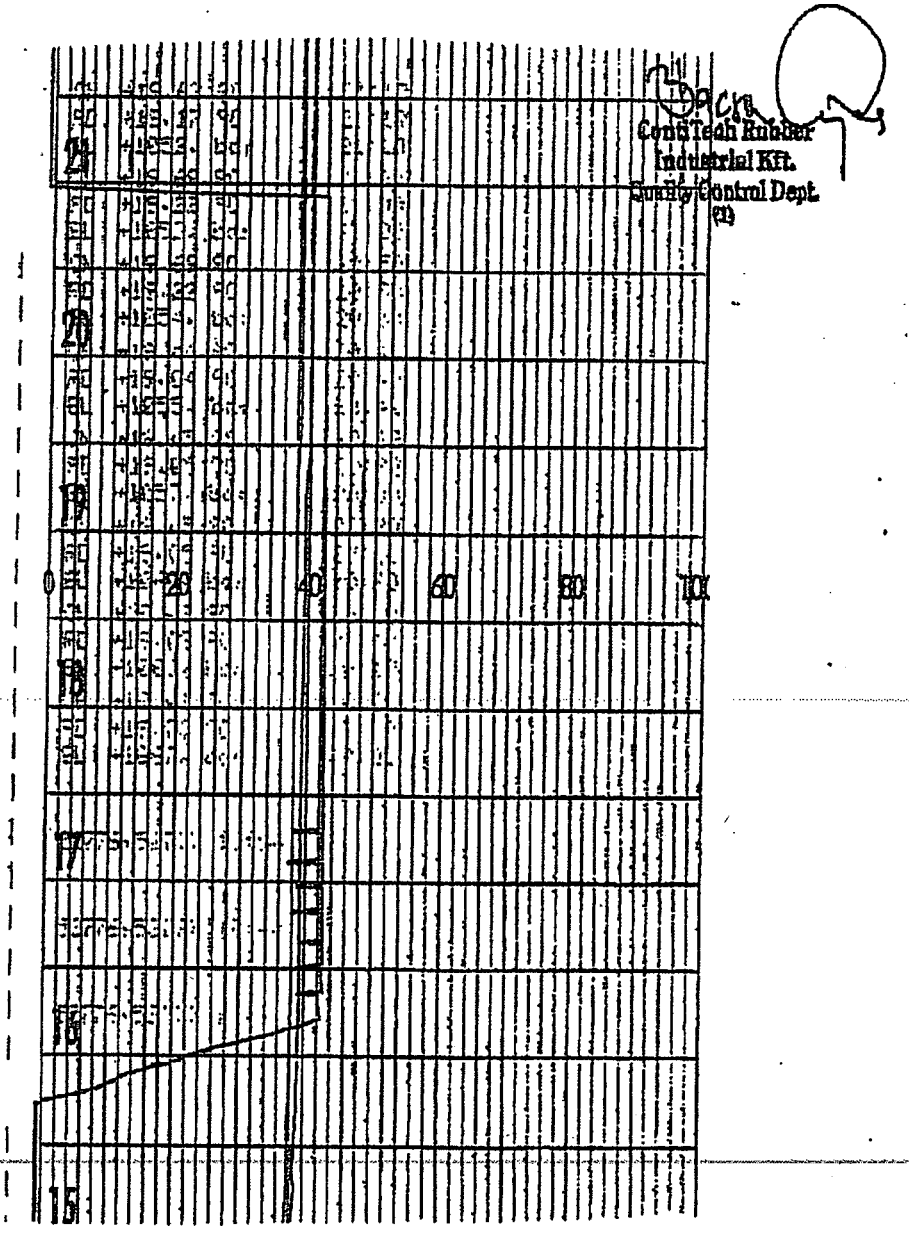
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

| Date: | Inspector | Quality Control |
|---|---|---|
| 04. April. 2008 | | ContiTech Rubber Industrial Kft. Quality Control Dept. (1) |

FH-2

## Coflex Hose Certification





FH-3

# Coflex Hose Certification

Form No 100/12

PHOENIX Beattie

Phoenix Beattie Corp
11535 Brittmoore Park Drive
Houston, TX 77041
Tel: (832) 327-0141
Fax: (832) 327-0148
E-mail mail@phoenixbeattie.com
www.phoenixbeattie.com

## Delivery Note

| Customer Order Number | 370-369-001 | Delivery Note Number | 003078 | Page | 1 |
|---|---|---|---|---|---|
| **Customer / Invoice Address**<br>HELMERICH & PAYNE INT'L DRILLING CO<br>1437 SOUTH BOULDER<br>TULSA, OK<br>74119 | | **Delivery / Address**<br>HELMERICH & PAYNE IDC<br>ATTN: JOE STEPHENSON - RIG 370<br>13609 INDUSTRIAL ROAD<br>HOUSTON, TX<br>77015 | | | |

| Customer Acc No | Phoenix Beattie Contract Manager | Phoenix Beattie Reference | Date |
|---|---|---|---|
| H01 | JJL | 006330 | 05/23/2008 |

| Item No | Beattie Part Number / Description | Qty Ordered | Qty Sent | Qty To Follow |
|---|---|---|---|---|
| 1 | HP10CK3A-35-4F1<br>3" 10K 16C C&K HOSE x 35ft OAL/CW 4.1/16" API SPEC FLANGE E/<br>End 1: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange<br>End 2: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange<br>c/w BX155 Standard ring groove at each end<br>Suitable for H2S Service<br>Working pressure: 10,000psi<br>Test pressure: 15,000psi<br>Standard: API 16C Full specification<br>Armor Guarding: Included<br>Fire Rating: Not Included<br>Temperature rating: -20 Deg C to +100 Deg C | 1 | 1 | 0 |
| 2 | SECK3-HPF3<br>LIFTING & SAFETY EQUIPMENT TO SUIT HP10CK3-35-F1<br>2 x 160mm ID Safety Clamps<br>2 x 244mm ID Lifting Collars & element C's<br>2 x 7ft Stainless Steel wire rope 3/4" OD<br>4 x 7.75t Shackles | 1 | 1 | 0 |
| 3 | SC725-200CS<br>SAFETY CLAMP 200MM 7.25T C/S GALVANISED | 1 | 1 | 0 |

Continued...

FH-4

## Coflex Hose Certification

Form No 100/12

PHOENIX Beattie

**Phoenix Beattie Corp**
11535 Brittmoore Park Drive
Houston, TX 77041
Tel: (832) 327-0141
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E-mail sales@phoenixbeattie.com
www.phoenixbeattie.com

# Delivery Note

| Customer Order Number | 370-369-001 | Delivery Note Number | 003078 | Page | 2 |
|---|---|---|---|---|---|

**Customer / Invoice Address**
HELMERICH & PAYNE INT'L DRILLING CO
1437 SOUTH BOULDER
TULSA, OK
74119

**Delivery / Address**
HELMERICH & PAYNE IDC
ATTN: JOE STEPHENSON - RIG 370
13609 INDUSTRIAL ROAD
HOUSTON, TX
77015

| Customer Acc No | Phoenix Beattie Contract Manager | Phoenix Beattie Reference | Date |
|---|---|---|---|
| H01 | JJL | 006330 | 05/23/2008 |

| Item No | Beattie Part Number / Description | Qty Ordered | Qty Sent | Qty To Follow |
|---|---|---|---|---|
| 4 | SC725-132CS<br>SAFETY CLAMP 132MM 7.25T C/S GALVANIZED C/W BOLTS | 1 | 1 | 0 |
| 5 | 00CERT-HYDRO<br>HYDROSTATIC PRESSURE TEST CERTIFICATE | 1 | 1 | 0 |
| 6 | 00CERT-LOAD<br>LOAD TEST CERTIFICATES | 1 | 1 | 0 |
| 7 | 00FREIGHT<br>INBOUND / OUTBOUND FREIGHT<br>PRE-PAY & ADD TO FINAL INVOICE<br>NOTE: MATERIAL MUST BE ACCOMPANIED BY PAPERWORK INCLUDING THE PURCHASE ORDER, RIG NUMBER TO ENSURE PROPER PAYMENT | 1 | 1 | 0 |

**Phoenix Beattie Inspection Signature :**

**Received In Good Condition :** Signature

Print Name

Date

All goods remain the property of Phoenix Beattie until paid for in full. Any damage or shortage on this delivery must be advised within 5 days. Returns may be subject to a handling charge.

**PHOENIX Beattie**

# Material Identification Certificate

| PA No | 006330 | Client | HELMERICH & PAYNE INT'L DRILLING | Client Ref | 370-369-001 | Page | 1 |
|---|---|---|---|---|---|---|---|

| Part No | Description | Material Desc | Material Spec | Qty | WO No | Batch No | Test Cert No | Bin No | Drg No | Issue No |
|---|---|---|---|---|---|---|---|---|---|---|
| HP10CK3A-35-4F1 | 3" 10K 16C C&K HOSE x 35ft OAL | | | 1 | 2491 | 52777/H884 | | MATER | | |
| SECK3-HPFJ | LIFTING & SAFETY EQUIPMENT TO | | | 1 | 2440 | 032440 | | N/STK | | |
| SC725-200CS | SAFETY CLAMP 200MM 7.25T | CARBON STEEL | | 1 | 2519 | H665 | | 22C | | |
| SC725-132CS | SAFETY CLAMP 132MM 7.25T | CARBON STEEL | | 1 | 2242 | H139 | | 22 | | |

We hereby certify that these goods have been inspected by our Quality Management System, and to the best of our knowledge are found to conform to relevant industry standards within the requirements of the purchase order as issued to Phoenix Beattie Corporation.

08/23/00

Coflex Hose Certification

FH-5

Continental CONTITECH

Fluid Technology

Quality Document

FH-6

# CERTIFICATE OF CONFORMITY

**Supplier** : CONTITECH RUBBER INDUSTRIAL KFT.
**Equipment** : 6 pcs. Choke and Kill Hose with installed couplings
**Type** : **3" x 10,67 m WP: 10000 psi**
**Supplier File Number** : 412638
**Date of Shipment** : April. 2008
**Customer** : Phoenix Beattie Co.
**Customer P.o.** : 002491
**Referenced Standards / Codes / Specifications** : API Spec 16 C
Serial No.: 52754,52755,52776,52777,52778,52782

## 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

Signed : .....

ContiTech Rubber Industrial Kft. Quality Control Dept.

Position: Q.C. Manager

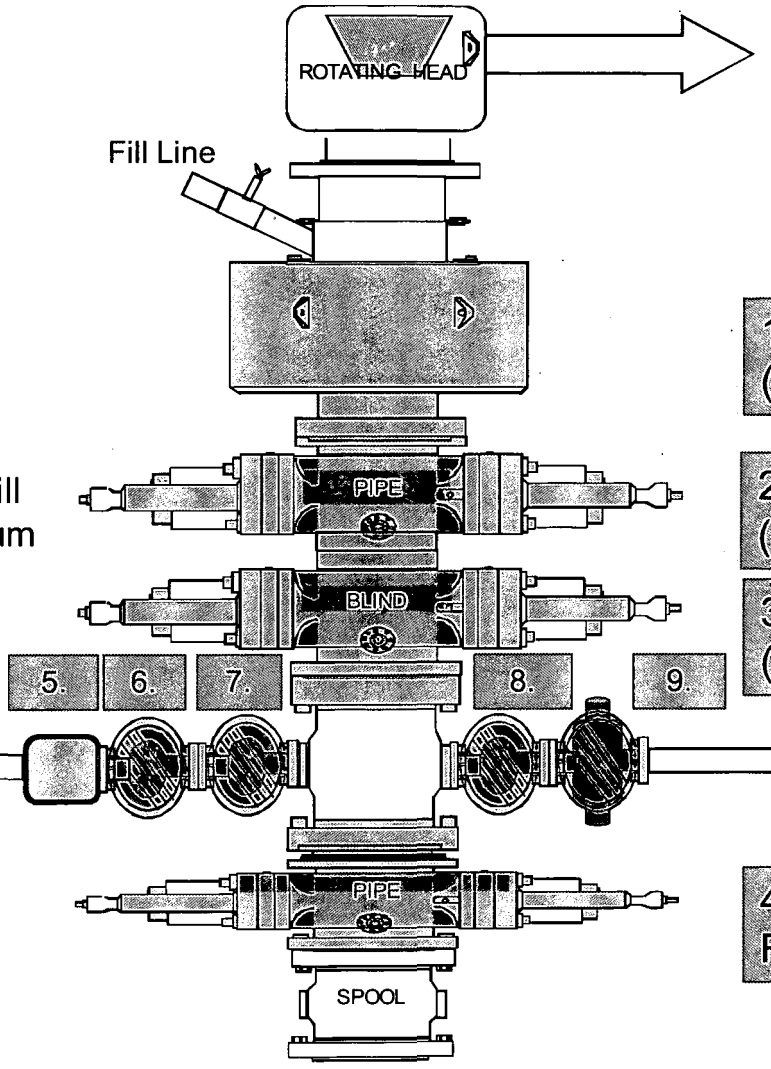
Date: 04. April. 2008

# 5M BOP Stack

Mud Cross Valves:

5. 5M Check Valve
6. Outside 5M Kill Line Valve
7. Inside 5M Kill Line
8. Outside 5M Kill Line Valve
9. 5M HCR Valve

*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side




To Kill Line

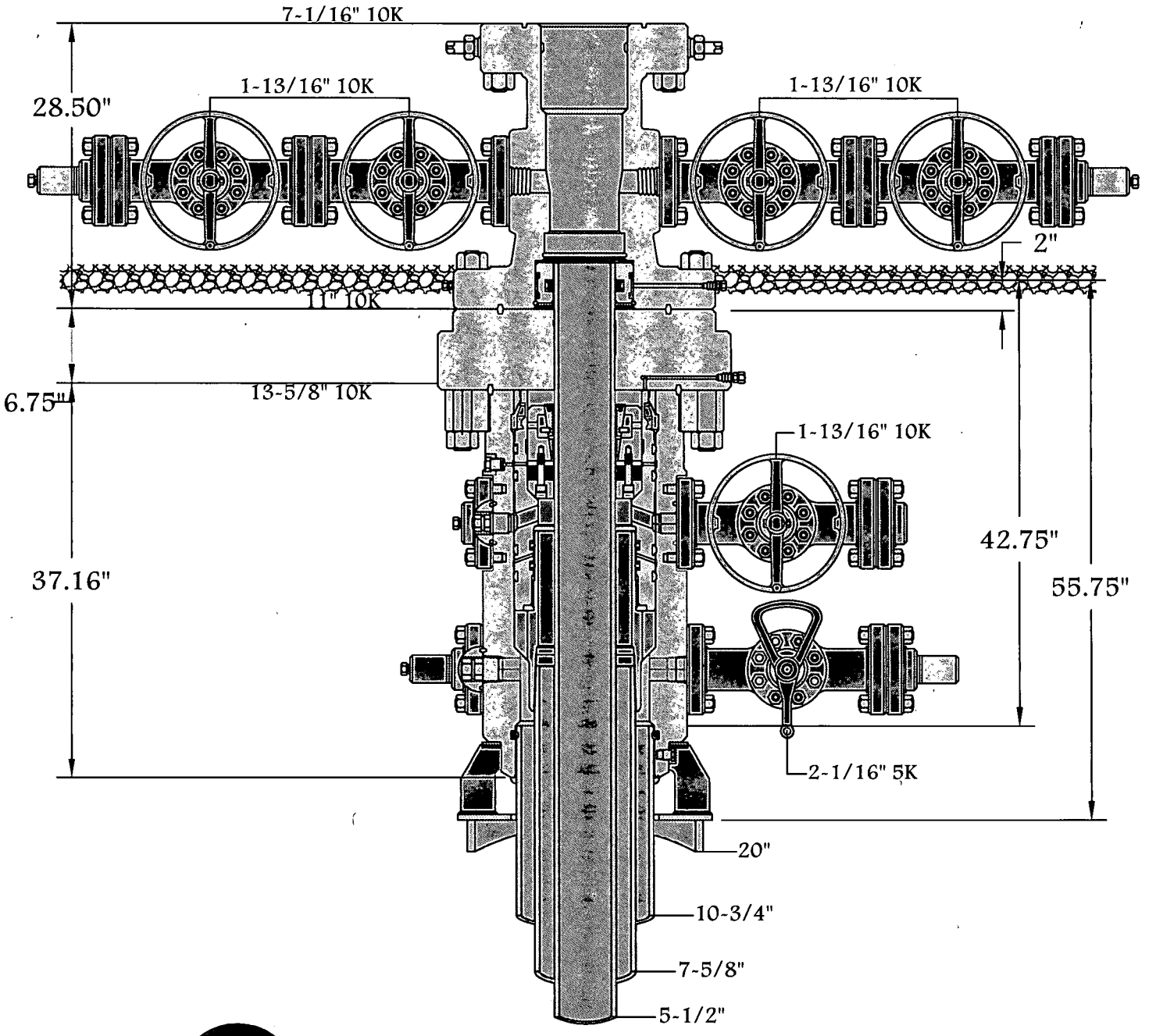
To Co-Flex and Choke Manifold

1. 5000 psi Annular (13-5/8" ID)

2. 5,000 psi Upper Pipe Ram (13-5/8" ID)

3. 5,000 psi Blind Ram (13-5/8" ID)

4. 5,000 psi Lower Pipe Ram (13-5/8" ID)



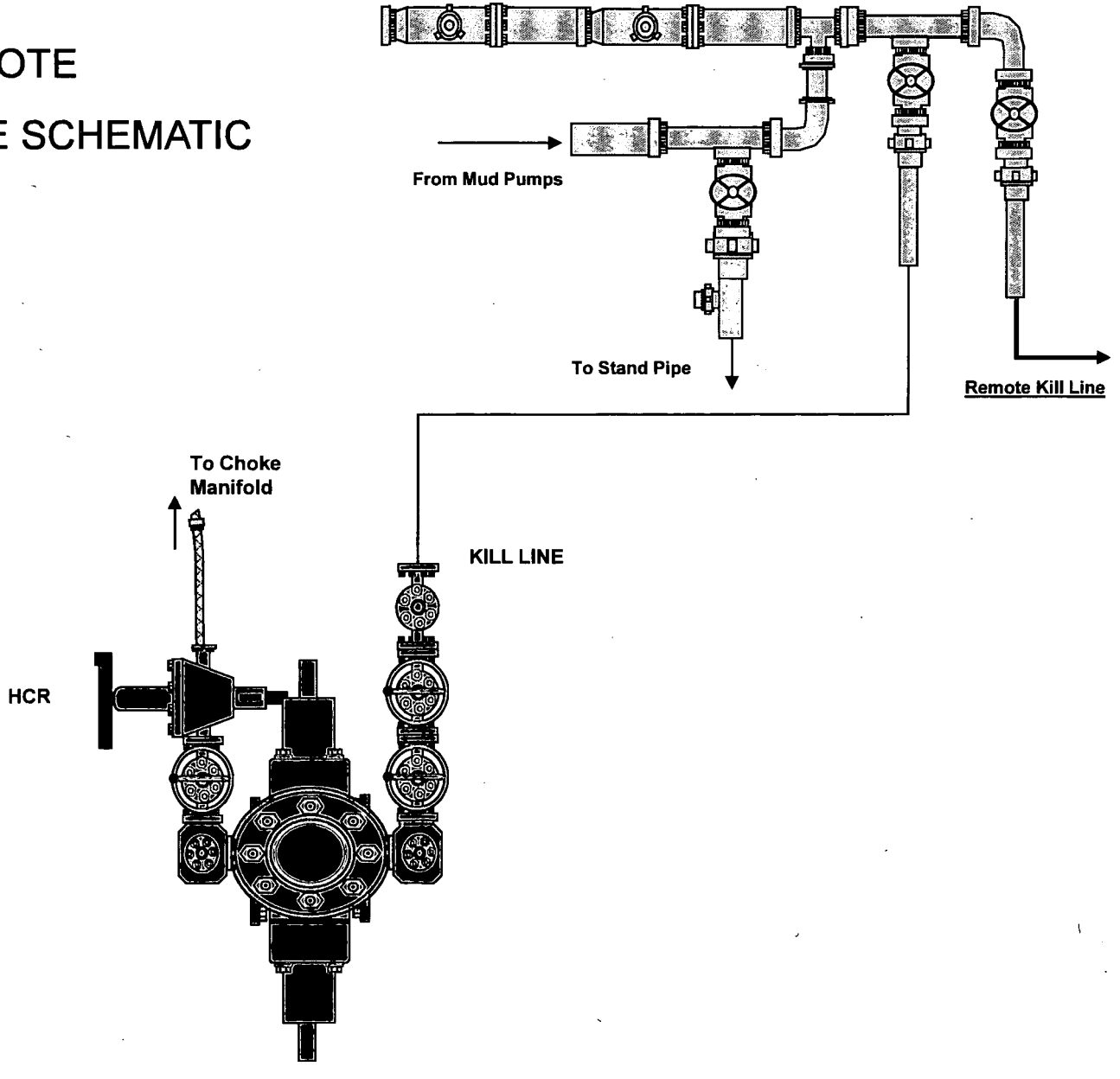

OXY

13-5/8" 10K MN-DS

CAMERON
A Schlumberger Company

| Name: | Date: | Working Pressure: | # |
|---|---|---|---|

# 10M REMOTE KILL LINE SCHEMATIC



# Coflex Hose Certification

Continental CONTITECH

Fluid Technology

Quality Document

| QUALITY CONTROL INSPECTION AND TEST CERTIFICATE | | | | CERT. N°: 746 |
|---|---|---|---|---|
| PURCHASER: Phoenix Beattie Co. | | | | P.O. N°: 002491 |
| CONTITECH ORDER N°: 412638 | | HOSE TYPE: 3" ID | Choke and Kill Hose | |
| HOSE SERIAL N°: 52777 | | NOMINAL / ACTUAL LENGTH: | 10,67 m | |
| W.P. 68,96 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 = 25 MPa

COUPLINGS

| Type | Serial N° | Quality | Heat N° |
|---|---|---|---|
| 3" coupling with | 917 913 | AISI 4130 | T7998A |
| 4 1/16" Flange end | | AISI 4130 | 26984 |

INFOCHIP INSTALLED

API Spec 16 C
Temperature rate:"B"

All metal parts are flawless

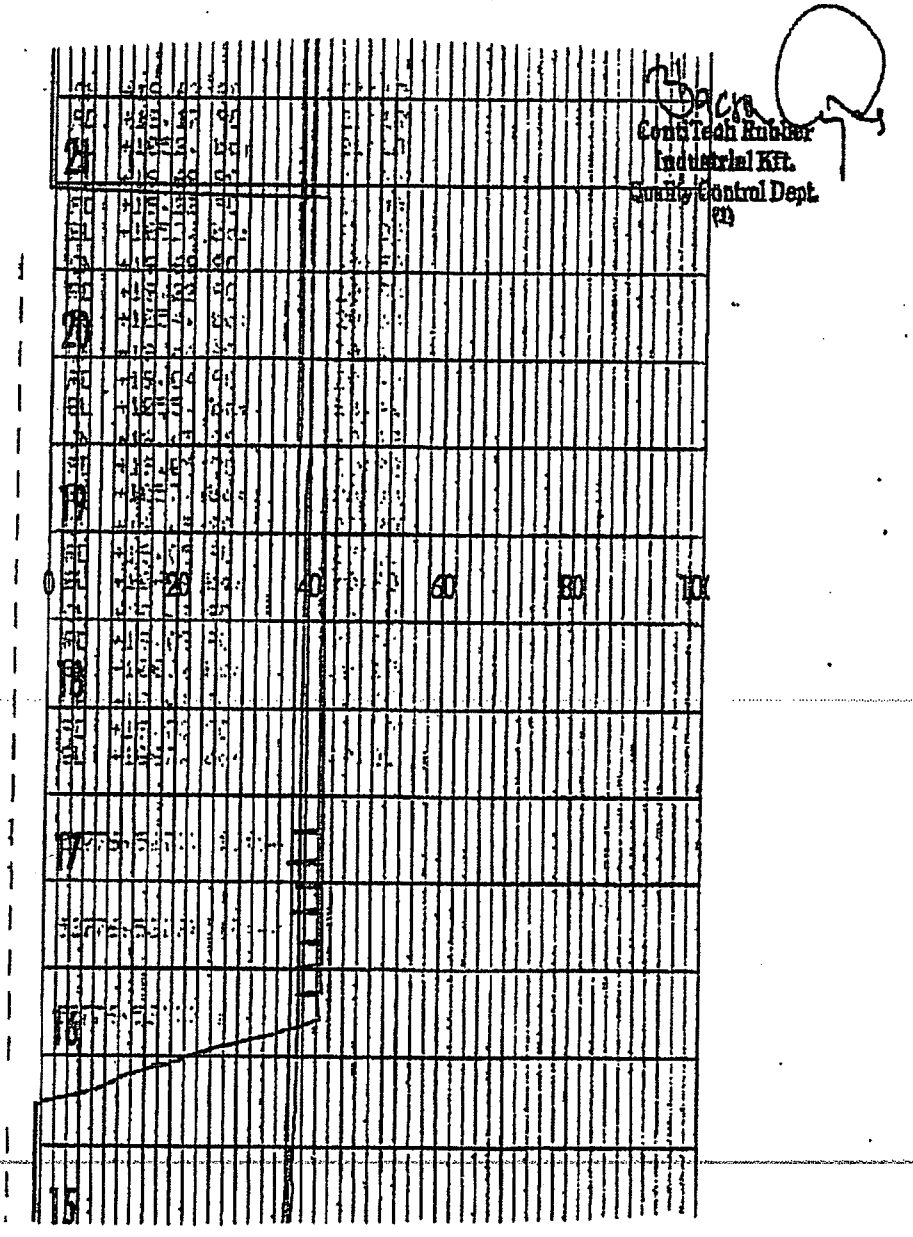
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

| Date: | Inspector | Quality Control |
|---|---|---|
| 04. April. 2008 | | ContiTech Rubber Industrial Kft. Quality Control Dept. (1) |

FH-2

## Coflex Hose Certification





FH-3

# Coflex Hose Certification

Form No 100/12

PHOENIX Beattie

Phoenix Beattie Corp
11535 Brittmoore Park Drive
Houston, TX 77041
Tel: (832) 327-0141
Fax: (832) 327-0148
E-mail mail@phoenixbeattie.com
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## Delivery Note

| Customer Order Number | 370-369-001 | Delivery Note Number | 003078 | Page | 1 |
|---|---|---|---|---|---|
| **Customer / Invoice Address**<br>HELMERICH & PAYNE INT'L DRILLING CO<br>1437 SOUTH BOULDER<br>TULSA, OK<br>74119 | | **Delivery / Address**<br>HELMERICH & PAYNE IDC<br>ATTN: JOE STEPHENSON - RIG 370<br>13609 INDUSTRIAL ROAD<br>HOUSTON, TX<br>77015 | | | |

| Customer Acc No | Phoenix Beattie Contract Manager | Phoenix Beattie Reference | Date |
|---|---|---|---|
| H01 | JJL | 006330 | 05/23/2008 |

| Item No | Beattie Part Number / Description | Qty Ordered | Qty Sent | Qty To Follow |
|---|---|---|---|---|
| 1 | HP10CK3A-35-4F1<br>3" 10K 16C C&K HOSE x 35ft OAL CW 4.1/16" API SPEC FLANGE E/<br>End 1: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange<br>End 2: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange<br>c/w BX155 Standard ring groove at each end<br>Suitable for H2S Service<br>Working pressure: 10,000psi<br>Test pressure: 15,000psi<br>Standard: API 16C Full specification<br>Armor Guarding: Included<br>Fire Rating: Not Included<br>Temperature rating: -20 Deg C to +100 Deg C | 1 | 1 | 0 |
| 2 | SECK3-HPF3<br>LIFTING & SAFETY EQUIPMENT TO SUIT HP10CK3-35-F1<br>2 x 160mm ID Safety Clamps<br>2 x 244mm ID Lifting Collars & element C's<br>2 x 7ft Stainless Steel wire rope 3/4" OD<br>4 x 7.75t Shackles | 1 | 1 | 0 |
| 3 | SC725-200CS<br>SAFETY CLAMP 200MM 7.25T C/S GALVANISED | 1 | 1 | 0 |

Continued...

FH-4

## Coflex Hose Certification

Form No 100/12

PHOENIX Beattie

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Houston, TX 77041
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# Delivery Note

| Customer Order Number | 370-369-001 | Delivery Note Number | 003078 | Page | 2 |
|---|---|---|---|---|---|
| **Customer / Invoice Address**<br>HELMERICH & PAYNE INT'L DRILLING CO<br>1437 SOUTH BOULDER<br>TULSA, OK<br>74119 | | **Delivery / Address**<br>HELMERICH & PAYNE IDC<br>ATTN: JOE STEPHENSON - RIG 370<br>13609 INDUSTRIAL ROAD<br>HOUSTON, TX<br>77015 | | | |

| Customer Acc No | Phoenix Beattie Contract Manager | Phoenix Beattie Reference | Date |
|---|---|---|---|
| H01 | JJL | 006330 | 05/23/2008 |

| Item No | Beattie Part Number / Description | Qty Ordered | Qty Sent | Qty To Follow |
|---|---|---|---|---|
| 4 | SC725-132CS<br>SAFETY CLAMP 132MM 7.25T C/S GALVANIZED C/W BOLTS | 1 | 1 | 0 |
| 5 | 00CERT-HYDRO<br>HYDROSTATIC PRESSURE TEST CERTIFICATE | 1 | 1 | 0 |
| 6 | 00CERT-LOAD<br>LOAD TEST CERTIFICATES | 1 | 1 | 0 |
| 7 | 00FREIGHT<br>INBOUND / OUTBOUND FREIGHT<br>PRE-PAY & ADD TO FINAL INVOICE<br>NOTE: MATERIAL MUST BE ACCOMPANIED BY PAPERWORK INCLUDING THE PURCHASE ORDER, RIG NUMBER TO ENSURE PROPER PAYMENT | 1 | 1 | 0 |

**Phoenix Beattie Inspection Signature :** _____

**Received In Good Condition :** Signature _____

Print Name _____

Date _____

All goods remain the property of Phoenix Beattie until paid for in full. Any damage or shortage on this delivery must be advised within 5 days. Returns may be subject to a handling charge.

**PHOENIX Beattie**

# Material Identification Certificate

| PA No | 006330 | Client | HELMERICH & PAYNE INT'L DRILLING | Client Ref | 370-369-001 | Page | 1 |
|---|---|---|---|---|---|---|---|

| Part No | Description | Material Desc | Material Spec | Qty | WO No | Batch No | Test Cert No | Bin No | Drg No | Issue No |
|---|---|---|---|---|---|---|---|---|---|---|
| HP10CK3A-35-4F1 | 3" 10K 16C C&K HOSE x 35ft OAL | | | 1 | 2491 | 52777/H884 | | WATER | | |
| SECK3-HFF3 | LIFTING & SAFETY EQUIPMENT TO | | | 1 | 2440 | 032440 | | W/STK | | |
| SC725-200CS | SAFETY CLAMP 200MM 7.25T | CARBON STEEL | | 1 | 2519 | H665 | | ZZC | | |
| SC725-132CS | SAFETY CLAMP 132MM 7.25T | CARBON STEEL | | 1 | 2242 | H139 | | ZZ | | |

We hereby certify that these goods have been inspected by our Quality Management System, and to the best of our knowledge are found to conform to relevant industry standards within the requirements of the purchase order as issued to Phoenix Beattie Corporation.

05/13/08.

Coflex Hose Certification

FH-5

Continental CONTITECH

Fluid Technology

Quality Document

FH-6

# CERTIFICATE OF CONFORMITY

**Supplier** : CONTITECH RUBBER INDUSTRIAL KFT.
**Equipment** : 6 pcs. Choke and Kill Hose with installed couplings
**Type** : **3" x 10,67 m WP: 10000 psi**
**Supplier File Number** : 412638
**Date of Shipment** : April. 2008
**Customer** : Phoenix Beattie Co.
**Customer P.o.** : 002491
**Referenced Standards / Codes / Specifications** : API Spec 16 C
Serial No.: 52754,52755,52776,52777,52778,52782

## 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

Signed : .....

ContiTech Rubber Industrial Kft. Quality Control Dept.

Position: Q.C. Manager

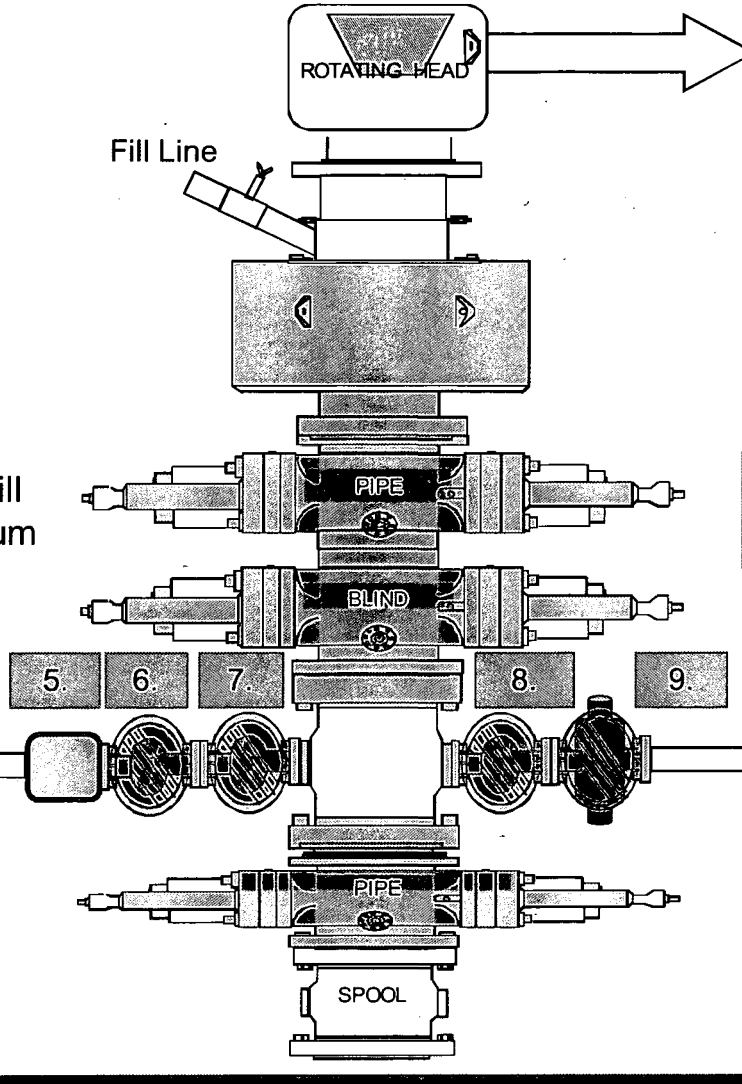
Date: 04. April. 2008

# 5M BOP Stack

Mud Cross Valves:

5. 5M Check Valve
6. Outside 5M Kill Line Valve
7. Inside 5M Kill Line
8. Outside 5M Kill Line Valve
9. 5M HCR Valve

*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side




1. 5000 psi Annular (13-5/8" ID)
2. 5,000 psi Upper Pipe Ram (13-5/8" ID)
3. 5,000 psi Blind Ram (13-5/8" ID)
4. 5,000 psi Lower Pipe Ram (13-5/8" ID)

To Kill Line

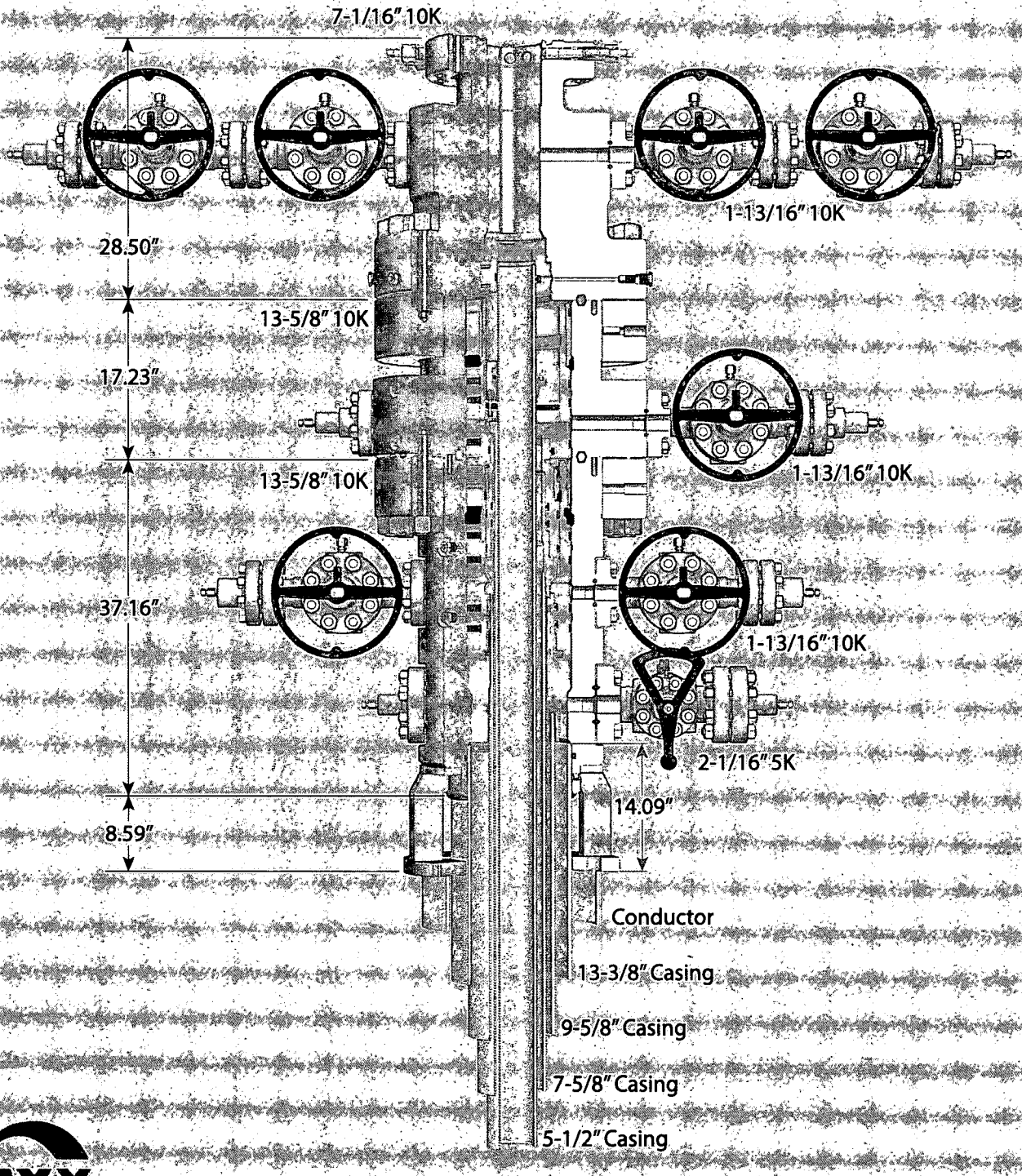
To Co-Flex and Choke Manifold

CAMERON

A Schlumberger Company

# 13-5/8" 10K MN-DS Wellhead

## Four String




1615045

NOTE: All dimensions on this drawing are estimated measurements and should be evaluated by engineering.

## OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

### 1) Casing Design Assumptions

#### a) Burst Loads

CSG Test (Surface)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
  - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
  - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
  - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
  - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of 0.02 X MD of the shoe to account for pumping friction pressure.
- External: Mud weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Kick (Intermediate)

- The string must be designed to at least a gas kick load case unless the rig is unable to detect a kick. For the gas kick load case, the internal pressure profile must be based on a minimum volume of 50 bbl or the minimum kick detection capability of the rig, whichever is greater, and a kick intensity of 2.0 ppg for Class 1, 1.0 ppg of Class 2, and 0.5 ppg for Class 3 and 4 wells.
- Internal: Influx depth of the maximum pore pressure of 0.55 "gas kick gravity" of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Producing (Production)

- Internal: SITP plus a packer fluid gradient to the shoe or top of packer.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Stimulating (Production)

- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Injection / Stimulation Down Casing (Production)

- Internal: Surface pressure plus injection fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

**b)** Collapse Loads

Lost Circulation (Surface / Intermediate)

- Internal: Lost circulation at the TD of the next hole section, and the fluid level falls to a depth where the hydrostatic of the mud equals pore pressure at the depth of the lost circulation zone.
- External: MW of the drilling mud that was in the hole when the casing was run.

