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ATS-09-123

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248

Form 3160-3
(February 2005)

JAN 21 2009

HOBBSOCD

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No 1004-0137
Expires March 31, 2007

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5 Lease Serial No.
**NM 108503**

6 If Indian, Allotee or Tribe Name

1a. Type of work ☑ DRILL ☐ REENTER

7 If Unit or CA Agreement, Name and No

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

8 Lease Name and Well No. (13270)
**VACA 14 FED 3**

2 Name of Operator
**EOG Resources, Inc.** (7377)

9 API Well No.
30-025-39327

3a Address **P.O. Box 2267 Midland, TX 79702**

3b Phone No. (include area code)
**432-686-3642**

10 Field and Pool, or Exploratory (51020)
**Bone Springs** Red Hills

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

At surface **660' FNL & 1980' FEL (U/L B)**

At proposed prod zone **660' FSL & 1980' FEL (U/L O)** Carlsbad Controlled Water Basin

11 Sec., T., R., M., or Blk and Survey or Area
**Section 14, T25S-R33E, N.M.P.M.**

14 Distance in miles and direction from nearest town or post office*
**Approx 20 miles W from Jal, NM**

12 County or Parish
**Lea**

13 State
**NM**

| 15 Distance from proposed location to nearest property or lease line, ft (Also to nearest drig. unit line, if any) | 16 No. of acres in lease | 17 Spacing Unit dedicated to this well |
|---|---|---|
| **660'** | **160** | **W/2 E/2** |
| 18 Distance from proposed location to nearest well, drilling, completed, applied for, on this lease, ft | 19 Proposed Depth | 20 BLM/BIA Bond No. on file |
| **4000'** | **12300' TVD; 16052'TMD** | **NM2308** |
| 21 Elevations (Show whether DF, KDB, RT, GL, etc.) | 22 Approximate date work will start* | 23 Estimated duration |
| **GL 3357.7'** | **02/01/2009** | **30 days** |

## 24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No 1, must be attached to this form:

1. Well plat certified by a registered surveyor
2. A Drilling Plan
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office)
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above)
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM

| 25 Signature | Name (Printed/Typed) | Date |
|---|---|---|
| Donny G. Glanton | **Donny G. Glanton** | **12/11/2008** |

Title
**Sr. Lease Operations ROW Representative**

| Approved by (Signature) | Name (Printed/Typed) | Date |
|---|---|---|
| /s/ James Stovall | /s/ James Stovall | JAN 15 2009 |
| Title | Office | |
| FIELD MANAGER | CARLSBAD FIELD OFFICE | |

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

APPROVAL FOR TWO YEARS

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

*(Instructions on page 2)

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

APPROVAL SUBJECT TO
GENERAL REQUIREMENTS
AND SPECIAL STIPULATIONS
ATTACHED

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease- 4 Copies
Fee Lease- 3 Copies

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| API Number | Pool Code | Pool Name |
|---|---|---|
| 30-025-39327 | 51020 | Bone Springs Red Hills |

| Property Code | Property Name | Well Number |
|---|---|---|
| 13270 | VACA "14" FED. | 3 |

| OGRID No. | Operator Name | Elevation |
|---|---|---|
| 7377 | EOG RESOURCES, INC. | 3357.7' |

## Surface Location

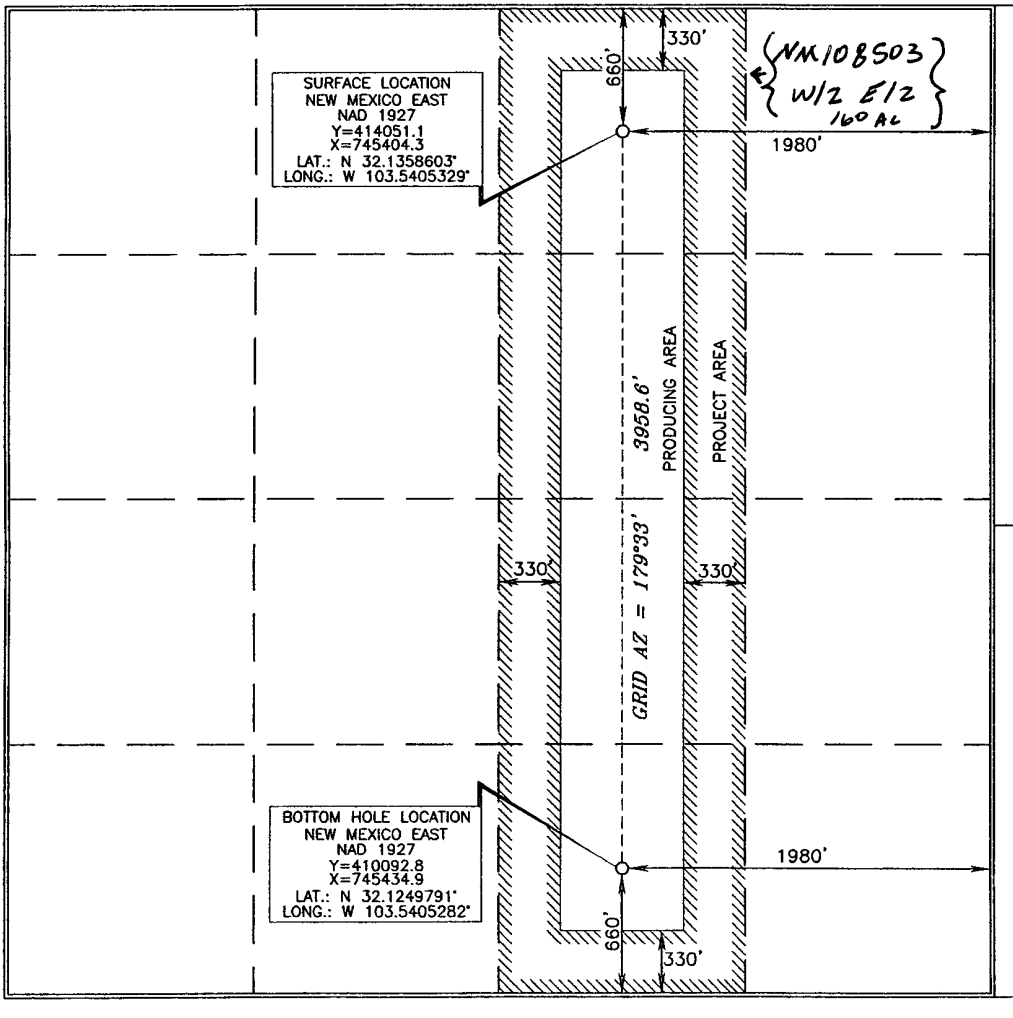
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| B | 14 | 25 SOUTH | 33 EAST, N.M.P.M. | | 660 | NORTH | 1980 | EAST | LEA |

## Bottom Hole Location If Different From Surface

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| O | 14 | 25 SOUTH | 33 EAST, N.M.P.M. | | 660 | SOUTH | 1980 | EAST | LEA |

| Dedicated Acres | Joint or Infill | Consolidation Code | Order No. |
|---|---|---|---|
| 160 | | | |

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.




## OPERATOR CERTIFICATION

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

Signature 12/6/08 Date

Donny G. Glanton
Printed Name

## SURVEYOR CERTIFICATION

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

OCTOBER 21, 2008
Date of Survey

Signature and Seal of Professional Surveyor:

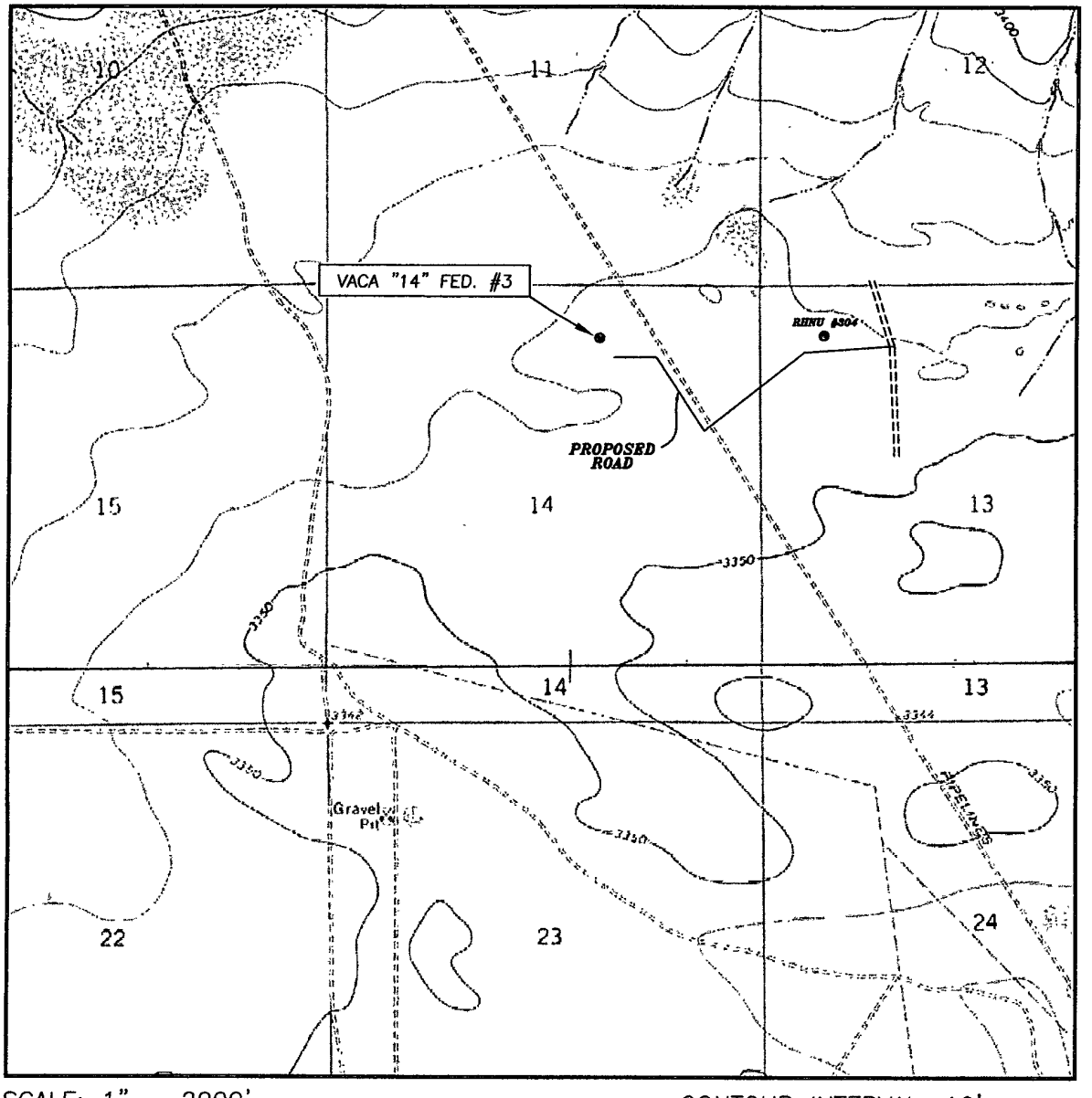
NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

11/12/2008

Certificate Number 15079

WO# 081021WL (Rev. B)(KA)

# LOCATION VERIFICATION MAP




SCALE: 1" = 2000'

CONTOUR INTERVAL: 10'

SEC. 14 TWP. 25-S RGE. 33-E

SURVEY N.M.P.M.

COUNTY LEA

DESCRIPTION 660' FNL & 1980' FEL

ELEVATION 3357.7'

OPERATOR EOG RESOURCES INC.

LEASE VACA "14" FED. #3

U.S.G.S. TOPOGRAPHIC MAP
BELL LAKE, N.M.

Asel Surveying

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

EOG RESOURCES, INC.
VACA 14 FED 3

**1. GEOLOGIC NAME OF SURFACE FORMATION:**
Permian

**2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:**

| | |
|---|---|
| Rustler | 1,150' |
| Delaware | 5,100' |
| Cherry Canyon | 6,200' |
| Leonard | 9,100' |
| 1st Bone Spring Sand | 10,080' |
| 2nd Bone Spring Sand | 10,900' |
| 3rd Bone Spring Sand | 11,950' |

**3. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:**

| | | |
|---|---|---|
| Upper Permian Sands | 0- 400' | Fresh Water |
| Delaware | 5,100' | Oil |
| Cherry Canyon | 6,200' | Oil |
| Leonard | 9,100' | Oil |
| 1st Bone Spring Sand | 10,080' | Oil |
| 2nd Bone Spring Sand | 10,900' | Oil |
| 3rd Bone Spring Sand | 11,950' | Oil |

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 13.375" casing at 650' and circulating cement back to surface.

see COA

**4. CASING PROGRAM-NEW**

| Hole | Interval | OD Csg | Weight | Grade | Conn. | Collapse Design Factor | Burst Design Factor | Tension Design Factor |
|---|---|---|---|---|---|---|---|---|
| 17.50" | 0-650' | 13.375" | 48# | H-40 | ST&C | 2.64 | 1.72 | 3.98 |
| 12.25" | 0-4,200' | 9.625" | 40# | J-55 | LT&C | 1.48 | 1.26 | 2.60 |
| 12.25" | 4,200- 5,150' | 9.625" | 40# | HCK-55 | LT&C | 1.48 | 1.26 | 2.60 |
| 8.75" | 0-12,575' | 7" | 26# | HCP-110 | LT&C | 1.17 | 1.32 | 1.55 |
| 6.125" | 11,618-16,052' | 4.5" | 11.6# | HCP-110 | LT&C | 1.41 | 1.42 | 3.54 |

see COA

**EOG RESOURCES, INC.**
**VACA 14 FED 3**

Cementing Program:

13.375" Surface Casing: Cement to surface, Lead: 240 sx 35:65 Poz: C + 0.005 pps Static Free + 5% NaCl + 5 pps LCM-1 + 0.005 gps FP-6L + 5 pps MPA-5 + 0.8% SMS + 4% Bentonite, 12.7 ppg, 2.02 yield

Tail: 300 sx Premium Plus C + 0.005 pps Static Free + 2% CaCl2 + 0.25 pps CelloFlake + 0.005 gps FP-6L, 14.8 ppg, 1.33 yield

9.625" 1st Intermediate Casing: Cement to surface, Lead: 955 sx 35:65 Poz: C + 0.005 pps Static Free + 5% NaCl + 0.25 pps CelloFlake + 5 pps LCM-1 + 0.005 gps FP-6L + 6% Bentonite, 12.4 ppg, 2.10 yield
Tail: 200 sx Prem Plus C + 0.25 pps CelloFlake + 0.005 FP-6L + 0.005 pps Static Free + 1% $CaCl_2$, 14.8 ppg, 1.34 yield

7" 2nd Intermediate Casing: Cement to 4,650', Lead: 725 sx 35:65 Poz: H + 0.005 pps Static Free + 5% NaCl + 0.25 pps CelloFlake + 5 pps LCM-1 + 0.005 gps FP-6L + 6% Bentonite, 12.4 ppg, 2.10 yield
Tail: 500 sx 50:50 Poz: H + 2% Bentonite + 0.005 gps FP-6L + 0.005 pps Static Free + 5% NaCl + 0.1% R-3 + 0.2% CD-32 + 0.3% FL-52A, 14.2 ppg, 1.30 yield

4.5" Production Casing: Cement to 11,618', 430 sx Premium Plus Class H + 0.005 gps FP-13L + 0.005 pps Static Free + 5% NaCl + 0.3% R-3 + 0.3% CD-32 + 0.2% FL-52A + 1% FL-62 + 0.1% ASA-301 + .1% SMS, 15.6 ppg, 1.19 yield

## 5. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:

(SEE EXHIBIT #1)

The blowout preventer equipment (BOP) shown in Exhibit #1 will consist of a double ram-type (5000 psi WP) preventer and an annular preventer (5000-psi WP). Units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOP's and accessory equipment will be tested in accordance with Onshore Oil & Gas order No. 2. for a 2M system prior to drilling out of the surface casing shoe and while drilling the first intermediate section. Before drilling out of the first and second intermediate casing strings, the ram- type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 2500/ 250 psig.

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.

Hydraulically operated choke will not be installed prior to the setting and cementing of the 1st intermediate casing string, but will be installed prior to drilling out of the 1st intermediate casing shoe.

## 6. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:

The well will be drilled to TD with a combination of brine, cut brine, and polymer mud system. The applicable depths and properties of this system are as follows:

| Depth | Type | Wt (PPG) | Viscosity (sec) | Waterloss (cc) |
|---|---|---|---|---|
| 0-650' | Fresh – Gel | 8.6-8.8 | 28-34 | N/c |
| 650'-5,150' | Brine | 10.0-10.2 | 28-34 | N/c |
| 5,150'–7,500' | Fresh water | 8.4-8.6 | 28-34 | N/c |
| 7,500'–11,500' | Cut Brine | 8.6-9.6 | 28-34 | N/c |
| 11,500'–12,300' | Cut Brine | 8.6-9.6 | 28-34 | 10-15 |
| 11,818'-16,052' | Polymer (Lateral) | 8.6-9.6 | 35-45 | 10-25 |

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the wellsite at all times.

## 7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:

(A) A kelly cock will be kept in the drill string at all times.

(B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.

**8. LOGGING, TESTING AND CORING PROGRAM:**

Electric logging will consist of GR-Dual Laterlog and GR-Compensated Density-Neutron from TD to 1st intermediate casing with a GR- Compensated Neutron run from 1st intermediate casing to surface and optional Sonic from TD to 1st intermediate casing.

Possible FMI over selected intervals. Possible sidewall cores based on shows.

**9. ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:**

The estimated bottom hole temperature (BHT) at TD is 185 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 4500 psig. No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. No major loss circulation zones have been reported in offsetting wells.

**10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:**

The drilling operation should be finished in approximately one month. If the well is productive, an additional 30-60 days will be required for completion and testing before a decision is made to install permanent facilities.

**Permit Information:**

Well Name: Vaca 14 Fed #3

Location:
SL: 660' FNL & 1980' FEL, Section 14, T-25-S, R-33-E, Lea Co., N.M.
BHL: 660' FSL & 1980' FEL, Section 14, T-25-S, R-33-E, Lea Co., N.M.

**Casing Program:**

| Casing | Setting Depth | Hole Size | Casing Size | Casing Weight | Casing Grade | Desired TOC |
|---|---|---|---|---|---|---|
| Surface | 650' | 17-1/2" | 13-3/8" | 48# | J-55 | Surface |
| 1st Intermediate | 4,000'<br>5,150' | 12-1/4"<br>12-1/4" | 9-5/8"<br>9-5/8" | 40#<br>40# | J-55<br>HCK-55 | Surface |
| 2nd Intermediate | 12,575' | 8-3/4" | 7" | 26# | HCP-110 | 4,650' |
| Production Liner | 16,052' | 6-1/8" | 4-1/2" | 11.6# | HCP-110 | 11,618' TOL |

See COA

**Cement Program:**

| Depth | No. Sacks | |
|---|---|---|
| 650' | 240 | Lead: 35:65 Poz C + 4% Bentonite+ 0.005 gps FP-6L + 0.005 pps Static Free + 5 pps LCM-1 + 5% NaCl + 5% MPA-5 + 0.8% SMS |
| | 300 | Tail: Premium Plus C + 0.005 pps Static Free + 2% CaCl2 + 0.25 pps CelloFlake + 0.005 gps FP-6L |
| 5,150' | 955 | Lead: 35:65 Poz C + 0.005 pps Static Free + 5% NaCl + 0.25 pps CelloFlake + 5 pps LCM-1 + 0.005 gps FP-6L + 6% Bentonite |
| | 200 | Tail: Premium Plus C + 0.005 pps Static Free + 1% CaCl2 + 0.25 pps CelloFlake + 0.005 gps FP-6L |
| 12,575' | 725 | Lead: 35:65 Poz H + 0.005 pps Static Free + 5% NaCl + 0.25 pps CelloFlake + 5 pps LCM-1 + 0.005 gps FP-6L + 6% Bentonite |
| | 275 | Tail: 50:50 Poz H + 2% Bentonite + 0.005 gps FP-13L + 0.005 pps Static Free + 5% NaCl + 0.1% R-3 + 0.2% CD-32 + 0.3% FL-52A |
| 16,052' | 430 | Premium Plus H + 0.005 gps FP-13L + 0.2% FL-52A + 0.005 pps Static Free + 0.3% R-3 + 0.3% CD-32 + 1% FL-62 + 0.1% ASA-301 + 0.1% SMS |

See COA

**Mud Program:**

| Depth | Type | Weight (ppg) | Viscosity | Water Loss |
|---|---|---|---|---|
| 0 – 650' | Fresh - Gel | 8.6-8.8 | 28-34 | N/c |
| 650' – 5,150' | Brine | 10.0-10.2 | 28-34 | N/c |
| 5,150' – 7,500' | Fresh Water | 8.4-8.6 | 28-34 | N/c |
| 7,500'– 11,500' | Cut Brine | 8.6-9.6 | 28-34 | N/c |
| 11,500'– 12,300' | Cut Brine | 8.6-9.6 | 28-34 | 10-15 |
| 11,818' – 16,052' | Cut Brine (Lateral) | 8.6-9.6 | 35-45 | 10-15 |

See COA

# EOG Resources Inc
## Planning Report

| | | | |
|---|---|---|---|
| Database: | EDM | Local Co-ordinate Reference: | Well Vaca 14 Fed #3 |
| Company: | Midland - New Mexico | TVD Reference: | WELL @ 3376 70ft (Original Well Elev) |
| Project: | Red Hills | MD Reference: | WELL @ 3376.70ft (Original Well Elev) |
| Site: | Vaca 14 Fed #3 | North Reference: | Grid |
| Well: | Vaca 14 Fed #3 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Vaca 14 Fed #3 | | |
| Design: | Original Plan | | |

**Project** Red Hills

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

**Site** Vaca 14 Fed #3

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 414,051 10ft | **Latitude:** | 32° 8' 9 097 N |
| **From:** | Map | **Easting:** | 745,404.30ft | **Longitude:** | 103° 32' 25.918 W |
| **Position Uncertainty:** | 0.00 ft | **Slot Radius:** | " | **Grid Convergence:** | 0.42 deg |

**Well** Vaca 14 Fed #3

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.00 ft | **Northing:** | 414,051.10 ft | **Latitude:** | 32° 8' 9.097 N |
| | **+E/-W** | 0 00 ft | **Easting:** | 745,404.30 ft | **Longitude:** | 103° 32' 25.918 W |
| **Position Uncertainty** | | 0.00 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 3,357.70ft |

**Wellbore** Vaca 14 Fed #3

| Magnetics | Model Name | Sample Date | Declination (deg) | Dip Angle (deg) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF200510 | 12/9/2008 | 7 85 | 60 19 | 48,845 |

**Design** Original Plan

**Audit Notes:**

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

| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (deg) |
|---|---|---|---|---|
| | 12,300 00 | 0 00 | 0.00 | 179.56 |

**Plan Sections**

| Measured Depth (ft) | Inclination (deg) | Azimuth (deg) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (?/100ft) | Build Rate (?/100ft) | Turn Rate (?/100ft) | TFO (deg) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0 00 | 0.00 | 0.00 | 0 00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 11,818 00 | 0 00 | 0.00 | 11,818.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 | |
| 12,575.12 | 90 00 | 179.55 | 12,300.00 | -481.99 | 3.79 | 11.89 | 11 89 | 0.00 | 179.55 | |
| 12,575 39 | 90 00 | 179.56 | 12,300.00 | -482.25 | 3.79 | 3.00 | 0 00 | 3.00 | 90.00 | |
| 16,051.49 | 90 00 | 179 56 | 12,300.00 | -3,958 24 | 30 60 | 0.00 | 0.00 | 0 00 | 0.00 | |
| 16,051.55 | 90.00 | 179.56 | 12,300 00 | -3,958 31 | 30.60 | 3.00 | 0 00 | 3.00 | 90.00 | BHL (Vaca 14 #3) |

| | | | |
|---|---|---|---|
| Database: | EDM | Local Co-ordinate Reference: | Well Vaca 14 Fed #3 |
| Company: | Midland - New Mexico | TVD Reference: | WELL @ 3376.70ft (Original Well Elev) |
| Project: | Red Hills | MD Reference: | WELL @ 3376 70ft (Original Well Elev) |
| Site: | Vaca 14 Fed #3 | North Reference: | Grid |
| Well: | Vaca 14 Fed #3 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Vaca 14 Fed #3 | | |
| Design: | Original Plan | | |

Planned Survey

| Measured Depth (ft) | Inclination (deg) | Azimuth (deg) | 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 |
| 5,300.00 | 0 00 | 0.00 | 5,300 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0 00 |

| | | | |
|---|---|---|---|
| Database: | EDM | Local Co-ordinate Reference: | Well Vaca 14 Fed #3 |
| Company: | Midland - New Mexico | TVD Reference: | WELL @ 3376.70ft (Original Well Elev) |
| Project: | Red Hills | MD Reference: | WELL @ 3376 70ft (Original Well Elev) |
| Site: | Vaca 14 Fed #3 | North Reference: | Grid |
| Well: | Vaca 14 Fed #3 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Vaca 14 Fed #3 | | |
| Design: | Original Plan | | |