Cementing (Surface / Intermediate / Production)

- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

**c)** Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.

## OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

## 1) Casing Design Assumptions

### a) Burst Loads

CSG Test (Surface)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
  - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
  - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
  - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
  - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of 0.02 X MD of the shoe to account for pumping friction pressure.
- External: Mud weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Kick (Intermediate)

- The string must be designed to at least a gas kick load case unless the rig is unable to detect a kick. For the gas kick load case, the internal pressure profile must be based on a minimum volume of 50 bbl or the minimum kick detection capability of the rig, whichever is greater, and a kick intensity of 2.0 ppg for Class 1, 1.0 ppg of Class 2, and 0.5 ppg for Class 3 and 4 wells.
- Internal: Influx depth of the maximum pore pressure of 0.55 "gas kick gravity" of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Producing (Production)

- Internal: SITP plus a packer fluid gradient to the shoe or top of packer.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Stimulating (Production)

- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Injection / Stimulation Down Casing (Production)

- Internal: Surface pressure plus injection fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

**b)** Collapse Loads

Lost Circulation (Surface / Intermediate)

- Internal: Lost circulation at the TD of the next hole section, and the fluid level falls to a depth where the hydrostatic of the mud equals pore pressure at the depth of the lost circulation zone.
- External: MW of the drilling mud that was in the hole when the casing was run.

Cementing (Surface / Intermediate / Production)

- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

**c)** Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.

## OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

### 1) Casing Design Assumptions

#### a) Burst Loads

CSG Test (Surface)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
  - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
  - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
  - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
  - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of 0.02 X MD of the shoe to account for pumping friction pressure.
- External: Mud weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Kick (Intermediate)

- The string must be designed to at least a gas kick load case unless the rig is unable to detect a kick. For the gas kick load case, the internal pressure profile must be based on a minimum volume of 50 bbl or the minimum kick detection capability of the rig, whichever is greater, and a kick intensity of 2.0 ppg for Class 1, 1.0 ppg of Class 2, and 0.5 ppg for Class 3 and 4 wells.
- Internal: Influx depth of the maximum pore pressure of 0.55 "gas kick gravity" of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Producing (Production)

- Internal: SITP plus a packer fluid gradient to the shoe or top of packer.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Stimulating (Production)

- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Injection / Stimulation Down Casing (Production)

- Internal: Surface pressure plus injection fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

**b)** Collapse Loads

Lost Circulation (Surface / Intermediate)

- Internal: Lost circulation at the TD of the next hole section, and the fluid level falls to a depth where the hydrostatic of the mud equals pore pressure at the depth of the lost circulation zone.
- External: MW of the drilling mud that was in the hole when the casing was run.

Cementing (Surface / Intermediate / Production)

- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

**c)** Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.

# PERFORMANCE DATA

**TMK UP DQX** **5.500 in** **20.00 lbs/ft** **P-110**
**Technical Data Sheet**

## Tubular Parameters

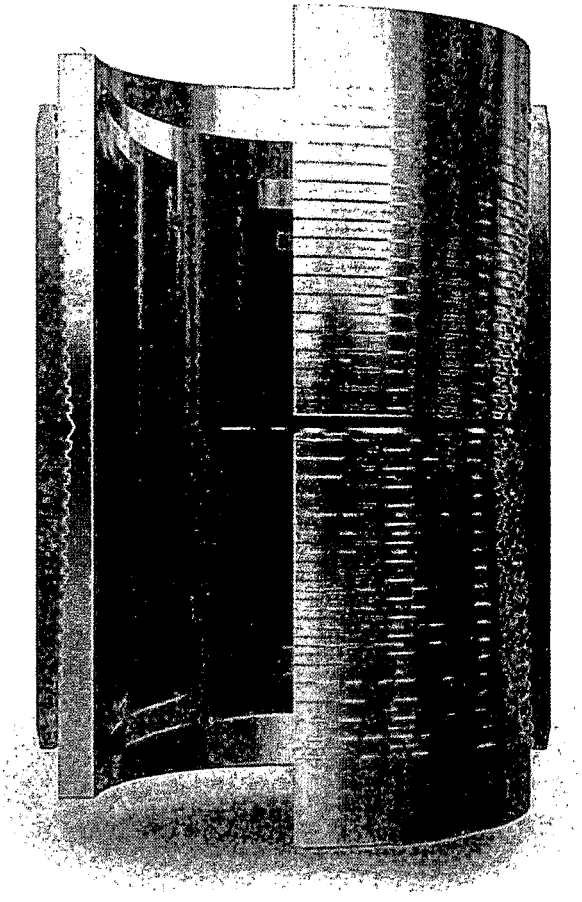
| | | | | | |
|---|---|---|---|---|---|
| Size | 5.500 | in | Minimum Yield | 110,000 | psi |
| Nominal Weight | 20.00 | lbs/ft | Minimum Tensile | 125,000 | psi |
| Grade | P-110 | | Yield Load | 641,000 | lbs |
| PE Weight | 19.81 | lbs/ft | Tensile Load | 729,000 | lbs |
| Wall Thickness | 0.361 | in | Min. Internal Yield Pressure | 12,600 | psi |
| Nominal ID | 4.778 | in | Collapse Pressure | 11,100 | psi |
| Drift Diameter | 4.653 | in | | | |
| Nom. Pipe Body Area | 5.828 | in² | | | |

## Connection Parameters

| | | |
|---|---|---|
| Connection OD | 6.050 | in |
| Connection ID | 4.778 | in |
| Make-Up Loss | 4.122 | in |
| Critical Section Area | 5.828 | in² |
| Tension Efficiency | 100.0 | % |
| Compression Efficiency | 100.0 | % |
| Yield Load In Tension | 641,000 | lbs |
| Min. Internal Yield Pressure | 12,600 | psi |
| Collapse Pressure | 11,100 | psi |

## Make-Up Torques

| | | |
|---|---|---|
| Min. Make-Up Torque | 11,600 | ft-lbs |
| Opt. Make-Up Torque | 12,900 | ft-lbs |
| Max. Make-Up Torque | 14,100 | ft-lbs |
| Yield Torque | 20,600 | ft-lbs |



**Printed on: July-29-2014**



TMK IPSCO

## OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

## 1) Casing Design Assumptions

### a) Burst Loads

CSG Test (Surface)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
  - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
  - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
  - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
  - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of 0.02 X MD of the shoe to account for pumping friction pressure.
- External: Mud weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Kick (Intermediate)

- The string must be designed to at least a gas kick load case unless the rig is unable to detect a kick. For the gas kick load case, the internal pressure profile must be based on a minimum volume of 50 bbl or the minimum kick detection capability of the rig, whichever is greater, and a kick intensity of 2.0 ppg for Class 1, 1.0 ppg of Class 2, and 0.5 ppg for Class 3 and 4 wells.
- Internal: Influx depth of the maximum pore pressure of 0.55 "gas kick gravity" of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Producing (Production)

- Internal: SITP plus a packer fluid gradient to the shoe or top of packer.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Stimulating (Production)

- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Injection / Stimulation Down Casing (Production)

- Internal: Surface pressure plus injection fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

**b)** Collapse Loads

Lost Circulation (Surface / Intermediate)

- Internal: Lost circulation at the TD of the next hole section, and the fluid level falls to a depth where the hydrostatic of the mud equals pore pressure at the depth of the lost circulation zone.
- External: MW of the drilling mud that was in the hole when the casing was run.

Cementing (Surface / Intermediate / Production)

- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

**c)** Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.

## OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

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### a) Burst Loads

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- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
  - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
  - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
  - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
  - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of 0.02 X MD of the shoe to account for pumping friction pressure.
- External: Mud weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Kick (Intermediate)

- The string must be designed to at least a gas kick load case unless the rig is unable to detect a kick. For the gas kick load case, the internal pressure profile must be based on a minimum volume of 50 bbl or the minimum kick detection capability of the rig, whichever is greater, and a kick intensity of 2.0 ppg for Class 1, 1.0 ppg of Class 2, and 0.5 ppg for Class 3 and 4 wells.
- Internal: Influx depth of the maximum pore pressure of 0.55 "gas kick gravity" of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Producing (Production)

- Internal: SITP plus a packer fluid gradient to the shoe or top of packer.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Stimulating (Production)

- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Injection / Stimulation Down Casing (Production)

- Internal: Surface pressure plus injection fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

**b)** Collapse Loads

Lost Circulation (Surface / Intermediate)

- Internal: Lost circulation at the TD of the next hole section, and the fluid level falls to a depth where the hydrostatic of the mud equals pore pressure at the depth of the lost circulation zone.
- External: MW of the drilling mud that was in the hole when the casing was run.

Cementing (Surface / Intermediate / Production)

- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

**c)** Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.

# PERFORMANCE DATA

**TMK UP TORQ™ DQW** **5.500 in** **20.00 lbs/ft** **P110 CY**

**Technical Data Sheet**

## Tubular Parameters

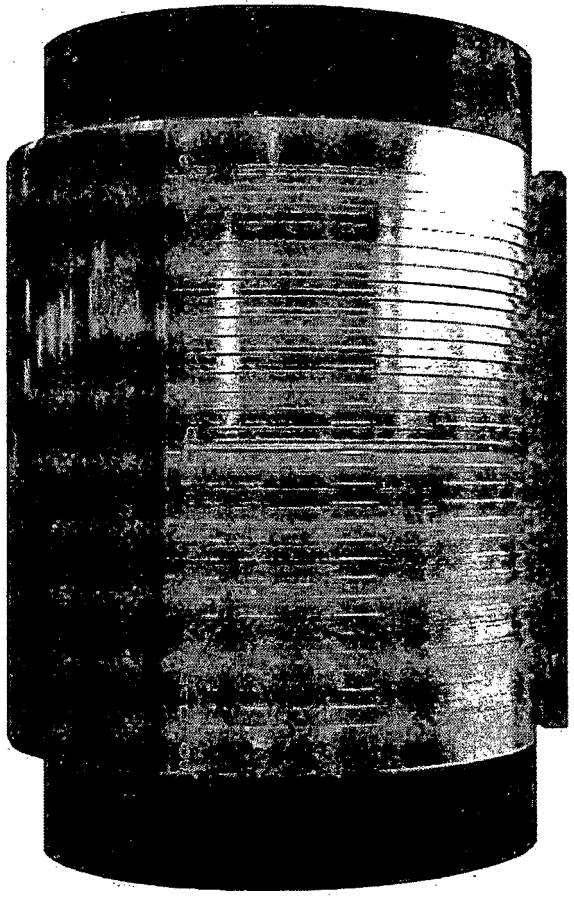
| | | | | | |
|---|---|---|---|---|---|
| Size | 5.500 | in | Minimum Yield | 110,000 | psi |
| Nominal Weight | 20.00 | lbs/ft | Minimum Tensile | 125,000 | psi |
| Grade | P110 CY | | Yield Load | 641,000 | lbs |
| PE Weight | 19.81 | lbs/ft | Tensile Load | 729,000 | lbs |
| Wall Thickness | 0.361 | in | Min. Internal Yield Pressure | 12,640 | psi |
| Nominal ID | 4.778 | in | Collapse Pressure | 11,110 | psi |
| Drift Diameter | 4.653 | in | | | |
| Nom. Pipe Body Area | 5.828 | in² | | | |

## Connection Parameters

| | | |
|---|---|---|
| Connection OD | 6.050 | in |
| Connection ID | 4.778 | in |
| Make-Up Loss | 4.324 | in |
| Critical Section Area | 5.828 | in² |
| Tension Efficiency | 100.0 | % |
| Compression Efficiency | 100.0 | % |
| Yield Load In Tension | 641,000 | lbs |
| Min. Internal Yield Pressure | 12,640 | psi |
| Collapse Pressure | 11,110 | psi |
| Uniaxial Bending | 92 | °/ 100 ft |

## Make-Up Torques

| | | |
|---|---|---|
| Min. Make-Up Torque | 14,000 | ft-lbs |
| Opt. Make-Up Torque | 16,000 | ft-lbs |
| Max. Make-Up Torque | 18,000 | ft-lbs |
| Operating Torque | 36,800 | ft-lbs |
| Yield Torque | 46,000 | ft-lbs |



**Printed on: March-05-2019**



TMK IPSCO

# PERFORMANCE DATA

**TMK UP DQX** **5.500 in** **20.00 lbs/ft** **P-110**
**Technical Data Sheet**

## Tubular Parameters

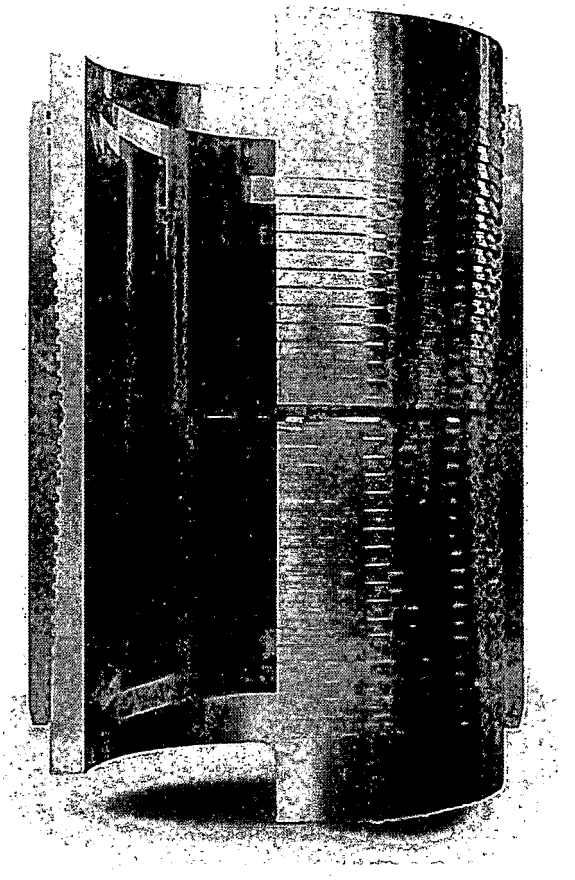
| | | | | | |
|---|---|---|---|---|---|
| Size | 5.500 | in | Minimum Yield | 110,000 | psi |
| Nominal Weight | 20.00 | lbs/ft | Minimum Tensile | 125,000 | psi |
| Grade | P-110 | | Yield Load | 641,000 | lbs |
| PE Weight | 19.81 | lbs/ft | Tensile Load | 729,000 | lbs |
| Wall Thickness | 0.361 | in | Min. Internal Yield Pressure | 12,600 | psi |
| Nominal ID | 4.778 | in | Collapse Pressure | 11,100 | psi |
| Drift Diameter | 4.653 | in | | | |
| Nom. Pipe Body Area | 5.828 | in² | | | |

## Connection Parameters

| | | |
|---|---|---|
| Connection OD | 6.050 | in |
| Connection ID | 4.778 | in |
| Make-Up Loss | 4.122 | in |
| Critical Section Area | 5.828 | in² |
| Tension Efficiency | 100.0 | % |
| Compression Efficiency | 100.0 | % |
| Yield Load In Tension | 641,000 | lbs |
| Min. Internal Yield Pressure | 12,600 | psi |
| Collapse Pressure | 11,100 | psi |

## Make-Up Torques

| | | |
|---|---|---|
| Min. Make-Up Torque | 11,600 | ft-lbs |
| Opt. Make-Up Torque | 12,900 | ft-lbs |
| Max. Make-Up Torque | 14,100 | ft-lbs |
| Yield Torque | 20,600 | ft-lbs |



**Printed on: July-29-2014**

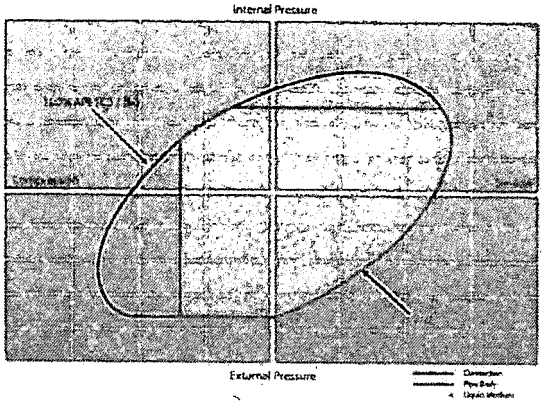
# TECHNICAL DATA SHEET TMK UP DQX 5.5 X 20 P110

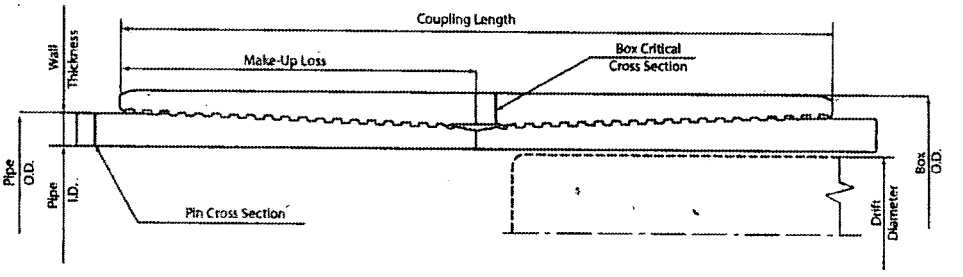
| TUBULAR PARAMETERS | |
|---|---|
| Nominal OD, (inch) | 5.500 |
| Wall Thickness, (inch) | 0.361 |
| Pipe Grade | P110 |
| Coupling | Regular |
| Coupling Grade | P110 |
| Drift | Standard |

| CONNECTION PARAMETERS | |
|---|---|
| Connection OD (inch) | 6.05 |
| Connection ID, (inch) | 4.778 |
| Make-Up Loss, (inch) | 4.122 |
| Connection Critical Area, (sq inch) | 5.828 |
| Yield Strength in Tension, (klbs) | 641 |
| Yeld Strength in Compression, (klbs) | 641 |
| Tension Efficiency | 100% |
| Compression Efficiency | 100% |
| Min. Internal Yield Pressure, (psi) | 12 640 |
| Collapse Pressure, (psi) | 11 110 |
| Uniaxial Bending (deg/100ft) | 91.7 |

| MAKE-UP TORQUES | |
|---|---|
| Yield Torque, (ft-lb) | 20 600 |
| Minimum Make-Up Torque, (ft-lb) | 11 600 |
| Optimum Make-Up Torque, (ft-lb) | 12 900 |
| Maximum Make-Up Torque, (ft-lb) | 14 100 |

| PIPE BODY PROPERTIES | |
|---|---|
| PE Weight, (lbs/ft) | 19.81 |
| Nominal Weight, (lbs/ft) | 20.00 |
| Nominal ID, (inch) | 4.778 |
| Drift Diameter, (inch) | 4.653 |
| Nominal Pipe Body Area, (sq inch) | 5.828 |
| Yield Strength in Tension, (klbs) | 641 |
| Min. Internal Yield Pressure, (psi) | 12 640 |
| Collapse Pressure, (psi) | 11 110 |



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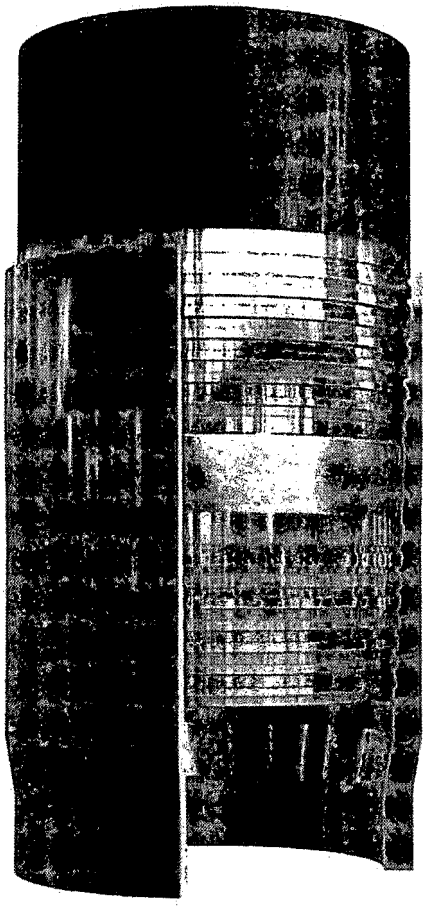
# PERFORMANCE DATA

**TMK UP SF TORQ™** **5.500 in** **20.00 lbs/ft** **P110 HC**

**Technical Data Sheet**

## Tubular Parameters

| | | | | | |
|---|---|---|---|---|---|
| Size | 5.500 | in | Minimum Yield | 110,000 | psi |
| Nominal Weight | 20.00 | lbs/ft | Minimum Tensile | 125,000 | psi |
| Grade | P110 HC | | Yield Load | 641,000 | lbs |
| PE Weight | 19.81 | lbs/ft | Tensile Load | 728,000 | lbs |
| Wall Thickness | 0.361 | in | Min. Internal Yield Pressure | 12,640 | psi |
| Nominal ID | 4.778 | in | Collapse Pressure | 12,780 | psi |
| Drift Diameter | 4.653 | in | | | |
| Nom. Pipe Body Area | 5.828 | in² | | | |



## Connection Parameters

| | | |
|---|---|---|
| Connection OD | 5.777 | in |
| Connection ID | 4.734 | in |
| Make-Up Loss | 5.823 | in |
| Critical Section Area | 5.875 | in² |
| Tension Efficiency | 90.0 | % |
| Compression Efficiency | 90.0 | % |
| Yield Load In Tension | 576,000 | lbs |
| Min. Internal Yield Pressure | 12,640 | psi |
| Collapse Pressure | 12,780 | psi |
| Uniaxial Bending | 83 | °/ 100 ft |

## Make-Up Torques

| | | |
|---|---|---|
| Min. Make-Up Torque | 15,700 | ft-lbs |
| Opt. Make-Up Torque | 19,600 | ft-lbs |
| Max. Make-Up Torque | 21,600 | ft-lbs |
| Operating Torque | 29,000 | ft-lbs |
| Yield Torque | 36,000 | ft-lbs |

**Printed on: February-22-2018**



TMK IPSCO

## OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

## 1) Casing Design Assumptions

### a) Burst Loads

CSG Test (Surface)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
  - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
  - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
  - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
  - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of 0.02 X MD of the shoe to account for pumping friction pressure.
- External: Mud weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Kick (Intermediate)

- The string must be designed to at least a gas kick load case unless the rig is unable to detect a kick. For the gas kick load case, the internal pressure profile must be based on a minimum volume of 50 bbl or the minimum kick detection capability of the rig, whichever is greater, and a kick intensity of 2.0 ppg for Class 1, 1.0 ppg of Class 2, and 0.5 ppg for Class 3 and 4 wells.
- Internal: Influx depth of the maximum pore pressure of 0.55 "gas kick gravity" of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Producing (Production)

- Internal: SITP plus a packer fluid gradient to the shoe or top of packer.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Stimulating (Production)

- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Injection / Stimulation Down Casing (Production)

- Internal: Surface pressure plus injection fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

**b)** Collapse Loads

Lost Circulation (Surface / Intermediate)

- Internal: Lost circulation at the TD of the next hole section, and the fluid level falls to a depth where the hydrostatic of the mud equals pore pressure at the depth of the lost circulation zone.
- External: MW of the drilling mud that was in the hole when the casing was run.

Cementing (Surface / Intermediate / Production)

- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

**c)** Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.

## OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

## 1) Casing Design Assumptions

### a) Burst Loads

CSG Test (Surface)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
  - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
  - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
  - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
  - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of 0.02 X MD of the shoe to account for pumping friction pressure.
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- Internal: Influx depth of the maximum pore pressure of 0.55 "gas kick gravity" of gas to surface while drilling the next hole section.
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- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
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- External: MW of the drilling mud that was in the hole when the casing was run.

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- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

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- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

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Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

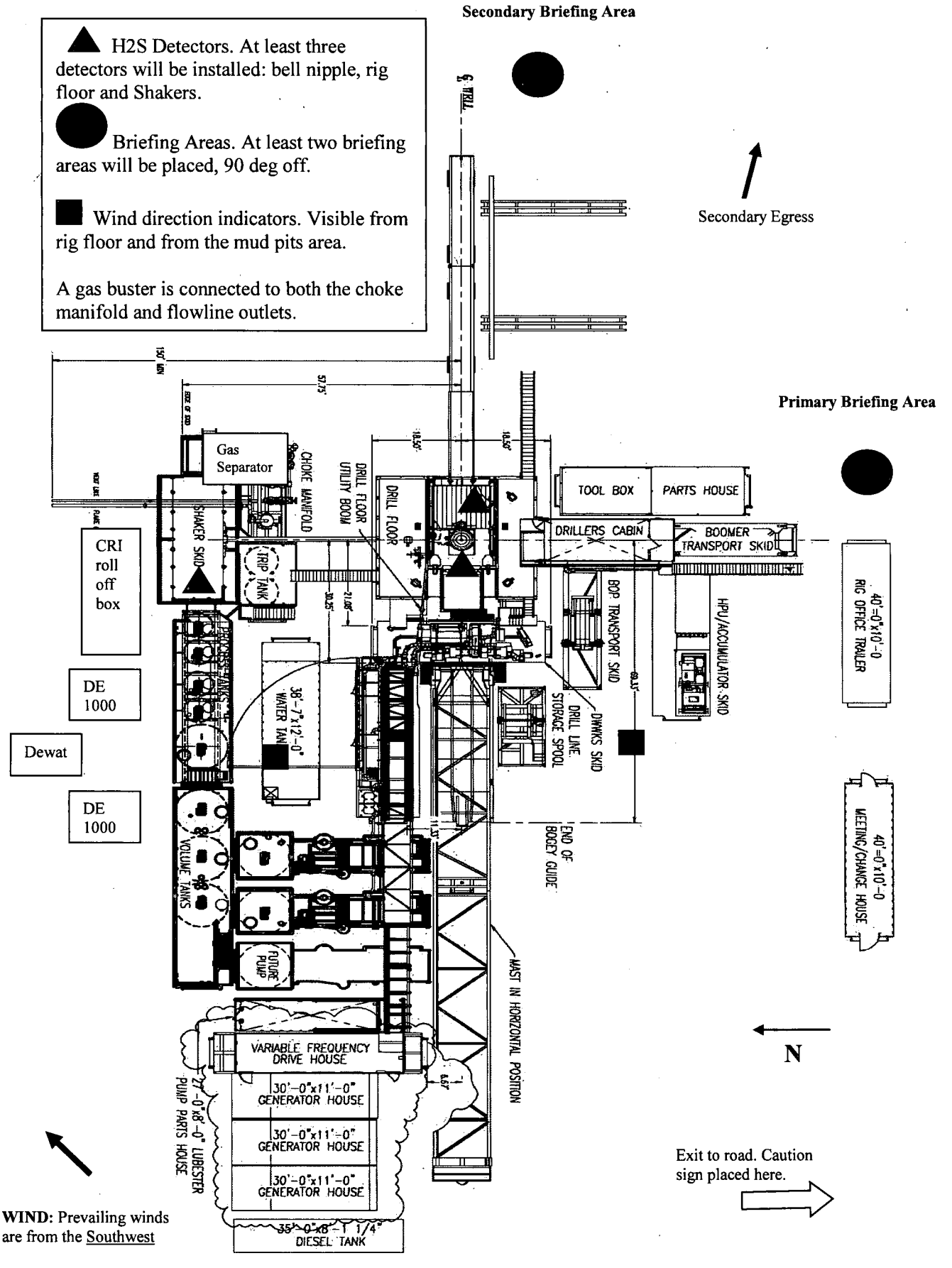
- Axial: Buoyant weight of the string plus cement plug bump pressure load.

# Permian Drilling
# Hydrogen Sulfide Drilling Operations Plan
# Palladium MDP1 7-6 Federal Com 171H

Open drill site. No homes or buildings are near the proposed location.

1. Escape

   Personnel shall escape upwind of wellbore in the event of an emergency gas release. Escape can take place through the lease road on the Southeast side of the location. Personnel need to move to a safe distance and block the entrance to location. If the primary route is not an option due to the wind direction, then a secondary egress route should be taken.


Secondary Briefing Area
H2S Detectors. At least three detectors will be installed: bell nipple, rig floor and Shakers.
Briefing Areas. At least two briefing areas will be placed, 90 deg off.
Wind direction indicators. Visible from rig floor and from the mud pits area.
A gas buster is connected to both the choke manifold and flowline outlets.
Secondary Egress
Primary Briefing Area
Gas Separator
CHOKE MANIFOLD
DRILL FLOOR UTILITY BOOM
DRILL FLOOR
SHAKER SKID
TRIP TANK
TOOL BOX
PARTS HOUSE
DRILLERS CABIN
BOOMER TRANSPORT SKID
BOP TRANSPORT SKID
HPU/ACCUMULATOR SKID
DRILL LINE STORAGE SPOOL
DWWKS SKID
40'-0"x10'-0 RIG OFFICE TRAILER
40'-0"x10'-0 MEETING/CHANGE HOUSE
CRI roll off box
DE 1000
Dewat
DE 1000
38'-7"x12'-0" WATER TANK
VOLUME TANKS
FUTURE PUMP
END OF BOGEY GUIDE
MAST IN HORIZONTAL POSITION
VARIABLE FREQUENCY DRIVE HOUSE
30'-0"x11'-0" GENERATOR HOUSE
30'-0"x11'-0" GENERATOR HOUSE
30'-0"x11'-0" GENERATOR HOUSE
27'-0"x8'-0" LUBESTER PUMP PARTS HOUSE
35'-0"x8'-1 1/4" DIESEL TANK
N
Exit to road. Caution sign placed here.
WIND: Prevailing winds are from the Southwest


# Permian Drilling
# Hydrogen Sulfide Drilling Operations Plan
# New Mexico

## Scope

This contingency plan establishes guidelines for the public, all company employees, and contract employees who's work activities may involve exposure to hydrogen sulfide (H2S) gas.
While drilling this well, it is possible to encounter H2S bearing formations. At all times, the first barrier to control H2S emissions will be the drilling fluid, which will have a density high enough to control influx.

## Objective

1. Provide an immediate and predetermined response plan to any condition when H2S is detected. All H2S detections in excess of 10 parts per million (ppm) concentration are considered an Emergency.

2. Prevent any and all accidents, and prevent the uncontrolled release of hydrogen sulfide into the atmosphere.

3. Provide proper evacuation procedures to cope with emergencies.

4. Provide immediate and adequate medical attention should an injury occur.

## Discussion

| | |
|---|---|
| Implementation: | This plan with all details is to be fully implemented before drilling to commence. |
| Emergency response Procedure: | This section outlines the conditions and denotes steps to be taken in the event of an emergency. |
| Emergency equipment Procedure: | This section outlines the safety and emergency equipment that will be required for the drilling of this well. |
| Training provisions: | This section outlines the training provisions that must be adhered to prior to drilling. |
| Drilling emergency call lists: | Included are the telephone numbers of all persons to be contacted should an emergency exist. |
| Briefing: | This section deals with the briefing of all people involved in the drilling operation. |
| Public safety: | Public safety personnel will be made aware of any potential evacuation and any additional support needed. |
| Check lists: | Status check lists and procedural check lists have been included to insure adherence to the plan. |
| General information: | A general information section has been included to supply support information. |

## Hydrogen Sulfide Training

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on the well:

1. The hazards and characteristics of H2S.
2. Proper use and maintenance of personal protective equipment and life support systems.
3. H2S detection.
4. Proper use of H2S detectors, alarms, warning systems, briefing areas, evacuation procedures and prevailing winds.
5. Proper techniques for first aid and rescue procedures.
6. Physical effects of hydrogen sulfide on the human body.
7. Toxicity of hydrogen sulfide and sulfur dioxide.
8. Use of SCBA and supplied air equipment.
9. First aid and artificial respiration.
10. Emergency rescue.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H2S on metal components. If high tensile strength tubular is to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling a well, blowout prevention and well control procedures.
3. The contents and requirements of the H2S Drilling Operations Plan.

H2S training refresher must have been taken within one year prior to drilling the well. Specifics on the well to be drilled will be discussed during the pre-spud meeting. H2S and well control (choke) drills will be performed while drilling the well, at least on a weekly basis. This plan shall be available in the well site. All personnel will be required to carry the documentation proving that the H2S training has been taken.

Service company and visiting personnel

A. Each service company that will be on this well will be notified if the zone contains H2S.

B. Each service company must provide for the training and equipment of their employees before they arrive at the well site.

C. Each service company will be expected to attend a well site briefing

## Emergency Equipment Requirements

1. Well control equipment

The well shall have hydraulic BOP equipment for the anticipated pressures. Equipment is to be tested on installation and follow Oxy Well Control standard, as well as BLM Onshore Order #2.

*Special control equipment:*

A. Hydraulic BOP equipment with remote control on ground. Remotely operated choke.
B. Rotating head
C. Gas buster equipment shall be installed before drilling out of surface pipe.

2. Protective equipment for personnel

A. Four (4) 30-minute positive pressure air packs (2 at each briefing area) on location.

B. Adequate fire extinguishers shall be located at strategic locations.

C. Radio / cell telephone communication will be available at the rig.

- Rig floor and trailers.
- Vehicle.

3. Hydrogen sulfide sensors and alarms

A. H2S sensor with alarms will be located on the rig floor, at the bell nipple, and at the flow line. These monitors will be set to alarm at 10 ppm with strobe light, and audible alarm.
B. Hand operated detectors with tubes.
C. H2S monitor tester (to be provided by contract Safety Company.)
D. There shall be one combustible gas detector on location at all times.

4. Visual Warning Systems

A. One sign located at each location entrance with the following language:

**Caution – potential poison gas**
**Hydrogen sulfide**
**No admittance without authorization**

*Wind sock – wind streamers*:

A. One 36" (in length) wind sock located at protection center, at height visible from rig floor.
B. One 36" (in length) wind sock located at height visible from pit areas.

*Condition flags*

A. One each condition flag to be displayed to denote conditions.

**green – normal conditions**
**yellow – potential danger**
**red – danger, H2S present**

B. Condition flag shall be posted at each location sign entrance.

5. Mud Program

The mud program is designed to minimize the risk of having H2S and other formation fluids at surface. Proper mud weight and safe drilling practices will be applied. H2S scavengers will be used to minimize the hazards while drilling. Below is a summary of the drilling program.

*Mud inspection devices:*

Garrett gas train or hatch tester for inspection of sulfide concentration in mud system.

6. Metallurgy

A. Drill string, casing, tubing, wellhead, blowout preventers, drilling spools or adapters, kill lines, choke manifold, lines and valves shall be suitable for the H2S service.
B. All the elastomers, packing, seals and ring gaskets shall be suitable for H2S service.

7. Well Testing

No drill stem test will be performed on this well.

8. Evacuation plan

Evacuation routes should be established prior to well spud for each well and discussed with all rig personnel.

9. Designated area

A. Parking and visitor area: all vehicles are to be parked at a predetermined safe distance from the wellhead.
B. There will be a designated smoking area.
C. Two briefing areas on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds perpendicularly, or at a 45-degree angle if wind direction tends to shift in the area.

## Emergency procedures

A. In the event of any evidence of H2S level above 10 ppm, take the following steps:

1. The Driller will pick up off bottom, shut down the pumps, slow down the pipe rotation.

2. Secure and don escape breathing equipment, report to the upwind designated safe briefing / muster area.

3. All personnel on location will be accounted for and emergency search should begin for any missing, the Buddy System will be implemented.

4. Order non-essential personnel to leave the well site, order all essential personnel out of the danger zone and upwind to the nearest designated safe briefing / muster area.

5. Entrance to the location will be secured to a higher level than our usual "Meet and Greet" requirement, and the proper condition flag will be displayed at the entrance to the location.

6. Take steps to determine if the H2S level can be corrected or suppressed and, if so, proceed as required.

B. If uncontrollable conditions occur:

1. Take steps to protect and/or remove any public in the down-wind area from the rig – partial evacuation and isolation. Notify necessary public safety personnel and appropriate regulatory entities (i.e. BLM) of the situation.

2. Remove all personnel to the nearest upwind designated safe briefing / muster area or off location.

3. Notify public safety personnel of safe briefing / muster area.

4. An assigned crew member will blockade the entrance to the location. No unauthorized personnel will be allowed entry to the location.

5. Proceed with best plan (at the time) to regain control of the well. Maintain tight security and safety procedures.

C. Responsibility:

1. Designated personnel.

a. Shall be responsible for the total implementation of this plan.
b. Shall be in complete command during any emergency.
c. Shall designate a back-up.

| | |
|---|---|
| All personnel: | 1. On alarm, don escape unit and report to the nearest upwind designated safe briefing / muster area upw<br>2. Check status of personnel (buddy system).<br>3. Secure breathing equipment.<br>4. Await orders from supervisor. |
| Drill site manager: | 1. Don escape unit if necessary and report to nearest upwind designated safe briefing / muster area.<br>2. Coordinate preparations of individuals to return to point of release with tool pusher and driller (using the buddy system).<br>3. Determine H2S concentrations.<br>4. Assess situation and take control measures. |
| Tool pusher: | 1. Don escape unit Report to up nearest upwind designated safe briefing / muster area.<br>2. Coordinate preparation of individuals to return to point of release with tool pusher drill site manager (using the buddy system).<br>3. Determine H2S concentration.<br>4. Assess situation and take control measures. |
| Driller: | 1. Don escape unit, shut down pumps, continue |

| | |
|---|---|
| | rotating DP.<br>2. Check monitor for point of release.<br>3. Report to nearest upwind designated safe briefing / muster area.<br>4. Check status of personnel (in an attempt to rescue, use the buddy system).<br>5. Assigns least essential person to notify Drill Site Manager and tool pusher by quickest means in case of their absence.<br>6. Assumes the responsibilities of the Drill Site Manager and tool pusher until they arrive should they be absent. |
| Derrick man<br>Floor man #1<br>Floor man #2 | 1. Will remain in briefing / muster area until instructed by supervisor. |
| Mud engineer: | 1. Report to nearest upwind designated safe briefing / muster area.<br>2. When instructed, begin check of mud for ph and H2S level. (Garett gas train.) |
| Safety personnel: | 1. Mask up and check status of all personnel and secure operations as instructed by drill site manager. |

**Taking a kick**

When taking a kick during an H2S emergency, all personnel will follow standard Well control procedures after reporting to briefing area and masking up.

**Open-hole logging**

All unnecessary personnel off floor. Drill Site Manager and safety personnel should monitor condition, advise status and determine need for use of air equipment.

**Running casing or plugging**

Following the same "tripping" procedure as above. Drill Site Manager and safety personnel should determine if all personnel have access to protective equipment.

## Ignition procedures

The decision to ignite the well is the responsibility of the operator (Oxy Drilling Management). The decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. There is no hope controlling the blowout under the prevailing conditions at the well.

Instructions for igniting the well

1. Two people are required for the actual igniting operation. They must wear self-contained breathing units and have a safety rope attached. One man (tool pusher or safety engineer) will check the atmosphere for explosive gases with the gas monitor. The other man is responsible for igniting the well.
2. Primary method to ignite: 25 mm flare gun with range of approximately 500 feet.
3. Ignite upwind and do not approach any closer than is warranted.
4. Select the ignition site best for protection, and which offers an easy escape route.
5. Before firing, check for presence of combustible gas.
6. After lighting, continue emergency action and procedure as before.
7. All unassigned personnel will remain in briefing area until instructed by supervisor or directed by the Drill Site Manager.

**Remember**: After well is ignited, burning hydrogen sulfide will convert to sulfur dioxide, which is also highly toxic. **Do not assume the area is safe after the well is ignited.**

## Status check list

Note: All items on this list must be completed before drilling to production casing point.

1. H2S sign at location entrance.
2. Two (2) wind socks located as required.
3. Four (4) 30-minute positive pressure air packs (2 at each Briefing area) on location for all rig personnel and mud loggers.
4. Air packs inspected and ready for use.
5. Cascade system and hose line hook-up as needed.
6. Cascade system for refilling air bottles as needed.
7. Condition flag on location and ready for use.
8. H2S detection system hooked up and tested.
9. H2S alarm system hooked up and tested.
10. Hand operated H2S detector with tubes on location.
11. 1 – 100' length of nylon rope on location.
12. All rig crew and supervisors trained as required.
13. All outside service contractors advised of potential H2S hazard on well.
14. No smoking sign posted and a designated smoking area identified.
15. Calibration of all H2S equipment shall be noted on the IADC report.

Checked by:_____ Date:_____

## Procedural check list during H2S events

**Perform each tour:**

1. Check fire extinguishers to see that they have the proper charge.

2. Check breathing equipment to ensure that it in proper working order.

3. Make sure all the H2S detection system is operative.

**Perform each week:**

1. Check each piece of breathing equipment to make sure that demand or forced air regulator is working. This requires that the bottle be opened and the mask assembly be put on tight enough so that when you inhale, you receive air or feel air flow.

2. BOP skills (well control drills).

3. Check supply pressure on BOP accumulator stand by source.

4. Check breathing equipment mask assembly to see that straps are loosened and turned back, ready to put on.

5. Check pressure on breathing equipment air bottles to make sure they are charged to full volume. ( Air quality checked for proper air grade "D" before bringing to location)

6. Confirm pressure on all supply air bottles.

7. Perform breathing equipment drills with on-site personnel.

8. Check the following supplies for availability.

   A. Emergency telephone list.
   B. Hand operated H2S detectors and tubes.

## General evacuation plan

1. When the company approved supervisor (Drill Site Manager, consultant, rig pusher, or driller) determines the H2S gas cannot be limited to the well location and the public will be involved, he will activate the evacuation plan.

2. Drill Site Manager or designee will notify local government agency that a hazardous condition exists and evacuation needs to be implemented.

3. Company or contractor safety personnel that have been trained in the use of H2S detection equipment and self-contained breathing equipment will monitor H2S concentrations, wind directions, and area of exposure. They will delineate the outer perimeter of the hazardous gas area. Extension to the evacuation area will be determined from information gathered.

4. Law enforcement personnel (state police, police dept., fire dept., and sheriff's dept.) Will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.

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

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

## Emergency actions

Well blowout – if emergency

1. Evacuate all personnel to "Safe Briefing / Muster Areas" or off location if needed.
2. If sour gas – evacuate rig personnel.
3. If sour gas – evacuate public within 3000 ft radius of exposure.
4. Don SCBA and shut well in if possible using the buddy system.
5. Notify Drilling Superintendent and call 911 for emergency help (fire dept and ambulance) if needed.
6. Implement the Blowout Contingency Plan, and Drilling Emergency Action Plan.
6. Give first aid as needed.

Person down location/facility

1. If immediately possible, contact 911. Give location and wait for confirmation.
2. Don SCBA and perform rescue operation using buddy system.

## Toxic effects of hydrogen sulfide

Hydrogen sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 ppm, which is .001% by volume. Hydrogen sulfide is heavier than air (specific gravity – 1.192) and colorless. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. Hydrogen sulfide is almost as toxic as hydrogen cyanide and is between five and six times more toxic than carbon monoxide. Toxicity data for hydrogen sulfide and various other gases are compared in table i. Physical effects at various hydrogen sulfide exposure levels are shown in table ii.

Table i
Toxicity of various gases

| Common name | Chemical formula | Specific gravity (sc=1) | Threshold limit (1) | Hazardous limit (2) | Lethal concentration (3) |
|---|---|---|---|---|---|
| Hydrogen Cyanide | Hcn | 0.94 | 10 ppm | 150 ppm/hr | 300 ppm |
| Hydrogen Sulfide | H2S | 1.18 | 10 ppm | 250 ppm/hr | 600 ppm |
| Sulfur Dioxide | So2 | 2.21 | 5 ppm | - | 1000 ppm |
| Chlorine | Cl2 | 2.45 | 1 ppm | 4 ppm/hr | 1000 ppm |
| Carbon Monoxide | Co | 0.97 | 50 ppm | 400 ppm/hr | 1000 ppm |
| Carbon Dioxide | Co2 | 1.52 | 5000 ppm | 5% | 10% |
| Methane | Ch4 | 0.55 | 90,000 ppm | Combustible above 5% in air | |

1) threshold limit – concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.

2) hazardous limit – concentration that will cause death with short-term exposure.

3) lethal concentration – concentration that will cause death with short-term exposure.

## Toxic effects of hydrogen sulfide

Table ii
Physical effects of hydrogen sulfide

| Percent (%) | Ppm | Concentration Grains 100 std. Ft3* | Physical effects |
|---|---|---|---|
| 0.001 | <10 | 00.65 | Obvious and unpleasant odor. |

| | | | |
|---|---|---|---|
| 0.002 | 10 | 01.30 | Safe for 8 hours of exposure. |
| 0.010 | 100 | 06.48 | Kill smell in 3 – 15 minutes. May sting eyes and throat. |
| 0.020 | 200 | 12.96 | Kills smell shortly; stings eyes and throat. |
| 0.050 | 500 | 32.96 | Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration. |
| 0.070 | 700 | 45.36 | Unconscious quickly; death will result if not rescued promptly. |
| 0.100 | 1000 | 64.30 | Unconscious at once; followed by death within minutes. |

*at 15.00 psia and 60'f.

## Use of self-contained breathing equipment (SCBA)

1. Written procedures shall be prepared covering safe use of SCBA's in dangerous atmosphere, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available SCBA.

2 SCBA's shall be inspected frequently at random to insure that they are properly used, cleaned, and maintained.

3. Anyone who may use the SCBA's shall be trained in how to insure proper face-piece to face seal. They shall wear SCBA's in normal air and then wear them in a test atmosphere. (note: such items as facial hair {beard or sideburns} and eyeglasses will not allow proper seal.) Anyone that may be reasonably expected to wear SCBA's should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses or contact lenses.

4. Maintenance and care of SCBA's:

   a. A program for maintenance and care of SCBA's shall include the following:
      1. Inspection for defects, including leak checks.
      2. Cleaning and disinfecting.
      3. Repair.
      4. Storage.

   b. Inspection, self-contained breathing apparatus for emergency use shall be inspected monthly.
      1. Fully charged cylinders.
      2. Regulator and warning device operation.
      3. Condition of face piece and connections.
      4. Rubber parts shall be maintained to keep them pliable and prevent deterioration.

   c. Routinely used SCBA's shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.

5. Persons assigned tasks that requires use of self-contained breathing equipment shall be certified physically fit (medically cleared) for breathing equipment usage at least annually.

6. SCBA's should be worn when:

   A. Any employee works near the top or on top of any tank unless test reveals less than 10 ppm of H2S.

B. When breaking out any line where H2S can reasonably be expected.

C. When sampling air in areas to determine if toxic concentrations of H2S exists.

D. When working in areas where over 10 ppm H2S has been detected.

E. At any time there is a doubt as to the H2S level in the area to be entered.

## Rescue
## First aid for H2S poisoning

Do not panic!

Remain calm – think!

1. Don SCBA breathing equipment.

2. Remove victim(s) utilizing buddy system to fresh air as quickly as possible. (go up-wind from source or at right angle to the wind. Not down wind.)

3. Briefly apply chest pressure – arm lift method of artificial respiration to clean the victim's lungs and to avoid inhaling any toxic gas directly from the victim's lungs.

4. Provide for prompt transportation to the hospital, and continue giving artificial respiration if needed.

5. Hospital(s) or medical facilities need to be informed, before-hand, of the possibility of H2S gas poisoning – no matter how remote the possibility is.

6. Notify emergency room personnel that the victim(s) has been exposed to H2S gas.

Besides basic first aid, everyone on location should have a good working knowledge of artificial respiration.

Revised CM 6/27/2012

# OXY

**PRD NM DIRECTIONAL PLANS (NAD 1983)**
**PALLADIUM MDP1 7-6 FEDERAL COM**
**PALLADIUM MDP1 7-6 FEDERAL COM 171H**

**WB00**

**Plan: Permitting Plan**

# Standard Planning Report

**30 May, 2018**

| | | | |
|---|---|---|---|
| **Database:** | HOPSPP | **Local Co-ordinate Reference:** | Well PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| **Company:** | ENGINEERING DESIGNS | **TVD Reference:** | DATUM @ 3564.40ft |
| **Project:** | PRD NM DIRECTIONAL PLANS (NAD 1983) | **MD Reference:** | DATUM @ 3564.40ft |
| **Site:** | PALLADIUM MDP1 7-6 FEDERAL COM | **North Reference:** | Grid |
| **Well:** | PALLADIUM MDP1 7-6 FEDERAL COM 171H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | WB00 | | |
| **Design:** | Permitting Plan | | |

**Project** PRD NM DIRECTIONAL PLANS (NAD 1983)

| | | | |
|---|---|---|---|
| **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** PALLADIUM MDP1 7-6 FEDERAL COM

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 444,713.43 usft | **Latitude:** | 32° 13' 17.488845 N |
| **From:** | Map | **Easting:** | 702,101.68 usft | **Longitude:** | 103° 48' 48.486733 W |
| **Position Uncertainty:** | 0.00 ft | **Slot Radius:** | 13.200 in | **Grid Convergence:** | 0.28 ° |

**Well** PALLADIUM MDP1 7-6 FEDERAL COM 171H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 1,712.55 ft | **Northing:** | 446,425.87 usft | **Latitude:** | 32° 13' 34.557250 N |
| | **+E/-W** | -2,583.09 ft | **Easting:** | 699,518.75 usft | **Longitude:** | 103° 49' 18.459603 W |
| **Position Uncertainty** | | 0.00 ft | **Wellhead Elevation:** | 0.00 ft | **Ground Level:** | 3,537.90 ft |

**Wellbore** WB00

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | HDGM | 5/30/2018 | 6.90 | 59.95 | 48,028 |

**Design** Permitting Plan

**Audit Notes:**

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

| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
|---|---|---|---|---|
| | 0.00 | 0.00 | 0.00 | 355.35 |

**Plan Sections**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,280.00 | 0.00 | 0.00 | 5,280.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,780.22 | 10.00 | 233.30 | 5,777.68 | -26.03 | -34.93 | 2.00 | 2.00 | 0.00 | 233.30 | |
| 10,697.67 | 10.00 | 233.30 | 10,620.36 | -536.56 | -719.86 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 11,197.89 | 0.00 | 359.77 | 11,118.04 | -562.60 | -754.79 | 2.00 | -2.00 | 0.00 | 180.00 | PALLADIUM_171H |
| 12,101.89 | 90.40 | 359.77 | 11,690.98 | 14.36 | -757.10 | 10.00 | 10.00 | 0.00 | -0.23 | |
| 21,867.25 | 90.39 | 359.77 | 11,624.00 | 9,779.41 | -796.22 | 0.00 | 0.00 | 0.00 | 180.00 | PALLADIUM_171H |

| | | | |
|---|---|---|---|
| **Database:** | HOPSPP | **Local Co-ordinate Reference:** | Well PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| **Company:** | ENGINEERING DESIGNS | **TVD Reference:** | DATUM @ 3564.40ft |
| **Project:** | PRD,NM DIRECTIONAL PLANS (NAD 1983) | **MD Reference:** | DATUM @ 3564.40ft |
| **Site:** | PALLADIUM MDP1 7-6 FEDERAL COM | **North Reference:** | Grid |
| **Well:** | PALLADIUM MDP1 7-6 FEDERAL COM 171H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | WB00 | | |
| **Design:** | Permitting Plan | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 0.00 | 0.00 | 2,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 0.00 | 0.00 | 2,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 0.00 | 0.00 | 2,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 0.00 | 0.00 | 2,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 0.00 | 0.00 | 2,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 0.00 | 0.00 | 2,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 0.00 | 0.00 | 2,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 0.00 | 0.00 | 3,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 0.00 | 0.00 | 3,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 0.00 | 0.00 | 3,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 0.00 | 0.00 | 3,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 0.00 | 0.00 | 3,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 0.00 | 0.00 | 3,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 0.00 | 0.00 | 3,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 0.00 | 0.00 | 3,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 0.00 | 0.00 | 3,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 0.00 | 0.00 | 3,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 0.00 | 0.00 | 4,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 0.00 | 0.00 | 4,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 0.00 | 0.00 | 4,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 0.00 | 0.00 | 4,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 0.00 | 0.00 | 4,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 0.00 | 0.00 | 4,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 0.00 | 0.00 | 4,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 0.00 | 0.00 | 4,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 0.00 | 0.00 | 4,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 0.00 | 0.00 | 4,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 0.00 | 0.00 | 5,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 0.00 | 0.00 | 5,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 0.00 | 0.00 | 5,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | HOPSPP | **Local Co-ordinate Reference:** | Well PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| **Company:** | ENGINEERING DESIGNS | **TVD Reference:** | DATUM @ 3564.40ft |
| **Project:** | PRD NM DIRECTIONAL PLANS (NAD 1983) | **MD Reference:** | DATUM @ 3564.40ft |
| **Site:** | PALLADIUM MDP1 7-6 FEDERAL COM | **North Reference:** | Grid |
| **Well:** | PALLADIUM MDP1 7-6 FEDERAL COM 171H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | WB00 | | |
| **Design:** | Permitting Plan | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,280.00 | 0.00 | 0.00 | 5,280.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 0.40 | 233.30 | 5,300.00 | -0.04 | -0.06 | -0.04 | 2.00 | 2.00 | 0.00 |
| 5,400.00 | 2.40 | 233.30 | 5,399.97 | -1.50 | -2.01 | -1.33 | 2.00 | 2.00 | 0.00 |
| 5,500.00 | 4.40 | 233.30 | 5,499.78 | -5.05 | -6.77 | -4.48 | 2.00 | 2.00 | 0.00 |
| 5,600.00 | 6.40 | 233.30 | 5,599.34 | -10.67 | -14.31 | -9.47 | 2.00 | 2.00 | 0.00 |
| 5,700.00 | 8.40 | 233.30 | 5,698.50 | -18.37 | -24.64 | -16.31 | 2.00 | 2.00 | 0.00 |
| 5,780.22 | 10.00 | 233.30 | 5,777.68 | -26.03 | -34.93 | -23.11 | 2.00 | 2.00 | 0.00 |
| 5,800.00 | 10.00 | 233.30 | 5,797.16 | -28.09 | -37.68 | -24.94 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 10.00 | 233.30 | 5,895.64 | -38.47 | -51.61 | -34.15 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 10.00 | 233.30 | 5,994.12 | -48.85 | -65.54 | -43.37 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 10.00 | 233.30 | 6,092.60 | -59.23 | -79.47 | -52.59 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 10.00 | 233.30 | 6,191.08 | -69.61 | -93.40 | -61.81 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 10.00 | 233.30 | 6,289.56 | -80.00 | -107.32 | -71.02 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 10.00 | 233.30 | 6,388.04 | -90.38 | -121.25 | -80.24 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 10.00 | 233.30 | 6,486.52 | -100.76 | -135.18 | -89.46 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 10.00 | 233.30 | 6,585.00 | -111.14 | -149.11 | -98.68 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 10.00 | 233.30 | 6,683.48 | -121.52 | -163.04 | -107.89 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 10.00 | 233.30 | 6,781.96 | -131.91 | -176.97 | -117.11 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 10.00 | 233.30 | 6,880.44 | -142.29 | -190.90 | -126.33 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 10.00 | 233.30 | 6,978.92 | -152.67 | -204.83 | -135.55 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 10.00 | 233.30 | 7,077.39 | -163.05 | -218.75 | -144.76 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 10.00 | 233.30 | 7,175.87 | -173.43 | -232.68 | -153.98 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 10.00 | 233.30 | 7,274.35 | -183.82 | -246.61 | -163.20 | 0.00 | 0.00 | 0.00 |
| 7,400.00 | 10.00 | 233.30 | 7,372.83 | -194.20 | -260.54 | -172.42 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 10.00 | 233.30 | 7,471.31 | -204.58 | -274.47 | -181.63 | 0.00 | 0.00 | 0.00 |
| 7,600.00 | 10.00 | 233.30 | 7,569.79 | -214.96 | -288.40 | -190.85 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 10.00 | 233.30 | 7,668.27 | -225.34 | -302.33 | -200.07 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 10.00 | 233.30 | 7,766.75 | -235.73 | -316.26 | -209.29 | 0.00 | 0.00 | 0.00 |
| 7,900.00 | 10.00 | 233.30 | 7,865.23 | -246.11 | -330.18 | -218.50 | 0.00 | 0.00 | 0.00 |
| 8,000.00 | 10.00 | 233.30 | 7,963.71 | -256.49 | -344.11 | -227.72 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 10.00 | 233.30 | 8,062.19 | -266.87 | -358.04 | -236.94 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 10.00 | 233.30 | 8,160.67 | -277.25 | -371.97 | -246.16 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 10.00 | 233.30 | 8,259.15 | -287.64 | -385.90 | -255.37 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 10.00 | 233.30 | 8,357.63 | -298.02 | -399.83 | -264.59 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 10.00 | 233.30 | 8,456.11 | -308.40 | -413.76 | -273.81 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 10.00 | 233.30 | 8,554.59 | -318.78 | -427.68 | -283.03 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 10.00 | 233.30 | 8,653.07 | -329.17 | -441.61 | -292.24 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 10.00 | 233.30 | 8,751.55 | -339.55 | -455.54 | -301.46 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 10.00 | 233.30 | 8,850.02 | -349.93 | -469.47 | -310.68 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 10.00 | 233.30 | 8,948.50 | -360.31 | -483.40 | -319.90 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 10.00 | 233.30 | 9,046.98 | -370.69 | -497.33 | -329.11 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 10.00 | 233.30 | 9,145.46 | -381.08 | -511.26 | -338.33 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 10.00 | 233.30 | 9,243.94 | -391.46 | -525.19 | -347.55 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 10.00 | 233.30 | 9,342.42 | -401.84 | -539.11 | -356.76 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 10.00 | 233.30 | 9,440.90 | -412.22 | -553.04 | -365.98 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 10.00 | 233.30 | 9,539.38 | -422.60 | -566.97 | -375.20 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 10.00 | 233.30 | 9,637.86 | -432.99 | -580.90 | -384.42 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 10.00 | 233.30 | 9,736.34 | -443.37 | -594.83 | -393.63 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 10.00 | 233.30 | 9,834.82 | -453.75 | -608.76 | -402.85 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 10.00 | 233.30 | 9,933.30 | -464.13 | -622.69 | -412.07 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 10.00 | 233.30 | 10,031.78 | -474.51 | -636.62 | -421.29 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 10.00 | 233.30 | 10,130.26 | -484.90 | -650.54 | -430.50 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 10.00 | 233.30 | 10,228.74 | -495.28 | -664.47 | -439.72 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | HOPSPP | **Local Co-ordinate Reference:** | Well PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| **Company:** | ENGINEERING DESIGNS | **TVD Reference:** | DATUM @ 3564.40ft |
| **Project:** | PRD NM DIRECTIONAL PLANS (NAD 1983) | **MD Reference:** | DATUM @ 3564.40ft |
| **Site:** | PALLADIUM MDP1 7-6 FEDERAL COM | **North Reference:** | Grid |
| **Well:** | PALLADIUM MDP1 7-6 FEDERAL COM 171H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | WB00 | | |
| **Design:** | Permitting Plan | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 10,400.00 | 10.00 | 233.30 | 10,327.22 | -505.66 | -678.40 | -448.94 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 10.00 | 233.30 | 10,425.70 | -516.04 | -692.33 | -458.16 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 10.00 | 233.30 | 10,524.18 | -526.42 | -706.26 | -467.37 | 0.00 | 0.00 | 0.00 |
| 10,697.67 | 10.00 | 233.30 | 10,620.36 | -536.56 | -719.86 | -476.38 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 9.96 | 233.30 | 10,622.66 | -536.80 | -720.19 | -476.59 | 2.00 | -2.00 | 0.00 |
| 10,800.00 | 7.96 | 233.30 | 10,721.43 | -546.11 | -732.67 | -484.85 | 2.00 | -2.00 | 0.00 |
| 10,900.00 | 5.96 | 233.30 | 10,820.69 | -553.35 | -742.38 | -491.28 | 2.00 | -2.00 | 0.00 |
| 11,000.00 | 3.96 | 233.30 | 10,920.31 | -558.51 | -749.31 | -495.86 | 2.00 | -2.00 | 0.00 |
| 11,100.00 | 1.96 | 233.30 | 11,020.17 | -561.60 | -753.45 | -498.60 | 2.00 | -2.00 | 0.00 |
| 11,197.89 | 0.00 | 359.77 | 11,118.04 | -562.60 | -754.79 | -499.49 | 2.00 | -2.00 | 0.00 |
| 11,200.00 | 0.21 | 359.77 | 11,120.15 | -562.59 | -754.79 | -499.49 | 10.00 | 10.00 | 0.00 |
| 11,300.00 | 10.21 | 359.77 | 11,219.61 | -553.52 | -754.82 | -490.44 | 10.00 | 10.00 | 0.00 |
| 11,400.00 | 20.21 | 359.77 | 11,315.99 | -527.32 | -754.93 | -464.32 | 10.00 | 10.00 | 0.00 |
| 11,500.00 | 30.21 | 359.77 | 11,406.35 | -484.78 | -755.10 | -421.90 | 10.00 | 10.00 | 0.00 |
| 11,600.00 | 40.21 | 359.77 | 11,487.95 | -427.19 | -755.33 | -364.49 | 10.00 | 10.00 | 0.00 |
| 11,700.00 | 50.21 | 359.77 | 11,558.31 | -356.31 | -755.61 | -293.82 | 10.00 | 10.00 | 0.00 |
| 11,800.00 | 60.21 | 359.77 | 11,615.29 | -274.29 | -755.94 | -212.04 | 10.00 | 10.00 | 0.00 |
| 11,900.00 | 70.21 | 359.77 | 11,657.16 | -183.62 | -756.31 | -121.64 | 10.00 | 10.00 | 0.00 |
| 12,000.00 | 80.21 | 359.77 | 11,682.66 | -87.05 | -756.69 | -25.36 | 10.00 | 10.00 | 0.00 |
| 12,100.00 | 90.21 | 359.77 | 11,690.99 | 12.47 | -757.09 | 73.87 | 10.00 | 10.00 | 0.00 |
| 12,101.89 | 90.40 | 359.77 | 11,690.98 | 14.36 | -757.10 | 75.75 | 10.00 | 10.00 | 0.00 |
| 12,200.00 | 90.40 | 359.77 | 11,690.30 | 112.47 | -757.49 | 173.57 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 90.40 | 359.77 | 11,689.60 | 212.46 | -757.89 | 273.27 | 0.00 | 0.00 | 0.00 |
| 12,400.00 | 90.40 | 359.77 | 11,688.90 | 312.46 | -758.29 | 372.96 | 0.00 | 0.00 | 0.00 |
| 12,500.00 | 90.40 | 359.77 | 11,688.21 | 412.46 | -758.69 | 472.66 | 0.00 | 0.00 | 0.00 |
| 12,600.00 | 90.40 | 359.77 | 11,687.51 | 512.45 | -759.10 | 572.36 | 0.00 | 0.00 | 0.00 |
| 12,700.00 | 90.40 | 359.77 | 11,686.81 | 612.45 | -759.50 | 672.06 | 0.00 | 0.00 | 0.00 |
| 12,800.00 | 90.40 | 359.77 | 11,686.12 | 712.45 | -759.90 | 771.76 | 0.00 | 0.00 | 0.00 |
| 12,900.00 | 90.40 | 359.77 | 11,685.42 | 812.44 | -760.30 | 871.46 | 0.00 | 0.00 | 0.00 |
| 13,000.00 | 90.40 | 359.77 | 11,684.72 | 912.44 | -760.70 | 971.16 | 0.00 | 0.00 | 0.00 |
| 13,100.00 | 90.40 | 359.77 | 11,684.03 | 1,012.44 | -761.10 | 1,070.86 | 0.00 | 0.00 | 0.00 |
| 13,200.00 | 90.40 | 359.77 | 11,683.33 | 1,112.43 | -761.50 | 1,170.56 | 0.00 | 0.00 | 0.00 |
| 13,300.00 | 90.40 | 359.77 | 11,682.64 | 1,212.43 | -761.90 | 1,270.26 | 0.00 | 0.00 | 0.00 |
| 13,400.00 | 90.40 | 359.77 | 11,681.94 | 1,312.43 | -762.30 | 1,369.96 | 0.00 | 0.00 | 0.00 |
| 13,500.00 | 90.40 | 359.77 | 11,681.25 | 1,412.42 | -762.70 | 1,469.66 | 0.00 | 0.00 | 0.00 |
| 13,600.00 | 90.40 | 359.77 | 11,680.55 | 1,512.42 | -763.10 | 1,569.36 | 0.00 | 0.00 | 0.00 |
| 13,700.00 | 90.40 | 359.77 | 11,679.86 | 1,612.42 | -763.50 | 1,669.06 | 0.00 | 0.00 | 0.00 |
| 13,800.00 | 90.40 | 359.77 | 11,679.17 | 1,712.41 | -763.90 | 1,768.76 | 0.00 | 0.00 | 0.00 |
| 13,900.00 | 90.40 | 359.77 | 11,678.47 | 1,812.41 | -764.30 | 1,868.46 | 0.00 | 0.00 | 0.00 |
| 14,000.00 | 90.40 | 359.77 | 11,677.78 | 1,912.41 | -764.70 | 1,968.16 | 0.00 | 0.00 | 0.00 |
| 14,100.00 | 90.40 | 359.77 | 11,677.08 | 2,012.41 | -765.10 | 2,067.86 | 0.00 | 0.00 | 0.00 |
| 14,200.00 | 90.40 | 359.77 | 11,676.39 | 2,112.40 | -765.51 | 2,167.56 | 0.00 | 0.00 | 0.00 |
| 14,300.00 | 90.40 | 359.77 | 11,675.70 | 2,212.40 | -765.91 | 2,267.26 | 0.00 | 0.00 | 0.00 |
| 14,400.00 | 90.40 | 359.77 | 11,675.01 | 2,312.40 | -766.31 | 2,366.95 | 0.00 | 0.00 | 0.00 |
| 14,500.00 | 90.40 | 359.77 | 11,674.31 | 2,412.39 | -766.71 | 2,466.65 | 0.00 | 0.00 | 0.00 |
| 14,600.00 | 90.40 | 359.77 | 11,673.62 | 2,512.39 | -767.11 | 2,566.35 | 0.00 | 0.00 | 0.00 |
| 14,700.00 | 90.40 | 359.77 | 11,672.93 | 2,612.39 | -767.51 | 2,666.05 | 0.00 | 0.00 | 0.00 |
| 14,800.00 | 90.40 | 359.77 | 11,672.24 | 2,712.38 | -767.91 | 2,765.75 | 0.00 | 0.00 | 0.00 |
| 14,900.00 | 90.40 | 359.77 | 11,671.55 | 2,812.38 | -768.31 | 2,865.45 | 0.00 | 0.00 | 0.00 |
| 15,000.00 | 90.40 | 359.77 | 11,670.86 | 2,912.38 | -768.71 | 2,965.15 | 0.00 | 0.00 | 0.00 |
| 15,100.00 | 90.40 | 359.77 | 11,670.17 | 3,012.37 | -769.11 | 3,064.85 | 0.00 | 0.00 | 0.00 |
| 15,200.00 | 90.40 | 359.77 | 11,669.48 | 3,112.37 | -769.51 | 3,164.55 | 0.00 | 0.00 | 0.00 |
| 15,300.00 | 90.40 | 359.77 | 11,668.78 | 3,212.37 | -769.91 | 3,264.25 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | HOPSPP | **Local Co-ordinate Reference:** | Well PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| **Company:** | ENGINEERING DESIGNS | **TVD Reference:** | DATUM @ 3564.40ft |
| **Project:** | PRD NM DIRECTIONAL PLANS (NAD 1983) | **MD Reference:** | DATUM @ 3564.40ft |
| **Site:** | PALLADIUM MDP1 7-6 FEDERAL COM | **North Reference:** | Grid |
| **Well:** | PALLADIUM MDP1 7-6 FEDERAL COM 171H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | WB00 | | |
| **Design:** | Permitting Plan | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 15,400.00 | 90.40 | 359.77 | 11,668.09 | 3,312.36 | -770.31 | 3,363.95 | 0.00 | 0.00 | 0.00 |
| 15,500.00 | 90.40 | 359.77 | 11,667.41 | 3,412.36 | -770.71 | 3,463.65 | 0.00 | 0.00 | 0.00 |
| 15,600.00 | 90.39 | 359.77 | 11,666.72 | 3,512.36 | -771.11 | 3,563.35 | 0.00 | 0.00 | 0.00 |
| 15,700.00 | 90.39 | 359.77 | 11,666.03 | 3,612.35 | -771.51 | 3,663.05 | 0.00 | 0.00 | 0.00 |
| 15,800.00 | 90.39 | 359.77 | 11,665.34 | 3,712.35 | -771.92 | 3,762.75 | 0.00 | 0.00 | 0.00 |
| 15,900.00 | 90.39 | 359.77 | 11,664.65 | 3,812.35 | -772.32 | 3,862.45 | 0.00 | 0.00 | 0.00 |
| 16,000.00 | 90.39 | 359.77 | 11,663.96 | 3,912.34 | -772.72 | 3,962.15 | 0.00 | 0.00 | 0.00 |
| 16,100.00 | 90.39 | 359.77 | 11,663.27 | 4,012.34 | -773.12 | 4,061.85 | 0.00 | 0.00 | 0.00 |
| 16,200.00 | 90.39 | 359.77 | 11,662.58 | 4,112.34 | -773.52 | 4,161.55 | 0.00 | 0.00 | 0.00 |
| 16,300.00 | 90.39 | 359.77 | 11,661.90 | 4,212.34 | -773.92 | 4,261.25 | 0.00 | 0.00 | 0.00 |
| 16,400.00 | 90.39 | 359.77 | 11,661.21 | 4,312.33 | -774.32 | 4,360.95 | 0.00 | 0.00 | 0.00 |
| 16,500.00 | 90.39 | 359.77 | 11,660.52 | 4,412.33 | -774.72 | 4,460.64 | 0.00 | 0.00 | 0.00 |
| 16,600.00 | 90.39 | 359.77 | 11,659.83 | 4,512.33 | -775.12 | 4,560.34 | 0.00 | 0.00 | 0.00 |
| 16,700.00 | 90.39 | 359.77 | 11,659.15 | 4,612.32 | -775.52 | 4,660.04 | 0.00 | 0.00 | 0.00 |
| 16,800.00 | 90.39 | 359.77 | 11,658.46 | 4,712.32 | -775.92 | 4,759.74 | 0.00 | 0.00 | 0.00 |
| 16,900.00 | 90.39 | 359.77 | 11,657.77 | 4,812.32 | -776.32 | 4,859.44 | 0.00 | 0.00 | 0.00 |
| 17,000.00 | 90.39 | 359.77 | 11,657.09 | 4,912.31 | -776.72 | 4,959.14 | 0.00 | 0.00 | 0.00 |
| 17,100.00 | 90.39 | 359.77 | 11,656.40 | 5,012.31 | -777.12 | 5,058.84 | 0.00 | 0.00 | 0.00 |
| 17,200.00 | 90.39 | 359.77 | 11,655.72 | 5,112.31 | -777.52 | 5,158.54 | 0.00 | 0.00 | 0.00 |
| 17,300.00 | 90.39 | 359.77 | 11,655.03 | 5,212.30 | -777.92 | 5,258.24 | 0.00 | 0.00 | 0.00 |
| 17,400.00 | 90.39 | 359.77 | 11,654.35 | 5,312.30 | -778.32 | 5,357.94 | 0.00 | 0.00 | 0.00 |
| 17,500.00 | 90.39 | 359.77 | 11,653.66 | 5,412.30 | -778.73 | 5,457.64 | 0.00 | 0.00 | 0.00 |
| 17,600.00 | 90.39 | 359.77 | 11,652.98 | 5,512.29 | -779.13 | 5,557.34 | 0.00 | 0.00 | 0.00 |
| 17,700.00 | 90.39 | 359.77 | 11,652.29 | 5,612.29 | -779.53 | 5,657.04 | 0.00 | 0.00 | 0.00 |
| 17,800.00 | 90.39 | 359.77 | 11,651.61 | 5,712.29 | -779.93 | 5,756.74 | 0.00 | 0.00 | 0.00 |
| 17,900.00 | 90.39 | 359.77 | 11,650.93 | 5,812.28 | -780.33 | 5,856.44 | 0.00 | 0.00 | 0.00 |
| 18,000.00 | 90.39 | 359.77 | 11,650.24 | 5,912.28 | -780.73 | 5,956.14 | 0.00 | 0.00 | 0.00 |
| 18,100.00 | 90.39 | 359.77 | 11,649.56 | 6,012.28 | -781.13 | 6,055.84 | 0.00 | 0.00 | 0.00 |
| 18,200.00 | 90.39 | 359.77 | 11,648.88 | 6,112.28 | -781.53 | 6,155.54 | 0.00 | 0.00 | 0.00 |
| 18,300.00 | 90.39 | 359.77 | 11,648.19 | 6,212.27 | -781.93 | 6,255.24 | 0.00 | 0.00 | 0.00 |
| 18,400.00 | 90.39 | 359.77 | 11,647.51 | 6,312.27 | -782.33 | 6,354.94 | 0.00 | 0.00 | 0.00 |
| 18,500.00 | 90.39 | 359.77 | 11,646.83 | 6,412.27 | -782.73 | 6,454.64 | 0.00 | 0.00 | 0.00 |
| 18,600.00 | 90.39 | 359.77 | 11,646.15 | 6,512.26 | -783.13 | 6,554.34 | 0.00 | 0.00 | 0.00 |
| 18,700.00 | 90.39 | 359.77 | 11,645.46 | 6,612.26 | -783.53 | 6,654.04 | 0.00 | 0.00 | 0.00 |
| 18,800.00 | 90.39 | 359.77 | 11,644.78 | 6,712.26 | -783.93 | 6,753.74 | 0.00 | 0.00 | 0.00 |
| 18,900.00 | 90.39 | 359.77 | 11,644.10 | 6,812.25 | -784.33 | 6,853.43 | 0.00 | 0.00 | 0.00 |
| 19,000.00 | 90.39 | 359.77 | 11,643.42 | 6,912.25 | -784.73 | 6,953.13 | 0.00 | 0.00 | 0.00 |
| 19,100.00 | 90.39 | 359.77 | 11,642.74 | 7,012.25 | -785.14 | 7,052.83 | 0.00 | 0.00 | 0.00 |
| 19,200.00 | 90.39 | 359.77 | 11,642.06 | 7,112.24 | -785.54 | 7,152.53 | 0.00 | 0.00 | 0.00 |
| 19,300.00 | 90.39 | 359.77 | 11,641.38 | 7,212.24 | -785.94 | 7,252.23 | 0.00 | 0.00 | 0.00 |
| 19,400.00 | 90.39 | 359.77 | 11,640.70 | 7,312.24 | -786.34 | 7,351.93 | 0.00 | 0.00 | 0.00 |
| 19,500.00 | 90.39 | 359.77 | 11,640.02 | 7,412.23 | -786.74 | 7,451.63 | 0.00 | 0.00 | 0.00 |
| 19,600.00 | 90.39 | 359.77 | 11,639.34 | 7,512.23 | -787.14 | 7,551.33 | 0.00 | 0.00 | 0.00 |
| 19,700.00 | 90.39 | 359.77 | 11,638.66 | 7,612.23 | -787.54 | 7,651.03 | 0.00 | 0.00 | 0.00 |
| 19,800.00 | 90.39 | 359.77 | 11,637.98 | 7,712.23 | -787.94 | 7,750.73 | 0.00 | 0.00 | 0.00 |
| 19,900.00 | 90.39 | 359.77 | 11,637.30 | 7,812.22 | -788.34 | 7,850.43 | 0.00 | 0.00 | 0.00 |
| 20,000.00 | 90.39 | 359.77 | 11,636.62 | 7,912.22 | -788.74 | 7,950.13 | 0.00 | 0.00 | 0.00 |
| 20,100.00 | 90.39 | 359.77 | 11,635.95 | 8,012.22 | -789.14 | 8,049.83 | 0.00 | 0.00 | 0.00 |
| 20,200.00 | 90.39 | 359.77 | 11,635.27 | 8,112.21 | -789.54 | 8,149.53 | 0.00 | 0.00 | 0.00 |
| 20,300.00 | 90.39 | 359.77 | 11,634.59 | 8,212.21 | -789.94 | 8,249.23 | 0.00 | 0.00 | 0.00 |
| 20,400.00 | 90.39 | 359.77 | 11,633.91 | 8,312.21 | -790.34 | 8,348.93 | 0.00 | 0.00 | 0.00 |
| 20,500.00 | 90.39 | 359.77 | 11,633.24 | 8,412.20 | -790.74 | 8,448.63 | 0.00 | 0.00 | 0.00 |
| 20,600.00 | 90.39 | 359.77 | 11,632.56 | 8,512.20 | -791.14 | 8,548.33 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | HOPSPP | **Local Co-ordinate Reference:** | Well PALLADIUM MDP1 7-6 FEDERAL COM 171H |
| **Company:** | ENGINEERING DESIGNS | **TVD Reference:** | DATUM @ 3564.40ft |
| **Project:** | PRD NM DIRECTIONAL PLANS (NAD 1983) | **MD Reference:** | DATUM @ 3564.40ft |
| **Site:** | PALLADIUM MDP1 7-6 FEDERAL COM | **North Reference:** | Grid |
| **Well:** | PALLADIUM MDP1 7-6 FEDERAL COM 171H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | WB00 | | |
| **Design:** | Permitting Plan | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 20,700.00 | 90.39 | 359.77 | 11,631.88 | 8,612.20 | -791.55 | 8,648.03 | 0.00 | 0.00 | 0.00 |
| 20,800.00 | 90.39 | 359.77 | 11,631.20 | 8,712.19 | -791.95 | 8,747.73 | 0.00 | 0.00 | 0.00 |
| 20,900.00 | 90.39 | 359.77 | 11,630.53 | 8,812.19 | -792.35 | 8,847.43 | 0.00 | 0.00 | 0.00 |
| 21,000.00 | 90.39 | 359.77 | 11,629.85 | 8,912.19 | -792.75 | 8,947.13 | 0.00 | 0.00 | 0.00 |
| 21,100.00 | 90.39 | 359.77 | 11,629.18 | 9,012.19 | -793.15 | 9,046.83 | 0.00 | 0.00 | 0.00 |
| 21,200.00 | 90.39 | 359.77 | 11,628.50 | 9,112.18 | -793.55 | 9,146.53 | 0.00 | 0.00 | 0.00 |
| 21,300.00 | 90.39 | 359.77 | 11,627.83 | 9,212.18 | -793.95 | 9,246.23 | 0.00 | 0.00 | 0.00 |
| 21,400.00 | 90.39 | 359.77 | 11,627.15 | 9,312.18 | -794.35 | 9,345.92 | 0.00 | 0.00 | 0.00 |
| 21,500.00 | 90.39 | 359.77 | 11,626.48 | 9,412.17 | -794.75 | 9,445.62 | 0.00 | 0.00 | 0.00 |
| 21,600.00 | 90.39 | 359.77 | 11,625.80 | 9,512.17 | -795.15 | 9,545.32 | 0.00 | 0.00 | 0.00 |
| 21,700.00 | 90.39 | 359.77 | 11,625.13 | 9,612.17 | -795.55 | 9,645.02 | 0.00 | 0.00 | 0.00 |
| 21,800.00 | 90.39 | 359.77 | 11,624.45 | 9,712.16 | -795.95 | 9,744.72 | 0.00 | 0.00 | 0.00 |
| 21,867.25 | 90.39 | 359.77 | 11,624.00 | 9,779.41 | -796.22 | 9,811.77 | 0.00 | 0.00 | 0.00 |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| PALLADIUM_171H_K<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 11,118.04 | -562.60 | -754.79 | 445,863.31 | 698,764.01 | 32° 13' 29.025816 N | 103° 49' 27.276991 |
| PALLADIUM_171H_B<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 11,624.00 | 9,779.41 | -796.22 | 456,204.65 | 698,722.58 | 32° 15' 11.362037 N | 103° 49' 27.188630 |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 5,280.00 | 5,280.00 | 0.00 | 0.00 | STEP OUT DLS 2.00 |
| 5,780.22 | 5,777.68 | -26.03 | -34.93 | HOLD 10 DEG TANGENT |
| 10,697.67 | 10,620.36 | -536.56 | -719.86 | DROP BACK TO VERTICAL DLS 2.00 |
| 11,197.89 | 11,118.04 | -562.60 | -754.79 | BUILD CURVE 10 DEG / 100 |
| 12,101.89 | 11,690.98 | 14.36 | -757.10 | LANDING POINT |
| 21,867.25 | 11,624.00 | 9,779.41 | -796.22 | TD at 21867.25 |