Planned Survey

| Measured Depth (ft) | Inclination (deg) | Azimuth (deg) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (?/100ft) | Build Rate (?/100ft) | Turn Rate (?/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,400 00 | 0 00 | 0 00 | 5,400 00 | 0.00 | 0.00 | 0.00 | 0 00 | 0 00 | 0 00 |
| 5,500.00 | 0 00 | 0.00 | 5,500.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 5,600 00 | 0 00 | 0.00 | 5,600 00 | 0.00 | 0 00 | 0 00 | 0.00 | 0 00 | 0.00 |
| 5,700 00 | 0.00 | 0 00 | 5,700.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,800 00 | 0.00 | 0 00 | 5,800.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 5,900 00 | 0.00 | 0.00 | 5,900 00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,000 00 | 0 00 | 0.00 | 6,000.00 | 0 00 | 0 00 | 0.00 | 0.00 | 0 00 | 0 00 |
| 6,100.00 | 0 00 | 0.00 | 6,100 00 | 0 00 | 0 00 | 0.00 | 0 00 | 0 00 | 0 00 |
| 6,200.00 | 0 00 | 0.00 | 6,200.00 | 0 00 | 0 00 | 0.00 | 0.00 | 0 00 | 0 00 |
| 6,300.00 | 0 00 | 0.00 | 6,300.00 | 0.00 | 0 00 | 0.00 | 0 00 | 0 00 | 0.00 |
| 6,400 00 | 0 00 | 0.00 | 6,400.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 6,500 00 | 0.00 | 0 00 | 6,500 00 | 0.00 | 0.00 | 0 00 | 0.00 | 0 00 | 0 00 |
| 6,600.00 | 0 00 | 0 00 | 6,600.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 |
| 6,700 00 | 0.00 | 0 00 | 6,700 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 0 00 | 0.00 | 6,800.00 | 0 00 | 0.00 | 0.00 | 0 00 | 0 00 | 0 00 |
| 6,900 00 | 0.00 | 0 00 | 6,900 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0 00 |
| 7,000 00 | 0.00 | 0 00 | 7,000 00 | 0.00 | 0 00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 7,100.00 | 0 00 | 0.00 | 7,100.00 | 0 00 | 0 00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 7,200 00 | 0.00 | 0.00 | 7,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 0 00 | 0.00 | 7,300.00 | 0.00 | 0 00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 7,400.00 | 0.00 | 0.00 | 7,400 00 | 0.00 | 0 00 | 0.00 | 0 00 | 0.00 | 0 00 |
| 7,500.00 | 0 00 | 0.00 | 7,500.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 |
| 7,600 00 | 0 00 | 0.00 | 7,600.00 | 0.00 | 0.00 | 0 00 | 0 00 | 0.00 | 0.00 |
| 7,700 00 | 0.00 | 0.00 | 7,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,800 00 | 0.00 | 0.00 | 7,800 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 7,900.00 | 0 00 | 0.00 | 7,900.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 |
| 8,000 00 | 0.00 | 0.00 | 8,000 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 0 00 | 0.00 | 8,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 8,200 00 | 0.00 | 0.00 | 8,200.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0 00 |
| 8,300 00 | 0.00 | 0.00 | 8,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 8,400.00 | 0 00 | 0.00 | 8,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 8,500 00 | 0.00 | 0.00 | 8,500.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 8,600.00 | 0 00 | 0.00 | 8,600 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 8,700 00 | 0.00 | 0.00 | 8,700 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 8,800.00 | 0 00 | 0.00 | 8,800.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 8,900.00 | 0 00 | 0.00 | 8,900 00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 9,000.00 | 0 00 | 0.00 | 9,000.00 | 0.00 | 0 00 | 0 00 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 0.00 | 0.00 | 9,100.00 | 0 00 | 0 00 | 0 00 | 0.00 | 0 00 | 0 00 |
| 9,200.00 | 0.00 | 0.00 | 9,200.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 9,300.00 | 0 00 | 0.00 | 9,300.00 | 0 00 | 0 00 | 0 00 | 0.00 | 0 00 | 0.00 |
| 9,400.00 | 0.00 | 0.00 | 9,400.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 0.00 | 0.00 | 9,500.00 | 0 00 | 0 00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 9,600.00 | 0 00 | 0.00 | 9,600 00 | 0 00 | 0 00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 9,700 00 | 0.00 | 0.00 | 9,700.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 9,800 00 | 0 00 | 0 00 | 9,800.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,900 00 | 0 00 | 0 00 | 9,900.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 10,000.00 | 0.00 | 0 00 | 10,000.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 0.00 | 0 00 | 10,100 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 0 00 | 0 00 | 10,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 0 00 | 0 00 | 10,300 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 10,400.00 | 0 00 | 0.00 | 10,400 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,500 00 | 0 00 | 0.00 | 10,500 00 | 0 00 | 0 00 | 0 00 | 0.00 | 0 00 | 0.00 |
| 10,600 00 | 0.00 | 0 00 | 10,600.00 | 0.00 | 0.00 | 0 00 | 0 00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| Database: | EDM | Local Co-ordinate Reference: | Well Vaca 14 Fed #3 |
| Company: | Midland - New Mexico | TVD Reference: | WELL @ 3376.70ft (Original Well Elev) |
| Project: | Red Hills | MD Reference: | WELL @ 3376.70ft (Original Well Elev) |
| Site: | Vaca 14 Fed #3 | North Reference: | Grid |
| Well: | Vaca 14 Fed #3 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Vaca 14 Fed #3 | | |
| Design: | Original Plan | | |

Planned Survey

| Measured Depth (ft) | Inclination (deg) | Azimuth (deg) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (?/100ft) | Build Rate (?/100ft) | Turn Rate (?/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 10,700 00 | 0.00 | 0 00 | 10,700.00 | 0 00 | 0.00 | 0 00 | 0.00 | 0 00 | 0 00 |
| 10,800 00 | 0.00 | 0 00 | 10,800 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 10,900 00 | 0 00 | 0 00 | 10,900 00 | 0.00 | 0.00 | 0 00 | 0.00 | 0.00 | 0 00 |
| 11,000 00 | 0.00 | 0.00 | 11,000 00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 11,100 00 | 0 00 | 0 00 | 11,100.00 | 0.00 | 0 00 | 0.00 | 0 00 | 0.00 | 0.00 |
| 11,200 00 | 0.00 | 0.00 | 11,200.00 | 0 00 | 0.00 | 0.00 | 0 00 | 0.00 | 0 00 |
| 11,300 00 | 0.00 | 0.00 | 11,300.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,400 00 | 0 00 | 0.00 | 11,400.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 11,500.00 | 0 00 | 0 00 | 11,500.00 | 0.00 | 0.00 | 0 00 | 0.00 | 0 00 | 0 00 |
| 11,600.00 | 0.00 | 0.00 | 11,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | 0.00 |
| 11,700.00 | 0.00 | 0 00 | 11,700 00 | 0.00 | 0 00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 0.00 | 0.00 | 11,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 |
| 11,818.00 | 0 00 | 0 00 | 11,818 00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 9 75 | 179.55 | 11,899 61 | -6.96 | 0.05 | 6 96 | 11.89 | 11.89 | 0.00 |
| 12,000.00 | 21.63 | 179 55 | 11,995.71 | -33 95 | 0 27 | 33 95 | 11.89 | 11.89 | 0.00 |
| 12,100 00 | 33.52 | 179.55 | 12,084.19 | -80.16 | 0 63 | 80 17 | 11 89 | 11.89 | 0 00 |
| 12,200 00 | 45 41 | 179.55 | 12,161 25 | -143.61 | 1.13 | 143.61 | 11.89 | 11.89 | 0.00 |
| 12,300 00 | 57.30 | 179.55 | 12,223.59 | -221.57 | 1.74 | 221.57 | 11.89 | 11.89 | 0.00 |
| 12,400.00 | 69.18 | 179.55 | 12,268.53 | -310.69 | 2.44 | 310 70 | 11 89 | 11.89 | 0.00 |
| 12,500.00 | 81.07 | 179.55 | 12,294.16 | -407.17 | 3 20 | 407.18 | 11.89 | 11.89 | 0.00 |
| 12,575.12 | 90.00 | 179 55 | 12,300.00 | -481 99 | 3 79 | 482 00 | 11.89 | 11 89 | 0.00 |
| 12,575.39 | 90 00 | 179.56 | 12,300 00 | -482.25 | 3 79 | 482 27 | 3 00 | 0.00 | 3 00 |
| 12,600.00 | 90.00 | 179 56 | 12,300.00 | -506.86 | 3.98 | 506.88 | 0.00 | 0 00 | 0.00 |
| 12,700 00 | 90.00 | 179.56 | 12,300.00 | -606.86 | 4.75 | 606 88 | 0.00 | 0.00 | 0.00 |
| 12,800.00 | 90.00 | 179.56 | 12,300.00 | -706.85 | 5.52 | 706.88 | 0.00 | 0.00 | 0.00 |
| 12,900 00 | 90.00 | 179.56 | 12,300 00 | -806.85 | 6 29 | 806.88 | 0.00 | 0 00 | 0.00 |
| 13,000.00 | 90.00 | 179.56 | 12,300 00 | -906.85 | 7 06 | 906 88 | 0.00 | 0.00 | 0.00 |
| 13,100.00 | 90.00 | 179.56 | 12,300 00 | -1,006.85 | 7 83 | 1,006.88 | 0.00 | 0 00 | 0.00 |
| 13,200 00 | 90.00 | 179.56 | 12,300 00 | -1,106.84 | 8 61 | 1,106.88 | 0.00 | 0.00 | 0.00 |
| 13,300.00 | 90.00 | 179.56 | 12,300.00 | -1,206.84 | 9.38 | 1,206.88 | 0.00 | 0.00 | 0.00 |
| 13,400.00 | 90.00 | 179.56 | 12,300.00 | -1,306.84 | 10.15 | 1,306.88 | 0.00 | 0 00 | 0.00 |
| 13,500.00 | 90 00 | 179.56 | 12,300 00 | -1,406 83 | 10.92 | 1,406.88 | 0.00 | 0.00 | 0 00 |
| 13,600 00 | 90 00 | 179.56 | 12,300 00 | -1,506.83 | 11.69 | 1,506.88 | 0.00 | 0.00 | 0 00 |
| 13,700.00 | 90.00 | 179 56 | 12,300 00 | -1,606.83 | 12 46 | 1,606 88 | 0 00 | 0.00 | 0.00 |
| 13,800.00 | 90.00 | 179.56 | 12,300 00 | -1,706.82 | 13.23 | 1,706 88 | 0.00 | 0 00 | 0.00 |
| 13,900.00 | 90.00 | 179 56 | 12,300 00 | -1,806.82 | 14.00 | 1,806 88 | 0.00 | 0 00 | 0.00 |
| 14,000.00 | 90.00 | 179.56 | 12,300.00 | -1,906 82 | 14 78 | 1,906.88 | 0.00 | 0 00 | 0 00 |
| 14,100.00 | 90.00 | 179.56 | 12,300.00 | -2,006.82 | 15 55 | 2,006.88 | 0.00 | 0 00 | 0 00 |
| 14,200.00 | 90.00 | 179 56 | 12,300 00 | -2,106.81 | 16 32 | 2,106 88 | 0.00 | 0 00 | 0.00 |
| 14,300.00 | 90 00 | 179.56 | 12,300.00 | -2,206 81 | 17.09 | 2,206.88 | 0 00 | 0.00 | 0.00 |
| 14,400.00 | 90.00 | 179 56 | 12,300.00 | -2,306.81 | 17 86 | 2,306.88 | 0.00 | 0.00 | 0 00 |
| 14,500.00 | 90 00 | 179 56 | 12,300 00 | -2,406.80 | 18 63 | 2,406 88 | 0 00 | 0 00 | 0.00 |
| 14,600.00 | 90 00 | 179.56 | 12,300 00 | -2,506.80 | 19.40 | 2,506.88 | 0.00 | 0.00 | 0.00 |
| 14,700.00 | 90.00 | 179.56 | 12,300 00 | -2,606.80 | 20 18 | 2,606 88 | 0.00 | 0 00 | 0 00 |
| 14,800.00 | 90.00 | 179.56 | 12,300 00 | -2,706.80 | 20 95 | 2,706.88 | 0.00 | 0.00 | 0.00 |
| 14,900.00 | 90 00 | 179.56 | 12,300.00 | -2,806 79 | 21.72 | 2,806.88 | 0.00 | 0.00 | 0.00 |
| 15,000.00 | 90.00 | 179.56 | 12,300 00 | -2,906.79 | 22 49 | 2,906 88 | 0.00 | 0.00 | 0 00 |
| 15,100.00 | 90 00 | 179.56 | 12,300.00 | -3,006.79 | 23.26 | 3,006.88 | 0.00 | 0.00 | 0 00 |
| 15,200.00 | 90.00 | 179.56 | 12,300.00 | -3,106.78 | 24.03 | 3,106.88 | 0.00 | 0.00 | 0.00 |
| 15,300.00 | 90.00 | 179.56 | 12,300.00 | -3,206 78 | 24.80 | 3,206 88 | 0.00 | 0 00 | 0.00 |
| 15,400 00 | 90.00 | 179 56 | 12,300 00 | -3,306.78 | 25.57 | 3,306.88 | 0.00 | 0.00 | 0.00 |
| 15,500 00 | 90.00 | 179 56 | 12,300 00 | -3,406.77 | 26 35 | 3,406.88 | 0.00 | 0.00 | 0 00 |
| 15,600.00 | 90.00 | 179.56 | 12,300 00 | -3,506.77 | 27.12 | 3,506.88 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| Database: | EDM | Local Co-ordinate Reference: | Well Vaca 14 Fed #3 |
| Company: | Midland - New Mexico | TVD Reference: | WELL @ 3376 70ft (Original Well Elev) |
| Project: | Red Hills | MD Reference: | WELL @ 3376.70ft (Original Well Elev) |
| Site: | Vaca 14 Fed #3 | North Reference: | Grid |
| Well: | Vaca 14 Fed #3 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Vaca 14 Fed #3 | | |
| Design: | Original Plan | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (deg) | Azimuth (deg) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (?/100ft) | Build Rate (?/100ft) | Turn Rate (?/100ft) |
|---|---|---|---|---|---|---|---|---|---|
| 15,700 00 | 90 00 | 179.56 | 12,300 00 | -3,606.77 | 27.89 | 3,606 88 | 0.00 | 0.00 | 0.00 |
| 15,800 00 | 90.00 | 179 56 | 12,300.00 | -3,706 77 | 28.66 | 3,706.88 | 0.00 | 0 00 | 0 00 |
| 15,900.00 | 90.00 | 179 56 | 12,300 00 | -3,806 76 | 29.43 | 3,806.88 | 0.00 | 0 00 | 0 00 |
| 16,000 00 | 90.00 | 179 56 | 12,300.00 | -3,906.76 | 30 20 | 3,906.88 | 0.00 | 0 00 | 0.00 |
| 16,051.49 | 90 00 | 179 56 | 12,300.00 | -3,958 24 | 30.60 | 3,958 36 | 0 00 | 0.00 | 0.00 |
| 16,051.55 | 90.00 | 179.56 | 12,300.00 | -3,958 31 | 30.60 | 3,958.43 | 3.00 | 0.00 | 3 00 |
| **BHL (Vaca 14 #3)** | | | | | | | | | |

**Targets**

| Target Name - hit/miss target - Shape | Dip Angle (deg) | Dip Dir (deg) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| BHL (Vaca 14 #3) - plan hits target center - Point | 0.00 | 0.00 | 12,300.00 | -3,958 31 | 30 60 | 410,092.80 | 745,434.90 | 32° 7' 29.925 N | 103° 32' 25.901 W |