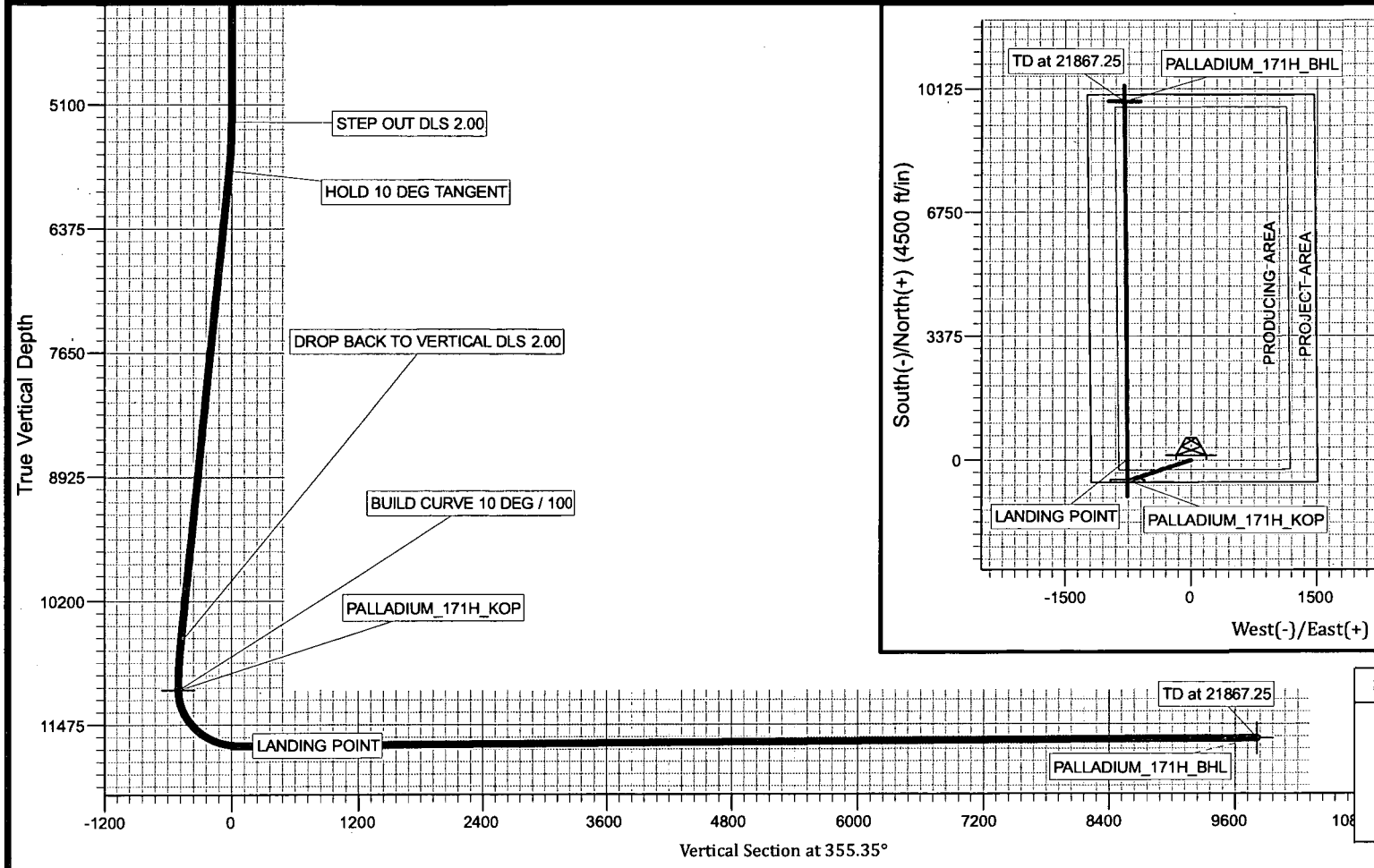
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: PALLADIUM MDP1 7-6 FEDERAL COM
Well: PALLADIUM MDP1 7-6 FEDERAL COM 171H
Wellbore: WB00
Design: Permitting Plan

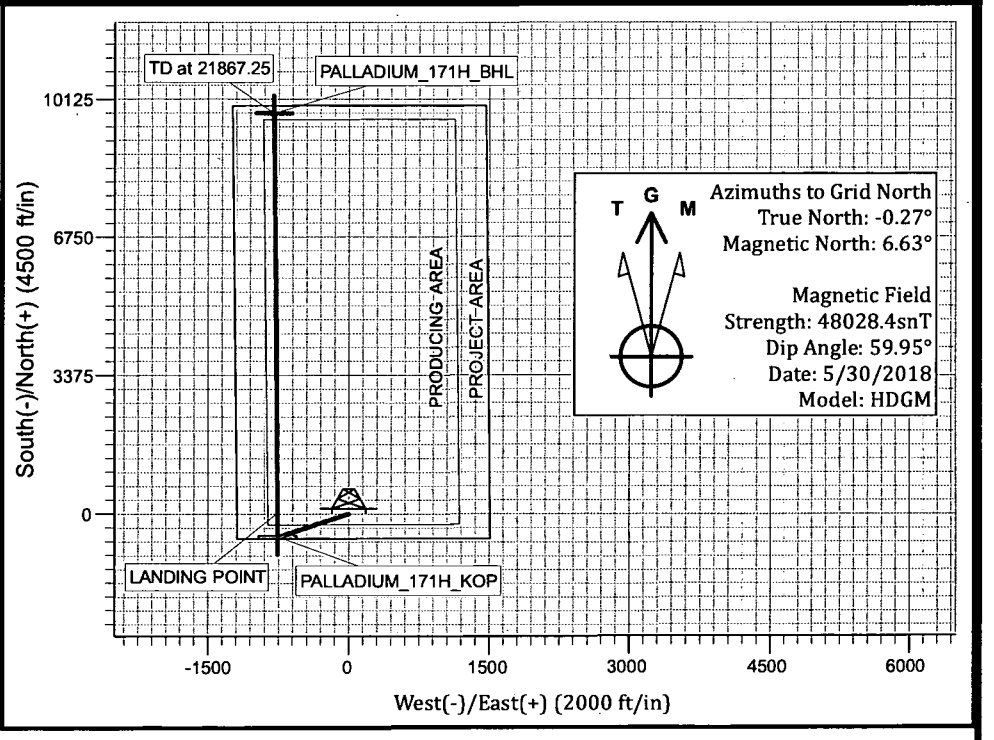
**WELL DETAILS:** PALLADIUM MDP1 7-6 FEDERAL COM 171H

Ground Level: 3537.90

| +N/-S | +E/-W | Northing | Easting | Latittude | Longitude |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 446425.87 | 699518.75 | 32° 13' 34.557250 N | 103° 49' 18.459603 W |

DATUM @ 3564.40ft




PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

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

System Datum: Mean Sea Level

## SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 5280.00 | 0.00 | 0.00 | 5280.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3 | 5780.22 | 10.00 | 233.30 | 5777.68 | -26.03 | -34.93 | 2.00 | 233.30 | -23.11 | |
| 4 | 10697.67 | 10.00 | 233.30 | 10620.36 | -536.56 | -719.86 | 0.00 | 0.00 | -476.38 | |
| 5 | 11197.89 | 0.00 | 359.77 | 11118.04 | -562.60 | -754.79 | 2.00 | 180.00 | -499.49 | |
| 6 | 12101.89 | 90.40 | 359.77 | 11690.98 | 14.36 | -757.10 | 10.00 | -0.23 | 75.75 | |
| 7 | 21867.25 | 90.39 | 359.77 | 11624.00 | 9779.41 | -796.22 | 0.00 | 180.00 | 9811.77 | |

Annotation

STEP OUT DLS 2.00
HOLD 10 DEG TANGENT
DROP BACK TO VERTICAL DLS 2.00
BUILD CURVE 10 DEG / 100
LANDING POINT
TD at 21867.25

# OXY USA Inc
## APD ATTACHMENT: SPUDDER RIG DATA

**OPERATOR NAME / NUMBER:** OXY USA Inc

**1. SUMMARY OF REQUEST:**

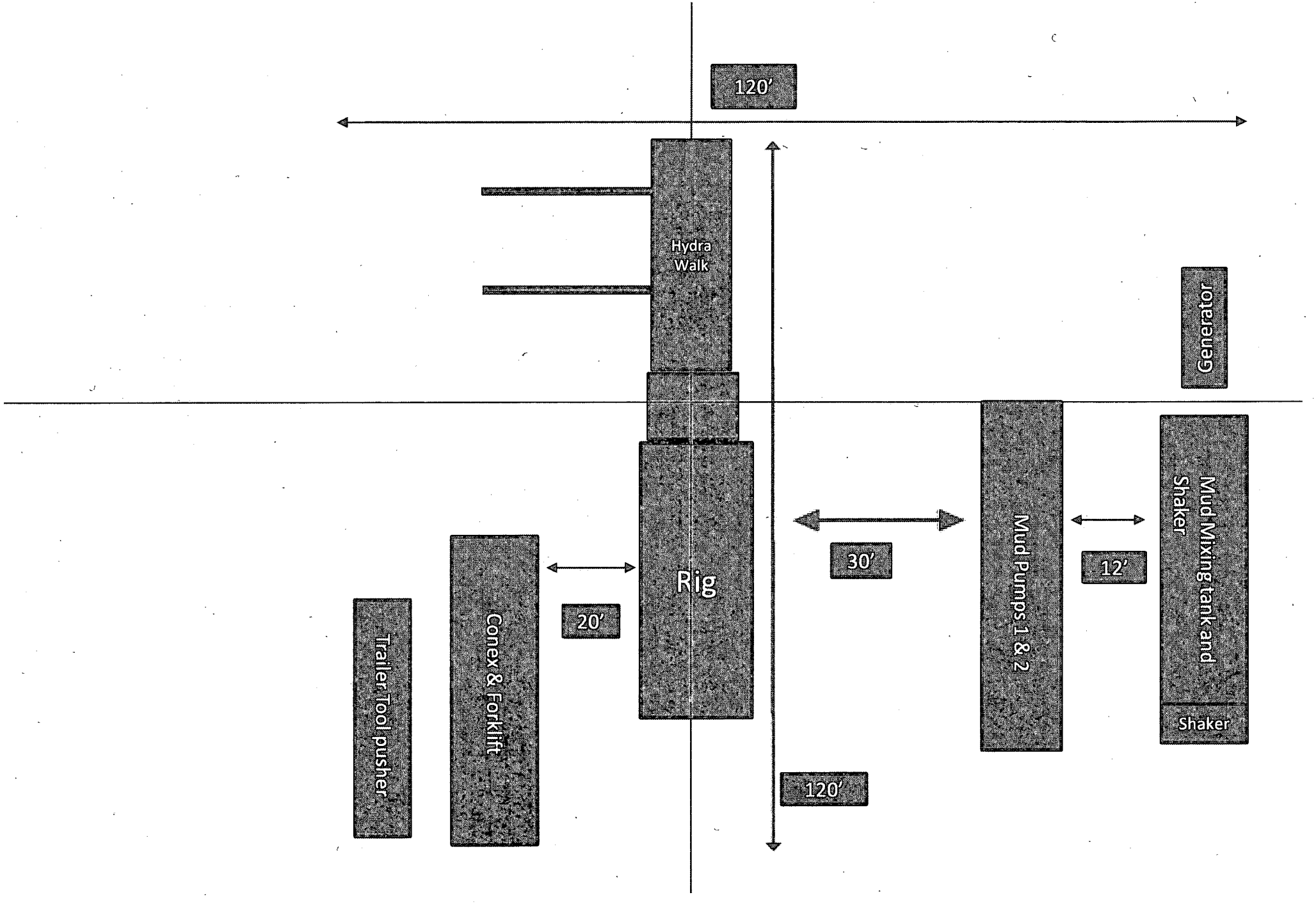
Oxy USA respectfully requests approval for the following operations for the surface hole in the drill plan:

1. Utilize a spudder rig to pre-set surface casing for time and cost savings.

**2. Description of Operations**

1. Spudder rig will move in to drill the surface hole and pre-set surface casing on the well.
    a. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
    b. The spudder rig will utilize fresh water-based mud to drill the surface hole to TD. Solids control will be handled entirely on a closed loop basis. No earth pits will be used.
2. The wellhead will be installed and tested as soon as the surface casing is cut off and the WOC time has been reached.
3. A blind flange at the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with needle valves installed on two wingvalves.
    a. A means for intervention will be maintained while the drilling rig is not over the well.
4. Spudder rig operations are expected to take 2-3 days per well on the pad.
5. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
6. Drilling operations will begin with a larger rig and a BOP stack equal to or greater than the pressure rating that was permitted will be nippled up and tested on the wellhead before drilling operations resume on each well.
    a. The larger rig will move back onto the location within 90 days from the point at which the wells are secured and the spudder rig is moved off location.
    b. The BLM will be contacted / notified 24 hours before the larger rig moves back on the pre-set locations.
7. Oxy will have supervision on the rig to ensure compliance with all BLM and NMOCD regulations and to oversee operations.
8. Once the rig is removed, Oxy will secure the wellhead area by placing a guard rail around the cellar area.

# Spudder Rig Layout



# Oxy USA Inc. - Palladium MDP1 7-6 Federal Com 171H

## 1. Geologic Formations

| TVD of target | 11690' | Pilot Hole Depth | N/A |
|---|---|---|---|
| MD at TD: | 21867' | Deepest Expected fresh water: | 653' |

**Delaware Basin**

| Formation | TVD - RKB | Expected Fluids |
|---|---|---|
| Rustler | 653 | |
| Salado | 946 | Salt |
| Castile | 2,813 | Salt |
| Lamar/Delaware | 4,293 | Oil/Gas/Brine |
| Bell Canyon | 4,323 | Oil/Gas/Brine |
| Cherry Canyon | 5,195 | Oil/Gas/Brine |
| Brushy Canyon | 6,419 | Losses |
| Bone Spring | 8,138 | Oil/Gas |
| 1st Bone Spring | 9,112 | Oil/Gas |
| 2nd Bone Spring | 9,906 | Oil/Gas |
| 3rd Bone Spring | 11,108 | Oil/Gas |
| **Wolfcamp** | **11,566** | **Oil/Gas** |

*H2S, water flows, loss of circulation, abnormal pressures, etc.

## 2. Casing Program

| Hole Size (in) | Casing Interval | | Csg. Size | Weight | Grade | Conn. | SF | | Buoyant Body SF | Buoyant Joint SF |
|---|---|---|---|---|---|---|---|---|---|---|
| | From (ft) | To (ft) | (in) | (lbs) | | | Collapse | SF Burst | Tension | Tension |
| 17.5 | 0 | 703 | 13.375 | 54.5 | J-55 | BTC | 1.125 | 1.2 | 1.4 | 1.4 |
| 12.25 | 0 | 4343 | 9.625 | 43.5 | L-80 | BTC | 1.125 | 1.2 | 1.4 | 1.4 |
| 8.5 | 0 | 11098 | 7.625 | 26.4 | L-80 HC | SF (0 ft to 4000 ft) FJ (4000 ft to 11098 ft) | 1.125 | 1.2 | 1.4 | 1.4 |
| 6.75 | 0 | 21867 | 5.5 | 20 | P-110 | DQX | 1.125 | 1.2 | 1.4 | 1.4 |
| | | | | | | | SF Values will meet or Exceed | | | |

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

*Oxy requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage, we will drop a cancelation cone and not pump the second stage.

*Oxy requests the option to run production casing with DQX, SF TORQ, and/or DQW TORQ connections to accommodate hole conditions or drilling operations.

## Oxy USA Inc. - Palladium MDP1 7-6 Federal Com 171H

### Annular Clearance Variance Request

As per the agreement reached in the Oxy/BLM face-to-face meeting on Feb 22, 2018, Oxy requests permission to allow deviation from the 0.422" annular clearance requirement from Onshore Order #2 under the following conditions:

1. Annular clearance to meet or exceed 0.422" between intermediate casing ID and production casing coupling only on the first 500' overlap between both casings.
2. Annular clearance less than 0.422" is acceptable for the curve and lateral portions of the production open hole section.

| | Y or N |
|---|---|
| Is casing new? If used, attach certification as required in Onshore Order #1 | Y |
| Does casing meet API specifications? If no, attach casing specification sheet. | Y |
| Is premium or uncommon casing planned? If yes attach casing specification sheet. | Y |
| Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria). | Y |
| Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing? | Y |
| Is well located within Capitan Reef? | N |
| If yes, does production casing cement tie back a minimum of 50' above the Reef? | |
| Is well within the designated 4 string boundary. | |
| Is well located in SOPA but not in R-111-P? | Y |
| If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing? | Y |
| Is well located in R-111-P and SOPA? | N |
| If yes, are the first three strings cemented to surface? | |
| Is 2nd string set 100' to 600' below the base of salt? | |
| Is well located in high Cave/Karst? | N |
| If yes, are there two strings cemented to surface? | |
| (For 2 string wells) If yes, is there a contingency casing if lost circulation occurs? | |
| Is well located in critical Cave/Karst? | N |
| If yes, are there three strings cemented to surface? | |

## 3. Cementing Program

| Casing String | # Sks | Wt. (lb/gal) | Yld (ft3/sack) | H20 (gal/sk) | 500# Comp. Strength (hours) | Slurry Description |
|---|---|---|---|---|---|---|
| Surface (Lead) | N/A | N/A | N/A | N/A | N/A | N/A |
| Surface (Tail) | 746 | 14.8 | 1.33 | 6.365 | 5:26 | Class C Cement, Accelerator |
| Intermediate (Lead) | 921 | 12.9 | 1.88 | 10.130 | 14:22 | Pozzolan Cement, Retarder |
| Intermediate (Tail) | 155 | 14.8 | 1.33 | 6.370 | 12:45 | Class C Cement, Accelerator |
| Intermediate II 1st Stage (Lead) | N/A | N/A | N/A | N/A | N/A | N/A |
| Intermediate II 1st Stage (Tail) | 218 | 13.2 | 1.65 | 8.640 | 11:54 | Class H Cement, Retarder, Dispersant, Salt |
| Intermediate II 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus | | | | | | |
| Intermediate II 2nd Stage (Lead) | N/A | N/A | N/A | N/A | N/A | N/A |
| Intermediate II 2nd Stage (Tail) | 351 | 12.9 | 1.92 | 10.410 | 23:10 | Class C Cement, Accelerator |
| Production (Lead) | N/A | N/A | N/A | N/A | N/A | N/A |
| Production (Tail) | 826 | 13.2 | 1.38 | 6.686 | 3:49 | Class H Cement, Retarder, Dispersant, Salt |

| Casing String | Top (ft) | Bottom (ft) | % Excess |
|---|---|---|---|
| Surface (Lead) | N/A | N/A | N/A |
| Surface (Tail) | 0 | 703 | 100% |
| Intermediate (Lead) | 0 | 3843 | 50% |
| Intermediate (Tail) | 3843 | 4343 | 20% |
| Intermediate II 1st Stage (Lead) | N/A | N/A | N/A |
| Intermediate II 1st Stage (Tail) | 6669 | 11098 | 5% |
| Intermediate II 2nd Stage (Lead) | N/A | N/A | N/A |
| Intermediate II 2nd Stage (Tail) | 0 | 6669 | 25% |
| Production (Lead) | N/A | N/A | N/A |
| Production (Tail) | 10598 | 21867 | 20% |

## 4. Pressure Control Equipment

| BOP installed and tested before drilling which hole? | Size? | Min. Required WP | Type | ✓ | Tested to: |
|---|---|---|---|---|---|
| 12.25" Hole | 13-5/8" | 3M | Annular | ✓ | 70% of working pressure |
| | | 3M | Blind Ram | ✓ | 250 psi / 3000 psi |
| | | | Pipe Ram | | |
| | | | Double Ram | ✓ | |
| | | | Other* | | |
| 8.5" Hole | 13-5/8" | 5M | Annular | ✓ | 70% of working pressure |
| | | 5M | Blind Ram | ✓ | 250 psi / 5000 psi |
| | | | Pipe Ram | | |
| | | | Double Ram | ✓ | |
| | | | Other* | | |
| 6.75" Hole | 13-5/8" | 5M | Annular | ✓ | 70% of working pressure |
| | | 5M | Blind Ram | ✓ | 250 psi / 5000 psi |
| | | | Pipe Ram | | |
| | | | Double Ram | ✓ | |
| | | | Other* | | |

*Specify if additional ram is utilized.

Oxy will utilize a 5M annular with a 10M BOPE stack. The BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

| | | |
|---|---|---|
| | Formation integrity test will be performed per Onshore Order #2.<br>On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i. | |
| | A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart. | |
| | Y | Are anchors required by manufacturer? |
| | A multibowl or a unionized multibowl wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. We will test the flange connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015. See attached schematics. | |

**BOP Break Testing Request**

As per the agreement reached in the Oxy/BLM face-to-face meeting on Feb 22, 2018, Oxy requests permission to allow BOP Break Testing under the following conditions:

- After a full BOP test is conducted on the first well on the pad.
- When skidding to drill an intermediate section that casing point is either shallower than the 3rd Bone Spring or 10,000'TVD.
- Full BOP test will be required prior to drilling any production hole.

## 5. Mud Program

| Depth | | Type | Weight (ppg) | Viscosity | Water Loss |
|---|---|---|---|---|---|
| From (ft) | To (ft) | | | | |
| 0 | 703 | Water-Based Mud | 8.6-8.8 | 40-60 | N/C |
| 703 | 4343 | Saturated Brine-Based Mud | 9.8-10.0 | 35-45 | N/C |
| 4343 | 11098 | Water-Based or Oil-Based Mud | 8.0-9.6 | 38-50 | N/C |
| 11098 | 21867 | Water-Based or Oil-Based Mud | 9.5-12.0 | 38-50 | N/C |

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2. Oxy will use a closed mud system.

| | |
|---|---|
| What will be used to monitor the loss or gain of fluid? | PVT/MD Totco/Visual Monitoring |

## 6. Logging and Testing Procedures

| Logging, Coring and Testing. | |
|---|---|
| Yes | Will run GR from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM. |
| No | Logs are planned based on well control or offset log information. |
| No | Drill stem test? If yes, explain |
| No | Coring? If yes, explain |

| Additional logs planned | | Interval |
|---|---|---|
| No | Resistivity | |
| No | Density | |
| No | CBL | |
| Yes | Mud log | ICP - TD |
| No | PEX | |

## 7. Drilling Conditions

| Condition | Specify what type and where? |
|---|---|
| BH Pressure at deepest TVD | 7295 psi |
| Abnormal Temperature | No |
| BH Temperature at deepest TVD | 174°F |

Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times. Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

| Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM. | |
|---|---|
| N | H2S is present |
| Y | H2S Plan attached |

**8. Other facets of operation**

| | Yes/No |
|---|---|
| Will the well be drilled with a walking/skidding operation? If yes, describe. | No |
| Will more than one drilling rig be used for drilling operations? If yes, describe.<br>• Oxy requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that Oxy would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig. | Yes |

**Total estimated cuttings volume:** 1690.5 bbls.

Attachments
_x__ Directional Plan
_x__ H2S Contingency Plan
_x__ Flex III Attachments
_x__ Spudder Rig Attachment
_x__ Premium Connection Specs

**9. Company Personnel**

| Name | Title | Office Phone | Mobile Phone |
|---|---|---|---|
| Linsay Earle | Drilling Engineer | 713-350-4921 | 832-596-5507 |
| Margaret Giltner | Drilling Engineer Supervisor | 713-366-5026 | 210-683-8480 |
| Simon Benavides | Drilling Superintendent | 713-522-8652 | 281-684-6897 |
| Diego Tellez | Drilling Manager | 713-350-4602 | 713-303-4932 |

**OXY USA Inc.**
**APD Attachment**
**Offline Cementing**

OXY respectfully requests a variance to cement the 9-5/8" and/or 7-5/8" intermediate casing strings offline.

The summarized operational sequence will be as follows:

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment (float collar and shoe).
2. Land casing.
3. Fill pipe with kill weight fluid, and confirm well is static.
    a. If well is not static notify BLM and kill well.
    b. Once well is static notify BLM with intent to proceed with nipple down and offline cementing.
4. Set and pressure test annular packoff.
5. After confirmation of both annular barriers and internal barriers, nipple down BOP and install cap flange. If any barrier fails to test, the BOP stack will not be nippled down until after the cement job is completed.
6. Skid rig to next well on pad.
7. Confirm well is static before removing cap flange.
8. If well is not static notify BLM and kill well prior to cementing or nippling up for further remediation.
9. Install offline cement tool.
10. Rig up cement equipment.
    a. Notify BLM prior to cement job.
11. Perform cement job.
12. Confirm well is static and floats are holding after cement job.
13. Remove cement equipment, offline cement tools and install night cap with pressure gauge for monitoring.

**APD ID:** 10400035697 **Submission Date:** 11/13/2018

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Well Type:** OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Existing Roads

**Will existing roads be used?** YES

**Existing Road Map:**

PalladiumMDP17_6FedCom171H_ExistRoads_20181106114451.PDF

**Existing Road Purpose:** FLUID TRANSPORT **Row(s) Exist?** NO

### ROW ID(s)

**ID:**

**Do the existing roads need to be improved?** NO

**Existing Road Improvement Description:**

**Existing Road Improvement Attachment:**

## Section 2 - New or Reconstructed Access Roads

**Will new roads be needed?** YES

**New Road Map:**

PalladiumMDP17_6FedCom171H_NewRoad_20181106114654.pdf

**New road type:** LOCAL

**Length:** 185.3 Feet **Width (ft.):** 25

**Max slope (%):** 0 **Max grade (%):** 0

**Army Corp of Engineers (ACOE) permit required?** NO

**ACOE Permit Number(s):**

**New road travel width:** 14

**New road access erosion control:** Watershed Diversion every 200' if needed.

**New road access plan or profile prepared?** YES

**New road access plan attachment:**

PalladiumMDP17_6FedCom171H_NewRoad_20181112075253.pdf

**Access road engineering design?** NO

**Access road engineering design attachment:**

**Turnout?** N

**Access surfacing type:** OTHER

**Access topsoil source:** ONSITE

**Access surfacing type description:** Caliche

**Access onsite topsoil source depth:** 0

**Offsite topsoil source description:**

**Onsite topsoil removal process:** If available

**Access other construction information:** None

**Access miscellaneous information:** The access road will begin at an existing caliche road and will go south for 185.3' through a pasture to the northeast corner of pad.
**Number of access turnouts:** **Access turnout map:**

## Drainage Control

**New road drainage crossing:** CULVERT

**Drainage Control comments:** Watershed Diversion every 200' if needed.

**Road Drainage Control Structures (DCS) description:** Watershed Diversion every 200' if needed.

**Road Drainage Control Structures (DCS) attachment:**

## Access Additional Attachments

## Section 3 - Location of Existing Wells

**Existing Wells Map?** YES

**Attach Well map:**

PalladiumMDP17_6FedCom171H_ExistWells_20181112080211.pdf

## Section 4 - Location of Existing and/or Proposed Production Facilities

**Submit or defer a Proposed Production Facilities plan?** SUBMIT

**Production Facilities description:** a. In the event the well is found productive, the Sand Dunes South Corridor central tank battery would be utilized and the necessary production equipment will be installed at the well site. See proposed facilities layout diagram. b. All flow lines will adhere to API standards. They will consist of 2 – 4" composite flowlines operating 75% MAWP, surface and 2 – 4" steel gas lift supply line operating 1500 psig, buried, lines to follow surveyed route. Survey of a strip of land 30' wide and 2777.5' in length crossing USA Land in Sections 7 & 18 T24S R31E NMPM, Eddy County, NM and being 25' left and 25' right of the centerline survey, see attached. c. Electric line will follow a route approved by the BLM. Survey of a strip of land 30' wide and 476.4' in length crossing USA Land in Section 7 T24S R31E NMPM, Eddy County, NM and being 15' left and 15' right of the centerline survey, see attached.
**Production Facilities map:**

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

PalladiumMDP17_6FedCom171H_FacilityPLEL_20181112080338.pdf

PalladiumMDP1_7_6FdCom171H_LeaseFacilityInfo_20190625111624.pdf

## Section 5 - Location and Types of Water Supply

### Water Source Table

**Water source type:** GW WELL

**Water source use type:** SURFACE CASING

INTERMEDIATE/PRODUCTION CASING

OTHER **Describe use type:** Drilling

**Source latitude:** **Source longitude:**

**Source datum:**

**Water source permit type:** WATER WELL

**Water source transport method:** TRUCKING

PIPELINE

**Source land ownership:** COMMERCIAL

**Source transportation land ownership:** COMMERCIAL

**Water source volume (barrels):** 2000 **Source volume (acre-feet):** 0.25778618

**Source volume (gal):** 84000

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**Water source and transportation map:**

PalladiumMDP17_6FedCom171H_GRRWtrSrc_20181112080623.pdf

PalladiumMDP17_6FedCom171H_MesqWtrSrc_20181112080632.pdf

**Water source comments:** This well will be drilled using a combination of water mud systems. It will be obtained from commercial water stations (Gregory Rockhouse, Mesquite) in the area and will be hauled to location by transport truck using existing and proposed roads.

**New water well?** NO

### New Water Well Info

**Well latitude:** **Well Longitude:** **Well datum:**

**Well target aquifer:**

**Est. depth to top of aquifer(ft):** **Est thickness of aquifer:**

**Aquifer comments:**

**Aquifer documentation:**

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Well depth (ft):**

**Well casing type:**

**Well casing outside diameter (in.):**

**Well casing inside diameter (in.):**

**New water well casing?**

**Used casing source:**

**Drilling method:**

**Drill material:**

**Grout material:**

**Grout depth:**

**Casing length (ft.):**

**Casing top depth (ft.):**

**Well Production type:**

**Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

## Section 6 - Construction Materials

**Using any construction materials:** YES

**Construction Materials description:** Primary - All caliche utilized for the drilling pad and proposed access road will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits found on the location. Will use BLM recommended extra caliche from other locations close by for roads, if available. Secondary - The secondary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well site. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cubic yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel: a. The top 6" of topsoil is pushed off and stockpiled along the side of the location. b. An approximate 120' X 120' area is used within the proposed well site to remove caliche. c. Subsoil is removed and piled alongside the 120' X 120' within the pad site. d. When caliche is found, material will be stockpiled within the pad site to build the location and road. e. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road. f. Once the well is drilled the stockpiled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stockpiled outside of the well pad. Topsoil will be stockpiled along the edge of the pad. Caliche will be provided from a pit located in Section 7 T24S R31E. Water will be provided from a frac pond located in Sections 7 T24S R31E.

**Construction Materials source location attachment:**

## Section 7 - Methods for Handling Waste

**Waste type:** DRILLING

**Waste content description:** Water-Based Cuttings, Water-Based Mud, Oil-Based Cuttings, Oil-Based Mud, Produced Water

**Amount of waste:** 1465.9 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Haul-Off Bins

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

**Disposal type description:**

**Disposal location description:** An approved facility that can process drill cuttings, drill fluids, flowback water, produced water, contaminated soils, and other non-hazardous wastes.

## Reserve Pit

**Reserve Pit being used?** NO

**Temporary disposal of produced water into reserve pit?**

**Reserve pit length (ft.)** **Reserve pit width (ft.)**

**Reserve pit depth (ft.)** **Reserve pit volume (cu. yd.)**

**Is at least 50% of the reserve pit in cut?**

**Reserve pit liner**

**Reserve pit liner specifications and installation description**

## Cuttings Area

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** YES

**Description of cuttings location** A closed loop system will be utilized consisting of above ground steel tanks and haul-off bins. Disposal of liquids, drilling fluids and cuttings will be disposed of at an approved facility.

**Cuttings area length (ft.)** **Cuttings area width (ft.)**

**Cuttings area depth (ft.)** **Cuttings area volume (cu. yd.)**

**Is at least 50% of the cuttings area in cut?**

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

## Section 8 - Ancillary Facilities

**Are you requesting any Ancillary Facilities?:** NO

**Ancillary Facilities attachment:**

**Comments:**

## Section 9 - Well Site Layout

**Well Site Layout Diagram:**

PalladiumMDP17_6FedCom171H_WellSiteCL_20181112100030.pdf

**Comments:** V-Door-West - CL Tanks-South - 330' X 440' – 2 Well Pad

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

## Section 10 - Plans for Surface Reclamation

**Type of disturbance:** New Surface Disturbance **Multiple Well Pad Name:** PALLADIUM MDP1 7-6 FEDERAL COM

**Multiple Well Pad Number:** 171H

**Recontouring attachment:**

**Drainage/Erosion control construction:** Reclamation to be wind rowed as needed to control erosion

**Drainage/Erosion control reclamation:** Reclamation to be wind rowed as needed to control erosion

| | | |
|---|---|---|
| **Well pad proposed disturbance (acres):** 3.21 | **Well pad interim reclamation (acres):** 1.15 | **Well pad long term disturbance (acres):** 2.07 |
| **Road proposed disturbance (acres):** 0.02 | **Road interim reclamation (acres):** 0.01 | **Road long term disturbance (acres):** 0.01 |
| **Powerline proposed disturbance (acres):** 1.51 | **Powerline interim reclamation (acres):** 1.51 | **Powerline long term disturbance (acres):** 0 |
| **Pipeline proposed disturbance (acres):** 4.39 | **Pipeline interim reclamation (acres):** 1.46 | **Pipeline long term disturbance (acres):** 2.92 |
| **Other proposed disturbance (acres):** 0 | **Other interim reclamation (acres):** 0.33 | **Other long term disturbance (acres):** 0 |
| **Total proposed disturbance:** 9.13 | **Total interim reclamation:** 4.46 | **Total long term disturbance:** 5 |

**Disturbance Comments:** See Below

**Reconstruction method:** If the well is deemed commercially productive, caliche from the areas of the pad site not required for operations will be reclaimed. The original topsoil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation. After concluding the drilling and/or completion operations, if the well is found non-commercial, the caliche will be removed from the pad and transported to the original caliche pit or used for other drilling locations. The road will be reclaimed as directed by the BLM. The original topsoil will again be returned to the pad and contoured, as close as possible, to the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.
**Topsoil redistribution:** The original topsoil will be returned to the area of the drill pad not necessary to operate the well.

**Soil treatment:** To be determined by the BLM.

**Existing Vegetation at the well pad:** To be determined by the BLM at Onsite.

**Existing Vegetation at the well pad attachment:**

**Existing Vegetation Community at the road:** To be determined by the BLM at Onsite.

**Existing Vegetation Community at the road attachment:**

**Existing Vegetation Community at the pipeline:** To be determined by the BLM at Onsite.

**Existing Vegetation Community at the pipeline attachment:**

**Existing Vegetation Community at other disturbances:** To be determined by the BLM at Onsite.

**Existing Vegetation Community at other disturbances attachment:**

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Non native seed used?** NO

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?** NO

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?** NO

**Seed harvest description:**

**Seed harvest description attachment:**

## Seed Management

### Seed Table

**Seed type:**

**Seed source:**

**Seed name:**

**Source name:**

**Source address:**

**Source phone:**

**Seed cultivar:**

**Seed use location:**

**PLS pounds per acre:**

**Proposed seeding season:**

### Seed Summary

| Seed Type | Pounds/Acre |
|---|---|

**Total pounds/Acre:**

**Seed reclamation attachment:**

## Operator Contact/Responsible Official Contact Info

**First Name:** JIM **Last Name:** WILSON

**Phone:** (575)631-2442 **Email:** jim_wilson@oxy.com

**Seedbed prep:**

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** To be determined by the BLM.

**Weed treatment plan attachment:**

**Monitoring plan description:** To be determined by the BLM.

**Monitoring plan attachment:**

**Success standards:** To be determined by the BLM.

**Pit closure description:** NA

**Pit closure attachment:**

## Section 11 - Surface Ownership

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:** **USFS Ranger District:**

**Disturbance type:** PIPELINE

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:** **USFS Ranger District:**

**Disturbance type:** OTHER

**Describe:** Electric Line

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:** **USFS Ranger District:**

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Disturbance type:** NEW ACCESS ROAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:** **USFS Ranger District:**

## Section 12 - Other Information

**Right of Way needed?** YES **Use APD as ROW?** YES

**ROW Type(s):** 281001 ROW - ROADS,288100 ROW – O&G Pipeline,289001 ROW- O&G Well Pad

## ROW Applications

**SUPO Additional Information:** Permian Basin MOA - see attached SUPO and to be determined by BLM GIS Shapefiles furnished upon requested

**Use a previously conducted onsite?** NO

**Previous Onsite information:**

## Other SUPO Attachment

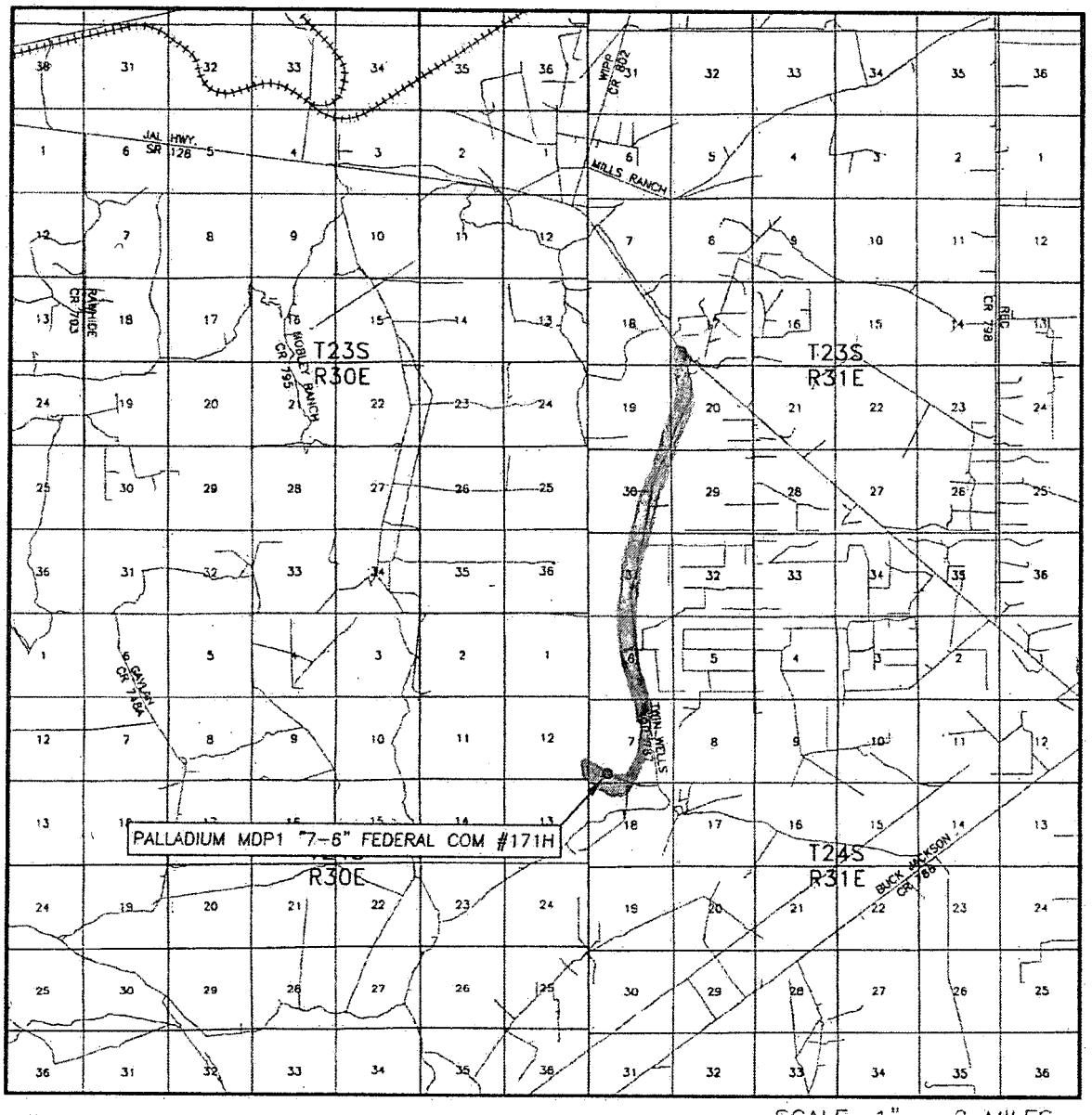
PalladiumMDP17_6FedCom171H_GasCapPlan_20181112144546.pdf

PalladiumMDP17_6FedCom171H_MiscSvyPlats_20181112144625.pdf

PalladiumMDP17_6FedCom171H_StakeForm_20181112144633.pdf

PalladiumMDP17_6FedCom171H_SUPO_20181112144644.pdf

# VICINITY MAP




SCALE: 1" = 2 MILES

SEC. 7 TWP. 24-S RGE. 31-E
SURVEY N.M.P.M.
COUNTY EDDY
DESCRIPTION 609' FSL & 1197' FWL
ELEVATION 3537.9'
OPERATOR OXY USA INC.

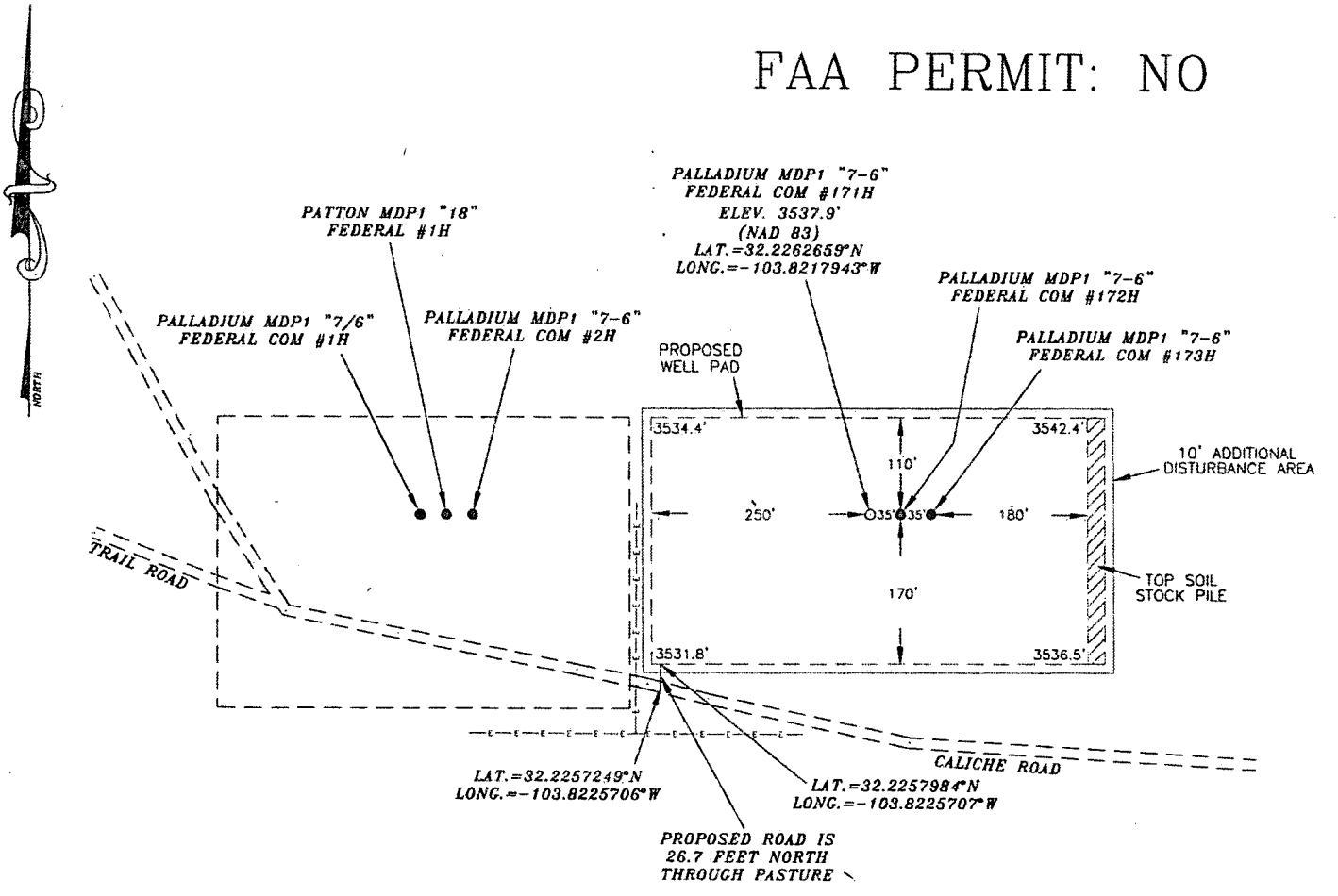
Asel Surveying
P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

LEASE PALLADIUM MDP1 "7-6" FEDERAL COM #171H

DIRECTIONS BEGINNING AT THE INTERSECTION OF N.M. STATE HWY. #128 AND EDDY COUNTY ROAD #787 (TWIN WELLS ROAD), GO SOUTH ON COUNTY ROAD #787 FOR 5.3 MILES, TURN RIGHT ON CALICHE ROAD AND GO WEST FOR 0.7 MILES, TURN RIGHT ON PROPOSED ROAD AND GO NORTH FOR 26.7 FEET TO LOCATION.

# OXY USA INC.
## PALLADIUM MDP1 "7-6" FEDERAL COM #171H
## SITE PLAN

# FAA PERMIT: NO




TERRY J ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**LEGEND**

- – – – DENOTES PROPOSED WELL PAD
- —·—·— DENOTES PROPOSED ROAD
- ▨ DENOTES STOCK PILE AREA

200' 0 200' 400' FEET

SCALE: 1"=200'

**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 6/14/2018

Terry J. Asel N.M. R.P.L.S. No. 15079


Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

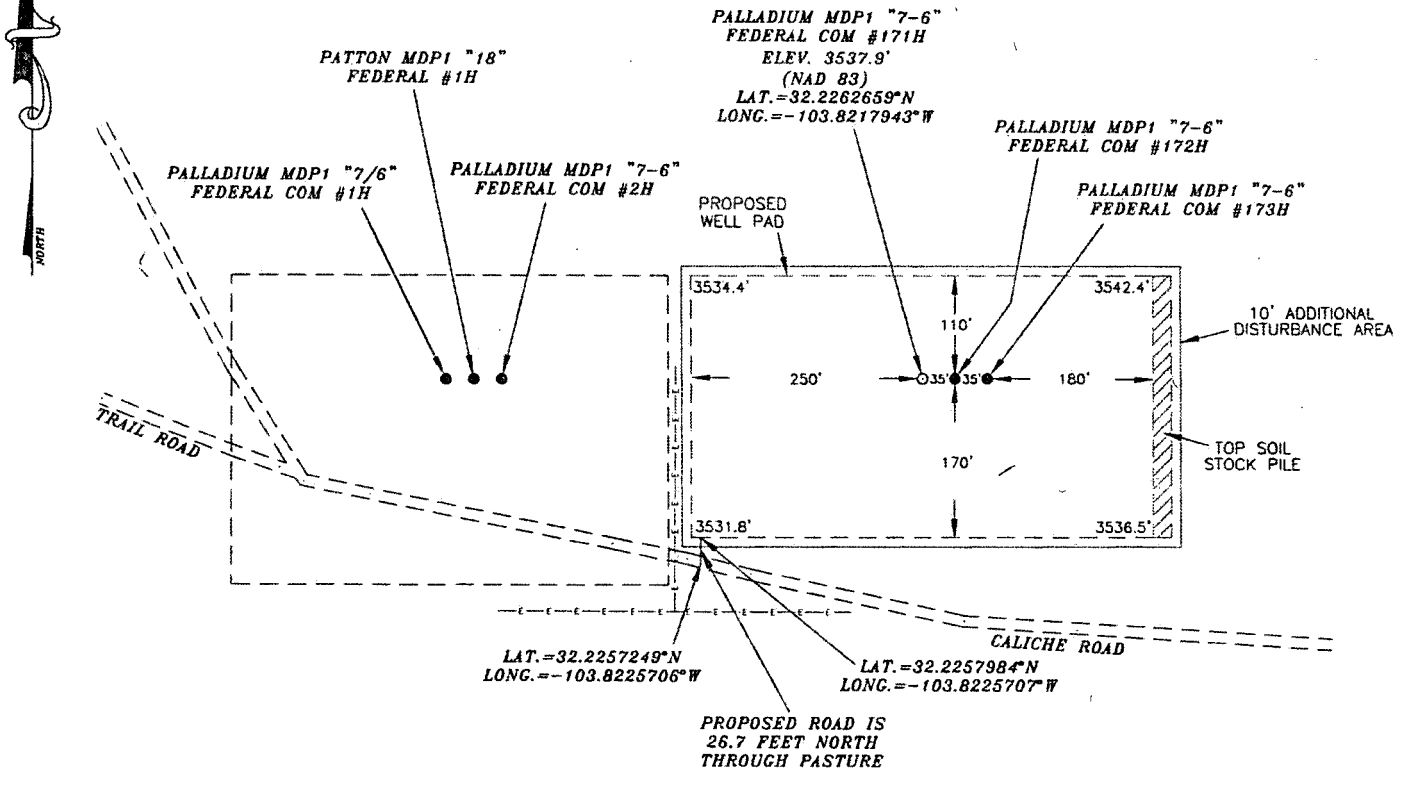

## OXY USA INC.

PALLADIUM MDP1 "7-6" FEDERAL COM #171H
LOCATED AT 609' FSL & 1197' FWL IN
SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31
EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

| | | |
|---|---|---|
| Survey Date: 11/22/17 | Sheet 1 of 1 Sheets | |
| W.O. Number: 171122WL-a | Drawn By: KA | Rev: |
| Date: 08/13/18 | 171122WL-a | Scale:1"=200' |

# OXY USA INC.
## PALLADIUM MDP1 "7-6" FEDERAL COM #171H
## SITE PLAN

# FAA PERMIT: NO




TERRY J ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**LEGEND**

- – – – – DENOTES PROPOSED WELL PAD
- —·—·— DENOTES PROPOSED ROAD
- ▨ DENOTES STOCK PILE AREA

200' 0 200' 400' FEET

SCALE: 1"=200'

**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 6/14/2018

Terry J. Asel N.M. R.P.L.S. No. 15079

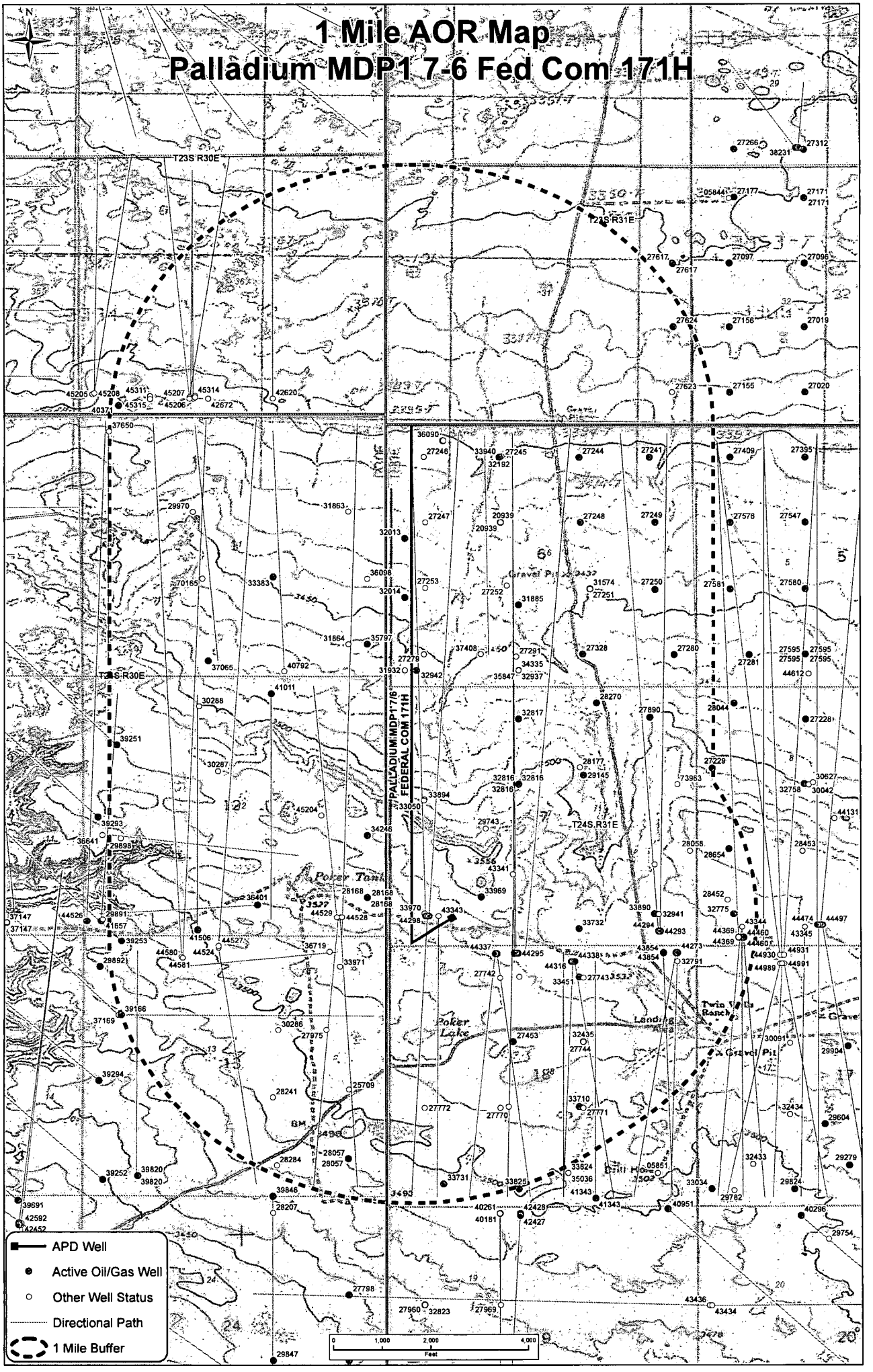

Asel Surveying

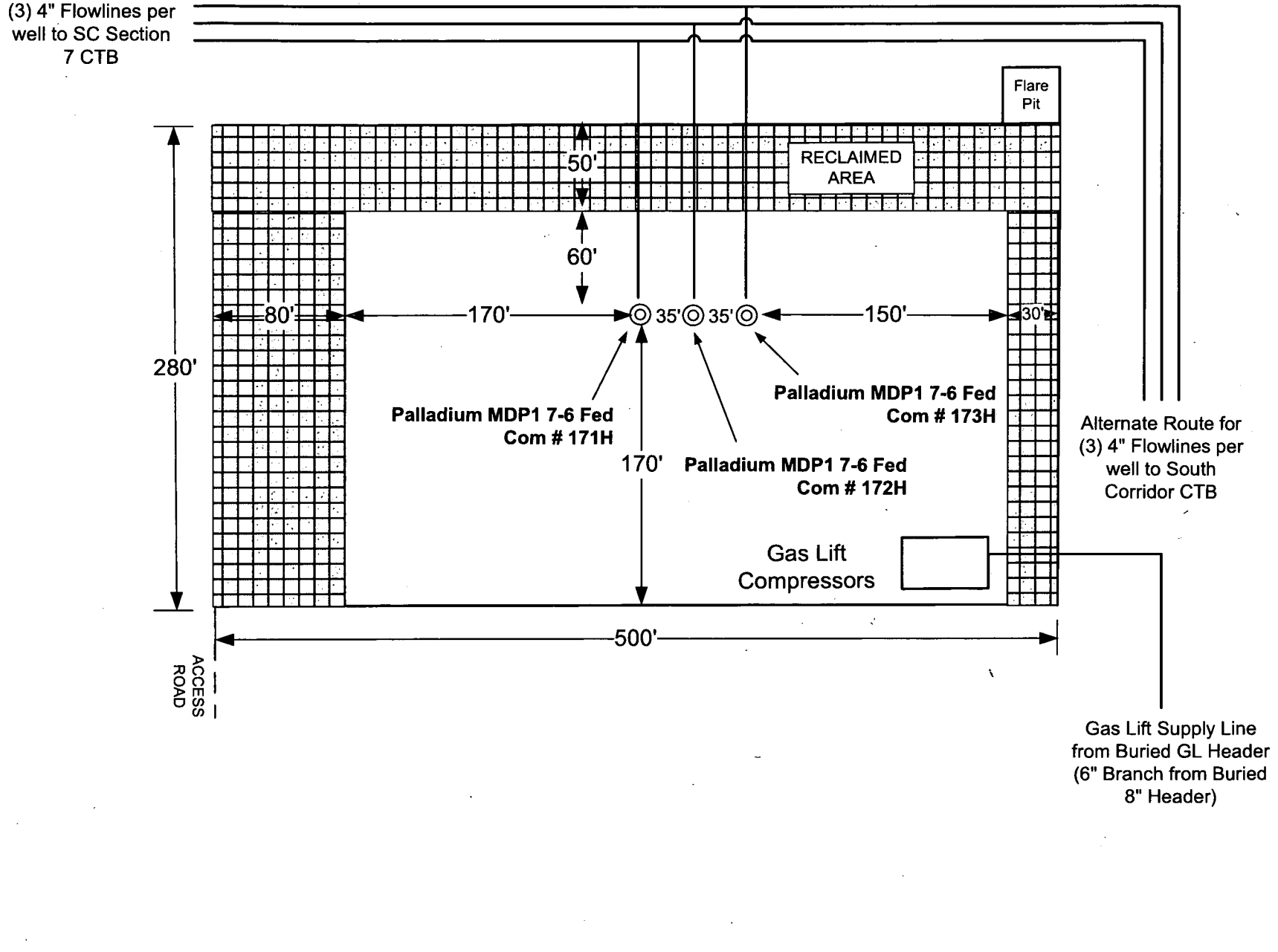
P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146


## OXY USA INC.

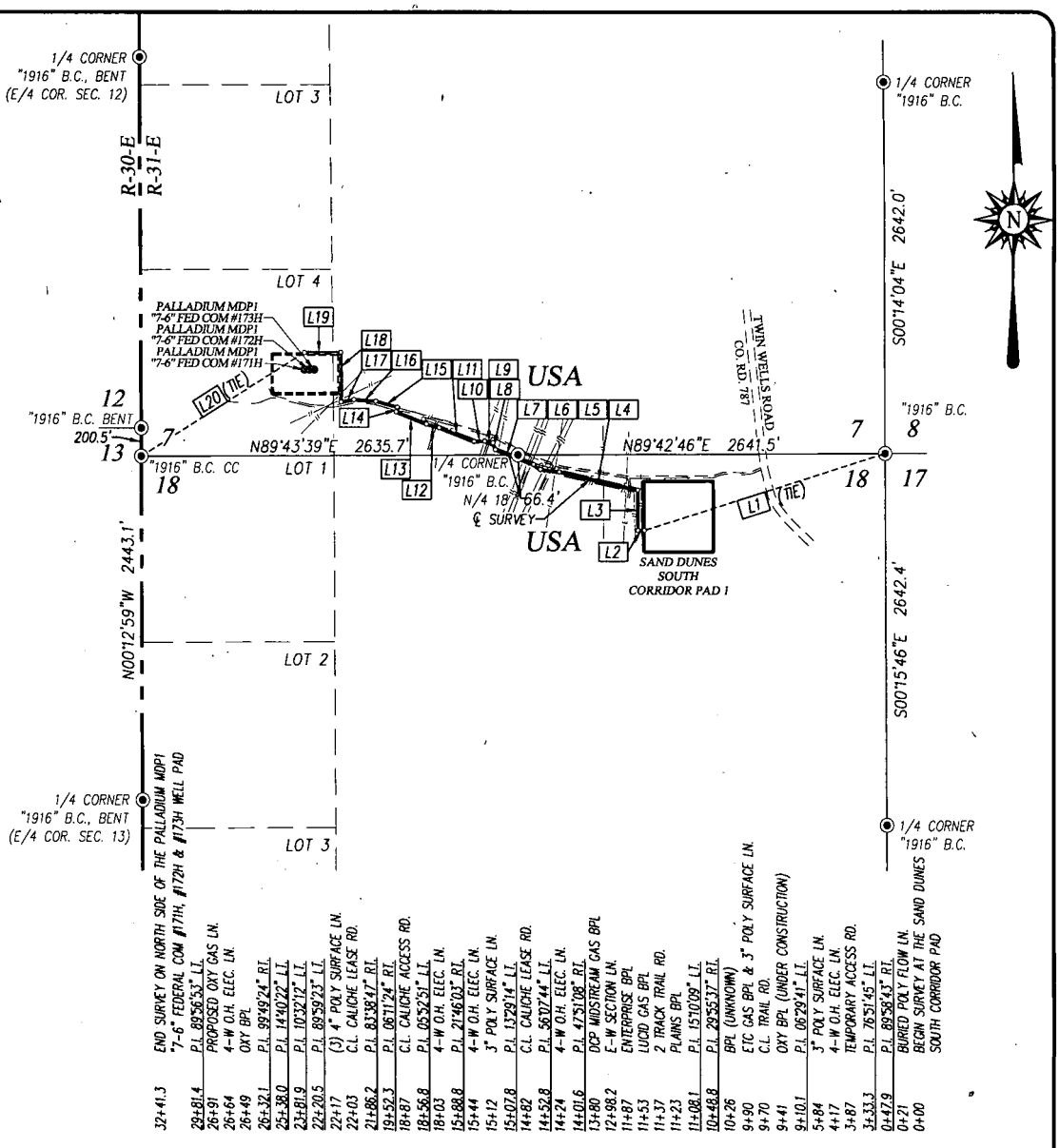
PALLADIUM MDP1 "7-6" FEDERAL COM #171H
LOCATED AT 609' FSL & 1197' FWL IN
SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31
EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

| | | |
|---|---|---|
| Survey Date: 11/22/17 | Sheet 1 of 1 Sheets | |
| W.O. Number: 171122WL-a | Drawn By: KA | Rev: |
| Date: 08/13/18 | 171122WL-a | Scale:1"=200' |


1 Mile AOR Map
Palladium MDP1 7-6 Fed Com 171H
T23S R30E
T23S R31E
T24S R30E
T24S R31E
PALLADIUM MDP1 7/6 FEDERAL COM 171H
Poker Lake
Gravel Pit
APD Well
Active Oil/Gas Well
Other Well Status
Directional Path
1 Mile Buffer
0 1,000 2,000 4,000
Feet




| REVISION BLOCK | | | | | | ENGINEERING RECORD | | FACILITY LAYOUT DIAGRAM |
|---|---|---|---|---|---|---|---|---|
| NO. | DATE | DESCRIPTION | BY | CHK | APP | BY | DATE | Palladium MDP1 7-6 Fed Com # 171H, 172H, 173H<br>EDDY COUNTY, NEW MEXICO |
| | | | | | | | | |




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 3241.3 FEET OR 0.614 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

| LINE | BEARING | DISTANCE | LINE | BEARING | DISTANCE |
|---|---|---|---|---|---|
| L1 (TIE) | S72°31'11"W | 1817.1' | L11 | N68°53'29"W | 268.0' |
| L2 | S89°43'33"W | 47.9' | L12 | N74°46'20"W | 95.5' |
| L3 | N00°17'44"W | 285.4' | L13 | N68°34'56"W | 233.9' |
| L4 | N77°09'29"W | 576.8' | L14 | N15°03'51"E | 34.3' |
| L5 | N83°39'10"W | 138.7' | L15 | N74°55'32"W | 161.4' |
| L6 | N53°43'33"W | 59.3' | L16 | N85°27'44"W | 156.1' |
| L7 | N68°53'42"W | 293.5' | L17 | S79°51'54"W | 94.1' |
| L8 | N21°02'34"W | 51.2' | L18 | N00°18'42"W | 349.3' |
| L9 | N77°10'18"W | 55.0' | L19 | S89°44'25"W | 259.9' |
| L10 | S89°20'28"W | 81.0' | L20 (TIE) | N57°51'18"E | 1381.2' |

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM, "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH 3239 BASED, WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J Eidson

DATE: 01/16/2018

RONALD J. EIDSON
NEW MEXICO
3239
PROFESSIONAL SURVEYOR

## LEGEND

◉ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

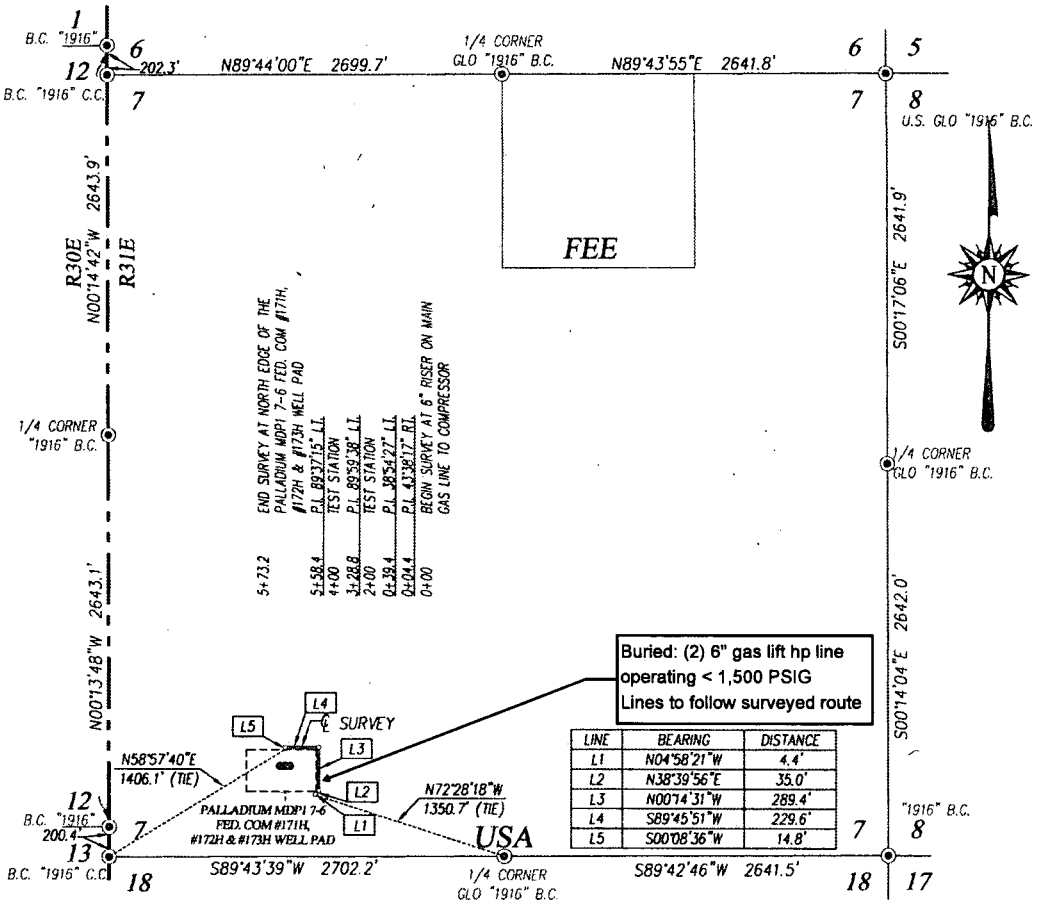
Scale: 1"=1000'

# OXY U.S.A. INC.

## SURVEY OF A FLOW LINE TO THE PALLADIUM MDP1 "7-6" FEDERAL COM 171H, 172H & 173H WELLS CROSSING SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

| Survey Date: 11/20/17 | CAD Date: 1/11/12 | Drawn By: DSS |
|---|---|---|
| W.O. No.: 17111088 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 573.2 FEET OR 0.109 MILES IN LENGTH CROSSING USA LAND IN SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON

DATE: 12-12-2017

## LEGEND

◉ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'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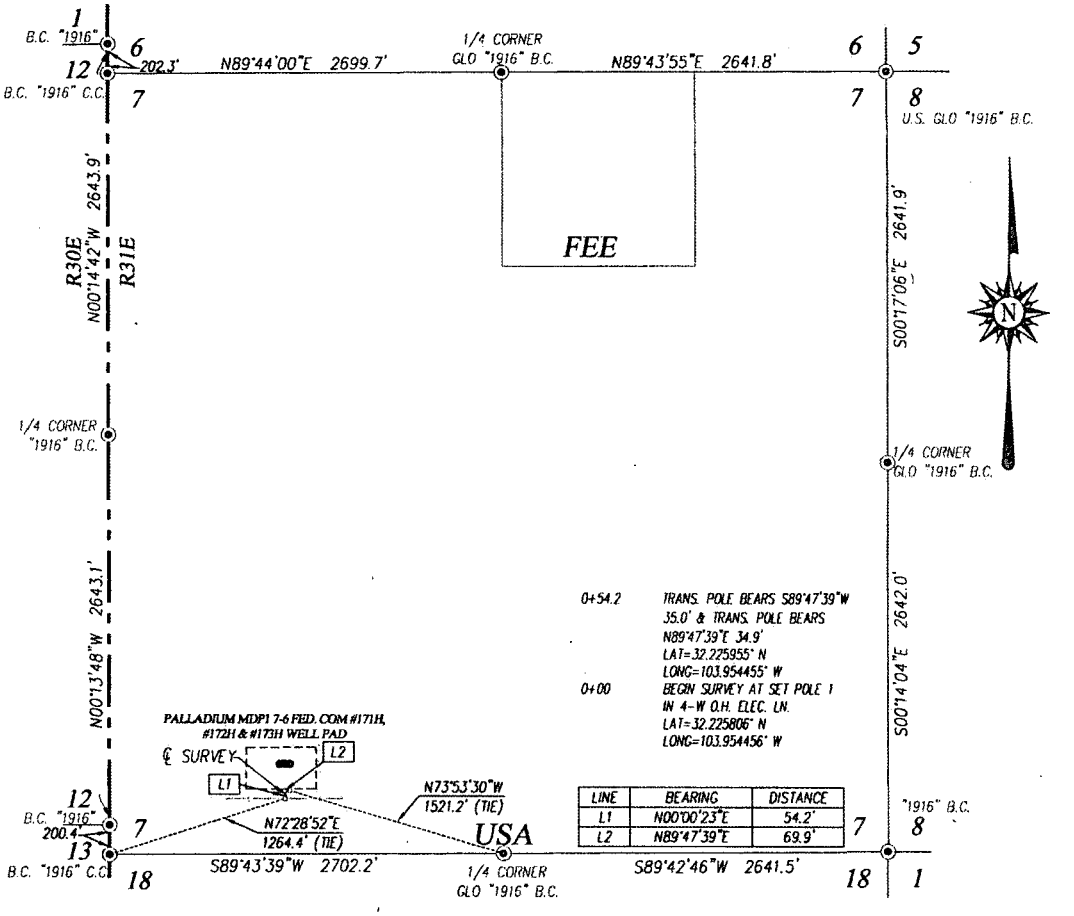
TBPLS# 10021000


# OXY U.S.A. INC.

SURVEY FOR A GAS LIFT PIPELINE TO THE PALLADIUM MDP1 7-6 FEDERAL COM #171H, #172H & #173H CROSSING SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

| Survey Date: 11/15/17 | CAD Date: 12/11/17 | Drawn By: ACK |
|---|---|---|
| W.O. No.: 17111091 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |




| LINE | BEARING | DISTANCE |
|---|---|---|
| L1 | N00°00'23"E | 54.2' |
| L2 | N89°47'39"E | 69.9' |

## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 124.1 FEET OR 0.023 MILES IN LENGTH CROSSING USA LAND IN SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## NOTE

1) BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

2) LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM 1983 (NAD83).

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON

DATE: 12·12·2017

## LEGEND

◉ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'

# OXY U.S.A. INC.

SURVEY FOR AN ELECTRIC LINE TO THE PALLADIUM MDP1 7-6 FEDERAL COM #171H, #172H & #173H CROSSING SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO


PROVIDING SURVEYING SERVICES SINCE 1946

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TBPLS# 10021000


| Survey Date: 11/15/17 | CAD Date: 12/08/17 | Drawn By: ACK |
|---|---|---|
| W.O. No.: 17111092 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |

**Sand Dunes South Corridor WC Development – Surface Production Facilities**

**CTB Site**

A new Central Tank Battery is required in Section 7 which will be composed of (3) tracts with the following dimensions: 500'x500', 200'x30', and 150'x150' and an access road. This will be called the South West Corridor Section 7 CTB.

Reference plats:

(4) John West Surveying Company W.O. No: 1811700 Survey: 6/18/18 CAD: 6/27/18

**Production Flowlines**

Each well will have (3) surface laid flowlines operating at less than 75% of the MAWP of the flowline per the survey plats from the well site to the CTB following access roads. The flowlines will be routed to the South West Section 7 CTB and to the existing South Corridor CTB. The wells will produce to only one of these CTBs at any given time.

Reference plats per well APD package

(1) John West Surveying Company W.O. No: 17111088 Survey: 11/20/17 CAD: 1/11/18

(1) John West Surveying Company W.O. No: 18110921 Survey: 8/31/18 CAD: 9/24/18

**Gas Lift**

A new gas lift supply line will be routed from the new South West Corridor Section 7 CTB. Gas will flow into two (2) 20" CS buried lines operating at less than 125 PSIG.

Reference plats:

(1) John West Surveying Company W.O. No: 18110863 Survey: 8/10/18 CAD: 8/23/18 REV: 8/28/18

Each well pad will have two (2) 6" buried gas lift supply lines operating at < 1500 PSIG branching off of a common 8" main line (existing).

Reference plats per well APD package

(1) John West Surveying Company W.O. No: 17111091 Survey: 11/15/17 CAD: 12/11/17

**Gas Sales**

The South West CTB in Section 7 will require a gas sales pipeline. Gas will flow into two (2) 20" CS buried lines operating at less than 250 PSIG. The gas line will interconnect to an existing pipeline routed to the Enterprise (3rd Party Processor) tie-in point per the attached plat.

Reference plats:

(1) John West Surveying Company W.O. No: 18110862 Survey: 8/10/18 CAD: 8/23/18 REV: 8/23/18

**Oil Sales**

The South West CTB in Section 7 will require an oil sales pipeline. Oil will be pumped into two (2) 8" buried pipelines operating less than 750 PSIG. This will be routed to the existing South Corridor CTB where it will be solf via pipeline through a 3rd Party Processor.

Reference plats:

(1) John West Surveying Company W.O. No: 18110861 Survey: 8/10/18 CAD: 8/23/18 REV: 8/23/18

**Water Disposal**

The South West CTB in Section 7 will require a Water Disposal pipeline to both the existing water disposal system and also the water treatment facilities. Water will be pumped through two (2) 16" HDPE buried lines operating at less than 300 PSIG in each of these routes. The disposal line will connect to the disposal system at the existing South Corridor CTB in section 18. The produced water line to treatment

will connect to the OXY water treatment facility in Section 4 Township 24S Range 31E and will connect to the rest of the Sand Dunes disposal system.

Reference plats:

(1) John West Surveying Company W.O. No: 18110862 Survey: 8/10/18 CAD: 8/23/18 REV: 8/23/18
(1) John West Surveying Company W.O. No: 18110861 Survey: 8/02/18 CAD: 8/22/18
(3) John West Surveying Company W.O. No: 18110971 Survey: 8/27-28/18 CAD: 9/10/18

**Electrical Systems**

The new South West Corridor Section 7 CTB will require electricity for site lighting, PLC, pumps, etc. Overhead electrical will be taken from the main electrical lines.

Reference plats:

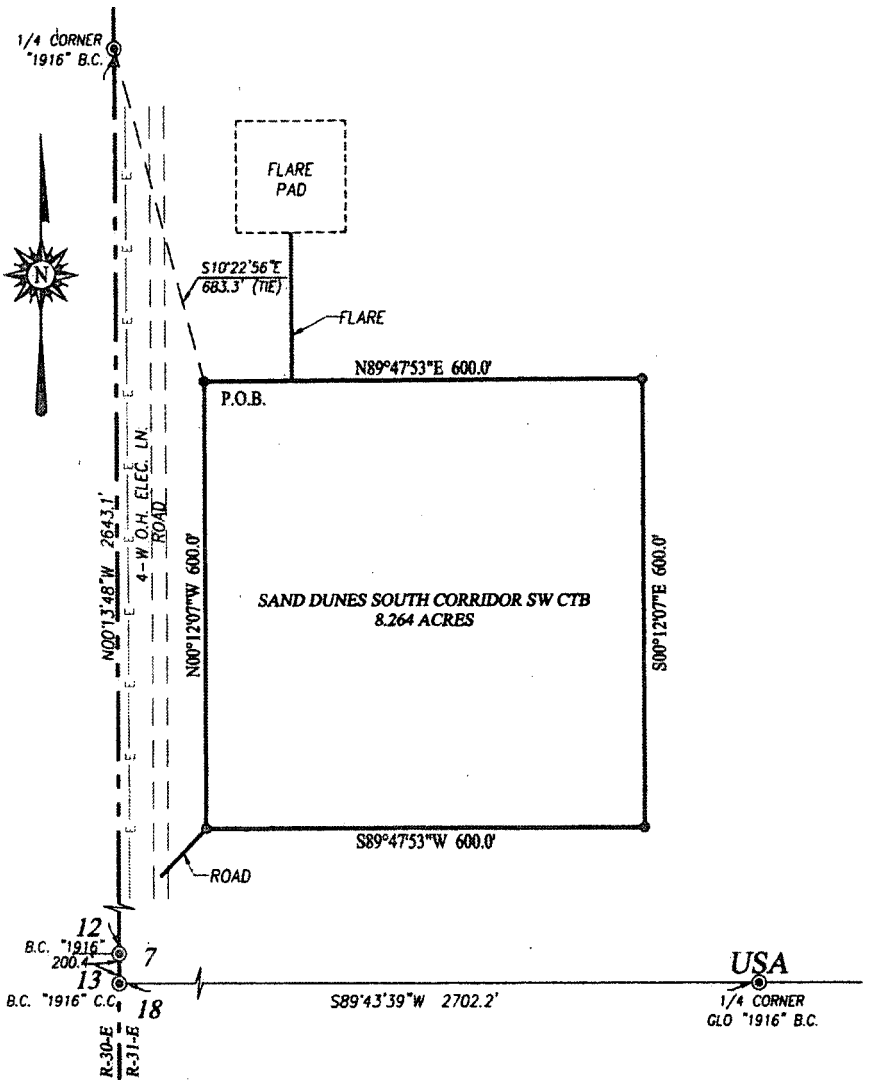
(1) John West Surveying Company W.O. No: 18110825 Survey: 7/26/18 CAD: 8/07/18

Electrical overhead connections are required from the existing electrical infrastructure to connect to each individual well pad.

Reference plats per well APD package

(1) John West Surveying Company W.O. No: 17111092 Survey: 11/15/17 CAD: 12/08/17

CTB-1




## DESCRIPTION:

A TRACT SITUATED IN THE SOUTHWEST QUARTER OF SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER WHICH LIES S10°22'56"E 683.3 FEET FROM THE WEST 1/4 CORNER; THEN N89°47'53"E 600.0 FEET; THEN S00°12'07"E 600.0 FEET; THEN S89°47'53"W 600.0 FEET; THEN N00°12'07"W 600.0 FEET TO THE POINT OF BEGINNING AND CONTAINING 8.264 ACRES MORE OR LESS.