## WELL DETAILS: Vaca 14 Fed #3

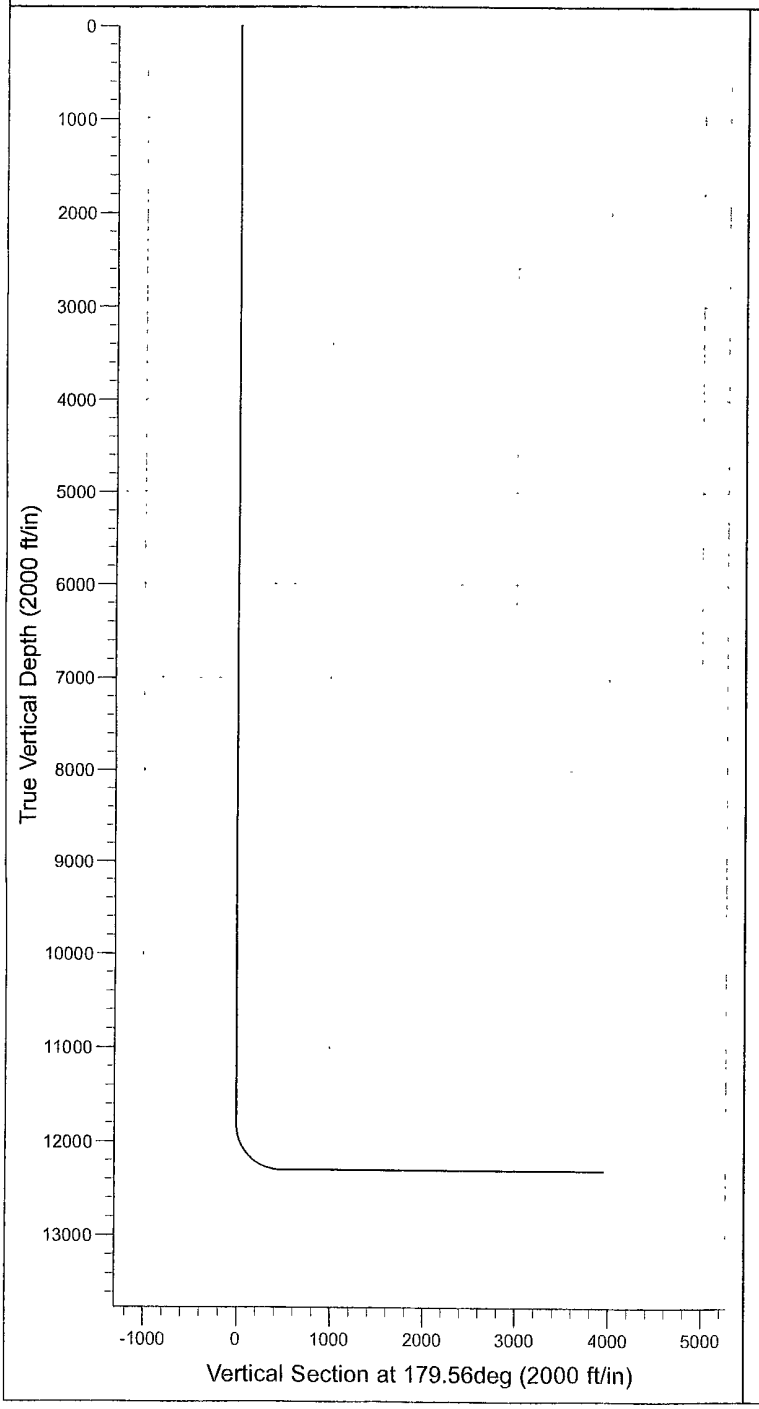
Ground Level: 3357.70

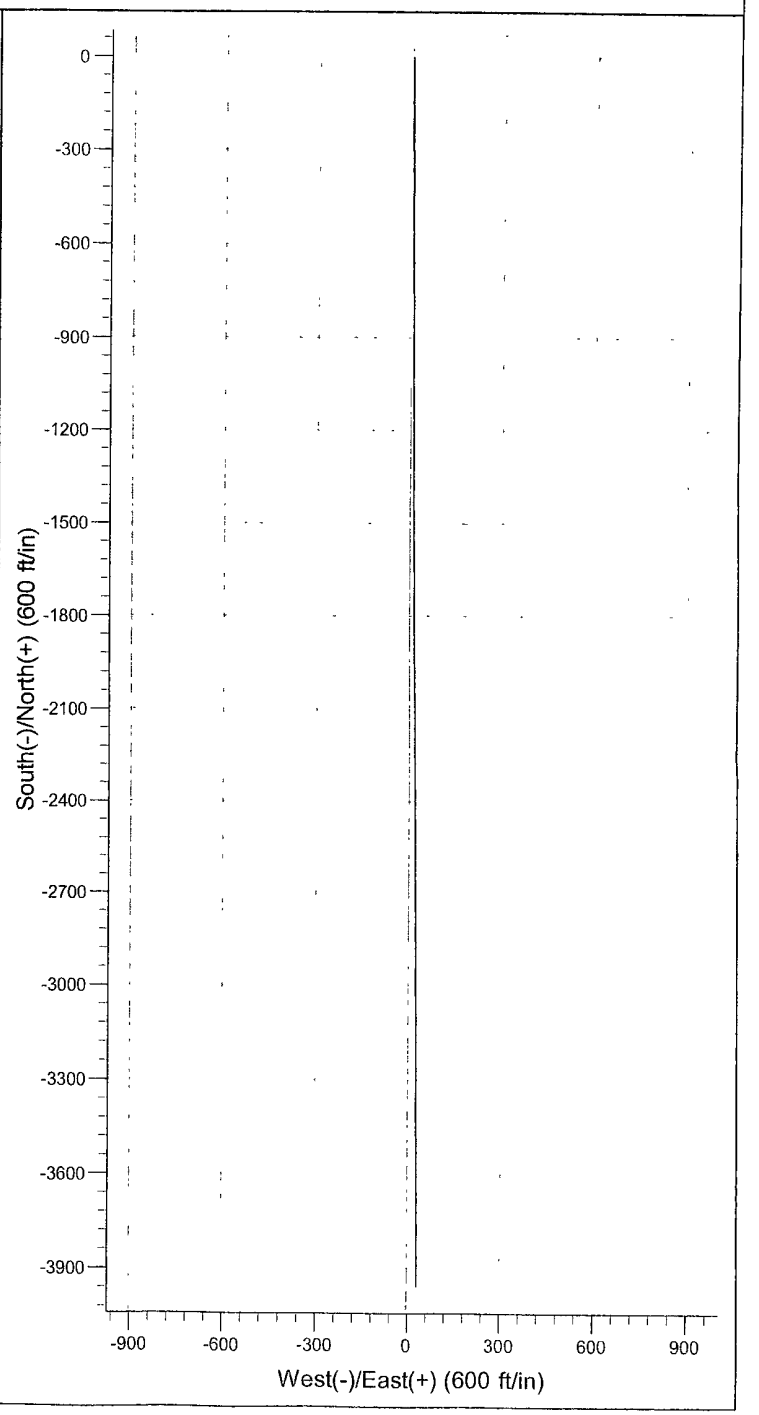
| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Slot |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 414051.10 | 745404.30 | 32° 8' 9.097 N | 103° 32' 25.918 W | |

## SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | VSec |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 11818.00 | 0.00 | 0.00 | 11818.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 12575.12 | 90.00 | 179.55 | 12300.00 | -481.99 | 3.79 | 11.89 | 179.55 | 482.00 |
| 4 | 12575.39 | 90.00 | 179.56 | 12300.00 | -482.25 | 3.79 | 3.00 | 90.00 | 482.27 |
| 5 | 16051.49 | 90.00 | 179.56 | 12300.00 | -3958.24 | 30.60 | 0.00 | 0.00 | 3958.36 |
| 6 | 16051.55 | 90.00 | 179.56 | 12300.00 | -3958.31 | 30.60 | 3[illegible] | [illegible] | 3958.43 |





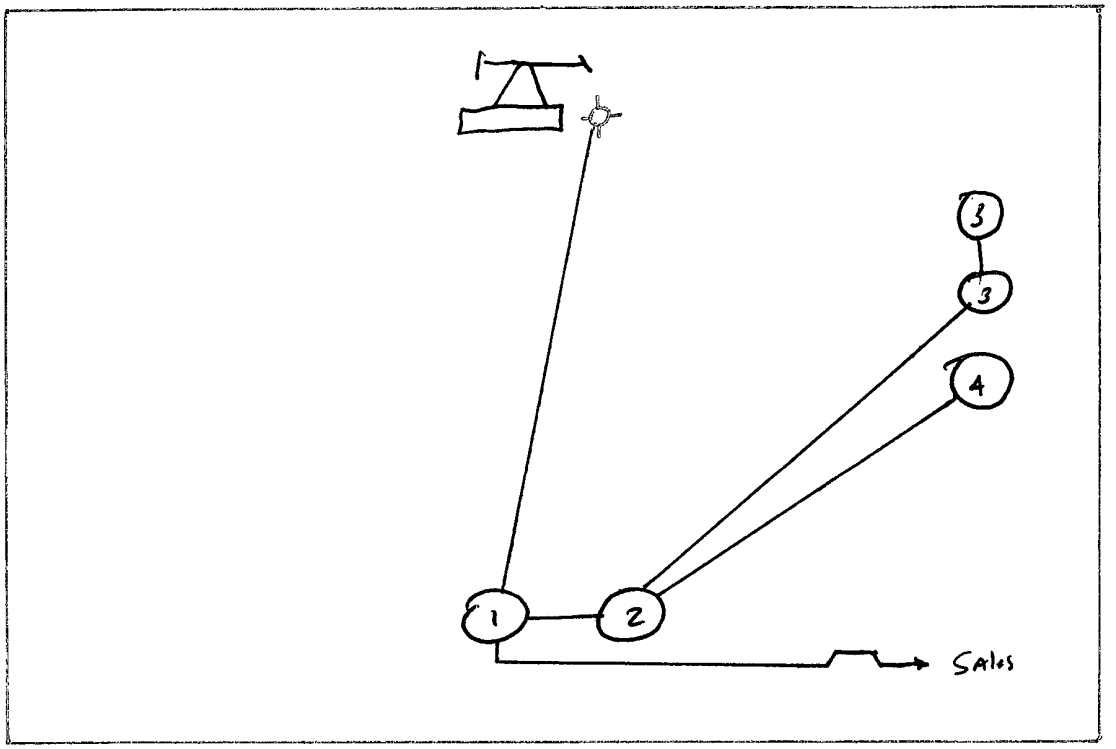
PRODUCTION FACILITY LAYOUT

Exhibit 4

WELL NAME: Vaca 14 Fed 3

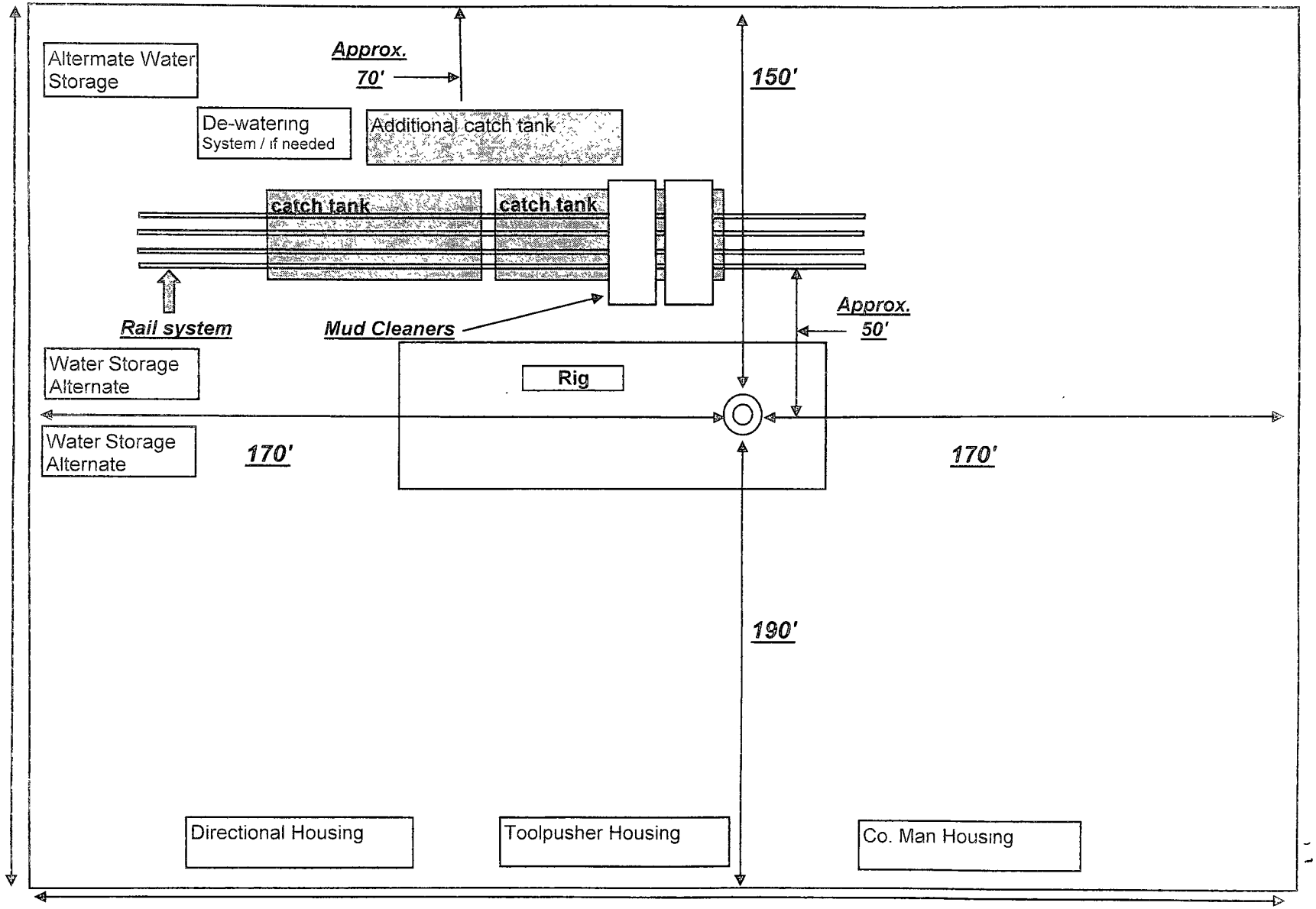

CLOSED LOOP EQUIPMENT

Closed Loop EQUIPMENT




"NOT TO SCALE"

1. Separator
2. Heater
3. O:1 Tank
4. Water Tank




*EOG Resources / Closed Loop Location Design Plan*

Not to scale

6/30/2008

## ATTACHMENT TO EXHIBIT #1

1. Wear ring to be properly installed in head.

2. Blow out preventer and all fittings must be in good condition, 5000 psi W.P. minimum. Exhibit #1.

3. All fittings to be flanged

4. Safety valve must be available on rig floor at all times with proper connections, valve to be full bore 5000 psi W.P. minimum.