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM, "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 6/28/2018

## LEGEND

- ◉ DENOTES FOUND CORNER AS NOTED
- ● DENOTES SET SPIKE NAIL
- ——— DENOTES CENTERLINE SURVEY

200 0 200 400 Feet

Scale: 1"=200'


PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
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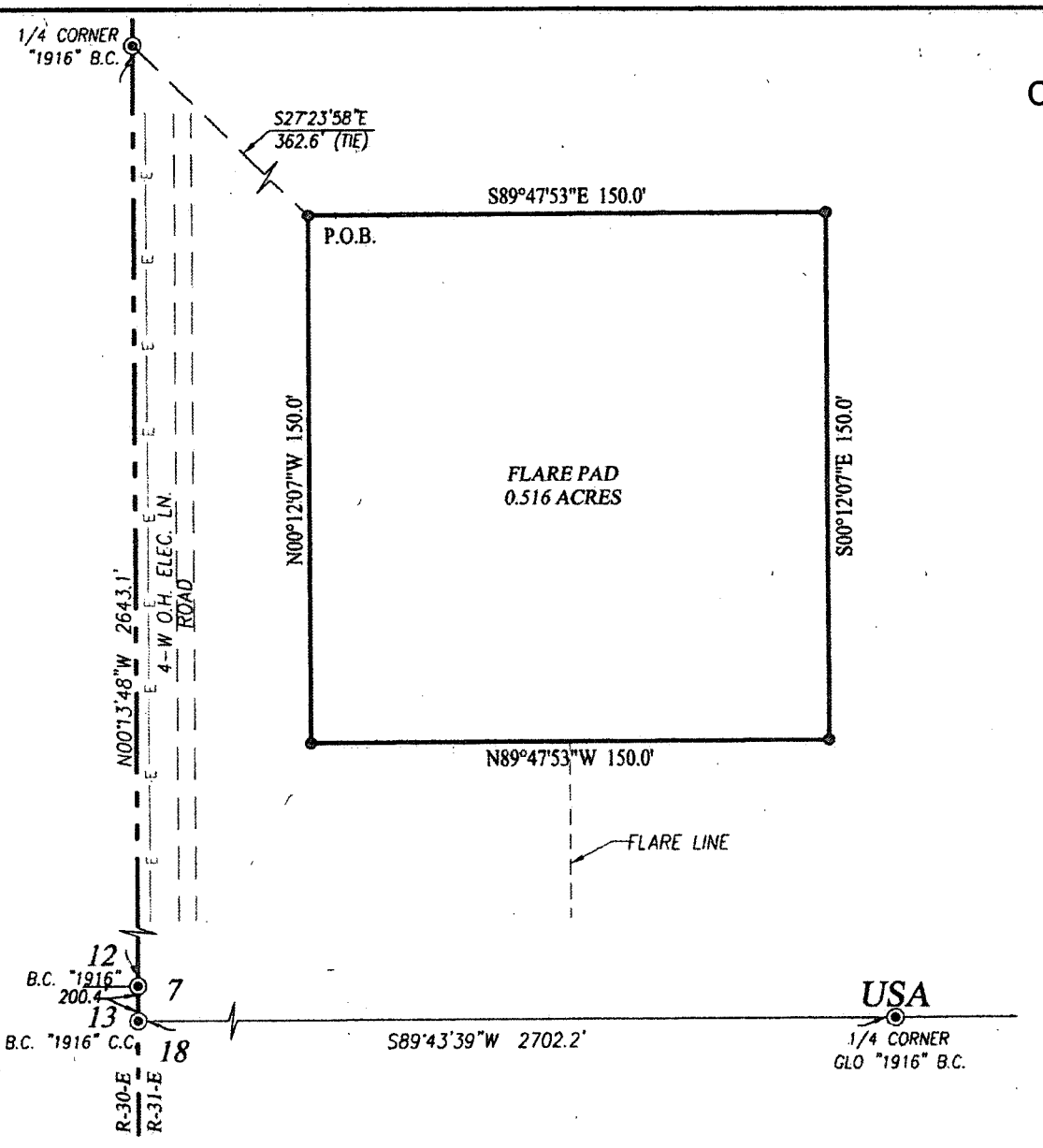
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000


# OXY U.S.A. INC.

**SURVEY FOR A 600x600 SAND DUNES SOUTH CORRIDOR SW CTB SITUATED IN THE SW/4 OF SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO**

| Survey Date: 6/18/18 | CAD Date: 6/27/18 | Drawn By: ACK |
|---|---|---|
| W.O. No.: 18110700 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |

CTB-2




## LEGEND

- ◉ DENOTES FOUND CORNER AS NOTED
- ● DENOTES SET SPIKE NAIL

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

## DESCRIPTION:

A TRACT SITUATED IN THE SOUTHWEST QUARTER OF SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER WHICH LIES S27°23'58"E 362.6 FEET FROM THE WEST 1/4 CORNER; THEN S89°47'53"E 150.0 FEET; THEN S00°12'07"E 150.0 FEET; THEN N89°47'53"W 150.0 FEET; THEN N00°12'07"W 150.0 FEET TO THE POINT OF BEGINNING AND CONTAINING 0.516 ACRES MORE OR LESS.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT, AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON

DATE: 6/28/2018

RONALD J. EIDSON NEW MEXICO 3239 REGISTERED PROFESSIONAL SURVEYOR

100 0 50 100 Feet

Scale: 1"=50'

# OXY U.S.A. INC.

**SURVEY FOR A 150 x 150 FLARE PAD SITUATED IN THE SW/4 OF SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO**

| | | | |
|---|---|---|---|
| Survey Date: 6/18/18 | CAD Date: 6/27/18 | | Drawn By: ACK |
| W.O. No.: 18110700 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |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JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

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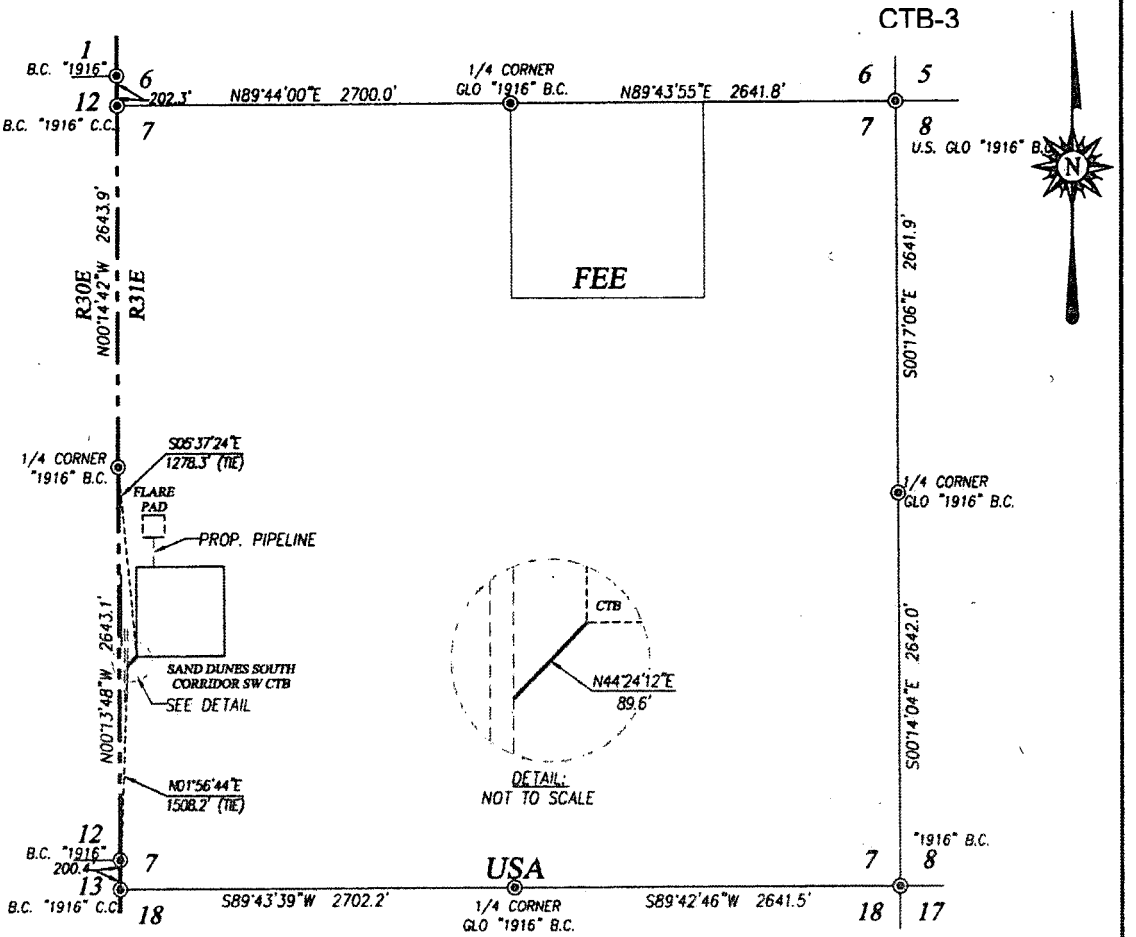
TBPLS# 10021000

CTB-3




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 89.6 FEET OR 0.017 MILES IN LENGTH CROSSING USA LAND IN SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

## LEGEND

◉ – DENOTES FOUND CORNER AS NOTED

——— – DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

Scale: 1"=1000'

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 6/28/2018

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JOHN WEST SURVEYING COMPANY

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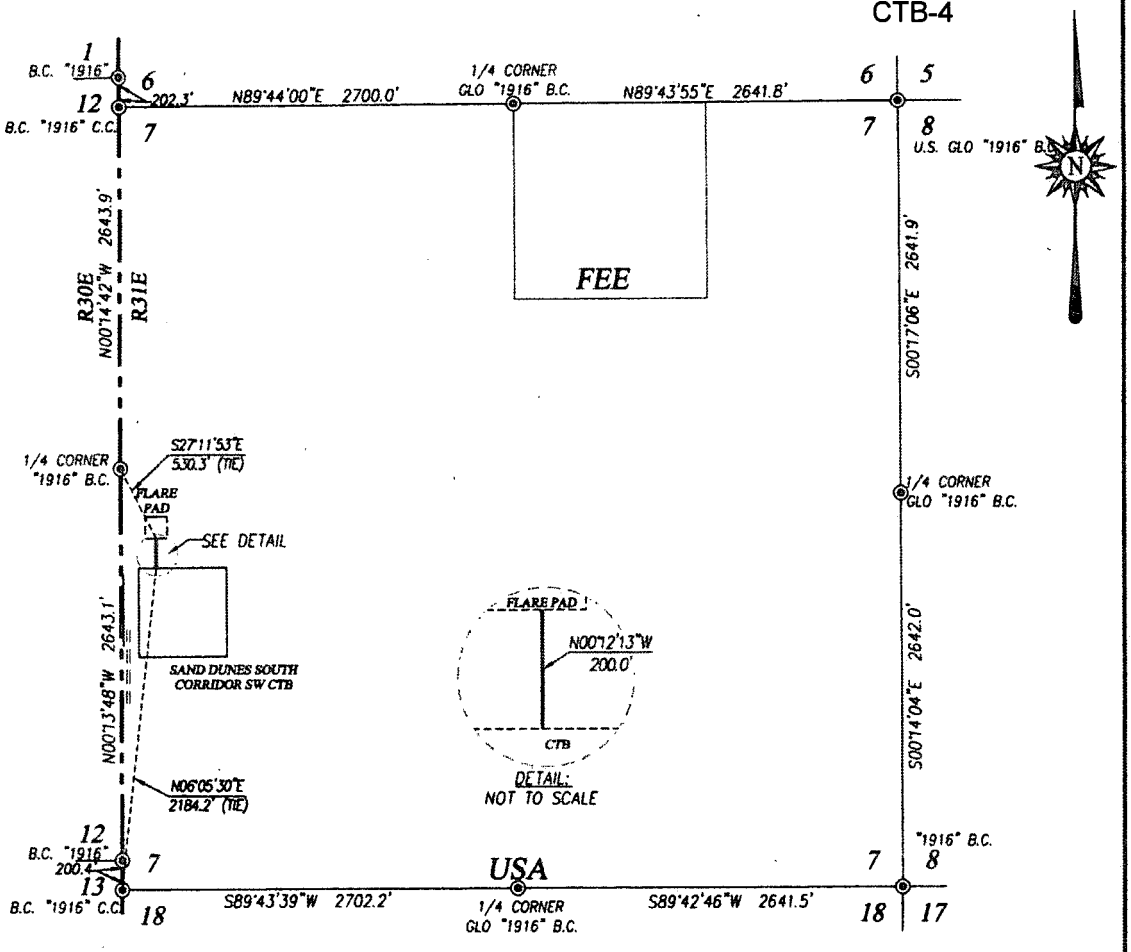
TBPLS# 10021000

# OXY U.S.A. INC.

## SURVEY FOR AN ACCESS ROAD TO THE SAND DUNES SOUTH CORRIDOR SW CTB CROSSING SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

| Survey Date: 6/18/18 | CAD Date: 6/27/18 | Drawn By: ACK |
|---|---|---|
| W.O. No.: 18110700 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |

CTB-4




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 200.0 FEET OR 0.038 MILES IN LENGTH CROSSING USA LAND IN SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 6/28/2018

## LEGEND

◉ – DENOTES FOUND CORNER AS NOTED

——— – DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

Scale: 1"=1000'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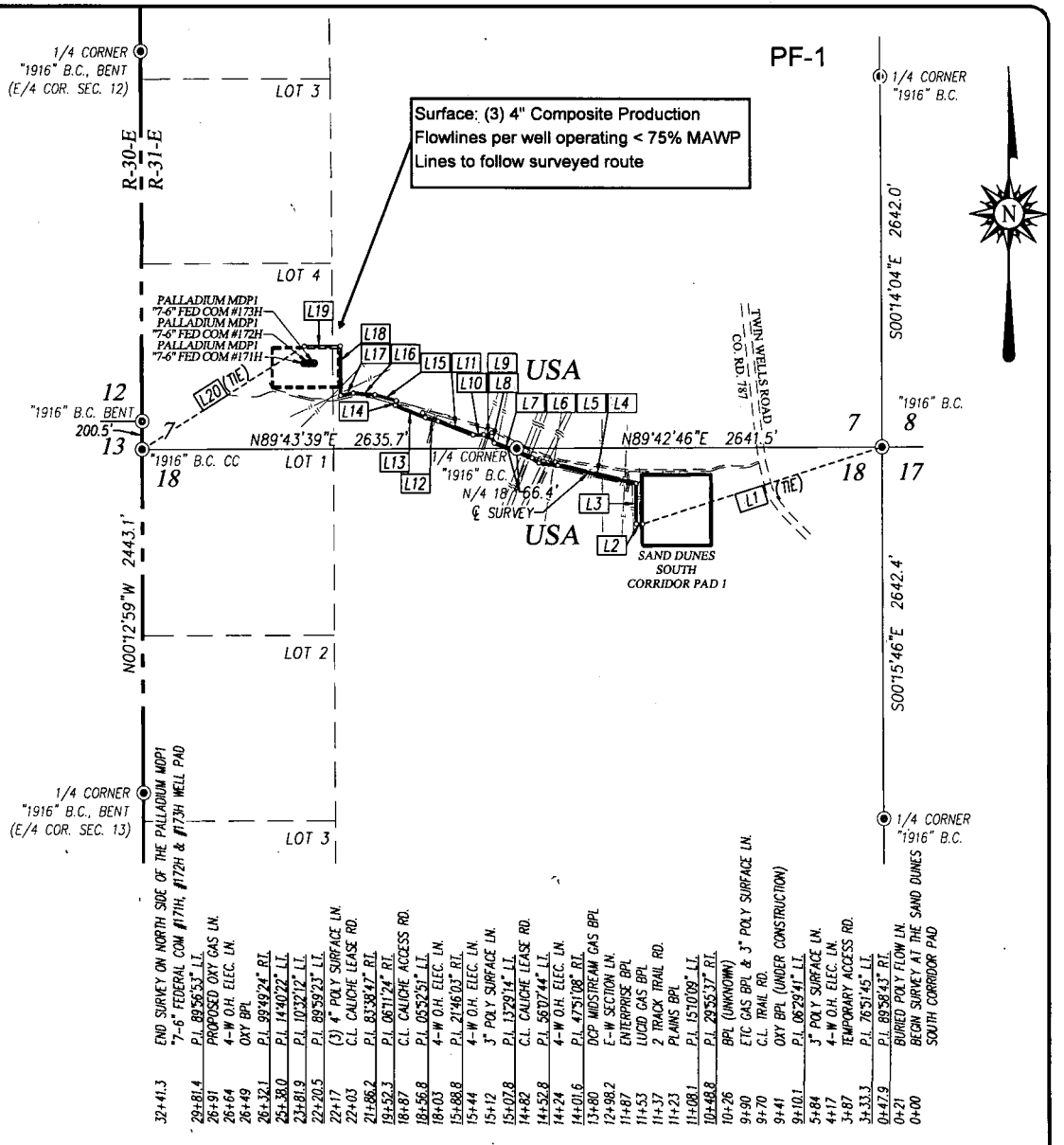
# OXY U.S.A. INC.

## SURVEY FOR A FLARE LINE FOR THE SAND DUNES SOUTH CORRIDOR SW CTB CROSSING SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

| Survey Date: 6/18/18 | CAD Date: 6/27/18 | Drawn By: ACK |
|---|---|---|
| W.O. No.: 18110700 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 3241.3 FEET OR 0.614 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

| LINE | BEARING | DISTANCE | LINE | BEARING | DISTANCE |
|---|---|---|---|---|---|
| L1 (TIE) | S72°31'11"W | 1817.1' | L11 | N68°53'29"W | 268.0' |
| L2 | S89°43'33"W | 47.9' | L12 | N74°46'20"W | 95.5' |
| L3 | N00°17'44"W | 285.4' | L13 | N68°34'56"W | 233.9' |
| L4 | N77°09'29"W | 576.8' | L14 | N15°03'51"E | 34.3' |
| L5 | N83°39'10"W | 138.7' | L15 | N74°55'32"W | 161.4' |
| L6 | N53°43'33"W | 59.3' | L16 | N85°27'44"W | 156.1' |
| L7 | N68°53'42"W | 293.5' | L17 | S79°51'54"W | 94.1' |
| L8 | N21°02'34"W | 51.2' | L18 | N00°18'42"W | 349.3' |
| L9 | N77°10'18"W | 55.0' | L19 | S89°44'25"W | 259.9' |
| L10 | S89°20'28"W | 81.0' | L20 (TIE) | N57°51'18"E | 1381.2' |

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM, "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH 3239 BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J Eidson

DATE: 01/16/2018

RONALD J. EIDSON NEW MEXICO 3239 PROFESSIONAL SURVEYOR

## LEGEND

◉ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'

# OXY U.S.A. INC.

## SURVEY OF A FLOW LINE TO THE PALLADIUM MDP1 "7-6" FEDERAL COM 171H, 172H & 173H WELLS CROSSING SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO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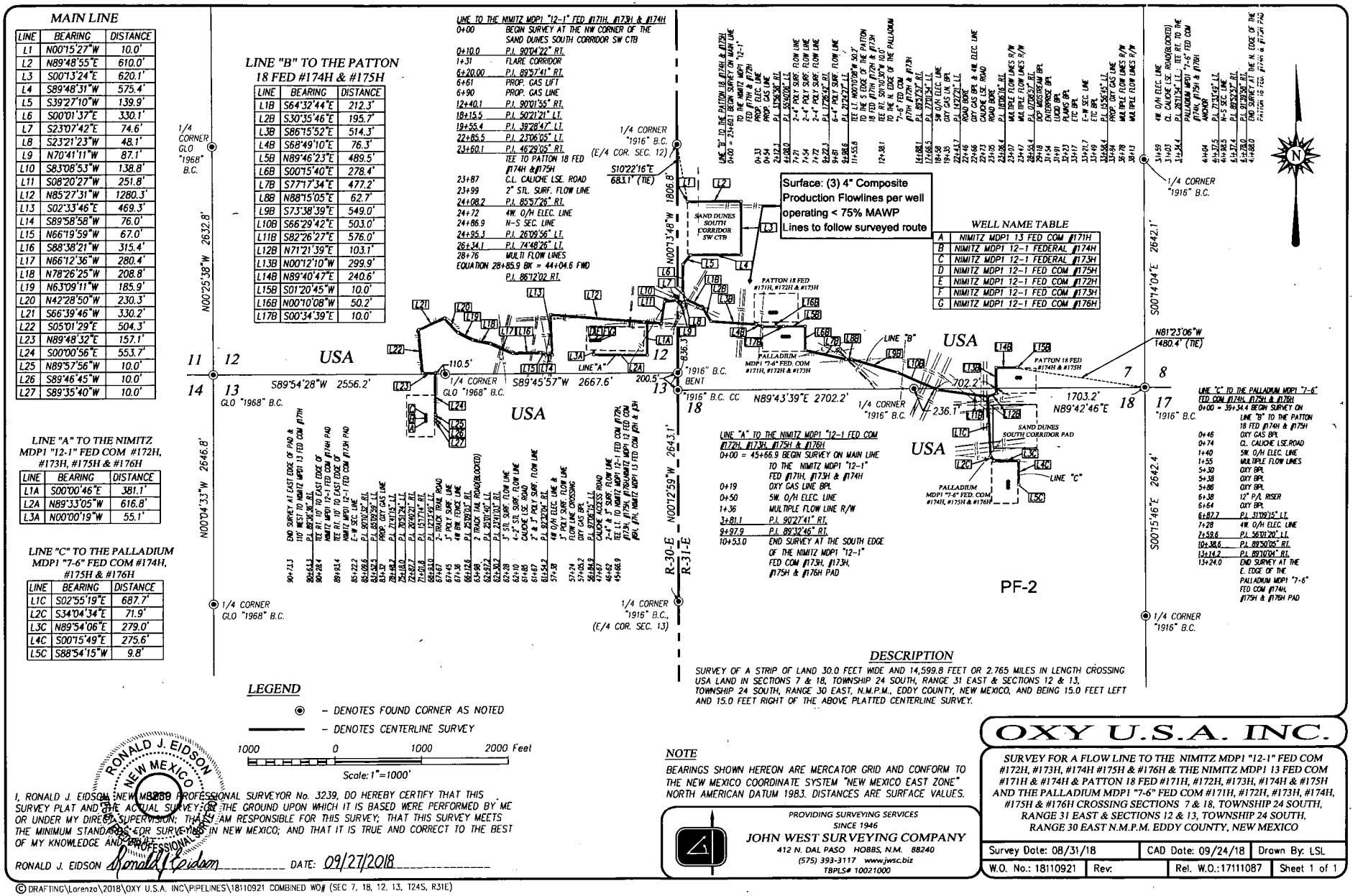
| Survey Date: 11/20/17 | CAD Date: 1/11/12 | Drawn By: DSS |
|---|---|---|
| W.O. No.: 17111088 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |




| MAIN LINE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | N00°15'27"W | 10.0' |
| L2 | N89°48'55"E | 610.0' |
| L3 | S00°13'24"E | 620.1' |
| L4 | S89°48'31"W | 575.4' |
| L5 | S39°27'10"W | 139.9' |
| L6 | S00°01'37"E | 330.1' |
| L7 | S23°07'42"E | 74.6' |
| L8 | S23°21'23"W | 48.1' |
| L9 | N70°41'11"W | 87.1' |
| L10 | S83°08'53"W | 138.8' |
| L11 | S08°20'27"W | 251.8' |
| L12 | N85°27'31"W | 1280.3' |
| L13 | S02°33'46"E | 469.3' |
| L14 | S89°58'58"W | 76.0' |
| L15 | N66°19'59"W | 67.0' |
| L16 | S88°38'21"W | 315.4' |
| L17 | N66°12'36"W | 280.4' |
| L18 | N78°26'25"W | 208.8' |
| L19 | N63°09'11"W | 185.9' |
| L20 | N42°28'50"W | 230.3' |
| L21 | S66°39'46"W | 330.2' |
| L22 | S05°01'29"E | 504.3' |
| L23 | N89°48'32"E | 157.1' |
| L24 | S00°00'56"E | 553.7' |
| L25 | N89°57'56"W | 10.0' |
| L26 | S89°46'45"W | 10.0' |
| L27 | S89°35'40"W | 10.0' |

| LINE "B" TO THE PATTON 18 FED #174H & #175H | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1B | S64°32'44"E | 212.3' |
| L2B | S30°35'46"E | 195.7' |
| L3B | S86°15'52"E | 514.3' |
| L4B | S68°49'10"E | 76.3' |
| L5B | N89°46'23"E | 489.5' |
| L6B | S00°15'40"E | 278.4' |
| L7B | S77°17'34"E | 477.2' |
| L8B | N88°15'05"E | 62.7' |
| L9B | S73°38'39"E | 549.0' |
| L10B | S66°29'42"E | 503.0' |
| L11B | S82°26'27"E | 576.0' |
| L12B | N71°21'39"E | 103.1' |
| L13B | N00°12'10"W | 299.9' |
| L14B | N89°40'47"E | 240.6' |
| L15B | S01°20'45"W | 10.0' |
| L16B | N00°10'08"W | 50.2' |
| L17B | S00°34'39"E | 10.0' |

| LINE "A" TO THE NIMITZ MDP1 "12-1" FED COM #172H, #173H, #175H & #176H | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1A | S00°00'46"E | 381.1' |
| L2A | N89°33'05"W | 616.8' |
| L3A | N00°00'19"W | 55.1' |

| LINE "C" TO THE PALLADIUM MDP1 "7-6" FED COM #174H, #175H & #176H | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1C | S02°55'19"E | 687.7' |
| L2C | S34°04'34"E | 71.9' |
| L3C | N89°54'06"E | 279.0' |
| L4C | S00°15'49"E | 275.6' |
| L5C | S88°54'15"W | 9.8' |

LINE "B" TO THE NIMITZ MDP1 "12-1" FED COM #171H, #173H & #174H
0+00 BEGIN SURVEY AT THE NW CORNER OF THE SAND DUNES SOUTH CORRIDOR SW CTB
0+10.0 P.I. 90°04'22" RT.
1+31 FLARE CORRIDOR
6+20.00 P.I. 89°57'41" RT.
6+61 PROP. GAS LIFT
6+90 PROP. GAS LINE
12+40.1 P.I. 90°01'55" RT.
18+15.5 P.I. 50°21'21" LT.
19+55.4 P.I. 39°28'47" LT.
22+85.5 P.I. 23°06'05" LT.
23+60.1 P.I. 46°29'05" RT.
TIE TO PATTON 18 FED #174H & #175H
23+87 C.L. CALICHE LSE. ROAD
23+99 2" STL. SURF. FLOW LINE
24+08.2 P.I. 85°57'26" RT.
24+72 4W. O/H ELEC. LINE
24+86.9 N-S SEC. LINE
24+95.3 P.I. 26°09'56" LT.
26+34.1 P.I. 74°48'26" LT.
28+76 MULTI FLOW LINES
EQUATION 28+85.9 BK = 44+04.6 FWD
P.I. 86°12'02" RT.

LINE "A" TO THE NIMITZ MDP1 "12-1 FED COM #172H, #173H, #175H & #176H
0+00 = 45+66.9 BEGIN SURVEY ON MAIN LINE TO THE NIMITZ MDP1 "12-1" FED #171H, #173H & #174H
0+19 OXY GAS LINE BPL
0+50 5W. O/H ELEC. LINE
1+36 MULTIPLE FLOW LINE R/W
3+81.1 P.I. 90°27'41" RT.
9+97.9 P.I. 89°32'46" RT.
10+53.0 END SURVEY AT THE SOUTH EDGE OF THE NIMITZ MDP1 "12-1" FED COM #173H, #173H, #175H & #176H PAD

LINE "C" TO THE PALLADIUM MDP1 "7-6" FED COM #174H, #175H & #176H
0+00 = 39+34.4 BEGIN SURVEY ON LINE "B" TO THE PATTON 18 FED #174H & #175H
0+46 OXY GAS BPL
0+74 CL. CALICHE LSE.ROAD
1+40 5W. O/H ELEC. LINE
1+55 MULTIPLE FLOW LINES
5+38 OXY BPL
5+38 OXY BPL
5+86 OXY BPL
6+38 12" P/L RISER
6+64 OXY BPL
6+87.2 P.I. 31°09'15" LT.
7+28 4W. O/H ELEC. LINE
7+58.6 P.I. 56°01'20" LT.
10+38.6 P.I. 89°50'05" RT.
13+14.2 P.I. 89°10'04" RT.
13+24.0 END SURVEY AT THE E. EDGE OF THE PALLADIUM MDP1 "7-6" FED COM #174H, #175H & #176H PAD

## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 14,599.8 FEET OR 2.765 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST & SECTIONS 12 & 13, TOWNSHIP 24 SOUTH, RANGE 30 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson DATE: 09/27/2018

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

# OXY U.S.A. INC.

SURVEY FOR A FLOW LINE TO THE NIMITZ MDP1 "12-1" FED COM #172H, #173H, #174H #175H & #176H & THE NIMITZ MDP1 13 FED COM #171H & #174H & PATTON 18 FED #171H, #172H, #173H, #174H & #175H AND THE PALLADIUM MDP1 "7-6" FED COM #171H, #172H, #173H, #174H, #175H & #176H CROSSING SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST & SECTIONS 12 & 13, TOWNSHIP 24 SOUTH, RANGE 30 EAST N.M.P.M. EDDY COUNTY, NEW MEXICO

| Survey Date: 08/31/18 | CAD Date: 09/24/18 | Drawn By: LSL |
|---|---|---|
| W.O. No.: 18110921 | Rev: | Rel. W.O.: 17111087 | Sheet 1 of 1 |

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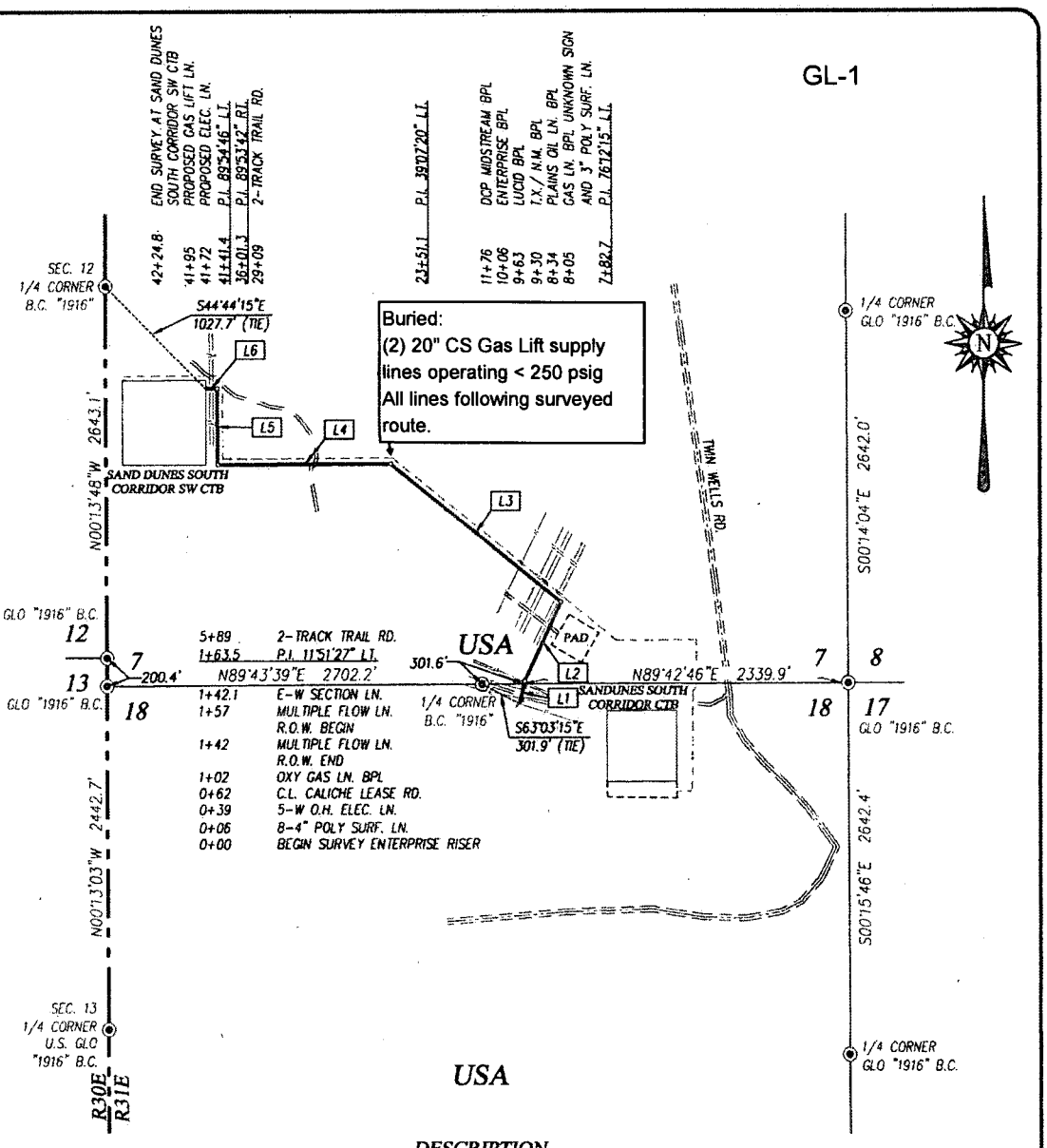
GL-1




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 4224.8 FEET OR 0.800 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

| LINE | BEARING | DISTANCE |
|---|---|---|
| L1 | N13°11'28"E | 163.5' |
| L2 | N25°02'55"E | 619.2' |
| L3 | N51°09'20"W | 1568.4' |
| L4 | S89°43'20"W | 1250.2' |
| L5 | N00°22'58"W | 540.1' |
| L6 | S89°42'16"W | 83.4' |

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 8/28/2018

## LEGEND

- ⊙ – DENOTES FOUND CORNER AS NOTED
- ——— – DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

Scale: 1"=1000'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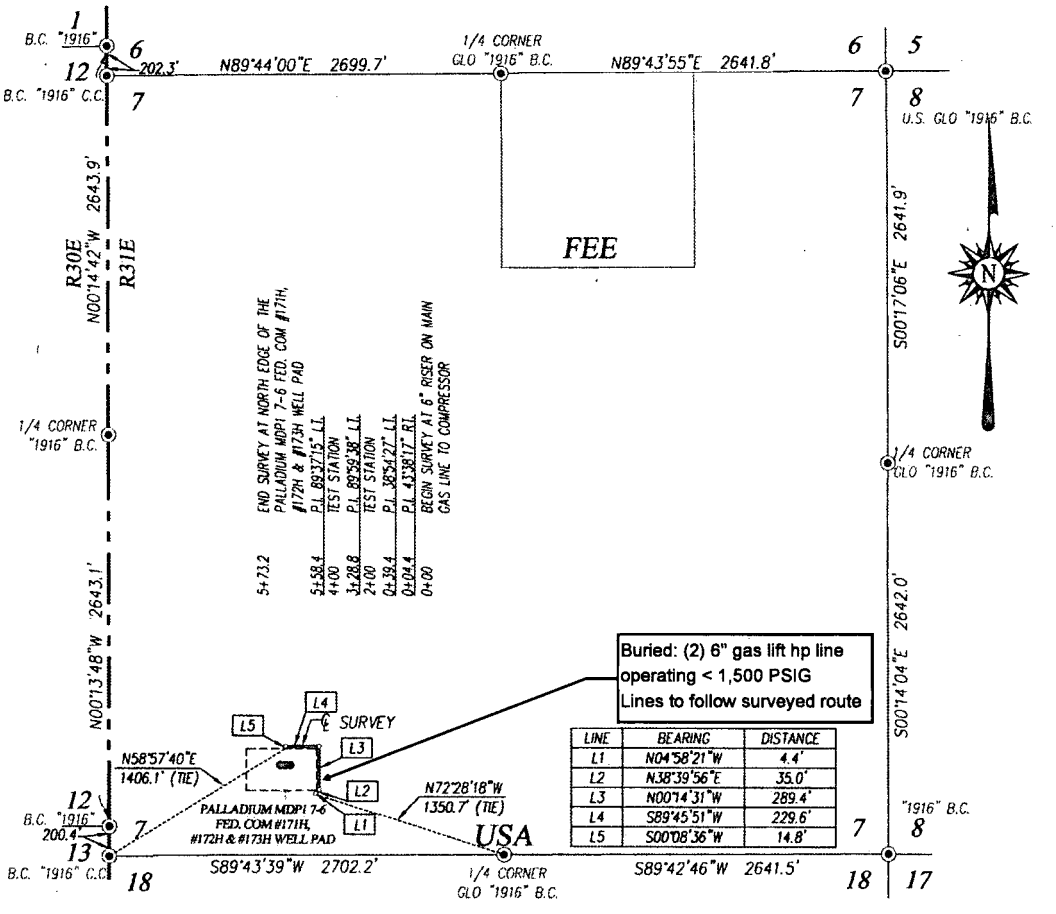
# OXY U.S.A. INC.

## SURVEY FOR AN GAS SALES PIPELINE FROM AN EXISTING OXY RISER TO THE SOUTHWEST CTB CROSSING SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

| Survey Date: 8/10/18 | CAD Date: 8/23/18 | Drawn By: ACK |
|---|---|---|
| W.O. No.: 18110863 | Rev: 8/28/18 | Rel. W.O.: | Sheet 1 of 1 |




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 573.2 FEET OR 0.109 MILES IN LENGTH CROSSING USA LAND IN SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

GL-2

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON

DATE: 12-12-2017

## LEGEND

◉ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
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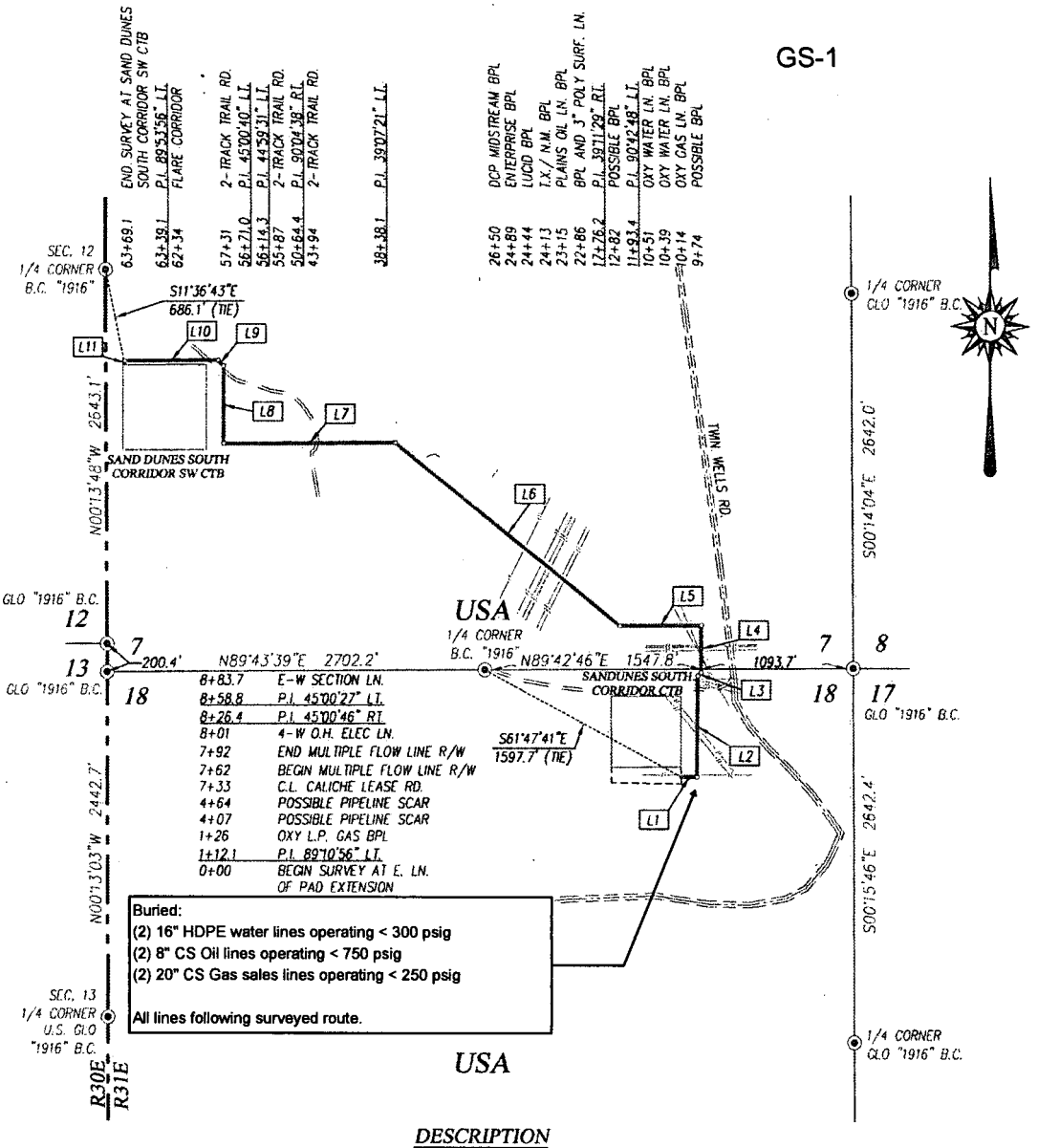
# OXY U.S.A. INC.