5. All choke and fill lines to be securely anchored especially ends of choke lines.

6. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.

7. Kelly cock on kelly.

8. Extension wrenches and hand wheels to be properly installed.

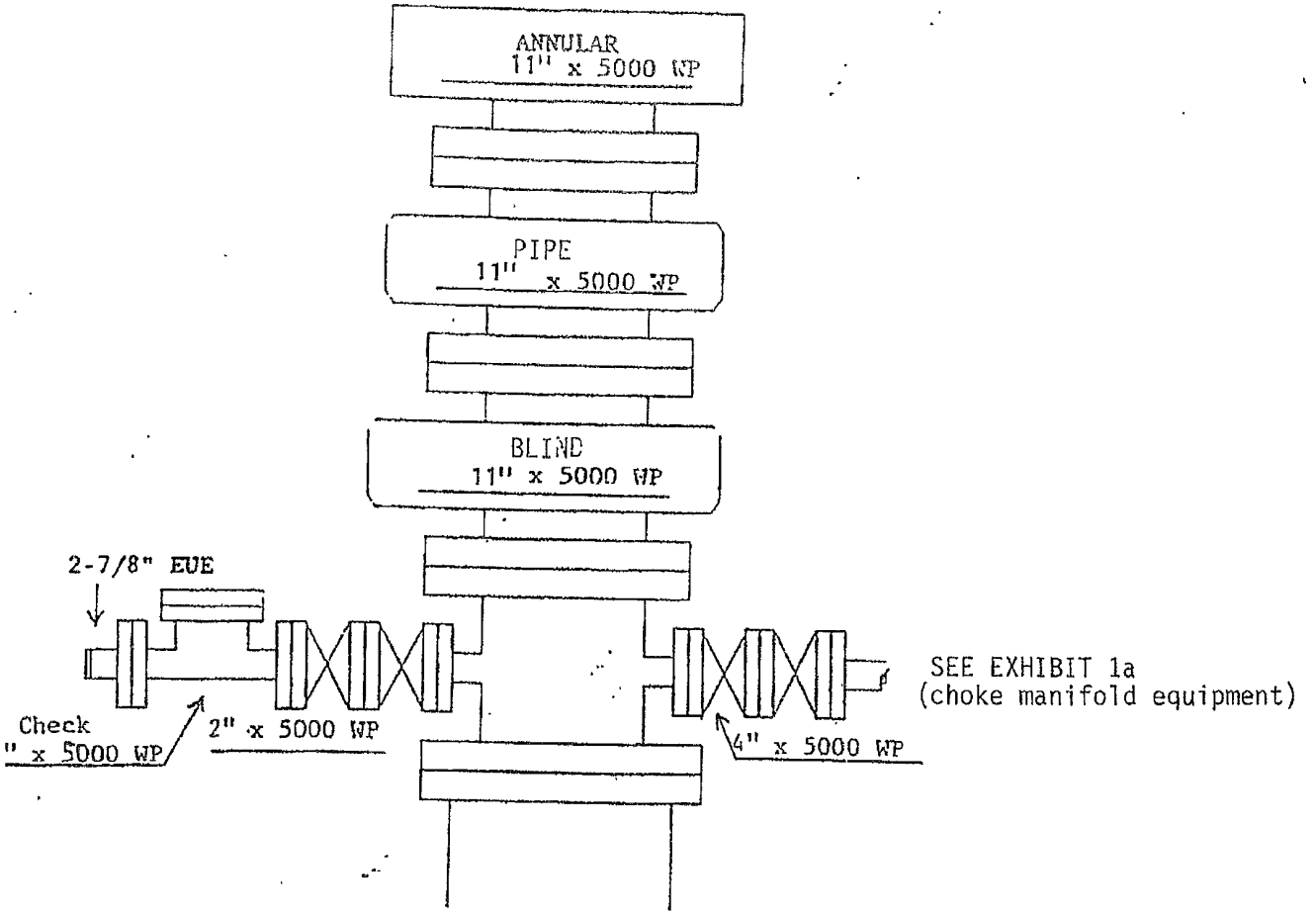
9. Blow out preventer control to be located as close to driller's position as feasible.

10. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation, and meet all API specifications.

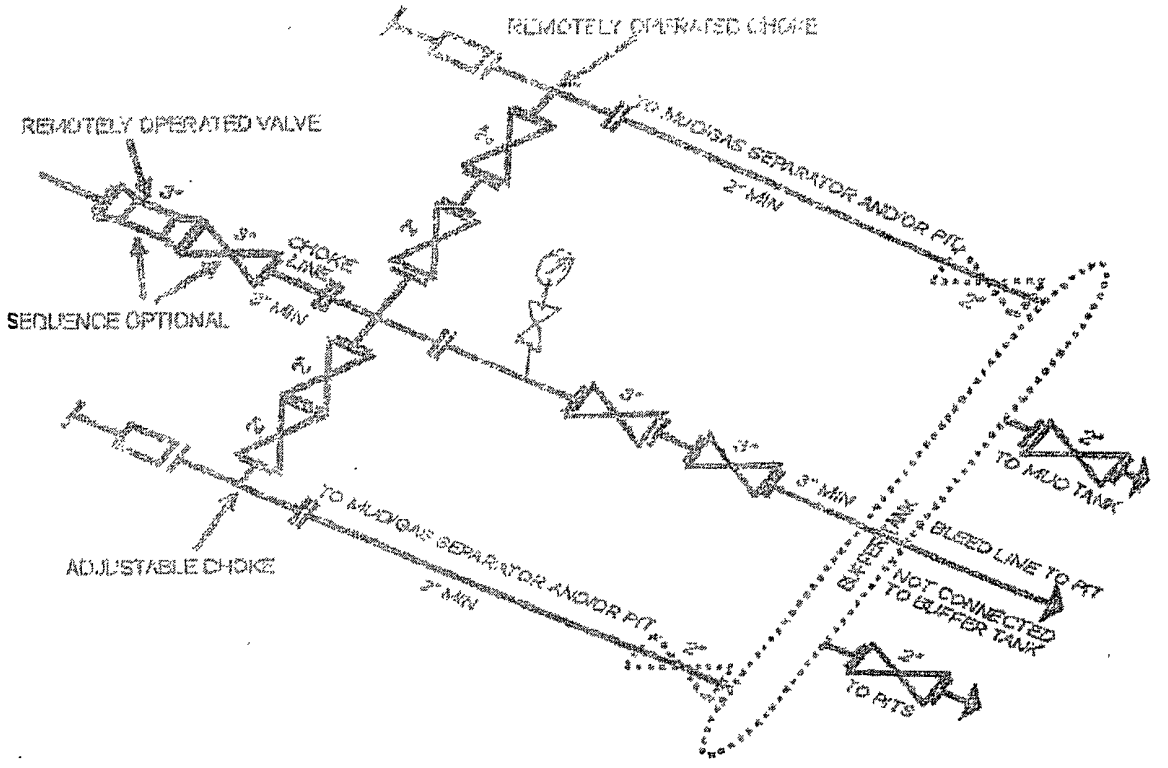
EXHIBIT 1

EOG Resources, Inc.

Vaca 14 Fed 3



WELL NAME: VACA 14 Fed 3 Exhibit 1a




## 5M CHOKE MANIFOLD EQUIPMENT - CONFIGURATION OF CHOKES MAY VARY

**Although not required for any of the choke manifold systems, buffer tanks are sometimes installed downstream of the choke assemblies for the purpose of manifolding the bleed lines together. When buffer tanks are employed, valves shall be installed upstream to isolate a failure or malfunction without interrupting flow control. Though not shown on 2M, 3M, 10M, OR 15M drawings, it would also be applicable to those situations.**

**[54 FR 39528, Sept. 27, 1989]**

# OPERATOR CERTIFICATION

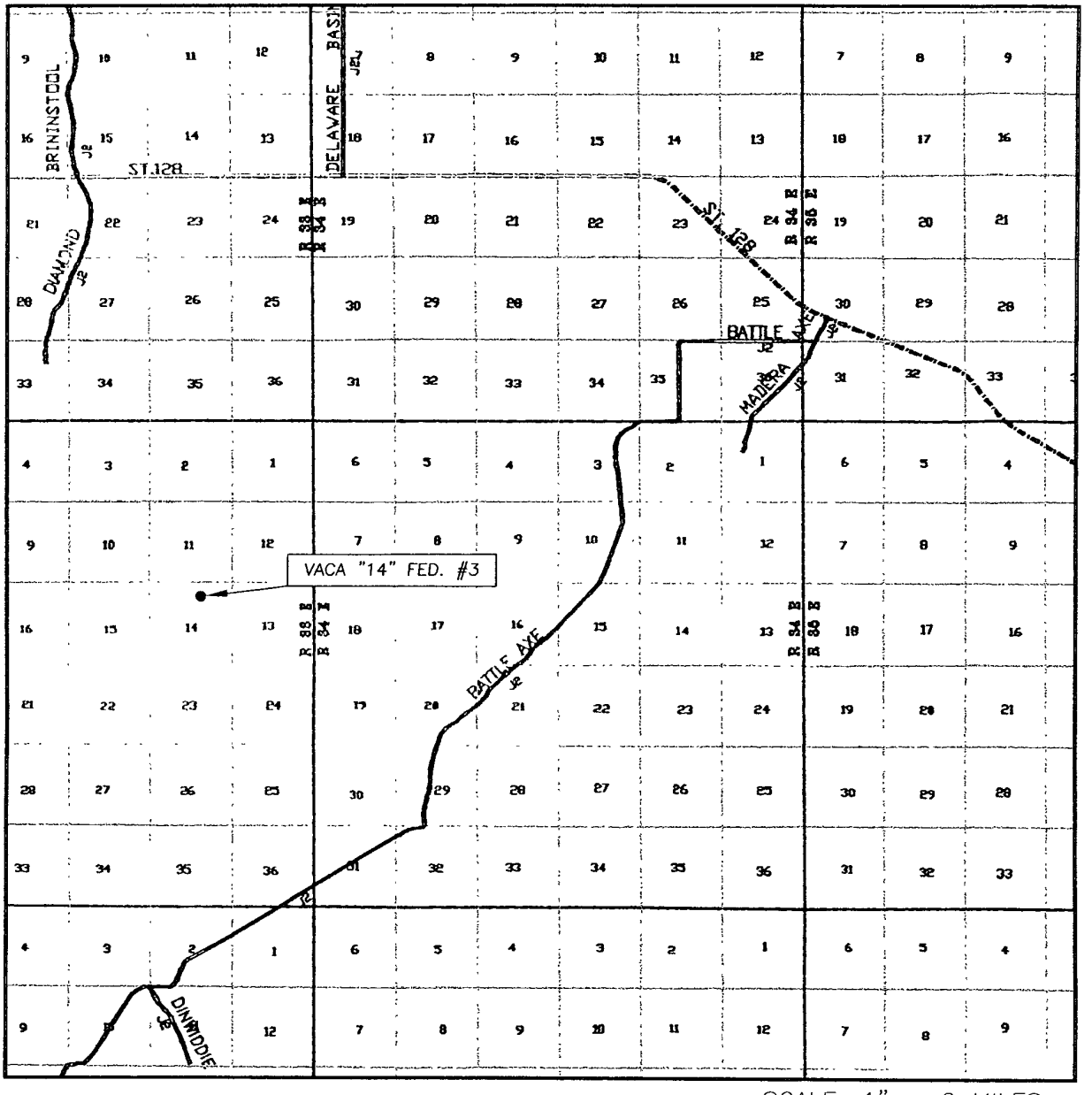
I certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal Laws applicable to this operation; that the statements made in this APD 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. Executed this 22nd day of November 2008.

Name: Donny G. Glanton
Position: Sr. Lease Operations ROW Representative
Address: P.O. Box 2267 Midland, TX 79705
Telephone: 432-686-3642
Email: donny_glanton@eogresources.com

Signed: Don G. Mly

Exhibit 2

# VICINITY MAP




SEC. 14 TWP. 25-S RGE. 33-E
SURVEY N.M.P.M.
COUNTY LEA
DESCRIPTION 660' FNL & 1980' FEL
ELEVATION 3357.7'
OPERATOR EOG RESOURCES INC.
LEASE VACA "14" FED. #3

SCALE: 1" = 2 MILES

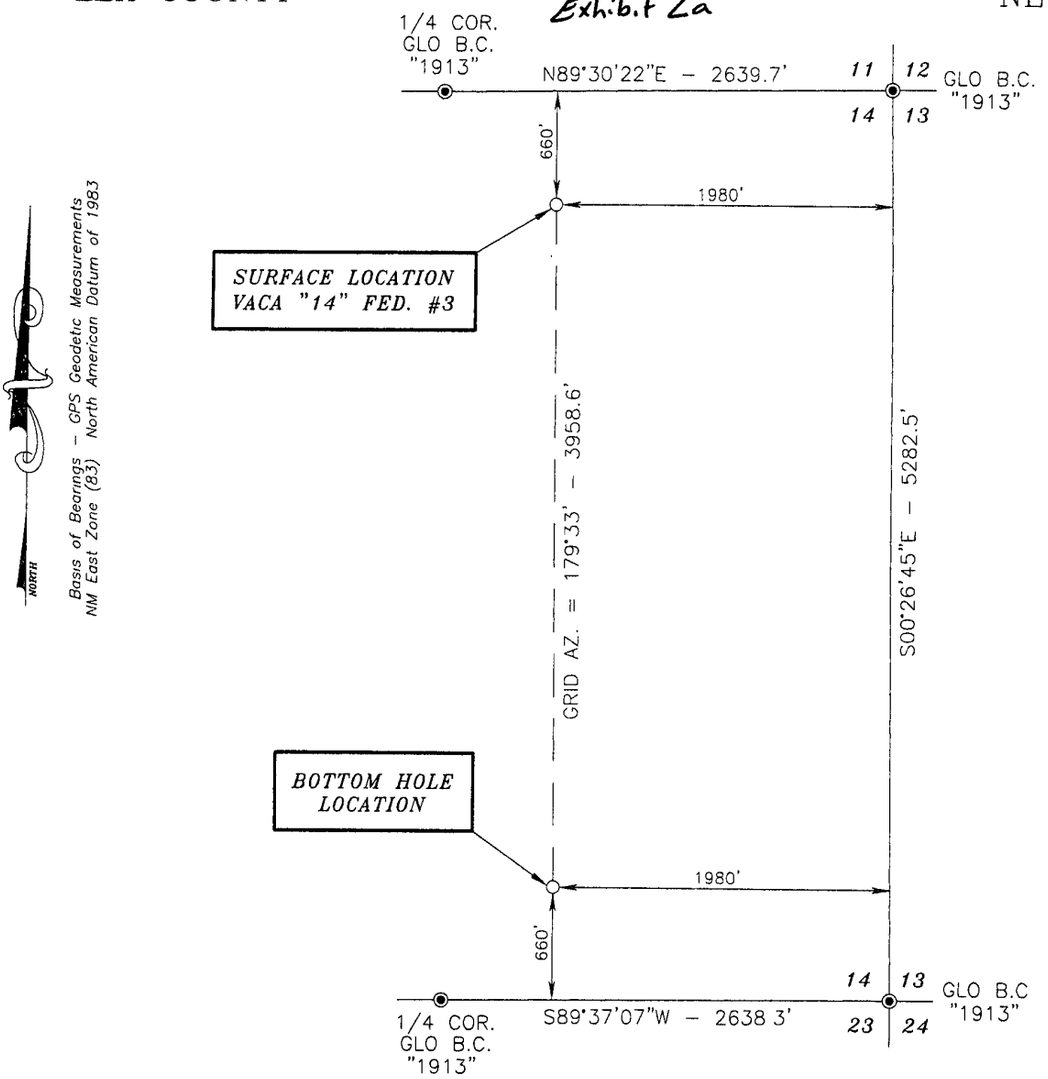
Asel Surveying

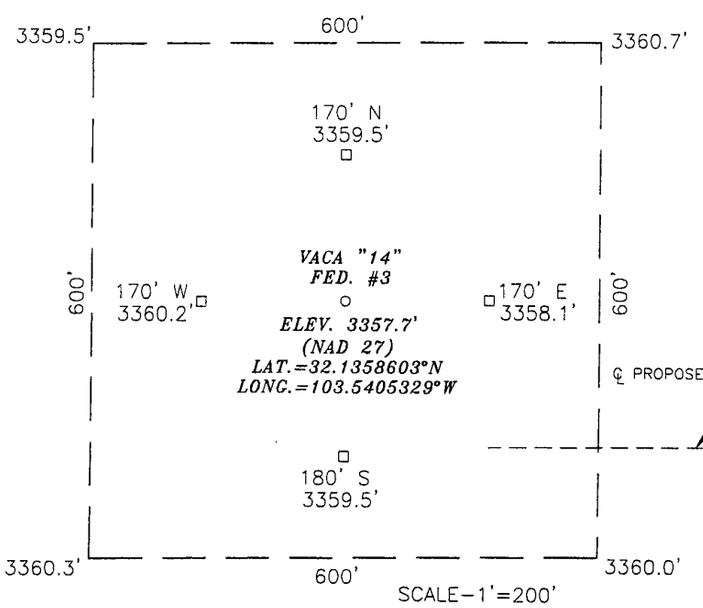
P.O BOX 393 - 310 W TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

DIRECTIONS BEGINNING IN JAL AT THE INTERSECTION OF N.M. STATE HWY. #18 AND N.M. STATE HWY. #128, GO WEST ON N.M. STATE HWY. #128 FOR 22.0 MILES, TURN LEFT AND GO SOUTH ON LEASE ROAD FOR 6.3 MILES, TURN LEFT AND GO WEST FOR 0.2 MILES, GO SOUTHWEST FOR 0.3 MILES, GO NORTHWEST FOR 0.2 MILES, GO WEST FOR 0.1 MILES TO LOCATION.

# SECTION 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY NEW MEXICO

Exhibit 2a




DIRECTIONS:
BEGINNING IN JAL AT THE INTERSECTION OF N.M. STATE HWY. #18 AND N.M. STATE HWY. #128, GO WEST ON N.M. STATE HWY. #128 FOR 22.0 MILES, TURN LEFT AND GO SOUTH ON LEASE ROAD FOR 6.3 MILES, TURN LEFT AND GO WEST FOR 0.2 MILES, GO SOUTHWEST FOR 0.3 MILES, GO NORTHWEST FOR 0.2 MILES, GO WEST FOR 0.1 MILES TO LOCATION.

***LEGEND***

◉ – DENOTES FOUND MONUMENT AS NOTED

1000' 0 1000' 2000' FEET

SCALE: 1"=1000'

**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 10/31/2008

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

TERRY J. ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

Asel Surveying

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

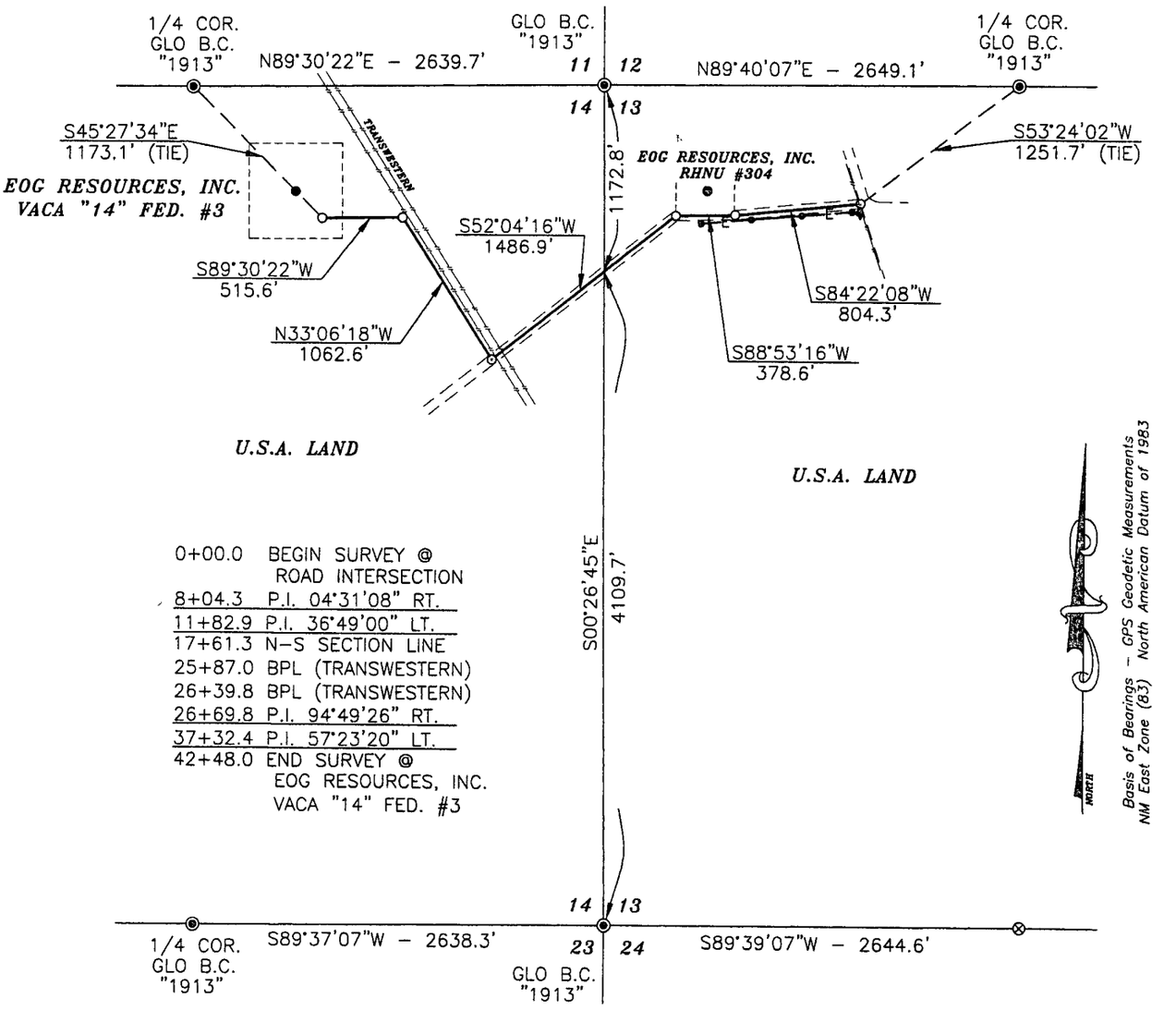
# EOG RESOURCES, INC.

VACA "14" FED. #3 LOCATED AT 660' FNL & 1980' FEL IN SECTION 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

| | | |
|---|---|---|
| Survey Date: 10/21/08 | Sheet 1 of 1 Sheets | |
| W.O. Number: 081021WL (Rev. A) | Drawn By: KA | Rev: A |
| Date: 10/30/08 | 081021WL | Scale:1"=1000' |

# SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY NEW MEXICO

Exhibit 2b




DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 4248.0 FEET OR 0.805 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED SURVEY.

TERRY J. ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**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 11/7/2008

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


Asel Surveying

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


***LEGEND***

◉ – DENOTES FOUND MONUMENT AS NOTED
⊗ – DENOTES CALCULATED CORNER

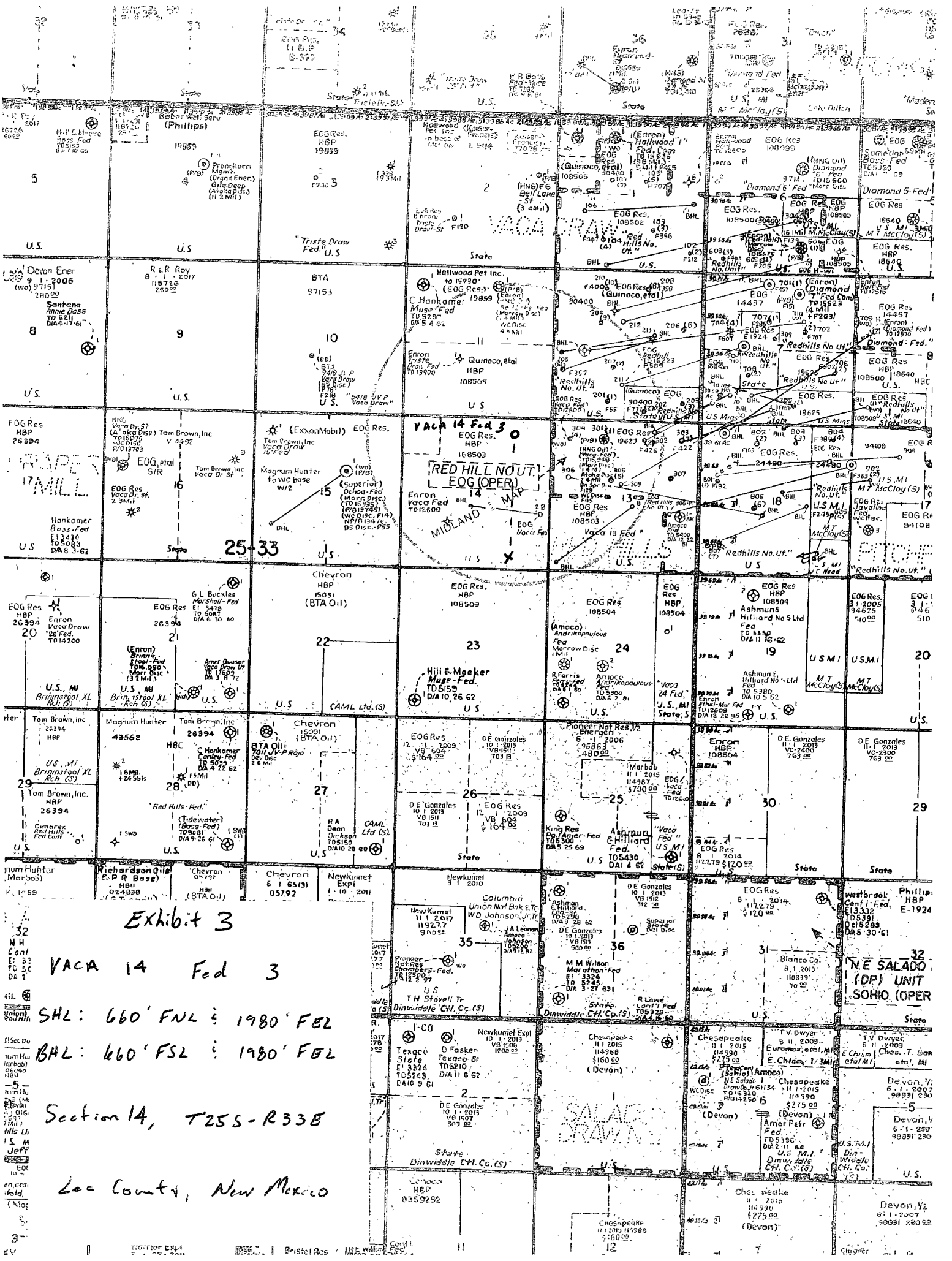
1000' 0 1000' 2000' FEET

SCALE: 1"=1000'