SURVEY FOR A GAS LIFT PIPELINE TO THE PALLADIUM MDP1 7-6 FEDERAL COM #171H, #172H & #173H CROSSING SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

| | | | |
|---|---|---|---|
| Survey Date: 11/15/17 | CAD Date: 12/11/17 | | Drawn By: ACK |
| W.O. No.: 17111091 | Rev: | Rel. W.O.: | Sheet 1 of 1 |

GS-1




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 6369.1 FEET OR 1.206 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

| LINE | BEARING | DISTANCE | LINE | BEARING | DISTANCE |
|---|---|---|---|---|---|
| L1 | N89°32'35"E | 112.1' | L6 | N51°09'21"W | 2061.9' |
| L2 | N00°21'39"E | 714.3' | L7 | S89°43'18"W | 1226.3' |
| L3 | N45°22'25"E | 32.4' | L8 | N00°12'04"W | 549.9' |
| L4 | N00°21'58"E | 334.6' | L9 | N45°11'35"W | 56.7' |
| L5 | S89°39'10"W | 582.8' | L10 | S89°47'45"W | 668.1' |
| | | | L11 | S00°06'11"E | 30.0' |

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT, AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 8/28/2018

NEW MEXICO PROFESSIONAL SURVEYOR

## LEGEND

⊙ - DENOTES FOUND CORNER AS NOTED

——— - DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

Scale: 1"=1000'

# OXY U.S.A. INC.

**SURVEY FOR AN OIL PIPELINE FROM THE SOUTH CORRIDOR CTB TO THE SOUTHWEST CTB CROSSING SECTIONS 7 & 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO**


PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

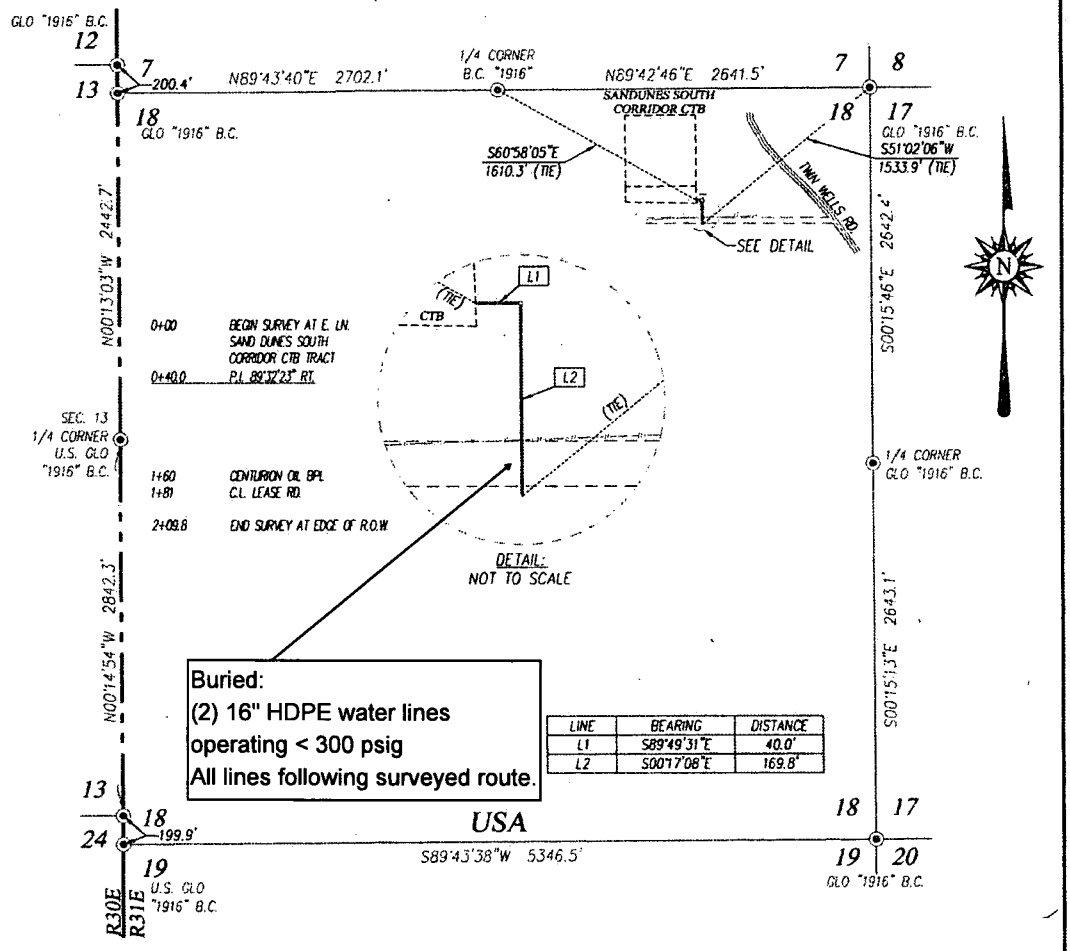
412 N. DAL PASO HOBBS, N.M. 88240

(575) 393-3117 www.jwsc.biz

TBPLS# 10021000


| | | | |
|---|---|---|---|
| Survey Date: 8/10/18 | CAD Date: 8/23/18 | Drawn By: ACK | |
| W.O. No.: 18110862 | Rev: 8/28/18 | Rel. W.O.: | Sheet 1 of 1 |

OS-1




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 209.8 FEET OR 0.040 MILES IN LENGTH CROSSING USA LAND IN SECTION 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 9/17/2018

NEW MEXICO PROFESSIONAL SURVEYOR

## LEGEND

◉ – DENOTES FOUND CORNER AS NOTED

——— – DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

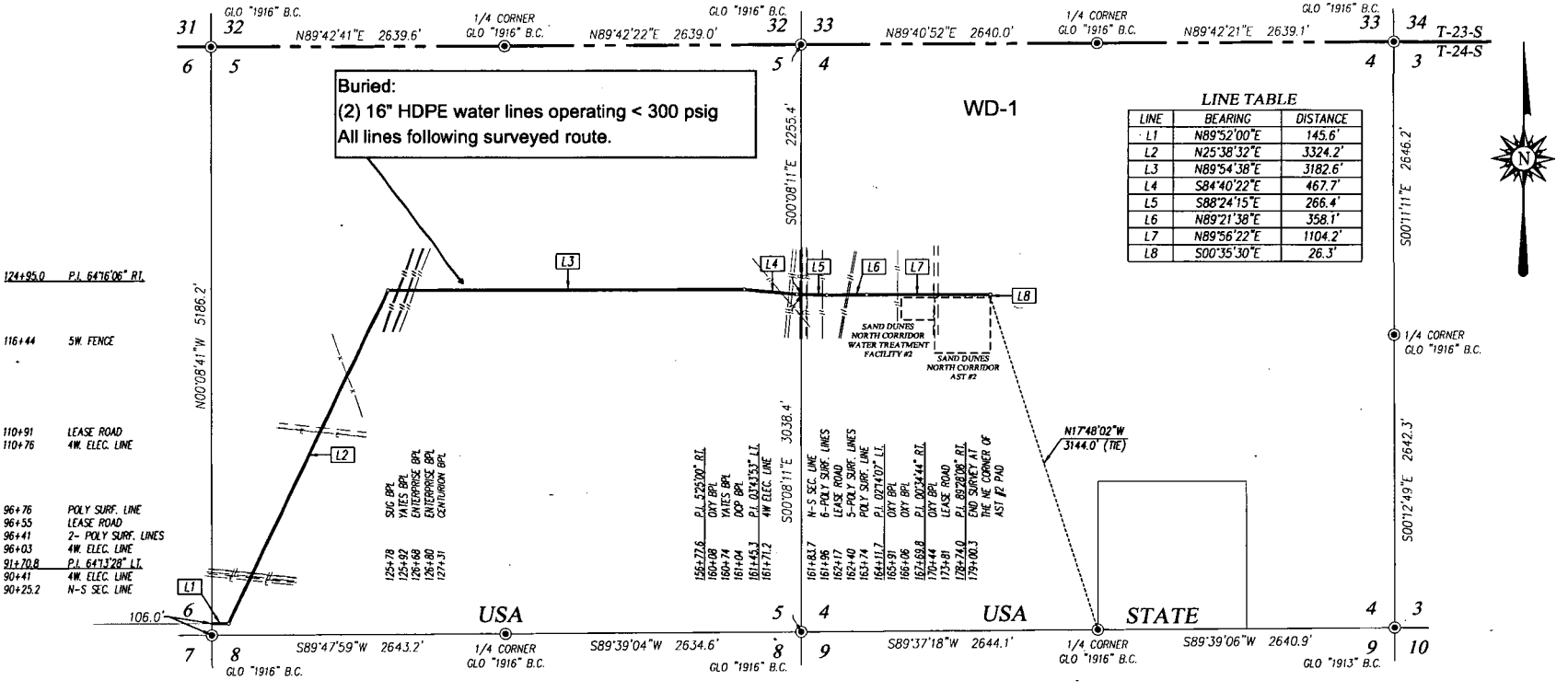
Scale: 1"=1000'


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000


# OXY U.S.A. INC.

## SURVEY FOR AN OIL PIPELINE FROM THE SAND DUNES SOUTH CORRIDOR CTB TO THE CENTURION PIPELINE CROSSING SECTION 18, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

| | | | |
|---|---|---|---|
| Survey Date: 8/02/18 | CAD Date: 8/22/18 | | Drawn By: ACK |
| W.O. No.: 18110861 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |




## DESCRIPTION

SURVEY FOR A STRIP OF LAND 30.0 FEET WIDE AND 8875.1 FEET OR 1.681 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 4 & 5, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## LEGEND

◉ – DENOTES FOUND CORNER AS NOTED

——— – DENOTES CENTERLINE SURVEY

1000 0 1000 2000 Feet

Scale: 1"=1000'

## NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

RONALD J. EIDSON NEW MEXICO 3239 PROFESSIONAL SURVEYOR

I, RONALD J. EIDSON, NEW MEXICO 3239 PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

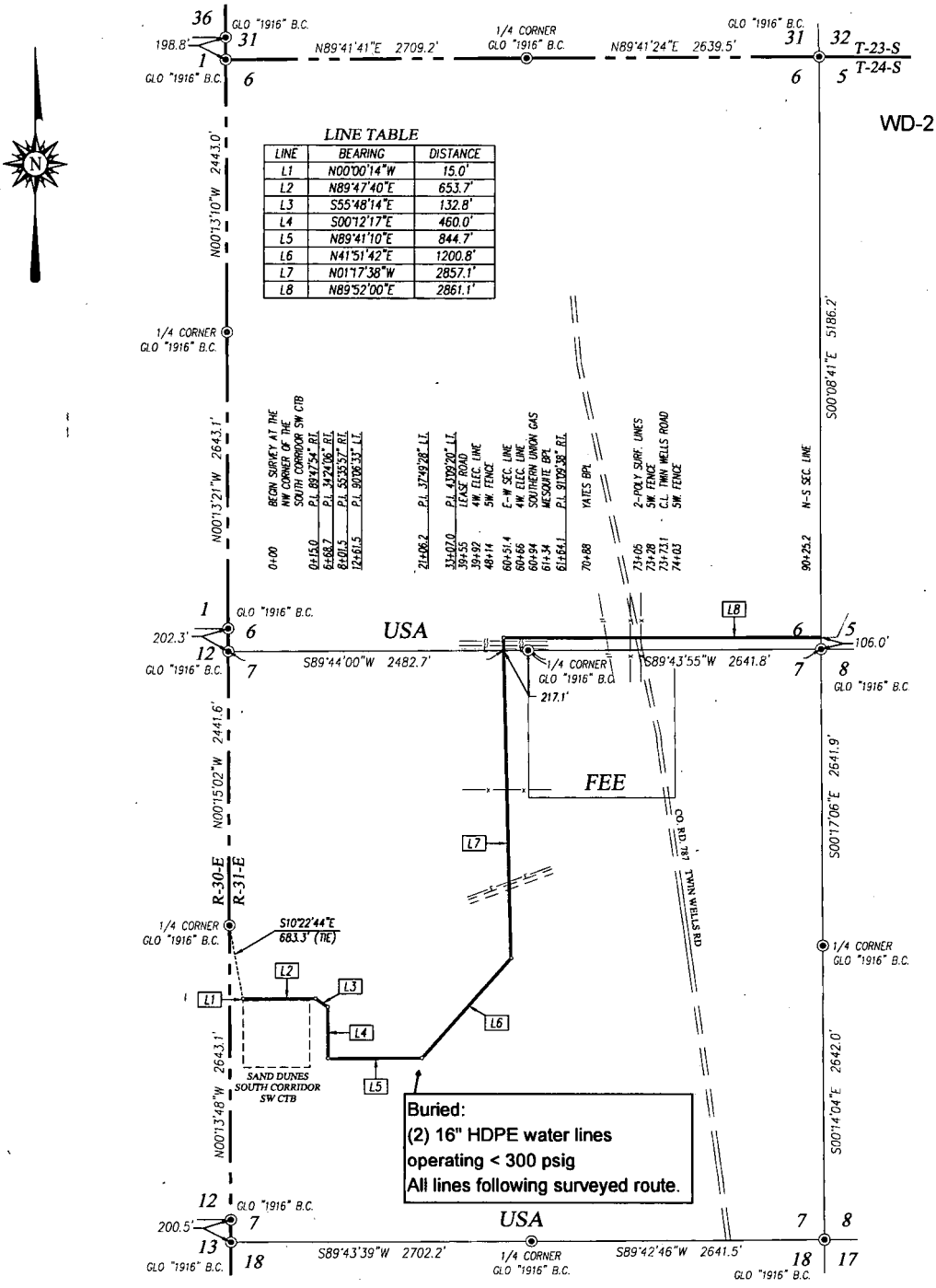
RONALD J. EIDSON Ronald J. Eidson DATE: 09/10/2018

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

# OXY U.S.A. INC.

SURVEY FOR A BURIED WATER LINE
TO THE SAND DUNES NORTH CORRIDOR AST #2
CROSSING SECTIONS 6 & 7,
TOWNSHIP 24 SOUTH, RANGE 31 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO

| | | | |
|---|---|---|---|
| Survey Date: 08/27 & 28/18 | CAD Date: 09/10/18 | Drawn By: LSL | |
| W.O. No.: 18110971 | Rev: | Rel. W.O.: | Sheet 1 of 1 |




## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 9025.0 FEET OR 1.709 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 6 & 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 09/10/2018

RONALD J. EIDSON 3239 REGISTERED PROFESSIONAL SURVEYOR

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

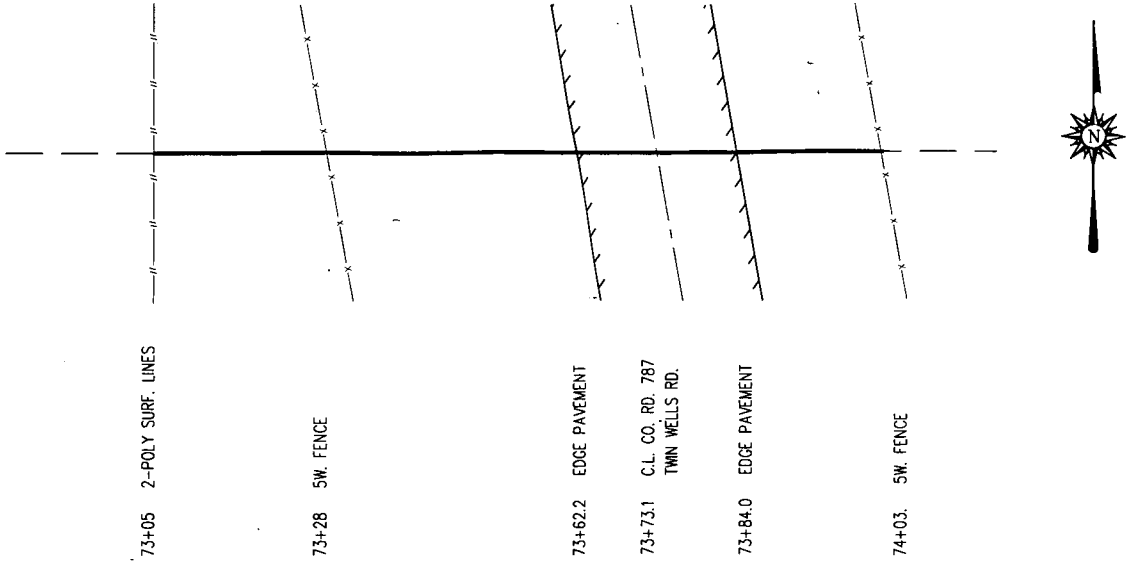
### NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

# OXY U.S.A. INC.

SURVEY FOR A BURIED WATER LINE
TO THE SAND DUNES NORTH CORRIDOR AST #2
CROSSING SECTIONS 6 & 7,
TOWNSHIP 24 SOUTH, RANGE 31 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO

| Survey Date: 08/27 & 28/18 | CAD Date: 09/10/18 | Drawn By: LSL |
|---|---|---|
| W.O. No.: 18110971 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |




CARRIER PIPE

CASING OR HEAVY WALL PIPE

CONTENTS:

MATERIAL:

OUTSIDE DIA:

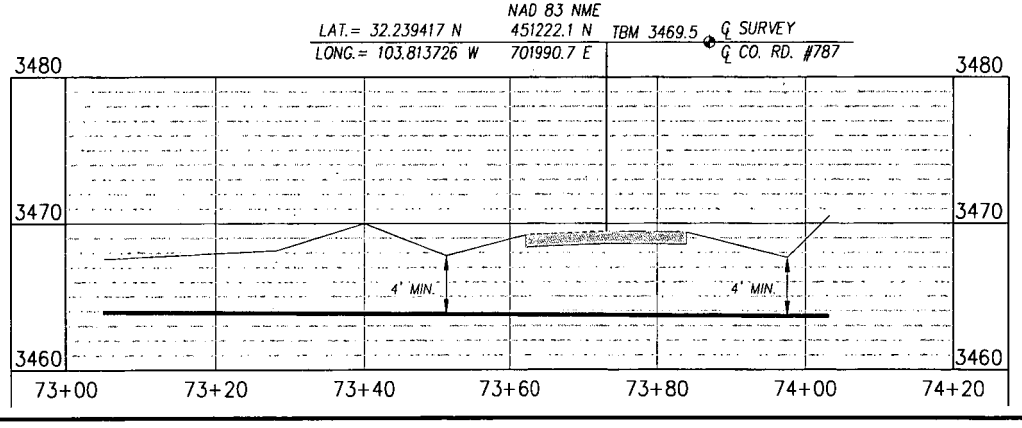
GRADE & SPEC:

WALL THICKNESS:

**WD-3**

20 0 20 FEET

Horizontal Scale: 1"=20'




NOTE:
BEARINGS AND COORDINATE VALUES SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE", NORTH AMERICAN DATUM OF 1983. DISTANCES ARE SURFACE VALUES. ELEVATIONS ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM 1988 (GEOID 2003).

# OXY U.S.A. INC.

PIPELINE CROSSING UNDER EDDY CO. RD. #787
TWIN WELLS ROAD IN SECTION 6,
TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

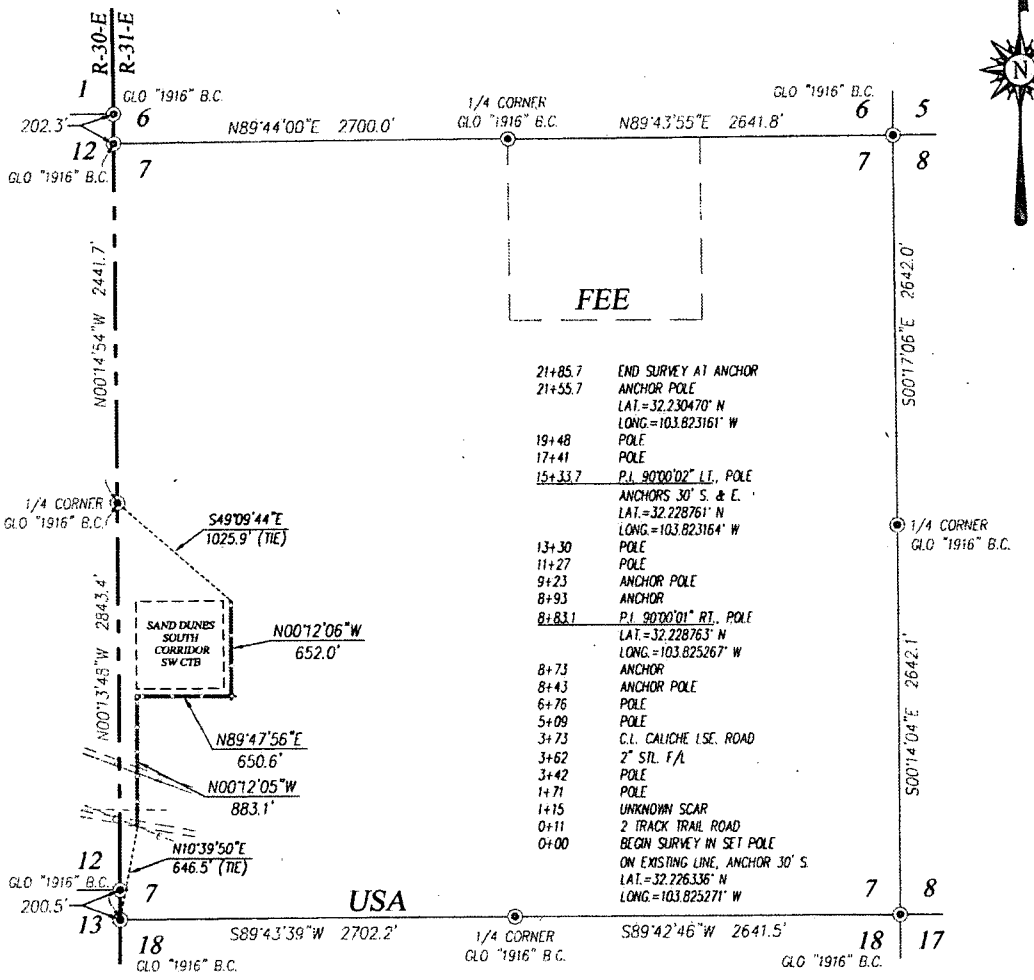
SCALE
HORZ.: 1"=20'
VERT.: 1"=10'

Drawn By: LSL

Date: 08/27/18

W.O. No.: 18110971

ES-1




## DESCRIPTION

SURVEY FOR A STRIP OF LAND 30.0 FEET WIDE AND 2185.7 FEET OR 0.414 MILES IN LENGTH CROSSING USA LAND IN SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## NOTE

1) BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

2) LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM 1983 (NAD83).

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J Eidson

DATE: 8/07/2018

## LEGEND

◉ – DENOTES FOUND CORNER AS NOTED

——— – DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

Scale: 1"=1000'


PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

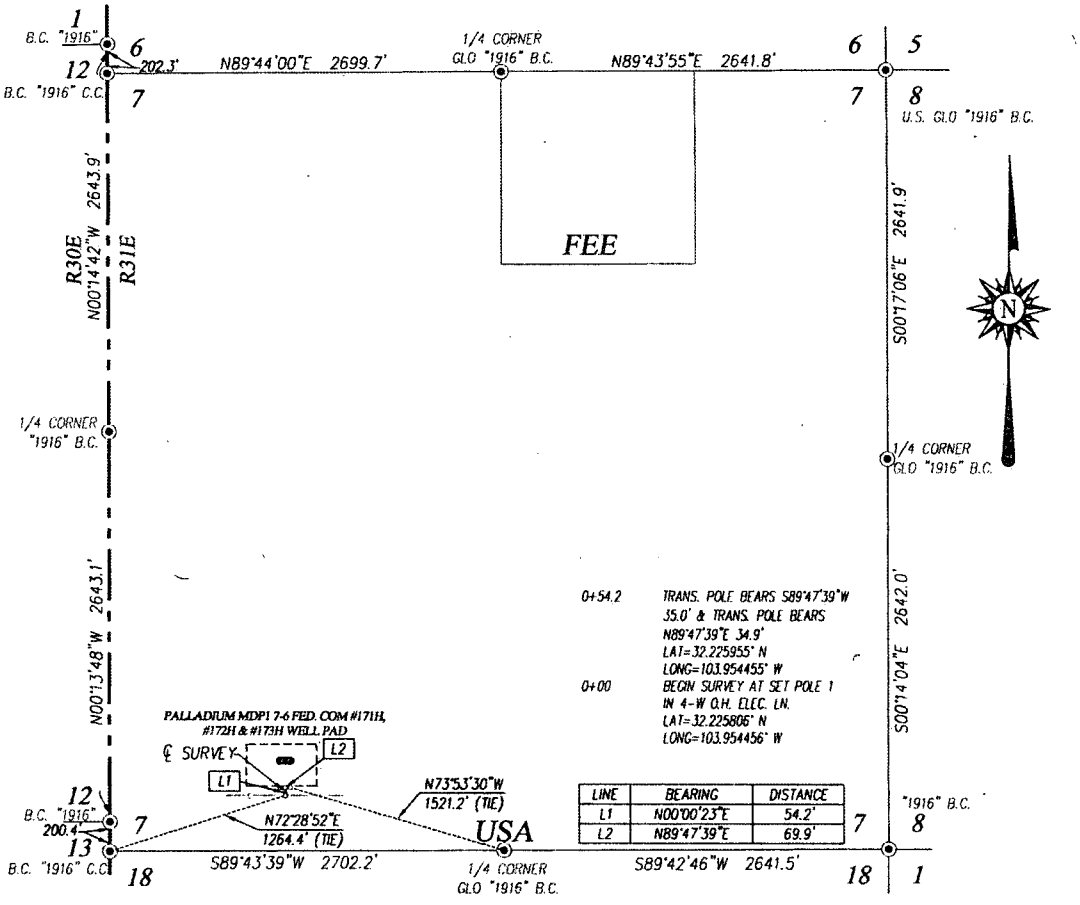
(575) 393-3117 www.jwsc.biz

TBPLS# 10021000


# OXY U.S.A. INC.

## SURVEY FOR AN ELECTRIC LINE TO THE SAND DUNES SOUTH CORRIDOR SW CTB CROSSING SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

| Survey Date: 07/26/18 | CAD Date: 08/07/18 | Drawn By: LSL |
|---|---|---|
| W.O. No.: 18110825 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |




| LINE | BEARING | DISTANCE |
|---|---|---|
| L1 | N00°00'23"E | 54.2' |
| L2 | N89°47'39"E | 69.9' |

## DESCRIPTION

SURVEY OF A STRIP OF LAND 30.0 FEET WIDE AND 124.1 FEET OR 0.023 MILES IN LENGTH CROSSING USA LAND IN SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

ES-2

## NOTE

1) BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

2) LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM 1983 (NADB3).

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

DATE: 12-12-2017

## LEGEND

◉ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000


# OXY U.S.A. INC.

SURVEY FOR AN ELECTRIC LINE TO THE PALLADIUM MDP1 7-6 FEDERAL COM #171H, #172H & #173H CROSSING SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

| Survey Date: 11/15/17 | CAD Date: 12/08/17 | Drawn By: ACK |
|---|---|---|
| W.O. No.: 17111092 | Rev: . | Rel. W.O.: | Sheet 1 of 1 |

Prepared by:
Dave Andersen
GRR Land Department

GRR, INC. WATER SOURCES
FOR OXY CERTAIN POND LOCATIONS

08/26/2016

| Pond Name | Water Source1 | Water Source2 | Water Source3 | Water Source4 |
|---|---|---|---|---|
| Cedar Canyon | Mine_Industrial | C-3478 | C-2772 | C-1360 |
| Corral Fly | C-1360 | C-1361 | C-3358 | C-3836 |
| Cypress | Mine_Industrial | C-3478 | C-2772 | C-1361 |
| Mesa Verde | C-2571 | C-2574 | J-27 | J-5 |
| Peaches | C-906 | C-3200 | SP-55 & SP-1279 A | C-100 |

## GRR Inc.

| NMOSE WELL NUMBER | WELL COMMON NAME | LAND OWNERSHIP | GPS LOCATION |
|---|---|---|---|
| C-100 | Tres Rios - Next to well shack | PRIVATE | 32.201921° -104.254317° |
| C-100-A | Tres Rios - Center of turnaround | PRIVATE | 32.201856° -104.254443° |
| C-272-B | Tres Rios - Northwest | PRIVATE | 32.202315° -104.254812° |
| C-906 | Whites City Commercial | PRIVATE | 32.176949°-104.374371° |
| C-1246-AC & C-1246-AC-S | Lackey | PRIVATE | 32.266978°-104.271212° |
| C-1886 | 1886 Tank | BLM | 32.229316° -104.312930° |
| C-1083 | Petska | PRIVATE | 32.30904° -104.16979° |
| C-1142 | Winston West | BLM | 32.507845-104.177410 |
| C-1360 | ENG#1 | PRIVATE | 32.064922° -103.908818° |
| C-1361 | ENG#2 | PRIVATE | 32.064908° -103.906266° |
| C-1573 | Cooksey | PRIVATE | 32.113463° -104.108092° |
| C-1575 | ROCKHOUSE Ranch Well - Wildcat | BLM | 32.493190° -104.444163° |
| C-2270 | CW#1 (Oliver Kiehne) | PRIVATE | 32.021440° -103.559208° |
| C-2242 | Walterscheid | PRIVATE | 32.39199° -104.17694° |
| C-2492POD2 | Stacy Mills | PRIVATE | 32.324203° -103.812472° |
| C-2569 | Paduca well #2 | BLM | 32.160588 -103.742051 |
| C-2569POD2 | Paduca well replacement | BLM | 32.160588 -103.742051 |
| C-2570 | Paduca (tank) well #4 | BLM | 32.15668 -103.74114 |
| C-2571 | Paduca (road) well | BLM | 32.163993° -103.745457° |
| C-2572 | Paduca well #6 | BLM | 32.163985 -103.7412 |
| C-2573 | Paduca (in the bush) well | BLM | 32.16229 -103.74363 |
| C-2574 | Paduca well (on grid power) | BLM | 32.165777° -103.747590° |
| C-2701 | 401 Water Station | BLM | 32.458767° -104.528097° |
| C-2772 | Mobley Alternate | BLM | 32.305220° -103.852360° |
| C-3011 | ROCKY ARROYO - MIDDLE | BLM | 32.409046° -104.452045° |
| C-3060 | Max Vasquez | PRIVATE | 32.31291° -104.17033° |
| C-3095 | ROCKHOUSE Ranch Well - North of Rockcrusher | PRIVATE | 32.486794° -104.426227° |
| C-3200 | Beard East | PRIVATE | 32.168720 -104.276600 |
| C-3260 | Hayhurst | PRIVATE | 32.227110° -104.150925° |
| C-3350 | Winston Barn | PRIVATE | 32.511871° -104.139094° |
| C-3358 | Branson | PRIVATE | 32.19214° -104.06201° |
| C-3363 | Watts#2 | PRIVATE | 32.444637° -103.931313° |
| C-3453 | ROCKY ARROYO - FIELD | PRIVATE | 32.458657° -104.460804° |
| C-3478 | Mobley Private | PRIVATE | 32.294937° -103.888656° |
| C-3483pod1 | ENG#3 | BLM | 32.065556° -103.894722° |
| C-3483pod3 | ENG#5 | BLM | 32.06614° -103.89231° |
| C-3483POD4 | CW#4 (Oliver Kiehne) | PRIVATE | 32.021803° -103.559030° |
| C-3483POD5 | CW#5 (Oliver Kiehne) | PRIVATE | 32.021692° -103.560158° |
| C-3554 | Jesse Baker #1 well | PRIVATE | 32.071937° -103.723030° |
| C-3577 | CW#3 (Oliver Kiehne) | PRIVATE | 32.021773° -103.559738° |
| C-3581 | ENG#4 | BLM | 32.066083° -103.895024° |
| C-3595 | Oliver Kiehne house well #2 | PRIVATE | 32.025484° -103.682529° |
| C-3596 | CW#2 (Oliver Kiehne) | PRIVATE | 32.021793° -103.559018° |

GRR Inc.

| NMOSE WELL NUMBER | WELL COMMON NAME | LAND OWNERSHIP | GPS LOCATION |
|---|---|---|---|
| C-3614 | Dale Hood #2 well | PRIVATE | 32.449290° -104.214500° |
| C-3639 | Jesse Baker #2 well | PRIVATE | 32.073692° -103.727121° |
| C-3679 | McCloy-Batty | PRIVATE | 32.215790° -103.537690° |
| C-3689 | Winston Barn_South | PRIVATE | 32.511504° -104.139073° |
| C-3731 | Ballard Construction | PRIVATE | 32.458551° -104.144219° |
| C-3764 | Watts#4 | PRIVATE | 32.443360° -103.942890° |
| C-3795 | Beckham#6 | BLM | 32.023434°-103.321968° |
| C-3821 | Three River Trucking | PRIVATE | 32.34636° -104.21355 |
| C-3824 | Collins | PRIVATE | 32.224053° -104.090129° |
| C-3829 | Jesse Baker #3 well | PRIVATE | 32.072545°-103.722258° |
| C-3830 | Paduca | BLM | 32.156400° -103.742060° |
| C-3836 | Granger | PRIVATE | 32.10073° -104.10284° |
| C-384 | ROCKHOUSE Ranch Well - Rockcrusher | PRIVATE | 32.481275° -104.420706° |
| C-459 | Walker | PRIVATE | 32.3379° -104.1498° |
| C-496pod2 | Munoz #3 Trash Pit Well | PRIVATE | 32.34224° -104.15365° |
| C-496pod3&4 | Munoz #2 Corner of Porter & Derrick | PRIVATE | 32.34182° -104.15272° |
| C-552 | Dale Hood #1 well | PRIVATE | 32.448720° -104.214330° |
| C-764 | Mike Vasquez | PRIVATE | 32.230553° -104.083518° |
| C-766(old) | Grandi | PRIVATE | 32.32352° -104.16941° |
| C-93-S | Don Kidd well | PRIVATE | 32.344876 -104.151793 |
| C-987 | ROCKY ARROYO - HOUSE | PRIVATE | 32.457049° -104.461506° |
| C-98-A | Bindel well | PRIVATE | 32.335125° -104.187255° |
| CP-1170POD1 | Beckham#1 | PRIVATE | 32.065889° -103.312583° |
| CP-1201 | Winston Ballard | BLM | 32.580380° -104.115980° |
| CP-1202 | Winston Ballard | BLM | 32.538178° -104.046024° |
| CP-1231 | Winston Ballard | PRIVATE | 32.618968° -104.122690° |
| CP-1263POD5 | Beckham#5 | PRIVATE | 32.065670° -103.307530° |
| CP-1414 | Crawford #1 | PRIVATE | 32.238380° -103.260890° |
| CP-1414 POD 1 | RRR | PRIVATE | 32.23911° -103.25988° |
| CP-1414 POD 2 | RRR | PRIVATE | 32.23914° -103.25981° |
| CP-519 | Bond_Private | PRIVATE | 32.485546 -104.117583 |
| CP-556 | Jimmy Mills (Stacy) | STATE | 32.317170° -103.495080° |
| CP-626 | Ol Loco (W) | STATE | 32.692660° -104.068064° |
| CP-626-S | Beach Exploration/ Ol Loco (E) | STATE | 32.694229° -104.064759° |
| CP-73 | Laguna #1 | BLM | 32.615015°-103.747615° |
| CP-74 | Laguna #2 | BLM | 32.615255°-103.747688° |
| CP-741 | Jimmy Richardson | BLM | 32.61913° -104.06101° |
| CP-742 | Jimmy Richardson | BLM | 32.614061° -104.017211° |
| CP-742 | Hidden Well | BLM | 32.614061 -104.017211 |
| CP-745 | Leaning Tower of Pisa | BLM | 32.584619° -104.037179° |
| CP-75 | Laguna #3 | BLM | 32.615499°-103.747715° |
| CP-924 | Winston Ballard | BLM | 32.545888° -104.110114° |
| CP-926 | Winchester well (Winston) | BLM | 32.601125° -104.128358° |

GRR Inc.

| NMOSE WELL NUMBER | WELL COMMON NAME | LAND OWNERSHIP | GPS LOCATION |
|---|---|---|---|
| J-27 | Beckham | PRIVATE | 32.020403° -103.299333° |
| J-5 | EPNG Jal Well | PRIVATE | 32.050232° -103.313117° |
| J-33 | Beckham | PRIVATE | 32.016443° -103.297714° |
| J-34 | Beckham | PRIVATE | 32.016443° -103.297714° |
| J-35 | Beckham | PRIVATE | 32.016443° -103.297714° |
| L-10167 | Angell Ranch well | PRIVATE | 32.785847° -103.644705° |
| L-10613 | Northcutt3 (2nd House well) | PRIVATE | 32.687922°-103.472452° |
| L-11281 | Northcutt4 | PRIVATE | 32.687675°-103.471512° |
| L-12459 | Northcutt1 (House well) | PRIVATE | 32.689498°-103.472697° |
| L-12462 | Northcutt8 Private Well | PRIVATE | 32.686238°-103.435409° |
| L-13049 | EPNG Maljamar well | PRIVATE | 32.81274° -103.67730° |
| L-13129 | Pearce State | STATE | 32.726305°-103.553172° |
| L-13179 | Pearce Trust | STATE | 32.731304°-103.548461° |
| L-13384 | Northcutt7 (State) CAZA | STATE | 32.694651°-103.434997° |
| L-1880S-2 | HB Intrepid well #7 | PRIVATE | 32.842212° -103.621299° |
| L-1880S-3 | HB Intrepid well #8 | PRIVATE | 32.852415° -103.620405° |
| L-1881 | HB Intrepid well #1 | PRIVATE | 32.829124° -103.624139° |
| L-1883 | HB Intrepid well #4 | PRIVATE | 32.828041° -103.607654° |
| L-3887 | Northcutt2 (Tower or Pond well) | PRIVATE | 32.689036°-103.472437° |
| L-5434 | Northcutt5 (State) | STATE | 32.694074°-103.405111° |
| L-5434-S | Northcutt6 (State) | STATE | 32.693355°-103.407004° |
| RA-14 | Horner Can | PRIVATE | 32.89348° -104.37208° |
| RA-1474 | Irvin Smith | PRIVATE | 32.705773° -104.393043° |
| RA-1474-B | NLake WS / Jack Clayton | PRIVATE | 32.561221°-104.293095° |
| RA-9193 | Angell Ranch North Hummingbird | PRIVATE | 32.885162° -103.676376° |
| SP-55 & SP-1279-A | Blue Springs Surface POD | PRIVATE | 32.181358° -104.294009° |
| SP-55 & SP-1279 (Bounds) | Bounds Surface POD | PRIVATE | 32.203875° -104.247076° |
| SP-55 & SP-1279 (Wilson) | Wilson Surface POD | PRIVATE | 32.243010° -104.052197° |
| City Treated Effluent | City of Carlsbad Waste Treatment Plant | PRIVATE | 32.411122° -104.177030° |
| Mine Industrial | Mosaic Industrial Water | PRIVATE | 32.370286° -103.947839° |
| Mobley State Well (NO OSE) | Mobley Ranch | STATE | 32.308859° -103.891806° |
| EPNG Industrial | Monument Water Well Pipeline (Oil Center, Eunice) | PRIVATE | 32.512943° -103.290300° |
| MCOX Commercial | Matt Cox Commercial | PRIVATE | 32.529431° -104.188017° |
| AMAX Mine Industrial | Mosaic Industrial Water | N/A | VARIOUS TAPS |
| WAG Mine Industrial | Mosaic Industrial Water | N/A | VARIOUS TAPS |
| HB Mine Industrial | Intrepid Industrial Water | N/A | VARIOUS TAPS |