# EOG RESOURCES, INC.

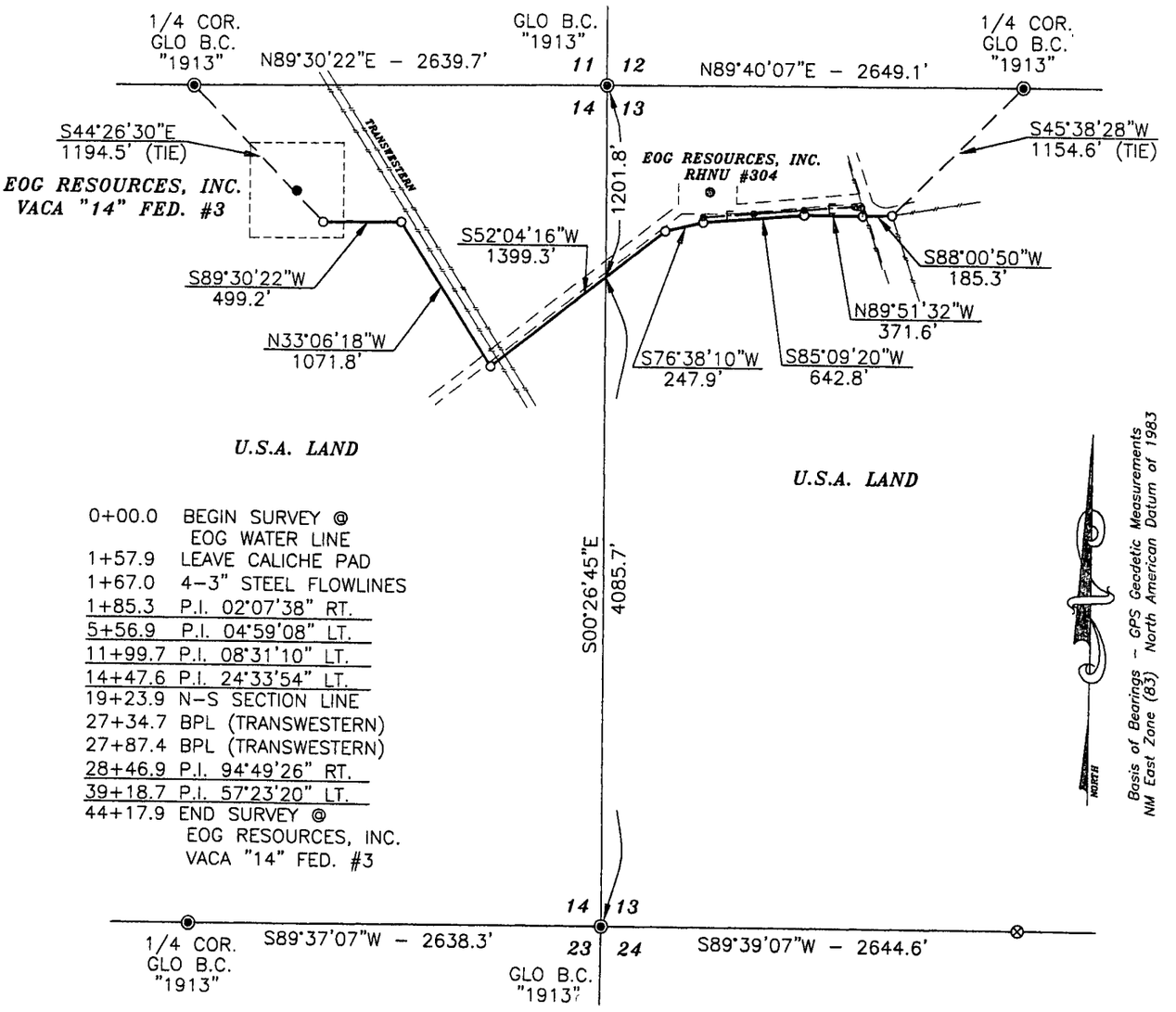
SURVEY FOR A ROAD EASEMENT IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

| | |
|---|---|
| Survey Date: 11/04/08 | Sheet 1 of 1 Sheets |
| W.O. Number: 081021RD | Drawn By: KA |
| Date: 11/06/08 | 081021RD.DWG Scale:1"=1000' |


VACA RAN
SALADO DRAW
RED HILL NO UT.
EOG (OPER.)
VACA 14 Fed 3
MIDLAND MAP
Exhibit 3
VACA 14 Fed 3
SHL: 660' FNL & 1980' FEL
BHL: 660' FSL & 1980' FEL
Section 14, T25S-R33E
Lea County, New Mexico

# SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY NEW MEXICO

Exhibit 6




| | |
|---|---|
| 0+00.0 | BEGIN SURVEY @ EOG WATER LINE |
| 1+57.9 | LEAVE CALICHE PAD |
| 1+67.0 | 4–3" STEEL FLOWLINES |
| 1+85.3 | P.I. 02°07'38" RT. |
| 5+56.9 | P.I. 04°59'08" LT. |
| 11+99.7 | P.I. 08°31'10" LT. |
| 14+47.6 | P.I. 24°33'54" LT. |
| 19+23.9 | N–S SECTION LINE |
| 27+34.7 | BPL (TRANSWESTERN) |
| 27+87.4 | BPL (TRANSWESTERN) |
| 28+46.9 | P.I. 94°49'26" RT. |
| 39+18.7 | P.I. 57°23'20" LT. |
| 44+17.9 | END SURVEY @ EOG RESOURCES, INC. VACA "14" FED. #3 |

DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 4417.9 FEET OR 0.837 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED SURVEY.

TERRY J. ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**LEGEND**

◉ – DENOTES FOUND MONUMENT AS NOTED

⊗ – DENOTES CALCULATED CORNER

1000' 0 1000' 2000' FEET

SCALE: 1"=1000'

**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 11/7/2008

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


Asel Surveying

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

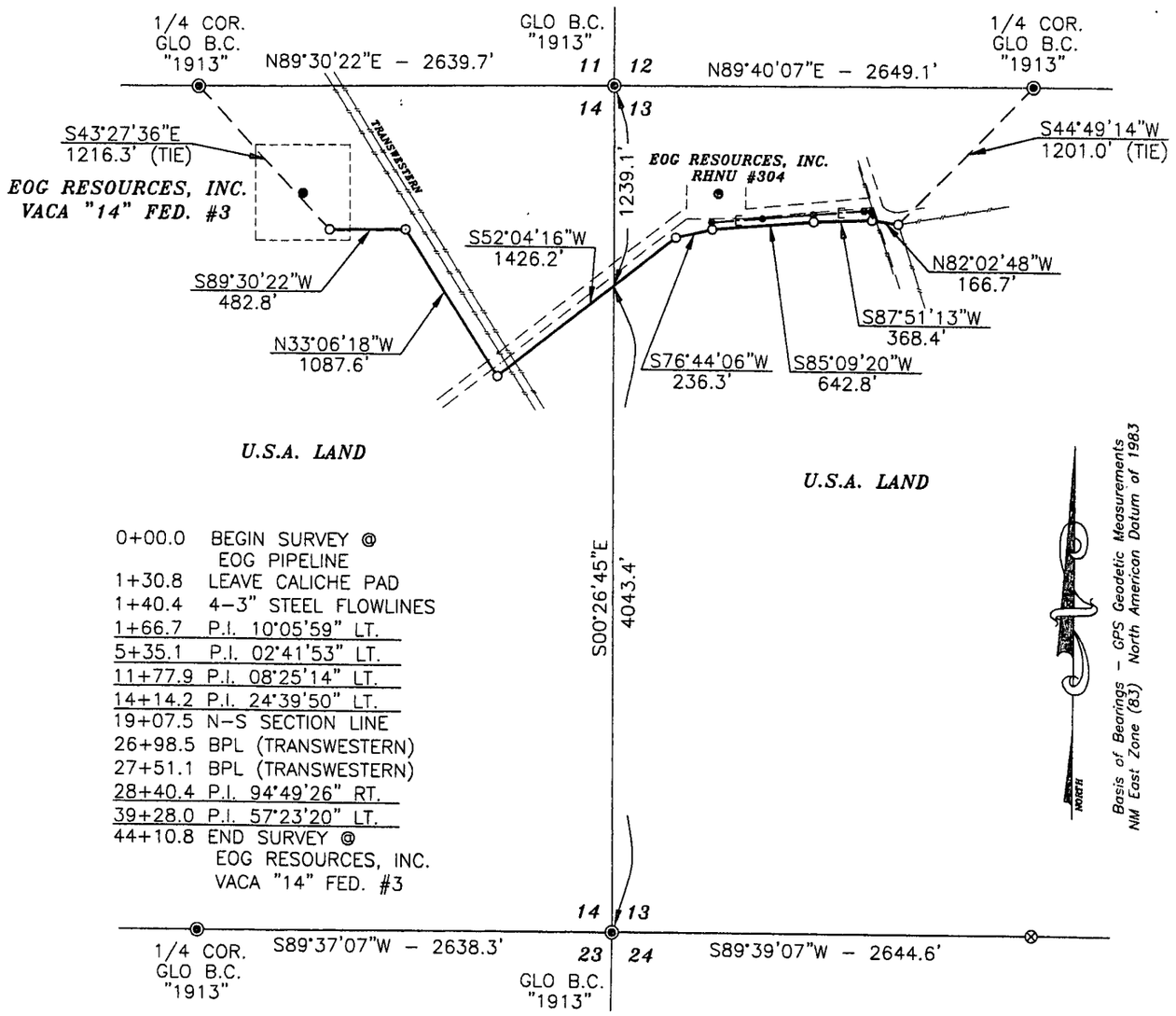

# EOG RESOURCES, INC.

SURVEY FOR A PROPOSED ELECTRIC LINE / WATER LINE EASEMENT IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

| | | | |
|---|---|---|---|
| Survey Date: 11/04/08 | | Sheet 1 of 1 Sheets | |
| W.O. Number: 081021EL | | Drawn By: KA | |
| Date: 11/06/08 | | 081021EL.DWG | Scale:1"=1000' |

# SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY NEW MEXICO

Exhibit 7




| | |
|---|---|
| 0+00.0 | BEGIN SURVEY @ EOG PIPELINE |
| 1+30.8 | LEAVE CALICHE PAD |
| 1+40.4 | 4–3" STEEL FLOWLINES |
| 1+66.7 | P.I. 10°05'59" LT. |
| 5+35.1 | P.I. 02°41'53" LT. |
| 11+77.9 | P.I. 08°25'14" LT. |
| 14+14.2 | P.I. 24°39'50" LT. |
| 19+07.5 | N–S SECTION LINE |
| 26+98.5 | BPL (TRANSWESTERN) |
| 27+51.1 | BPL (TRANSWESTERN) |
| 28+40.4 | P.I. 94°49'26" RT. |
| 39+28.0 | P.I. 57°23'20" LT. |
| 44+10.8 | END SURVEY @ EOG RESOURCES, INC. VACA "14" FED. #3 |

## DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 4410.8 FEET OR 0.835 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED SURVEY.

TERRY J. ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**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 11/7/2008

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


Asel Surveying

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


***LEGEND***

⊙ – DENOTES FOUND MONUMENT AS NOTED
⊗ – DENOTES CALCULATED CORNER

1000' 0 1000' 2000' FEET

SCALE: 1"=1000'

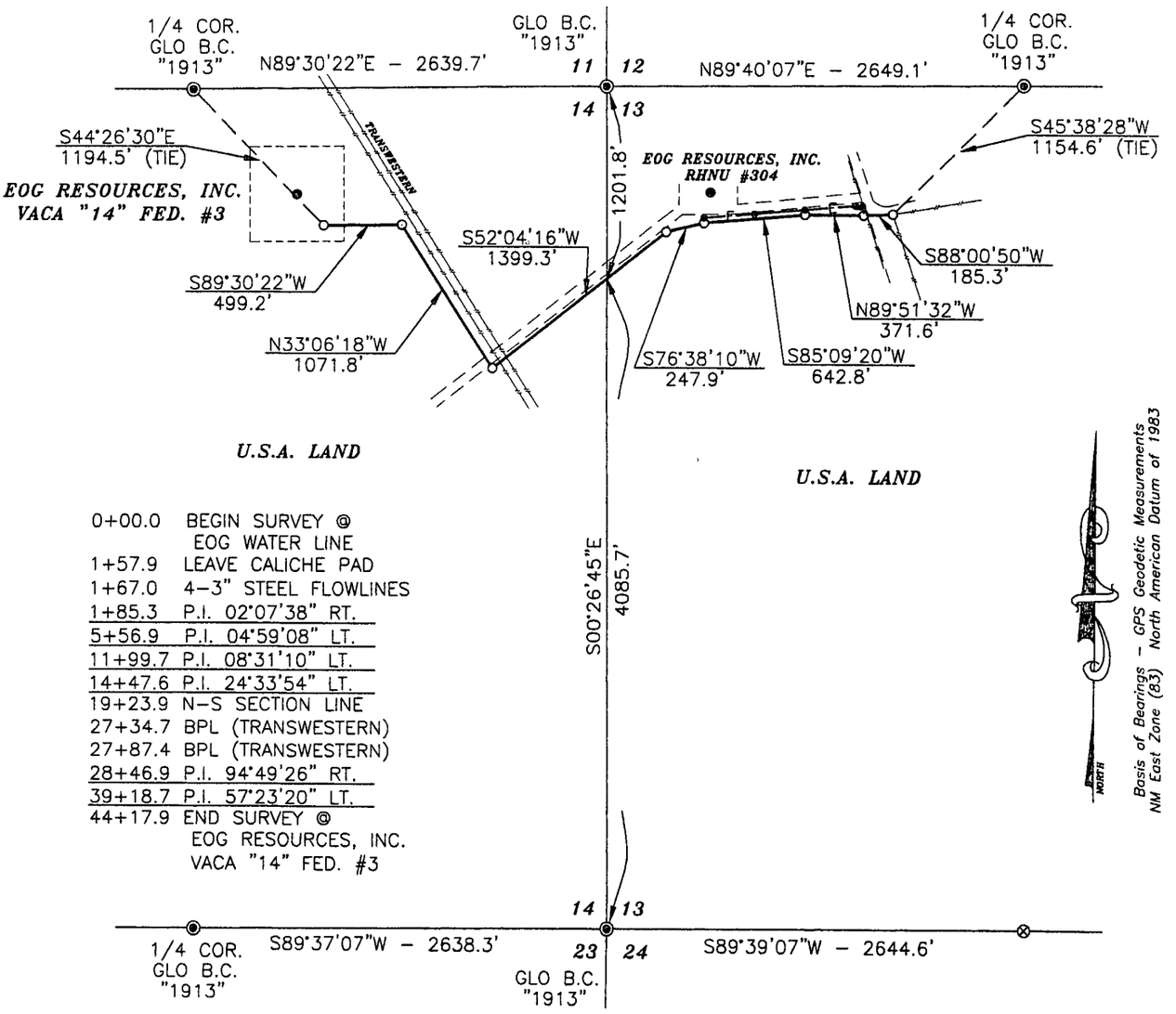
# EOG RESOURCES, INC.

SURVEY FOR A PIPELINE EASEMENT IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

| | | | |
|---|---|---|---|
| Survey Date: 11/04/08 | | Sheet 1 of 1 Sheets | |
| W.O. Number: 081021PL | | Drawn By: KA | |
| Date: 11/06/08 | | 081021PL.DWG | Scale:1"=1000' |

# SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY NEW MEXICO

Exhibit B




| | |
|---|---|
| 0+00.0 | BEGIN SURVEY @ EOG WATER LINE |
| 1+57.9 | LEAVE CALICHE PAD |
| 1+67.0 | 4–3" STEEL FLOWLINES |
| 1+85.3 | P.I. 02°07'38" RT. |
| 5+56.9 | P.I. 04°59'08" LT. |
| 11+99.7 | P.I. 08°31'10" LT. |
| 14+47.6 | P.I. 24°33'54" LT. |
| 19+23.9 | N–S SECTION LINE |
| 27+34.7 | BPL (TRANSWESTERN) |
| 27+87.4 | BPL (TRANSWESTERN) |
| 28+46.9 | P.I. 94°49'26" RT. |
| 39+18.7 | P.I. 57°23'20" LT. |
| 44+17.9 | END SURVEY @ EOG RESOURCES, INC. VACA "14" FED. #3 |

## DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 4417.9 FEET OR 0.837 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED SURVEY.

TERRY J. ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

**LEGEND**

◉ – DENOTES FOUND MONUMENT AS NOTED
⊗ – DENOTES CALCULATED CORNER

1000' 0 1000' 2000' FEET
SCALE: 1"=1000'

## 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 11/7/2008

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


Asel Surveying

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


# EOG RESOURCES, INC.

SURVEY FOR A PROPOSED ELECTRIC LINE / WATER LINE EASEMENT IN SECTIONS 13 & 14, TOWNSHIP 25 SOUTH, RANGE 33 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

| | | | |
|---|---|---|---|
| Survey Date: | 11/04/08 | Sheet 1 of 1 Sheets | |
| W.O. Number: | 081021EL | Drawn By: KA | |
| Date: | 11/06/08 | 081021EL.DWG | Scale:1"=1000' |

# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | EOG Resources, Inc. |
| LEASE NO.: | NM-108503 |
| WELL NAME & NO.: | VACA 14 Federal #3 |
| SURFACE HOLE FOOTAGE: | 660' FNL & 1980' FEL |
| BOTTOM HOLE FOOTAGE | 660' FSL & 1980' FEL |
| LOCATION: | Section 14, T. 25 S., R 33 E., NMPM |
| COUNTY: | Lea County, New Mexico |

## TABLE OF CONTENTS

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


☐ **General Provisions**
☐ **Permit Expiration**
☐ **Archaeology, Paleontology, and Historical Sites**
☐ **Noxious Weeds**
☒ **Special Requirements**
- **Pipeline & Electric line not authorized**
- Lesser Prairie Chicken

☐ **Construction**
- Notification
- Topsoil
- Reserve Pit
- Federal Mineral Material Pits
- Well Pads
- Roads

☐ **Road Section Diagram**
☒ **Drilling**
- **Surface Casing**

☐ **Production (Post Drilling)**
- Well Structures & Facilities

☐ **Interim Reclamation**
☐ **Final Abandonment/Reclamation**

## 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)

**PIPELINE AND ELECTRIC LINE, APPLIED FOR WITH THE APPLICATION, CROSSES LEASE BOUNDARIES AND WILL REQUIRE A RIGHT-OF-WAY PERMIT.**

LESSER PRAIRIE-CHICKENS

No surface use is allowed during the following time periods; unless otherwise specified, this stipulation does not apply to operation and maintenance of production facilities.

For the purpose of: Protecting Lesser Prairie-Chickens:

> 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, geophysical exploration other than 3-D operations, and 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 ft. from the source of the noise.

## 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) 234-5972 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 stockpile the topsoil of the well pad. The topsoil to be stripped is approximately 8 inches in depth. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

### C. RESERVE PITS

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

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. 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. 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 thirty (30) 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.

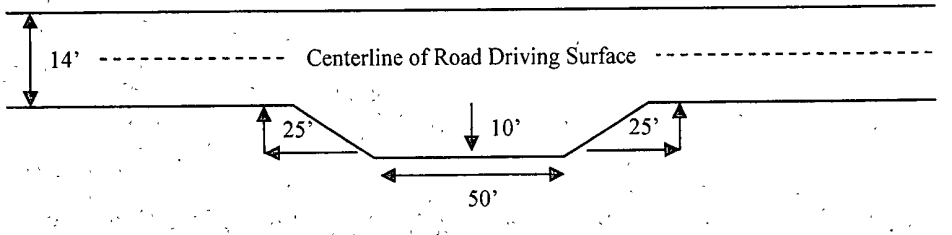
**Crowning**
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

**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 be constructed on all blind curves. Turnouts shall conform to the following diagram:

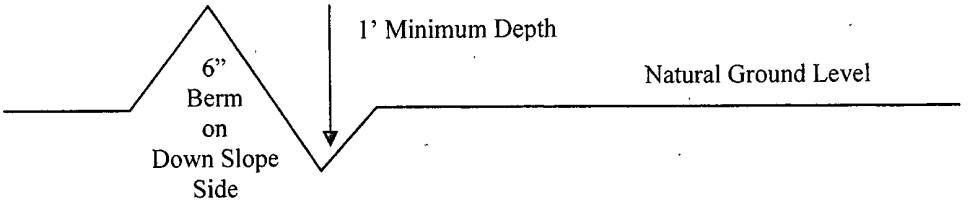
**Standard Turnout – Plan View**



**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

**Culvert Installations**
Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

**Cattleguards**
An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road 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 cattleguard(s) that are in place and are utilized during lease operations.

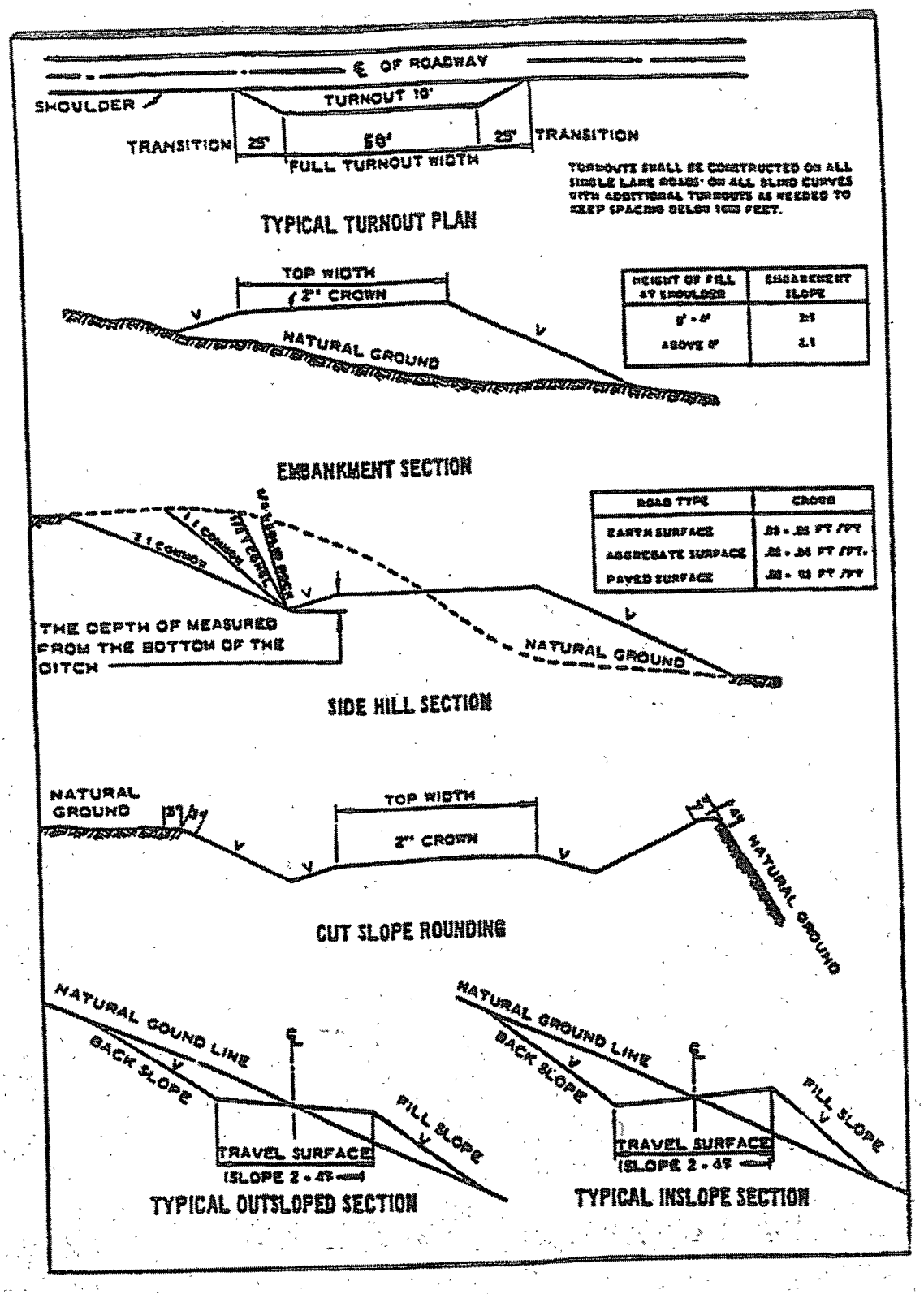
A gate shall be constructed and fastened securely to H-braces.

**Fence Requirement**
Where entry is required 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 fence(s).

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

## Figure 1 – Cross Sections and Plans For Typical Road Sections



## VII. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

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

1. **Although Hydrogen Sulfide has not been reported in this section, it is always a possible hazard. It has been reported in the sections to the East and West in the Bone Spring formation. It is recommended that monitoring equipment be onsite for potential Hydrogen Sulfide. If Hydrogen Sulfide is encountered, please report measured amounts and formations to the BLM.**

2. 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.

3. 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.

### B. CASING

**Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.**

**Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**

**Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.**

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

**Possible lost circulation in the Castile and Delaware Mountain Groups.**
**Possible water flows in the Salado, Castile and Delaware Mountain Groups.**

1. The **13-3/8** inch surface casing shall be set **at approximately 1175 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface. **Fresh water mud to be used to setting depth. Additional cement required due to additional depth.**

**Onshore Order II requires casing to be set across a competent bed and the Rustler Anhydrite is the first formation that meets that criteria.**

   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 a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

   **b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**

   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 minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

   ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

**Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

3. The minimum required fill of cement behind the 7 inch production casing is:

   ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

**Formation below the 7" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.**

**Centralizers required on horizontal leg, must be type for horizontal service and minimum of one every other joint.**

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

   ☒ Cement to come to top of liner. Operator shall provide method of verification. **Additional cement may be required as excess calculated to less than 20%.**

5. 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.

## C. 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. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8"** intermediate casing shoe shall be **5000 (5M)** psi.

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

   a. The tests shall be done by an independent service company.

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

c. 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.

d. 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.

## D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

**WWI 011009**

# VIII. 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.

**Containment Structures**
The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

**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, Munsell Soil Color Chart # 5Y 4/2

# IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE

## A. INTERIM RECLAMATION

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting 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.

The operators should work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions 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 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.

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 |
| **Four-winged Saltbush | 5lbs/A |

* This can be used around well pads and other areas where caliche cannot be removed.

*Pounds of pure live seed:

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

(Insert Seed Mixture Here)

## X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.