**Mesquite**

Cedar Canyon
Major Source: C464 (McDonald) Sec. 13 T24S R28E
Secondary Source: C-00738 (McDonald/Faulk) Sec. 12 T24S R28E

Corral Fly – South of Cedar Canyon
Major Source: C464 (McDonald) Sec. 13 T24S R28E
Secondary Source: C-00738 (McDonald/Faulk) Sec. 12 T24S R28E

Cypress – North of Cedar Canyon
Major Source: Caviness B: C-501-AS2 Sec 23 T28S R15E
Secondary Source: George Arnis; C-1303

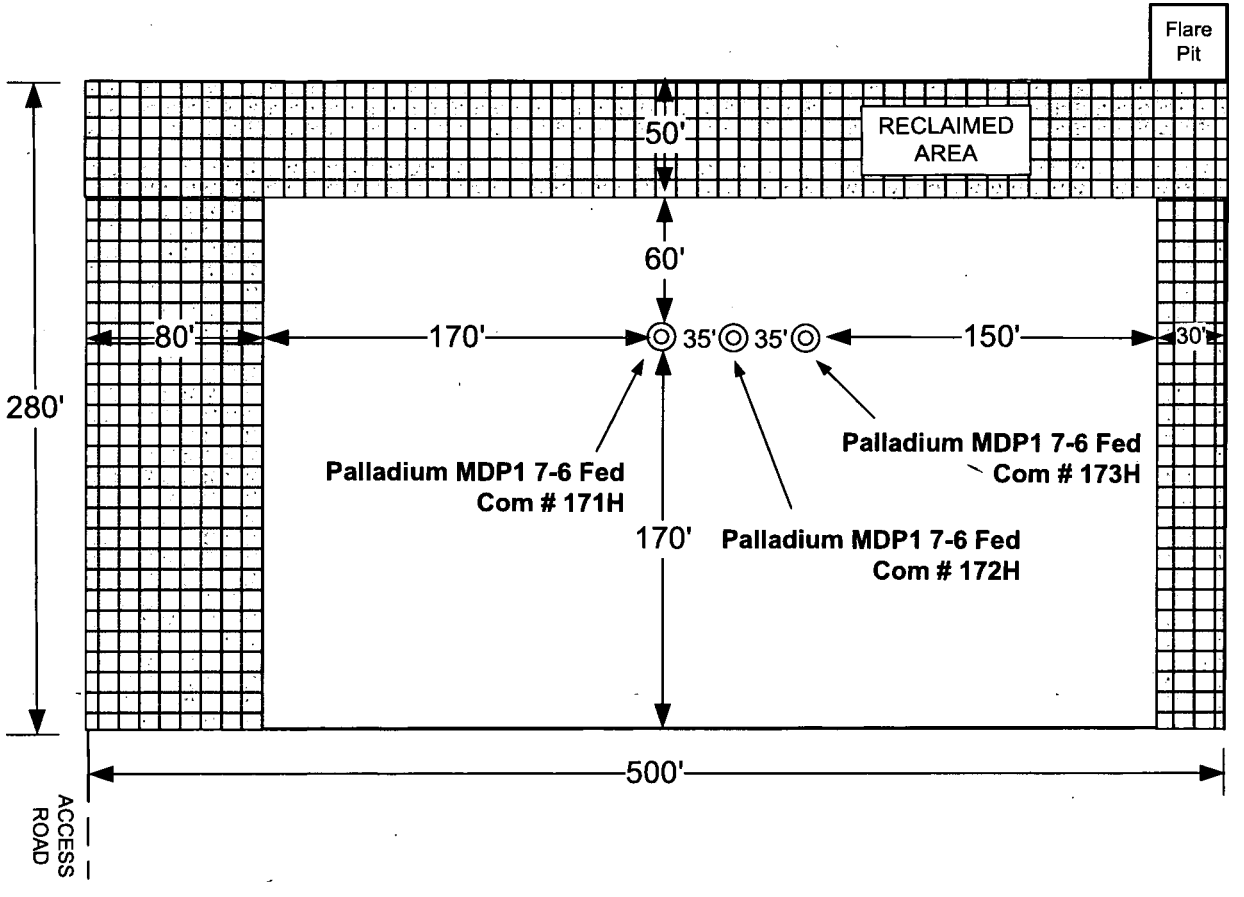
Sand Dunes – new frac pond
Major Source: 128 Fresh Water Pond (Mesquite/Mosaic) – located at MM 4 on 128; 240,000 bbl pond
Secondary Source: George Arnis; C-1303

Mesa Verde – east of Sand Dunes
Major Source: 128 Fresh Water Pond (Mesquite/Mosaic) – located at MM 4 on 128; 240,000 bbl pond
Secondary Source: Unknown at this time; needs coordinates to determine secondary source

Smokey Bits/Ivore/Misty – had posiden tanks before
Major Source: Unknown at this time; need coordinates to determine major source
Secondary Source: Unknown at this time; needs coordinates to determine secondary source

Red Tank/Lost Tank
Major Source: Unknown at this time; need coordinates to determine major source
Secondary Source: Unknown at this time; needs coordinates to determine secondary source

Peaches
Major Source: Unknown at this time; need coordinates to determine major source
Secondary Source: Unknown at this time; needs coordinates to determine secondary source



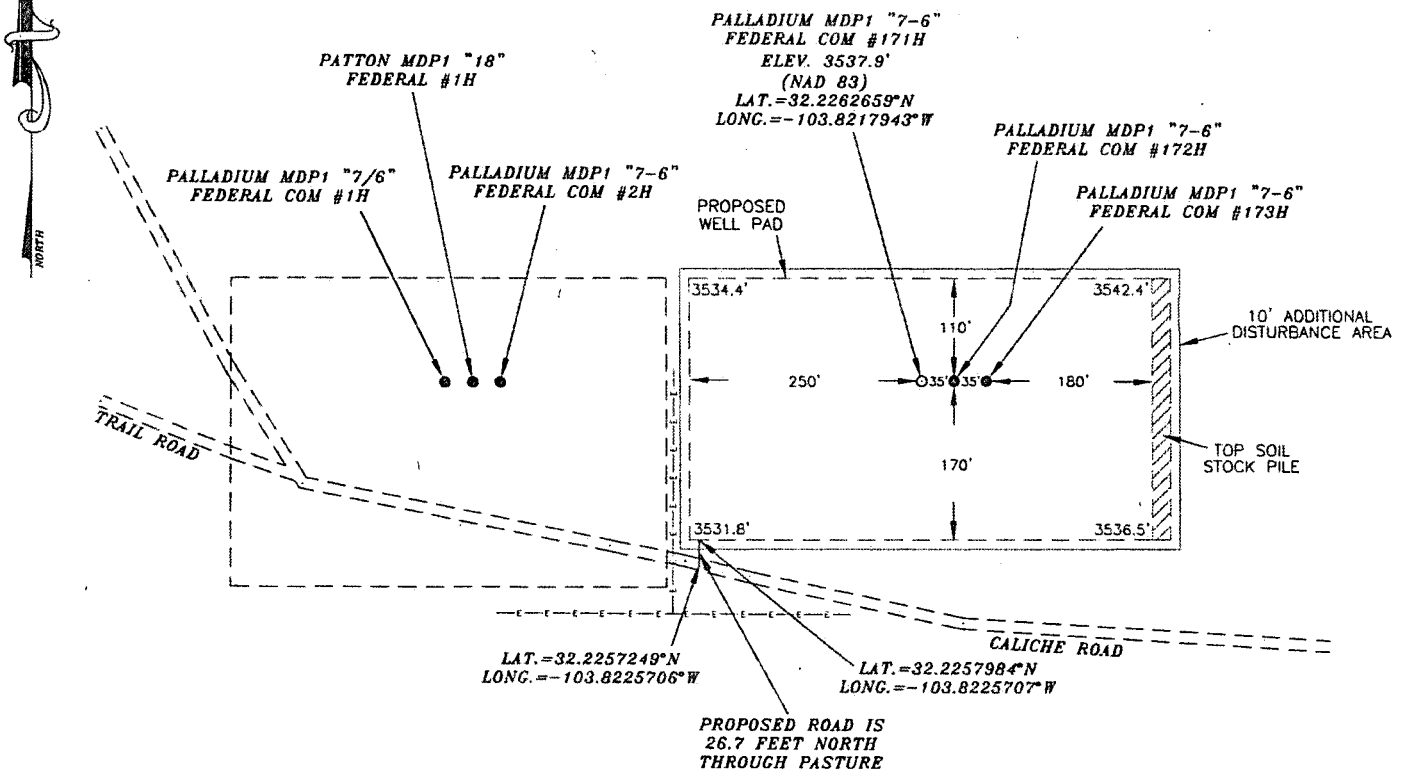

| REVISION BLOCK | | | | | | ENGINEERING RECORD | |
|---|---|---|---|---|---|---|---|
| NO. | DATE | DESCRIPTION | BY | CHK | APP | BY | DATE |
| | | | | | | | |

# FLEX 3 RIG DIAGRAM

Palladium MDP1 7-6 Fed Com # 171H, 172H, 173H
EDDY COUNTY, NEW MEXICO

# OXY USA INC.
## PALLADIUM MDP1 "7-6" FEDERAL COM #171H
## SITE PLAN

# FAA PERMIT: NO




TERRY J ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**LEGEND**

- – – – DENOTES PROPOSED WELL PAD
- — — — DENOTES PROPOSED ROAD
- ▨ DENOTES STOCK PILE AREA

200' 0 200' 400' FEET

SCALE: 1"=200'

**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 6/14/2018

Terry J. Asel N.M. R.P.L.S. No. 15079


Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

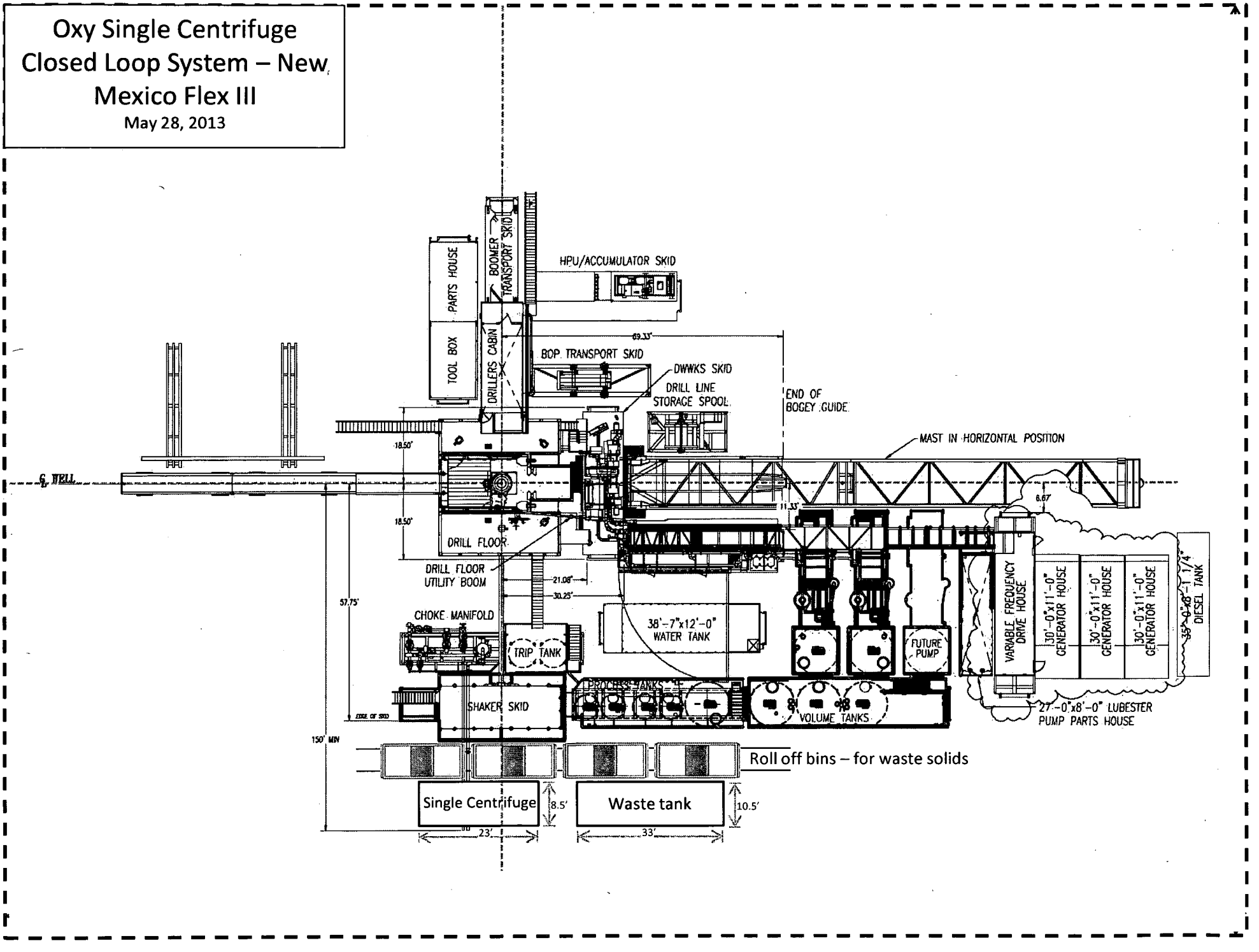

## OXY USA INC.

PALLADIUM MDP1 "7-6" FEDERAL COM #171H
LOCATED AT 609' FSL & 1197' FWL IN
SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31
EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

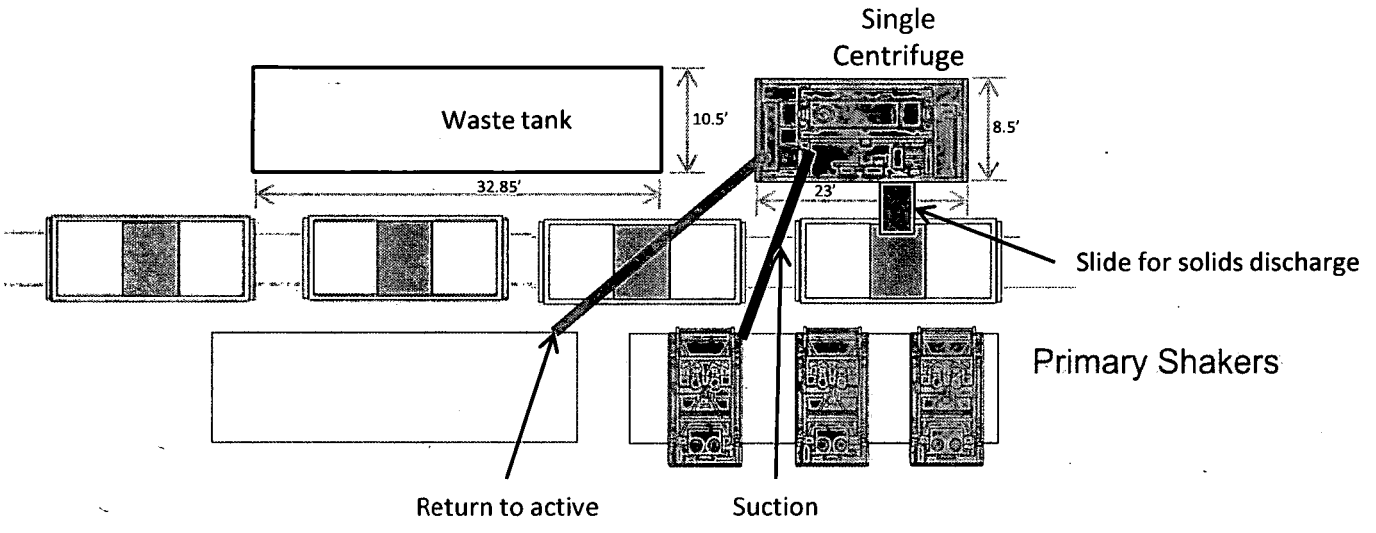
| | | |
|---|---|---|
| Survey Date: 11/22/17 | Sheet 1 of 1 Sheets | |
| W.O. Number: 171122WL-a | Drawn By: KA | Rev: |
| Date: 08/13/18 | 171122WL-a | Scale:1"=200' |

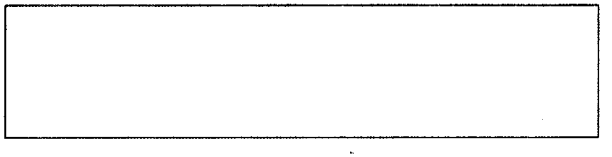
# Oxy Single Centrifuge Closed Loop System – New Mexico Flex III

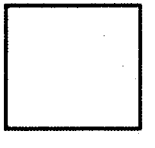
May 28, 2013

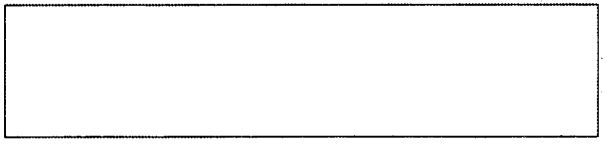


# Oxy



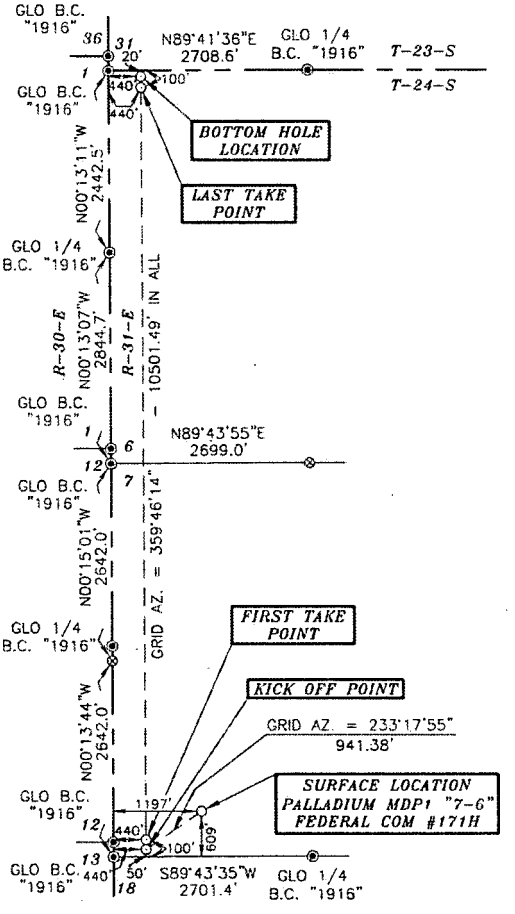


Oxy Single Centrifuge
Closed Loop System – New
Mexico Flex III

May 28, 2013

# SECTIONS 7 & 6, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.,
EDDY COUNTY NEW MEXICO




Basis of Bearings - GPS Geodetic Measurements
NM East Zone (83) North American Datum of 1983

DRIVING DIRECTIONS:
BEGINNING AT THE INTERSECTION OF N.M. STATE HWY. #128 AND EDDY COUNTY ROAD #787 (TWIN WELLS ROAD), GO SOUTH ON COUNTY ROAD #787 FOR 5.3 MILES, TURN RIGHT ON CALICHE ROAD AND GO WEST FOR 0.7 MILES, TURN RIGHT ON PROPOSED ROAD AND GO NORTH FOR 26.7 FEET TO LOCATION.

TERRY J ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**LEGEND**

◉ – DENOTES FOUND MONUMENT AS NOTED
⊗ – DENOTES CALCULATED CORNER

2000' 0 2000' 4000' FEET
SCALE: 1"=2000'

**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 6/14/2018
Terry J. Asel, N.M. R.P.L.S. No. 15079

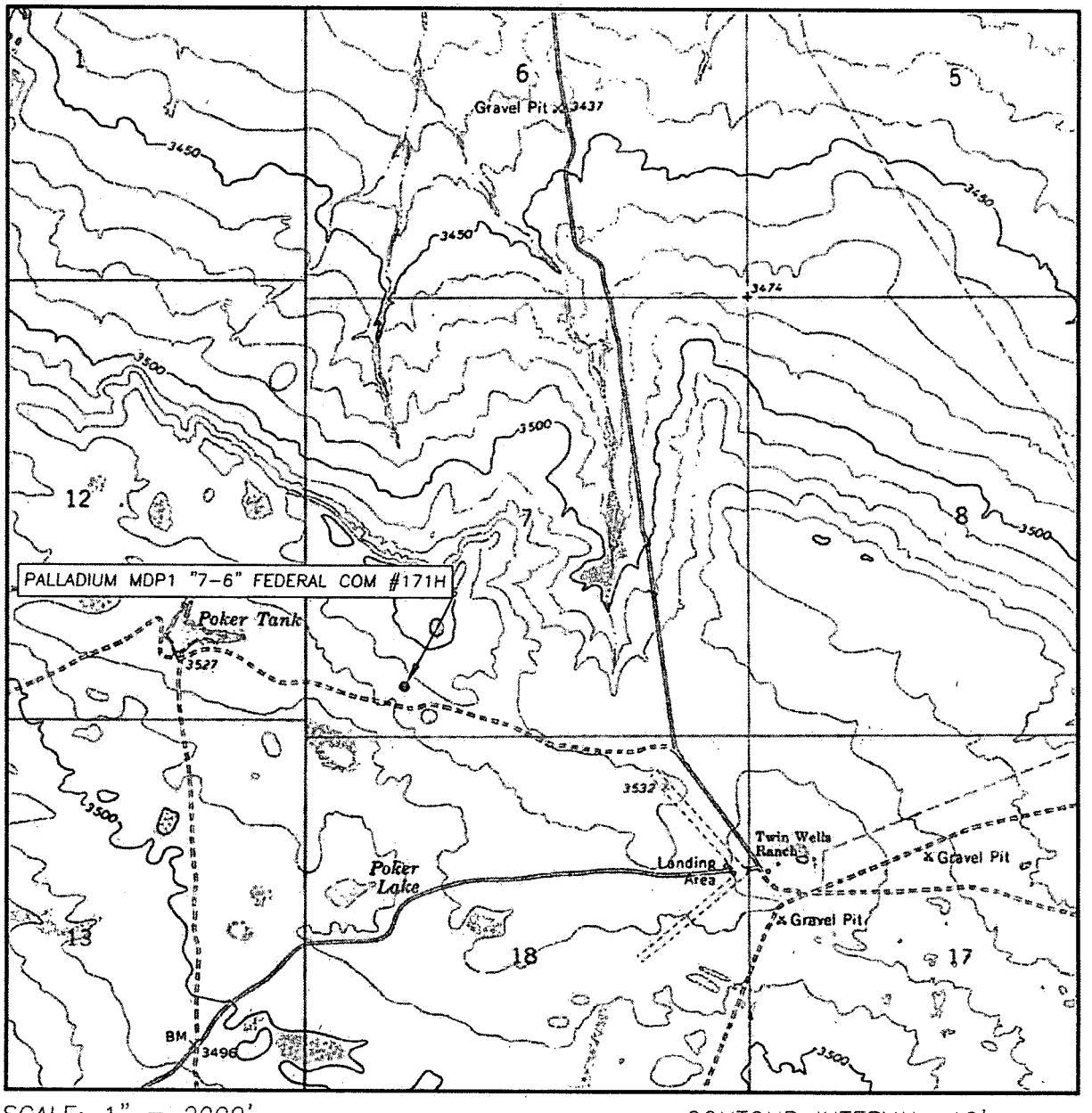

Asel Surveying
P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146


## OXY USA INC.

PALLADIUM MDP1 "7-6" FEDERAL COM #171H
LOCATED AT 609' FSL & 1197' FWL IN
SECTION 7, TOWNSHIP 24 SOUTH, RANGE 31
EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

| | | |
|---|---|---|
| Survey Date: 11/22/17 | Sheet 1 of 1 Sheets | |
| W.O. Number: 171122WL-a | Drawn By: KA | Rev: |
| Date: 08/13/18 | 171122WL-a | Scale: 1"=2000' |

# LOCATION VERIFICATION MAP




SCALE: 1" = 2000'

CONTOUR INTERVAL: 10'

SEC. 7 TWP. 24-S RGE. 31-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 609' FSL & 1197' FWL

ELEVATION 3537.9'

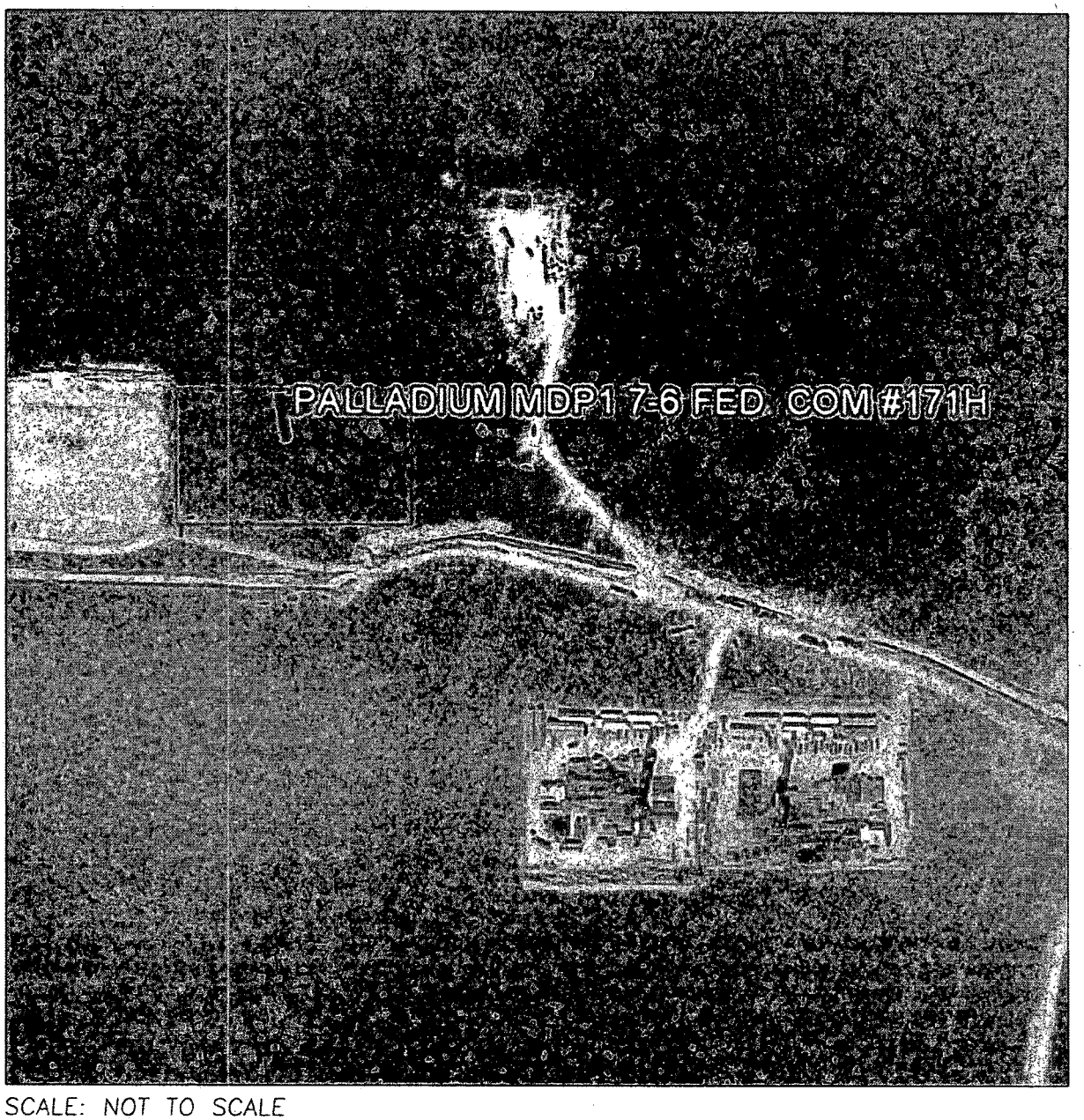
OPERATOR OXY USA INC.

LEASE PALLADIUM MDP1 "7-6" FEDERAL COM #171H

U.S.G.S. TOPOGRAPHIC MAP
BIG SINKS, N.M.

Asel Surveying
P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

# AERIAL MAP




SCALE: NOT TO SCALE

SEC. 7 TWP. 24-S RGE. 31-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 609' FSL & 1197' FWL

ELEVATION 3537.9'

OPERATOR OXY USA INC.

LEASE PALLADIUM MDP1 "7-6" FEDERAL COM #171H

Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

Re-Stake

OXY U.S.A. INC.

# NEW MEXICO STAKING FORM

Date Staked: 2-8-18

Lease / Well Name: Palladium MDP1 7-6 Fed Com #171H

Legal Description: 609' FSL 1197' FWL Sec 7 T24S R31E

Latitude: 32° 13' 34.56" NAD 83

Longitude: -103° 49' 18.46" NAD 83

X: 699518.75 NAD 83

Y: 446425.87 NAD 83

Elevation: 3537.9 NAD 83

Move information:

County: Eddy

Surface Owner BLM

Nearest Residence: ?

Nearest Water Well:

V-Door: EAST

Top soil: EAST

Road Description: SW Cor From SOUTH

New Road:

Upgrade Existing Road:

Interim Reclamation: 80' West 50' North

Source of Caliche:

Onsite Attendees: ~~Jessie Bassett~~, Chelsey-BLM Jim Wilson - Oxy SWCA Asel Survey

DATE 3-30-18

## Surface Use Plan of Operations

**Operator Name/Number:** OXY USA Inc. – 16696
**Lease Name/Number:** Palladium MDP1 7-6 Federal Com #171H
**Pool Name/Number:** Purple Sage Wolfcamp 98220
**Surface Location:** 609 FSL 1197 FWL SWSW (4) Sec 7 T24S R31E - NMNM057273
**Bottom Hole Location:** 20 FNL 440 FWL NWNW (4) Sec 6 T24S R31E – NMNM082904

### 1. Existing Roads

a. A copy of the USGS "Big Sinks, NM" quadrangle map is attached showing the proposed location. The well location is spotted on the map, which shows the existing road system.

b. The well was staked by Terry J Asel, Certificate No. 15079 on 02/08/18, certified 08/14/18.

c. Directions to Location: From the intersection of USH 128 and CR 787 (Twin Wells Road), go south on CR 787 for 5.3 miles. Turn right on caliche road and go west for 0.7 miles. Turn left on proposed road and go north for 26.7' to location.

### 2. New or Reconstructed Access Roads:

a. A new access road will be built. The access road will run approximately 26.7' north through pasture to the southwest corner of the pad.

b. The maximum width of the road will be 14'. It will be crowned and made up of 6" of rolled and compacted caliche. Water will be deflected, as necessary, to avoid accumulation and prevent surface erosion.

c. Surface material will be native caliche. This material will be obtained from a BLM approved pit nearest in proximity to the location. The average grade will be approximately 1%.

d. No cattle guards, grates or fence cuts will be required. No turnouts are planned.

e. Blade, water and repair existing caliche roads as needed.

### 3. Location of Existing Wells:

Existing wells within a one mile radius of the proposed well are shown on attached plat.

### 4. Location of Existing and/or Proposed Facilities:

a. In the event the well is found productive, the Sand Dunes South West Corridor CTB would be utilized and the necessary production equipment will be installed at the well site. See proposed facilities layout diagram.

b. All flow lines will adhere to API standards. They will consist of 3 – 4" composite flowlines operating < 75% MAWP, surface and 2 – 6" steel gas lift supply line operating <1500 psig, buried, lines to follow surveyed route. Survey of a strip of land 30' wide and 573.2' in length crossing USA Land in Sections 7 T24S R31E NMPM, Eddy County, NM and being 15' left and 15' right of the centerline survey, see attached.

c. Electric line will follow a route approved by the BLM. Survey of a strip of land 30' wide and 124.1' in length crossing USA Land in Section 7 T24S R31E NMPM, Eddy County, NM and being 15' left and 15' right of the centerline survey, see attached.

d. All of the Palladium MDP1 7-6 Fed Com #171H - #173H wells will be routed to the Sand Dunes South West Corridor CTB. Each well will have (2) surface laid flowlines operating at less than 75% of the MAWP of the flowline. The Sand

Dunes South West Corridor CTB will be supported by centralized gas lift. The main gas lift compressors will be located on the pad of the Palladium MDP1 7-6 Fed Com 171H, directly adjacent to the Sand Dunes South West Corridor CTB, and will be fed by (2) 20' buried suction lines from the Sand Dunes South West Corridor CTB at low pressure. From the existing 8" trunk line, there will be (2) 6" high pressure lines running to each well. Additional gas lift compressors may be needed at the wellhead if higher injection pressures are required. See Attached.

## 5. Location and types of Water Supply

This well will be drilled using a combination of water mud systems. It will be obtained from commercial water stations (Gregory Rockhouse, Mesquite) in the area and will be hauled to location by transport truck using existing and proposed roads.

## 6. Construction Materials:

**Primary**

All caliche utilized for the drilling pad and proposed access road will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits found on the location. Will use BLM recommended extra caliche from other locations close by for roads, if available.

**Secondary**

The secondary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well site. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cubic yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

a. The top 6" of topsoil is pushed off and stockpiled along the side of the location.
b. An approximate 120' X 120' area is used within the proposed well site to remove caliche.
c. Subsoil is removed and piled alongside the 120' X 120' within the pad site.
d. When caliche is found, material will be stockpiled within the pad site to build the location and road.
e. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.
f. Once the well is drilled the stockpiled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stockpiled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in the attached plat.

## 7. Methods of Handling Waste Material:

a. A closed loop system will be utilized consisting of above ground steel tanks and haul-off bins. Disposal of liquids, drilling fluids and cuttings will be disposed of at an approved facility. Solids-CRI, Liquids-Laguna

b. All trash, junk and other waste material will be contained in trash cages or bins to prevent scattering. When the job is completed, all contents will be removed and disposed of in an approved sanitary landfill.

c. The supplier, including broken sacks, will pickup slats remaining after completion of well.

d. A Porto-john will be provided for the rig crews. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete.

e. Disposal of fluids to be transported will be by the following companies. TFH Ltd, Laguna SWD Facility

## 8. Ancillary Facilities: None needed.

## 9. Well Site Layout:

The proposed well site layout with dimensions of the pad layout and equipment location.

V-Door – East  CL Tanks – South  Pad – 280' X 500' – 3 well pad

## 10. Plans for Surface Reclamation:

a. After concluding the drilling and/or completion operations, if the well is found non-commercial, the caliche will be removed from the pad and transported to the original caliche pit or used for other drilling locations. The road will be reclaimed as directed by the BLM. The original topsoil will again be returned to the pad and contoured, as close as possible, to the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

b. If the well is deemed commercially productive, caliche from the areas of the pad site not required for operations will be reclaimed. The original topsoil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

## 11. Surface Ownership:

The surface is owned by the U.S. Government and is administered by the BLM. The surface is multiple use with the primary uses of the region for the grazing of livestock and the production of oil and gas. The surface is leased to: Richardson Land & Cattle, P.O. Box 487, Carlsbad, NM 88221. They will be notified of our intention to drill prior to any activity.

## 12. Other Information:

a. The vegetation cover is generally sparse consisting of mesquite, yucca, shinnery oak, sandsage and perennial native range grass. The topsoil is sandy in nature. Wildlife in the area is also sparse consisting of deer, coyotes, rabbits, rodents, reptiles, dove and quail.

b. There is no permanent or live water in the general proximity of the location.

c. There are no dwellings within one mile of the proposed well site.

d. Cultural Resources Examination–This well is located in the Permian Basin PA. Payment to be determined by BLM. This well shares the same pad as the Palladium MDP1 7-6 Federal Com #172H and Palladium MDP1 7-6 Federal #173H.

e. Copy of this application has been mailed to SWCA Environmental Consultants, 5647 Jefferson St. NE, Albuquerque, NM 87109. No Potash leases within one mile of surface location.

## 13. Bond Coverage:

Bond coverage is Individual-NMB000862, Nationwide-ESB00226.

## 14. Operators Representatives:

The OXY Permian representatives responsible for ensuring compliance of the surface use plan are listed below:

Leo Ortega
Operations Superintendent
1502 West Commerce Dr.
Carlsbad, NM 88220
Office – 575-628-4012
Cellular – 575-706-8995

Cuong Q. Phan
Asset Manager
P.O. Box 4294
Houston, TX Carlsbad, NM 88220
Office – 713-513-6645
Cellular – 281-832-0978

Jim Wilson
Operation Specialist
P.O. Box 50250
Midland, TX 79710
Cellular – 575-631-2442

Michael Walton
RMT Lead
P.O. Box 4294
Houston, TX 77210
Office – 713-366-5526
Cellular – 281-814-2971

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

# PWD Data Report
09/30/2019

**APD ID:** 10400035697 **Submission Date:** 11/13/2018

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Well Type:** OIL WELL **Well Work Type:** Drill

## Section 1 - General

**Would you like to address long-term produced water disposal?** NO

## Section 2 - Lined Pits

**Would you like to utilize Lined Pit PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Lined pit PWD on or off channel:**

**Lined pit PWD discharge volume (bbl/day):**

**Lined pit specifications:**

**Pit liner description:**

**Pit liner manufacturers information:**

**Precipitated solids disposal:**

**Decribe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Lined pit precipitated solids disposal schedule:**

**Lined pit precipitated solids disposal schedule attachment:**

**Lined pit reclamation description:**

**Lined pit reclamation attachment:**

**Leak detection system description:**

**Leak detection system attachment:**

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Lined pit Monitor description:**

**Lined pit Monitor attachment:**

**Lined pit: do you have a reclamation bond for the pit?**

**Is the reclamation bond a rider under the BLM bond?**

**Lined pit bond number:**

**Lined pit bond amount:**

**Additional bond information attachment:**

## Section 3 - Unlined Pits

**Would you like to utilize Unlined Pit PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD disturbance (acres):** **PWD surface owner:**

**Unlined pit PWD on or off channel:**

**Unlined pit PWD discharge volume (bbl/day):**

**Unlined pit specifications:**

**Precipitated solids disposal:**

**Decribe precipitated solids disposal:**

**Precipitated solids disposal permit:**

**Unlined pit precipitated solids disposal schedule:**

**Unlined pit precipitated solids disposal schedule attachment:**

**Unlined pit reclamation description:**

**Unlined pit reclamation attachment:**

**Unlined pit Monitor description:**

**Unlined pit Monitor attachment:**

**Do you propose to put the produced water to beneficial use?**

**Beneficial use user confirmation:**

**Estimated depth of the shallowest aquifer (feet):**

**Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?**

**TDS lab results:**

**Geologic and hydrologic evidence:**

**State authorization:**

**Unlined Produced Water Pit Estimated percolation:**

**Unlined pit: do you have a reclamation bond for the pit?**

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Is the reclamation bond a rider under the BLM bond?**

**Unlined pit bond number:**

**Unlined pit bond amount:**

**Additional bond information attachment:**

## Section 4 - Injection

**Would you like to utilize Injection PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Injection PWD discharge volume (bbl/day):**

**Injection well mineral owner:**

**Injection well type:**

**Injection well number:** **Injection well name:**

**Assigned injection well API number?** **Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection attachment:**

**Underground Injection Control (UIC) Permit?**

**UIC Permit attachment:**

## Section 5 - Surface Discharge

**Would you like to utilize Surface Discharge PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

## Section 6 - Other

**Would you like to utilize Other PWD options?** NO

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:** **PWD disturbance (acres):**

**Other PWD discharge volume (bbl/day):**

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM **Well Number:** 171H

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

# Bond Info Data Report

09/30/2019

**APD ID:** 10400035697

**Submission Date:** 11/13/2018

**Operator Name:** OXY USA INCORPORATED

**Well Name:** PALLADIUM MDP1 7-6 FEDERAL COM

**Well Number:** 171H

**Well Type:** OIL WELL

**Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

## Bond Information

**Federal/Indian APD:** FED

**BLM Bond number:** ESB000226

**BIA Bond number:**

**Do you have a reclamation bond?** NO

**Is the reclamation bond a rider under the BLM bond?**

**Is the reclamation bond BLM or Forest Service?**

**BLM reclamation bond number:**

**Forest Service reclamation bond number:**

**Forest Service reclamation bond attachment:**

**Reclamation bond number:**

**Reclamation bond amount:**

**Reclamation bond rider amount:**

**Additional reclamation bond information attachment:**